

ΑΡΙΣΤΟΤΕΛΟΥΣ ΦΥΣΙΚΗ ΑΚΡΟΑΣΙΣ

ARISTOTLE'S
PHYSICS

A REVISED TEXT
WITH INTRODUCTION AND COMMENTARY

BY

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PREFACE

THE *Physics* has always been recognized to be one of the most important of Aristotle's works, and it is therefore rather surprising that, until the appearance of Wicksteed and Cornford's edition, no edition with an introduction and commentary had been produced in modern times. The need of such an edition was brought home to me when I was engaged in preparing for publication the translation by R. P. Hardie and R. K. Gaye; and the task of an editor had been facilitated by the Berlin Academy's editions of the paraphrase by Themistius and of the commentaries of Philoponus and Simplicius. I had some hopes that new light might be thrown on the text by a collation of the hitherto neglected Vienna MS. Gr. 100; but these have hardly been realized, since that MS. does not preserve many good readings that were not already known to exist in other MSS. More light has in fact been derived from a study of the three Greek commentators. I owe much to the careful and scholarly work of Messrs. Hardie and Gaye; and at an earlier stage I learned much in the pleasant hours spent, in reading the *Physics* as a member of the Oxford Aristotelian Society, under the guidance of such consummate Aristotelians as Professors Bywater, Smith, and Joachim.

I have varied the plan adopted in my edition of the *Metaphysics*, by printing the analysis continuously instead of prefixing it to the several chapters; I hope that this will make it easier for readers to follow the course of the magnificently continuous argument which runs, in particular, through books v, vi, and viii.

It would have been possible, and might have been profitable, to make the Introduction much longer, by attempting to discuss more fully the philosophical merits of Aristotle's argument and of the resultant doctrines; but I thought that the interests of readers would on the whole be better served by keeping the work within the limits of a single volume. I have tried to supply, in text and commentary, the foundation on which such a discussion by others may be based.

I wish to acknowledge with gratitude the provision by the Jowett Copyright Fund of a subsidy which has assisted the publication of the book, and to thank the officers and staff of the Clarendon Press for the care they have bestowed on its production. I would also thank Mr. D. J. Allan, Fellow of Balliol College, for his kindness in looking up some doubtful readings of the Paris MSS. 1859 and 1861.

W. D. R.

CONTENTS

BOOKS REFERRED TO viii

INTRODUCTION :

I. THE STRUCTURE OF THE <i>PHYSICS</i>	I
II. ARISTOTLE'S NATURAL PHILOSOPHY	19
III. THE TEXT OF THE <i>PHYSICS</i>	102

PHYSICS :

TEXT	119
SIGLA	120
SECOND VERSION OF vii I-3	327
ANALYSIS	337
COMMENTARY	456

INDEXES :

INDEX VERBORUM	733
INDEX TO THE INTRODUCTION AND COMMENTARY	748

BOOKS AND ARTICLES ON THE *PHYSICS*
AND OTHER BOOKS REFERRED TO

(This list is meant only to facilitate reference, and does not aim at completeness.)

A.G.P. = *Archiv für Geschichte der Philosophie.*

J.P. = *Journal of Philology.*

R.M.M. = *Revue de Métaphysique et de Morale.*

R.P. = *Revue Philosophique.*

- Aldus Manutius: *Arist. vita ex Laertio . . . Arist. de phys. auditu . . .*
Ven. 1497.
- Arnim, H. von: *Die Entstehung d. Gotteslehre d. Arist.* Wien, 1931.
- Bäumker, C: *Vermeintliche Arist. Zeugnisse über Anaximandros'*
ΑΙΕΙΠΟΝ, in *Jahrb. f. Cl. Philol.* 131 (1885), 827-32.
- Bekker, I: *Arist. Opera.* Berol., 1831.
- Bergson, H.: *Quid Arist. de loco senserit.* Paris, 1889.
- Bonitz, H.: *Arist. Studien* i, ii-iii, iv. Wien, 1862, 1863, 1866.
- Bonitz, H: *Index Arist.* Berol., 1870.
- Brandis, C. A.: *Comment. Eleaticae.* Altona, 1813.
- Burnet, J.: *Early Greek Philosophy*, ed. 3. Lond. 1920.
- Bywater, I.: *Aristotelia* ii, v, in *J.P.* xiv (1885), 41 and xxxi (1913),
107.
- Camotius, J. B.: *Arist. de phys. auscultatione, &c.* Ven. 1551.
- Carteron, H.: *La Notion de Force dans le Système d'Arist.* Paris,
1924.
- Carteron, H.: *Arist. Phys.* Paris, 1926, 1931.
- Cornford, F. M.: *The Laws of Motion in Ancient Thought.* Camb.,
1931.
- Cornford, F. M.: *Arist. Phys.*, 250^a 9-19 and 266^a 12-24, in *Class. Quart.*,
xxvi (1932), 52-4.
- Dickerman, S. O.: *Some Stock Illustrations of Animal Intelligence in*
Greek Psychology, in *Trans. of American Philol. Assocn.* xliii (1911),
123-30.
- Diels, H.: *Doxographi Graeci.* Berol., 1879.
- Diels, H.: *Zur Textgeschichte d. Arist. Phys.* Berlin, 1882.
- Diels, H.: *Fragmente d. Vorsokratiker*, ed. 3. Berlin, 1912.
- Edel, A.: *Aristotle's Theory of the Infinite.* New York, 1934.
- Emminger, A.: *Die vorsokratischen Philosophen nach d. Berichten d.*
Arist. Würzburg, 1878.
- Erasmus, D.: *Arist. . . Opera.* Basil, 1531.

- Fröhlings, A.: *Die Begriffe Dynamis u. Energie d. Arist. u. d. modernen physikalischen Begriffe d. Kraft u. Energie.* Koblenz, 1929.
- Gagnebin, S.: *Un Aperçu de la Physique d'Arist.* Lausanne, 1934.
- Gohlke, P.: *Die Entstehungsgeschichte d. naturwissenschaftlichen Schriften d. Arist.*, in *Hermes* lix (1924), 274-306.
- Goldbeck, E.: *Die geozentrische Lehre d. Arist. u. ihre Auflösung.* Berlin, 1911.
- Gottschlich, E.: *Zur Phys. d. Arist.*, in *Jahrb. f. Cl. Philol.* cv (1872), 618-20 and cvii (1873), 109-10.
- Guthrie, W. K. C.: *The Development of Arist.'s Theology*, in *Class. Quart.* xxvii (1933), 162-71, xxviii (1934), 90-8.
- Haas, A. E.: *Die Grundlagen d. antiken Dynamik*, in *Arch. d. Gesch. d. Naturwissenschaften u. d. Technik* i (1908), 19-47.
- Hamelin, O.: *La Nature et le Mouvement d'après Arist.*, in *R.P.* lxxxvii (1919), 353-68.
- Hamelin, O.: *Arist. Phys. ii — Traduction et Commentaire*, ed. 2. Paris, 1931.
- Hardcastle, J. H. and Greenhill, G.: *Prof. Turner and Arist.*, in *Nature*, xcii (1913-14), 584-5.
- Hardcastle, J. H.: *Aristotle's Physics*, in *Nature* xciii (1914), 428.
- Hardie, R. P. and Gaye, R. K.: *Translation of Physics.* Oxford, 1930.
- Hayduck, M.: *Bemerkungen zur Phys. d. Arist.* Greifswald, 1871.
- Hayduck, M.: *Observationes Criticae in aliquot locos Arist.* Greifswald, 1873.
- Heath, D. D.: *On some Misconceptions of Arist.'s doctrine on Causation and τὸ αὐτόματον*, in *J.P.* vii (1877), 97-115.
- Heidel, W. A.: *Qualitative Change in Pre-Socratic Philosophy*, in *A.G.P.* xix (1906), 553-79.
- Hoffmann, E.: *De Arist. Phys. septimi libri origine at auctoritate.* Berol., 1905.
- Hoffmann, E.: *De Arist. Phys. libri septimi forma*, I, II. Friedenau, 1908-9.
- Jackson, H.: *Plato's Later Theory of Ideas*, in *J.P.* x (1882), 291.
- Jaeger, W. W.: *Emendationum Aristotelearum Specimen.* Berol., 1911.
- Jaeger, W.: *Aristoteles.* Berlin, 1923.
- Kappes, M.: *Die Arist. Lehre über Begriff u. Ursache d. κίνησις.* Bonn, 1887.
- Kühner, R.: *Ausführliche Grammatik d. Gr. Sprache.* Hannover, 1890-1904.
- Laas, E.: *Arist. Textes-Studien.* Berlin, 1863.
- Mansion, A.: *La Notion de nature dans la Phys. arist.*, in *Univ. de Louvain, Annales de l'Inst. sup. de philos.* i (1912), 469 ff.
- Mansion, A.: *Introduction à la Phys. arist.* Louvain et Paris, 1913.
- Mansion, A.: *Étude critique sur le texte de la Phys. d'Arist. (L. I-IV)*, in *Revue de Philol.* xlvii (1923), 5-41.

- Mansion, A.: *La Genèse de l'Œuvre d'Arist. d'après les Travaux récents*, in *Revue Néo-Scol. de Philos.*, 2^e série iv, 1927, 307-41, 425-66.
- Mansion, A.: *Note sur les traductions arabo-latines de la Phys. d'Arist. dans la tradition manuscrite*, ib. xxxvii (1934), 202-18.
- Mansion, A.: *La Théorie aristotélicienne du temps chez les péripatéticiens médiévaux*, ib. xxxvi (1934), 275-307.
- Montucla, J. E.: *Hist. des Recherches sur la quadrature du cercle*. Paris, 1831.
- Morelius, G.: *Arist. commentationum de natura lib. viii, &c.* Paris, 1561.
- Mosses, A.: *Vorgeschichte d. vier Arist. Principien b. Platon*. Bern, 1893.
- Mugnier, R.: *La Théorie du premier moteur et l'évolution de la pensée arist.* Paris, 1930.
- Natorp, P.: *Arist. u. d. Eleaten*, in *Philos. Monatsch.* xxvi (1890), 1-16, 147-69.
- Neuhäuser, J.: *Anaximander Milesius*. Bonn, 1880.
- Offner, M.: *Zur Beurteilung d. Melissos*, in *A.G.P.* iv (1891), 22-35.
- Pacius, J.: *Naturalis Auscultationis Lib. VIII*. Francof., 1596.
- Pauler, A. von.: *Über d. Theismus d. Arist.*, in *A.G.P.* xxxvii (1926), 202-10.
- Philoponus, I.: *In Arist. Phys. Commentaria*, ed. H. Vitelli. Berol., 1887-8.
- Prantl, C.: *Arist. Acht Bücher Phys.* Leipz., 1854.
- Prantl, C.: *Arist. Phys.* Lips., 1879.
- Reiche, L.: *Das Problem d. Unendlichen b. Arist.* Breslau, 1911.
- Robin, L.: *Sur la conception arist. de la causalité*, in *A.G.P.* xxiii (1910), 1-28, 184-210.
- Rodier, G.: *Sur la Composition de la Phys. d'Arist.*, in *A.G.P.*, viii (1895), 445-60 and ix (1896), 185-9.
- Rolfes, E.: *Die Philos. d. Arist. als Naturerklärung u. Weltanschauung*. Leipz., 1923.
- Ruelle, C.-E.: *Étude sur un Passage d'Arist. relatif à la Mécanique* (249^b 27-250^a 19), in *Rev. Arch.* xiv (1857), 7-21.
- Schmitz, J.: *De ΦΥΣΕΩΣ apud Arist. Notione eiusque ad animam ratione*. Bonn, 1884.
- Shute, R.: *On Prantl's Recension of the Arist. Phys.*, in *Trans. of Oxf. Philol. Soc.*, 1879-80, 29-31.
- Shute, R.: *Arist. Phys. Bk. VII*, in *Anecdota Oxon.* Oxf.; 1882.
- Simplicius: *In Arist. Phys. Commentaria*, ed. H. Diels. Berol., 1882, 1885.
- Spengel, L.: *Über d. siebente Buch d. Phys. d. Arist.*, in *Abh. d. Philos.-Philol. Cl. d. Königl. Bayer. Akad. d. Wissenschaften*, iii. 2 (1841), 305-49.

- Spengel, L.: *Über d. Reihenfolge d. naturwissenschaftlichen Schriften d. Arist.* Ib. xv. 2 (1849), 141-67.
- Sperling, K.: *Arist. Ansicht v. d. psychologischen Bedeutung d. Zeit*, &c. Marburg, 1888.
- Stölzle, R.: *Die Lehre vom Unendlichen b. Arist.* Würzburg, 1882.
- Susemihl, F.: *Arist. quae feruntur Oeconomica*, Appendix. Lips., 1887.
- Tannery, P.: *Sur un point de la méthode d'Arist.* In *A.G.P.* vi. (1893), 468-74.
- Tannery, P.: *Sur la Composition de la Phys. d'Arist.* Ib. vii (1894), 224-9 and ix (1896), 115-8.
- Taylor, A. E.: *Aristotle's Doctrine of Space*, in *A Commentary on Plato's Timaeus.* Oxford, 1928, 664-77.
- Tennemann, W. G.: *Gesch. d. Phil.* Leipzig, 1798-1819.
- Themistius: *In Arist. Phys. Paraphrasis*, ed. H. Schenkl. Berol., 1900.
- Torstrik, A.: *Die authentica d. Berliner Ausgabe d. Arist.*, in *Philol.* xii (1857), 494-530.
- Torstrik, A.: *Der Anfang d. Phys. d. Arist.*, in *Jahrb. f. Cl. Philol.* xcv (1867), 236-44.
- Torstrik, A.: *Über d. Abhandlung d. Arist. v. d. Zeit. Phys. Δ 10ff.*, in *Philol.* xxvi (1867), 446-523.
- Torstrik, A.: *Περὶ τύχης καὶ τοῦ αὐτομάτου*, *Arist. Phys. B*, 4-6, in *Hermes* ix (1875), 425-70.
- Veazie, W. B.: *The word φύσις*, in *A.G.P.* xxxiii (1920), 1-22.
- Vicomercatus, F.: *In octo libros Arist. de Naturali Auscultatione.* Paris, 1550.
- Wallies, M.: *Zur doppelten Rezension d. siebenten Buches d. Arist. Phys.*, in *Rhein. Mus.* N.F. lxx (1915), 147-9.
- Wicksteed, P. H. and Cornford, F. M.: *Arist., the Phys.* Lond., 1929, 1934.
- Wilson, J. Cook: *Difficulties in the Text of Arist.*, in *J.P.* xxxii (1913), 147-51.
- Wunderle, G.: *Die Lehre d. Arist. v. d. Zeit.* Münch. 1908.
- Zahlfleisch, J.: *Die Polemik d. Simplicius . . . gegen Arist. Phys. Δ 1-5 über d. Raum*, in *A.G.P.* x (1897), 85-109.
- Zeller, E.: *Philos. d. Griechen.* Vol. i, ed. 6; vol. ii. 1, ed. 4; vol. ii. 2, ed. 4. Leipz., 1919-20, 1889, 1921.

(Books and Articles on Zeno's Paradoxes about Motion.)

- Broad, C. D., in *Mind* xxii (1913), 318-19.
- Brochard, V., in *Séances et Travaux de l'Acad. des Sc. Mor. et Pol.* N.S. xxix (1888), 1, 555-68.
- Brochard, V., in *R.M.M.* i (1893), 209-15.
- Brochard, V.: *Études de Philos. ancienne et de Philos. moderne.* Paris, 1912.

- Cajori, F.: *The History of Zeno's arguments on Motion*, in *Amer. Math. Monthly* xxii (1915), 1-6, 39-47, 77-82, 109-15, 143-9, 179-86, 215-20, 253-8, 352-7.
- Couturat, L., in *R.P.* xxxiii (1892), 314-15.
- Dunan, C.: *Zenonis Eleatici argumenta*. Nannetibus, 1884.
- Dunan, C.: *Les arguments de Zénon d'Elée contre le mouvement*. Paris, 1884.
- Dunan, C., in *Annales de Philos. Chrét.*, 1909.
- Évellin, F., in *R.M.M.* i (1893), 382-95.
- Frontera, G.: *Etudes sur les arguments de Zénon d'Elée*, &c. Paris, 1891.
- Frontera, G., in *R.P.* xxxiii (1892), 311-4.
- Gaye, R. K., in *J.P.* xxxi (1908), 94-116.
- Gerling: *De Zenonis paralogismis motum spectantibus*. Marburg, 1825.
- Hamelin, O., in *Année Philos.* xvii (1907), 39-44.
- Heath, Sir T. L.: *Hist. of Greek Math.* i, 273-83. Oxf., 1921.
- Jourdain, P. E. B., in *Mind* xxv (1916), 42-55.
- Lachelier, J., in *R.M.M.* xviii (1910), 345-55.
- Lechalas, G., in *R.M.M.* i (1893), 396-400.
- Lechalas, G.: *Étude sur l'espace et le temps*. Paris, 1910.
- Masci, F.: *Su alcuni luoghi della Fisica d'Arist.* Napoli, 1912.
- Milhaud, G., in *R.M.M.* i (1893), 151-6, 400-6.
- Mouret, G., in *R.P.* xxxiii (1892), 67-71.
- Noel, G., in *R.M.M.* i (1893), 108-25.
- Petronievics, B., in *A.G.P.* xx (1907), 56-80.
- Raab, C.: *Die Zenonischen Beweise*. Schweinfurt, 1880.
- Renouvier, C. B.: *Esquisse d'une Classification systématique des Doctrines philosophiques*, i. 34-9. Paris, 1885.
- Russell, B.: *Principles of Math.*, i. 347-60. Camb., 1903.
- Russell, B.: *Our Knowledge of the External World*, 129-37, 165-82. Chicago and Lond., 1914.
- Salinger, R., in *A.G.P.*, xix (1906), 99-122.
- Sorel, G., in *Revue Scientifique* l (1892), 141-4.
- Tannery, P., in *R.P.* xx (1885), 385-410.
- Tannery, P.: *Pour l'histoire de la science hellène*, 247-61. Paris, 1887.
- Wellmann, E.: *Zenos Beweise gegen d. Bewegung u. ihre Widerlegungen*. Frankf. a. O., 1870.
- Zeller, E.: *Philos. d. Griechen*, i. 1. ed. 6, 755-65. Leipz., 1919.

INTRODUCTION

I

THE STRUCTURE OF THE *PHYSICS*

IN inquiring into the structure of the *Physics* we may begin with the statement of Simplicius¹ that 'Aristotle and his companions' describe the first five books as constituting τὰ περὶ ἀρχῶν, φυσικὰ λεγόμενα, and the last three as constituting τὰ περὶ κινήσεως. Simplicius in more than one passage contends for this division of the work. He describes it as having been known to Adrastus² (a Peripatetic of the second century A.D.) and to Porphyry³ (third century A.D.), and as having been adopted by Andronicus.⁴ He also quotes Theophrastus⁵ as testimony for this division; but what he quotes from Theophrastus does not prove his point. It only amounts to showing that Theophrastus regarded book v as part of the *Physics*, but since in any case this is in *some* sense true, it does not prove Simplicius' point, that Theophrastus regarded book v as belonging to the φυσικὰ in the sense in which that work was distinguished from the περὶ κινήσεως. Nor is Simplicius' argument⁶ from Aristotle's own modes of reference to the various books of the *Physics* conclusive. The references he quotes only show that in *Phys.* viii (251^a 9, 253^b 8, 267^b 21) Aristotle implies that books ii and iii belong to the φυσικὰ and that book viii itself does not, and that the *De Caelo* (272^a 30, 275^b 21) refers to books vi and viii as belonging to the περὶ κινήσεως. They throw no light on the question whether book v was regarded by Aristotle as belonging to the one or to the other treatise.

Simplicius further quotes Damas,⁷ the biographer and perhaps the disciple of Eudemus, as referring to τὰ περὶ κινήσεως τρία.

A further argument used by Simplicius to prove the correctness of his division into five books on nature and three books on movement is clearly incorrect. When Aristotle in *Phys.* viii. 257^a 34 refers back to τὰ καθόλου τὰ περὶ φύσεως, Simplicius

¹ 801. 13-16.

² 4. 14.

³ 802. 9.

⁴ 923. 9.

⁵ 923. 10.

⁶ 923. 16.

⁷ 924. 14.

says that the reference is to book v, and Diels gives 228^a 20 as the passage referred to. But neither there nor elsewhere in book v is the point in question proved; the reference is to vi. 4.

Simplicius admits that another division of the Physics was adopted by Porphyry, viz. that which reckoned books v-viii as forming the *περὶ κινήσεως*.¹ This division is accepted by Philoponus.²

It will be well to state here all the evidence on the subject that can be drawn from Aristotle's own references. He uses the phrases *τὰ φυσικά*, *τὰ περὶ φύσεως*, in referring back to

Phys. i (*Met.* 986^b 30, 1062^b 31, 1076^a 9, 1086^a 23),

Phys. ii (*Phys.* 253^b 8, *Met.* 983^a 33, 985^a 12, 988^a 22, 993^a 11, 1059^a 34),

Phys. iii (*Phys.* 251^a 8, 267^b 21),

Phys. v (*Met.* 1042^b 8),

but also to *Phys.* vi (*Phys.* 257^a 34) and to *Phys.* viii (*Met.* 1073^a 32). He uses the phrase *τὰ περὶ κινήσεως* in referring forward to *Phys.* vi (*An. Post.* 95^b 11), and in referring back to

Phys. vi (*Phys.* 263^a 11, *De Caelo* 272^a 30, 299^a 10, *De Sensu* 445^b 19, *Met.* 1049^b 36), and to *Phys.* viii (*De Caelo* 275^b 22, *De Gen. et Corr.* 318^a 3).

He also uses the phrase *τὰ περὶ χρόνου καὶ κινήσεως* in referring back to *Phys.* vi (*De Caelo* 303^a 23). Further, he uses the phrase *τὰ περὶ τὰς ἀρχάς* in referring back to *Phys.* iii (*De Caelo* 274^a 21). He also uses the words *τὰ περὶ φύσεως* in referring back to the *De Caelo* (*Met.* 989^a 24). Bonitz quotes *Met.* 1073^a 32, and (with hesitation) *Met.* 1042^b 8, 1062^b 31, 1086^a 23, as also referring to the *De Caelo* and the *De Gen. et Corr.* by the title *τὰ φυσικά* or *τὰ περὶ φύσεως*; but in all these places there are passages in the *Physics* itself that may be referred to.

These passages show that the titles *τὰ περὶ φύσεως*, *τὰ φυσικά* had not for Aristotle a fixed meaning. They had, in fact, three meanings, a narrower, an intermediate, and a wider meaning. (1) Three references to *τὰ φυσικά* in *Phys.* viii³ show that Aristotle sometimes used the phrase of a course of lectures which included *Phys.* ii, iii but did not include *Phys.* viii itself. Books vi and viii are in distinction from this course called *τὰ περὶ κινήσεως*. (2) There is a sense in which books vi and viii are re-

¹ 802. 7-13.

² P. 2. 16.

³ 251^a 9, 253^b 8, 267^b 21.

ferred to as belonging to τὰ περὶ φύσεως (*Phys.* 257^a 34) or τὰ φυσικά (*Met.* 1073^a 32). In this sense probably the whole of the *Physics*, or the whole of it with the exception of book vii, were thought of as belonging to τὰ φυσικά. A further proof that Aristotle thought of the whole of the *Physics* as forming a unit, though within a larger unit, is offered by the opening of the *Meteorologica*, which sums up the *Physics*, the *De Caelo*, and the *De Gen. et Corr.*, but separates the *Physics* from the other two works:—περὶ μὲν οὖν τῶν πρώτων αἰτίων τῆς φύσεως καὶ περὶ πάσης κινήσεως φυσικῆς, ἔτι δὲ περὶ τῶν κατὰ τὴν ἄνω φορὰν διακεκοσμημένων ἀστρῶν καὶ περὶ τῶν στοιχείων τῶν σωματικῶν, πόσα τε καὶ ποῖα, καὶ τῆς εἰς ἄλλα μεταβολῆς, καὶ περὶ γενέσεως καὶ φθορᾶς τῆς κοινῆς εἴρηται πρότερον. (3) τὰ φυσικά is used at least once of a group which included the *De Caelo*, and probably also the *De Gen. et Corr.* and the *Meteorologica*, as well as the *Physics*.

Aristotle's references do not show whether he regarded books i, iv, v, vii as belonging either to the group περὶ φύσεως or to the group περὶ κινήσεως. But book i pretty obviously assigns itself to the earlier group. Book iv is clearly continuous with book iii, since the programme laid down in iii. 200^b 12-25 is carried out in the two books taken together. Book v, on the other hand, makes a fresh start with an analysis of change into its kinds, and clearly belongs to the same line of inquiry as book vi; for the latter starts with the notions of continuity, contiguity, and succession, which have been defined in v. 3. A mere glance at the contents of book v, occupied entirely as it is with the problem of movement, shows how wrong-headed is Simplicius' insistence on separating it from books vi-viii and tacking it on to books i-iv.

Yet Simplicius was not alone in his error. The headings prefixed to books vi-viii in our most important MS. (E) describe them as περὶ τῆς κινήσεως τῶν εἰς γ̄ τὸ β̄, τὸ ᾱ, τὸ γ̄. This strange numbering probably rests on a tradition much older than the manuscript. What was the origin of the tradition? The probable answer will appear presently.

Book vii demands, and will receive, special consideration. I will here anticipate so far as to say that it breaks the continuity of what would otherwise be a continuous treatise on movement, books v, vi, viii. We know that Eudemus recognized this and passed over book vii in his *Physics*, which otherwise covered the

same ground as Aristotle's work. Now Simplicius quotes Damas, the biographer of Eudemus, as one of his authorities for the division of the *Physics* into five books on nature and three on movement. It was books v, vi, viii that were the *τρία περὶ κινήσεως*. But either Damas, or Simplicius, or some one in the chain of tradition which connected them, having before him our *Physics* in eight books, made the natural mistake of supposing that it was the last three that were the *τρία περὶ κινήσεως*, and then, in the face of plain facts, proceeded to distinguish the first five as being *τὰ περὶ φύσεως*. Porphyry's common sense saved him from this mistake.

What we find, then, is two main parts of the *Physics*, (1) books i-iv, referred to as *τὰ φυσικά* or *τὰ περὶ φύσεως*, (2) books v, vi, viii, referred to as *τὰ περὶ κινήσεως*, but also included in *τὰ φυσικά* in a wider sense of that term. There is also (3) a comparatively isolated book, book vii.

It is natural to ask whether any light is cast on the original structure of the *Physics* by the lists of Aristotle's works that have come down from antiquity. The relevant evidence is as follows:—

Diogenes Laertius' list,

- Nos. 41 *περὶ ἀρχῆς* $\bar{\alpha}$
 45 *περὶ κινήσεως* $\bar{\alpha}$
 90 *περὶ φύσεως* $\alpha\beta\gamma$
 91 *φυσικὸν* $\bar{\alpha}$
 115 *περὶ κινήσεως* $\bar{\alpha}$

Hesychius' list,

- Nos. 21 *περὶ ἀρχῶν ἢ φύσεως* $\bar{\alpha}$
 40 *περὶ κινήσεως* $\bar{\alpha}$
 81 *περὶ φύσεως* $\bar{\alpha}$
 82 *περὶ φυσικῶν* $\bar{\alpha}$
 102 *περὶ κινήσεως* $\bar{\alpha}$
 148 *φυσικῆς ἀκροάσεως* $\bar{\tau}\eta$
 170 *περὶ χρόνου*

Ptolemy's list,

- 17 *περὶ κινήσεων* $\bar{\eta}$
 34 *περὶ ἀκροάσεως φυσικῆς* $\bar{\eta}$
 57 *θέσεις φυσικαὶ* $\bar{\alpha}$
 85 *περὶ χρόνου* $\bar{\alpha}$

Almost everything in the interpretation of these lists, especially those of Diogenes and Hesychius, is highly conjectural; but it seems pretty certain that these titles were the titles of MSS. in the Alexandrian library. E. Howald has made out¹ a good case for supposing that the first two lists depend on the authority of Hermippus (about 200 B.C.), and the third on that of Andronicus (about 85 B.C.). It is reasonable to suppose that Diog. 41 and Hesych. 21 refer to book i of the *Physics*, which announces as its subject (184^a 15) τὰ περὶ τὰς ἀρχάς and describes itself at the end (192^b 2) as having established ὅτι εἰσὶν ἀρχαί, καὶ τίνες, καὶ πόσαι τὸν ἀριθμὸν. It seems probable also that Diog. 90 refers to books ii-iv. The beginning of book ii presents the appearance of being the beginning of a separate work. It makes no reference to the results of book i, but starts straight off with an analysis of the notion of φύσις. In most of the MSS. and in the lemmata of Philoponus and Simplicius it begins without a connecting particle, which is an unusual feature in Aristotle's works, and one that points to relative independence. Yet we have seen that the *Metaphysics* several times refers to book i as part of τὰ φυσικά, and though it seems to have been originally a separate essay περὶ ἀρχῶν, an attempt was later made (quite possibly by Aristotle himself) to link it up with the three following books. The evidence of this patchwork is seen in the best MS., E, where at the end of book i, after the words ὅτι μὲν οὖν . . . λέγωμεν, we have τῶν γὰρ ὄντων τὰ μὲν ἐστὶν φύσει τὰ δὲ δι' ἄλλας αἰτίας, and then at the beginning of book ii (as in the other MSS.) τῶν ὄντων τὰ μὲν ἐστὶν φύσει τὰ δὲ δι' ἄλλας αἰτίας. I conjecture that here the abrupt particle-less beginning of book ii is its original beginning, and that ὅτι μὲν οὖν . . . λέγωμεν and E's γάρ in τῶν γὰρ ὄντων represent a later attempt to produce at any rate an external connexion (for there is no organic connexion) between the two books.

If we treat book i as the treatise περὶ ἀρχῶν *par excellence*, we must at the same time recognize that this phrase had a wider application; for the only actual reference in Aristotle under this title (in *De Caelo* 274^a 21) is to *Phys.* iii. We must suppose that the treatise formed by uniting the one book περὶ ἀρχῶν with the three περὶ φύσεως could be referred to by either

¹ *Hermes*, 1920, 204-21.

title, though the latter greatly predominates; Simplicius¹ bears witness to the double nomenclature.

Again, though books ii-iv are in a genuine sense continuous, it is book ii alone that deals specifically with the conception of nature, and it seems probable that it is to it that Hesych. 81 refers. It is possible that Diog. 91 and even Hesych. 82 also refer to it, but the reference of these titles is highly doubtful.

Hesych. 170 and Ptol. 85 probably refer to the essay on time in *Phys.* iv. 10-14, which may well have been originally a separate treatise. Diog. 45, 115, Hesych. 40, 102 probably refer to the two versions of book vii, which forms a fairly independent essay on movement; but it is possible that one of the two in each list refers to the essay on movement in iii. 1-3, which is now co-ordinated with the essay on time in iv. 10-14.

Ptolemy's 34 clearly refers to the existing *Physics*, and it is possible that his 17 may also refer to this; the title *περὶ κινήσεως* or *κινήσεων* may have at some time been extended to cover the whole work, as *τὰ φυσικά* was extended to cover that which was not *φυσικά* in the narrower sense, but *περὶ κινήσεως*.

Hesychius' reference (148) to a *φυσικὴ ἀκρόασις* in 18 books is puzzling, and Zeller and Diels conjecture that η (8) should be read. But we have seen that even the *De Caelo* and the *De Gen. et Corr.* were in the widest sense of *τὰ φυσικά* included in this term, and it seems likely that the reference is to the *Physics* (eight books) + *De Caelo* (four books) + *De Gen. et Corr.* (two books) + *Meteor.* (four books); for the *Meteorologica* in its opening sentence treats all four works as forming a single *μέθοδος*.

The process of the building up of our *Physics* may then have taken the following form: -

<i>περὶ ἀρχῶν</i> $\bar{\alpha}$ (D. 41, H. 21) = Bk. i	$\left. \begin{array}{l} \text{περὶ φύσεως} \\ \alpha\beta\gamma \text{ (D. 90)} \end{array} \right\} \text{φύσεως}$ $\left. \begin{array}{l} \text{φυσικὴ ἀκρόασις } \eta \text{ (P. 34)} \\ \text{? = περὶ κινήσεων } \eta \text{ (P. 17)} \end{array} \right\}$
<i>περὶ φύσεως</i> $\bar{\alpha}$ (H. 81) = Bk. ii	
<i>περὶ κινήσεως</i> $\bar{\alpha}$ (? D. 45, H. 40) = Bk. iii. 1-3	
<i>περὶ ἀπείρου καὶ τόπου καὶ κενοῦ</i> = Bk. iii. 4-iv. 9	
<i>περὶ χρόνου</i> $\bar{\alpha}$ (H. 170, P. 85) = Bk. iv. 10-14	
<i>περὶ κινήσεως</i> $\alpha\beta\gamma$ (unknown to the lists, but known to the tradition) = Bks. v, vi, viii	
<i>περὶ κινήσεως</i> $\bar{\alpha}$ (? D. 115, H. 102) = Bk. vii	

When we turn to the question of the comparative dates of

¹ 801. 13.

the different parts of the *Physics*, we may start with the fact that books i and ii are presupposed by the earliest parts of the *Metaphysics*, the parts which Jaeger's researches enable us to assign with some probability to Aristotle's stay at Assos (c. 347-4) immediately after leaving Athens on the death of Plato. Not only does *Met. A* contain explicit references to *Phys. i, ii* (these might have been added later), but it is plain that the whole treatment of earlier philosophers in *Met. A* is based on the distinction of matter and form established in *Phys. i*, and on the doctrine of the four causes established in *Phys. ii*. We may therefore say with some confidence that these two books were composed while Aristotle was still a member of the Academy, though no doubt rapidly coming to feel his divergence from his master's views.

The comparative date of books iii-iv and v-vi has been the subject of a debate between Tannery and Rodier.¹ Tannery points out that in v. 1-2 *μεταβολή* is divided into *γένεσις, φθορά, and κίνησις*, which in turn is divided into *ἀλλοιώσις, αὔξις* and *φθίσις*, and *φορά*; while in iii. 1 *κίνησις* is used as the generic term (with *μεταβολή* as an equivalent), and is divided into *γένεσις* and *φθορά, ἀλλοιώσις, αὔξις* and *φθίσις, and φορά*. The question then is, whether Aristotle first used *κίνησις* in a wide sense (= *μεταβολή*) in which it included generation-and-destruction as one of its kinds, and later refined upon this by using it in a sense which excludes generation and destruction, or whether he widened its usage from the latter to the former sense. On the face of it the first is the more likely hypothesis, since it is quite in Aristotle's manner to proceed by a method of approximation in which terms at first not distinguished are later distinguished from each other. And, as Rodier points out, there is a definite trace of this method in the phrase in iv. 218^b 19 *μηδὲν δὲ διαφερέτω λέγειν ἡμῖν ἐν τῷ παρόντι κίνησιν ἢ μεταβολήν*. Tannery, on the other hand, thinks that the sharp division of generation and destruction from the other kinds of *μεταβολή* as not being *κίνησις* is a relic of the Platonic belief in a transcendent Form, and that the recognition of generation and destruction as merely one kind of *κίνησις* marks an approach to a more scientific point of view. His notion of a truly scientific point

¹ Tannery in *A.G.P.*, vii. 224-9, ix. 115-18; Rodier, *ib.*, viii. 455-60, ix, 185-9.

of view evidently is that it would be one from which generation and destruction would be reduced to change of quality, and this in turn to change of position, in the manner of nineteenth-century science. But Aristotle at no time adopts either of these identifications. Even when he argues that generation and destruction *involve* change of quality (*Met.* 1042^b 3), and that change of quality *involves* change of position (*Phys.* viii. 260^b 4), he never *identifies* γένεσις-φθορά with ἀλλοίωσις, or ἀλλοίωσις with φθορά, but always distinguishes them.

If he had passed from a narrower to a wider use of κίνησις, and if this had had the metaphysical significance that Tannery ascribes to it, we should expect to find the wider usage carefully adopted in later works. In fact, in works which are probably later than the middle books of the *Physics*, the usage is not constant, but the narrower use of κίνησις predominates. We find the wider use in *Phys.* viii. 261^a 4, 264^a 29, *De Gen. et Corr.* 315^a 28. We find the narrower in *Phys.* 260^a 27, *De Caelo* 310^a 23, *De Anima* 406^a 12; and in *Phys.* viii. 265^a 11, *De Gen. et Corr.* 319^b 31, 336^a 19, *Met.* H. 1042^b 4, Λ. 1069^b 9 μεταβολή, not κίνησις, is the general term under which generation is brought. This variation, with a leaning to the stricter usage, is what we should expect to find if the change of nomenclature was one that had no great metaphysical significance, but was inspired simply by the wish for a more precise terminology.

Tannery's view that books v-vi are an earlier work which is the *περὶ κινήσεως*, and that books i-iv, viii are the *φυσικά* proper, has the incidental disadvantage that he has to try to make out that the end of book iv is continuous in subject with the beginning of book viii, and has to pass over the much more striking continuity between books vi and viii. I may add that book v contains a definite reference back to book iii (224^b 11).

I conclude that books iii-iv are earlier than books v-vi.

When I come to discuss the problem of book vii, I will give reasons for thinking that it is an early work, written before Aristotle had broken with the Platonic belief in idea-numbers. But each of the two versions of the book contains references to earlier books of the *Physics*: α 242^b 41 (= β 242^b 7), 247^b 13 refer back to book v; β 242^a 6 refers back to book vi, and the last of these references is too casual to be likely to have been inserted later. This, then, would point to an early date for

books i-vi as well as for book vii itself. Nor is there anything in the contents of these books that implies much departure from the Platonic way of thinking. At the same time, the discussions in books iii-vi, while not in any way anti-Platonic, attack a series of problems for which there was little in Plato's teaching to prepare the way; and in various places, as in the discussion of time, Plato's views are criticized. For the exploration of this new line of thought a considerable time must be allowed.

The ancient title of the *Physics*, φυσικὴ ἀκρόασις, implies that it was originally a course of lectures; and this must have been delivered either at Athens during Aristotle's membership of the Academy or during his headship of the Lyceum, or else at Assos. We must not crowd too much into the short stay at Assos; and Jaeger has given fairly convincing reasons for dating the early books of the *Metaphysics* during that stay; which does not leave much time for the composition of anything else during it. The few references to places which the *Physics* contain—to the road from Thebes to Athens (iii. 202^b 13), to the Lyceum (iv. 219^b 21), to Athens (v. 224^b 21), and to walking to Thebes (vi. 231^b 30)—suggest composition at Athens; and the reference to the Lyceum does not necessarily belong to the period of Aristotle's *Meisterjahre*; for the Lyceum was one of Socrates' favourite resorts, and allusions to it in Plato are frequent. On the other hand, the references to Coriscus (iv. 219^b 21, v. 227^b 32) do not compel us to date the books in which they occur in the period of Aristotle's association with Coriscus, either in the Academy or at Assos; for Coriscus is referred to not only in the *Topics*, which is, and in the *Prior Analytics*, which may be, early, but also in books which cannot be dated early—the *Parva Naturalia*, the *De Partibus Animalium*, the *De Generatione Animalium*, and *Metaphysics E* and *Z*. Coriscus, having once been adopted as a stock example of 'man', seems to have been retained in that capacity.

The early character of book vii, and the fact that it presupposes books v-vi, which in turn are later than books iii-iv, coupled with the fact that the early part of the *Metaphysics* presupposes *Phys.* i-ii, seem to suggest that it was during Aristotle's earlier stay at Athens that the greater part of the *Physics* was composed. There is nothing that need surprise us very much in this; for by the end of that stay Aristotle was a man of thirty-seven.

The older members of the Academy were not pupils of Plato so much as associates, working independently at subjects which fell within the general programme of Academic studies, and probably giving lectures on their own account. The older view, which ascribed all Aristotle's extant works to the period of his headship of the Lyceum, crowded more lecturing and writing into that period of twelve years than was intrinsically probable, and left the rest of his life unnaturally empty of such activity. The biological works and the large schemes of historical and constitutional research, to which Jaeger has directed attention, together with the philosophical works (such as the middle books of the *Metaphysics*) which are late in character, are sufficient to fill the *Meisterjahre* with as much literary activity as can reasonably be ascribed to it.

On the other hand, *Phys.* i-vii cannot be dated *very* early. In contrast with the dialogues, which contain few original ideas and are mainly expositions and applications of Platonism, the *Physics* is a continuous and elaborate piece of reasoning on subjects on which Plato had given little guidance; and it can only, I think, be ascribed to the end of Aristotle's Academic period, when he had already acquired independence of mind and the full use of his philosophical powers.

Book viii, in its present form, is undoubtedly later. There are three passages in chapter 6¹ which refer to movers of the planetary spheres, in distinction from the prime mover of the universe; and Aristotle's attention was probably drawn to this problem by Callippus,² somewhere about 330 B.C. Jaeger argues³ that all these passages are later additions, and this would allow us to date the original form of the book much earlier. But it seems more likely that the first two passages, in which the sphere-movers are mentioned only as possibilities, belong to the original form of the book, and that only the last, in which their existence is taken for granted, is a later addition. If that be so, even the earlier form of the book cannot be dated earlier than Aristotle's final residence in Athens, from 334 to 323 B.C.

¹ 258^b 11, 259^a 6-13, ^b28-31; cf. *infra*, pp. 101-2.

² Cf. *Met.* A. 1073^b 32-8, and Jaeger, *Aristoteles*, 366-8.

³ *ib.* 383-90.

If any one should think that I have accepted the cross-references in Aristotle too readily as evidence of comparative date, I would urge that the cross-references only make it more easy to detect sequences which would be fairly certain even without the existence of the references. The backward references refer to premisses required for the argument in hand, and claimed to have been proved earlier; and if they had *not* been proved earlier, we should have to suppose Aristotle to have proceeded in a most topsy-turvy manner, assuming points which he had not in fact proved but was going to prove in a later work. This he may have done now and then, but we cannot suppose him to have done it to the extent which alone would justify us in not regarding the cross-references as genuine evidence, in the main, of the order in which he developed his various arguments.

There are, however, three references to *Phys.* viii in the *De Caelo*, which in view of the obviously early character of that work, lend colour to the view that *Phys.* viii *may* itself be early: the references in 273^a 17, 275^b 21, 311^a 11 to *Phys.* viii. 8, viii. 10, and viii. 4 respectively.

There are two main problems about book vii. There is the problem of its relation to the *Physics* as a whole, and there is the problem raised by the existence of two versions of the first three chapters. The two problems cannot be kept entirely apart; and it seems advisable to address ourselves first to the second question.

Simplicius tells us (1036. 4) that in his time there existed two versions of the book, containing the same problems and arguments, and in the same order, but differing slightly in verbal form. He implies that the two versions existed throughout the book, and he makes definite references to the *ἕτερον ἔβδομον βιβλίον* in four places:—

(1) in 1051. 5, where the words quoted are found in the version which I (following Prantl, and in part Bekker) have printed as secondary (and will refer to as β), at 243^b 27-9.

(2) in 1054. 31, where the words are found in β 243^b 23-4.

(3) in 1086. 23 (on 248^b 6). Here he says that some MSS. of the first version have borrowed the reading of the second version

ἀλλ' ἀρά γε ὅσα μὴ ὁμώνυμα, ἅπαντα συμβλητά. This reading occurs in none of our MSS., but it seems probable that the original reading of *a* was ἀλλ' ὅσα μὴ συνώνυμα, πάντ' ἀσύμβλητα (HΣ) and that the reading ἀλλ' ὅσα μὴ ὁμώνυμα, πάντα συμβλητά (FJK) is due to contamination of *a* by *β*.

(4) in 1093. 10 (on 249^a 15). Here he cites the reading ὁ μὲν γὰρ χρόνος ὁ αὐτὸς ἀεὶ ἄτομος τῷ εἶδει. ἢ ἅμα κακείνα εἶδει διαφέρει (F, and apart from small variations JΣ), as having been introduced from *β*. The reading which he himself follows is not found in any of our MSS.

For the first three chapters, two markedly different versions are found in two groups of MSS., while some MSS. offer a combination of the two. *a* is found in Bekker's b and c, in Par. 2033, and in Bodl. Misc. 238. From 244^b 5b to the end of chapter 3 H (Vat. 1027), and from 245^b 9 to the end of chapter 3 I (Vat. 241) have version *a*. Throughout the first three chapters EFJK and nine other MSS. studied by Bekker have *β*, which H also has down to 244^b 20 and I down to 245^b 24. Eight minor MSS. studied by Bekker have from 244^b 5 to the end of chapter 3 a mixed text.

The Aldine edition prints *β* throughout. The Basel editions (1531, 1538, 1550) print 243^a 11-247^a 19 and 247^b 7-248^a 9 as they stand in *a*, and relegate the corresponding parts of *β* to an appendix; but from 247^b 1 to 7 they follow *β*. Through a misinterpretation of Simplicius' words in 1036. 15-17 the editor of these editions, Erasmus, thought that *β* was Themistius' paraphrase of *a*; but Themistius' paraphrase in fact bears a much closer relation to *a* than to *β*. Erasmus does not say where he found the text of *a*, but he follows word for word the text printed in the Aldine Simplicius of 1526, and deserts *a* in exactly the places in which that text does so.

The beginning of *a*, 241^b 34-243^a 40, was first printed by Morel, in an appendix to his edition (Paris, 1561). Morel says that he found it in a MS., but does not say which; evidently however it was Par. 1859 (b).

Finally, *a* 247^b 1-7 was printed first by Spengel in 1841.

Bekker's quarto prints at the beginning of the book *β* 241^b 24-243^a 11. For the rest of the first three chapters he prints *a* as his principal text, and *β* below. Prantl prints *a*, throughout these chapters, as the principal text, and *β* below, and in this

I follow him; but, unlike him, I have followed Bekker's lineation, and have numbered the lines of the beginning of α (which does not exist in Bekker) in such a way as to avoid confusion between α and β .

Apart from small variations, such as exist elsewhere between his readings and those of our MSS., Simplicius agrees throughout chapters 1 to 3 with bcjy (i.e. he follows α); and, as we have seen, he expressly refers two of the readings of EFHIJK to the 'other second book'. With regard to Themistius, in one place (204. 16-205. 2; cf. β 244^a 28-^b 18) his language is closer to that of β than to that of α , but in the main it is much closer to α . The fragments of Philoponus occasionally refer to readings which we find in β (874. 5, cf. 241^b 26; 874. 14, cf. 242^b 4; 875. 25, cf. 244^a 23; 876. 3, cf. 244^b 17), but for the most part follow α .

Shute maintains that in chapters 4 and 5 bcjy alone preserve the text of α in comparative purity, while EFHIK contain a mixture of α and β . It is undeniable that in certain places Simplicius' readings, and therefore the main version, which he follows, are better preserved by the whole or greater part of the group bcjy than by the whole or greater part of the group EFHIJK; this can be seen from the apparatus to 248^a 22, ^b 1, 5, 9, 249^b 1, 22, 250^a 5, 6, ^b 2. But it is equally true that in 248^a 15, ^b 7, 249^a 17, 20, ^b 2, 9, 18, 250^a 10, 12 (*bis*), ^b 1 the opposite is the case. Further, in two of the former passages, where the first group of MSS. (bcjy) has the fuller reading, Simplicius may not be quoting Aristotle exactly, but expanding, and bcjy may have borrowed the extra words from him (see 250^a 5, 6). We have seen, too, that in one of the passages in these chapters, in his comment on which he refers to 'the other second book' (248^b 6), none of our MSS. has the reading which he ascribes to β , and that in the other (249^a 15) the reading which he ascribes to it is found (apart from slight variations) in bcjy as well as in FJ. The general conclusion which emerges is rightly drawn by Hoffmann:—that for chapters 4 and 5 we have only α . There is for these chapters no such broad divergence of versions between EFJK and bcjy as there is for the first three, but only such minute divergences as arise when different scribes copy from a single archetype. There has been in some MSS. contamination from β in 248^b 6-7 and in 249^a 15, and perhaps

elsewhere, but in the main β is lost, so far as these chapters are concerned.

It is plain that the ancient commentators all regarded α as the more authoritative of the two versions; and there is no doubt that they were right in so doing. Several considerations demonstrate the superiority of α .

(1) In 243^a 17 α gives the main forms of *φορά* in the order *ἐλέις*, *ᾧσις*, *ὄχησις*, *δίνησις*. It then refers to the subspecies of *ἐλέις* and *ᾧσις* in ^a 18-^b 16, and finally points out in ^b 16-244^a 4 that *ὄχησις* and *δίνησις* are reducible to *ἐλέις* and *ᾧσις*. β first in 243^a 24 gives the species of *φορά*, in the order *ᾧσις*, *ἐλέις*, *ὄχησις*, *δίνησις*, but expounds them in the order *ᾧσις* (^a 26-8), *ὄχησις* (^a 28-^b 23), *ἐλέις* (^b 23-9), *δίνησις* (^b 29-244^a 17), which obscures the point clearly brought out in α that *ἐλέις* and *ᾧσις* are logically prior to *ὄχησις* and *δίνησις*.

(2) In α 243^b 12-15 *ἐκπνοή*, *πτύσις*, and the *ἐκκριτικαὶ κινήσεις* are rightly described as forms of *ᾧσις*. In β 243^b 25-7 they are absurdly described as *ἐλέεις*. (But this should perhaps be emended by excising *ἐλέεις* and understanding *κινήσεις* with *αἱ λοιπαί*.)

(3) β 245^b 26-7 puts less accurately what is better stated in α 245^b 9-11.

(4) β 246^a 22-^b 21 is rather a jejune restatement of what is stated more fully, and in a thoroughly Aristotelian way, in α 246^a 1-^b 4.

(5) β 247^a 28-^b 21 is similarly related to α 247^b 1-7.

(6) β has several un-Aristotelian phrases:—

ἐν τῇ αὐτῇ κατηγορίᾳ τῆς οὐσίας ἢ τοῦ γένους 242^b 4.

ὑπὲρ τῆς φορᾶς for *περὶ τῆς φορᾶς* in 243^a 10 creates some suspicion. This use of *ὑπὲρ* is found thrice in the *Categories*, five times in the *Topics*, and five times in the *Nicomachean Ethics*, and nowhere else in Aristotle's genuine works. But it is common in the *Magna Moralia* and in the *Rhetorica ad Alexandrum*. It is a late use; where it occurs in genuine works of Aristotle it is probably due to corruption, and where it exists in a work of unknown date it is an argument for lateness.

τὸ τῆς ἀλλοιώσεως 245^a 20, 246^a 29, ^b 26, 248^b 27, *τὸ τῆς ἡδονῆς* 247^a 25, 27, *τὸ τῆς ἐπιστήμης* ib. 30. This seems to be found, in genuine works of Aristotle, only in *De Resp.* 472^b 9, and it is a late and feeble idiom.

ἐν τῇ τῆς ἐπιστήμης ὑπαρχῇ 247^b 29 and γένηται νήφων πρὸς τὴν ἐνέργειαν 248^b 26 are definitely un-Aristotelian.

We may now proceed to consider the origin of book vii and of the two versions of it. There are several indications that the book is not an integral part of the *Physics*, but is, even if it be by Aristotle, an excrescence on the main plan, as αΔΚΛ are in the *Metaphysics*.

(1) Simplicius quotes Damas, the biographer and perhaps the disciple of Eudemus, as referring to τὰ περὶ κινήσεως τρία (924. 14). Simplicius himself interprets these as being books vi, vii, viii (801. 14-16). But book v is plainly inseparable from book vi, and there can be no real doubt that the reference is to books v, vi, viii. (MS. E's numbering of books vi, vii, viii respectively as περὶ κινήσεως τῶν εἰς γ τὸ β, τὸ α, τὸ γ is an unsuccessful attempt to make a well-ordered unity of the three books which Simplicius identifies with τὰ περὶ κινήσεως τρία; book v cannot properly be excluded from the title, and book vii must be excluded from it.)

(2) The list of Aristotle's works preserved by Diogenes Laertius has twice over περὶ κινήσεως α (nos. 45, 115 in Rose), and these reappear in Hesychius' list as nos. 40 and 102. The most probable interpretation is that these are references to the two versions of book vii. They form evidence of the comparative separateness of that book, but not of a greater separateness than that of books v, vi, viii from books i-iv.

(3) Eudemus, in his *Physics*, which otherwise closely followed Aristotle's *Physics*, omitted book vii (S. 1036. 13).

(4) Themistius, who devotes 231 pages to the remaining 74 pages of the *Physics*, devotes only five to the nine pages of this book. He says nothing about the first section, 241^b 34-243^a 31; but it cannot be inferred that he had not it before him. He omits it because its subject-matter is dealt with more fully in viii. 4-5, as he omits vi. 7 because its subject-matter is treated more fully in viii. 10.

(5) The beginning of book vii does not fit on, as regards subject-matter, to the end of book vi, nor its end to the beginning of book viii; while the beginning of book viii does fit on to the end of book vi.

(6) The book starts without a connecting particle. This is

unusual in Aristotle. The only other clear cases are *An. Post.* ii, *Met.* αBFEZIKΛ, *Pol.* iii, iv. (In *Phys.* ii, viii, *De Caelo* ii, *Met.* ΔM, *E. N.* vii, *Pol.* ii, vii, *Rhet.* iii the MSS. disagree.) This is always evidence of at least comparative separateness from what precedes.

(7) The book is apparently not referred to in any other work of Aristotle. (Hoffmann's contention¹ that viii. 256^a 13-29 refers back to vii. 1 is not convincing. The reasoning is much the same as that in vii. 1, but there is no allusion to the latter.) But an argument from silence like this is not very conclusive. Against it may be set the fact that book vii itself does refer twice to book v (242^b 42 ἐν τοῖς πρότερον, cf. v. 4; 247^b 13 πρότερον, cf. v. 225^b 15) in such a way that it claims both to be by Aristotle and to be (in at least a wide sense) part of the same work as book v. Version β seems in the word ἦν 242^a 6 to refer to vi. 240^b 8-241^a 26, and in ἐν τοῖς πρότερον 242^b 8 to v. 4.

(8) With regard to the character of the book, Alexander described its arguments as λογικώτεραι (rather verbal), and Simplicius describes them as μαλθακώτεραι (S. 1036. 12). Simplicius further remarks that the more important of the problems discussed in the book, and those most relevant to the subject-matter of the *Physics*, are found again in book viii (ib. 8); but this is an exaggeration, since it is only the arguments of ch. 1 that are to be found in book viii. Finally, Simplicius expresses the view that the book is neither inappropriate to the *Physics*, nor unworthy of Aristotle; and adds that it was probably written by Aristotle, was then superseded by book viii, but was inserted in the *Physics* by some of his successors as being appropriate to the general inquiry. He himself comments on the whole book with his usual care.

These remarks about the inferiority of the book have usually been accepted by modern scholars. Hoffmann, who has studied the book most carefully, regards it as rather elementary and suited for tiros, and further as being, unlike the rest of the *Physics*, concerned with physics proper and not with the philosophy of nature. I cannot altogether share this view. The arguments do not seem markedly different in character from many that occur in other parts of the *Physics*. It is true that book vii remains within the region of the material and does not

¹ *De Arist. Phys. Lib. Sept.* 25.

unfold the notion of an unmoved mover which moves in a non-physical way. But the same is true of all the books of the *Physics* other than book viii. Nor do the arguments seem to be especially elementary, or expressed with a tedious fullness suitable only to the instruction of beginners. The comparative fullness of the expression is rightly used by Hoffmann against the view that book vii contains Aristotle's notes in preparation for lecturing. Such a theory, which might be plausible when applied for instance to *De An.* iii or to *Met.* A, is quite inapplicable to book vii. But I see no reason for holding with Hoffmann that version α (as well as β) is a hearer's notes of Aristotle rather than written by Aristotle himself. Version α seems to me nowhere to betray an un-Aristotelian turn of thought or an un-Aristotelian idiom. If it has come to us from the notes of a hearer, his notes were so accurate that he has actually preserved in the main Aristotle's *ipsissima verba*. It is clear that the three Greek commentators thought that they had the words of Aristotle before them, and it does not seem likely that they were all mistaken.

On the other hand, book vii does stand outside the main structure of the *Physics*. Books v, vi, viii form a unity which it interrupts. And it has two passages which have been rightly signalized by Jaeger¹ as marks of early date:—(1) the reference in 246^b 4–8 to the ἀρεταὶ τοῦ σώματος—ὑγίεια, κάλλος, ἰσχὺς. We find these in *Pl. Rep.* 591 b, *Phil.* 25 e ff. (especially 26 b), *Laws* 631 c. We find them in Aristotle's dialogue the *Eudemus* (fr. 45, p. 50. 13–23 Rose). The only other work of Aristotle's in which we find them is the *Topics*, which we know to be early (116^b 18, 139^b 21, 145^b 8). (2) The phrase in 249^b 23 καὶ εἰ ἔστιν ἀριθμὸς ἡ οὐσία, πλείων καὶ ἐλάττων ἀριθμὸς ὁμοειδής. Aristotle is here still treating it as an open question whether the Platonic reduction of essence to number is correct.

A third evidence of early date cited by Hoffmann² (viz. the implicit reliance on etymology as a guide to meaning, in 247^b 10) seems to me unconvincing. In view, however, of the two passages cited by Jaeger, Carteron's opinion that book vii was written after book viii in order to prepare the way for it more fully than books v–vi had done, seems to me less probable than Simplicius' view that book vii is earlier than book viii and was

¹ *Aristoteles*, 42 n., 313 n.

² *De Arist. Phys. Lib. Sept.* 27.

superseded by it. On the other hand, the caustic remark in 241^b 39-42 about the notion of a self-mover indicates that, on one point at least, Aristotle has already diverged from Plato's teaching. The book may perhaps belong to the Assos period which Jaeger has led us to recognize as the time of origin of some of Aristotle's works.

If we ask ourselves when book vii was incorporated in the *Physics*, the first point to be noticed is that apparently Eudemus did not regard it as part of the *Physics*. On the other hand, Alexander (fl. c. 200 A.D.) did so regard it; for Simplicius would certainly have quoted him along with Eudemus and Themistius if Alexander had *not* included book vii in his commentary on the *Physics*; and in fact Simplicius frequently in the course of the book quotes Alexander's interpretation.

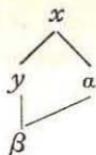
But we can probably carry the matter farther than this. In the list of Aristotle's works preserved by Hesychius there is mentioned (no. 148 Rose) φυσικῆς ἀκροάσεως ιη. ιη means 18, and the reference is probably to *Physics* i-viii + *De Caelo* i-iv + *De Gen. et Corr.* i-ii + *Meteor.* i-iv. Now E. Howald has made out a good case¹ for the view that Hesychius' list rests on the authority of Hermippus, the Alexandrian scholar of about 200 B.C. By this time, then, book vii had been incorporated in the *Physics*. If we adopt Diels's emendation φυσικῆς ἀκροάσεως η̄, we reach the same conclusion. Book vii, then, was included in the *Physics* sometime in the third century B.C.

While I can see no ground for Hoffmann's view that both versions are derived from notes taken by pupils, there is much to be said for supposing that version β is so derived. The language, as we have seen, is in certain respects un-Aristotelian. Further, the variations from α seem on the whole not such as a person with α before him would have made. They look more like a hearer's abbreviated and in some respects confused notes of the course of which α is Aristotle's own notes.² Or it may be that they are the notes of an earlier or later course than that reported in α, in which Aristotle used a different order and mode of expression.

¹ *Hermes*, 1920, 204-21.

² Probably his notes made after delivery, with a view to publication.

Hoffmann thinks that β has been contaminated from α . His scheme is



Now Simplicius says in two places (1086. 23, 1093. 10) that α had been contaminated from β . This may, of course, have happened in other places (cf. 244^a 10 τοῦ ἔλκοντος, probably introduced from β 243^b 24). And the converse may very well have happened. For instances see 245^b 17-18 (cf. ^a 16-^b 2), 21 (cf. ^b 6), 23 (cf. ^b 8). But it is impossible to tell to what extent either process has taken place. Version β was known to Alexander (S. 1051. 5). And it was probably already known to Hermippus, since the *περὶ κινήσεως* $\bar{\alpha}$ which occurs twice in Diogenes Laertius' list, and twice in that of Hesychius, may most probably be identified with the double version of book vii.

α , then, I believe to be an early work by Aristotle. Torstrik¹ may even be right in thinking it to be all that is left of the original version of the *Physics*. β almost certainly existed at least as early as the third century B.C., and *may* quite probably be a pupil's notes of the course of which Aristotle's own notes form α , or of a course of Aristotle's lectures differing but slightly from this. For chs. 4, 5, β is lost except for two brief indications by Simplicius. α does not belong to the main scheme composed of books v, vi, viii, but was inserted in the *Physics* in the third century B.C. by the zeal of disciples who were unwilling to sacrifice anything that Aristotle had written—very much as $\alpha\Delta\text{K}\Lambda$ were inserted in the *Metaphysics*.

II

ARISTOTLE'S NATURAL PHILOSOPHY

The Factors of Change—Matter, Form, and Privation.

THE first book of the *Physics* announces its subject-matter to be 'nature', but makes no attempt to define what nature is. Instead of this, it addresses itself at once to the task of determining the first principles, necessary conditions, or elements of

¹ *De Anima*, Pref. xxvii.

nature, 'nature' standing simply for the whole world of natural objects. The inquiry about its first principles is stated as an inquiry about their number,¹ but it is, as might be expected, by discovering *what* they are that it is discovered *how many* they are. At the start, however, we may say that either there is but one principle or there are more than one, and if the latter, either a finite or an infinite number. Aristotle examines first the view that there is but one first principle, and shows that by this two very different things may be meant. The first form of such a view is absolute monism such as that of the Eleatics, which denies the existence of any plurality and of any change. To examine this view is no proper task of physics; for the task of physics has been stated to be the discovery of the first principle or first principles of nature, and this presupposes that there is a plurality of facts to be explained by reference to certain simple factors, while absolute monism denies the existence of any plurality of facts, and therefore of any explanatory factors.² Since such a view denies the essential presupposition of physics, it is not the business of physics to discuss it. Nevertheless, to clear the ground for physics, Aristotle proceeds to refute the view which would make physics impossible by denying its very presupposition; and this he does, first³ by applying the distinction of the categories (which is treated as familiar to his hearers) and pointing out that whether monism admits the existence of different categories,⁴ or asserts the existence of quality or quantity only,⁵ or of substance only,⁶ it in any case falls into hopeless difficulties; and again by pointing out the difficulties into which it falls whether, when it says 'reality is *one*', it means 'continuous'⁷ or 'indivisible'⁸ or 'one in definition'⁹; and then¹⁰ by examining in detail typical arguments used by the monists.

The other kind of monism is not absolute monism. It asserts the existence of a single underlying body, but it admits that plurality and change exist. One form of this view derives a plurality of bodies from the one underlying body by densification and rarefaction; the other supposes different bodies that were always present in the underlying body to have been in course of time sifted out.¹¹ The latter form again has two varieties; Anaxa-

¹ 184^b 15-22.² 185^a 3.³ In ch. 2.⁴ 185^a 27-9.⁵ *ib.* 29-^b 3.⁶ 185^b 4-5.⁷ *ib.* 9-16.⁸ *ib.* 16-19.⁹ *ib.* 19-25.¹⁰ In ch. 3.¹¹ 187^a 12-23.

goras holds that an infinite variety of bodies is thus sifted out; Empedocles holds that all that emerges is of four kinds and no more. Aristotle criticizes at some length Anaxagoras' view, and expresses his preference for that of Empedocles.¹

What emerges from this discussion is that all former thinkers have recognized *contraries* as first principles. Even the absolute monist Parmenides does so in his Way of Opinion; the first school of incomplete monists do so by admitting the principles of rarity and density; a member of the second school like Democritus does so by asserting the opposition of plenum and void, and by admitting contrarieties of position, shape, and arrangement among his atoms.² Aristotle next attempts³ to confirm by argument what he has found to be the universal belief. Primary contraries possess the two characteristics that the first principles of things ought to possess; they do not involve either each other or anything else in their composition, and they are involved in the composition of everything else. It is clear, he maintains, that everything that comes into being or passes away comes out of, and passes into, not any chance thing but its own contrary, or an intermediate, which is a mixture of it and its contrary. Where that which comes into being is a simple quality, ordinary language describes it as coming from its contrary, white from black, musical from unmusical. Where that which comes into being is something more complex, ordinary language has no easily recognized contrary term, but it is none the less true that things come from their contraries; each mode of arrangement, as of a house or of a statue, comes into being precisely out of the absence of that mode of arrangement.

We have thus established that to account for the existence of change (which is assumed to be a fact of nature) we must suppose at least a pair of contrary principles, and we have shown that if nature is to be intelligible, there must not be an infinite number of ultimate principles. The question arises, whether a pair of contrary principles is enough. Evidently not; for a contrary (such as density or Love) does not act on its contrary, but on some third thing; and again no contrary completely constitutes the substance of anything; it always presupposes a substratum; and again no substance is contrary

¹ ib. 26-188^a 18.

² 188^a 19-25.

³ ib. 27-^b 26.

to any other, but substance cannot be made up out of non-substances; it therefore cannot be made up out of contraries. The thinkers who assert the existence of contrary principles always in fact suppose a third thing which is differentiated, permanently or temporarily, by the possession of one or other contrary. At the same time, it would be a mistake to assume the existence of more than three ultimate principles; for two contraries need only one substratum to serve as their basis, and one substratum needs only two contraries to account for its differentiation. If there are more than one pair of contraries, all but one must be regarded as specifications of that one; for each genus—and substance is a single genus—admits of only one ultimate contrariety.¹

Aristotle proceeds in ch. 7 to establish more securely and more definitely the triad of principles already reached. He does so by a general consideration of coming into being. A process of coming into being may be described in any one of three ways. We may say (1) 'a man becomes musical', or (2) 'something unmusical becomes musical', or (3) 'an unmusical man becomes a musical man'. In (1) we take account of a persistent element in the *terminus a quo*, and in (2) of a non-persistent element; but the complete fact is expressed only in (3), in which we take account of both elements. The two elements, it is to be observed, are only distinguishable by thought, not actually separate. The man *is* the something unmusical, but to be a man and to be unmusical are different things. The necessity of a substratum is most obvious when the change is merely the acquisition of a new size or quality or relation or place; for any such qualification obviously presupposes a substratum to which it attaches. But even when the change is the production of one substance out of another, there must be something that underlies the change. All change, then, proceeds from a supposite and an opposite; its general formula is '*x* qualified as not-*a* becomes *x* qualified as *a*', and thus involves the three factors *x*, non-*a*, *a*, though, owing to the numerical identity of that which is *x* and that which is non-*a*, the conceptual difference of *x* and non-*a* is easily overlooked, and change may seem to involve only a pair of contraries. The three factors may be called (1) ὑποκείμενον or ὕλη, (2) ἀντικείμενον

¹ Ch. 6.

or στέρησις, (3) μορφή or εἶδος or ἀρχὴ ἧς ὁ λόγος, the principle which forms the object of definition. (1) and (2), or (1) and (3), together make up an οὐσία or τόδε τι.

The Eleatics denied the existence of coming into being, because they held that it must be either from that which is or from that which is not, and could not be from either; not from that which is, because then there would be no change, and not from that which is not, because out of nothing nothing can come. Aristotle gets over this difficulty by pointing out the distinction between generation out of something *per se* and generation out of something in virtue of the concomitance of that with something else. If a doctor becomes, by neglecting his art, no doctor, it is *qua* doctor that he undergoes the change; but if he turns grey it is not *qua* doctor but *qua* black-haired, i.e. in virtue of a concomitant of his doctorhood, that he does so. So too, if an ὄν comes into being ἐκ μὴ ὄντος, it is not ἐκ μὴ ὄντος as such (which would contradict the principle *ex nihilo nihil fit*); it comes into being ἐκ μὴ ὄντος, i.e. from a στέρησις, non-*a*, but ἐκ μὴ ὄντος in virtue of the concomitance of the στέρησις with a ὑποκείμενον, *x*. Again, if an ὄν comes into being ἐξ ὄντος, it is not ἐξ ὄντος as such (in which case there would be no change), but ἐξ ὄντος, i.e. from a ὑποκείμενον, *x*, in virtue of the concomitance of the ὑποκείμενον with a στέρησις, non-*a*. Thus we save the existence of generation, without denying the principle 'everything either is or is not', which to an Eleatic seemed to make change impossible.¹

The Platonists also recognize a triad, the one, the great, and the small. But though they speak of the great and the small, they treat the great and small as a single principle, not distinguishing within the *terminus a quo* of change the persistent and the non-persistent element, supposite and opposite. Thus when the question is asked what it is that aims at the divine principle of form, *we* answer that it is the supposite or matter that does so, but *they* can only say that it is the opposite that does so—though this can no more desire its own opposite, which will destroy it, than form can desire itself.²

If we ask whether matter comes into being, or passes away, we must answer that *qua* that in which the στέρησις is present, it passes away when the στέρησις passes away (for 'that in which

¹ Ch. 8.

² 191^b 35—192^a 25.

the *στέγησις* is present' then no longer exists), but that in virtue of its function it is eternal. For if matter ever was coming into being, there must have been something that underlay this process, and this itself would be matter, so that there would have been matter before matter came into being; and if matter perishes, it must pass into something, and this would still be matter, so that matter would survive its own perishing.¹

Thus the whole substance of book i, if we eliminate incidental digressions, is the establishment of matter, form, and privation as the factors involved in all change. Aristotle's chief claim is that he has for the first time exhibited clearly the distinction between matter and privation, and the necessity of both to any account of change; and this claim is a well-founded one.

Nature as Internal Source of Change.

He begins his account of nature, in book ii, by assuming the existence of two kinds of thing which ordinary language distinguishes as 'existing by nature' and 'existing as a result of other causes'; and the context shows that this latter phrase may be paraphrased by 'existing by art, or by other rational activity'. To the former class belong animals and their parts, plants (and presumably their parts), and the simple bodies fire, air, water, and earth; to the other, such things as beds and clothes. Now the former have this characteristic, that they have in themselves a power of initiating change and of bringing it to an end; animals and the simple bodies can initiate change of place; animals and plants can initiate change of size and of quality. Beds and clothes initiate no change. In a sense the two classes overlap; for beds and clothes are, after all, made up out of the simple bodies, and as such can initiate change of place; they will of themselves fall if unsupported, though no external force acts on them. But they do this not *qua* beds or clothes but *qua* composed of simple bodies. The distinction therefore holds good, and it reveals the fact that when *a* is said to be a natural object and *b* is not, what is meant is that *a* as such has, and *b* as such has not, an internal power of originating movement. This then is what nature is; things that have this 'have a nature', and these of course are substances, since nature can exist only in a substratum; both these and

¹ 192^a 25^{-b} 4.

their essential attributes 'are by nature' or 'are according to nature'.¹

Aristotle adds that, while the nature or essence of a natural object is by some thinkers identified with the material of which it is made, it is more properly identified with the shape, or with the form which would be stated in the definition of the thing. A thing is most truly itself when it exists actually, not potentially, and its nature should therefore be identified not with the material out of which it *can* develop, but with the form it exhibits when it *has* developed. Form then is nature; but a certain definite absence of form is itself a kind of form and constitutes the nature of things at an earlier stage of development.²

Further light is thrown on Aristotle's view of φύσις by the discussion in book viii. In book ii φύσις is spoken of as an ἀρχὴ κινήσεως ἐν αὐτῷ, and we are apt to form the impression that Aristotle thinks of it as a power, resident in natural objects, of absolutely initiating movement. The apparent presence of such a power both in lifeless and more particularly in living things is cited in book viii among the grounds that *seem* to indicate the possibility of the origination of movement out of complete immobility.³ But as regards lifeless objects, Aristotle implies that their passage from a state of rest to one of movement is in fact not initiated from within but due to the action of an external agent. What is characteristic of them is that when a particular movement takes place, viz. the removal of an obstacle to their free movement, they respond to this by a movement of their own—upward in the case of fire and air, downward in that of water and earth—which is the actualization of a permanent potentiality of their nature. What is characteristic of living things is that when certain elements of their environment (notably air and food) set up changes in them which are not of the nature of locomotion, they respond by local movements of their limbs, which again are the realization of permanent potentialities of their nature.⁴ Thus neither the four elements nor living things are absolute originators of movement from a state of complete immobility. Yet the distinction between natural movements, which are the realization of typical potentialities,

¹ 192^b 8—193^a 9.

² 193^b 18—20.

³ 252^b 12—28.

⁴ For the details of the discussion in bk. viii cf. pp. 86-8.

and compulsory movements, which are forced on things from without, contrary to their typical potentialities, remains for Aristotle complete.

*Aristotle's Dynamics.*¹

The distinction between natural and compulsory movement lies at the basis of Aristotle's whole dynamics. His theory of natural movement is a theory about the facts which are now summed up under the heading of gravitation. With regard to these facts there were three main theories in antiquity. There was the theory that bodies may be divided into light bodies, which tend towards the circumference of the universe, and heavy bodies, which tend towards its centre. This is Aristotle's view, but he adds² that while it is the nature of fire to move as far as it can towards the circumference, and of earth to move as far as it can towards the centre, to air we can ascribe only a tendency towards the region just inside the circumferential region, and to water only a tendency towards the region just outside the central region. Thus air is only in a qualified sense light, water only in a qualified sense heavy.³ He adds that earth has weight (i.e. a centripetal tendency) wherever it is, water such a tendency everywhere except in the region of earth, air everywhere except in the regions of water and earth, all three having weight in their own region⁴; and he adds as proof of this that an inflated skin weighs more than an empty one.⁵

This last allusion illustrates forcibly two great defects of Aristotle's theory. In the first place, the supposed experimental fact is not correct. If the experiment had been conducted exactly enough, he would have found that an empty skin and a skin inflated with air weigh, in air, exactly the same. In the second place, the theory is not true to the experimental facts he thought he had at his command; for if the inflated skin really weighed more than the empty one, that would suggest not that air has an upward tendency but that it has a downward one and that air is prevented from moving to the centre of the

¹ This section owes much to A. E. Haas's article in *Archiv für d. Gesch. d. Naturwissenschaften u. d. Technik*, i (1908), 19-47.

² Anticipated by Anaxagoras, *D. L.* ii. 8.

³ *De Caelo* 311^a 22-9

⁴ *ib.* 311^b 5-9.

⁵ *ib.* 9.

universe merely by the greater weight of earth and of water. The supposed fact should have suggested therefore a comparative theory of weight, not the theory that different elements have contrary properties of heaviness and lightness.

This experiment played an important part in the development of later theories. Ptolemy repeated the experiment, obtained the opposite result, that the inflated skin is lighter than the empty one, and drew the conclusion that air has no heaviness in its own region¹; and from the fact that divers do not suffer from the pressure of the water above them he inferred that water also has no heaviness in its own region.² Finally Simplicius again made the experiment of the skins, got the correct result, that the inflated skin weighs the same in air as the empty skin, and explained this on the ground that since the natural *ῥοπή* of each element is to its own region, it has no *ῥοπή* when it is already there.³

Though, in Aristotle's cosmology, the centre of the earth coincides with the centre of the universe, he was careful to say that it was to the latter as such and not to the former that heavy bodies go⁴; and he added that if the earth were to leave the centre of the universe and be placed where the moon is, particles of earth would still tend to the centre of the universe.⁵ Both Plutarch and the Epicureans⁶ rejected as absurd the notion that a point in space, irrespective of what occupies it, could be the natural *terminus ad quem* of gravitation. Plutarch argues that it is absurd to suppose that a heavy mass plunging through the earth would rest when it reaches the centre,⁷ or if it overshot that mark would return to it.⁸

The Epicureans also rejected the notion that there are absolutely light bodies, and assigned to all bodies alike a tendency downwards, holding that the upward movement of light bodies was an unnatural movement imparted to them by heavier bodies which squeezed them upwards.⁹

The theory of Plato was intermediate between that of Aristotle and that of the Atomists. Like the Atomists he rejects the notion that any of the elements is absolutely light.¹⁰ Like

¹ *Simp. de Caelo* 710. 24.

² *ib.* 17.

³ *ib.* 29.

⁴ *De Caelo* 296^b 16.

⁵ 310^b 2-5.

⁶ *Lucr. i. ib.* 1052-60, 1074-6.

⁷ *De Caelo* 273^a 11.

⁸ *Mor.* 924 ab.

⁹ *Simp. de Caelo* 267. 30, *Epic. fr.* 276.

¹⁰ *Simp. de Caelo* 269. 6.

Aristotle, he thinks they have their characteristic regions to which they tend. Essentially, however, he makes this not a tendency towards different spatial regions, but a tendency of like towards like, of small parts of any of the elements to aggregate themselves with the main masses of what resembles them respectively; it is in fact a selective gravitation of like to like.¹ Thus the distinction between heavy and light becomes a relative one. All bodies are heavy, because all tend to unite with the main mass of what resembles them.² Some are lighter than others simply because they offer less opposition to a force that moves them towards what is unlike them.³ Plato's principle of universal selective gravitation, it will be seen, was more on the lines on which advance was to take place than Aristotle's division of the elements into two classes, distinguished by the spatial position of the regions they tend to.

When we turn to consider the *velocity* of natural movement, we find that Aristotle considers this to be in the main determined by two factors, (1) the amount of $\rho\sigma\pi\eta$, i.e. of weight or lightness, possessed by the moving object,⁴ which in turn, as between bodies of the same kind, is said to vary directly with their size,⁵ and (2) the density of the medium.⁶ To these must be added a third factor, (3) the shape of the moving thing,⁷ the notion being of course that a pointed object penetrates a given medium faster than a less pointed object of the same kind. If we ignore this as not lending itself readily to formulation, his formula would be

$$D = \frac{CM \times T}{\text{Density of medium}} \quad \text{or} \quad V = \frac{CM}{\text{Density of medium}}.^8$$

From this he draws the conclusion that in a void, if there could be such a thing, since density of medium would = 0, all bodies would move with infinite velocity, or in other words would take no time to move.⁹ But since he (rightly) thinks it impossible that any distance should be traversed in no time, he draws the wrong conclusion that a void must be impossible since motion through it *would* occupy no time. His error of course lies in

¹ *Tim.* 52 e-53 a.

² *ib.* 63 e.

³ *ib.* 63 d.

⁴ *Phys.* 215^a 28.

⁵ *ib.* 216^a 15, *De Caelo* i. 6, 277^b 4, 308^b 18.

⁶ *Phys.* 215^a 26.

⁷ *ib.* 216^a 19, *De Caelo* iv. 6.

⁸ D = distance, M = mass, T = time, V = velocity, C = a constant.

⁹ *Phys.* 215^b 12-216^a 11.

not seeing that the essence of motion is the traversal of a given distance in a given time, and in supposing that it is essentially the penetration of a medium to a certain distance, so that the resistance of the medium, instead of being something that merely reduces the velocity of the moving body, is something by which the $\rho\omicron\pi\eta$ of the body has to be divided, to get its velocity. In fact, having observed accurately that motion through a denser medium is slower than through a rarer one, he makes the natural enough mistake of supposing that velocity and density *ceteris paribus* vary inversely; failing to notice that the relation which connected them might be more complex than that of inverse proportion. A better mathematician might, even in the absence of evidence, have noticed the possibility of this.

Major J. H. Hardcastle, writing in *Nature*,¹ has pointed out that Aristotle's view that bodies fall with a speed proportional to their weight is approximately true of the terminal velocity of projectiles, i.e. the velocity at which retardation due to a medium such as air or water almost exactly balances the acceleration due to gravity, resulting in an almost constant speed of fall. Aristotle may have been relying on rough observation of this fact. But it is clear that he has not analysed out the factors that combine to produce this result.

Though in the main he works with the idea of velocity and says little of acceleration, he assumed that the free fall of a heavy body is subject to acceleration, and that the free rise of a light body is so too.² Strato later sought to establish the former fact by two observations—that when water is poured from a jug the lower part of the water breaks into drops while the upper does not, and that a body falling from a shorter distance makes no great impact on the ground, while one falling from a greater distance does.³ We do not know how Aristotle satisfied himself of the truth of the principle. It seems probable that he simply assumed that the attraction of the *terminus ad quem* increased as the moving body approached it. Simplicius quotes a current explanation, that the nearer a portion of any element gets to its proper region, the more it acquires its own proper form, which is the tendency to move towards that region.⁴ This

¹ xcii (1913-14). 584-5, xciii (1914). 428.

² *Phys.* 230^b 24, *De Caelo* 277^a 27.

³ *Simp. Phys.* 916. 12-28.

⁴ *ib.* 5, *Simp. De Caelo* 266. 32.

is in accordance with Aristotle's principle that for a thing to move towards its place is to move towards its form.¹

According to Aristotle compulsory movement is an entirely different phenomenon from natural movement. He no doubt realized that the nature of the medium affected the former as well as the latter, but in his actual treatment of compulsory movement he ignores the medium. In the case of compulsory movement the mass of the moving body is thought of not as increasing but as diminishing its velocity, so that his formula is

$$\frac{M \times D}{F \times T} = C, \text{ or } D = \frac{CF \times T}{M}, \text{ or } V = \frac{CF}{M}.$$

But this principle according to him is valid only when the ratio of force to mass moved remains constant or when the force increases relatively to the mass.

(1) M can be halved and D doubled, F and T remaining the same.

(2) M and T can be halved, F and D remaining the same.

Since (3) D and T can be both halved or both doubled, F and M remaining the same,

\therefore (4) F and M can be halved, D and T remaining the same.³

Since (5) M cannot be doubled and D halved, F and T remaining the same.

\therefore (6) F and D cannot be halved, M and T remaining the same.

(7) If F' moves M' distance D in time T , and F'' moves M'' distance D in time T , $F' + F''$ move $M' + M''$ distance D in time T .⁴

The enunciation of (5) and (6) is based by Aristotle on empirical grounds, e.g. on the fact that where a company of men can haul a ship a certain distance in a certain time, a single man may not be able to move it at all. He does not realize that this is due to friction, and speaks as if the mere weightiness of the object to be moved demanded a certain minimum force to move it at all. He does not contemplate a force acting on a mass and giving it a definite velocity of movement, which it then retains until some other force or some resistance brings its motion to an end or alters it. His general principle is that the continuance of imparted motion implies continued contact

¹ *De Caelo* 310^a 33.

³ *Phys.* 249^b 30—250^a 9.

² F = force.

⁴ *ib.* 250^a 9—28.

between mover and moved; and when this seems not to be the case, as in the movement of a projectile, he falls back on some special explanation, such as that the air continues to impart movement to the moving body.¹ In the present passage, as the example of the ship-haulers² shows, he contemplates a force remaining in contact with the moving body. He sees correctly enough that the speed of the movement varies with the duration of the application of the force, but fails to see that in the absence of a resisting medium and of friction the application of a force however small for a time however short would move a mass however great with a certain velocity.

In another place,³ as we have seen, Aristotle shows himself aware of the importance, in the theory of motion, of the nature of the medium, and indeed exaggerates its importance, making velocity inversely proportional to the density of the medium. He can hardly be supposed to have overlooked in the present passage⁴ the existence of the resistance of the medium, and we must assume that he presupposes an identical medium to be present throughout.

When he came to notice that though *A* moves *B* distance *C* in time *D*, *A* need not move $2B$ (or $\frac{A}{2}$ move *B*) distance $\frac{C}{2}$ in time *D*, Aristotle, if he had reasoned more profoundly, would have seen that this upset his original principle that if *A* moves *B* distance *C* in time *D*, *A* moves $\frac{B}{2}$ precisely distance $2C$ in time *D*. He would have seen that his principle that velocity varies with force and inversely to mass moved, while true in itself (if we substitute acceleration for velocity), could not be the complete theory of the velocity of movement, and would have been led to suspect that the apparent breach of his principle was due to the interference of friction. He erred by underestimating the complexity of the problem. As Duhem well remarks,⁵ 'Cette Dynamique, en effet, semble s'adapter si heureusement aux observations courantes qu'elle ne pouvait manquer de s'imposer, tout d'abord, à l'acceptation des premiers qui aient spéculé sur les forces et les mouvements.

'Au Pirée, Aristote observe un groupe de hâleurs; le corps

¹ ib. 266^b 27—267^a 20.

² ib. 250^a 18.

³ *Phys.* iv. 8.

⁴ ib. vii. 5.

⁵ *Système du Monde*, i. 194-5.

penché en avant, ils pèsent de toute leur force sur un câble amarré à la proue d'un bateau; lentement, la galère approche du rivage avec une vitesse qui semble constante; d'autres hâleurs surviennent et, à la suite des premiers, s'attellent au câble; le vaisseau fend maintenant l'eau plus vite qu'il ne la fendait tout à l'heure; mais tout à coup, il s'arrête; sa quille a touché le sable; les hommes qui étaient assez nombreux et assez forts pour vaincre la résistance de l'eau ne peuvent surmonter le frottement de la coque sur le sable; pour tirer le bateau sur la grève, il leur faudra un nouveau renfort. Ne sont-ce pas là les observations qu'Aristote s'est efforcé de traduire en langage mathématique?

'Pour que les physiciens en viennent à rejeter la Dynamique d'Aristote et à construire la Dynamique moderne, il leur faudra comprendre que les faits dont ils sont chaque jour les témoins ne sont aucunement les faits simples, élémentaires auxquels les lois fondamentales de la Dynamique se doivent immédiatement appliquer; que la marche du navire tiré par les hâleurs, que le roulement, sur une route, de la voiture attelée, doivent être regardés comme des mouvements d'une extrême complexité; qu'un rôle de grande importance y est joué par des résistances dont les phénomènes vraiment simples doivent être entièrement exempts; en un mot, que pour formuler les principes de la science du mouvement, on doit, par abstraction, considérer un mobile qui, sous l'action d'une force unique, se meut dans le vide. Or, de sa Dynamique, Aristote va justement conclure qu'un tel mouvement est inconcevable.'

Having no conception of the First Law of Motion, Aristotle finds it necessary to offer some explanation of the fact that a body goes on moving after the body which moved it has ceased to be in contact with it. In one passage¹ he says that this must be due either to ἀντιπερίστασις or to the fact that the impelled air pushes the body with a movement faster than its natural movement. The first explanation is that mooted by Plato in the *Timaeus*,² that the air which is dispelled by the moving body gathers in behind it and pushes it on. The second explanation, since it is distinguished from this, must be that there was from the start air between the propellant and the projectile, and that this pushes on the projectile so long as

¹ *Phys.* 215^a 14-17.

² 79 a-80 c.

the motion imparted to it by the propellant is more vigorous than the natural motion of the projectile.¹ Further, since Aristotle thinks of impressed movement not as a tendency to move for ever with a uniform velocity but as the property of moving a certain distance in a certain time and then coming to a stop, he naturally thinks of the movement as gradually losing velocity till it merges into immobility. Compulsory motion tends to decelerate, while natural motion tends to accelerate.²

Apart from the defects of Aristotle's dynamics named above, perhaps his most serious error is his division of natural movement into two kinds, the rectilinear movement of the terrestrial elements and the rotatory movement of the celestial spheres. In regarding circular motion as being equally simple with rectilinear, he falls into a natural confusion between identity of direction and constant change of direction. This bifurcation, and the wider bifurcation of movement into natural and compulsory, are the main reasons why he failed to reach a correct and unified dynamical theory. Yet there is in Aristotle a hint at a true theory of rotation. In book vii³ he says there are four ways in which one body may be set in motion by another—pulling, pushing, carrying, and twirling or rotation. The accounts given of pulling and pushing imply that they act in a straight line to or from the motive agent⁴; and rotation is said⁵ to be compounded out of pulling and pushing, the motive agent pulling one part of the moving object and pushing another part. Here circular motion is in fact described as the resultant of two simple rectilinear movements. If Aristotle had extended this analysis to include the 'natural' circular motion of the celestial spheres, he would have been on the track which ultimately led to Newton's explanation of the movement of the planets. But in fact he always treats the rotation of the heavenly spheres as equally simple with rectilinear motion.⁶

The Four Causes. Chance. Necessity.

We may now resume the thread of the argument in book ii. Aristotle next turns⁷ to discuss what it is that is the precise

¹ Cf. *Phys.* 266^b 27—267^a 20, *De Caelo* 301^b 22—9.

² *Phys.* 230^b 24, *De Caelo* 277^b 6.

⁴ *ib.* 18—^b 6.

⁶ *Phys.* 261^b 28—31, *De Caelo* 268^b 17—19.

³ 243^a 17.

⁵ *ib.* 244^a 2.

⁷ *ii.* 2.

object of study to the student of nature. In particular, how does he differ from the mathematician? Physical bodies contain solids, planes, lines, points, which are the very things studied by the mathematician. But the mathematician studies them in abstraction from the fact that they are the limits of physical bodies. Though these things have no existence apart from physical bodies, we can study them in abstraction from the whole fact of change, and since they have a nature of their own, and consequential properties of their own, which are entirely independent of change, no error arises from their being studied in abstraction. It is a mistake, however, to suppose, as Aristotle accuses the Platonists of doing, that *physical objects* can be studied in abstraction from the fact of change. The difference between a mathematical and a physical object may be seen by comparing curvature with snubness. Curvature exists in physical bodies and (Aristotle would say) nowhere else; but it can be studied—the properties of various curves can be studied—in abstraction from the fact of change. Snubness, on the other hand, is a particular curvature in a particular sort of body. A certain kind of body, and therefore susceptibility to certain kinds of change, is involved in the very definition of snubness, and cannot properly be abstracted from when we study snubness. And in this respect flesh, bone, man, in short all the objects of the physicist's study, are like the snub. Each of them is a τὸδε ἐν τῷδε,¹ a particular form embodied in a particular kind of body which that form requires for its embodiment; they, and their attributes, are λόγοι ἐνυλοι, enmattered forms.² Not only physics, but even the more physical branches of mathematics—optics, harmonics, astronomy—study objects which no doubt have a mathematical character, but study them in respect of their physical attributes.

Since the objects of physics are essentially complexes of matter and form, it follows that physics must take account both of their matter and of their form. But Aristotle implies that it is only 'up to a certain point' that it studies each of these.³ It is not made very clear in his account how this point is fixed. But we may perhaps say that in studying any particular complex of form *a* with matter *b*, physics must know what kind

¹ *Met.* 1030^b 18, 1036^b 23.

² *De An.* 403^a 25.

³ *Phys.* 194^a 23, ^b 9.

of matter that form needs for its embodiment, and what form that matter is fitted to embody, as a doctor (though he is not a natural philosopher or physicist but an artist, whose task, however, is in this respect akin to that of the physicist)¹ must know both the nature or definition of health so far as that can be stated without reference to any kind of matter, and also the kind of matter in which that nature can be embodied, viz. 'bile and phlegm'. On the other hand, *qua* studying *a* in *b*, the physicist is not bound to know what further ends *a* conduces to, nor what more primitive matter *b* is composed of. It is enough that he should know *a* and *b* in their relation of form to matter, of end to means, of actuality to potentiality.

It is easy to see the agreement between this account of the nature of physics and that given in the *Metaphysics*,² where θεωρητικὴ ἐπιστήμη is divided into physics, dealing with χωριστὰ ἀλλ' οὐκ ἀκίνητα, things that have separate, substantial existence, but involve movement in their being, and therefore matter, which is the potentiality of movement; mathematics, dealing with ἀκίνητα μὲν οὐ χωριστὰ δὲ ἴσως ἀλλ' ὡς ἐν ἕλῃ, things that are devoid of movement but have no separate existence, but only exist as embodied in matter; and theology, which deals with χωριστὰ καὶ ἀκίνητα, pure forms that exist separately and exempt from change (viz. God and the beings that move the heavenly spheres). A typical example of physics as thus conceived is Aristotle's psychology, which is really psychophysics, in which both body and soul, and the relation between them, are held constantly in view. In intention at least, all Aristotle's physical treatises adhere to this programme. The form or end is always in the forefront; the method of treatment, particularly in the biological works, is predominantly teleological. But constant regard is also had to the material structure by which and by which alone the ends of nature can be realized.

Aristotle next points out that, since the object of physics is to understand natural change or process, in other words to know *why* it takes place, the physicist must inquire what are the various kinds of αἴτιον. αἴτιον must not here be understood as meaning 'cause'; for the several αἴτια are not causes in the sense of furnishing complete explanations of natural processes. It is only the union of them all that furnishes a complete

¹ ib. 194^a 21-4.

² 1026^a 13-16.

explanation, and severally they are merely necessary conditions of natural process.

The chapter in which they are expounded¹ is repeated, but for its beginning and its end, in *Met. Δ. 2*, and it is impossible to say with certainty whether it was in its context in the *Physics* or as part of his philosophical lexicon that Aristotle first formulated his doctrine. But it is to the *Physics* and not to book Δ that he refers in the *Metaphysics*² as the place in which the doctrine has been already expounded, and the exposition arises naturally enough out of its context in the *Physics*. In i. 5-8 Aristotle has pointed out that everything that comes to be is a union of form and matter, that these are at least among the necessary conditions of its coming to be. The same two elements have been in ii. 1 described as being the two meanings of the word 'nature', and in ii. 2 he has described physics as necessarily studying both. These reappear in ii. 3 as the constituent elements³ in everything that comes to be by nature, and he adds to them the external conditions of natural process—the efficient and the final cause.

Though these are here distinguished from one another and from the formal cause, and are distinguished from the latter as external from internal conditions of change, Aristotle tells us later that all three 'often coincide'.⁴ This is clear enough as regards the formal and the final cause. In the case of the building of a house, one and the same thing, 'capacity to shelter living bodies and goods',⁵ is at the same time the internal factor which distinguishes the house from the bricks and mortar which are its proximate matter, and an external condition of the house's coming to be, the final cause which draws the builder on to his act of building. And so, too, in the case of natural as opposed to artistic process, the form which characterizes the product is also that at which nature was unconsciously aiming when it produced the product. The identity of the *efficient* with the formal cause is less obvious. The concrete things cited as examples of the efficient cause—'the person who advised a course of action, the father who begot a child, the maker and in general the cause of change'⁶—sound very different from the abstractions cited as instances of the formal

¹ ii. 3.² 983^a 33, 985^a 12, 988^a 22, 993^a 11.³ 195^a 19.⁴ 198^a 24.⁵ *Met.* 1043^a 16.⁶ 194^b 30-2.

cause, e.g. the ratio of 2 to 1 as formal cause of the harmony of a note with its octave.¹ Yet the general principle holds good:—
*ἀεὶ ἐκ τοῦ δυνάμει ὄντος γίγνεται τὸ ἐνεργείᾳ ὄν ὑπὸ ἐνεργείᾳ ὄντος.*²
 That which potentially has a certain form comes to have it actually only through the actual presence of that form in the motive agent. But the form is present as efficient cause in different manners according as the process is natural and unconscious, or artistic and intelligent. In natural process the form is literally present in the efficient cause. That which produces the form of heat in other things does so by possessing the form of heat itself; that which produces the form of man in another being produces it by possessing the form of man itself. The form is that which is really efficient in the concrete efficient cause. In the case of artistic production the form is not present in the efficient cause as qualifying this; that which produces a house is not itself a house. But the form is present in the builder as being known by him and as filling his mind. *Prima facie* we might say that the efficient cause of a house is a man, but if we look more closely we see that it is a builder, and if we look more closely still we see that it is the building art, in other words the form of house as known, that is the efficient cause.³ Thus one thing, the form, functions both as a component in that which is produced, as its final cause, and as the really efficient element in its efficient cause.

We do not know how Aristotle arrived at the doctrine of the four causes; where we find the doctrine in him, we find it not argued for but presented as self-evident. He may have reached it by direct reflection on instances of natural process and of artistic production. But if so, the reflection was aided by the work of his predecessors; just as the doctrine of the categories was apparently the result of a direct attempt at classifying the contents of the universe, but was undoubtedly aided by Plato's recognition now of substance and again of quality or relation as main forms of being. The material cause, as Aristotle himself points out,⁴ is writ large in the whole history of early Greek philosophy. The efficient cause was implicitly recognized by Empedocles and Anaxagoras when they introduced love and strife, or reason, as moving principles. The formal cause was

¹ *ib.* 27-9.

² *Met.* 1049^b 24, cf. *Phys.* 202^a 11.

³ 195^b 21-5.

⁴ *Met.* A. 7.

recognized most clearly in the Theory of Ideas. The final cause, Aristotle says,¹ was not recognized in its true nature by any of his predecessors. He says elsewhere² that Plato used only the material and the formal cause. He strangely and grudgingly ignores the many passages in Plato which emphasize the efficient cause—the self-moving soul of the *Phaedrus*³ and the *Laws*,⁴ the demiurgus of the *Sophistes*⁵ and the *Timaeus*,⁶ the αἰτία τῆς μίξεως of the *Philebus*⁷; and the many references to a final cause—the ultimate good or οὐδ' χάριν of the *Philebus*,⁸ the object of the creator's purpose in the *Timaeus*⁹ and the *Laws*.¹⁰ In the *Philebus*¹¹ the material cause, the formal, the efficient (τὸ ἄπειρον, πέρασ, ἢ αἰτία τῆς μίξεως) are all to be found. In the *Timaeus* the ὑποδοχή and the παραδείγματα answer to the material and the formal cause, the δημιουργός and the object of his beneficent purpose to the efficient and the final. But Aristotle did not find anywhere in Plato the statement that in *all* change all four causes are needed.

In his account of the αἴτια¹² Aristotle interpolates a discussion of chance—not that he thinks chance is a *vera causa*, but because it is often so regarded.¹³

He reaches his theory of chance by a series of approximations. To begin with, we may note that in chs. 4 and 5 τύχη and τὸ αὐτόματον are used almost indiscriminately, with only occasional suggestions that there is a difference between them, and that it is only in ch. 6 that they are carefully distinguished. When they are distinguished, it becomes clear that τὸ αὐτόματον has a specific usage in which it stands for something different from τύχη, and a generic usage in which it includes both τύχη and τὸ αὐτόματον in the specific sense. We may perhaps use 'chance' as equivalent to τὸ αὐτόματον in its generic sense, and 'luck' to stand for τύχη; we have no very natural English equivalent for τὸ αὐτόματον in its specific sense, but may perhaps call this 'random'.

After pointing out in ch. 4 the variety of views held by earlier thinkers about chance, Aristotle proceeds in ch. 5 to give his own account of its nature. He first points out that 'some

¹ ib. 988^b 6-16.² ib. 988^a 9.³ 245 c, d.⁴ 891-9.⁵ 265 b-d.⁶ 28 c ff.⁷ 23 d, 26 e-27 b.⁸ 20 d, 53 e.⁹ 29 d ff.¹⁰ 903 c.¹¹ 27 b.¹² ii. 3, 7-9.¹³ 195^b 31-3.

things happen always in the same way, others for the most part'. I.e. there are observable sequences which can be formulated quite rigidly in the form '*a* is followed by *b*', and others which can only be formulated in the form '*a* is usually followed by *b*'. Aristotle is not contending that there is any lack of necessity in the causation of *b* in the latter case. It may well be that there is an absolute rule '*a* when accompanied by *x* is always followed by *b*'. He is simply pointing to the fact that there are nameable conditions (or sets of conditions) *a* which are usually but not always followed by a certain result *b*. There are, then, also cases in which such conditions are followed by results other than their normal results. As a first approximation, he identifies chance sequences with such cases.¹ But this is only an approximation to the truth. He proceeds to a further division of events into those that happen *ἕνεκά του* and those that do not. It is impossible to make sense of his doctrine of chance if we take *ἕνεκά του* to have here its natural meaning of 'for a purpose'. Things that happen *ἕνεκά του* are 'those that *might* be done as a result of thought and those that *might* happen as a result of nature',² i.e. those that produce end-like results. Now, events being divided (A) into (1) τὰ ἀεὶ ὡσαύτως γιγνόμενα, (2) τὰ ὡς ἐπὶ τὸ πολὺ, (3) τὰ παρὰ ταῦτα, and (B) into (1) τὰ ἕνεκά του (those having end-like results) and (2) τὰ μὴ ἕνεκά του, it is obviously possible that some events in class A (3) are also in class B (1). Such events are chance events. Further, if we consider class A (3), where *a* is followed by an unusual result *c*, we can see that *a* does not as such cause *c* (for if it did, it would always cause it). It must be followed by *c* κατὰ συμβεβηκός, in virtue of a concomitant, as when some one who is pale or musical builds a house not *qua* pale or musical but because of the concomitance of capacity to build with paleness or musicalness. Thus κατὰ συμβεβηκός can take the place of μήτ' ἀεὶ μήθ' ὡς ἐπὶ τὸ πολὺ in the definition of chance.³ A typical example of chance is the following:—*M* goes to the market-place, say, to hear the news. *N*, who is in *M*'s debt, happens at the same time to be in the market-place and to have just recovered a debt from *O*. *M*'s going to the market-place leads, by virtue of *N*'s concomitant presence there, to the result that *M* recovers his debt from *N*, a result which is end-like because *M* would have

¹ 196^b 10-17.² ib. 21-2.³ ib. 23, 28, 193^a 5.

sought to produce it by going to the market-place if he had known that *N* was to be there and in funds.¹

Aristotle complicates his statement by anticipating the distinction between *τύχη* and *τὸ αὐτόματον* which is professedly deferred to ch. 6. The end-like result that occurs in the case in question is, he says, 'not one of the causes in the man himself, but one of the objects of choice or thought'. This is an obscure way of saying that the result in question is one that would normally be produced not as the result of an internal (and, we may add, blind) impulse, such as that by which living things grow and conduct their organic processes, but as the result of voluntary aiming at an imagined end. This is precisely what distinguishes *τύχη* from *τὸ αὐτόματον* in its specific sense; and a consideration of this instance leads to the definition *ἢ τύχη αἰτία κατὰ συμβεβηκός ἐν τοῖς κατὰ προαίρεσιν τῶν ἕνεκά του.*²

This distinction is developed in ch. 6. Of chance events, those are said to be matters of *luck* which happen to beings capable of intelligent action,³ i.e. to adult human beings.⁴ But animals and lifeless things may be said to do things by *chance*; a horse which loses its rider in battle, by chance (*αὐτόματος*) runs back to a place of safety; a tripod by chance falls into a position in which it can be sat on. Random events are those in which the behaviour or movement of irrational or lifeless things, owing to the concomitance of some external cause,⁵ produces a result which though end-like was not actually aimed at.

The differentia which distinguishes random from lucky events is most clearly seen, says Aristotle,⁶ in events that happen by nature. When by some natural force an end-like result is produced in a way contrary to the usual course of nature, that is a typical case of *τὸ αὐτόματον* as opposed to *τὸ ἀπὸ τύχης*. But this is distinguished from the kind of random event mentioned above. *There* the concomitant which was operative was something external to the thing in question; some feature of the path, for instance, which led the horse to take it rather than another. *Here* the operative concomitant is something in the nature of the thing itself. This type of random event is left without illustration, but we can get some help from the discussion in *Met. Z*. We see from that that the type of event

¹ 196^b 33—197^a 3.

² 197^a 5.

³ 197^b 1-2.

⁴ *ib.* 6-8.

⁵ *ib.* 20.

⁶ *ib.* 32.

Aristotle has in mind is spontaneous generation, which in his view is due to the fact that matter of certain kinds, such as rotting earth, dew, or mud,¹ has in it the power of initiating a change in itself which transforms it into a living thing, and thus simulates the process of natural generation from seed.²

The general upshot is clear. Aristotle recognizes the existence of chance, not as a cause or type of cause, nor as a breach in necessary causation, but as a type of sequence whose general character is that an action or movement, by virtue of some concomitant that happens to accompany it, exceptionally produces a result which, though it was not aimed at, is of a kind that might naturally have been aimed at. It is a name for sequences that simulate the conscious purposiveness of human action, or the unconscious teleology of nature. Its essence lies, according to Aristotle, not in the absence of a necessary connexion between antecedents and results, but in the absence of *final* causation, in cases in which the result is so strikingly end-like as to suggest to an uninformed observer the presence of final causation. Not that final causation is in such cases absent. *M* and *N* both go to the market-place for purposes of their own. But *M* does not go there for the end which, nevertheless, owing to *N*'s also going there, supervenes on *M*'s going.

It will be seen that *bad* luck does not fit easily into this account. Unlucky events certainly do *not* suggest or simulate purposive action on the part of the person concerned. We can bring in bad luck only as a kind of appendix to Aristotle's account of luck; unlucky sequences are those that suggest and simulate purposive action by a hostile agent, as lucky events suggest and simulate purposive action by the person himself who experiences the lucky event.

Having enumerated the four causes, and shown that chance is not a separate cause but the operation of an efficient cause,³ which produces by the aid of a concomitant an end-like though not aimed-at result, Aristotle proceeds⁴ to discuss the use which physics should make of the four causes. Incidentally he notes that the four causes are normally reducible to two. If we were dealing with unchangeable entities, such as the objects of mathematics, our explanation would be by means of the formal

¹ Cf. Bonitz, *Index*, 124^b 3-22.

² *Met.* 1032^a 30, 1034^b 4-7.

³ 198^a 2-3.

⁴ ii. 7.

cause,¹ and no question of a material, a final, or an efficient cause would arise ; the possession of any given attribute by any type of figure is to be explained by showing that the attribute is involved in the form or definition of the figure. But where we are dealing with things subject to change (as in physics we always are) the formal cause is at the same time the final cause ; i.e. the essence or characteristic nature of each species of thing is to be regarded as the end which nature in producing that thing aims at. And the formal or final cause is also identical with the efficient ; the presence of the form in one member of the species is to be explained by the previous presence of the same form in another member of the species ; it is one man *qua* possessing the form of man that becomes the efficient cause of the birth of another man ; it is one thing possessing heat that becomes the efficient cause of heat in another thing.

Most inquirers about nature, Aristotle remarks, ignore this implication of formal and final causation in efficient causation. They merely try to trace the sequence of events, and in particular to find the direct and the remote efficient and material causes.² But we must recognize, besides the efficient causes which merely transmit movement they have themselves received, and which are members of the same species as that on which they act, two agents that are subject to no movement, viz. the being which is the ultimate originator of movement, and the formal or final cause, which, though embodied in transient individuals of the species, is itself eternal and unchangeable. The importance of recognizing the prime mover, and of recognizing the formal-final cause implicit in efficient causation, is the chief moral Aristotle wishes to emphasize.

His emphasizing of the final cause brings him into conflict³ with the view, of which he takes Empedocles as representative, that everything in nature is a matter of mechanical causation, of necessity operating *a tergo*. It is agreed that the rain which now swells the crops and now sweeps them to destruction does not fall for either of these purposes, but because clouds when cooled *must* fall in rain. Similarly, Empedocles suggests, the parts of animals and of plants, which are so well adapted to their functions, are nevertheless produced by mechanical causation. Aristotle replies that occasional adaptation might

¹ 198^a 16-18.

² 198^a 33-5.

³ ii. 8.

well be treated as due to chance (which, as we have seen, is the unreal appearance of purposiveness), but that it is of the nature of chance events to be exceptional, while *everything* or almost everything in nature has the appearance of adaptation to purpose. That end-like results should be *constantly* produced in the absence of final causation would be too extraordinary a coincidence to be credible. Aristotle further points to the analogy between the processes by which nature and art respectively produce their products, and infers that since art, which finds in nature the models it seeks to imitate, is manifestly purposive, so too must nature be. He points to conspicuous instances of adaptation—to the instinct of spiders, ants, and swallows, to the protection of the fruits of plants by the leaves, to the movement of the roots downwards, where their nutriment is to be found—and claims that all this is evidence of the operation of a final cause, and that occasional failures of adaptation in nature, such as monstrous births, are no more evidence of lack of purpose in nature than the failures of art are evidence of lack of purpose in the artist. If chance ruled in nature, any kind of animal should be liable to give birth to any other, but nothing is more obvious than the tendency of animals and plants to breed true to type. The absence of any evidence of deliberation is no indication of the absence of teleology, for art also moves straight to its goal without deliberation. In fact the only difference between art and nature is that in artistic activity agent and patient are disjoined, while in natural activity they are conjoined in one individual, so that when *per accidens* the agent and the patient of artistic action are conjoined, as when a physician heals himself, we get a true picture of the working of nature; and if art is purposive, so is nature.

It is not the case, Aristotle maintains,¹ that in nature there is an absolute necessitation working from pre-existing causes to effects; to say that is like saying that a wall is produced necessarily by the sinking of its heavy materials to the bottom and the rising of its light materials to the top. There is only an *ex hypothesi* necessitation; *if* certain results are to be achieved, certain preconditions must be present. It is not the form or result that is necessitated by the matter, but the matter and the processes in it that are necessitated by the result that

¹ ii. 9.

nature aims at, the form that is to be achieved. Though the physicist must take account both of the material and of the formal-final cause, it is the latter that must chiefly interest him, since it is the prius which necessitates the other. Here again, the analogy between nature and art holds good. As the purpose for which a house exists necessitates the materials that are to be used, so the form of man requires certain organs, these require certain tissues, and these in turn require the presence of the 'simple bodies' in a certain proportion. Indeed the bond of union between the form to be achieved and the materials to be used is so close that the appropriate materials become part of the very definition of the product; 'even in the definition there are parts which form the quasi-material element of the definition.'²

Change.

Books iii and iv form a continuous treatise, dealing with change, and with subjects which necessarily arise in the consideration of change—the infinite, place, the void, time.

The existence of change, Aristotle points out, depends on the fact that while certain things never exist except in fulfilment or actuality, others exist potentially before they exist actually. The distinction of actuality and potentiality can be found within each of the categories. There is nothing in the world which overrides the categories and is neither a substance nor a quantity nor a quality nor in any other category; and from this it follows that there is no such thing as change which overrides the distinction of the categories and is not change in respect either of substance or of quantity or of some other category. But there is not change in respect of all the categories, but in respect of four only—substance, quantity, quality, place; the reason for this is given later. Within each category two poles are to be distinguished: in substance there is form and privation, in quantity completeness and incompleteness, in place up and down; in quality there are no general names for the poles, but a variety of contraries is to be found, such as white and black. This polarity gives rise to the two forms of change in respect of substance, acquisition of form and loss of form, or generation and destruction; to the two forms of change of quantity, growth

¹ 200^b 7.

and diminution; to the two forms of natural locomotion (rotation being here overlooked), movement up and down; and to a variety of pairs of opposed changes of quality.

Change is always the actualization of potentiality as such. In any subject of change we may distinguish two elements which are factually united but conceptually distinct, its actual *a*-ness (say the bronzeness of a piece of bronze) and its capacity of being transformed into a *b* (say a statue). Change is the actualization, not of its *a*-ness (which is actual before the change begins) but of its capacity to become *b*. For the actualization of this capacity must be either the change which transforms *a* into *b*, or the *b* which is thus produced; but it cannot be the latter, for by the time the latter exists, the capacity of being transformed into *b* has ceased to exist and is no longer being actualized. Change is to be identified neither with *a* nor with *b*, but with the transition from *a* to *b*. Being the actualization of a potentiality, it exists only while the potentiality is being actualized and is not yet fully actualized; it is an actualization which at every moment of its existence is incomplete.¹

The imparting of change is achieved by contact, and is therefore normally mutual. Its complete formulation is this:—*m*, which is actually *x* and potentially *y*, imparts *x*-ness to *n*, which is actually *y* and potentially *x*, while *n* simultaneously imparts *y*-ness to *m*.² But Aristotle keeps the way open for the doctrine of the prime unmoved mover, by the limiting statement that it is only that which imparts change φυσικῶς that is itself also changed.³ Finally, he points out that within each change we may distinguish two moments or elements, factually united but conceptually distinct. Each change is at once the actualization *in* the patient of the agent's capacity of imparting change, and the actualization *by* the agent of the patient's capacity of suffering change (τοῦδε ἐν τῷδε and τοῦδε ὑπὸ τοῦδε).⁴

In the account of change in book iii κίνησις and μεταβολή are not distinguished from one another; both words are used as names for change in general, including the four varieties generation and destruction, alteration, growth and diminution, and locomotion. But in book iv a hint is dropped that this identification is only provisional.⁵ This hint is taken up in

¹ 201^b 31.

² 201^a 19-23, 202^a 3-13.

³ 201^a 24.

⁴ iii. 3.

⁵ 218^b 19.

book v, where μεταβολή is used as the generic term, and κίνησις is distinguished from it as including the latter three kinds of change but not generation and destruction. Aristotle starts by distinguishing the type of case in which a given subject *A* can be said to change καθ' αὐτό, from two other types of case: (1) change κατὰ συμβεβηκός, viz. the type of case in which *A* is said to change because *B*, of which *A* is a concomitant, changes, e.g. when we say τὸ μουσικὸν βαδίζει because a person who happens to be musical walks; (2) change κατὰ μέρος, viz. the type of case in which *A* is said to change because *B*, which is a part of *A*, changes, e.g. when a living body is said to be cured because the eye or the chest is cured.¹ The essential or proper cause of change is similarly distinguished from the accidental and (as we may call it) the inclusive (κατὰ μέρος) cause of change.²

The elements involved in change are next enumerated—agent, patient, time, *terminus a quo*, *terminus ad quem*; and the distinction of the essential from the accidental and the inclusive is shown to be applicable to the termini as well as to the agent and the patient.³ Essential change is asserted to be not between any chance termini, but either between contraries or their intermediates (i.e. between contraries, or between one of two contraries and a state intermediate between the two contraries, or between two intermediates between one pair of contraries), or between contradictories.⁴ Putting the matter otherwise, we may say that change must be (1) from a positive term *A* to a positive term *B*, or (2) from a positive term *A* to its contradictory not-*A*, or (3) from a negative term not-*A* to its contradictory *A*, or (4) from a negative term not-*A* to a negative term not-*B*. But (4) is in fact ruled out, since here there is no opposition between the two terms; not-*B* is neither the contrary nor the contradictory of not-*A*. Case (3) is described as γένεσις, but of this two varieties are recognized. The genesis of a quality is γένεσις τις, that of a substance γένεσις ἀπλή. Case (2) is described as φθορά, which is similarly divided into two kinds.⁵ Now γένεσις is not κίνησις, since κίνησις implies the existence, throughout the κίνησις, of that which κινεῖται, while γένεσις implies the original non-existence of that which γίγνεται; and besides, that which κινεῖται is always somewhere, while that which γίγνεται is originally nowhere.

¹ 224^a 21–30.

² ib. 30–4.

³ ib. 34—^b 26.

⁴ 224^b 28–35.

⁵ ib. 35–225^a 20.

And *φθορά* is not *κίνησις*, because the contrary of a *κίνησις* is always either another *κίνησις* or an *ἡρεμία*, while the contrary of a *φθορά* is a *γένεσις*. It follows that only case (1), the passage from a positive state to the contrary positive state (or an intermediate), is *κίνησις*.

It will be noticed that there is an overlapping here between *γένεσις* and *κίνησις*. For the passage from not-white to white, which would usually be called *ἀλλοίωσις*, i.e. a form of *κίνησις*, is included under *γένεσις*, though only as *γένεσις τις*. In fact one and the same change may be considered from two points of view. It may be considered as the passage of a subject from blackness to whiteness, and then it will be called a *κίνησις*. Or it may be considered (more abstractly) as the coming into being of a particular instance of whiteness, and then it will be called *γένεσις τις*. Aristotle more often considers it in the former light, and limits *γένεσις* to what he here calls *γένεσις ἀπλῆ*, the coming into being of a substance.

Though the subject of *γένεσις* is here called, in distinction from the subject of *κίνησις*, a *μὴ ὄν*, it must not be supposed that Aristotle considers *γένεσις* to be the emergence of something out of nothing. A hint is dropped that the subject of *γένεσις* is only *per accidens* a *μὴ ὄν*,¹ and this has been definitely stated in book i.² In *γένεσις* what happens is that prime matter characterized by a certain set of attributes comes to be characterized by another set of attributes. But since prime matter is not a thing, but only an element recognized by analysis as involved in the being of a thing, and since anything, to be anything, must have certain indispensable attributes (at the very least, either dryness or wetness, and either heat or cold) as well as prime matter, when prime matter loses one set of attributes and gains a new set there is no thing that persists through the change, and therefore no *κίνησις*, but one thing ceases to be and another comes into being.

Since there are certain ultimate categories of being, it follows that any *κίνησις* must be in respect of one or other of the categories, and the main kinds of *κίνησις* will be discovered by noting the categories in respect of which it can take place. Aristotle assumes here a list of categories shorter than the complete list which he offers in the *Organon*.³ *κείσθαι* and *ἔχειν*

¹ 225^a 27-9.

² 191^b 13-16.

³ *Cat.* 1^b 26, *Top.* 103^b 22.

are not mentioned; it may be supposed that he had come to think of them as reducible to one or more of the other categories. Further, ποιεῖν and πάσχειν are treated as a single category, and ποτέ is omitted,¹ no doubt because time has already been noted² as standing in quite a different relation to change, viz. as that in which *all* change takes place.

There remain the categories of substance, relation, action and passion, quality, place, quantity. Now there is no κίνησις in respect of substance, because a substance has no contrary. Change in respect of relation cannot be one of the primary kinds of change, because it is always incidental to change in some other respect. Change 'of agent and patient' might be interpreted as meaning either change of which the subject is an action or passion, or change of which the termini are actions or passions. But an action or passion cannot be a persisting subject of change; what we might be tempted to call a change in an action or in a passion is (so Aristotle would say) the replacement of one action or passion by another. And change of which the termini are actions or passions is always incidental to change which has termini of another order; e.g. the change from getting ill to getting well is incidental to two changes of quality, getting ill and getting well. Thus we are left with change of quality, change of quantity, change of place as the fundamental kinds of κίνησις.

*The Infinite.*³

The discussion of movement naturally leads to the discussion of the infinite; for movement is continuous, and the continuous is naturally thought of as the infinitely divisible.⁴ Not only with regard to movement itself, but with regard to spatial extensions and time, which are involved in the nature of movement, the question presents itself, whether they are finite or infinite.⁵ Aristotle finds that many of his predecessors have assumed the existence of the infinite. The Pythagoreans and Plato assume the existence of an infinite whose nature is just to be infinite; some of the more genuinely physical philosophers

¹ if our reading is right in 225^b 6.

² 224^a 35.

³ I regret that Dr Edel's full and acute discussion of Aristotle's theory of the infinite has reached me too late to be taken notice of here.

⁴ 200^b 16-20.

⁵ 202^b 30-2.

assume a primary body—water or air or an intermediate—which has the characteristic of being infinite; others, like Anaxagoras and Democritus, who believe in an infinity of elements, suppose that they form together an infinite whole.¹ Aristotle has little difficulty in disposing of the belief in an infinite which is just infinite without being either an infinite extension or an infinite plurality,² and turns to consider the question which is appropriate to physics, viz. whether there can be an infinite *body*. He refutes its possibility first by the general consideration that it is the nature of any body to be *bounded* by a surface; and remarks incidentally that a similar consideration shows an infinite number to be impossible, viz. the consideration that it is the nature of number to be counted, i.e. traversed completely in thought.³ More detailed arguments follow. (1) An infinite body cannot be (a) composite. For no one element in it could be infinite and the rest finite, or the infinite element would destroy those that were finite. Nor can *each* of the elements be infinite, since each is limited by all the rest. Nor (b) can an infinite body be *simple*. There cannot be an infinite body distinct from the four familiar 'simple bodies'; for there is *no* body distinct from them. Nor can any one of them be or become infinite; for change is from contrary to contrary and implies that the material universe is not an undifferentiated simple body—let alone the question of its infinity.⁴

(2) The same conclusion follows from a consideration of the *movement* of parts of the supposed infinite body. Suppose first that the whole body is homogeneous. Then it will have an infinite region proper to it, and there is no reason why any part of it should move to or rest in any part of this region rather than any other; while obviously no part of its body occupies the *whole* of the region. Suppose then that the infinite body is *not* homogeneous. Its differentiated parts will have to be either finite or infinite in number. They cannot be finite in number; for then (to make the whole infinite) one or more of them would have to be infinite in extent, and then the infinite part or parts would destroy the finite. Nor can they be infinite in number; for then there would have to be an infinite

¹ ib. 36—203^b 2.

² 204^a 8—34.

³ 204^b 1—10.

⁴ ib. 10—205^a 7.

number of regions proper to them, but the regions are limited in number, since space has three dimensions and no more.¹

(3) An infinite body is incompatible with the observed tendency of all bodies to move either up or down, according as they are light or heavy. This tendency shows the existence of absolute distinctions in space; but in the infinite space which an infinite body would need, there would be no absolute distinctions of up and down, before and behind, right and left.²

On the other hand, if we deny outright the existence of infinity, we are faced with equal difficulties. Time will have a beginning and an end; spatial magnitudes will not be divisible without limit into spatial magnitudes; number will not be infinite. An intermediate line must therefore be adopted. So far as spatial magnitude is concerned, there is no actual infinite; spatial magnitude is unlimited, however, in its potentiality of being successively divided. This potentiality must not be taken to be, as most potentialities are (like the bronze's potentiality of becoming a statue), one that can ever be completely realized; it can only be progressively and partially realized. There could never be a time at which a spatial magnitude would have been divided into an infinite number of parts; its infinity consists only in the fact that into however many parts it has been divided, it *can* be divided into more. It can only have the kind of realization that a day or a contest can have, a progressive and successive realization; with this difference, however, that in these cases each partial realization has ceased to be when its successor exists, while in the progressive division of a spatial whole each part still exists when its successor has come into being. Incidentally, the infinite potentiality of division involves an infinite potentiality of addition. For when we divide a whole line into halves, the second half into halves, the fourth quarter into halves, and so on, we generate not only the series $\frac{1}{2}, \frac{1}{4}, \frac{1}{8} \dots$ but also the series $\frac{1}{2}, \frac{1}{2} + \frac{1}{4}, \frac{1}{2} + \frac{1}{4} + \frac{1}{8} \dots$

Thus the infinite exists 'potentially and by way of exhaustion, (though it also exists actually, in the way in which we say that a day or a contest exists actually); and its potential existence is akin to that of matter, and not a capacity of separate existence like that of a finite thing'.³ The statement is a difficult one, but the suggestion seems to be that, if we pursue the path of division

¹ 205^a 8—^b 1.

² 205^b 14—206^a 7.

³ 206^b 12—16.

(διαίρεσις) or exhaustion (καθαίρεσις), taking first half of a given finite whole, then half of what is left, and so on, an infinite series is not merely potentially involved in the finite whole, but can be progressively and partially realized, as a day or a contest not only exists potentially before it has begun, but is also brought into being by its parts successively coming into being;¹ while on the other hand the potentiality of being of this infinite series is not such that it could ever come to be completely realized so that we could have it before us as we can have a finite thing.² Its potentiality is rather akin to that of matter, which exists not separately but only as realized in a succession of things concrete of matter and form.

The additive series $\frac{1}{2}, \frac{1}{2} + \frac{1}{4}, \frac{1}{2} + \frac{1}{4} + \frac{1}{8} \dots$ is potentially infinite because, however far we have gone, we can go still farther in tracing it; but it is not the case that in tracing it we can find a term greater than any assigned magnitude (as in tracing the series $\frac{1}{2}, \frac{1}{4}, \frac{1}{8} \dots$ we can get a term less than any assigned magnitude); we only approach the finite whole (represented by 1) of which we are gradually taking in more and more.³ There is no infinitely great spatial magnitude, and no infinitely small spatial magnitude, but there is a magnitude than which there is none greater (viz. that of the material universe), while there is no magnitude than which there is none smaller (for Aristotle holds firmly to the infinite divisibility of space, and firmly discards the doctrine of indivisible lines).⁴

Aristotle refuses to accept the identification of the infinite with the complete or whole⁵ or all-inclusive.⁶ The infinite is not that which has nothing beyond it but that of which there is always something beyond.⁷ An infinite as such would not be complete (τέλειον); for what is complete must have an end (τέλος).⁸ 'The infinite element in the complete constitution of a magnitude is matter, that which is potentially a whole, but not actually . . . and is a whole and limited not in its own nature but in virtue of something else'⁹—a hard saying which we may perhaps interpret thus: what is infinite, in the only sense in which Aristotle admits infinity to belong to spatial magnitudes, i.e. infinite divisibility, is never the whole of any whole. It is

¹ Cf. 206^a 23-5.

² Cf. 206^a 18-21.

³ 206^b 16-22.

⁴ 206^a 17.

⁵ 207^a 9.

⁶ ib. 19.

⁷ ib. 1.

⁸ ib. 14.

⁹ ib. 21-4.

matter, an element present in all wholes, but not enough to constitute them wholes; to make a whole it must be supplemented by a definite form.

When we pass from spatial magnitudes to number, in one respect we find an exactly opposite situation. There is a greatest magnitude but no smallest; there is a smallest number but no greatest. That there is a smallest number follows from the fact that number is a system built up on the basis of a unit taken as indivisible, and finding its lower limit in the unit. That there is no largest number follows from the fact that there is no limit to the bisection of spatial magnitude. But it must not be supposed that because there is no finite number than which there is not a greater number, there is actually existent an infinite number greater than all finite numbers. The infinity of the number series consists in the fact that however far we have counted, we *can* count still farther; it is a potential infinity, only capable of successive and partial realization, like that of time.¹

Aristotle claims that his denial of an actual infinite does no injury to mathematical theory. It is enough for mathematicians, he says, if they may conceive of a finite line as great as they wish to make it.² On this Sir Thomas Heath remarks³ that 'Aristotle's denial of even the potential existence of a sum of magnitudes which shall exceed every definite magnitude was . . . inconsistent with the lemma or assumption used by Eudoxus in his method of exhaustion'. But if we take the lemma as quoted by Heath,⁴ "'of unequal lines, unequal surfaces, or unequal solids, the greater exceeds the less by such a magnitude as is capable, if added (continually) to itself, of exceeding any magnitude of those which are comparable to one another"', i.e. of magnitudes of the same kind as the original magnitudes', this merely states the principle, stated by Aristotle himself,⁵ that however small a magnitude is, if added to itself sufficiently often it would produce a sum greater than any finite magnitude however great. This obviously does not involve the existence *in rerum natura* of an actual infinite such as Aristotle denies.

There is much that is acute in Aristotle's discussion of the infinite; and it cannot be said that he has failed where others

¹ 207^b 1-15.

² *ib.* 27-34.

³ *Gk. Mathematics*, i. 344.

⁴ *Ib.* 326.

⁵ 266^b 2, 206^b 9-12.

have succeeded. For the claim which some modern mathematicians have made, to have solved the difficulties of the infinite by describing it not as that which has no end, but as that, a part of which can have as many members as the whole, seems merely to substitute one incomprehensible for another. But there are two features of the problem to which he seems insufficiently alive. He does not see the difficulty of supposing a finite material universe with nothing whatever, not even space, beyond it. And he accepts too easily the view that the infinitely numerous parts of a spatial whole are only potentially existent in it. It seems impossible to accept his view that the points in a line are brought into existence either by our act of dividing it, or by our act of counting points in it,¹ or by a body's coming to rest at them.² All these processes alike must be held to imply the pre-existence of the points, and thus the existence of an actual infinity of points in a line; and, similarly, we must believe in the actual existence of an infinite number of lines in a plane and of planes in a solid, not brought successively and partially into existence but coexistent from the start. It is on this rock that Aristotle's solution of Zeno's problem seems to split.

Place.

It is noteworthy that the short account of place in the *Categories* shows no trace of the theory of place developed in the *Physics*. What Aristotle says is: 'Again, place is a continuum; for the parts of a body occupy a certain place, and these meet at a common limit; therefore also the parts of the place which are occupied by each of the parts of the body meet at the same limit as the parts of the body. Therefore place also must be continuous; for its parts meet at a single common limit.'³ These words, as Duhem points out,⁴ imply simply the common idea of place as the part of space occupied by a body.⁵ It is noteworthy too that place is treated under the category of quantity, while in the *Physics* they are different categories.

¹ 263^a 23-9.

² 262^a 22-6.

³ *Cat.* 5^a 8-14.

⁴ *Système du Monde*, i. 197-8.

⁵ This seems to support the view that the *Categories* are an early work of Aristotle, not a text-book prepared by a disciple. In the latter case Aristotle's mature doctrine of place would probably have been reproduced.

The doctrine of place in the *Physics* is not a doctrine of space. Neither here nor elsewhere does Aristotle say much about space, *χώρα*, and he cannot be said to have a theory about it. He says much about *μέγεθος*; he accepts it as a familiar attribute of material things, and from the absence of any remarks about its general nature we may perhaps infer that he regarded it as indefinable. He offers here no theory of space answering to the theory of time in iv. 10-14; he offers a theory of position in space, of *τὸ ποῦ*, which answers not to time but to date or position in time, i.e. to *τὸ πότε*. Thus objections which might be made to Aristotle's theory, if it were a theory of space, are irrelevant; but, as we shall see, it is open to serious objections on other grounds.

The conception of place has a special significance for Aristotle. Not merely is the existence of place, as something distinct from what occupies it, proved by the phenomenon of successive occupation of the same place by different bodies; place is proved not merely to exist but to have a physical significance by the fact that bodies have their proper places to which they tend to move, fire and all light things upwards, earth and all heavy things downwards. These constant tendencies convince him that differences of place are not relative to us, but involved in the nature of the universe and possessed of a physical influence.¹

Having shown that place exists, Aristotle proceeds to the problem of *what* it is. We may pass over the discussion² in which he points out difficulties in stating its nature and shows that it cannot be identified either with matter or with form; not with form, because it is separable from that whose place it is; not with matter, because it contains that whose place it is.³ Chapter 3, on the meanings of 'in' and the question whether a thing can be in itself, may also be passed over. In chapter 4 Aristotle comes to the real discussion of the nature of place. He lays down five conditions to which a true account must conform. (1) Place contains that whose place it is; (2) it is no part of it. (3) The immediate place of a thing, as distinct from larger places in which this is contained,⁴ is neither less nor greater than it. (4) Place may be left behind by that whose

¹ iv. 208^b 1-22.

³ 209^b 30-2.

² 209^a 2-210^a 13.

⁴ Cf. 209^a 31-^b 1.

place it is. (5) Every place has the characteristic of being either up or down, and everything naturally moves to and stays in its proper place, i.e. up or down.¹

If we say that we are ἐν τῷ οὐρανῷ (within the celestial system), we do so because we are ἐν τῷ ἀέρι; or, more strictly, within the innermost surface of the air, because only this and not the air as a whole has the characteristic (3) above. When that which immediately contains a given thing is continuous with it, we describe that which is contained as being in the other as part in whole; when the two are discontinuous but in contact we describe the inner one as being in the outer one as a thing is in its place. As a first approximation, then, we may say that the place of a thing is the inner surface of whatever is in continuous contact with the thing's outer surface.²

There are, Aristotle maintains, only four things one or other of which the place of a thing might reasonably be identified with—its shape or form, its matter, an interval stretching between the inner extremities of its container, or these extremities themselves.³ It cannot be any one of the first three; yet we can see to what each of these suggestions owes its plausibility. The view that place is *form* owes its plausibility to the fact that the place of a thing contains it. Now in fact a thing is contained both by its own outer extremities and by the inner extremities of what bounds it; but it is the latter that are the place of the body, the former being its form. The fact that while a container remains the same its content can change gives plausibility to the view that place is the *interval between the extremities*, this being assumed to be something distinct from the successive bodies that fill it. But there is no such thing; if there were, (1) there would be an infinity of places coinciding, since, when water and air replaced one another, each part of either would be constantly moving from one self-subsistent interval to another, and (water or air being divisible *ad infinitum*) there would thus be an infinite number of self-subsistent intervals one inside another and therefore partially coincident; and (2) one place would have another place, since, when the container itself moves, the self-subsistent interval inside it will, on the view in question, be coming to occupy another self-subsistent interval.⁴

¹ 210^b 34—211^a 6.

² 211^a 23—34.

³ 211^b 6—9.

⁴ *ib.* 14—29.

It is clear that the view Aristotle is here opposing is not the view that there is one single space, distinguishable from the bodies that occupy it and move about in it. Against such a view, neither of the objections he urges would have any force; for (1) there would be no difficulty in supposing such a space to contain an infinity of parts, and (2) it could not be suggested that when a body changes place its place changes place; the body would simply leave one part of space and move to another. Curiously enough, Aristotle does not seem anywhere to consider such a view. The view he is opposing is the view that inside each container there is a self-subsistent interval specially connected with the container, and being the place of the contents, in such a way that when the contents leave the container an interval remains behind,¹ but that, when the container moves, it carries with it the interval within it, which thus acquires a new place.² Against such a view Aristotle's objections are sound.

The view that place is *matter* derives plausibility from our looking at the case of a thing not moving locally but changing its substantial character without becoming detached from its surroundings. There is then a close analogy between matter and place; matter is that *which* was air and now is water, place that *where* there was air and now is water. But matter is not separable from that whose matter it is, and does not contain it, and place is separable and does contain.³ We are thus left with the fourth view, that place is the *limit of the containing body* at which it is in contact with the contained body.⁴

There is however a further distinction which is needed to complete the account of place. When a thing moves in a container that is itself moving (as when a boat moves along a river), the container should be called the vessel of the contained rather than its place. A vessel might be called a movable place, or a place an immovable vessel. The final definition of place, then, is that it is 'the first unmoved boundary of the container', i.e. the inner surface of the innermost unmoved container of the body.⁵

This definition is exposed to two obvious criticisms. (1) What guarantee is there, with regard to any given thing, that it has

¹ *ib.* 20.

² *ib.* 23-4.

³ *ib.* 29-212^a 2.

⁴ 212^a 2-7.

⁵ *ib.* 14-21.

any unmoved container? For those who believe that space is infinite and body not so, there is no such guarantee; for they will find it possible to believe that the whole material universe may move from one part of space to another. But for Aristotle, who does not believe in the possibility of a void, and does not, indeed, use the conception of space (as something that may be either full or empty) but only that of *μέγεθος*, the extension of material bodies, it is axiomatic that the celestial system as a whole is not subject to translation (though it is to rotation); and in it he finds the place of all the things inside it. The inner surface and the centre of the rotating celestial system are the 'up' and 'down' which form the limits for all that comes between them.¹ But (2) if the place of a thing must be exempt from translation, it will follow that not everything need have an *οικείος τόπος*, a place that contains nothing but it; for clearly that which immediately surrounds a given thing *may* be in process of translation. It is only a remote or larger place constituted by the celestial system that is necessarily (on Aristotle's view) exempt from translation. Thus the condition that the place of a thing must be no larger than the thing itself, proves incompatible with the requirement that the place of a thing must be at rest. This objection Aristotle nowhere meets, and possibly did not notice.

He holds that the conception of place has been unnecessarily wrapped in mystery.² He seeks to end this by identifying the place of a thing with something already familiar, the inner boundary of the thing's container. In doing so he would seem to be adopting a purely relational view of place (and of motion, which is change of place); and perhaps this was his original intention. But in the course of his discussion he comes to see that the place of a thing is not to be identified with the possibly moving vessel in which it is contained, and in his requirement that the place of a thing must be unmoved he clearly comes round to thinking of position as absolute. His view amounts to saying that the position of body *a* is relative, is to be stated by naming the body *b* which contains body *a*, only provided that body *b* continues to occupy the same *absolute* position. There is thus in Aristotle's doctrine a vacillation between an absolute and a relational view of place; but it is only an

¹ *ib.* 21-9.

² 212^a 7.

absolute view that agrees with his view of motion, which throughout supposes that absolute motion exists and that 'relative motion' is only a *façon de parler*.

The internal incoherence of the view is further seen in what he says of the celestial system. Since nothing surrounds this, he has to say that it has no place.¹ Yet what fits it to be the place and not the mere vessel of what is inside it is the fact that it itself continues in the same place.

The difficulty of the view is further seen in this: The celestial system does not as a whole change place; but as it rotates, its parts change place. Aristotle therefore has to attribute place to them, though not to the whole. But since nothing surrounds the celestial system, the place of any part can only be identified with the other parts.² Since, however, all the parts are moving, this is a place which lacks the immobility that Aristotle has ascribed to place. He has here reverted to his original view of place as the inner boundary of the container, and forgotten the later-introduced qualification that the place of a thing must be itself unmoved.

Aristotle's identification of place with something already familiar is a praiseworthy attempt to avoid 'multiplying entities beyond necessity'; but for the reasons given above it can hardly be regarded as successful.

The Void.

The subject of the void is closely connected with that of place. For a void is thought of, by those who believe in it, as a place without any body in it.³ Furthermore, the definition Aristotle has adopted of place makes it impossible for him to believe that there can be a place without any body in it. He finds, however, that the refutation of the void offered by Anaxagoras is unsatisfactory. Anaxagoras succeeded in showing experimentally that air is a material substance, and thus deprived believers in a void of one supposed evidence of the existence of voids; but he did not disprove the possibility of a void.⁴ The balance of argument remained, so far, with the Atomists, who had four reasons for their belief in a void: (1) that *movement* implies a void for things to move into, since one body cannot trespass upon a

¹ 212^b 8.

³ 213^a 15-18.

² 212^a 33, ^b 12-13.

⁴ *ib.* 22—^b 3.

space occupied by another body; (2) that the fact of *compression* (itself supposed to be proved by the supposed experimental fact that a cask which holds a certain amount of wine not in skins will hold the same amount in skins) involves voids within a body, which the body occupies when compressed; (3) that the fact of *growth* by nutrition involves voids in the nourished body, into which the food enters; (4) that a void is implied by the supposed empirical fact that a vessel with ashes in it will hold as much water as it will hold when empty of ashes.¹ Aristotle distinguishes three types of belief in a void: (a) the belief in a *κεχωρισμένον κενόν* outside bodies²—a belief based on argument (1) above; (b) the belief in pockets of void existing *κεχωρισμένα* within bodies³—a view based presumably on (3) above; and (c) the belief in a void diffused throughout bodies⁴—based on the facts of compression and expansion referred to in arguments (2) and (4). These are the three views referred to in the summary⁵ as the beliefs (a) in an *ἀποκεκριμένον κενόν ἀπλῶς*, (b) in an *ἀποκεκριμένον κενόν ἐν τῷ μανῶ*, and (c) in a *κενόν δυνάμει*; cf. the distinction between *κενόν ἀχώριστον* and *κενόν κεχωρισμένον* in 214^a 19.

In a preliminary discussion in chapter 7, Aristotle argues, as against the first of the above proofs,⁶ that motion does not need a void for its explanation; it can be explained just as well by supposing an *ἀντιπερίστασις* in which bodies take one another's place, one entering into a given place just as another moves out of it; and, as against the second and the fourth proof,⁷ that compression may be explained by supposing a body to be compressed by virtue of the expulsion of something previously contained in it (e.g. water by the expulsion of air), instead of by supposing that it subsides into voids or a void contained in it. Against the third proof, he argues⁸ that growth sometimes takes place not by intussusception, but by qualitative change, as when water turns into air; and against the third and the fourth proof together,⁹ that the invoking of a void hinders rather than helps matters, since if bodies increase (as they do) not in bits but uniformly all through their extent, and if this is to be explained by the filling of voids, that involves that bodies are void all through their extent.

¹ 213^b 3–22.

⁴ *ib.* 33.

⁷ *ib.* 32—^b 1.

² 214^b 12, 216^b 20.

⁶ 217^b 20–1.

⁸ 214^b 1–3.

³ 216^b 30.

⁶ 214^a 19–32.

⁹ *ib.* 3–10.

He now turns to consider view (a).¹ His first argument² is really an *ignoratio elenchi*. He argues that the supposition of a void will not explain why some bodies naturally move up and others down, nor (since a void must be uniform throughout) why bodies should move into one part of a void rather than another. This would be a valid objection if the void had been put forward as a complete explanation of movement and of its varieties, but is not valid against the supposition that the void is a *sine qua non* of movement. The argument throws an interesting light on Aristotle's conception of the natural movements of the four elements. The argument assumes that no void or empty place can as such account for the movement of anything towards it rather than towards any other empty place, since both places are exactly alike. It follows then that the natural movements must be essentially towards *filled* places, and must be accounted for by what fills the places. This agrees with an earlier passage in which the movement of water to the position next to air is accounted for by the fact that air is in a sense the actualization of water, so that the movement is an instance of the normal movement of potentiality towards its actualization.³ On the same principle, fire must be the actualization of air, and water of earth. What this would point to is a centrifugal movement of the three inferior elements, air trying to get as near as possible to the sphere of fire, water to get as near as possible to that of air, and earth to get as near as possible to that of water. This cannot be reconciled, however, with Aristotle's general theory that water and earth have a downward tendency, towards the centre of the universe. His normal view is that natural movement is towards certain positions as such, independently of what happens to occupy these.⁴

But Aristotle's main argument against view (a) is that beginning in 215^a 24. Here he assumes that a body of given weight moves faster than another (i) in inverse proportion to the resistance offered by the medium through which they travel, and (ii) in direct proportion to their relative weight. He considers the two factors separately. (i) If A moves a certain distance through medium B in time Γ, it will move the same distance through a rarer medium Δ in a time E which will be to Γ in

¹ ch. 8.

² 214^b 13—215^a 14.

³ 212^b 29—213^a 4.

⁴ Cf. p. 27.

length as Δ is to B in density. Therefore it will move the same distance through a void Z in *no* time. For suppose that, instead, it takes the finite time H. Then the void would have to be to the medium Δ in density as H is to E; but in fact it is to it in the ratio of zero to a finite quantity, which is less than the ratio between the finite times H and E.

Or again, in the time H in which A is supposed to traverse the void Z, it will traverse a certain part of Δ , viz. Θ . But then, if there is a medium which is to Δ in density as time H is to time E, A will go the same distance through this medium in time H as it does through the void. But it is impossible that it should traverse in equal times equal distances in a void and in a medium.¹

The argument would be sound if velocity was essentially the characteristic of overcoming a certain amount of resistance in a certain time. Then if two bodies with equal velocity were to enter respectively a void and a medium, the former *would* move through the void in no time. But if, as modern physics has come to see, velocity is the characteristic of moving a certain *distance* in a certain time, the first body will pass through the void, and the second the same distance through a medium, in times which are to one another in a finite ratio; i.e. the body which moves through the void will take a finite time to move through it, and Aristotle's argument falls to the ground. He has been misled by thinking of velocity as essentially the overcoming of resistance and not as the traversing of a certain distance in a certain time.

(ii) A heavier body is supposed to pass more quickly through a certain medium than a lighter, in direct proportion to their respective weights, weight being thought of as power to overcome a certain resistance in a certain time. From this it follows that all bodies should move with equal and infinite speed through a vacuum (since there is no resistance to be overcome); and this is rejected by Aristotle as absurd.² The argument turns on the same mistake that has been noted above; $\rho\sigma\pi\eta$, the velocity due to weight, is thought of as consisting, not in power to move a certain distance in a certain time, but in power to overcome a certain resistance in a certain time. The argument reveals one of the fundamental errors of Aristotle's dynamics.

¹ 215^a 24—216^a 11.

² 216^a 11—21.

View (b), which to account for compression supposes pockets of void present in a body, into which the body is squeezed, is briefly dismissed, on the ground that to suppose separate voids within a body is in principle the same as to suppose a separate void outside bodies¹—the view which has already been refuted.

And so Aristotle passes² to view (c), which is harder to grasp, but seems to be the view that there is void diffused throughout bodies, in greater or less amount. This is supposed to account for the difference of bodies in respect of density. The argument of Aristotle's opponents, the Atomists, consists of two parts:—(i) Suppose a certain bulk of water A is transformed into air, the bulk of the air will clearly be greater than that of the water, say B. Then, either somewhere else a bulk B of air must be being transformed into a bulk of water A (which is highly improbable), or the pressure of the newly made air will ultimately cause a bulging of the surface of the universe (which is assumed both by Aristotle and by the Atomists to be impossible, since there is no outside space for the universe to bulge into), or it must be possible for the air, as it is produced, to make room for itself by compressing what is next it. (ii) To account for this there must be a void diffused throughout a body before it is compressed. Aristotle in reply admits step (i) and denies step (ii). He admits the existence of compression and of expansion, but offers a different account of them. They are to be explained not by supposing a void to exist, but by assuming matter to include in its nature not merely the potentiality of opposite states such as heat and cold, whiteness and blackness, but also the potentiality of different degrees of expansion. These potentialities are numerically distinct, but factually united in one single $\epsilon\lambda\eta$. When air is produced from water, it is not by the intussusception of anything (not even of a void) from outside, but by the actualizing of a potentiality; and similarly with the opposite transformation. But this actualization of potentiality can take place not merely when there is a change of substance (as from water to air) but also when the substance remains the same; a portion of air can become larger or smaller, while remaining air. The expansion and contraction of matter is thus to be explained on the same lines as qualitative change, and not by the assumption of a void of which there is

¹ 216^b 30-3.

² ch. 9.

more in rare than in dense bodies. And when water is expanded into air, we need not, in order to avoid admitting that the universe bulges, assume a corresponding transformation of air into water, but only a corresponding compression of something somewhere else without necessary change of substance.

We must, according to Aristotle, as Professor Joachim has observed,¹ 'not think of a "dense" body as one in which there are few or small "pores", and of a "rare" body as one with large or many gaps interspacing its corporeal particles. We must rather conceive of $\epsilon\lambda\eta$ as a material capable of filling space with all possible degrees of intensity, or capable of expanding and contracting without a break in its continuity. In this respect Aristotle's $\epsilon\lambda\eta$ resembles "das Reale", as Kant conceives it: cf. *Kritik d. r. Vernunft*, "Anticipationen d. Wahrnehmung".'

Time.

Aristotle approaches his own account of time by considering an old view which identified it with the rotation of the heavens.² A view which identifies time with this or any other change is easily refuted,³ but it is merely a mis-statement of the fact that time *involves* change, which Aristotle seeks to establish by pointing out that it is only the awareness of change that makes us aware of the lapse of time.⁴ Time then must be either change or some element in change, and since it is not the former it must be the latter.⁵ The question is, what element?

Movement is from something to something, and the interval traversed must, like all other $\mu\epsilon\gamma\acute{\epsilon}\theta\eta$, be continuous; i.e., however short it may be, it is divisible. So too then must be the movement which is the traversing of it, and so too the time in which the movement is accomplished. In every length, every movement, every time, there must be a before and an after, the distinction of before and after in place being the fundamental distinction on which the other two are based. That which is before or after in movement is always as regards its $\acute{\upsilon}\pi\omicron\kappa\epsilon\acute{\iota}\mu\epsilon\nu\omicron\nu$ ⁶ a movement; an earlier or a later phase in a movement can itself only be a movement. But to be it, to be earlier or later, is not to be a movement; i.e., besides its general character of

¹ *De Gen. et Corr.* 321^a 5-9 n.

² 218^a 33.

³ 218^b 1-20.

⁴ *ib.* 21-219^a 1.

⁵ 219^a 1-10.

⁶ *ib.* 19-21.

being a movement, it has something further which is its being earlier or later. Now to recognize the existence of a lapse of time is just to recognize the distinction between an earlier and a later phase of movement. For, distance, and therefore movement over distance, being infinitely divisible, to recognize two separated phases of movement is to recognize that there has been intermediate movement linking them up; and to recognize that we have passed through two nows is to recognize that there has been a lapse of time between them and bounded by them. To be aware of a single now without either regarding it as coming earlier or later than some other in a continuous movement, or regarding it as separating an earlier from a later phase, is not to become aware of movement, and therefore not to become aware of the lapse of time. But when an earlier and a later *are* distinguished, we recognize the lapse of time. Time is thus not movement, but 'the number of movement in respect of before and after', 'that in virtue of which movement is numerable'.¹ But since the name 'number' is applicable both to that which is numbered (as when we say 'a number of men') and to the abstract number² which we use in counting it, Aristotle states that time is number in the first and not in the second sense; it is that in movement which is counted.

To appreciate the significance of this theory, we must first recognize that the 'movement' by reference to which time is defined is not simply locomotion. The word *μεταβολή*, which covers generation and destruction, growth and diminution, and qualitative change, as well as locomotion, is used, and it is stated that the recognition even of a change in one's own state of mind may enable us to recognize a lapse of time.³ The word *κίνησις*, which is mainly used, covers all the kinds of change except generation and destruction. It is true that the continuity of *μέγεθος* is treated as the primary fact on which the continuity of movement and time depends; and *μέγεθος* is directly involved only in locomotion and in growth and diminution. But even in generation and destruction and in qualitative change there is involved a quasi-*μέγεθος*, an interval to be covered, and this equally with spatial *μέγεθος* is continuous. There is thus no great difficulty in supposing change in its widest sense to be

¹ 219^b 1-3.

² The *ἀριθμὸς μοναδικός* of *Met.* 1080^b 19, &c.

³ 218^b 21, 219^a 4-6.

that by reference to which time is defined ; and this is explicitly stated in 223^a 29-^b 1.

When Aristotle says that time is that in change which is counted, it must not be supposed that he means that it is by the recognition of different nows as different that the existence of change is recognized. The nowness, the felt presentness, of each successive experience is exactly like the nowness of any other. It is rather by the noticing of change, by seeing that a body which *was* at A *is* at B, or that a body which *was* white *is* black, that we detect the existence of different nows and of a lapse of time between them. This is the plain teaching of the beginning of ch. II. Time is not the *ratio cognoscendi* of change. It is rather the *ratio essendi*. A thing can only be in one place, or in one state, at once ; it is the existence of time that makes it possible for a thing to be at different places or in different states ; and thus change, or rather (since change already involves time as an element) the existence of the same thing in different places or states, becomes the *ratio cognoscendi* of time.

The description of time as that in change which is *counted* is unfortunate. For 'counting' suggests denumeration, counting to the end ; and Aristotle's language arouses the suggestion that we can count the nows, or else the indivisible periods of time, involved in a change. This, however, would be foreign to Aristotle's whole theory ; he is absolutely consistent in maintaining the infinite divisibility of time and of change. By counting he means here simply the recognition of plurality ; the doctrine is that time is that element in change which makes it possible for there to be, and to be recognized, a plurality of phases, by making it possible for a thing to be in different places or in different states.

Besides the notion of counting, Aristotle uses in this connexion the notion of measurement, and says that we can measure movement by time, and time by movement.¹ This obviously raises difficulties. We have no direct knowledge that a certain amount of time has elapsed, from which we could then infer either that movement of a certain duration or that movement over a certain distance (whichever of these is meant to be implied in 'measuring movement') has taken place ; for we know that time has elapsed only by knowing that movement has

¹ 220^b 22-8.

taken place. And again we cannot from the fact that movement over a certain *distance* has taken place infer, without knowledge of the pace of the movement, that a certain time has elapsed; and it would be absurd to say that it was by knowing that movement of a certain *duration* has taken place that we know that a certain time has elapsed, for to know one of these two things is already to know the other. The statement refers, therefore, not to an initial or fundamental measuring of movement by time and *vice versa*, but to the ordinary fact of experience that, if we already know that a certain time has elapsed (and this we know only in the sense that we know that a certain number of units of time of a certain length has elapsed), we know (in the same sense) the duration of any movement which has lasted through the time, and (if we know the pace of the movement) can also infer the distance covered; and that similarly, if we know that a certain body moving at a certain known pace has covered a certain distance, we can infer the amount of time that has elapsed. In this connexion Aristotle emphasizes the importance of having as our standard of measurement a movement of known uniform pace. Now movement in a straight line, in his view, accelerates if it is natural movement, and decelerates if it is unnatural; the only kind of movement which naturally maintains a uniform pace is movement in a circle; and the rotation of the heavenly sphere therefore furnishes the best unit for measuring the movement of everything else, and every period of time other than that which it itself occupies. Thus he vindicates our actual procedure, in which the day-and-night is the fundamental unit of which all smaller units are fractions.

In a preliminary dialectical passage¹ he discusses the question whether the now is always the same or successive nows are different, and raises objections to either view. He answers the question in his accustomed manner, by drawing a distinction, which is stated twice.² Each of the two statements is obscure, but each throws some light on the other. Combining them, we see that his meaning is that if when the question is asked the meaning is 'is it by being the same thing specifically that every now is a now?', the answer is 'yes; by being an earlier or a later cross-section in a movement'; while if the meaning is 'does "being now" always mean the same thing?', the answer is 'no;

¹ 218^a 8-30.

² 219^b 12-15, 26-8.

on different occasions of its use the phrase stands for being in different parts of the time series' ($\eta\ \mu\acute{\epsilon}\nu\ \gamma\acute{\alpha}\rho\ \acute{\epsilon}\nu\ \acute{\alpha}\lambda\lambda\omega\ \kappa\alpha\iota\ \acute{\alpha}\lambda\lambda\omega,\ \acute{\epsilon}\tau\epsilon\rho\omicron\nu\ (\tau\omicron\upsilon\tau\omicron\ \delta'\ \eta\ \nu\acute{\iota}\nu\ \acute{\epsilon}\iota\nu\alpha\iota)$): or in other words, it is in so far as an earlier and a later cross-section in a movement are distinguishable and countable as two, that each of them is successively called now, each in contrast with the other ($\tau\omicron\ \delta'\ \acute{\epsilon}\iota\nu\alpha\iota\ \acute{\epsilon}\tau\epsilon\rho\omicron\nu\ (\eta\ \acute{\alpha}\rho\iota\theta\mu\eta\tau\omicron\nu\ \gamma\acute{\alpha}\rho\ \tau\omicron\ \pi\rho\acute{\omicron}\tau\epsilon\rho\omicron\nu\ \kappa\alpha\iota\ \upsilon\sigma\tau\epsilon\rho\omicron\nu,\ \tau\omicron\ \nu\acute{\iota}\nu\ \acute{\epsilon}\sigma\tau\iota\nu)$).

The parallelism between space covered, movement, and time is constantly before Aristotle's mind in the passage, and he now attempts to draw a corresponding parallel between point of the space covered, moving body, and now or moment. As he has said of the now that what is a now is always the same, but the significance of 'now' varies from time to time, so he points out here that, while that which is the moving body is throughout a single thing (e.g. an individual stone), for the moving body to be at one part of its path is different from its being at another part.¹ Again, as it is by attention to the moving body that we recognize movement, it is by attention to the now, i.e. to the felt presentness of objects of experience which could not be experienced together at one time (such as whiteness and blackness in the same body), that we recognize the lapse of time.² Finally, there is a suggestion that as it is because it is a $\tau\acute{\omicron}\delta\epsilon\ \tau\iota$ that the moving body is more easily recognized than its movement, it is because it is a $\tau\acute{\omicron}\delta\epsilon\ \tau\iota$ that the now is more easily recognized than time.³ The view that this suggests is that, as movement is the flux of a moving body, time is the flux of the now from the future through the present into the past.

This assimilation of the now to the moving body overlooks a vital difference. The moving body is a numerically single thing, but the only sense in which 'that which is now' can be said to be a single thing is that it is the same *type* of thing that is on different occasions said to be now, viz. an earlier or later moment in a movement. There is no single entity 'the now' which marches from the future through the present to the past, as the moving body moves from A to B through C. Rather 'now' is a name for each and all of an infinity of cross-sections or durationless dividing-points of time, a name applicable only to one of these at a time, but applicable to all at different times because of a

¹ ib. 18-22.

² ib. 28-30.

³ ib. 30-1.

common relation of presentness to a mind. Aristotle would have done better, it seems, if instead of saying that what is a now is always (specifically) the same but to be now is different, he had said that while the various things that are successively now are numerically different, their being now is specifically the same. He might then have said truly that the flow of time consists in the inheritance by one moment from another of an identical characteristic of nowness or presentness. And he might possibly have claimed that there was an analogy between the passage of nowness from moment to moment and the passage of the moving body from point to point. Such an idea may have been before his mind, but it cannot be said to be the doctrine expressed in what he says.

In a later passage¹ he discusses whether time depends for its existence on a mind. He answers that where there is nothing that can count, nothing can be countable, and therefore there can be no time, which is the number of movement, or movement *qua* countable. In the absence of mind, therefore, there would not be time but only the substratum of time, viz. movement. The answer is clearly unsatisfactory, for obviously change not only could not be apprehended, but could not exist, in the absence of time; and since the discussion is very brief and Aristotle nowhere recurs to the subject, we need not suppose that he attached much importance to the answer he gives.

At the same time, the answer he gives here is consistent with his general account of the nature of a continuum. According to him, a continuum is essentially one and only one; so long as it is a genuine continuum there are in it no parts having actual existence; there are only potentially existing parts, which are brought to actual existence only by some event which breaks up the continuum and makes it no longer a continuum. Thus a line has no parts until it is cut in two by a stroke of the pen or by the act of counting the parts,² or by a moving body's stopping at some part of the line.³ In the same way he holds that duration is in its own nature a perfect continuum admitting of no parts; parts of it and nows within it, which hitherto had only a potential existence, are brought to actual existence by a mind which distinguishes periods and nows within it, and it is

¹ 223^a 21-9.

² 263^a 23-9.

³ 262^a 22-6.

by this distinguishing act that time, as distinct from seamless duration, is brought into being.

There is to my mind the greatest possible difficulty in accepting Aristotle's view that the parts of a continuum are actualized by any mental act; the act of counting, for instance, is in truth not the creation of parts of a whole, but the recognition of parts that are already there. But even if we were to grant that this is *one* way in which the parts of a continuum can be actualized, it is, even on his own showing, not the only way. A moving body's stopping in its course also serves to actualize the parts of a line. And similarly the parts of duration are actualized by the commencement and termination of bodily events within it; duration is pluralized into time (as Aristotle conceives of time) independently of any mental act.

Continuity.

Early in book v we find a chapter in which Aristotle defines a number of important terms—*ἄμα* and *χωρίς*, *ἀπτεσθαι*, *μεταξύ*, *ἐφεξῆς*, *ἐχόμενον*, *συνεχές*.¹ The main object of the chapter is the establishment of the nature of the continuous. This is done by exhibiting continuity as the narrowest of three successive qualifications of the relation between two things. (1) One thing is *ἐφεξῆς* on another when it follows on the other in some series and there is nothing of the same kind between them. (2) Two things are *ἀπτόμενα* or *ἐχόμενα* when not merely is there nothing of the same kind between them but the adjacent extremes of the two are *ἄμα*, i.e. have *nothing* between them. (3) A thing is continuous when the converging extremes of its parts not merely are *ἄμα* but are *ἐν*. It follows from this, though he does not make the point, that two things cannot strictly speaking be continuous, since an extreme of one thing cannot be identical with an extreme of another thing alongside of it in space. On the other hand there is no difficulty in saying that an extreme of one part of a single thing is identical with an extreme of another part of the same thing; e.g. the upper extreme of one part may be the lower extreme of another. Again, continuity is compatible not merely with complete homogeneity of characteristics but also with diversity of characteristics, so long as this is within the same substance. You may have for instance a log of

¹ v. 3.

wood differently coloured in different parts, and a piece which is the lightest portion of the dark part may be at the same time the darkest portion of the light part.

The discussion of the continuous is resumed in vi. 1, 2, where Aristotle argues convincingly that every continuum must be infinitely divisible, and points out that the infinite divisibility of extension, that of movement, and that of time imply each other.¹ The firmness with which he rejects any suggestion that a line can be divided without remainder into points, a period of time into moments, or a movement into infinitesimal jerks—and this at a time when thinkers of repute believed in all these things—seems to me to indicate that he had a more mathematical turn of mind than he is usually credited with. So far as we know, he was the first thinker who clearly stated the infinite divisibility of all continua. In this he diverged markedly from Plato, who evidently had a leaning towards the conception of indivisible lines,² and presumably also of indivisible times.

One of Aristotle's arguments³ may be cited for its neatness. It is an argument for the infinite divisibility of time and of extension. He supposes a faster moving body A and a slower moving body B, and supposes B to move distance $\Gamma\Delta$ in time ZH. Then A will move distance $\Gamma\Delta$ in a lesser time ZΘ. Then B will move in time ZΘ a distance less than $\Gamma\Delta$, ΓK . Then A will move distance ΓK in a time less than ZΘ: and so on. The simple assumption of two bodies moving with uniform but different velocity establishes the infinite divisibility both of time and of distance.

We may note too another of Aristotle's arguments,⁴ a *reductio ad absurdum* of the view which seems to lie at the basis of Zeno's 'race-course' argument, the view that movement is the traversal of indivisible minima of distance in indivisible minima of time. This argument also merely assumes two bodies moving with uniform but unequal velocity, one, say, moving half as fast again as the other. Then in the same time the faster body will move through three indivisible units of distance, and the slower through two. The time of the movement, then, will be divided both into three and into two indivisible times, the second of the

¹ The infinite divisibility of movement forming the middle term by which that of extension and that of time are seen to imply one another.

² *Met.* 992^a 20, 1084^b 1.

³ 232^b 26—233^a 12.

⁴ 233^b 18—32.

three supposed indivisible times will be in fact divided at its mid-point, and the faster body will, contrary to the hypothesis that is being criticized, take a divisible time to move through an indivisible distance (the second of the three).

While Aristotle firmly rejects the notion of indivisible periods of time, he equally firmly asserts and argues for the existence of indivisible nows,¹ which are at the same time the limits of the past and of the future; before which movement and rest can cease, and after which they can begin, but in which neither movement nor rest can take place. In fact he maintains the existence of two types of element involved in the being of time: shorter times which are its components, and indivisible moments without which it could not exist but out of which it cannot be made up. And of course he would give a corresponding account of distance as involving both component and non-component elements. Further, he points out clearly that while every movement can be divided *ad infinitum* into smaller movements, a movement contains, implied in its being though not as components, the being of the moving body at successive places, and that we can never say that at a moment a body is in movement or at rest, but only that it is at a place.²

The remainder of book vi develops with unwearied diligence and (so far as I can judge) with unflinching accuracy the implications of the infinite divisibility of time and of extension.

The Paradoxes of Zeno.

Aristotle's attitude towards the continuity of extension, of movement, and of time is well illustrated by his treatment of the paradoxes of Zeno directed against the reality of motion. Almost all that we know about these comes from Aristotle. In fact, practically the only detail that reaches us independently of him is that Achilles' rival in Zeno's parable was a tortoise. This comes to us from the Greek commentators on Aristotle. The reference to the tortoise comes to us also from Plutarch, but in Plutarch the tortoise is matched not against Achilles but against 'the fast horse of Adrastus', so that possibly Achilles' rival was not a tortoise at all, and two independent stories may have got mixed up in the familiar title.

The main account of the paradoxes is in *Physics* vi. 9, but the

¹ vi. 3.

² 234^a 24-^b 9.

first paradox, the dichotomy, is also referred to in vi. 2 and in viii. 8. Aristotle tells us nothing about the opponents against whom Zeno's arguments were directed, but from a famous passage of the *Parmenides*¹ it is possible to infer that they were directed against people who ridiculed Parmenides' denial of the existence of plurality. The apparent fact of motion, involving the occupation of different places at different times, is a *prima facie* evidence of plurality, and therefore Zeno tried to deprive pluralism of this apparent support by proving the non-existence of motion; and this he proved by means of the absurd consequences which he held to follow if motion be assumed to exist.

The second argument is referred to by Aristotle as 'the so-called Achilles'; the third was probably called 'the flying arrow'; the first may have been called 'the dichotomy', and the fourth 'the race-course'. In the main discussion Aristotle happens to mention 'the flying arrow' first, because it connects directly with what he has been saying in the previous chapter. But he describes it definitely as the third argument, and we shall see that the order is a logical one.

The first argument is put (in vi. 9) in the brief form 'the argument that motion does not take place because the moving body must get to the midway point before it gets to the end'. But from vi. 2 we see that the argument was of the nature of an infinite regress argument. It is not quite clear which of two forms it took.² The general nature of the argument is not affected by this question; in either case the argument is that motion over a finite distance is impossible because an infinite number of lines must be traversed and an infinite number of points passed by the moving body. But here an important question comes in. In vi. 2 Aristotle says that Zeno falsely assumes that it is impossible to traverse an infinite number of lines *in a finite time*; Aristotle implies that Zeno is drawing a false antithesis between the infinity of the number of lines and the finitude of the time in which the moving body has to traverse them. And he charges Zeno with confusing infinity with infinite divisibility. The time available is finite, but so is the distance to be traversed; the distance to be traversed is infinitely divisible, but so is the time; and therefore there is no reason why the distance should not be traversed in a finite time. Zeno

¹ 128 c.

² cf. 239^b 11-14 n.

in fact, according to Aristotle, is failing to note the complete parallelism in this respect between the nature of space and that of time, and as soon as that is pointed out the difficulty disappears.

Recent writers have usually held that Aristotle here misses the point of Zeno's argument. Zeno, it is said, was not assuming time to be any otherwise constituted than space. His paradox therefore is not evaded by pointing out that time is infinitely divisible no less than space. In fact you will then merely have two difficulties on your hands instead of one. For you will have to admit that (1) a certain infinite number of finite spaces, added together, is less than a certain finite space, and (2) a certain infinite number of finite times is less than a certain finite time. Those who take this view seem to me not to have attended enough to (if indeed they have known of the existence of) the last of the three passages in which Aristotle refers to this paradox, *Phys.* viii. 8. He there expressly admits that his former answer is not a complete answer to the difficulty that underlies Zeno's paradox. 'For', he says, 'if one leaves out of account the length and the question whether it is possible to traverse an infinite number of lengths in a finite time, and asks the same question about the time itself (for the time has an infinite number of divisions), our former solution will be no longer adequate.'¹ That is to say, he recognizes the deeper significance of the paradox exactly as modern writers have done. But he still maintains that his former solution was an adequate *argumentum ad hominem* as against Zeno.² And this it could be only if Zeno made the paradox turn on a contrast between the infinite number of divisions of space to be covered in covering a finite space, and the finitude of a particular portion of time.³

If Aristotle had never admitted his earlier refutation to be only adequate *ad hominem*, we might suppose him to have misunderstood Zeno's meaning; but since he draws the distinction I have pointed out and still maintains that his earlier argument was good *ad hominem*, this can only be because he held that the paradox as stated by Zeno took account of the infinite divisibility of space only, and not of that of time. And since we have no knowledge of the nature of Zeno's argument independent of

¹ 263^a 18-22.

² 263^a 15.

³ ἐν πεπερασμένῳ χρόνῳ 233^a 23, 263^a 16, 19.

what Aristotle tells us, we should accept his testimony on this point.

Let us do as Aristotle suggests in viii. 8, leave out of account the precise form of Zeno's statement, and concentrate on the real underlying difficulty. This is a twofold one, that (1) in order to get to the end of a finite line, a moving body must have traversed an infinite number of lines and passed an infinite number of points, and that (2) in order to reach the moment at which it reaches the end of the line, it must have endured throughout an infinite number of times and through an infinite number of moments. It is possible to attack Zeno's argument as an *ignoratio elenchi*; to admit that he has proved that there is an infinite number of moments at which the moving body has *not* reached the end of the line, but contend that he has not proved that there is not also a moment at which it *has* reached it. But this seems not entirely to meet the difficulty. For the fact apparently remains that, before it gets to the end of the line, the moving body will have had to get to the end of an infinite series, i.e. to have got to the end of something that has no end. Aristotle's final solution, given in viii. 8, is that the moving body has not in fact performed an infinite number of processes; it has not traversed an infinite number of lines or passed an infinite number of points, or endured through an infinite number of times or of moments. For both the parts and the boundaries between the parts of a line, and the parts and the boundaries between the parts of a time, exist only potentially until they are actualized, and none of them are actualized in a movement which is continuous. All alike are actualized only when one or other of two things happens. (1) When a moving body pauses, and then resumes its movement, it actualizes (*a*) the two parts of its path, and the boundary that divides them, and (*b*) the two parts of the time of its movement, and the moment that divides them.¹ And (2) the parts and the boundaries can also be actualized by a mental act, the act of dividing a line or a time imaginatively into parts, or of counting parts of a line or of a time.² The same solution is, in principle, offered by Noel, who maintains that a continuous movement is not a whole of parts at all. I find it difficult to believe that there is any escape along this line. It surely can-

¹ 262^a 22-6.

² 263^a 23-9.

not be maintained that a moving particle actualizes a point of space by coming to rest at it. It can come to rest only at a point that is there to be rested at. And when it does not rest but moves continuously, the pre-existence of the points on its course is equally pre-supposed by its passage through them. Nor again can the process of counting be said to actualize that which it counts.

The doctrines of Cantor, which Lord Russell asserts to have solved all the difficulties of the continuous and the infinite, do not seem really to help us in this matter. In essence they seem to amount to substituting for the old conception of the infinite as that which has no end, the conception of it as a whole which has parts whose members are as numerous as those of the whole; there being in the infinite series of whole numbers, for instance, as many square whole numbers as there are whole numbers, though obviously not all whole numbers are square whole numbers. This is a property which can easily be seen to be involved in the nature of an infinite series, but it seems to do nothing to remove the paradox involved in an actual infinite. Nor have I found in any of the other discussions of this first paradox any more satisfactory solution. Some of them I have not thought it worth while to go into in detail, since they rest on the denial of the infinite divisibility of space and time; in refusing *this* way out, at least, Aristotle is surely on firm ground. But the modern solutions which assert the infinite divisibility of time and space seem no more successful than those which deny it. Zeno's first paradox still awaits its final answer.

Zeno's second paradox is the Achilles. It consists in pointing out that if one of two bodies starts behind another along a course, by the time the first has reached the point from which the second started the second has moved some distance on; that when the first has covered that distance the second has moved a further distance, and so on; and in inferring that the first will never overtake the second. Aristotle says that this argument is in principle the same as the first; both depend on our dividing (in thought) in a particular way the distance to be covered. The truth of this analysis is easily seen as regards the first paradox. If we think of the whole path as made up of *equal* parts the difficulty will not arise; for however small the

parts may be, a finite number of them will exhaust the whole, however large that may be. It is only if we think of the whole as made up of parts diminishing in a constant ratio that the difficulty arises. And the analysis is equally true as regards the second paradox. Let the tortoise's start be represented by 1 (it is immaterial whether this stands for one yard, or ten, or any other distance). And let the speed of Achilles be to that of the tortoise as a to b (it does not matter what the ratio is so long as a is greater than b). Then (1) if you take as the *προσλαμβανόμενον μέγεθος* (the distance still to be covered by Achilles—in order to catch the tortoise—after he has reached the tortoise's starting-point) $\frac{b}{a-b}$, you get the following position.

	T	A
Distance from start at t_1	1	0
at t_2	$1 + \frac{b}{a-b}$, which = $\frac{a}{a-b}$,	

i. e. Achilles will catch the tortoise at that distance. And (2) if you take as the *προσλαμβανόμενον μέγεθος* anything greater than $\frac{b}{a-b}$, say $\frac{b}{a-b-n}$, you get the following position.

	T	A
Distance from start		
at t_1	1	0
at t_2	$1 + \frac{b}{a-b-n}$, which = $\frac{a-n}{a-b-n}$	
		$\frac{a}{a-b-n}$

i. e. Achilles is $\frac{n}{a-b-n}$ ahead. But (3) if you take as the first stage of the *π. μ.* anything less than $\frac{b}{a-b}$, say $\frac{b}{a-b+n}$, two cases arise: (a) where n is less than b . Then at t_2 the tortoise will be $1 + \frac{b}{a-b+n}$ and Achilles $\frac{a}{a-b+n}$ from the beginning of the racecourse, i. e. the tortoise will be $\frac{n}{a-b+n}$ ahead. But if you go on taking stages each related to the previous one as b to $a-b+n$, Achilles will in the course of one of them (sooner or later according to the relative values of a , b , n) overtake the tortoise. E.g. put $a = 10$, $b = 1$, $n = \frac{1}{2}$.

Then you have	<i>T</i>	<i>A</i>	<i>T</i> 's lead.
at t_1	1	0	1
at t_2	$1 + \frac{2}{19}$	$\frac{20}{19}$	$\frac{1}{19}$
			<i>A</i> 's lead
at t_3	$1 + \frac{2}{19} + \frac{4}{19^2}$	$\frac{20}{19} + \frac{40}{19^2}$	$\frac{17}{19^2}$

But if (*b*) you take n not less than b , and take stages each of which is to its predecessor as b to $a - b + n$, Achilles will in no such stage overtake the tortoise. And in particular (and this is the case which Zeno took), if you take $n = b$, i. e. divide the $\mu\acute{\epsilon}\gamma\epsilon\theta\omicron\varsigma$ to be covered by Achilles into successive parts the first of which is equal to the tortoise's start, and each of which is to its predecessor as b to a , you get the following series.

	<i>T</i>	<i>A</i>	<i>T</i> 's lead
at t_1	1	0	1
at t_2	$1 + \frac{b}{a}$	1	$\frac{b}{a}$
at t_3	$1 + \frac{b}{a} + \frac{b^2}{a^2}$	$1 + \frac{b}{a}$	$\frac{b^2}{a^2}$

Zeno shows, in fact, that no number of terms of the series

1, $\frac{b}{a}$, $\frac{b^2}{a^2}$... has a sum which is equal to 1 + an equal number

of terms of the series $\frac{b}{a}$, $\frac{b^2}{a^2}$, $\frac{b^3}{a^3}$...

Aristotle is right then in saying that both paradoxes depend on our mentally dividing in a particular way the space to be covered by a moving body in covering a certain distance. His answer to the Achilles consists, in effect, in saying that it is an *ignoratio elenchi*. Zeno proves that Achilles is not level with the tortoise at any of the points got by dividing in a certain arbitrarily chosen way the space to be covered. But it does not follow that there is not some *other* point at which Achilles is level with the tortoise; and by dividing the space in front of Achilles in another way we can easily ascertain what point that is.

Aristotle's answer to the paradox *as stated by Zeno* seems complete. Zeno only shows that at none of the points on the course selected on a certain principle will Achilles overtake the

tortoise, and wrongly infers that there is no point at which he *will* overtake it. Now we found that in stating his first paradox Zeno (if Aristotle's report is correct) obscured his point by suggesting that time is not infinitely divisible as well as space; and yet he saw in principle a difficulty which goes right to the heart of the continuous and of the infinite series. It would seem that he similarly did not do complete justice to the difficulty of his own second paradox. Although his division of the space to be covered is arbitrary in the sense that it is only one of many ways of dividing it, it is as justifiable as any other. It remains true, after Aristotle's answer, that Achilles must first cover the tortoise's original start, and in doing so lets the tortoise get a fresh though smaller start, and that in covering each start he lets him get a further one, and therefore, apparently, can never catch him up.

I turn to ask whether modern students of the problem have solved Zeno's paradox. The best discussion known to me is one by Professor Broad,¹ of which I quote the essential part:

'The argument that I want to put forward may be divided into two parts. The first thing to notice is that it is perfectly true that at no point given by the construction are Achilles and the tortoise together at the same moment. But the points given by the construction are obviously not *all* the points in the common straight line, but only a small selection of them. Hence the conclusion that they *never* meet or meet at *no* point (which is what is actually asserted) cannot be justified by the explicit premises alone. As far as anything that is made explicit is concerned there is nothing to show that the two do not meet at one of the infinitely numerous points on the line which are not given by the construction. Hence there must be some implicit premise involved. And this brings me to the second part of my argument.

'The supporter of the Achilles must evidently hold that if the two do not meet at a point given by the construction they cannot meet at any point on the line. Why should he hold this? I think it is easy to see his reasons and to see that they are fallacious. He can prove that if they meet at any point it must be beyond every point given by the construction. He can also prove that the number of points given by the construc-

¹ *Mind* xxii (1913), 318-9.

tion is infinite. And now he assumes the plausible proposition "what is beyond every one of an infinite series of points must be infinitely beyond the first point of the series". If this were true his conclusion would follow, for it would take the two an infinite time to reach the only point at which they could possibly meet. But the proposition is utterly false. This can best be illustrated by considering a series of numbers instead of one of points, and the relation of "greater than" instead of that of "beyond". Consider the series whose general term is

$$2 - \frac{1}{n+1}$$

where n can have any integral value including 0.

It is clear that its first term is 1. It is further clear that it has an infinite number of terms. Finally 2 is greater than every term of the series. Hence if we had an analogous proposition to that assumed by the supporters of the Achilles we should have to say: "2 is infinitely greater than 1, for it is greater than every term of an infinite series whose first term is 1." The obvious absurdity of this shows the absurdity of the implicit premises without which the Achilles cannot draw its conclusion.'

Professor Broad's discussion is admirable, but is his satisfaction entirely justified? It remains true that Achilles, to catch the tortoise, must have completed a series which, though it has a limit, a term beyond all the terms in the series, has no end, no last term of its own. What modern discussions seem to have shown is simply that Zeno's first two paradoxes have no special application to space and time but are involved in the nature of the number-series itself. But this is grist to Zeno's mill; for his ultimate object is not to prove that motion is impossible, but that plurality is impossible. And to this I know of no better answer than the rather vague and unsatisfactory one, that our difficulties about infinite series arise only from our inveterate tendency to think of them as if they had the characteristics of finite series.

The third paradox is that of the flying arrow, stated at the beginning of vi. 9. The text is difficult, and (I think) certainly corrupt or imperfect. But the general sense is clear. The arrow, which is supposed to be flying, is never really doing so, because at every moment it is not moving but simply occupying a certain space. Aristotle's answer consists in saying that time is not composed of moments, any more than any other

continuum is composed of indivisibles. What Aristotle says is true, and furnishes a sufficient answer in advance to the attempts which have, strangely enough, been made by some modern mathematicians to represent time as made up of parts which must have duration in order to make up time and yet are supposed to be indivisible, or of moments at which the arrow is at rest + indivisible times in which it is moving. The nature of Aristotle's answer may be brought out by a quotation from Professor Broad.¹ 'We must distinguish between two senses at least of part and whole, viz., the sense in which a point is part of a line and the sense in which a little line is part of a bigger one. In the first sense we mean by "part" a term or constituent in a related complex which is of a different nature from its terms. A point is a part of a line in the sense in which McTaggart is part of Trinity. In the second sense we mean by "part" something which is of the same nature as the whole. I do not know of any other examples of this sense of part and whole except extensive magnitudes. Let us call parts in the first sense "constituents" and in the second sense "components". Then the current mathematical view, as I understand it, is that a line has an infinite number of simple constituents and no simple components.' This is exactly Aristotle's view of time, and of space, except that he adds (mistakenly, as I think) that when a continuum exists actually as a whole, both the constituents (moments or points) and the components (shorter times or lines) exist only potentially. And his answer to Zeno is that though a moving body is not moving in any of the moments of the time of the movement,² that does not prove that it does not move, since it *is* moving in each of the component parts of the time of the movement. His reply might be put in this form. 'When you say "a supposed moving body is always, in any now, not moving but simply at a part of space equal to itself", you must mean by your "now" either something that has duration or something that has not. If it has, there is no reason why movement should not take place in it; if it has not, then since no number of moments not having duration can make up a time that has duration, the fact that movement cannot take place in the moment is no reason why it should not take place in the time. If your "nows" have

¹ *ib.* xxx (1921), 323.

² cf. 239^b 2.

no duration, you are mistaken in thinking of them as the components of time. They are involved in the being of time, but only as boundaries between parts of time, and all that could be expected to be found at them is boundaries between different movements or between the parts of a continuous movement. The components of a whole movement could only be expected to take place in the components of the whole time of the movement, i.e. in shorter times; and you have shown no reason why they should not take place in these.'

But when we have maintained that time is composed not of moments but of times divisible without limit into shorter times, have we completely disposed of Zeno's difficulty? The present alone is real, standing between that which is no longer and that which is yet to be; and the present is indivisible; and in the present the arrow is at rest; how then does it move? Does movement consist simply in being at different places at different times? That is Lord Russell's solution, but it leaves us still with the problem how the moving body gets from one place to another, which yet it does. Modern mathematicians tell us that the fact that the arrow is at any moment not moving but at a place is only one example of the more general truth that every value of a variable is a constant; but do they by saying so make the fact of movement more intelligible?

The fourth paradox is that of the race-course. Aristotle describes this paradox as resting on the assumption that two bodies of equal size take equal times to pass respectively a moving body and a resting body of equal size. This is so contrary to common sense that it is most unlikely that so acute a thinker as Zeno should have adopted it on its own merits as even a plausible basis of argument. It acquires a degree of plausibility only when it is arrived at from a previous assumption having a greater degree of plausibility. Now such an assumption can be found, and has in fact been pointed out by Brochard and Noel. In the first two arguments, Zeno argues with his opponents on the basis of a belief in the infinite divisibility at least of space. And the difficulties he leads them into are great enough to make it natural for him to imagine them turning in perplexity to a belief that space and time are not infinitely divisible, but divisible into indivisible parts. This is probably the standpoint adopted with regard to time in the

third paradox. And in the fourth he seems to adopt it (or rather to assume his opponents to adopt it) with regard to both time and space. The *ὄγκοι*, then, are bodies of unitary size, and the passage of one past another occupies a unit of time. Now consider the transition from fig. 2 to fig. 3.¹ The front B has passed two A's; the front Γ has passed four B's. Common sense would say that when the front Γ was squarely opposite a B the B must have been overlapping an A to the extent of a half. But Zeno's supposed opponents cannot say this, because they say that each A and each B is indivisible, i.e. has no half. Therefore they must say that the front B has been resting during half of the time during which the front Γ has been moving, and has by two unitary movements passed two A's in the remaining half (*ὥστε ἡμισυν εἶναι τὸν χρόνον* 240^a 12). In other words their belief in indivisible bodies drives them either explicitly to assume that it takes as long for a body to pass a body moving in the opposite direction as to pass a resting body,² or at least to draw a conclusion which involves that as a corollary.

It looks as if Aristotle had failed to notice the original error on which this argument of Zeno's rests, viz. the assumption of minimal spaces and bodies and times. He would have done better to call attention to this than to reject the argument on the ground of what seems to be a mere consequence of this—the ignoring of the difference between absolute and relative motion.

Lord Russell sums up his later account of the general situation³ by saying that we may escape from Zeno's paradoxes 'either by maintaining that, though space and time do consist of points and instants, the number of them in any finite interval is infinite; or by denying that space and time consist of points and instants at all; or lastly, by denying the reality of space and time altogether'. Zeno's own position seems to be not so much that of denying explicitly the reality of space and time; rather, as being essentially a monist, he denies that they have any plurality in them, whether this be a plurality of smaller spaces and times, or a plurality of points and instants. Lord Russell prefers to rely on the first alternative. Aristotle so far agrees that he consistently maintains that any space or time however

¹ p. 661.

² 240^a 1-4.

³ *Our Knowledge of the External World*, 178.

short contains potentially an infinity of points or instants. But he combines with this the second alternative ; while holding that there is potentially an infinity of points in space and of moments in time, he denies that space and time can consist of points and moments. He accepts, then, the belief in the infinite divisibility of space which Zeno assumes as the basis of his first argument ; he points out in vi. 2 that the situation is relieved if we will take account also of the infinite divisibility of time ; and he argues in viii. 8 that the difficulties involved in the infinite divisibility of space and time are not insuperable. He accepts the basis of Zeno's second argument, i.e. the infinite divisibility of space, but points out that on this basis Zeno rears an *ignoratio elenchi*. He rejects *in toto* the denial of the infinite divisibility of time which underlies the third argument, and the denial of the infinite divisibility of both space and time which underlies the fourth.

The literature dealing with Zeno's paradoxes is very large, and I can only claim to have read most of the *recent* discussions of the subject. I may be allowed to try to sum up what seems to have been achieved in the course of discussion. (1) The earliest step forward from Aristotle was in the line of direct advance from him. He pointed out that, while Zeno shows that there is an infinite number of points at which Achilles has *not* overtaken the tortoise, he does not prove that there is not a point at which he *does* overtake it. The question was naturally asked, 'at what point does he overtake it?' Taking the tortoise's start as 1 and the ratio of Achilles' speed to that of the tortoise as a to b , the answer was very easily arrived at, once the device of solving equations by using x for the unknown quantity had been invented. You have then only to say 'Let x be the distance at which Achilles overtakes the tortoise ; then $x = 1 + \frac{bx}{a}$, i.e. $x = \frac{a}{a-b}$.' To take a simple case, if Achilles moves ten times as fast as the tortoise, he catches him at distance $1\frac{1}{9}$ from the start.¹ But obviously, in saying *where* Achilles catches the tortoise, we do not answer Zeno's question *how* he can do so.

(2) About the years 1892 and 1893 there was an intensive

¹ The problem was solved by Gregoire St. Vincent in 1647 by the summation of an infinite series, and by the Abbé Deidier in 1760 by the solving of a simple equation.

study of the paradoxes by a group of French mathematicians and philosophers—Noel, Brochard, Évellin, Tannery, and others. One solid result of their labours was to show that Zeno's four paradoxes were not thrown out at haphazard, but were arranged on a certain plan. What we know of Zeno's method from other sources suggests that he would probably proceed by way of dilemma. 'If you take this view', he would say, 'you are landed in this difficulty; and if you take that view, in this other.' Now in the first two paradoxes Zeno is clearly assuming the infinite divisibility of space (though probably not that of time). In the fourth paradox he is, as I have tried to show, working on the assumption that neither space nor time is infinitely divisible, that both are composed of small unitary parts. In the third paradox it is not very clear whether he is working with the notion that time is composed of an infinite number of unextended nows, or with the notion that it is composed of a finite number of small unitary times. But the latter is the more probable because we shall then have two paradoxes based on the assumption of infinite divisibility and two based on the assumption of divisibility into a finite number of indivisibles.

Again, the French writers point out that the first and the third paradoxes deal with one moving body and raise only the problem of absolute motion, while the second and fourth introduce two moving bodies and raise the problem of relative motion (the fourth introducing absolute motion as well).

In their attempts to get at the bottom of Zeno's arguments, to take them individually and show which, if any, are sound and which, if any, are unsound, the French writers are less successful. We get from them either ingenious but fantastic attempts to show that space, time, and movement are discontinuous, or rather cloudy theories of the complete unity and indivisibility of movement.

(3) The theories of Georg Cantor and Dedekind about the nature of transfinite numbers might seem to promise more hope. Lord Russell constantly assures us that these have finally settled all the difficulties about space, time, and movement, and in particular those raised by Zeno. But he never seems to succeed in showing just how they have done so. Two things, however, the German school seems to have done. They have shown that the problems about space, time, and movement are

not peculiar to space, time, and movement, but are involved in the nature of the number series itself and merely exemplified in such problems as Zeno's. And they have shown with much greater precision than any one before them what are the properties which an infinite series, if there be such a thing, must possess. One of these, and that which they adopt as the definition of an infinite series, is that certain selected parts of an infinite series must have as many members as the whole series. But to point out that an infinite series must have this and many other paradoxical properties, while it serves to make the notion of an infinite series more definite, does not help us to understand how there can be such a thing. And, this being so, it must, I think, be admitted that Zeno has not yet been finally answered.

The Prime Mover.

The subject of the *Physics* is nature; and nature is an internal principle of movement. Thus the *Physics* reaches its culmination in book viii, whose object is to account for the presence of movement in the world and for its having the characteristics it has. The argument of book viii is essentially an argument from the eternal existence of change to the existence of an unmoved mover which causes it. Now the first premiss needed for this argument is that change exists; but this is at the beginning taken for granted, and no attempt to prove it is made till 3. 253^a 32-^b 6. The essential argument to prove it is the appeal to the observed facts of sense-perception. The argument that it is not the business of the physicist to refute a view which cuts at the very root of his science has less weight. It is important only if Aristotle is content to regard physics as a mere departmental science, accepting hypotheses without any attempt to prove their truth; but for Aristotle, physics, though it is not first philosophy, is yet philosophy and cannot shield itself behind such an argument. The argument would be no good reason for not trying *somewhere* to prove the existence of change. What he really relies on is the appeal to experience, coupled with the important addition that if it be urged that sense-perception is fallacious, it may be answered that even the occurrence from time to time of these illusions itself implies change in our mental condition.¹

¹ 254^a 24-30.

Change being known to exist, the next step logically is to prove that it must be eternal. This is the point to which Aristotle actually first devotes himself.¹ The main argument used is to the effect that (change being the realization of potentiality) if it is alleged that there was a first change, there must have existed, before it, something capable of producing it and something capable of suffering it; and that either these must have previously come into being (which implies a change prior to the supposed first change), or they must have pre-existed without change occurring (which again requires a prior change to bring them into the condition in which they began to act one on the other).² A similar argument is used to prove that change cannot come to an end.³ And further, it is argued that, time being the 'number' or measurable extension of change, the eternity of change follows from the eternity of time, which itself follows from the fact that it is the very nature of any moment to have time before and after it.⁴

Certain objections to the view that change must be eternal are next mentioned. There is first the objection that no change can be eternal, change being a passage from one of two contraries to the other and therefore limited in duration.⁵ In reply, Aristotle admits that repeated changes between the same contraries cannot be regarded as forming a single continuous change, but promises to show later that there can nevertheless be a single continuous infinite change. This can be the case only if there is a change which is not bounded by contrary limits, and that is what Aristotle actually tries to show with regard to rotation, in ch. 8.

The second objection is that we can actually observe the origination of change in lifeless things, where no change pre-existed.⁶ In reply to this, he admits that *prima facie* there seem to be situations in which, even in the presence of a suitable motive agent, a thing remains for some time free from change and then undergoes change, and that such cases present a difficulty which must be considered later.⁷

The third objection is of the same type as the second. It consists in claiming that an absolute origination of movement

¹ In ch. 1.

⁴ 251^b 10-28.

⁷ 253^a 2-7.

² 251^a 8-^b 10.

⁵ 252^b 9-12.

³ 251^b 28-252^a 3.

⁶ *ib.* 12-16.

from complete rest is specially evident in the microcosm of a living thing, and may therefore by analogy be supposed to take place in the macrocosm.¹ To this Aristotle replies that such origination is not absolute origination. The movements of living things are to be explained by previous changes in the environment which awaken desire and thus lead to movements intended to secure the gratification of desire.² But here too he promises a fuller consideration of the objection. This is to be found in ch. 6,³ which, however, simply restates the answer given here.

The way in which Aristotle actually deals with the second objection is this: he first establishes the view that there *are* things which pass from rest into motion and from motion into rest, by refuting (1) the view that everything is always at rest,⁴ (2) the view that everything is always in motion,⁵ (3) the view that everything is either always at rest or always in motion.⁶ Various grounds are given for the rejection of these views, but they are all different forms of the appeal to experience. 'We have sufficient ground for rejecting all these theories in the simple fact that we *see* some things that are sometimes in motion and sometimes at rest'.⁷

The fact on which the second objection rests having been thus established, he next devotes himself to explaining the fact in such a way as to show that the occurrence of change in things that were previously at rest is not an absolute origination of change from rest, and therefore does not conflict with his principle that every change implies previous change, that change has existed eternally. We should expect him therefore to point to previous changes which account for the apparent emergence of change, whether in lifeless or in living things, out of pure immobility. What he does, does not strictly meet the requirements of the argument. For instead of proving the existence of previous *changes*, he proves the intelligibility of such emergences of change from immobility by pointing out that there is always a mover to account for them. He first divides changes into three kinds: (1) changes initiated within the thing that changes, i.e. the movements of living things, (2) the natural movements of things that derive their movement from something

¹ 252^b 17-28.² 253^a 7-20.³ 259^b 6-16.⁴ 253^a 32-^b 6.⁵ 253^b 6-254^a 1.⁶ 254^a 3-15.⁷ *ib.* 35.

else, e.g. the movement of fire upwards and of earth downwards, (3) the unnatural movements of such things, e.g. the movement of fire downwards and of earth upwards.¹ The fact that motion is always caused by a mover is most evident in the third case,² and evident enough in the first, since no one doubts that there is some motive agent that causes the movements of animals, though it may be difficult to specify what it is.³ It is least evident in the second case. The elements cannot be said to move themselves, for that is the property of living things; further, if they could move themselves they should also be able to stop their movement, and to initiate other movements than locomotion. Further, their continuity presents a difficulty; for action involves diversity between agent and patient. Yet it is hard to say what external thing it is that moves them. The difficulty of this, Aristotle with great ingenuity ascribes to the fact that there are two stages in the causation of the natural movements of the elements. That which originally generated them and made them light or heavy, i.e. presumably some hot substance which by imparting heat made them light, or some cold substance which by imparting cold made them heavy, was responsible for the first stage of the transition, the transition to the first actuality (akin to the transition which a student goes through when a teacher puts him in possession of knowledge). But when a substance has become light or heavy its nature is not yet completely actualized. For this to happen, any obstacle to its natural rising or falling must be removed, and that which removes this is the agent of the second stage of transition. Neither it alone nor the agent which originally made the substance light or heavy can be said in the full sense to give it its natural movement. Both successively are needed, and the division of function between them results in our inability to point to *the* cause of the movement. Changes of quality and of size are similarly divisible into two stages.⁴

Thus Aristotle's treatment of the second and third objections raised in ch. 2 to the eternity of change is inconclusive. What he has done is to establish by an appeal to experience the emergence of change in things that were previously at rest, and to point, not to previous changes that account for such emergence, but to movers that account for them. He may well have thought

¹ 254^b 12-24.

² *ib.* 24-7.

³ *ib.* 27-33.

⁴ *ib.* 33-255^b 30.

that the positive arguments for the eternity of change offered in ch. 1 are sufficient. He proceeds to deal with the question, what must be the nature of the ultimate mover which accounts for change. Change may happen in either of two ways. *A* may be moved by *B* in virtue of *B*'s own nature, or it may be moved by *B* because *B* is moved by *C*. But it is clear that movement caused by something that is a mere instrument presupposes movement by something that causes movement in its own right. If an infinite regress is to be avoided, there must be a first cause of movement which causes movement not by virtue of being moved by anything else; in other words, which is either self-moved or unmoved.¹

Aristotle adds a further argument to show that the first cause of movement is not always itself in movement. We may suppose (1) that the fact of being moved, though an invariable accompaniment of being the cause of movement, is not essential to it. Aristotle infers, by a piece of bad logic, that if the relation in question were thus merely incidental, there might be a time when nothing was in movement; which would contradict his principle (already proved) that motion is eternal.² This error of logic does not much affect Aristotle's argument. For evidently what any one *means* who says that the cause of movement is always in movement is (2) that its being in movement is a necessary condition of its becoming a cause of movement. To this alternative Aristotle now turns. The supposition must take one of two forms. We may suppose (*a*) that the mover must be itself moved with the very kind of movement which it imparts. But if we are to be serious with this hypothesis we must carry it down to the minutest detail, and suppose that a teacher must not merely be learning, but be learning the very proposition he is teaching, and a catapult must be subject to the same kind of propulsion that it imparts—an absurd result!³ Or we may suppose (*b*) that the mover is suffering a different kind of movement from that which it imparts. But this is equally absurd, whether we suppose that there is a series of such movements each different from all that succeed it (which is refuted by the fact that the number of kinds of movement is limited), or that the series returns on itself, *A* suffering movement *X* and causing movement *Y* in *B*, *B* suffering movement *Y* and causing

¹ 256^a 4-^b 3.² 256^b 3-13.³ *ib.* 17-287^a 3.

movement Z in C , C suffering movement Z and causing movement X in D ; for that in the end means that to suffer movement X , D must be moved by an A which suffers the same movement; i.e. we are back at hypothesis (a). Any hypothesis which implies that that which causes a movement must also be suffering it involves ascribing contrary states at the same time to the same thing. For movement is the transmission of some characteristic from something that has it to something that has not it; but if that which imparts movement has also to be suffering it, it must be both moving towards the possession of that characteristic and already in possession of it.¹

Thus we come back to the alternatives already mentioned; movement must in the long run be caused either by something that is self-moved or by something that is unmoved. Aristotle proceeds to consider the first alternative, without mentioning Plato, but no doubt with reference to Plato's view that soul's power of self-movement is the cause of all other movement. We cannot suppose that the self-mover as a whole moves itself as a whole; for this view too would involve ascribing to the self-mover, as a whole, both the merely potential and the actual possession, i.e. both the non-possession and the possession, of the same attribute. Nor can the self-mover consist of two parts each of which is moved by the other. For in such a case there is no true *first* mover; but it is a first mover we are looking for. Besides, we have already found that that which causes movement need not be itself moved, otherwise than by itself. There must be, within the self-mover, an element that causes movement, and if moved by the remainder is moved only incidentally. Essentially, then, the self-mover consists of an element which causes movement and an element which is moved, and to call it a self-mover is only to approximate to the truth. Again, Aristotle has little difficulty in showing that if there were anything that in strictness moved itself, that which moved being precisely identical with that which was moved, neither one nor more than one part of such a thing could also be quite strictly a self-mover. If the relation mover-moved holds essentially between the whole and itself, it can only hold accidentally between any part and itself; and vice versa. Once more, then, we are driven to the conclusion that the self-mover must consist

¹ 357^a 1-23.

of a part that moves without being moved, and one that is moved without necessarily moving. But Aristotle has already shown that movement requires for its first cause either an unmoved or a self-moved mover; and now the second alternative has been shown to involve in the long run the first.¹

Aristotle next argues, in ch. 6, that to account for the eternity of movement there must be one or more eternal prime movers. He declines to claim that every unmoved mover is eternal. He makes several references in the chapter to unmoved movers which need not be regarded as eternal,² and again to self-movers which need not be so regarded.³ There is one passage from which it seems to follow that the self-movers referred to are plants and animals, and the unmoved movers their souls or vital principles.⁴ These vital principles, being unextended, may come into being and pass away immediately, without process. But not all unmoved movers can thus be non-eternal. No such non-eternal unmoved mover can account for the coming into being and passing away of the non-eternal self-movers themselves; nor can this be accounted for by a number of non-eternal unmoved movers (i.e. souls) acting successively. Such a succession could only account for a succession of changes, not for the eternity and continuity of change. There must be an all-embracing⁵ cause of movement apart from them, which accounts for the successive coming into being of the unmoved movers, and gives them their power to move their bodies, and therewith other things.

There appears to be an error in Aristotle's reasoning here. He has no doubt proved in ch. 1 the eternity of change. But what he has proved is that previous to any change there must have been some change to account for it. He has not proved the existence of a single continuous change in the sense in which he presently⁶ claims to have proved it to exist, viz. a change 'by one mover and of one moved', which alone, according to his doctrine,⁷ is genuinely continuous. In fact the 'eternal continuous change' for which he maintained that non-eternal movers will not account, and an eternal mover is needed, is the never-failing succession of the generation of living things;⁸

¹ ib. 26—258^b 9.

² 258^b 12, 20, 32.

³ 259^a 1.

⁴ 259^b 2.

⁵ 259^a 3.

⁶ ib. 15—20.

⁷ 227^b 21—228^a 3, 228^a 34—^b 11.

⁸ 258^b 26—9.

he has not proved that there is continuous change in the strict sense, continuous change of one single subject of change. His certainty that such change exists arises from a reason which has never been mentioned in the argument, viz. the observation of the never-ceasing rotation of the heavens. He has not proved, as he claims,¹ that there *must* be continuous change, but he has a strong reason for believing that there is.

Though the succession of the generation of living things has been said by Aristotle to be inexplicable without an eternal unmoved mover, the end of ch. 6² makes it plain that terrestrial phenomena are thought of by him as due not to the direct action of the first mover, nor even to the direct action of the *primum mobile* (the *πρῶτος οὐρανός*), but to the action of that which is moved by the *primum mobile*.³ The prime mover is always in the same relation to terrestrial things, and cannot, therefore, account directly for changes that happen to them. The first heaven, again, is as a whole always in the same relation to the earth, rotating symmetrically round it. But the sun, moon, and planets, which are moved by the first heaven, come to occupy opposite regions, and to be grouped differently,⁴ with regard to things on earth, and thus become the cause of the alternation of the seasons, of seed-time and harvest, and of the changing fortunes of terrestrial things. *ἄνθρωπος ἄνθρωπον γεννᾷ καὶ ἥλιος*, as he has said much earlier.⁵ This view is expounded more fully elsewhere;⁶ here it is only hinted at in the most general terms.

Aristotle has claimed that there *must* exist a single eternal continuous movement. He has in fact assumed, on the ground of observation of the heavens, that it *does* exist. He now proceeds to prove that it *can* exist, in answer to the objection raised in ch. 2 on the ground that all movement must be limited by the contraries between which it lies.⁷ His answer, in which he attempts to show (1) that locomotion is the primary kind of change,⁸ (2) that locomotion can be continuous and eternal, and that no other kind of motion can,⁹ (3) that circular motion can be continuous and eternal and that no other kind of locomotion

¹ 259^a 16, ^b 23.

² 260^a 1-19.

³ *ib.* 5-7.

⁴ 260^a 8-9.

⁵ 194^b 13.

⁶ *De Gen. et Corr.* 336^a 31-^b 19, *Met.* 1071^a 15, 1072^a 10-8.

⁷ 252^b 9-12.

⁸ 260^a 26-261^a 26.

⁹ 261^a 31-^b 26.

can,¹ I pass over, as being of small general interest. In ch. 10 he returns to the subject of the prime mover, and undertakes to show that this must be without parts and without magnitude. The first part of the proof consists in showing that nothing having finite magnitude can cause motion through infinite time, such as the unmoved mover has been shown to cause.² What Aristotle does succeed in proving is that a finite magnitude does not need to be applied for an infinite time in order to move a finite magnitude. But, not knowing the first law of motion, and supposing as he does that a force can move a magnitude only so long as it continues to be applied to it, he infers that a finite magnitude cannot move a finite magnitude for an infinite time. Secondly, he lays down the more general proposition that a finite magnitude cannot have infinite force;³ this is more general because it means that a finite magnitude cannot move an infinite magnitude, any more than it can move a finite magnitude for an infinite time. Thirdly, Aristotle adds for the sake of completeness, though it is irrelevant to his main theme, a proof to show that there cannot be a finite power in an infinite magnitude.⁴

All these proofs have rested on the assumption that, in order that a body may continue to be in movement, the body that moves it must continue to be in contact with it. But that is contrary to the plain facts of our experience of projectiles. Aristotle sees the difficulty, but instead of giving up his assumption embarks on an ingenious but unconvincing attempt to explain the observed facts consistently with the assumption.⁵ This, however, is a side issue. He returns to the main theme by arguing that, since it has been proved that no finite magnitude can produce movement for an infinite time, and since the discussion in book iii has shown that no actual infinite magnitude exists, the eternal movement of the heavens can only be accounted for by a being which is without magnitude and without parts.

The cosmic system is for Aristotle a system of concentric spheres, the outermost and quickest-moving being the heaven of the non-planetary stars, and each sphere moving at a pace proportional to its size⁶ (with the exception of the terrestrial

¹ chs. 8, 9.

² 266^a 12-24.

³ ib. 24-^b 6.

⁴ 266^b 6-24.

⁵ ib. 27-267^a 22.

⁶ *De Caelo* 289^b 15.

sphere, which is fixed). Such being the system, where is the first mover to be located? Either at the centre or at the circumference, Aristotle replies; these are the ἀρχαί; the system must be actuated either from within or from without. And, since the speed of the outermost sphere is perceptibly the greatest, and speed diminishes with distance from the actuating principle, he concludes that the actuating principle is at the circumference. He must have thought therefore of the prime mover as being, though unextended itself, able to operate at a place, very much as we think of the soul as unextended but able to operate on this or that part of our extended bodies. Nothing is said here of the mode of operation of the first cause; Aristotle considers, presumably, that the task of physics is ended when he has shown that the eternity of bodily movement demands a cause that is not bodily.

The Development of Aristotle's Theology.

It is possible to trace to some extent, though there are gaps in the story and conjecture has sometimes to be used, the development of Aristotle's thought about the cause of the movement of the heavens. We must begin with the treatment of the subject in Plato's *Laws*. Plato there lays it down that the primary cause of movement must be that which can move both itself and other things;¹ and identifies this with soul.² He credits soul with carrying round the sun and moon and the other stars,³ but, taking the sun as an example, leaves it an open question whether (1) soul is present in the sun and regulates its movement as a man's soul does that of his body, or (2) it provides itself with a body of fire or of some sort of air and forcibly pushes body with body, or (3) it is bare of body but guides the sun by 'certain other powers excelling in wonder'.⁴ Further, he leaves it doubtful whether the guidance of the several stars is the work of one soul or of more than one. What is certain is that this soul is, or these souls are, divine, and that therefore, as Thales said, 'all things are full of gods'.⁵ These various alternatives mark out the lines on which the speculation of the next generation proceeded. The first view, the belief in an immanent soul which guides each star as an

¹ 894 c—895 b.

² 895 c.

³ 898 d.

⁴ 898 e—899 a.

⁵ 899 b.

ordinary soul does its body, seems to be that which Plato himself leaned to; at any rate it is adopted in the *Epinomis*, where the stars are said *νοῦν ἔχειν* and to be *ἔμψυχα*,¹ and to maintain an unchanging motion because they have 'deliberated on it long ago'.² But it should be noted that even the *Epinomis* leaves it an open question whether soul is *in* the several stars or there is simply a soul *for* each star,³ and again whether the stars are gods or images of gods,⁴ which is another way of expressing the same doubt.

The second view, which is described as the *λόγος τινῶν*,⁵ is perhaps to be understood by reference to the view of Eudoxus which described the stars as carried round ('body by body') by the spheres in which they were set. It is not clear that Eudoxus himself believed the movement of the spheres to be caused by souls, but presumably Plato had in mind thinkers who combined his own belief in soul as the prime mover with Eudoxus' belief in celestial spheres. The third view is the belief in a transcendent prime mover, and the *δυνάμεις ὑπερβάλλουσαι θαύματι* with which this is credited are presumably the directive forces with which Aristotle was later to credit *τὸ ὀρεκτόν* or *ἐρώμενον*.⁶

For Aristotle's earliest views on these questions we must rely on three passages of Cicero relating to the *De Philosophia*.⁷ In the first of these⁸ he is described as assigning to the stars sense-perception and intelligence. In the second⁹ he is said to have argued that the heavenly bodies must be moved either by nature or by force or by will. They cannot be moved by nature, because then they would move either up or down instead of in circles. They cannot be moved by force, because there is no power greater than they which could move them contrary to nature. Therefore their motion must be voluntary. In the third passage¹⁰ an Epicurean critic charges Aristotle with inconsistency in assigning divinity to mind alone and giving the world a transcendent mover, and on the other hand making the world (or the *πρῶτος οὐρανός*) itself divine, and presumably self-moving. But not much can be inferred from the passage; for it is put in the mouth of a speaker whose object is to pour

¹ 982 c, 983 a.² 982 c.³ 983 c 2.⁴ 983 e.⁵ 899 a.⁶ *Met.* 1072^a 26, ^b 3.⁷ *Arist.*, fr. 23, 24, 26.⁸ *Cic. de Nat. Deorum*, ii. 15, 42.⁹ *ib.* ii. 16, 44.¹⁰ *ib.* i. 13, 33.

contempt on all thinkers but the Atomists. The passage is a confused one. Views which are essentially two in number—the belief in a transcendent mover, and the belief in a self-moving celestial system—are represented as four distinct views, and one of the four is described unintelligently.

The last of these passages has been treated by Jaeger as showing that in the *De Philosophia* Aristotle taught the doctrine of the transcendent mover of the heavens; the other two have been treated by von Arnim as proving the contrary. In truth Cicero's references prove neither the one nor the other. The first two passages, if Cicero is to be trusted, show that Aristotle described the heavenly bodies as endowed with life, sense-perception, and intelligence. The second might seem to go further, since it represents him as denying that there is any might greater than that of the stars themselves which could constrain them to move contrary to nature. But it is the words 'contrary to nature' that are important. Aristotle is not denying that there is any force greater than that of the stars, but that there is any great enough to move them contrary to nature. The suggestion is that the movement of the stars is voluntary, neither imposed on them by an inevitable necessity of their own nature nor imposed on them contrary to nature from without. It might be thought of either as akin to the motion imparted to animals by their souls, without any implication of a transcendent mover, or as due to the voluntary effort of such souls to imitate the perfection of a transcendent mover. From the third passage perhaps the safest inference would be, not that Aristotle committed himself to the contradictory views ascribed to him by his critic, but that, imitating the caution of his master, he at this early stage of his thought put forward the various possibilities without choosing between them.

Perhaps the next step which Aristotle took was to distinguish the celestial element, the ether, from the four terrestrial elements. Plato had treated the stars as being composed mainly of fire (*Tim.* 40 a), and no one, perhaps, before Aristotle had thought the celestial bodies to be composed of an element peculiar to themselves. In fr. 23 (referred to above) it is implied that the home of the celestial bodies is identical with the fourth element, fire, and in fr. 24 it is implied that the only natural movements are the movements upward or downward which

characterize the four elements, and that the movement of the stars is neither natural nor contrary to nature. But in the *De Caelo*¹ it is argued that motion *must* be either natural or contrary to nature, and that the heavens and the stars must be composed of a fifth element to which movement in a circle is natural. This, in distinction from the other four elements, is further said to be free from any change except locomotion.

From the fact that in the *De Caelo* the celestial system is said to consist of an element whose nature it is to move in a circle, von Arnim argues that in that work Aristotle entirely dispenses with the notion of a transcendent mover. The inference is not justified; for in *Phys.* viii, though the movement of the elements is described as natural, the actualization of their potentiality of movement is said to demand the action of an outside agent. The doctrine of a transcendent mover is in no way inconsistent with the doctrine that the movement of the heavenly bodies is the realization of their own nature. But there *are* passages in the *De Caelo* which tell strongly in favour of von Arnim's thesis that there is there no thought of a transcendent mover. In i. 279^a 33-^b3 Aristotle expressly says that there is nothing more powerful (*κρείττον*) than the heavenly system and capable of moving it, since such a mover would have to be more divine than it—which nothing can be, since the heavenly system is 'lacking in none of its own perfections'. It is true that just before this² Aristotle has spoken of beings beyond the outermost heaven which *ἀναλλοίωτα καὶ ἀπαθῆ τὴν ἀρίστην ἔχοντα ζῶν καὶ τὴν ἀνταρκεστάτην διατελεῖ τὸν ἅπαντα αἰῶνα*. He believes, then, in gods other than the heavenly bodies. But it is clear that he does not ascribe the motion of the heavens to them.

Another passage tells the same tale—ii. i. 284^a 18-23, 27-35, where not only is there no thought of a transcendent mover, but the eternal movement of the heavens is said to be incompatible even with necessitation by a soul, since the required effort would be unworthy of the moving soul. Here at first sight Aristotle seems to dispense not only with a transcendent mover, but even with an immanent soul, and to give a purely mechanistic account of the heavenly movements.

Yet that this is not his meaning is clearly indicated by two passages in the same book. In ii. 6 he argues for the regularity

¹ 268^b 11-270^a 12.

² 279^a 17-22.

of the movement of the heavens. Two proofs of this are offered from the nature of the movement itself.¹ But two others are used which refer directly to a mover of the heavenly bodies,² and in one of these it is definitely described as *ἀσώματον*.³ Again, in ii. 12 Aristotle freely describes the motion of the heavenly bodies as due to soul. ἡμεῖς ὡς περὶ σωμάτων αὐτῶν μόνον, καὶ μονάδων τάξιν μὲν ἔχόντων, ἀψύχων δὲ πάμπαν, διανοούμεθα· δεῖ δ' ὡς μετεχόντων ὑπολαμβάνειν πράξεως καὶ ζωῆς . . . διὸ δεῖ νομίζειν καὶ τῆν τῶν ἀστρον πρᾶξιν εἶναι τοιαύτην οἷα περὶ ἡ τῶν ζώων καὶ φυτῶν.⁴ Each heavenly body is described as having a *ζωή* and an *ἀρχή* or ruling principle, in fact a soul which moves it as the souls of living things move their bodies.⁵ In the light of this passage and that in ch. 6 we must realize that in ii. 1 what Aristotle is denying is not soul, but soul which constrains⁶ the heavenly bodies to motion contrary to their natural motion. What he is claiming is that his view of heavenly bodies as made of a substance different from the terrestrial elements, which naturally moves in a circle, is preferable to a view which treats rectilinear motion as alone natural and therefore, to account for the circular movement of the heavenly bodies, demands the action of an alien and constraining soul. What the three passages taken together point to is that Aristotle when he wrote the *De Caelo* explained the movements of the heavenly bodies by the action of immanent souls or powers of initiating movement. We need not adopt the precarious course of regarding any of the passages as merely taken over from the *De Philosophia* or as notes added when Aristotle had developed the doctrine of the transcendent mover.

The introduction of the transcendent mover, when it came, was not the negation but the completion of the view developed in the *De Caelo*.⁷ For if the view that movement is the actualization of an inherent capacity is true as far as it goes, it is not complete. The question remains, why does the capacity pass from being a mere capacity to being realized? The answer which Aristotle finally reached is that capacity is realized always by the action on the potential of that which is already

¹ 288^a 17-27, ^b 7-22.

² 288^a 27-^b 7, ^b 22-289^a 8.

³ 288^b 6.

⁴ 292^a 18-21, ^b 1-2.

⁵ 292^b 28-30.

⁶ 284^a 27, 28.

⁷ This is excellently brought out in Mr. Guthrie's article, *C.Q.* xxvii (1933), 162-71.

actual. And this he came to see to be incompatible with self-movement. In order to cause movement, the mover must already be in the state which is the terminus of the movement; in order to be moved, the moved must be not yet in that state. Thus that which moves cannot be identical with that which is moved. This is the essential argument by which Aristotle in *Phys.* viii proves the existence of a transcendent mover.

Probably the earliest passage in Aristotle in which the doctrine of the transcendent mover is adumbrated is *De Motu An.* 2-4. The general implication of the passage is that, just as the movement of animals would be impossible if there were not an unmoving earth for them to push against, the motion of the heavens would be impossible without an unmoved being which forms no part of them.¹ But the argument is only tentative, and it is a mere argument from analogy. Aristotle returns to the subject in what strikes me as a maturer argument, in *Phys.* vii. 1. He there establishes first² that everything that is in movement is moved by something; and this seems to be directed both against the view that motion is a state which needs no causation, and against the view that a thing can be, in strictness, moved by itself.³ Having established that everything that is in motion must be moved by something other than itself, he next argues⁴ that there cannot be a series *A, B, C...* such that the movement of *A* is caused by *B*, that of *B* by *C*, and so *ad infinitum*, but that there must be a first mover and a first moved. He does not say in so many words that the first mover must be unmoved, but we can draw the inference by applying to the first mover the proof advanced in the first part of the chapter. If the first mover were in movement, the movement could not be caused by the first mover itself, nor could it exist uncaused, nor is there any prior mover to cause it. We may fairly suppose that Aristotle drew this conclusion and considered himself to have proved the existence of a transcendent unmoved mover. But the argument is at two points, at least,⁵ invalid, and he may have become conscious of this. In viii. 4-5, therefore, he abandons this argument and offers a fresh argument for the necessity of a prime mover; and

¹ 698^b 8-27, 699^a 12-^b 11, ^b 32-700^a 6.

² 241^b 34-242^a 49.

³ 241^b 39.

⁴ 242^a 49-243^a 12.

⁵ cf. 242^a 38-49 n., ^b 53-9 n.

it is the argument of book viii that is retained and summarized in *Met. A*.

Though book viii offers an elaborate argument for the existence of the prime unmoved mover, it tells us nothing of how this operates, and *Met. A* carries the theory further by stating that it is *ὡς ὀρεκτόν* or *ὡς ἐρώμενον*, i.e. as final cause and as this alone, that God operates on the world. There are earlier hints of this view. In one passage of the *De Caelo*¹ Aristotle describes the stars as living beings aiming at an end, and the first heaven as attaining the *θειοτάτη ἀρχή* directly by a single movement. There is indeed in the passage no reference to the unmoved mover, and the *θειοτάτη ἀρχή* may be thought of as an immanent end, a perfect state of itself which beckons the first heaven on to its attainment. But when Aristotle had come to satisfy himself of the existence of the unmoved mover, it may be presumed that he retained the notion that the heavens act under final causation, and now thought of them as having in the first mover a transcendent end, and of their eternal rotation without translation as due to the endeavour to attain, in such measure as a material thing can, something akin to the eternal unchanging activity of the first mover. Again, in the *De Generatione et Corruptione*² he illustrates the action of an *ἀκίνητον* on that which it moves by the action of a man who grieves another. The suggestion is that the unmoved mover also acts on the *primum mobile* by inspiring a mental state, which must be that of desire. Finally, in *Phys. ii.*³ Aristotle says *διτταὶ δὲ αἱ ἀρχαὶ αἱ κινῶσαι φυσικῶς, ὧν ἡ ἑτέρα οὐ φυσική· οὐ γὰρ ἔχει κινήσεως* (i.e. τοῦ κινεῖσθαι) *ἀρχὴν ἐν αὐτῇ. τοιοῦτον δ' ἐστὶν εἴ τι κινεῖ μὴ κινούμενον, ὥσπερ τό τε παντελῶς ἀκίνητον καὶ [τὸ] πάντων πρῶτον καὶ τὸ τί ἐστὶ καὶ ἡ μορφή· τέλος γὰρ καὶ οὐ ἕνεκα.* Here *τὸ τί ἐστὶ καὶ ἡ μορφή* refers to the form of whatever physical object may be in question; but *τὸ παντελῶς ἀκίνητον καὶ πάντων πρῶτον* evidently refers to the prime mover, and it is plainly implied that this no less than the form operates as a final cause.

There is a minor point on which a progress in Aristotle's thought can be traced. Plato leaves it an open question whether the several stars have separate souls that move them—*ψυχὴ μὲν ἢ ψυχαὶ πάντων τούτων αἷτιαι ἐφάνησαν*⁴—and in the whole context he speaks freely both about God and about gods.

¹ 292^a 18–b 25.

² 323^a 31.

³ 198^a 35–b 4.

⁴ *Laus*, 899 b.

Perhaps his meaning is best indicated in the passage in which he speaks of the overseer of the universe as appointing ἀρχοντες to preside over the several things in the universe in such a way that they shall make their contribution to the good of the whole.¹ His view probably is, then, that there is a supreme soul, and that to everything in the universe (including the stars) there is assigned a subordinate soul of its own. Similarly Aristotle in the *De Philosophia* spoke of the stars as gods,² but probably also spoke of the universe as God, or alternatively as being presided over by God.³ The same general view is indicated in the *De Caelo*,⁴ where the πρώτη ζωή καὶ ἀρχή, the soul of the first heaven, has ascribed to it πολλή ὑπεροχή over the souls of the other celestial bodies. In the *De Motu Animalium* nothing is said of separate moving principles for the sun, moon, and planets; but nothing can be inferred from this, since the problem of their movements is not discussed at all.

In the *De Philosophia* there is no trace of the view that the stars are moved by spheres in which they are set; it is the stars themselves that are besouled and are responsible for their movement. But by the time when he wrote the *De Caelo*, Aristotle had already accepted the theory of celestial spheres (a view already perhaps hinted at in the second hypothesis mentioned in the *Laws* as 'the view of some people'⁵). For in ii. 8 he argues at length that the stars have no principle of movement of their own but are carried round by the κύκλοι in which they are set. In ii. 9 he describes them definitely as attached to moving bodies,⁶ and in ii. 12 he substitutes the more exact σφαῖραι for κύκλοι.⁷

In the *Physics* there are three passages that refer to a plurality of eternal unmoved movers. In the first of these⁸ Aristotle leaves it an open question whether such a plurality exists. In the second⁹ he expresses a preference, on the ground of economy, for the view that there is ἐν ὁ πρώτων τῶν ἀκίνητων αἰδίων ὃν ἔσται ἀρχή τοῖς ἄλλοις κινήσεως. I.e., while recognizing the existence of many ἀκίνητα κινούμενα (for every soul is such, in the sense that it is ἀκίνητον καθ' αὐτό, and only κινήτων κατὰ συμβεβηκός through being involved in the movement of the body it moves), he

¹ ib. 903 b.² fr. 23, 24.³ fr. 26.⁴ 292^b 28-30.⁵ 899 a.⁶ 291^a 11, 17.⁷ 293^a 7.⁸ 258^b 11.⁹ 259^a 6-13.

prefers to suppose a single *eternal* unmoved mover on which all things depend for their movement. Jaeger's reasons for regarding these passages as later additions seem to be inadequate. But in a third passage¹ Aristotle speaks of some 'ruling principles of things in the heavens, i.e. of those that have more than one movement' (the sun, moon, and planets), as being moved incidentally by something other than themselves. It is implied, though not said, that these ἀρχαί are in their own nature unmoved, and the reference must be to movers of the celestial spheres of Eudoxus' system. And to account for the eternal movement of the planetary bodies, they must be eternal. Thus in this passage Aristotle assumes what in the first passage he had merely mentioned as a possibility, and in the second had treated as improbable, that there is a plurality of eternal unmoved movers. This passage alone of the three, then, seems to be a later addition, made after he had reached the final view which he states in *Met. Λ*.

III

THE TEXT OF THE *PHYSICS*.

The leading sources for the text of the *Physics* are the following:—

1. Parisinus 1853 (E), of the beginning of the tenth century, the MS. which forms one of the main sources for Aristotle's physical, psychological, and biological works, as well as for the *Metaphysics* of Aristotle and of Theophrastus.
2. Laurentianus 87. 7 (F), of the fourteenth century.
3. Laurentianus 87. 6 (G), of the twelfth century, including only book iv.
4. Vaticanus 1027 (H), of the beginning of the fourteenth or perhaps of the thirteenth century. The old hand of this MS., of which alone Bekker records the readings, begins at iv. 215^a 8.
5. Vaticanus 241 (I), of the thirteenth century.
6. Vindobonensis 100 (J), of the tenth century, which is an important source also for the *De Caelo*, the *De Generatione et Corruptione*, the *Meteorologica*, and the *Metaphysics*, as well as for Theophrastus' *Metaphysics*.

¹ 259^b 28-31.

7. Laurentianus 87. 24 (K), of the middle of the thirteenth century, including only books vi to viii.

Of these I have recollated E and G and collated J, which had not before been collated for the *Physics*.

Besides these I have traced the existence of 79 MSS. of the whole or parts (other than mere extracts) of the *Physics*. These have not been collated, except a certain number for book vii.

8. For certain passages in books ii, iii, v we have parallel passages in the *Metaphysics* (M).

9. For books i-iv the readings of the Arabo-Latin version (V) printed with Averroes' commentary have been collated by A. Mansion; v. *Revue de Philologie*, 47. 5-41.

10. Themistius' paraphrase (T). His date is about 317-390 A.D.

11. Philoponus' commentary (P), complete for books i-iv, very fragmentary for books v-viii. His *floruit* is about 530.

12. Simplicius' commentary (S), of about the same date.

13. Alexander's commentary (A), as quoted by Simplicius. His *floruit* is about 200 A.D.

Apart from J and V, of which he took no account, the situation as regards the authorities was stated in a masterly way by Hermann Diels in the *Abhandlungen* of the Berlin Academy (1882). He confined himself to books i-iv, of which alone he had at the time edited Simplicius' commentary. Though one may disagree with his treatment of many individual passages, there can be nothing but admiration for his general argument. He first shows that S presents a line of tradition independent of that represented by all the MSS. This is most clearly shown by 212^a 6, where S has after σώματος the words, omitted in all our MSS., καθ' ὃ συνάπτει τῷ περιεχομένῳ. The authenticity of these words is proved by what follows immediately in the MSS., λέγω δὲ τὸ περιεχόμενον σῶμα τὸ κινητὸν κατὰ φοράν, which presupposes a mention of τὸ περιεχόμενον. The additional words are found not only in S but in P and in T, so that we are led to suspect that the three commentators, while diverging in detail, follow in the main one common tradition. It is to be noted that V here agrees with the commentators.

Some of the passages used by Diels as proofs of the excellence of the indirect tradition are not convincing, since in some of them

the commentators may be merely paraphrasing, and in others the advantage is not on the side of the form in which they quote the text. But in 191^a 10 Diels is probably right in rejecting ἡ ὕλη καί, since it spoils the proportion ἀμορφον : τεχνητόν :: ὕλη : οὐσία. In 196^b 34 he seems right in preferring κομιζόμενον of JPST to the readings of the other MSS. In 197^a 17 S's φεύγων καὶ θεασόμενος (φεύγων καὶ θεασάμενος T, θεασόμενος καὶ φεύγων FI, θεασόμενος φεύγων J) seems to be right. In 221^a 7 AST Damascius seem to be right in omitting δέ. This provides a principal clause for the sentence.

In 216^b 17-20 PST omit the probably corrupt sentence which all the MSS., V, and Averroes have. (G and H preface the sentence with ἄλλως, which seems to imply that the writers of these MSS. (or the writer of their archetype) found this sentence only as a variant in some MSS.) But the Arabic translation used by Averroes belongs to the ninth century, and E has the character of a ninth-century MS. (absence of accents, and defective division of words); Diels infers that the archetype of our MSS. is to be placed between 600 and 800 A.D. It would be safer to say, between 530 (the approximate date of Philoponus and Simplicius) and 850.

Diels next cites a number of agreements between E and S which confirm the superiority already assigned to E by Laas, Bonitz, and Prantl. I may supplement Diels's argument by mentioning the following passages in books v-viii in which E alone or almost alone agrees with S in what is evidently the right reading:—

230^b 7 γὰρ om. E¹PS

233^b 23-5 τὸ μὲν . . . τὸ δὲ ES : τὰ μὲν . . . τὰ δὲ HIJK.

235^b 11 εἰ . . . ἀπολείπειν ES : omitted by haplography in KA.¹

239^b 9 τῶν omitted wrongly by KA.

240^b 19 δ' ES : γὰρ KA by anticipation of ^b 20.

241^a 6 μῆκος ES : μέγεθος KA.

241^a 17 ἡ omitted wrongly by KAP.

266^a 33 ἐν τῷ δὲ AB ES : ἐν ᾧ δ' ὁ AB Λ.

Again, EP seem to be right in the following places:—

235^b 24 ἡ δὲ : ἡ γὰρ KA. γὰρ repeated from οὐ γὰρ.

238^b 35 ἕτερον EFP : ἐκότερον HIJKS.

239^a 5 ἄν om. KAS.

¹ For the sense in which I use the symbol Λ see p. 120.

ET are right in :—

228^a 22 *μίαν* : *μία* ΔS.

228^b 21 *ἀνωμαλία* : *ἀνωμαλίας* ΔS.

233^a 20 *ὁ χρόνος* is probably a later addition by KA.

233^b 7 *ὡς* om. E¹ AT Aspasius, found in KAS.

EA are right in 258^a 27; *τὸ δὲ Γ . . . γάρ* is a gloss found in KA γρ. S but absent in EA.

Diels adds, however, a large number of passages in which E has additions, omissions, or changes that are condemned either by internal evidence or by the adverse testimony of the commentators. To this I may add that there are not a few places in which E agrees with one or more of the commentators in error :—

ES

249^a 23 *ὁμωνύμων*.

255^a 35 omission of the first *τὸ*.

259^b 28 the second *τὸ* is wrongly omitted in ES¹ but found in KAPSP.

262^b 2 *καὶ ἄλλῳ* is omitted by haplography.

EP

230^b 12 a sentence wrongly inserted.

238^b 31 *δὲ* wrongly omitted.

260^a 8 *ἐν* omitted by haplography.

241^b 27 *τῷ* wrongly omitted.

ET

229^b 12 *τῆ* wrongly omitted.

233^a 20 *τῆ διαίρει* omitted by haplography.

Similarly passages may easily be found in which one or more of the other MSS. goes wrong in company with one or more of the commentators. The position, then, is that while the MSS. sometimes all go wrong when one or more of the commentators is right, so that their archetype must have been in error, yet at times a given MS. agrees with one or more of the commentators in preserving the right reading against the other MSS., and at other times in giving a wrong reading where the other MSS. are right. How is this to be explained? Diels states three possibilities :—

(1) that the MSS. were derived from a vulgate text provided with numerous variants from which they drew at pleasure ;

- (2) that they used the commentators as well as their archetype ;
 (3) that they used other MSS. besides their archetype, and emended the text by their aid.

He argues that all three possibilities were realized, and that the writers of our MSS. were not mere copyists with a single text before them which they tried mechanically to reproduce, but were scholars who treated the archetype much as modern scholars do Bekker's text, emending it from any source that was at their disposal.

The hypothesis of an old MS. furnished with variants derives some confirmation from the presence in our MSS. themselves of many marginal or supralinear variants. Diels cites 215^a I as particularly instructive. Here IVST have *ἔπειθ' ὅτι πάντα κίνησις*, FG have *πρῶτον μὲν οὖν* (which is erased in J) *ὅτι πάντα κίνησις*, E has *ἔπειθ' ὅτε ἢ πάντα κίνησις πρῶτον μὲν ὅτι πάντα κίνησις*. Here *ἔπειθ'* is right; the *first* argument to prove that a void would be fatal to movement (214^b 30) has been adduced in 214^b 32, *οὐ γὰρ ἔστιν κτλ.* Here it is most natural to suppose that the archetype was furnished with the two readings (*πρῶτον μὲν οὖν, ἔπειθ'*) and that I used it skilfully, FG unskilfully, and E stupidly.

Again in 196^b I EFI have *αὐτοῦ*, S *τούτου*, J *αὐτοῦ τούτου*. In 200^b 23 S has *ταῦτα*, E *πάσι*, AP *ταῦτα πάσι*.

Such variants, in so far as they are not late conjectures (and they rarely look like this) may have been derived either from older MSS. or from the commentators. Now in 202^b 21 S has *καὶ τόδε*, and the true reading *καὶ τὸ τοῦδε* depends on the MSS. FIJ, confirmed by VP. The archetype probably had both variants, and E muddled them together. Or E may have taken his reading (*καὶ τοῦδε*) direct (but carelessly) from the commentators.

Again, in 208^b 24, where S preserves the original reading, FGIJ adopt A's conjecture, and E tries to improve upon it.

Diels concludes that it is doubtful whether the assumption of an archetype furnished with variants will account for all the facts. On that assumption it is not easy to see why some of the MSS. neglect obviously good readings and adopt poorer ones. It seems then that besides the archetype the various MSS. had other previous MSS. at their disposal, from which they adopted variants at their free will, sometimes good, sometimes bad. Now if Diels's account is sound, as in the main I

believe it to be, we have not in the *Physics* the situation that is found in many classical works, where you have a distinct family-tree with branches, and each descendant MS. perpetuates the distinctive errors of its ancestors and adds fresh distinctive errors, but never returns to the truth except by conjecture. If the writers of our MSS. (or at any rate of the older of them) were learned men, drawing upon a whole store of variants from older MSS. and from the commentators, and using their own judgement in selecting from them, there will be a far less definite affiliation among the MSS. Even if there are main branches of the family-tree, deriving from distinct early copies of the archetype, yet the access which all the writers had to variants will lead to constant criss-crossing between the main branches; MSS. belonging to different main branches will nevertheless constantly agree even in erroneous readings which they should not on the ordinary principles of filiation agree in. This is in truth what we find in the *Physics*. A fact which is evident to any one who will glance through Bekker's apparatus is that there are two main families of MSS., one consisting of E alone, the other of the MSS. FI in books i-iii, of FGI in iv. 208^a 27-215^a 8, of FGHI in iv. 215^a 8-end, of FHI in books v-viii. The only other MS. cited systematically by Bekker, viz. K in books vi-viii, needs separate consideration. It agrees with E against A about 48 times to 133 in book vi, about 80 times to 33 in book vii, about 161 times to 107 in book viii, about 289 times to 270 in all. It must, I think, be regarded as forming a third line of tradition intermediate between the other two; and, as we shall see presently, a very accurate line. On the other hand J belongs decidedly to the same family as FGHI; a count of certain passages taken at random in the second part of book iv, for which we have all five MSS., shows the grouping FGHIJ to be much commoner than any other. Within this family it seems to me difficult to establish definite branches, though on the whole GIJ belong specially closely together, and F and H are slightly more individual in their readings, and H more so than F.¹

To get a rough estimate of the value of the various sources for the text, I have drawn up a list of 268 passages in which

¹ Similarly in the *Meteorologica* H diverges considerably from FJ (Fobes's ed., p. viii). And in the *De Caelo*, Mr. D. J. Allan tells me that H diverges pretty widely from the group FJM.

Bekker's text can with fair certainty be improved upon, on grounds of sense or grammar, and I find that of these

E gives the right reading in 91 places ;

F gives the right reading in 40 places ;

G in 6 places in book iv, which would mean on the same ratio about 35 in the whole *Physics* ;

H in 35 places in iv. 215^a 8-end of viii, which would mean on the same ratio about 55 in the whole *Physics* ;

I in 56 places ;

J in 47 places ;

K in 25 places in books vi-viii, which would mean on the same ratio about 60 in the whole *Physics* ;

M in 20 places in books ii, iii, v ;

V in 20 places in books i-iv, which would mean on the same ratio about 45 in the whole *Physics* ;

A in 8 places ;

P in 54 places + 6 in which he *may* have the right reading ;

S in 112 places + 11 in which he *may* have the right reading ;

T in 40 places + 9 in which he *may* have the right reading.

The importance of E, of Λ as a whole (or a majority of the MSS. included in it), and of S is so obvious that it needs no illustration. I will proceed to illustrate the importance of individual MSS. of the Λ group even when they diverge from the main Λ tradition, and of K.

I take as illustrations for this purpose the passages in which a departure from Bekker's text appears to be either necessary or very likely to be right. Of course there are many others in which Bekker himself follows one or more of these MSS.

F

186^a 13 F alone with S omits *οἶεσθαι*, which seems likely to be a gloss. But its omission *may* be accidental.

190^a 19 *μη* before *μουσικόν* is required, and does not seem likely to be an emendation. Its presence in PST is doubtful.

194^b 1 The omission of the second *αι* is required by the sense and is found only in FP. It does not seem likely to be an emendation.

205^a 14 F's *οποιουονυν* points to the true reading *οπουονυν*, found in MV. This cannot be emendation.

206^b 8 τοῦ ὄλου μέγεθος is certainly right, and can hardly be an emendation. It is found only in FS.

219^b 7 δῆ FG. This is unimportant because the MSS. deal very freely with δέ and δῆ.

224^a 12 The omission of ὁ is certainly right, and is found only in FP. It is not likely to be an emendation.

224^b 17 The omission of the third τό is certainly right, and not likely to be due to emendation. F stands alone.

226^a 2 τό before the first γιγνόμενον is probably right. FJM (A^b) stand alone.

ib. 12 τί for δῆ FJM (JA^b) S. This is certainly right and cannot be an emendation.

237^a 30 τι FP for τό is certainly right.

267^b 14 ἄλλος FS for ἀλλ' ὄς.

F is clearly independent of all the other MSS.; its closest connexions are with the GIJ group and with K, but it diverges considerably more from GIJ than they do from one another. In the *Meteorologica* Fobes considers that it has a special affinity with J, but I see no trace of this in the *Physics*.

G

219^b 7 δῆ FG; this is unimportant.

(210^b 17: Diels says that here G stands nearest to S. In fact GI have the same reading, but in any case insertion or omission of articles is not very conclusive of independent value.

211^b 24: Diels says G stands nearest to S. G has a τισ, which I and S also have, but not in the same place. The passage is not very important evidence.

213^b 23, where Diels wishes to read ἀντῶ with GP¹S Stobaeus, is not conclusive evidence of any independent value of G, since the variation from ἀντό to ἀντῶ may be purely accidental, or may again be due to the influence of P, or to emendation.)

On the whole G does not seem to have much value except as forming one evidence of the GIJ tradition. Any two of these probably indicate the tradition where they agree against the third. G seems to be independent of J; for not only (1) has J none of these four readings, but also (2) G has none of the special readings of J where J seems to be right as against Bekker. On the whole G has the virtue of faithfully transmitting that which

was committed to it, and has fewer individual errors than most of the other MSS.

H

215^a 10 κενού HPST is pretty certainly right and not due to emendation.

219^a 20 αὐτῶν (an emblemata from l. 19) is lacking only in HST; this is certainly not due to emendation.

219^b 14 ὁ δὲ ποτε HPS.

222^a 28 καὶ before εἰς ἐκεῖνο om. HP. Not emendation.

^b 30 διωρισμένων HPT. Not emendation.

226^a 14 καὶ μὴ κίνησιν om. E²HIAS.

231^a 5-17 a late addition; om. HT Porph. γρ. A γρ. S.

240^a 29 δ' HS. Not important.

246^b 19 ὠδί HIS. Not emendation.

259^b 24 μὴ om. HS. Not emendation.

267^a 2 κινεῖν HS.

It is to be noticed that in nearly all these passages H is in agreement with S. Further in 222^b 30 one MS. of S has διωρισμένων. Only in 222^a 28 is H without definite support in S. Apart from these passages in which HS alone or almost alone preserve the true reading, H is one of the two MSS. which in general maintain the closest relation to S. It seems to me highly probable that where it alone of the MSS. preserves the true reading, it is because the writer has made an intelligent use of S's commentary. Considering how many passages there are in which S's reading is not known to us, it would be strange, if H's good readings were independent of S, that he should not sometimes come to the rescue when S is silent.

Another point to be noted about H is that it has more individual errors than any other of our MSS.

I

189^a 12 τὰ ἐναντία IJST.

202^b 24 πῶς IP.

204^b 25 ὅπως IJP.

207^a 7 κατὰ τὸ ποσόν E²IJS.

215^a 1 ἔπειθ' ὅτι πάντα κίνησις ἢ IVS.

226^a 14 καὶ μὴ κίνησιν om. E²HIAS.

230^a 28 τὸ γὰρ γηρᾶν IJ.

245^b 17 ἀνὰ . . . κινουμένου om. I. This looks like a gloss, but I's omission may be due to homoioteleuton.

246^b 19 ὠδί HIS.

J has four of these nine readings, and it looks as if I might be a descendant of J corrected by reference to the commentators.

J

187^a 7 ὡς om. J¹. Possibly emendation.

189^a 12 τὰ ἐναντία IJST.

193^b 17 second εἰς om. J¹S.

196^b 34 κομιζομένου JPST.

204^b 25 ὅπως IJP.

226^a 2 τὸ FJM(A^b).

226^a 12 τί FJM(JA^b)S.

230^a 28 τὸ γὰρ γηρᾶν IJ.

The independent value of J is not great. It is chiefly valuable as being the oldest and perhaps the most careful preserver of the Λ tradition.

K

241^b 7 τὸ μεταβαλεῖν K, 8 μεταβαλεῖν KS, 9 μεταβαλεῖν KS: an unimportant and perhaps accidental variation.

267^a 7 κινεῖ τι ἄλλο E²K.

267^b 13 δέ om. KS.

K has no great importance when it stands alone; but the fact that it is apparently independent both of E and of Λ gives it great importance when it agrees with one of these against the other. EK are probably right as against Λ , Δ K as against E.

It is evident that any one of these MSS. from time to time, either alone or in very slender company, is liable to preserve the true reading. It is impossible in many cases to say that this may not be the result of conjecture, but in the great majority of the cases the reading thus found in one or more MSS. is also found in one or more of the commentators; and, since they are most scrupulous in distinguishing traditional readings from conjectures, the pedigree of such readings is amply guaranteed. If a few of these readings are the result of conjecture by the copyists, they are so sound and so convincing that we may be just as grateful to their authors as we should be if they were preserving what was handed down to them.

There are a few other obviously correct readings which do not occur in the text of any MS. and were not actually followed by any of the commentators, but are recorded as variants by either a copyist or a commentator or both. Of these I have noted the following.

199^b 20 λυσάμενος γρ. I γρ. P.

201^a 28-9 οὐχ . . . κινητόν γρ I γρ. A Asp.

206^a 29a-33 ἔτι . . . ἕτερον om. γρ. A γρ. P γρ. S.

208^a 18 τοῦ ἄστεος and ἡ om. γρ P.

211^b 1-5 ἔτι . . . κάδω om. Aspasius, secl. A.

A few passages I have been led to regard as intruders, and it is noteworthy that in all of these there is some authority either in the MSS. or in the commentators for so regarding them. This is of course not definite proof that there are not passages that occur in all the MSS. and all the commentators and are yet intruders. But it seems safe to say that if there were many such some of them would have been detected before now by one scholar or another; and the fact that this has not happened is pretty good evidence of the soundness of the text, where it occurs *both* in the MSS. *and* in the commentators, so far as concerns its freedom from intrusive sentences or longer passages. The passages which must be regarded as intruders are:

186^a 7-10 καὶ γὰρ . . . χαλεπὸν is a repetition of 185^a 9-12; om. ut vid. ST. That it is out of place here, and not in the other context as Bekker suggests, is shown by the variety of reading in 186^a 8, where FIJ have ἀσυλλόγιστοί εἰσιν, as all the MSS. have in 185^a 10, but EP have ἀσυλλόγιστοί εἰσιν αὐτῶν οἱ λόγοι. The shorter reading is right in the earlier passage, where οἱ λόγοι have already been mentioned; E has doctored the later passage by putting in αὐτῶν οἱ λόγοι because the subject of λαμβάνουσι here is not the λόγοι but Parmenides and Melissus themselves.

186^b 20-21 ἡ ἐν ᾧ . . . συμβέβηκεν om. ΔPST. This is a doublet of the previous clause.

206^a 29a-33 ἔτι . . . ἕτερον om. γρ. A γρ. P γρ. S. This is easily recognized as an alternative briefer version of 206^a 21-9; cf. the beginning with ^a21, ^a31 with ^a22, and the end with ^a29. Here the language is unobjectionable, and the passage may have been an alternative version by Aristotle himself.

211^b 1-5 ἔτι . . . κάδω om. Asp. secl. A. This is an alternative version of ^a29-^b1.

216^b 17-20 ἔτι (ἄλλως ἔτι GH) . . . ἄπτου om. PST.

217^b 12-16 ἔτι . . . ὕλης om. T γρ.G γρ.S. An alternative version of ^a33-^b8.

231^a 5-17 ἀπορήσειε . . . ἀντίκειται om. HT Porphyry γρ.A γρ.S. This deals, like the rest of the chapter, with the opposition between motion and rest. It is shown to be spurious by the fact that it comes after the summary in ^a2-4, which is evidently meant to conclude the chapter, and by the weakness of the last clause ἴσως δ' ἡμεῖς κίνησιν πη ἀντίκειται.

When one comes to characterize the different MSS. more closely, it is obvious at once that E has special importance from the fact that it is the sole representative of one family. The superiority of many of its readings is manifest, and in general it makes the impression of having been less doctored than any of the other MSS. Such doctoring usually takes the form of putting in words and clauses to make the meaning clearer. When we have to choose between a fuller and a less full reading, both clear enough but the latter demanding rather closer attention to the context, the conclusion is almost unavoidable that elucidation has been at work, and it is generally the Δ family that undertakes this; but this is not always the case. E.g. in 185^a 22 it is FIJ that omit ἰδεῖν (with PS); in 186^a 13 it is F that omits οἴεσθαι (with S); in 231^b 23 it is FIJK that omit μερῶν; ib. 24 it is IJK that omit διαστάσεως.

As regards agreement with the indirect tradition, I have noted the following numbers of agreements:

	M	V	A	P	S	T	Total.
E	46	122	27	350	553	193	1291
F	70	111	24	517	724	283	1729
G		46	5	195	158	69	473
H	22		10	70	348	66	516
I	62	120	19	549	731	255	1736
J	73	112	27	507	724	240	1683
K			7	61	303	58	429

Allowing for the fact that G, H, and K cover only parts of the *Physics*, and taking account of certain more minute tests that I have made, we may say that FHIJ all agree more closely with M than E does; that EFGIJ agree about equally with V;

that all the other MSS. agree better with P than E, and KIG somewhat better than the others; that all the others agree better than E with S, and KHJ noticeably better than the rest; that all agree better than E with T, and KFI better than the others.

M. Mansion has made, in the article cited on p. 103, a valuable study of the light thrown on the text of the *Physics* by the Arabo-Latin translation. He shows that in all probability the Latin version printed with the commentary of Averroes was made early in the thirteenth century, and that it was the second of two versions made from an Arabic translation which in turn was made direct from the Greek by Ḥunain son of Ishāq, not long before 873. This translation at two removes is naturally in many places useless for the determination of the precise Greek text which Ḥunain used. But M. Mansion has been able in many places, where the MSS. of the *Physics* diverge, to detect which reading Ḥunain must have had before him. He argues that Ḥunain's text had a marked affinity with that of E, and that the divergences are due partly to the individual errors to which E is known to be prone—omission of short words and phrases, and an occasional tendency to doctor the Greek—and partly to the fact that E not only used its own archetype but not infrequently borrowed readings from the margin of its archetype, from the Greek commentators, and from other MSS. which it used as subsidiary sources. The figures I have quoted hardly support the view that E and V belong definitely together as against Λ. But they at least show that the text which Ḥunain translated stood about halfway between E and Λ.

My order for agreement with T (allowing for the fact that G, H, and K have the opportunity of agreeing with it only over parts of the work) is:—K, F, I, H, J, G, E. This agrees exactly (except for the fact that he omits J, which had not been collated when he wrote) with the percentages of agreement with T which result from the figures quoted by Schenkl on pp. xxii–xxiii of his edition of Themistius:—K 57, F 54, I 52, H 51, G 46, E 38.

On the whole, K stands best this test of comparison with the indirect tradition. On the other hand, the evidential value of E is much greater than that of any other single MS. For E stands *alone* in agreeing with M eleven times, and no other

MS. more than twice; with V 47 times (no other MS. more than thrice); with P 57 times (no other MS. more than 28); with S 78 times (no other MS. more than 28); with T 38 times (no other MS. more than 21). Of the other MSS. J is in this respect (as in total agreements) the most closely related to M; F and I to V; H to A; H and I to P; K and H to S; F to T. Apart from E, H has perhaps the greatest, G and J the least, evidential value; but the latter fact is only the natural consequence of the close agreement of G and J with one another.

The general position is this:—E represents one line of tradition, FGHIJ another. K does not belong to either line, but in book vi leans to Λ , in books vii and viii to E. Since the rediscovery of J, E has no longer the paramount importance which was formerly ascribed to it on the ground of age. The tradition it represents is probably a better tradition than that represented by Λ , but its individual errors, especially of omission, are so numerous that it cannot be counted a very good representative of its tradition. Though FGHIJ have many individual errors, the probability is that, where they do not all correctly represent their archetype, one or more of them will. Thus E on the one hand, FGHIJ on the other, or even a majority of them when none of them agree with E, have about equal claims to consideration. The argument, or the grammar, or the style, will usually enable us to choose without hesitation between the two families. On the other hand, when any of the MSS. FGHIJ agrees with E, that furnishes a presumption that E's reading is right. Or again, when K, or M, or V, or one of the commentators agrees with one family and there is no countervailing support on the other side, we need not hesitate to follow their testimony, except when the argument or the grammar or the style tells in the opposite direction. But this exception is important; there are many cases in which the readings of the commentators, and especially those of Alexander, are clearly inferior to readings that occur in the MSS.

It must be remembered too that the commentators are often divided against one another; and further, that their commentaries exist only in MSS. much later than the oldest MSS. of the *Physics* itself, so that their quotations from Aristotle have been liable to much alteration. Where we do not rely on the lemmata or quotations but infer the commentator's reading

from his interpretation, we are on much safer ground; but on such matters as the order of the words in Aristotle we are dependent on the lemmata and quotations. In many cases, therefore, even where we have some testimony from the commentators, the true reading remains in doubt. But there is this consolation, that where the sense or the style does not enable us to choose between the two readings, it usually makes little difference which we choose.

The first version of book vii (*a*) demands separate consideration. The only MSS. which contain this version throughout the first three chapters are:

1. Parisiensis 1859 (Bekker's *b*, Shute's *A*), of the fourteenth century;
2. Parisiensis 1861 (Bekker's *c*, Shute's *B*), of the fifteenth century;
3. Parisiensis 2033 (Shute's *C*, which I have called *j*), of the fifteenth century;
4. Bodleianus Misc. 238 (Shute's *D*, which I have called *y*), of the sixteenth century;

but at 244^b 5^b several other MSS. begin to give this version. Of his main MSS., Bekker reports *H* and *I* as exhibiting a mixture of the two versions; *H* gives version *a* from 244^b 5^b onwards, and *I* from 245^b 9.

Where only *bcjy* are available, *b* is very much the best authority. It is often supported by *S*, and only occasionally needs to be helped out by the use of the other three MSS.; more often all are in error, and *S* or conjectural emendation has to come to the rescue. When *H* and *I* become available, *b* remains the best authority, but not infrequently *H*, and less often *I*, come to our help.

Shute maintains that in chapters 4 and 5, while Bekker's and Prantl's texts are a mixture of the versions *a* and β , his four MSS. 'either give the true first text throughout or at least with very slight intermixture of the second'. I have elsewhere¹ given reasons for rejecting this view, and for holding that all our MSS. in these chapters give us version *a*, and that the corresponding part of β is gone beyond recall. And in the main *bcjy* give an inferior text of these chapters. I have there-

¹ pp. 13-14.

fore not given the readings even of b in full, which would have swollen the apparatus to an inordinate length, but have cited their readings only where they are plainly right and the other MSS. wrong, or where the authority of bcjy may help us to choose between divergent readings of the other MSS.

In view of the large number of completely collated MSS. (two of them, too, of very early date), and of the large number of variants recorded by their later hands and by the commentators, I have not thought it necessary to encumber the apparatus by quoting the readings of the Graeco-Latin translation or of the *editio princeps*; it seems to me improbable that important evidence would be forthcoming from these sources. And again, I have not attempted the delicate task of distinguishing between the later hands of any single MS., but have cited the readings of later hands, where they are cited, as E², F², &c. Finally, in order to simplify the apparatus, I have not as a rule distinguished between the lemmata, the paraphrases, and the citations of Philoponus and Simplicius. 'P' and 'S' must therefore be understood simply to mean that there is definite evidence in Philoponus and Simplicius for the reading in question. The symbols P^c, P^l, P^v, P^{cl}, P^{cp}, P^{lp}, P^{clp}, etc., would have made the apparatus unduly complicated, without any equivalent gain.

It may be of some assistance to the future study of the text if I append a list of the 75 MSS. which I have traced the existence of (other than those mentioned in the Sigla), with such indications of date as the catalogues supply, or as librarians have given me.

Ambr. 12 (A 64 sup.), XIII saec.	Barocc. 70. 4, XV (bk. i)
Ambr. 67 (A 174 sup.), XV	„ 79, XIV exeuntis (Bekkeri h)
„ 118 (B 96 sup.), XV	Bodl. Auct. T. iii. 21, XVI
„ 268 (E 6 sup.), XIII	Corp. Christ. Coll. (Oxon.) 104, XV (Bekkeri Z)
„ 396 (G 51 sup.), XIII	Erlang. 89, XV
„ 403 (G 61 sup.), XIII	Escorial. Σ. II. 15, XIV
„ 512 (M 46 sup.), XIII	„ Σ. III. 2, XVI
„ 657 (Q 1 sup.), XV	„ Φ. III. 9, XIV
„ 725 (R 119 sup.), XVI (iv. 221 ^b 28-vi. 230 ^a 24)	Laur. 86. 19, XIV
Ambr. 837 (B 7 inf.), XV	„ 87. 5, XIV
Barocc. 70. 3, XV (bks. i-iv)	„ 87. 10, XIV

- Laur. 87. 11, XV
 ,, 87. 16, XIII or XIV
 Marc. 200, ann. 1457 (Bekkeri Q)
 Marc. 205, XV ineuntis
 ,, 206, ann. 1467 (Bekkeri f)
 ,, 214, XIII ineuntis (Bekkeri H^a)
 Marc. 219, XV
 ,, 220, XV
 ,, 227, XIV or XIII exeuntis
 Matrit. Bibl. Nat. 26, XV vergentis
 Matrit. Bibl. Nat. 35, XV or XVI (bk. i)
 Monac. 200, XV-XVI
 ,, 234, XVI (bks. i, ii)
 ,, 336, XV
 Mutin. Estensis 4 (II. A. 4), XIV exeuntis
 Neapol. 233 (III. B. 9), XIV (bks. i-vii)
 Neapol. 291 (III. D. 7), XIV
 ,, 323 (III. E. 1), XIV
 Par. 1860, XV (Bekkeri l)
 ,, 2032, XIV (Bekkeri i)
 ,, 2063, XIV
 ,, 2595, XIII-XIV
 ,, Coisl. 166, XIV-XV (Bekkeri o)
 Par. Suppl. 332, XV
 ,, 643, XIV
 Riccard. 14 (K. I. 20), XV or XVI
 Vat. 249, XV
 Vat. 250, XIV or XV (Bekkeri d)
 Vat. 251, XIII-XV (Bekkeri a)
 Vat. 256, XIV ineuntis (? 1320-1) (Bekkeri T)
 Vat. 307, XIII or XIV
 ,, 935, XIII or XIV
 ,, 1025, XIV or XV (Bekkeri e)
 Vat. 1026, XIII (Bekkeri W) (vi. 238^b 30-viii fin.)
 Vat. 1028, XIV (bks. i-vii)
 ,, Barb. 136, XIV
 ,, ,, 237 c. ann. 1500 (bks. i, ii)
 ,, Ott. 152, XV (Bekkeri g)
 ,, Pal. 115, XV
 ,, ,, 161, XV
 ,, ,, 370, XV
 ,, Reg. 123, XVI
 ,, Urb. 36, XV
 ,, ,, 38, XV (Bekkeri Q^a)
 Vind. 2 (olim 35), ann. 1456
 ,, 27 (olim 39), XVI ineuntis
 Vind. 64 (olim 38), ann. 1457
 ,, 75 (olim 37), ann. 1445
 ,, 141 (olim 36), XV
 ,, 204 (olim 41), XV ineuntis (mutilated and imperfect)
 Vind. 213 (olim 40), XV ineuntis (bks. vii, viii)
 Voss. 3, XIV-XV
 ,, 23, XV (bks. i-iv)

Full information about the MSS. of Themistius, Philoponus, and Simplicius, in which the text of the *Physics* is included in the form of lemmata, will be found in the Berlin Academy's edition of these writers.

ΑΡΙΣΤΟΤΕΛΟΥΣ
ΦΥΣΙΚΗ ΑΚΡΟΑΣΙΣ

SIGLA

- Lib. 1-3. codices EFIJ
 Lib. 4. 208^a 27-215^a 8. EFGIJ
 215^a 8-224^a 17. EFGHIJ
 Lib. 5. EFHIJ
 Lib. 6, 8. EFHIJK
 Lib. 7. Textus primus. 241^b 34-244^b 5. bcjy
 244^b 5^b-245^b 9. Hbcjy
 245^b 9-248^a 9. Hlbcjy
 Textus alter. 241^b 24-244^b 19. EFHIJK
 244^b 19-245^b 24. EFIIJK
 245^b 24-248^b 28. EFJK
 248^a 10-250^b 7. EFHIJK : interdum citantur bcjy

- Lib. 1-3. Δ = FIJ
 Lib. 4. 208^a 27-215^a 8. Δ = FGIJ
 215^a 8-224^a 17. Δ = FGHIJ
 Lib. 5-8. Δ = FHIJ

Σ = bcjy

Π = codices omnes collati

E = Par. gr. 1853, saec. x ineuntis

F = Laur. 87. 7, saec. xiv

G = Laur. 87. 6, saec. xii

H = Vat. 1027, saec. xiii aut xiv

I = Vat. 241, saec. xiii

J = Vind. 100 (olim 34), saec. x

K = Laur. 87. 24, saec. xiii medii

b = Par. 1859, saec. xiv

c = Par. 1861, saec. xv

j = Par. 2033, saec. xv

y = Bodl. Misc. 238, saec. xvi

M = Aristotelis *Metaphysica* [saec. xii

M (E) = E *supra*: M (J) = J *supra*: M (A^b) = Laur. 87. 12,

V = Versio Arabo-Latina

A = Alexander apud commentaria Simplicii

P = Philoponi commentaria

S = Simplicii commentaria

T = Themistii paraphrasis

P^c, S^c = Philoponi, Simplicii citationes

Pl, Sl = Philoponi, Simplicii lemmata

PP, SP = Philoponi, Simplicii paraphrases

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Α

- 1 Ἐπειδὴ τὸ εἶδέναι καὶ τὸ ἐπίστασθαι συμβαίνει περὶ πά- 184^a
 σας τὰς μεθόδους, ὧν εἰσὶν ἀρχαὶ ἢ αἷτια ἢ στοιχεῖα, ἐκ
 τοῦ ταῦτα γνωρίζω (τότε γὰρ οἰόμεθα γινώσκω ἐκαστον,
 ὅταν τὰ αἷτια γνωρίσωμεν τὰ πρῶτα καὶ τὰς ἀρχὰς τὰς
 πρῶτας καὶ μέχρι τῶν στοιχείων), δῆλον ὅτι καὶ τῆς περὶ
 φύσεως ἐπιστήμης πειρατέον διορίσασθαι πρῶτον τὰ περὶ 15
 τὰς ἀρχάς. πέφυκε δὲ ἐκ τῶν γνωριμωτέρων ἡμῖν ἡ ὁδὸς
 καὶ σαφεστέρων ἐπὶ τὰ σαφέστερα τῇ φύσει καὶ γνωριμώ-
 τερα· οὐ γὰρ ταῦτ' ἡμῖν τε γνώριμα καὶ ἀπλῶς. διόπερ
 ἀνάγκη τὸν τρόπον τοῦτον προάγειν ἐκ τῶν ἀσαφεστέρων μὲν
 τῇ φύσει ἡμῖν δὲ σαφεστέρων ἐπὶ τὰ σαφέστερα τῇ φύσει 20
 καὶ γνωριμώτερα. ἔστι δ' ἡμῖν τὸ πρῶτον δῆλα καὶ σαφῆ τὰ
 συγκεχυμένα μᾶλλον· ὕστερον δ' ἐκ τούτων γίνεταί γνώριμα
 τὰ στοιχεῖα καὶ αἱ ἀρχαὶ διαιροῦσι ταῦτα. διὸ ἐκ τῶν κα-
 θόλου ἐπὶ τὰ καθ' ἕκαστα δεῖ προέιναι· τὸ γὰρ ὅλον κατὰ
 τὴν αἴσθησιν γνωριμώτερον, τὸ δὲ καθόλου ὅλον τί ἐστι· 25
 πολλὰ γὰρ περιλαμβάνει ὡς μέρη τὸ καθόλου. πέπονθε δὲ
 ταῦτ' οὗτο τρόπον τινὰ καὶ τὰ ὀνόματα πρὸς τὸν λόγον· 184^b
 ὅλον γάρ τι καὶ ἀδιορίστως σημαίνει, οἷον ὁ κύκλος, ὁ δὲ
 ὀρισμὸς αὐτοῦ διαιρεῖ εἰς τὰ καθ' ἕκαστα. καὶ τὰ παιδία τὸ
 μὲν πρῶτον προσαγορεύει πάντας τοὺς ἀνδρας πατέρας καὶ
 μητέρας τὰς γυναῖκας, ὕστερον δὲ διορίζει τούτων ἑκάτερον.
- 2 Ἀνάγκη δ' ἦτοι μίαν εἶναι τὴν ἀρχὴν ἢ πλείους, καὶ εἰ 15
 μίαν, ἦτοι ἀκίνητον, ὡς φησι Παρμενίδης καὶ Μέλισσος, ἢ κι-

184^a Titulum om. I A om. J: τὸ A E: ἡ περὶ ἀρχῶν A F
 13 γνωρίσωμεν EFIPS: γνωρίζωμεν J 15 πρῶτον διορίσασθαι FJ
 Eustratius: διορίσασθαι P 16 ἡ om. I 17 τῇ om. J¹
 18 γνωριμώτερα E 19 τοῦτον τὸν τρόπον F σαφεστέρων J¹
 μὲν om. A 20 τῇ om. IJ τῇ φύσει E²ΔV: om. E¹ 21 τὸ
 om. E 22 γνώριμα γίνεται I: γνώριμα F 24 ἐπὶ ΔP: εἰς ES
 26 ὡς ΔP: ὥσπερ E ^b II καὶ om. P ἀδιορίστως E¹FJVP:
 ἀδιορίστον E²I 12 τὸ] δὲ τὸ I 13 μὲν om. FJ προσα-
 γορεύει . . . ἀνδρας FJT: ὑπολαμβάνει πάντας τοὺς ἀνδρας IV: πάντας
 τοὺς ἀνδρας ὑπολαμβάνει (hoc verbum erasum) προσαγορεύει E
 14 δὲ om. F 15 δ'] δὴ Torstrik 16 ὡς ES: ὥσπερ ΔP
 φησι EFPS: φασιν IJ

νουμένην, ὡσπερ οἱ φυσικοί, οἱ μὲν ἀέρα φάσκοντες εἶναι οἱ δ' ὕδωρ τὴν πρώτην ἀρχὴν· εἰ δὲ πλείους, ἢ πεπερασμένας ἢ ἀπείρους, καὶ εἰ πεπερασμένας πλείους δὲ μίας, ἢ δύο ἢ τρεῖς ἢ τέταρας ἢ ἄλλον τιὰ ἀριθμόν, καὶ εἰ ἀπείρους, ἢ οὕτως ὡσπερ 20 Δημόκριτος, τὸ γένος ἓν, σχήματι δὲ (διαφερούσας), ἢ εἶδει διαφερούσας ἢ καὶ ἐναντίας. ὁμοίως δὲ ζητοῦσι καὶ οἱ τὰ ὄντα ζητοῦντες πόσα· ἐξ ὧν γὰρ τὰ ὄντα ἐστὶ πρώτων, ζητοῦσι ταῦτα πότερον ἐν ἢ πολλά, καὶ εἰ πολλά, πεπερασμένα ἢ ἄπειρα, ὥστε 25 τὴν ἀρχὴν καὶ τὸ στοιχεῖον ζητοῦσι πότερον ἐν ἢ πολλά.

25 οὖν εἰ ἐν καὶ ἀκίνητον τὸ ὄν σκοπεῖν οὐ περὶ φύσεώς ἐστι σκο-

185ⁿ πείν· ὡσπερ γὰρ καὶ τῷ γεωμέτρῳ οὐκέτι λόγος ἐστὶ πρὸς τὸν ἀνελόντα τὰς ἀρχάς, ἀλλ' ἦτοι ἐτέρας ἐπιστήμης ἢ πασῶν κωϊῆς, οὕτως οὐδὲ τῷ περὶ ἀρχῶν· οὐ γὰρ ἔτι ἀρχὴ ἐστίν, εἰ ἐν μόνον καὶ οὕτως ἐν ἐστίν. ἢ γὰρ ἀρχὴ τιὸς ἢ 5 τινῶν. ὁμοιον δὴ τὸ σκοπεῖν εἰ οὕτως ἐν καὶ πρὸς ἄλλην θέσιν ὅποια οὖν διαλέγεσθαι τῶν λόγου ἕνεκα λεγομένων (οἷον τὴν Ἑρακλείτειον, ἢ εἰ τις φαίη ἀνθρωπον ἓνα τὸ ὄν εἶναι), ἢ λύειν λόγον ἐριστικόν, ὅπερ ἀμφότεροι μὲν ἔχουσιν οἱ λόγοι, καὶ ὁ Μελίσσου καὶ ὁ Παρμενίδου· καὶ γὰρ ψευδῆ λαμ- 10 βάνουσι καὶ ἀσυλλόγιστοί εἰσιν· μᾶλλον δ' ὁ Μελίσσου φορτικὸς καὶ οὐκ ἔχων ἀπορίαν, ἀλλ' ἐνὸς ἀτόπου δοθέντος τὰ ἄλλα συμβαίνει· τοῦτο δὲ οὐδὲν χαλεπόν. ἡμῖν δ' ὑποκείσθω τὰ φύσει ἢ πάντα ἢ ἓνια κινούμενα εἶναι· δῆλον δ' ἐκ τῆς ἐπαγωγῆς. ἅμα δ' οὐδὲ λύειν ἅπαντα προσήκει, ἀλλ' 15 ἢ ὅσα ἐκ τῶν ἀρχῶν τις ἐπιδεικνύς ψεύδεται, ὅσα δὲ μὴ, οὐ, οἷον τὸν τετραγωνισμόν τὸν μὲν διὰ τῶν τμημάτων γεωμετρικοῦ διαλύσαι, τὸν δὲ Ἀντιφώντος οὐ γεωμετρικοῦ· οὐ μὴν ἀλλ' ἐπειδὴ περὶ φύσεως μὲν οὐ, φυσικὰς δὲ ἀπορίας

b 20 ἢ οὕτως omittendum ci. A 21 δὲ διαφερούσας Torstrick: δὲ EIST: om. FJ: δὲ καὶ τάξει καὶ θέσει διαφερούσας Bonitz 22 καὶ pr. om. I 23 πρώτων, ζητοῦσι Bonitz: πρώτον ζητοῦσι E: ζητοῦσι πρώτων AS^c: ζητοῦσι S¹ 24 καὶ εἰ πολλά om. E 25 ζητοῦσι ταῦτα πότερον E 26 ὄν] ἐν I 185^a I ἔσται I 3 τῶν I 5 εἰ] εἰ ἔστιν F 7 ἢ ὡς εἰ S φαίη om. AS ἀνθρωπον ἓνα ΠΑΡ: ἓνα ἀνθρωπον S εἶναι] λέγοι AS ἢ... 12 χαλεπόν ΠΡST: ἢ... II ἀπορίαν delenda censuit Cornford, 8-12 ὅπερ... χαλεπόν secl. Bekker, collatis 186^a 6-10 10 εἰσιν om. E μάλιστα I 13 εἶναι om. S 16 τὸν alt.] τοῦ κύκλου τὸν IJ²P διὰ om. I γεωμέτρου I 17 οὐ μὴν om. E¹

συμβαίνει λέγειν αὐτοῖς, ἴσως ἔχει καλῶς ἐπὶ μικρὸν δια-
λεχθῆναι περὶ αὐτῶν· ἔχει γὰρ φιλοσοφίαν ἢ σκέψιν. 20

ἀρχῇ 20

ὁδὲ οἰκειοτάτη πασῶν, ἐπειδὴ πολλαχῶς λέγεται τὸ ὄν,
πῶς λέγουσιν οἱ λέγοντες εἶναι ἐν τὰ πάντα, πότερον
οὐσίαν τὰ πάντα ἢ ποσὰ ἢ ποιὰ, καὶ πάλιν πότερον οὐσίαν
μίαν τὰ πάντα, οἷον ἀνθρωπον ἓνα ἢ ἵππον ἓνα ἢ ψυχὴν
μίαν, ἢ ποιὸν ἐν δὲ τοῦτο, οἷον λευκὸν ἢ θερμὸν ἢ τῶν ἄλλων 25
τι τῶν τοιούτων. ταῦτα γὰρ πάντα διαφέρει τε πολὺ καὶ
ἀδύνατα λέγειν. εἰ μὲν γὰρ ἔσται καὶ οὐσία καὶ ποιὸν καὶ
ποσόν, καὶ ταῦτα εἴτ' ἀπολελυμένα ἀπ' ἀλλήλων εἴτε μὴ,
πολλὰ τὰ ὄντα· εἰ δὲ πάντα ποιὸν ἢ ποσόν, εἴτ' οὐσης οὐσίας
εἴτε μὴ οὐσης, ἄτοπον, εἰ δεῖ ἄτοπον λέγειν τὸ ἀδύνατον. 30
οὐθεν γὰρ τῶν ἄλλων χωριστόν ἐστι παρὰ τὴν οὐσίαν· πάντα
γὰρ καθ' ὑποκειμένον λέγεται τῆς οὐσίας. Μέλισσος δὲ τὸ
ὄν ἄπειρον εἶναι φησιν. ποσὸν ἄρα τι τὸ ὄν· τὸ γὰρ ἄπει-
ρον ἐν τῷ ποσῷ, οὐσίαν δὲ ἄπειρον εἶναι ἢ ποιότητα ἢ πά-
θος οὐκ ἐνδέχεται εἰ μὴ κατὰ συμβεβηκός, εἰ ἅμα καὶ πο- 185^b
σὰ ἄττα εἶεν· ὁ γὰρ τοῦ ἀπείρου λόγος τῷ ποσῷ προσ-
χρητῆται, ἀλλ' οὐκ οὐσία οὐδὲ τῷ ποιῷ. εἰ μὲν τοίνυν καὶ οὐ-
σία ἔστι καὶ ποσόν, δύο καὶ οὐχ ἓν τὸ ὄν· εἰ δ' οὐσία μόνου,
οὐκ ἄπειρον, οὐδὲ μέγεθος ἔξει οὐδέν· ποσὸν γάρ τι ἔσται. 5

ἔτι 5

ἐπεὶ καὶ αὐτὸ τὸ ἐν πολλαχῶς λέγεται ὡσπερ καὶ τὸ ὄν,
σκεπτέον τίνα τρόπον λέγουσιν εἶναι ἐν τὸ πάν. λέγεται δ'
ἐν ἢ τὸ συνεχές ἢ τὸ ἀδιαίρετον ἢ ὧν ὁ λόγος ὁ αὐτὸς καὶ
εἰς ὁ τοῦ τί ἦν εἶναι, ὡσπερ μέθρ καὶ οἶνος. εἰ μὲν τοίνυν
συνεχές, πολλὰ τὸ ἔν· εἰς ἄπειρον γὰρ διαιρετόν τὸ συνε- 10
χές. (ἔχει δ' ἀπορίαν περὶ τοῦ μέρους καὶ τοῦ ὅλου, ἴσως δὲ

^a 19 αὐτοῖς EFJS: αὐτοῦς IP ἔχειν I 21 ἐπειδὴ AS¹T
Eudemus: ἐπεὶ EPS^o 22 πῶς APS: ἰδεῖν πῶς E ἐν εἶναι P:
ἐν F 23 οὐσίαν EI¹JS: ὡς οὐσίαν FI²P τὰ πάντα] ἅπαντα
EP ἢ alt.] τὰ πάντα ἢ J 24 τὰ] δὲ EJP: δὲ τὰ I 25 δὲ]
καὶ F τῶν ἄλλων] ἄλλο F 27 ποιὸν καὶ ποσόν EJVPT Eudemus:
ποσόν καὶ ποιόν FIS 29 ἅπαντα E²A 32 λέγεται τῆς οὐσίας AP:
τῆς οὐσίας λέγεται E Μέλισσος EFJS: ὁ Μέλισσος IP 33 εἶναι
φησιν ES: φησιν εἶναι AP ὄν] ἐν γρ. S 34 εἶναι post πάθος I:
om. J ^b 2 ἄττα ἄν εἶεν E: εἴη S γὰρ EVPS: δὲ A 3 τῷ om. S
5 ἄπειρον τὸ ὄν οὐδὲ IP 6 τὸ αὐτὸ F 7 ἐν εἶναι A 8 ἐν EFP:
om. IJ 9 ἦν om. E¹ τοίνυν] οὖν F 10 ὄν FP, et ex ἐν fecit
E ἄπειρα E 11 τοῦ alt. IPS: om. EFJ δὲ om. AS

οὐ πρὸς τὸν λόγον ἀλλ' αὐτὴν καθ' αὐτήν, πότερον ἐν ἡ
 πλειώ τὸ μέρος καὶ τὸ ὅλον, καὶ πῶς ἐν ἡ πλειώ, καὶ εἰ
 πλειώ, πῶς πλειώ, καὶ περὶ τῶν μερῶν τῶν μὴ συνεχῶν·
 15 καὶ εἰ τῷ ὄλῳ ἐν ἐκότερον ὡς ἀδιαίρετον, ὅτι καὶ αὐτὰ αὐ-
 τοῖς.) ἀλλὰ μὴν εἰ ὡς ἀδιαίρετον, οὐθὲν ἔσται ποσὸν οὐδὲ
 ποιόν, οὐδὲ δὴ ἄπειρον τὸ ὄν, ὥσπερ Μέλισσός φησιν, οὐδὲ
 πεπερασμένον, ὥσπερ Παρμενίδης· τὸ γὰρ πέρας ἀδιαίρε-
 20 τόν, οὐ τὸ πεπερασμένον. ἀλλὰ μὴν εἰ τῷ λόγῳ ἐν τὰ
 συμβαίνει λέγειν αὐτοῖς· ταῦτόν γὰρ ἔσται ἀγαθῷ καὶ κακῷ
 εἶναι, καὶ ἀγαθῷ καὶ μὴ ἀγαθῷ εἶναι—ὥστε ταῦτόν ἔσται ἀγα-
 θὸν καὶ οὐκ ἀγαθόν, καὶ ἄνθρωπος καὶ ἵππος, καὶ οὐ περὶ
 τοῦ ἐν εἶναι τὰ ὄντα ὁ λόγος ἔσται ἀλλὰ περὶ τοῦ
 25 μηδέν—καὶ τὸ τοιῷδὲ εἶναι καὶ τοσῷδὲ ταῦτόν. ἐθору-
 βοῦντο δὲ καὶ οἱ ὕστεροι τῶν ἀρχαίων ὅπως μὴ ἅμα γένη-
 ται αὐτοῖς τὸ αὐτὸ ἐν καὶ πολλά. διὸ οἱ μὲν τὸ ἔστιν ἀφεῖ-
 λον, ὥσπερ Λυκόφρων, οἱ δὲ τὴν λέξιν μετερρῦθμιζον, ὅτι
 ὁ ἄνθρωπος οὐ λευκός ἔστιν ἀλλὰ λελεύκωται, οὐδὲ βαδί-
 30 ζων ἔστιν ἀλλὰ βαδίζει, ἵνα μὴ ποτε τὸ ἔστιν προσάπτοντες
 πολλά εἶναι ποιῶσι τὸ ἐν, ὡς μοναχῶς λεγομένου τοῦ ἐνὸς
 ἢ τοῦ ὄντος. πολλά δὲ τὰ ὄντα ἢ λόγῳ (οἶον ἄλλο τὸ
 λευκῷ εἶναι καὶ μουσικῷ, τὸ δ' αὐτὸ ἄμφω· πολλά ἄρα
 τὸ ἐν) ἢ διαιρέσει, ὥσπερ τὸ ὅλον καὶ τὰ μέρη. ἐναυῦθα
 186^a δὲ ἤδη ἠπόρουσαν, καὶ ὁμολόγουν τὸ ἐν πολλά εἶναι—ὥσπερ
 οὐκ ἐνδεχόμενον ταῦτόν ἐν τε καὶ πολλά εἶναι, μὴ τάντικεί-
 μενα δέ· ἔστι γὰρ τὸ ἐν καὶ δυνάμει καὶ ἐντελεχείᾳ.
 Τόν τε δὴ τρόπον τοῦτον ἐπιούσῳ ἀδύνατον φαίνεται 3
 5 τὰ ὄντα ἐν εἶναι, καὶ ζε ὦν ἐπιδεικνύουσι, λύειν οὐ χα-
 λεπόν. ἀμφότεροι γὰρ ἐριστικῶς συλλογίζονται, καὶ Μέ-

^b 16 οὐθὲν] οὐκ P ἔστι FP οὐδὲν F 18 ἀδιαίρετον πέρας I
 19-20 πάντα τὰ ὄντα I 20 ἰμάτιον ἐν, τὸν J 21 ἔστι J 22 εἶναι
 om. FJP ἀγαθῷ . . . εἶναι] μὴ ἀγαθῷ εἶναι (εἶναι om. I) καὶ ἀγαθῷ
 Λ: μήτε ἀγαθῷ μήτε κακῷ P ἔσται] ἔσται καὶ I 24 ἀλλὰ
 ΔΡ: αὐτοῖς ἀλλὰ EV 25 καὶ alt.] καὶ τὸ IP 26-7 ὕστεροι . . .
 αὐτοῖς EVPS: ὕστερον καθάπερ καὶ (καὶ om. FI) οἱ ἀρχαῖοι μὴ ποτε
 συμβαίνει (συμβαίνει IJ) αὐτοῖς ἅμα FI γρ. E et post rasuram J
 28 ὥσπερ] ὡς ὁ F 29 λελεύκωται PST: λελευκωμένος Π 30 ποτε
 om. AS 31 τὸ ἐν Λ, add. E¹: τὸ ὄν S 33 τῷ δ' αὐτῷ FI
 186^a I διηπόρουσαν ex ἤδη ἠπόρουσαν fecit J¹ post καὶ add. E¹ sup. lin.
 οὐχί: om. ΔΡ 2 τε om. FI 3 ἐν EIJP: ὄν F: ὄν καὶ ἐν A

λισσος καὶ Παρμενίδης [καὶ γὰρ ψευδῆ λαμβάνουσι καὶ ἀσυλλόγιστοί εἰσι αὐτῶν οἱ λόγοι· μάλλον δ' ὁ Μελίσσου φορτικὸς καὶ οὐκ ἔχων ἀπορίαν, ἀλλ' ἐνὸς ἀτόπου δοθέντος τὰλλα συμβαίνει· τοῦτο δ' οὐθὲν χαλεπόν]. ὅτι μὲν οὖν πα- 10
ραλογίζεται Μελίσσος, δῆλον· οἴεται γὰρ εἰληφέναι, εἰ τὸ γενόμενον ἔχει ἀρχὴν ἅπαν, ὅτι καὶ τὸ μὴ γενόμενον οὐκ ἔχει. εἴτα καὶ τοῦτο ἄτοπον, τὸ παντὸς εἶναι ἀρχὴν— τοῦ πράγματος καὶ μὴ τοῦ χρόνου, καὶ γενέσεως μὴ τῆς ἀπλῆς ἀλλὰ καὶ ἀλλοιώσεως, ὥσπερ οὐκ ἀθρόας γιγνο- 15
μένης μεταβολῆς. ἔπειτα διὰ τί ἀκίνητον, εἰ ἐν; ὥσπερ γὰρ καὶ τὸ μέρος ἐν ὄν, τοδὶ τὸ ὕδωρ, κινεῖται ἐν ἑαυτῷ, διὰ τί οὐ καὶ τὸ πᾶν; ἔπειτα ἀλλοίωσις διὰ τί οὐκ ἂν εἴη; ἀλλὰ μὴν οὐδὲ τῷ εἶδει οἶόν τε ἐν εἶναι, πλὴν τῷ ἐξ οὗ (οὕτως δὲ ἐν καὶ τῶν φυσικῶν τινες λέγουσιν, ἐκείνως δ' 20 οὗ)· ἄνθρωπος γὰρ ἵππου ἕτερον τῷ εἶδει καὶ τὰναντία ἀλ- λήλων. 22

καὶ πρὸς Παρμενίδην δὲ ὁ αὐτὸς τρόπος τῶν λό- 22
γων, καὶ εἴ τινες ἄλλοι εἰσὶν ἴδιοι· καὶ ἡ λύσις τῇ μὲν ὅτι ψευδῆς τῇ δὲ ὅτι οὐ συμπεραίνεται, ψευδῆς μὲν ἢ ἀπλῶς λαμβάνει τὸ ὄν λέγεσθαι, λεγομένου πολλαχῶς, ἀσυμ- 25
πέρατος δὲ ὅτι, εἰ μόνα τὰ λευκὰ ληφθεῖη, σημαίνοντος ἐν τοῦ λευκοῦ, οὐθὲν ἦττον πολλὰ τὰ λευκὰ καὶ οὐχ ἔν· οὔτε γὰρ τῇ συνεχείᾳ ἐν ἔσται τὸ λευκὸν οὔτε τῷ λόγῳ. ἄλλο γὰρ ἔσται τὸ εἶναι λευκῷ καὶ τῷ δεδεγμένῳ. καὶ οὐκ ἔσται παρὰ τὸ λευκὸν οὐθὲν χωριστόν· οὐ γὰρ ἢ χωριστόν ἀλλὰ 30
τῷ εἶναι ἕτερον τὸ λευκὸν καὶ ᾧ ὑπάρχει. ἀλλὰ τοῦτο Παρμενίδης οὕτω συνεώρα. ἀνάγκη δὴ λαβεῖν μὴ μόνον ἐν σημαίνειν τὸ ὄν, καθ' οὗ ἂν κατηγορηθῆ, ἀλλὰ καὶ ὅπερ ὄν καὶ ὅπερ ἐν. τὸ γὰρ συμβεβηκὸς καθ' ὑποκειμένου τινὸς

^a 7-10 καὶ . . . χαλεπὸν seclusi, collatis 185^a 9-12: om. ut vid. ST: habent ΠΠ 8 αὐτῶν οἱ λόγοι EP: om. Λ 9-10 ἀλλ' . . . χαλεπὸν secl. Cornford 13 εἶναι FS: οἴεσθαι εἶναι EIJVP 15 ἀθρόως γενομένης I 16 διὰ EPS: καὶ διὰ Λ 18 οὐχί IP τὸ E²PS: om. E¹Λ 19 τῷ alt. APS, et ex τὸ fecit E 21 τῷ om. E¹ 23 ἴδιοι εἰσιν Λ: ἴδιοι P πῆ IJ 24 τῇ EFS: πῆ IJ ἢ om. E¹: ἢ καὶ F: εἰ J 25 λεγόμενον ST γρ. E ἀσυμπεράστος F 28 γὰρ om. E¹ ἄλλο . . . 29 δεδεγμένῳ E²APS: om. E¹ 29 τῷ] τὸ E²P ἔστι P 30 οὐ . . . χωριστόν E²APS: om. E¹ 31 τῷ] τὸ F τῷ λευκῷ F 32 συνεώρα FIJ²P: ἑώρα EJ¹S λαβεῖν EFJPS: λαβεῖν τοῖς λέγουσιν ἐν τὸ ὄν εἶναι IV μῆ] οὐ P

35 λέγεται, ὥστε ᾧ συμβέβηκε τὸ ὄν, οὐκ ἔσται (ἕτερον γὰρ
 186^b τοῦ ὄντος). ἔσται τι ἄρα οὐκ ὄν. οὐ δὴ ἔσται ἄλλω ὑπάρ-
 χον τὸ ὅπερ ὄν. οὐ γὰρ ἔσται ὄν τι αὐτὸ εἶναι, εἰ μὴ
 πολλὰ τὸ ὄν σημαίνει οὕτως ὥστε εἶναι τι ἕκαστον. ἀλλ'
 ὑπόκειται τὸ ὄν σημαίνειν ἔν. εἰ οὖν τὸ ὅπερ ὄν μηδενὶ συμ-
 5 βέβηκεν ἀλλὰ (τὰ ἄλλα) ἐκείνω, τί μᾶλλον τὸ ὅπερ ὄν σημαίνει
 τὸ ὄν ἢ μὴ ὄν; εἰ γὰρ ἔσται τὸ ὅπερ ὄν [ταυτό] καὶ λευκόν,
 τὸ λευκῷ δ' εἶναι μὴ ἔστιν ὅπερ ὄν (οὐδὲ γὰρ συμβεβηκέ-
 ναι αὐτῷ οἷόν τε τὸ ὄν· οὐδὲν γὰρ ὄν ἢ οὐχ ὅπερ ὄν), οὐκ ἄρα
 ὄν τὸ λευκόν· οὐχ οὕτω δὲ ὥσπερ τι μὴ ὄν, ἀλλ' ὅλως μὴ
 10 ὄν. τὸ ἄρα ὅπερ ὄν οὐκ ὄν· ἀληθὲς γὰρ εἰπεῖν ὅτι λευκόν,
 τοῦτο δὲ οὐκ ὄν ἐσήμαινεν. ὥστε καὶ τὸ λευκὸν σημαίνει
 ὅπερ ὄν· πλείω ἄρα σημαίνει τὸ ὄν. οὐ τοῖνυν οὐδὲ μέγεθος
 ἔξει τὸ ὄν, εἴπερ ὅπερ ὄν τὸ ὄν· ἐκατέρω γὰρ ἕτερου τὸ εἶ-
 14 ναι τῶν μορίων.

14 ὅτι δὲ διαιρεῖται τὸ ὅπερ ὄν εἰς ὅπερ ὄν τι
 15 ἄλλο, καὶ τῷ λόγῳ φανερόν, οἷον ὁ ἄνθρωπος εἰ ἔστιν ὅπερ
 ὄν τι, ἀνάγκη καὶ τὸ ζῶον ὅπερ ὄν τι εἶναι καὶ τὸ δίπουν.
 εἰ γὰρ μὴ ὅπερ ὄν τι, συμβεβηκότα ἔσται. ἢ οὖν τῷ ἀνθρώ-
 πῳ ἢ ἄλλω τινὶ ὑποκειμένῳ. ἀλλ' ἀδύνατον· συμβεβηκός
 20 χεῖν, ἢ οὐ ἐν τῷ λόγῳ ὑπάρχει τὸ ᾧ συμβέβηκεν [ἢ ἐν ᾧ
 ὁ λόγος ὑπάρχει ᾧ συμβέβηκεν] (οἷον τὸ μὲν καθῆσθαι ὡς
 χωριζόμενον, ἐν δὲ τῷ σιμῷ ὑπάρχει ὁ λόγος ὁ τῆς ῥιῶδς
 ἢ φαιέν συμβεβηκέναι τὸ σιμόν). ἔτι ὅσα ἐν τῷ ὀριστικῷ
 λόγῳ ἔνεστιν ἢ ἐξ ὧν ἐστιν, ἐν τῷ λόγῳ τῷ τούτων οὐκ ἐνυ-

^b 1-4 οὐ . . . ἐν AVPS: post 6 ὄν E 1 ἔσται τι ἄλλω F
 2 αὐτὸ IP: αὐτῷ EFJS 3 σημαίνει] σημαῖνοι ὥστε καὶ τὸ ὅπερ
 ὄν καὶ τὸ τούτω συμβεβηκός EV 5 ἀλλὰ τὰ ἄλλα scripsi, habet fort.
 T: ἀλλὰ IP et ut vid. S: τὰλλα δ' ci. Prantl 6 ταῦτο seclusi,
 om. S: τοῦτο T 7 τῷ J γὰρ] γὰρ οὐδὲ FIJ¹ 8 ὄν om.
 E¹ οὐδὲ F γὰρ E²AP: om. E¹ 9 ὡς ὅπερ E τι μὴ
 ὄν APS: μὴ ὄν τι E 10 τὸ ἄρα] ἔσται ἄρα τὸ I ὅτι] ὅτι τὸ ὄν I
 11 ὥστε E¹VS: ὥστ' εἰ E²AP ἐσήμαινεν I 12 ὅπερ PPS:
 καὶ ὅπερ Natorp οὐδὲ] οὐδὲ τὸ F 13 ἔσται J τὸ ὄν alt. FIP
 et mg. J¹: om. EJS 14 ὄν τι ἄλλο PPS^o: ὄντα SP^o et fort. AT
 16 τι pr. om. E 17 ὄν τι EIJ¹P: ὄντα FJ² et fort. T 19 γὰρ]
 γὰρ ἔσται καὶ I ὑπάρχειν alt. om. P 20 ἐν . . . ὑπάρχει EPS:
 ὑπάρχει ἐν τῷ λόγῳ Λ τὸ FPS, erasum in E: τοῦτο IJ ἢ . . .
 21 συμβέβηκεν om. APST 22 δὲ om. J¹ ὑπάρχει AP: ἐνυ-
 παρχει E

πάρχει ὁ λόγος ὁ τοῦ ὄλου, οἶον ἐν τῷ δίποδι ὁ τοῦ ἀνθρώ- 25
 που ἢ ἐν τῷ λευκῷ ὁ τοῦ λευκοῦ ἀνθρώπου. εἰ τοίουν ταῦτα
 τοῦτον ἔχει τὸν τρόπον καὶ τῷ ἀνθρώπῳ συμβέβηκε τὸ δί-
 πουν, ἀνάγκη χωριστὸν εἶναι αὐτό, ὥστε ἐνδέχοιτο ἂν μὴ
 δίπουν εἶναι τὸν ἀνθρωπον, ἢ ἐν τῷ λόγῳ τῷ τοῦ δίποδος
 ἐνέσται ὁ τοῦ ἀνθρώπου λόγος. ἀλλ' ἀδύνατον· ἐκεῖνο γὰρ ἐν 30
 τῷ ἐκείνου λόγῳ ἐνεστω. εἰ δ' ἄλλῳ συμβέβηκε τὸ δίπουν
 καὶ τὸ ζῶον, καὶ μὴ ἔστω ἐκάτερον ὅπερ ὄν τι, καὶ ὁ ἀν-
 θρωπος ἂν εἴη τῶν συμβεβηκότων ἐτέρῳ. ἀλλὰ τὸ ὅπερ ὄν
 ἔστω μηδενὶ συμβεβηκός, καὶ καθ' οὗ ἄμφω [καὶ ἐκατέ-
 ρον], καὶ τὸ ἐκ τούτων λεγέσθω· ἐξ ἀδιαιρέτων ἄρα τὸ πᾶν; 35
 ἔνιοι δ' ἐνέδοσαν τοῖς λόγοις ἀμφοτέροις, τῷ μὲν ὅτι πάντα 187^a
 ἔν, εἰ τὸ ὄν ἐν σημαίνει, ὅτι ἔστι τὸ μὴ ὄν, τῷ δὲ ἐκ τῆς
 διχοτομίας, ἄτομα ποιήσαντες μεγέθη. φανερόν δὲ καὶ ὅτι
 οὐκ ἀληθὲς ὡς, εἰ ἐν σημαίνει τὸ ὄν καὶ μὴ οἶόν τε ἅμα
 τὴν ἀντίφασιν, οὐκ ἔσται οὐθὲν μὴ ὄν· οὐθὲν γὰρ κωλύει, μὴ 5
 ἀπλῶς εἶναι, ἀλλὰ μὴ ὄν τι εἶναι τὸ μὴ ὄν. τὸ δὲ δὴ φά-
 ναι, παρ' αὐτὸ τὸ ὄν εἰ μὴ τι ἔσται ἄλλο, ἐν πάντα ἔσε-
 σθαι, ἄτοπον. τίς γὰρ μαθάνει αὐτὸ τὸ ὄν εἰ μὴ τὸ ὅπερ
 ὄν τι εἶναι; εἰ δὲ τοῦτο, οὐδὲν ὅμως κωλύει πολλὰ εἶναι τὰ
 ὄντα, ὥσπερ εἴρηται. ὅτι μὲν οὖν οὕτως ἐν εἶναι τὸ ὄν ἀδύνα- 10
 τον, δῆλον.

- 4 Ὡς δ' οἱ φυσικοὶ λέγουσι, δύο τρόποι εἰσίν. οἱ μὲν
 γὰρ ἐν ποιήσαντες τὸ [ὄν] σῶμα τὸ ὑποκείμενον, ἢ τῶν τριῶν
 τι ἢ ἄλλο ὃ ἔστι πρὸς μὲν πυκνότερου ἀέρος δὲ λεπτότε-
 ρον, τᾶλλα γεννώσι πυκνότητι καὶ μαυότητι πολλὰ ποι- 15
 οῦντες (ταῦτα δ' ἔστιν ἐναντία, καθόλου δ' ὑπεροχὴ καὶ
 ἔλλειψις, ὥσπερ τὸ μέγα φησὶ Πλάτων καὶ τὸ μικρόν,
 πλὴν ὅτι ὁ μὲν ταῦτα ποιεῖ ὕλην τὸ δὲ ἐν τὸ εἶδος, οἱ
 δὲ τὸ μὲν ἐν τὸ ὑποκείμενον ὕλην, τὰ δ' ἐναντία διαφορὰς

^b 32 ὄν FIP: om. EJ ὁ om. F 33 ὄν IJ²PS: τι F et
 fecit E¹: ὄν τι J¹ 34 συμβεβηκός μηδενὶ F καθ' οὗ ΠΠ γρ.
 S: καθόλου V γρ. P: καθόλου ὁ ut vid. S καὶ ἐκάτερον Λ γρ. P γρ.
 S: om. EPS 187^a 2 ὄν om. J¹ ἐκ EJVS: om. FIP 5 οὐκ
 εἶναι οὐκ F 6 εἶναι] μὴ εἶναι F εἶναι E²ΔPS: om. E¹ δὲ
 EFIJ²P: om. J¹ 7 εἰ] ὡς εἰ EFIJ²P 8 μαθάνει AP: ἂν μα-
 θάνοι E 9 τι om. fort. ST ὅπως I τὰ ὄντα εἶναι Λ 12 δ'
 om. J φασι S 13 ὄν seclusi: habent ΠΠ 18 ὅτι om.
 PS

σύνθετον ὑπολαμβάνομεν, ὅταν εἰδῶμεν ἐκ τίνων καὶ πόσων ἐστίν. ἴ ἐτι δ' εἰ ἀνάγκη, οὐ τὸ μόριον ἐνδέχεται ὀηλικουοῦν εἶναι κατὰ μέγεθος καὶ μικρότητα, καὶ αὐτὸ ἐνδέχεται (λέγω δὲ τῶν τοιούτων τι μορίων, εἰς ὃ ἐνυπάρχον διαιρεῖ- 15 ται τὸ ὅλον), εἰ δὴ ἀδύνατον ζῶον ἢ φυτὸν ὀηλικουοῦν εἶναι κατὰ μέγεθος καὶ μικρότητα, φανερόν ὅτι οὐδὲ τῶν μορίων ὀτιοῦν· ἔσται γὰρ καὶ τὸ ὅλον ὁμοίως. σὰρξ δὲ καὶ ὀστοῦν καὶ τὰ τοιαῦτα μόρια ζῶον, καὶ οἱ καρποὶ τῶν φυτῶν. δῆλον τοίνυν ὅτι ἀδύνατον σάρκα ἢ ὀστοῦν ἢ ἄλλο τι ὀηλι- 20 κουοῦν εἶναι τὸ μέγεθος ἢ ἐπὶ τὸ μείζον ἢ ἐπὶ τὸ ἔλαττον. ἔτι εἰ πάντα μὲν ἐνυπάρχει τὰ τοιαῦτα ἐν ἀλλήλοις, καὶ μὴ γίνονται ἀλλ' ἐκκρίνεται ἐνούτα, λέγεται δὲ ἀπὸ τοῦ πλείονος, γίνονται δὲ ἐξ ὀτουοῦν ὀτιοῦν (οἶον ἐκ σαρκὸς ὕδωρ ἐκκρινόμενον καὶ σὰρξ ἐξ ὕδατος), ἅπαν δὲ σῶμα πεπερασμέ- 25 νον ἀναιρεῖται ὑπὸ σῶματος πεπερασμένου, φανερόν ὅτι οὐκ ἐνδέχεται ἐν ἐκάστῳ ἕκαστον ὑπάρχειν. ἀφαιρεθείσης γὰρ ἐκ τοῦ ὕδατος σαρκός, καὶ πάλιν ἄλλης γενομένης ἐκ τοῦ λοιποῦ ἀποκρίσει, εἰ καὶ ἀεὶ ἐλάττων ἔσται ἢ ἐκκρινόμενη, ἀλλ' ὅμως οὐχ ὑπερβαλεῖ μέγεθός τι τῇ μικρότητι. ὥστ' 30 εἰ μὲν στήσεται ἢ ἐκκρίσει, οὐχ ἅπαν ἐν παντὶ ἐνέσται (ἐν γὰρ τῷ λοιπῷ ὕδατι οὐκ ἐνυπάρξει σὰρξ), εἰ δὲ μὴ στήσεται ἀλλ' ἀεὶ ἔξει ἀφαίρεσις, ἐν πεπερασμένῳ μεγέθει ἴσα πεπερασμένα ἐνέσται ἅπειρα τὸ πλήθος· τοῦτο δ' ἀδύνατον. πρὸς δὲ τούτοις, εἰ ἅπαν μὲν σῶμα ἀφαιρεθέντος τινὸς ἔλατ- 35 του ἀνάγκη γίνεσθαι, τῆς δὲ σαρκὸς ὄρισται τὸ ποσοῦν καὶ μεγέθει καὶ μικρότητι, φανερόν ὅτι ἐκ τῆς ἐλαχίστης σαρκὸς οὐθὲν ἐκκριθήσεται σῶμα· ἔσται γὰρ ἐλάττων τῆς ἐλα- 188^a χίστης. ἔτι δ' ἐν τοῖς ἀπείροις σώμασιν ἐνυπάρχοι ἂν ἦδη

^b 12 εἰδῶμεν ΔΡ: ἴδωμεν Ε 13 δ' εἰ ΑΣ: δὲ Ε¹VP: δ' ἂν Ε²
 14 σμκρότητα FIPS 16 δὴ Bonitz: δὲ Π 17 σμκρό-
 τητα FI 18 ὀτιοῦν] ὀποιοοῦν F 19 μόρια τοῦ ζῶου F 20 ἢ
 pr.] καὶ F ἄλλοτιον ὀηλικον Ε 21 ἢ pr. om. EV 22 ἔτι
 ΠΡΤ: εἰ οὐν τὰ ζῶα καὶ τὰ φυτὰ μήτε πηλικά ἐστὶ μήτε ποσά, οὐδὲ τὰ
 μόρια αὐτῶν ὀηλικαοῦν ἔσται οὔτε αὔξησιν οὔτε ἀλλοίωσιν ἐπ' ἀπειρον
 ἔξει, ὥστε οὔτε σὰρξ εἶναι ἂν ὀηλικηοῦν οὔτε ὀστοῦν οὔτε σπέρμα τῶν
 φυτῶν· ἐκ τούτων γὰρ ἐκάτερα αὐτῶν σύγκειται. ἔτι ut vid. A πάντα
 EJP: ἅπαντα FIS ἐν om. S 28 γινομένης F 29 ἔσται
 om. I 30 ὑπερβάλλει I et fecit J σμκρότητι Π 32 οὐκ
 ἐνυπάρξει Ε²ΔΣ: οὐκ ὑπαρξει Ε¹ σταθήσεται Ε 33 πεπερασμένῳ
 ... ἴσα ΔVPS: om. Ε 37 σμκρότητι FI 188^a I ἐλάττων
 scripsi cum SP: ἔλαττον PS¹T

σὰρξ ἄπειρος καὶ αἷμα καὶ ἐγκέφαλος, κεχωρισμένα μέντοι
 ἀπ' ἀλλήλων (οὐ), οὐθέν δ' ἦττον ὄντα, καὶ ἄπειρον ἕκαστον.
 5 τοῦτο δ' ἄλογον. τὸ δὲ μηδέποτε διακριθῆσθαι οὐκ εἰδότης
 μὲν λέγεται, ὀρθῶς δὲ λέγεται· τὰ γὰρ πάθη ἀχώριστα·
 εἰ οὖν μέμικται τὰ χρώματα καὶ αἰ εἴξις, ἐὰν διακριθῶσιν,
 ἔσται τι λευκὸν καὶ ὑγιεινὸν οὐχ ἕτερόν τι ὃν οὐδὲ καθ' ὑπο-
 κειμένον. ὥστε ἄτοπος τὰ ἀδύνατα ζητῶν ὁ νοῦς, εἴπερ βού-
 10 λεται μὲν διακρίναι, τοῦτο δὲ ποιῆσαι ἀδύνατον καὶ κατὰ
 τὸ ποσὸν καὶ κατὰ τὸ ποιόν, κατὰ μὲν τὸ ποσὸν ὅτι οὐκ
 ἔστιν ἐλάχιστον μέγεθος, κατὰ δὲ τὸ ποιὸν ὅτι ἀχώριστα τὰ
 πάθη. οὐκ ὀρθῶς δὲ οὐδὲ τὴν γένεσιν λαμβάνει τῶν ὁμο-
 ειδῶν. ἔστι μὲν γὰρ ὡς ὁ πηλὸς εἰς πηλοὺς διαιρεῖται, ἔστι
 15 δ' ὡς οὐ. καὶ οὐχ ὁ αὐτὸς τρόπος, ὡς πλίνθοι ἐξ οἰκίας καὶ
 οἰκία ἐκ πλίνθων, οὕτω [δὲ] καὶ ὕδωρ καὶ ἀήρ ἐξ ἀλλήλων
 καὶ εἰσὶ καὶ γίνονται. βέλτιόν τε ἐλάττω καὶ πεπερασμένα
 λαβεῖν, ὅπερ ποιεῖ Ἐμπεδοκλῆς.

Πάντες δὴ τὰναντία ἀρχὰς ποιοῦσιν οἳ τε λέγοντες ὅτι 5
 20 ἐν τὸ πᾶν καὶ μὴ κινούμενον (καὶ γὰρ Παρμενίδης θερμὸν
 καὶ ψυχρὸν ἀρχὰς ποιεῖ, ταῦτα δὲ προσαγορεύει πῦρ καὶ
 γῆν) καὶ οἱ μανὸν καὶ πυκνόν, καὶ Δημόκριτος τὸ πλήρες καὶ
 κενόν, ὧν τὸ μὲν ὡς ὃν τὸ δὲ ὡς οὐκ ὃν εἶναι φησιν· ἔτι θέ-
 σει, σχήματι, τάξει. ταῦτα δὲ γένη ἐναντίων· θέσεως ἄνω
 25 κάτω, πρόσθεν ὀπισθεν, σχήματος γεγωνιωμένον ἀγώνιον, εὐθὺ
 περιφερές. ὅτι μὲν οὖν τὰναντία πως πάντες ποιοῦσι τὰς ἀρχὰς,
 δηλόν. καὶ τοῦτο εὐλόγως· δεῖ γὰρ τὰς ἀρχὰς μήτε ἐξ ἀλλήλων
 εἶναι μήτε ἐξ ἄλλων, καὶ ἐκ τούτων πάντα· τοῖς δὲ ἐναν-
 τίοις τοῖς πρώτοις ὑπάρχει ταῦτα, διὰ μὲν τὸ πρώτα εἶναι

^a 4 οὐ addidi: om. ΠPST δ'] μέντοι P 6 λέγεται pr. AVS:
 λέγει E 7 μέμικται ΔVP: ἐμέμικτο E 8 καὶ EP: ἦ Δ ὑγιεινὸν
 FP: ὑγιαῖνον EIJ οὕτε E 10 μὲν] μὲν αὐτὰ E ἀδυνατεῖ I
 11 τὸ pr. et alt. om. E 13 ὁμοειδῶν PPS: ὁμοιομέρων A:
 ὁμοιοειδῶν Moreliana 14 μὲν om. FIJ¹ 15 πλίνθοι
 ΔVP: πλίνθος E 16 δὲ seclusi, om. fort. ST: habent ΠP καὶ
 pr. om. J 17 καὶ pr. om. F τε EP et ut vid. SP: δ' ΔS¹
 19 δῆ] δὲ P 22 καὶ τὸ πυκνόν S τὸ om. I πλήρες E¹IVPST:
 στερεὸν E²FJ γρ. I S in *de Caelo* 24 θέσειώς I 25 πρόσθεν
 ΠPST: τάξεως πρόσθεν Susemihl ὀπισθεν om. E σχήματι I
 γεγωνιωμένον FIBVPS^p: γωνία EJS^o S in *de Caelo*: om. T ἀγώ-
 νιον bVPS^p: om. EAS^cT S in *de Caelo* τὸ εὐθὺ E S in *de Caelo*:
 τὸ εὐθὺ τὸ FJ 26 τὰς om. P 27 εἰκότως P ἀλλήλων...
 28 ἄλλων ΠT: ἄλλων... ἀλλήλων PS 28 πάντα] τὰ ἄλλα PST

μη ἐξ ἄλλων, διὰ δὲ τὸ ἐναντία μη ἐξ ἀλλήλων. 30

ἀλλὰ 30

δεῖ τοῦτο καὶ ἐπὶ τοῦ λόγου σκέψασθαι πῶς συμβαίνει. λη-
πτέον δὴ πρῶτον ὅτι πάντων τῶν ὄντων οὐθέν οὔτε ποιεῖν πέ-
φυκεν οὔτε πάσχειν τὸ τυχὸν ὑπὸ τοῦ τυχόντος, οὐδὲ γίγνεται
ὅτιοῦν ἐξ ὅτουοῦν, ἂν μὴ τις λαμβάνη κατὰ συμβεβηκός·
πῶς γὰρ ἂν γένοιτο λευκὸν ἐκ μουσικοῦ, πλὴν εἰ μὴ συμ- 35
βεβηκός εἴη τῷ μὴ λευκῷ ἢ τῷ μέλανι τὸ μουσικόν; ἀλλὰ
λευκὸν μὲν γίγνεται ἐξ οὐ λευκοῦ, καὶ τούτου οὐκ ἐκ παντὸς
ἀλλ' ἐκ μέλανος ἢ τῶν μεταξύ, καὶ μουσικὸν οὐκ ἐκ μου- 188^b
σικοῦ, πλὴν οὐκ ἐκ παντὸς ἀλλ' ἐξ ἁμούσου ἢ εἴ τι αὐτῶν
ἔστι μεταξύ. οὐδὲ δὴ φθείρεται εἰς τὸ τυχὸν πρῶτον, οἶον
τὸ λευκὸν οὐκ εἰς τὸ μουσικόν, πλὴν εἰ μὴ ποτε κατὰ συμ-
βεβηκός, ἀλλ' εἰς τὸ μὴ λευκόν, καὶ οὐκ εἰς τὸ τυχὸν ἀλλ' 5
εἰς τὸ μέλαν ἢ τὸ μεταξύ· ὡς δ' αὐτως καὶ τὸ μουσικὸν
εἰς τὸ μὴ μουσικόν, καὶ τοῦτο οὐκ εἰς τὸ τυχὸν ἀλλ' εἰς τὸ
ἁμούσου ἢ εἴ τι αὐτῶν ἔστι μεταξύ. ὁμοίως δὲ τοῦτο καὶ
ἐπὶ τῶν ἄλλων, ἐπεὶ καὶ τὰ μὴ ἀπλᾶ τῶν ὄντων ἀλλὰ
σύνθετα κατὰ τὸν αὐτὸν ἔχει λόγον· ἀλλὰ διὰ τὸ μὴ τὰς 10
ἀντικειμένους διαθέσεις ὠνομάσθαι λαμβάνει τοῦτο συμβαίνειν.
ἀνάγκη γὰρ πᾶν τὸ ἡρμοσμένον ἐξ ἀναρμοστού γίνεσθαι καὶ
τὸ ἀναρμοστόν ἐξ ἡρμοσμένου, καὶ φθείρεσθαι τὸ ἡρμοσμέ-
νον εἰς ἀναρμοστίαν, καὶ ταύτην οὐ τὴν τυχούσαν ἀλλὰ τὴν
ἀντικειμένην. διαφέρει δ' οὐθέν ἐπὶ ἁρμονίας εἰπεῖν ἢ τάξεως 15
ἢ συνθέσεως· φανερόν γὰρ ὅτι ὁ αὐτὸς λόγος. ἀλλὰ μὴν
καὶ οἰκία καὶ ἀνδριάς καὶ ὅτιοῦν ἄλλο γίγνεται ὁμοίως· ἢ
τε γὰρ οἰκία γίγνεται ἐκ τοῦ μὴ συγκείσθαι ἀλλὰ διηρη-
σθαι ταδὶ ὠδί, καὶ ὁ ἀνδριάς καὶ τῶν ἐσχηματισμένων τι

^a 30 ἄλλων APST: ἑτέρων E διὰ . . . ἀλλήλων om. J¹ 31 λη-
πτέον] σκεπτέον F¹ 32 πάντων EPS S in *de Caelo*: ἀπάντων Δ οὐθέν
om. S 33 ἀπὸ I 35 λευκὸν FST S in *de Caelo*: τὸ λευκὸν
EIJ μουσικῆς F μὴ] μὴ κατὰ I 36 μὴ ES: om. ΔV S in
de Caelo 37 ἐξ οὐ EFS: οὐκ ἐξ IJ S in *de Caelo*. ^b 4 τὸ
alt. om. ΔT εἰ μὴ] εἰκῆ F: εἰ J S in *de Caelo* 5 καὶ] καὶ εἰς
μὴ λευκὸν Δ S in *de Caelo* 6 ἢ FI S in *de Caelo*: ἢ εἰς EJ δ'
om. F 7 εἰς . . . μουσικόν E² ΔV S in *de Caelo*: om. E¹ 8 τι
om. F¹ 9 ἐπὶ τὰ καὶ τὰ ex ἐπὶ τὰ κατὰ fecit E
II ἀντιθέσεις F λαμβάνει τοῦτο συμβαίνειν Δ S in *de Caelo*: λαμβά-
νειν τοῦτο συμβαίνει E 14 οὐ E S in *de Caelo*: οὐχι Δ 15 δ'
om. Bekker 16 λόγος ἐστίν. ἀλλὰ I μὴν ὅτι καὶ F 18 δια-
ρεῖσθαι F 19 τάδε I

- 20 ἐξ ἀσχημοσύνης· καὶ ἕκαστον τούτων τὰ μὲν τάξις, τὰ δὲ
 σύνθεσις τίς ἐστίν. εἰ τοίνυν τοῦτ' ἐστὶν ἀληθές, ἅπαν ἂν γί-
 γνυτο τὸ γιγνόμενον καὶ φθειρόμενον ἢ ἐξ ἐναν-
 τίων ἢ εἰς ἐναντία καὶ τὰ τούτων μεταξύ. τὰ δὲ μεταξύ
 ἐκ τῶν ἐναντίων ἐστίν, οἷον χρώματα ἐκ λευκοῦ καὶ μέλα-
 25 νος· ὥστε πάντ' ἂν εἴη τὰ φύσει γιγνόμενα ἢ ἐναντία ἢ ἐξ
 26 ἐναντίων.
- 26 μέχρι μὲν οὖν ἐπὶ τοσοῦτον σχεδὸν συνηκολουθήκασι
 καὶ τῶν ἄλλων οἱ πλείστοι, καθάπερ εἴπομεν πρότερον· πάντες
 γὰρ τὰ στοιχεῖα καὶ τὰς ὑπ' αὐτῶν καλουμένας ἀρχάς, καί-
 περ ἄνευ λόγου τιθέυτες, ὅμως τὰναντία λέγουσι, ὥσπερ ὑπ'
 30 αὐτῆς τῆς ἀληθείας ἀναγκασθέντες. διαφέρουσι δ' ἀλλή-
 λων τῶ τοὺς μὲν πρότερα τοὺς δ' ὕστερα λαμβάνειν, καὶ τοὺς
 μὲν γνωριμώτερα κατὰ τὸν λόγον τοὺς δὲ κατὰ τὴν αἴσθη-
 σιν (οἱ μὲν γὰρ θερμὸν καὶ ψυχρόν, οἱ δ' ὑγρὸν καὶ ξηρόν,
 ἔτεροι δὲ περιττὸν καὶ ἄρτιον ἢ νεῖκος καὶ φιλίαν αἰ-
 35 τίας τίθενται τῆς γενέσεως· ταῦτα δ' ἀλλήλων διαφέρει
 κατὰ τὸν εἰρημένον τρόπον), ὥστε ταῦτα λέγειν πως καὶ ἕτερα
 ἀλλήλων, ἕτερα μὲν ὥσπερ καὶ δοκεῖ τοῖς πλείστοις, ταῦτα
 189^a δὲ ἢ ἀνάλογον· λαμβάνουσι γὰρ ἐκ τῆς αὐτῆς συστοιχίας·
 τὰ μὲν γὰρ περιέχει, τὰ δὲ περιέχεται τῶν ἐναντίων. ταύτη
 τε δὴ ὡσαύτως λέγουσι καὶ ἐτέρως, καὶ χεῖρον καὶ βέλ-
 5 τιον, καὶ οἱ μὲν γνωριμώτερα κατὰ τὸν λόγον, ὥσπερ εἴρη-
 5 ται πρότερον, οἱ δὲ κατὰ τὴν αἴσθησιν (τὸ μὲν γὰρ καθόλου
 κατὰ τὸν λόγον γνώριμον, τὸ δὲ καθ' ἕκαστον κατὰ τὴν αἴ-
 σθησιν· ὁ μὲν γὰρ λόγος τοῦ καθόλου, ἢ δ' αἴσθησις τοῦ κατὰ
 μέρος), οἷον τὸ μὲν μέγα καὶ τὸ μικρὸν κατὰ τὸν λόγον, τὸ
 δὲ μαρὸν καὶ τὸ πυκνὸν κατὰ τὴν αἴσθησιν. ὅτι μὲν οὖν ἐναν-
 10 τίας δεῖ τὰς ἀρχάς εἶναι, φανερόν.
- Ἐχόμενον δ' ἂν εἴη λέγειν πότερον δύο ἢ τρεῖς ἢ πλείους **6**
 εἰσίν. μίαν μὲν γὰρ οὐχ οἶόν τε, ὅτι οὐχ ἔν τὰ ἐναντία, ἀπεί-

^b 21 τίς om. J¹ τοίνυν] δὴ F 23 εἰς EIPT S in *de Caelo*: εἰς
 τὰ FJ 24 χρώμα F 26 ἐπὶ τοσοῦτον E¹PST: τοῦτου E²Δ
 34 οἱ δὲ P ἢ P: οἱ δὲ Λ et in ras. E² 35 δ' om. IJ¹ 37 καὶ
 om. F 189^a 2 γὰρ om. S περιέχει... περιέχεται ΠAPS:
 ὑπερέχει... ὑπερέχεται Bonitz et fort. T 3 τε] δὲ FI 7-8 ὁ...
 μέρος om. E¹ 8 μὲν om. Λ τὸ JT: om. EFI σμικρὸν
 I τὸν om. E¹S 9 μαρὸν... πυκνὸν ΔVPS: πυκνὸν καὶ μαρὸν
 E τὴν ΔS: om. E 12 μία Λ τὰ ἐναντία IJST: τὸ ἐναντίον EF

ρους δ', ὅτι οὐκ ἐπιστητὸν τὸ ὄν ἔσται, μία τε ἐναντίωσις ἐν
 παντὶ γένει ἐνί, ἢ δ' οὐσία ἔν τι γένος, καὶ ὅτι ἐνδέχεται ἐκ
 πεπερασμένων, βέλτιον δ' ἐκ πεπερασμένων, ὥσπερ Ἐμπε- 15
 δοκλῆς, ἢ ἐξ ἀπείρων πάντα γὰρ ἀποδιδόναι οἶεται ὅσα-
 περ Ἀναξαγόρας ἐκ τῶν ἀπείρων. ἔτι δὲ ἔστιν ἄλλα ἄλλων
 πρότερα ἐναντία, καὶ γίγνεται ἕτερα ἐξ ἀλλήλων, οἶον γλυκὺ
 καὶ πικρὸν καὶ λευκὸν καὶ μέλαν, τὰς δὲ ἀρχὰς αἰεὶ δεῖ
 μένειν. 20

ὅτι μὲν οὖν οὔτε μία οὔτε ἀπειροί, δῆλον ἐκ τούτων 20
 ἐπεὶ δὲ πεπερασμένοι, τὸ μὴ ποιεῖν δύο μόνον ἔχει τιὰ λό-
 γον· ἀπορήσειε γὰρ ἂν τις πῶς ἢ ἢ πυκνότης τὴν μανότητα
 ποιεῖν τι πέφυκεν ἢ αὐτῇ τὴν πυκνότητα. ὁμοίως δὲ καὶ
 ἄλλη ὅποια οὖν ἐναντιότης· οὐ γὰρ ἢ φιλία τὸ νεῖκος συνάγει
 καὶ ποιεῖ τι ἐξ αὐτοῦ, οὐδὲ τὸ νεῖκος ἐξ ἐκείνης, ἀλλ' ἄμφω 25
 ἕτερόν τι τρίτον. ἔνιοι δὲ καὶ πλείω λαμβάνουσιν ἐξ ὧν κατα-
 σκευάζουσι τὴν τῶν ὄντων φύσιν. πρὸς δὲ τούτοις ἔτι κἀν
 τόδε τις ἀπορήσειεν, εἰ μὴ τις ἐτέραν ὑποθήσει τοῖς ἐναν-
 τίοις φύσιν· οὐθενὸς γὰρ ὄρωμεν τῶν ὄντων οὐσίαν τἀναντία,
 τὴν δ' ἀρχὴν οὐ καθ' ὑποκειμένου δεῖ λέγεσθαι τινος. ἔσται 30
 γὰρ ἀρχὴ τῆς ἀρχῆς· τὸ γὰρ ὑποκείμενον ἀρχή, καὶ πρό-
 τερον δοκεῖ τοῦ κατηγορουμένου εἶναι. ἔτι οὐκ εἶναι φαμεν
 οὐσίαν ἐναντίαν οὐσίᾳ· πῶς οὖν ἐκ μὴ οὐσιῶν οὐσία ἂν εἴη; ἢ
 πῶς ἂν πρότερον μὴ οὐσία οὐσίας εἴη; διόπερ εἴ τις τόν τε
 πρότερον ἀληθῆ νομίσειεν εἶναι λόγον καὶ τοῦτον, ἀναγκαῖον, 35
 εἰ μέλλει διασώσειν ἀμφοτέρους αὐτούς, ὑποτιθέναι τι τρίτον, 189^b
 ὥσπερ φασὶν οἱ μίαν τιὰ φύσιν εἶναι λέγοντες τὸ πᾶν, οἶον
 ὕδωρ ἢ πῦρ ἢ τὸ μεταξὺ τούτων. δοκεῖ δὲ τὸ μεταξὺ μᾶλ-
 λον· πῦρ γὰρ ἦδη καὶ γῆ καὶ ἀῆρ καὶ ὕδωρ μετ' ἐναντιότη-
 των συμπεπλεγμένα ἔστιν. διὸ καὶ οὐκ ἀλόγως ποιούσιν οἱ τὸ 5

^a 13 ὅτι οὐδὲ FJ: om. E ὄν ἔσται fecit I δὲ P 15 δὲ
 in ras. ii litt. E² ὥσπερ] ὡς ὁ F 16 ὅσαπερ EPS^p: ὥσπερ
 AS¹ 17 δὲ EIJS: om. FJ¹ γρ. E ἄλλων AVS γρ. E: ἀλλήλων
 E 18 πρότερα AV: πότερα E ἄλλων EVS οἶον] οἶον καὶ
 E: οἶον τὸ IJ 19 post καὶ pr. add. τὸ sup. lin. J¹ καὶ μέλαν
 om. E¹ 20 οὐδεμία οὐδὲ I 21 ἔχειν E 22 ἢ om. AT
 23 τι om. I ὅμως E¹ 24 οὐ FIJ¹P^o: οὔτε EJ²PP 25 οὔτε
 PP 28 ὑποθήσει AS: ὑποτίθησι EIJ: ὑποθήσεται FP 30 οὐ
 om. I 31 ὑπόκενον E¹ 33 οὐσίαν οὐσία ἐναντίαν I πῶς
 ἂν ὄν IP ἂν om. P 34 τε om. E¹ 35 λόγον εἶναι S
^b I διασώσειν FJS: διασώζειν EI¹: διασώζων I² ὑποθίειν S
 4 ἦδη EST: δὴ A ἐναντιότητος F 5 καὶ om. AT: expunxit E

ὑποκείμενον ἕτερον τούτων ποιούντες, τῶν δ' ἄλλων οἱ ἀέρα
καὶ γὰρ ὁ ἀήρ ἥκιστα ἔχει τῶν ἄλλων διαφορὰς αἰσθητάς·
ἐχόμενον δὲ τὸ ὕδωρ. ἀλλὰ πάντες γε τὸ ἐν τοῦτο τοῖς
ἐναντίοις σχηματίζουσιν, πυκνότητι καὶ μανότητι καὶ τῷ
10 μᾶλλον καὶ ἥττον. ταῦτα δ' ἐστὶν ὅλως ὑπεροχὴ δηλονότι
καὶ ἔλλειψις, ὥσπερ εἴρηται πρότερον. καὶ ἔοικε παλαιὰ
εἶναι καὶ αὕτη ἡ δόξα, ὅτι τὸ ἐν καὶ ὑπεροχὴ καὶ ἔλλει-
ψις ἀρχαὶ τῶν ὄντων εἰσὶ, πλὴν οὐ τὸν αὐτὸν τρόπον, ἀλλ'
οἱ μὲν ἀρχαῖοι τὰ δύο μὲν ποιεῖν τὸ δὲ ἐν πάσχειν, τῶν
15 δ' ὑστέρων τινὲς τούναντιον τὸ μὲν ἐν ποιεῖν τὰ δὲ δύο πάσχειν
16 φασὶ μᾶλλον.

16 τὸ μὲν οὖν τρία φάσκειν τὰ στοιχεῖα εἶναι ἕκ-
τε τούτων καὶ ἕκ τοιούτων ἄλλων ἐπισκοποῦσι δόξειεν ἂν ἔχειν
τινὰ λόγον, ὥσπερ εἴπομεν, τὸ δὲ πλείω τριῶν οὐκέτι· πρὸς
μὲν γὰρ τὸ πάσχειν ἰκανὸν τὸ ἐν, εἰ δὲ τεττάρων ὄντων δύο
20 ἔσονται ἐναντιώσεις, δεήσει χωρὶς ἑκατέρα ὑπάρχειν ἑτέραν
τινὰ μεταξὺ φύσιν· εἰ δ' ἐξ ἀλλήλων δύναται γεννᾶν δύο
οὐσαι, περίεργος ἂν ἡ ἑτέρα τῶν ἐναντιώσεων εἴη. ἅμα δὲ καὶ
ἀδύνατον πλείους εἶναι ἐναντιώσεις τὰς πρώτας. ἡ γὰρ οὐσία
ἐν τι γένος ἐστὶ τοῦ ὄντος, ὥστε τῷ πρότερον καὶ ὕστερον διοί-
25 σουσιν ἀλλήλων αἱ ἀρχαὶ μόνον, ἀλλ' οὐ τῷ γένει· αἰεὶ γὰρ
ἐν ἐνὶ γένει μία ἐναντίωσις ἔστω, πᾶσαι τε αἱ ἐναντιώσεις
ἀνάγεσθαι δοκοῦσιν εἰς μίαν. ὅτι μὲν οὖν οὔτε ἐν τὸ στοιχείου
οὔτε πλείω δυοῖν ἢ τριῶν, φανερόν· τούτων δὲ πότερον, κα-
θάπερ εἴπομεν, ἀπορίαν ἔχει πολλήν.

30 Ὡδ' οὖν ἡμεῖς λέγωμεν πρῶτον περὶ πάσης γενέσεως ἧ
ἐπελθόντες· ἐστὶ γὰρ κατὰ φύσιν τὰ κοινὰ πρῶτον εἰπόντας
οὕτω τὰ περὶ ἕκαστου ἴδια θεωρεῖν. φαιμέν γὰρ γίγνεσθαι ἐξ
ἄλλου ἄλλο καὶ ἐξ ἑτέρου ἕτερον ἢ τὰ ἀπλᾶ λέγοντες ἢ τὰ

^b6 ὑποκείμενον] περιέχον E¹ 8 γε om. P 9 πυκνότητι]
οἶον πυκνότητι E²ΔΤ 10 ὑπεροχὴ τε καὶ ἔλλειψις δηλονότι F
15 ὕστερον J 16 φάναι τὰ ΔΡST 19 μὲν ΔΤ: om. E
20 ἑκατέρα P et fecit J: ἑκατέρων ex ἑκατερ' fecit E²: ἑκατέρας FI
21 δύναται EIJ²P: δύναται FJ¹ δύο οὐσαι EIP: om. FJ 22 ἂν
et εἴη om. P 24 ἐστὶ τοῦ ὄντος om. fort. P τοῦ ὄντος om. V:
ταῦτο E¹AS Ammonius: καὶ ταῦτο ci. Diels τὸ I 26 ἔστιν
ἔτι πᾶσαι I δὲ FJS: om. I αἱ ES: om. Δ 27 τὸ στοι-
χείου EJPST: στοιχείου F: τῶν στοιχείων I 28 ὁπότερον IJ²
30 ἡμεῖς EJT: ἡμεῖς γε FI: om. P λέγωμεν EJVPP: λέγομεν FIT
32 ἴδια IJS: ἰδία EF γὰρ] δὴ VP 33 ἐξ om. J

συγκείμενα. λέγω δὲ τοῦτο ὡδί. ἔστι γὰρ γίνεσθαι ἄνθρωπον
 μουσικόν, ἔστι δὲ τὸ μὴ μουσικὸν γίνεσθαι μουσικόν ἢ τὸν 35
 μὴ μουσικὸν ἄνθρωπον ἄνθρωπον μουσικόν. ἀπλοῦν μὲν οὖν 190^a
 λέγω τὸ γιγνόμενον τὸν ἄνθρωπον καὶ τὸ μὴ μουσικόν, καὶ
 ὃ γίγνεται ἀπλοῦν, τὸ μουσικόν· συγκείμενον δὲ καὶ ὃ γίγνε-
 ται καὶ τὸ γιγνόμενον, ὅταν τὸν μὴ μουσικὸν ἄνθρωπον φῶ-
 μεν γίνεσθαι μουσικὸν ἄνθρωπον. τούτων δὲ τὸ μὲν οὐ μόνον 5
 λέγεται τὸδε γίνεσθαι ἀλλὰ καὶ ἐκ τούτου, οἷον ἐκ μὴ
 μουσικοῦ μουσικός, τὸ δ' οὐ λέγεται ἐπὶ πάντων· οὐ γὰρ ἐξ
 ἀνθρώπου ἐγένετο μουσικός, ἀλλ' ἄνθρωπος ἐγένετο μουσικός.
 τῶν δὲ γιγνομένων ὡς τὰ ἀπλᾶ λέγομεν γίνεσθαι, τὸ μὲν
 ὑπομένον γίγνεται τὸ δ' οὐχ ὑπομένον· ὁ μὲν γὰρ ἄνθρωπος 10
 ὑπομένει μουσικὸς γιγνόμενος ἄνθρωπος καὶ ἔστι, τὸ δὲ μὴ
 μουσικὸν καὶ τὸ ἄμουσον οὔτε ἀπλῶς οὔτε συντεθειμένον ὑπο-
 μένει.

διωρισμένων δὲ τούτων, ἐξ ἀπάντων τῶν γιγνομένων τοῦτο 13
 ἔστι λαβεῖν, ἐάν τις ἐπιβλέψῃ ὥσπερ λέγομεν, ὅτι δεῖ τι
 αἰεὶ ὑποκεῖσθαι τὸ γιγνόμενον, καὶ τοῦτο εἰ καὶ ἀριθμῶ ἔστιν 15
 ἔν, ἀλλ' εἶδει γε οὐχ ἔν· τὸ γὰρ εἶδει λέγω καὶ λόγῳ ταυ-
 τόν· οὐ γὰρ ταῦτόν τὸ ἀνθρώπῳ καὶ τὸ ἀμούσῳ εἶναι. καὶ τὸ
 μὲν ὑπομένει, τὸ δ' οὐχ ὑπομένει· τὸ μὲν μὴ ἀντικείμενον
 ὑπομένει (ὁ γὰρ ἄνθρωπος ὑπομένει), τὸ μὴ μουσικὸν δὲ καὶ τὸ
 ἄμουσον οὐχ ὑπομένει, οὐδὲ τὸ ἐξ ἀμφοῖν συγκείμενον, οἷον 20
 ὁ ἄμουσος ἄνθρωπος. τὸ δ' ἐκ τίνος γίνεσθαι τι, καὶ μὴ τό-
 δε γίνεσθαι τι, μᾶλλον μὲν λέγεται ἐπὶ τῶν μὴ ὑπομενόν-
 των, οἷον ἐξ ἀμούσου μουσικὸν γίνεσθαι, ἐξ ἀνθρώπου δὲ οὐ·
 οὐ μὴν ἀλλὰ καὶ ἐπὶ τῶν ὑπομενόντων ἐνίοτε λέγεται ὡσαύ-

^b 34 γὰρ] γάρ που I: γὰρ τοῦτο J 35 μουσικόν pr. EVPST: μου-
 σικόν τι Λ 190^a I ἀπλοῦν μὲν οὖν ΔP: om. E 2 τὸν om.
 P τὸν P 4 τὸν] τὸ E¹ 5 μουσικόν FIS: ἢ μουσικόν E:
 ἢ μουσικὸν ἢ μουσικὸν J ἄνθρωπον om. FT 6 τὸδε E¹VPSPT:
 τὸδε τι E²AS^c τούτου FIJ²PT: τούτου EJ¹ 7 οὐ γὰρ IVS: οἷον
 EF et fort. J¹: οὔτε γὰρ J² 8 μουσικόν J ἄνθρωπος scripsi: ἄνθρω-
 πος E: ὁ ἄνθρωπος Λ 11 μὴ FJVT et sup. lin. E²: δὴ I: om. E¹
 12 συντεθειμένον E 15 καὶ alt. EIST: om. FJ 16 ἀλλ' οὐκ εἶδει
 ἔν I τῷ F 17 οὐ γὰρ ταῦτόν E²AS S in *de Caelo*: om. E¹ τὸ
 pr. om. AT S in *de Caelo* τὸ alt.] τῷ I 19 ὑπομένει pr. AV S
 in *de Caelo*: αὐτῷ ὑπομένει E μὴ . . . τὸ] δὲ S in *de Caelo* μὴ
 F et fort. PST: om. EIJ δὲ καὶ τὸ in spatio iii litt. E²: καὶ τὸ F
 21 ὁ om. EJ τι . . . 22 γίνεσθαι E²AVP: om. E¹ 21 μὴ] τὸ
 μὴ E²: μετὰ vel μὴ ὡς μετὰ Laas 22 τι om. E¹J²VP 24 οὐ
 μὴν ἀλλὰ] ἀλλὰ μὴν E²IJ¹

25 τως· ἐκ γὰρ χαλκοῦ ἀνδριάντα γίνεσθαι φαμεν, οὐ τὸν
χαλκὸν ἀνδριάντα. τὸ μέντοι ἐκ τοῦ ἀντικειμένου καὶ μὴ
ὑπομένουτος ἀμφοτέρως λέγεται, καὶ ἐκ τοῦδε τόδε καὶ
τόδε τόδε· καὶ γὰρ ἐξ ἀμούσου καὶ ὁ ἄμουσος γίνεται μουσι-
30 σου ἀνθρώπου καὶ ὁ ἄμουσος ἄνθρωπος γίνεσθαι λέγεται
μουσικός. πολλαχῶς δὲ λεγομένου τοῦ γίνεσθαι, καὶ τῶν μὲν
οὐ γίνεσθαι ἀλλὰ τόδε τι γίνεσθαι, ἀπλῶς δὲ γίνεσθαι
τῶν οὐσιῶν μόνου, κατὰ μὲν τὰλλα φανερόν ὅτι ἀνάγκη
ὑποκεῖσθαι τι τὸ γιγνόμενον (καὶ γὰρ ποσὸν καὶ ποιὸν καὶ
35 πρὸς ἕτερον [καὶ ποτέ] καὶ ποὺ γίνεται ὑποκειμένου τινὸς διὰ
τὸ μόνην τὴν οὐσίαν μηθενὸς κατ' ἄλλου λέγεσθαι ὑποκειμένου,
190^b τὰ δ' ἄλλα πάντα κατὰ τῆς οὐσίας)· ὅτι δὲ καὶ αἱ οὐσίαι
καὶ ὅσα [ἄλλα] ἀπλῶς ὄντα ἐξ ὑποκειμένου τινὸς γίνεται,
ἐπισκοποῦντι γένοιτο ἂν φανερόν. αἰεὶ γὰρ ἔστι ὁ ὑπόκειται,
ἐξ οὗ τὸ γιγνόμενον, οἶον τὰ φυτὰ καὶ τὰ ζῶα ἐκ
5 σπέρματος. γίνεται δὲ τὰ γιγνόμενα ἀπλῶς τὰ μὲν με-
τασχηματίζει, οἶον ἀνδριάς, τὰ δὲ προσθέσει, οἶον τὰ
αὐξανόμενα, τὰ δ' ἀφαιρέσει, οἶον ἐκ τοῦ λίθου ὁ Ἐρμῆς,
τὰ δὲ συνθέσει, οἶον οἰκία, τὰ δ' ἀλλοιώσει, οἶον τὰ
τρεπόμενα κατὰ τὴν ὕλην. πάντα δὲ τὰ οὕτω γιγνόμενα
10 φανερόν ὅτι ἐξ ὑποκειμένων γίνεται. ὥστε δηλοῦν ἐκ τῶν εἰ-
ρημένων ὅτι τὸ γιγνόμενον ἅπαν αἰεὶ συνθετόν ἐστι, καὶ ἔστι
μὲν τί γιγνόμενον, ἔστι δέ τι ὃ τοῦτο γίνεται, καὶ τοῦτο διττόν·
ἢ γὰρ τὸ ὑποκείμενον ἢ τὸ ἀντικείμενον. λέγω δὲ ἀντικεί-
σθαι μὲν τὸ ἄμουσον, ὑποκεῖσθαι δὲ τὸν ἄνθρωπον, καὶ τὴν
15 μὲν ἀσχημοσύνην καὶ τὴν ἀμορφίαν καὶ τὴν ἀταξίαν τὸ ἀν-
τικείμενον, τὸν δὲ χαλκὸν ἢ τὸν λίθον ἢ τὸν χρυσὸν τὸ ὑπο-

^a 28 ὁ om. J 30 ὁ om. FS λέγεται γίνεσθαι I 31 δὲ
EIJPS: δὴ F et ut vid. T 33 μόνου EFJPP: μόνων IP¹ et fort. S
34 τὸ τὶ S 35 πρὸς τι ἕτερον P καὶ ποτέ seclusi: om. fort.
PT ^b I αἱ οὐσίαι EFVTS in *de Caelo*: οὐσίαι J¹: ἡ οὐσία J²PS:
οὐσία I 2 ἄλλα seclusi: om. fort. T: habent PPS S in *de*
Caelo ἐξ . . . τινὸς FIJ²P S in *de Caelo*: erasit E in *litura fere*
38 litt.: om. J¹ 3 γίνοιτο J 4 οὐ γίνεται τὸ Δ S in *de*
Caelo 5 τὰ pr. sup. lin. E¹ 6 ἀνδριάς EFJ¹PST: ἀνδριάς
ἐκ χαλκοῦ IJ²V 7 ὁ om. E 9 κατὰ (καὶ κατὰ E) τὴν ὕλην PVS:
secludenda ci. Hamelin 11 ἅπαν EIJ²PT: om. FJ¹ 12 τι
τὸ E¹: τι τὸ JP: τοι I τι om. JP 13 γὰρ om. P 15 καὶ
τὴν alt. EVT: ἢ Λ

κείμενον.

17

φανερὸν οὖν ὡς, εἴπερ εἰσὶν αἰτίαι καὶ ἀρχαὶ τῶν 17
 φύσει ὄντων, ἐξ ὧν πρώτων εἰσὶ καὶ γεγονάσι μὴ κατὰ
 συμβεβηκὸς ἀλλ' ἕκαστον ὃ λέγεται κατὰ τὴν οὐσίαν, ὅτι
 γίγνεται πᾶν ἕκ τε τοῦ ὑποκειμένου καὶ τῆς μορφῆς· σύγ- 20
 κείται γὰρ ὁ μουσικὸς ἄνθρωπος ἐξ ἀνθρώπου καὶ μουσικοῦ
 τρόπου τινά· διαλύσεις γὰρ [τοὺς λόγους] εἰς τοὺς λόγους τοὺς
 ἐκείνων. δῆλον οὖν ὡς γίγνεται ἂν τὰ γιγνόμενα ἐκ τούτων. ἔστι
 δὲ τὸ μὲν ὑποκείμενον ἀριθμῶ μὲν ἓν, εἶδει δὲ δύο (ὁ μὲν γὰρ
 ἄνθρωπος καὶ ὁ χρυσὸς καὶ ὅλως ἡ ἕλη ἀριθμητὴ· τότε 25
 γὰρ τι μᾶλλον, καὶ οὐ κατὰ συμβεβηκὸς ἐξ αὐτοῦ γίγνεται
 τὸ γιγνόμενον· ἢ δὲ στέρησις καὶ ἢ ἐναντίωσις συμβεβηκός)·
 ἓν δὲ τὸ εἶδος, οἶον ἢ τάξις ἢ ἡ μουσικὴ ἢ τῶν ἄλλων τι
 τῶν οὕτω κατηγορουμένων. διὸ ἔστι μὲν ὡς δύο λεκτέον εἶναι
 τὰς ἀρχάς, ἔστι δ' ὡς τρεῖς· καὶ ἔστι μὲν ὡς τὰναντία, 30
 οἶον εἴ τις λέγοι τὸ μουσικὸν καὶ τὸ ἄμουσον ἢ τὸ θερμὸν καὶ
 τὸ ψυχρὸν ἢ τὸ ἡρμοσμένον καὶ τὸ ἀνάρμοστον, ἔστι δ' ὡς οὐ·
 ὑπ' ἀλλήλων γὰρ πάσχει τὰναντία ἀδύνατον. λύεται δὲ
 καὶ τοῦτο διὰ τὸ ἄλλο εἶναι τὸ ὑποκείμενον· τοῦτο γὰρ οὐκ
 ἐναντίον. ὥστε οὔτε πλείους τῶν ἐναντίων αἱ ἀρχαὶ τρόπον τινά, 35
 ἀλλὰ δύο ὡς εἰπεῖν τῷ ἀριθμῶ, οὐτ' αὖ παντελῶς δύο διὰ
 τὸ ἕτερον ὑπάρχειν τὸ εἶναι αὐτοῖς, ἀλλὰ τρεῖς· ἕτερον γὰρ 191^a
 τὸ ἀνθρώπῳ καὶ τὸ ἀμούσῳ εἶναι, καὶ τὸ ἀσχηματίστῳ
 καὶ χαλκῶ.

3

πόσαι μὲν οὖν αἱ ἀρχαὶ τῶν περὶ γένεσιν φυ- 3
 σικῶν, καὶ πῶς ποσαί, εἴρηται· καὶ δῆλόν ἐστιν ὅτι δεῖ ὑπο-
 κείσθαι τι τοῖς ἐναντίοις καὶ τὰναντία δύο εἶναι. τρόπον δέ 5
 τινα ἄλλον οὐκ ἀναγκαῖον· ἱκανὸν γὰρ ἔσται τὸ ἕτερον τῶν

^b 18 πρώτων EFIS et sup. lin. J²: πρώτων ex πρώτων fecit J² καὶ FIJ¹T: ἢ EJ²VPS 20 ἅπαν I: πάντα P: om. J 22 τοὺς λόγους secl. Diels: om. fort. PS: τοὺς ὄρους E λόγους] ὄρους γρ. P τοὺς om. P 23 ἐκείνου I 24 μὲν pr. E¹JPS: om. E²FIT 25 ἢ ΔPST: om. E ἀριθμητὴ ΠPST: ἢ ἀρρυθμιστος Bonitz 26 γὰρ τι EIJPS: τι γὰρ F: τι Bonitz 27 ἢ δὲ . . . συμβεβηκός om. I συμβέβηκεν P 30 τὰς ἀρχάς AVPS: om. E 32 τὸ tert. om. E 36 αὖ om. P 191^a 2 τὸ EP: τῷ Δ τὸ EJP: τῷ FI ante εἶναι add. τὸ FI et sup. lin. E¹: om. JP τῷ AS 3 οὖν APS S in *de Caelo*: οὖν εἰσὶν ET αἱ EFS S in *de Caelo*: om. IJT περὶ γένεσιν ΠPST: an omittenda? 4 καὶ πῶς ποσαί om. P ποσαί scripsi: πόσαι edd. εἴρηται ΔPT: εἴρηται E ἔσται F τι ὑποκείσθαι F 6 post τινα expunxit E ἔστιν ἔστι S^c

ἐναντίων ποιεῖν τῇ ἀπουσίᾳ καὶ παρουσίᾳ τὴν μεταβολήν. ἡ δὲ ὑποκειμένη φύσις ἐπιστητὴ κατ' ἀναλογίαν. ὡς γὰρ πρὸς ἀνδριάντα χαλκὸς ἢ πρὸς κλίνην ξύλον ἢ πρὸς τῶν ἄλλων
 10 τι τῶν ἐχόντων μορφήν [ἢ ὕλη καὶ] τὸ ἄμορφον ἔχει πρὶν λαβεῖν τὴν μορφήν, οὕτως αὕτη πρὸς οὐσίαν ἔχει καὶ τὸ τὸδε τι καὶ τὸ ὄν. μία μὲν οὖν ἀρχὴ αὕτη, οὐχ οὕτω μία οὐσα οὐδὲ οὕτως ὄν ὡς τὸ τὸδε τι, μία δὲ ἦς ὁ λόγος, ἔτι δὲ τὸ ἐναντίον τούτῳ, ἢ στέρησις. ταῦτα δὲ πῶς δύο καὶ πῶς
 15 πλείω, εἴρηται ἐν τοῖς ἄνω. πρῶτον μὲν οὖν ἐλέχθη ὅτι ἀρχαὶ τὰναντία μόνον, ὕστερον δ' ὅτι ἀνάγκη καὶ ἄλλο τι ὑποκεῖσθαι καὶ εἶναι τρία· ἔκ δὲ τῶν νῦν φανερόν τίς ἢ διαφορὰ τῶν ἐναντίων, καὶ πῶς ἔχουσιν αἱ ἀρχαὶ πρὸς ἀλλήλας, καὶ τί τὸ ὑποκείμενον. πότερον δὲ οὐσία τὸ εἶδος
 20 ἢ τὸ ὑποκείμενον, οὕτω δῆλον. ἀλλ' ὅτι αἱ ἀρχαὶ τρεῖς καὶ πῶς τρεῖς, καὶ τίς ὁ τρόπος αὐτῶν, δῆλον. πόσαι μὲν οὖν καὶ τίνες εἰσὶν αἱ ἀρχαί, ἐκ τούτων θεωρεῖσθωσαν.

Ὅτι δὲ μοναχῶς οὕτω λύεται καὶ ἡ τῶν ἀρχαίων 8
 ἀπορία, λέγωμεν μετὰ ταῦτα. ζητοῦντες γὰρ οἱ κατὰ φι-
 25 λосоφίαν πρῶτοι τὴν ἀλήθειαν καὶ τὴν φύσιν τῶν ὄντων ἐξετράπησαν οἶον ὁδόν τινα ἄλλην ἀπωσθέντες ὑπὸ ἀπειρίας, καὶ φασιν οὔτε γίνεσθαι τῶν ὄντων οὐδὲν οὔτε φθείρεσθαι διὰ τὸ ἀναγκαῖον μὲν εἶναι γίνεσθαι τὸ γιγνόμενον ἢ ἐξ ὄντος ἢ ἐκ μὴ ὄντος, ἐκ δὲ τούτων ἀμφοτέρων ἀδύνατον
 30 εἶναι· οὔτε γὰρ τὸ ὄν γίνεσθαι (εἶναι γὰρ ἤδη) ἔκ τε μὴ ὄντος οὐδὲν ἂν γενέσθαι ὑποκεῖσθαι γάρ τι δεῖν. καὶ οὕτω δὴ τὸ ἐφεξῆς συμβαῖνον αὐξοῦντες οὐδ' εἶναι πολλά φασιν
 33 ἀλλὰ μόνον αὐτὸ τὸ ὄν.

33 ἐκεῖνοι μὲν οὖν ταύτην ἔλαβον τὴν δόξαν διὰ τὰ εἰρημένα· ἡμεῖς δὲ λέγομεν ὅτι τὸ ἐξ ὄντος

^a 7 παρουσία καὶ τῇ ἀπουσίᾳ VS 8 φύσις ΠΤ: ὕλη S ὡς
 AST: ὡσπερ E 9 τῶν ἄλλων] ἄλλων F: ἄλλο S 10 ἢ ὕλη καὶ
 secl. Diels: om. S 11 τὸ om. P 13 οὐσα] οὐσα ὄν E ὄν]
 ἐν FIVP ἦς scripsi: ηι E¹: ἢ E²FIPS P in *de Anima*: ἢ
 Bekker: ἢ Torstrik: τὸ εἶδος ἢ Bonitz: om. J γρ. A S in *de Caelo*
 14 δὲ alt. om. E¹ 15 ἄνωθεν E ἀρχὴ P: αἱ ἀρχαὶ E¹ 21 τρεῖς
 EIJ²P: om. FJ¹ τίς sup. lin. E¹ 22 θεωρεῖσθω FJ: θεωρή-
 σθωσαν I 24 λέγωμεν EIJV: λέγομεν FST 25 τῶν EJ²T:
 τὴν τῶν FIJ¹ 26 ἀπειρίας FIVPT: ἀπορίας EJS 31 γενέσθαι
 E²APS: γίνεσθαι E¹ δεῖν S^c Bonitz: δεῖ PPS¹T

ἢ μὴ ὄντος γίνεσθαι, ἢ τὸ μὴ ὄν ἢ τὸ ὄν ποιεῖν τι ἢ 35
 πάσχειν ἢ ὄτι οὖν τόδε γίνεσθαι, ἕνα μὲν τρόπον οὐθὲν δια-
 φέρει ἢ τὸ τὸν ἱατρὸν ποιεῖν τι ἢ πάσχειν ἢ ἐξ ἱατροῦ 191^b
 εἶναι τι ἢ γίνεσθαι, ὥστ' ἐπειδὴ τοῦτο διχῶς λέγεται,
 δῆλον ὅτι καὶ τὸ ἐξ ὄντος καὶ τὸ ὄν ἢ ποιεῖν ἢ πά-
 σχειν. οἰκοδομεῖ μὲν οὖν ὁ ἱατρὸς οὐχ ἢ ἱατρὸς ἀλλ' ἢ
 οἰκοδόμος, καὶ λευκὸς γίνεσθαι οὐχ ἢ ἱατρὸς ἀλλ' ἢ μέλας· 5
 ἱατροῦ δὲ καὶ ἀνῆατρος γίνεσθαι ἢ ἱατρός. ἐπεὶ δὲ μάλιστα
 λέγομεν κυρίως τὸν ἱατρὸν ποιεῖν τι ἢ πάσχειν ἢ γίνεσθαι
 ἐξ ἱατροῦ, εἴαν ἢ ἱατρὸς ταῦτα πάσχη ἢ ποιῆ ἢ γίγνηται,
 δῆλον ὅτι καὶ τὸ ἐκ μὴ ὄντος γίνεσθαι τοῦτο σημαίνει, τὸ
 ἢ μὴ ὄν. ὅπερ ἐκείνοι μὲν οὐ διελόντες ἀπέστησαν, καὶ διὰ 10
 ταύτην τὴν ἄγνοίαν τοσοῦτον προσηγνόησαν, ὥστε μὴθὲν οἴε-
 σθαι γίνεσθαι μὴδ' εἶναι τῶν ἄλλων, ἀλλ' ἀνελεῖν πᾶσαν
 τὴν γένεσιν· ἡμεῖς δὲ καὶ αὐτοὶ φαμεν γίνεσθαι μὲν μὴθὲν
 ἀπλῶς ἐκ μὴ ὄντος, πῶς μέντοι γίνεσθαι ἐκ μὴ ὄντος, οἷον
 κατὰ συμβεβηκός (ἐκ γὰρ τῆς στερήσεως, ὃ ἐστι καθ' αὐτὸ μὴ 15
 ὄν, οὐκ ἐνυπάρχοντος γίνεσθαι τι· θαυμάζεται δὲ τοῦτο καὶ
 ἀδύνατον οὕτω δοκεῖ γίνεσθαι τι, ἐκ μὴ ὄντος)· ὡσαύτως δὲ
 οὐδ' ἐξ ὄντος οὐδὲ τὸ ὄν γίνεσθαι, πλὴν κατὰ συμβεβηκός· οὕτω
 δὲ καὶ τοῦτο γίνεσθαι, τὸν αὐτὸν τρόπον οἷον εἰ ἐκ ζῶου ζῶον
 γίγνοιτο καὶ ἐκ τινὸς ζῶου τι ζῶον· οἷον εἰ κύων (ἐκ κυνὸς ἢ 20
 ἵππος) ἐξ ἵππου γίγνοιτο. γίγνοιτο μὲν γὰρ ἂν οὐ μόνον ἐκ τι-
 νὸς ζῶου ὁ κύων, ἀλλὰ καὶ ἐκ ζῶου, ἀλλ' οὐχ ἢ ζῶον· ὑπ-
 ἄρχει γὰρ ἡδὴ τοῦτο· εἰ δέ τι μέλλει γίνεσθαι ζῶον μὴ
 κατὰ συμβεβηκός, οὐκ ἐκ ζῶου ἔσται, καὶ εἴ τι ὄν, οὐκ ἐξ
 ὄντος· οὐδ' ἐκ μὴ ὄντος· τὸ γὰρ ἐκ μὴ ὄντος εἴρηται ἡμῖν 25

^a 35 μὴ pr. ET : ἐκ μὴ AP μὴ ὄν ἢ τὸ E²IJPT : μὴ ὄν ἢ E¹ : ὄν ἢ
 τὸ μὴ FS τι E²APS : om. E¹ 36 ἢ om. E ^b 1 ἐξ
 E¹]S : τὸ ἐξ E²FI 2 διχῶς E²APST : διχῶς ἢ πλεοναχῶς E¹V
 3 ἢ om. F ἢ] τι ἢ FJ² 4 οὖν om. F 7 λέγομεν . . . τὸν
 om. J¹ 8 ταῦτα FJV : ταῦτὰ I : ταῦτα ταῦτὰ E ἢ γίγνηται
 om. AV 9 ἐκ μὴ ET : μὴ ἐξ AP τοῦτο EIP : καὶ τοῦτο FJV
 10 μὲν om. F 13 τὴν om. E μὴθὲν ES : οὐδὲν AP 14 ἐκ
 τοῦ μὴ P πῶς Cornford : ὅπως E : ὅμως A οἷον om. P 16 τι
 EIP¹ : om. FJPP 17 τι om. P 19 τὸν] κατὰ τὸν E
 post ζῶον add. ἂν FI et sup. lin. E¹ : om. JP 20 καὶ] καὶ εἰ I
 om. EJ¹P ἐκ alt. . . 21 ἵππου Laas : ἐξ ἵππου IPST : ἢ ἵππος
 γρ. S γίγνοιτο pr.] γένοιτο E μὲν om. FP 22 ὑπάρχον P
 25 ἡμῖν fecit I

τί σημαίνει, ὅτι ἦ μὴ ὄν. ἔτι δὲ καὶ τὸ εἶναι ἅπαν ἢ
27 μὴ εἶναι οὐκ ἀναιροῦμεν.

27 εἰς μὲν δὴ τρόπος οὔτος, ἄλλος δ'
ὅτι ἐνδέχεται ταῦτὰ λέγειν κατὰ τὴν δύναμιν καὶ τὴν ἐνέρ-
γειαν· τοῦτο δ' ἐν ἄλλοις διώριται δι' ἀκριβείας μᾶλλον.
30 ὥσθ' (ὅπερ ἐλέγομεν) αἱ ἀπορίαι λύνονται δι' ἄς ἀναγκα-
ζόμενοι ἀναιροῦσι τῶν εἰρημένων ἔνια· διὰ γὰρ τοῦτο τοσοῦτον
καὶ οἱ πρότερον ἐξετράπησαν τῆς ὁδοῦ τῆς ἐπὶ τὴν γένεσιν
καὶ φθορὰν καὶ ὅλως μεταβολήν· αὕτη γὰρ ἂν ὀφθεῖσα ἢ
φύσις ἅπασαν ἔλυσεν αὐτῶν τὴν ἄγνοιαν.

35 Ἡμμένοι μὲν οὖν καὶ ἕτεροὶ τιwές εἰσιν αὐτῆς, ἀλλ' οὐχ 9
ἱκανῶς. πρῶτον μὲν γὰρ ὁμολογοῦσιν ἁπλῶς γίνεσθαι τι ἐκ μὴ
192^a ὄντος, ἢ Παρμενίδην ὀρθῶς λέγειν· εἶτα φαίνεται αὐτοῖς,
εἴπερ ἐστὶν ἀριθμῶ μία, καὶ δυνάμει μία μόνον εἶναι. τοῦτο
δὲ διαφέρει πλείστον. ἡμεῖς μὲν γὰρ ὕλην καὶ στέρησιν ἕτε-
ρόν φαμεν εἶναι, καὶ τούτων τὸ μὲν οὐκ ὄν εἶναι κατὰ συμ-
5 βεβηκός, τὴν ὕλην, τὴν δὲ στέρησιν καθ' αὐτήν, καὶ τὴν
μὲν ἐγγὺς καὶ οὐσίαν πως, τὴν ὕλην, τὴν δὲ οὐδαμῶς· οἱ
δὲ τὸ μὴ ὄν τὸ μέγα καὶ τὸ μικρὸν ὁμοίως, ἢ τὸ συναμ-
φότερον ἢ τὸ χωρὶς ἐκότερον. ὥστε παντελῶς ἕτερος ὁ τρό-
πος οὔτος τῆς τριάδος κακείνος. μέχρι μὲν γὰρ δεῦρο προ-
10 ἦλθον, ὅτι δεῖ τιwὰ ὑποκεῖσθαι φύσιν, ταύτην μέντοι μίαν
ποιοῦσιν· καὶ γὰρ εἴ τις δυάδα ποιεῖ, λέγων μέγα καὶ μι-
κρὸν αὐτήν, οὐθὲν ἦττον ταῦτό ποιεῖ· τὴν γὰρ ἑτέραν παρείδεν.
ἢ μὲν γὰρ ὑπομένουσα συναιτία τῇ μορφῇ τῶν γιγνομένων
ἐστίν, ὥσπερ μήτηρ· ἢ δ' ἑτέρα μοῖρα τῆς ἐναντιώσεως πολ-
15 λάκις ἂν φαντασθεῖη τῷ πρὸς τὸ κακοποιὸν αὐτῆς ἀτενί-
ζοντι τὴν διάνοιαν οὐδ' εἶναι τὸ παράπαν. οὗτός γάρ τινος
θείου καὶ ἀγαθοῦ καὶ ἐφετοῦ, τὸ μὲν ἐναντίον αὐτῷ φαμεν

b 26 ἢ E²J²PS : ἢ τὸ FIJ¹ 28 ταῦτα IJP : ταῦτα E²F : ταῦτα
ταῦτα E¹ κατὰ] καὶ κατὰ I 30 ἐλέγομεν EFJ²VP : λέγομεν
IJ¹ 3I γὰρ] γὰρ τοι I 32 τὴν om. E 34 ἅπασαν
(πᾶσαν P) ἔλυσεν αὐτῶν APS : ἔλυσεν αὐτῶν πᾶσαν E : πᾶσαν ἔλυσεν
A in *Metaphysica* τὴν EPS : ταύτην τὴν Δ : om. A in *Meta-*
physica 36 τι IVP : om. EFJS 192^a 2 μόνον μίαν εἶναι
FP : μίαν εἶναι μόνον S μόνον fecit E¹ 4 φαμεν εἶναι ESP :
εἶναι φαμεν AS^cT οὐκ ὄν FIJ¹S : ὄν et in litura iv litt. οὐκ E : ὄν
οὐκ J² 6 καὶ om. IPS δέ] δὲ στέρησιν E²APS 11 μικρὸν I
12 αὐτήν] αὐτό F παρείδε τὴν στέρησιν ἢ I 13 τῆς
μορφῆς PS

εἶναι, τὸ δὲ ὃ πέφυκεν ἐφίεσθαι καὶ ὀρέγεσθαι αὐτοῦ κατὰ τὴν αὐτοῦ φύσιν. τοῖς δὲ συμβαίνει τὸ ἐναντίον ὀρέγεσθαι τῆς αὐτοῦ φθορᾶς. καίτοι οὔτε αὐτὸ αὐτοῦ οἶόν τε ἐφίεσθαι ²⁰ τὸ εἶδος διὰ τὸ μὴ εἶναι ἐνδεές, οὔτε τὸ ἐναντίον (φθαρτικὰ γὰρ ἀλλήλων τὰ ἐναντία), ἀλλὰ τοῦτ' ἔστιν ἢ ὕλη, ὥσπερ ἂν εἰ θῆλυ ἄρρενος καὶ αἰσχροὺν καλοῦ· πλὴν οὐ καθ' αὐτὸ αἰσχροὺν, ἀλλὰ κατὰ συμβεβηκός, οὐδὲ θῆλυ, ἀλλὰ κατὰ ²⁵ συμβεβηκός.

φθείρεται δὲ καὶ γίγνεται ἔστι μὲν ὡς, ἔστι δ' ²⁵ ὡς οὐ. ὡς μὲν γὰρ τὸ ἐν φῖ, καθ' αὐτὸ φθείρεται (τὸ γὰρ φθειρόμενον ἐν τούτῳ ἔστιν, ἢ στέρησις)· ὡς δὲ κατὰ δύναμιν, οὐ καθ' αὐτό, ἀλλ' ἄφθαρτον καὶ ἀγέννητον ἀνάγκη αὐτὴν εἶναι. εἴτε γὰρ ἐγίγνετο, ὑποκείσθαι τι δεῖ πρῶτον ἐξ οὗ ἐνυπάρχοντος· τοῦτο δ' ἔστιν αὐτὴ ἢ φύσις, ὥστ' ἔσται πρὶν ³⁰ γενέσθαι (λέγω γὰρ ὕλην τὸ πρῶτον ὑποκείμενον ἐκάστω, ἐξ οὗ γίγνεται τι ἐνυπάρχοντος μὴ κατὰ συμβεβηκός)· εἴτε φθείρεται, εἰς τοῦτο ἀφίξεται ἔσχατον, ὥστε ἐφθαρμένη ἔσται πρὶν φθαρῆναι. περὶ δὲ τῆς κατὰ τὸ εἶδος ἀρχῆς, πότερον μία ἢ πολλαὶ καὶ τίς ἢ τίνες εἰσὶν, δι' ἀκριβείας τῆς πρώ- ³⁵ τῆς φιλοσοφίας ἔργον ἔστιν διορίσαι, ὥστ' εἰς ἐκείνων τὸν καιρὸν ἀποκείσθω. περὶ δὲ τῶν φυσικῶν καὶ φθαρτῶν εἰδῶν ^{192^b} ἐν τοῖς ὕστερον δεικνυμένοις ἐροῦμεν. ὅτι μὲν οὖν εἰσὶν ἀρχαί, καὶ τίνες, καὶ πόσαι τὸν ἀριθμὸν, διορίσθω ἡμῖν οὕτως· πάλιν δ' ἄλλην ἀρχὴν ἀρξάμενοι λέγωμεν.

B.

I Τῶν ὄντων τὰ μὲν ἔστι φύσει, τὰ δὲ δι' ἄλλας αἰ- ⁸ τίας, φύσει μὲν τά τε ζῶα καὶ τὰ μέρη αὐτῶν καὶ τὰ

^a 18 ὃ om. EFJP αὐτοῦ κατὰ τὴν om. E¹ 22 τὰ E²AP: om. E¹ 23 θῆλυ] θῆλυ καὶ F 24-5 οὐδὲ... συμβεβηκός EIPS: om. FJT 26 τῷ ἐν J φθειρόμενον γὰρ I 27 κατὰ EFJP: κατὰ τὴν IS 28 ἀγέννητον EFPS: ἀγέννητον IJ 29 γίγνεται ST ἐξ EJ¹PT: τὸ ἐξ FIJ² 30 αὐτὴ E¹FVST: αὐτῆς IP: αὐτῆ J 33 εἰς EIPST: τι εἰς FJ 36 ἔστιν ἔργον F διορίσαι PSP: διορίσασθαι PS^c ^b I ἀποσοβείσθω I καὶ EPST: καὶ τῶν Λ 3 ἡμῶν F 4 ἄλλην om. E¹ λέγωμεν FIV: λέγομεν EJ, deinde in E τῶν γὰρ ὄντων τὰ μὲν ἔστιν φύσει, τὰ δὲ δι' ἄλλας αἰτίας

Tit. B. περὶ αἰτίων E 9 μὲν] δέ φαμεν εἶναι EP τά... IO καὶ alt. om. J¹

10 φυτὰ καὶ τὰ ἀπλὰ τῶν σωμάτων, οἶον γῆ καὶ πῦρ καὶ
 ἀήρ καὶ ὕδωρ (ταῦτα γὰρ εἶναι καὶ τὰ τοιαῦτα φύσει
 φαμέν), πάντα δὲ ταῦτα φαίνεται διαφέροντα πρὸς τὰ
 μὴ φύσει συνεστῶτα. τούτων μὲν γὰρ ἕκαστον ἐν ἑαυτῷ
 ἀρχὴν ἔχει κινήσεως καὶ στάσεως, τὰ μὲν κατὰ τόπον,
 15 τὰ δὲ κατ' αὐξήσιω καὶ φθίσιω, τὰ δὲ κατ' ἀλλοίωσιω·
 κλίωη δὲ καὶ ἰμάτιον, καὶ εἴ τι τοιοῦτον ἄλλο γένος
 ἐστίν, ἧ μὲν τετύχηκε τῆς κατηγορίας ἐκάστης καὶ
 καθ' ὅσον ἐστίν ἀπὸ τέχνης, οὐδεμίαν ὀρμὴν ἔχει μετα-
 βολῆς ἔμφυτον, ἧ δὲ συμβέβηκεν αὐτοῖς εἶναι λιθίνους ἢ
 20 γήινοισ ἢ μικτοῖς ἐκ τούτων, ἔχει, καὶ κατὰ τοσοῦτον, ὡς
 οὔσης τῆς φύσεως ἀρχῆς τιωὸς καὶ αἰτίας τοῦ κινεῖσθαι καὶ
 ἡρεμεῖν ἐν ᾧ ὑπάρχει πρῶτως καθ' αὐτὸ καὶ μὴ κατὰ
 συμβεβηκός (λέγω δὲ τὸ μὴ κατὰ συμβεβηκός, ὅτι γέ-
 νοιτ' ἂν αὐτὸς αὐτῷ τις αἴτιος ὑγιείας ὡν ἰατροί· ἀλλ'
 25 ὅμως οὐ καθὸ ὑγιάζεται τὴν ἰατρικὴν ἔχει, ἀλλὰ συμβέ-
 βηκεν τὸν αὐτὸν ἰατρὸν εἶναι καὶ ὑγιαζόμενον· διὸ καὶ χωρί-
 ζεται ποτ' ἀπ' ἀλλήλων). ὁμοίως δὲ καὶ τῶν ἄλλων ἕκα-
 στον τῶν ποιουμένων· οὐδὲν γὰρ αὐτῶν ἔχει τὴν ἀρχὴν ἐν ἑαυ-
 τῷ τῆς ποιήσεως, ἀλλὰ τὰ μὲν ἐν ἄλλοις καὶ ἔξωθεν, οἶον
 30 οἰκία καὶ τῶν ἄλλων τῶν χειροκμητῶν ἕκαστον, τὰ δ' ἐν
 αὐτοῖς μὲν ἀλλ' οὐ καθ' αὐτά, ὅσα κατὰ συμβεβηκός αἰ-
 τια γένοιτ' ἂν αὐτοῖς. φύσις μὲν οὖν ἐστὶ τὸ ῥηθέν· φύσιω δὲ
 ἔχει ὅσα τοιαύτην ἔχει ἀρχὴν. καὶ ἔστιω πάντα ταῦτα οὐσία·
 ὑποκειμένω γάρ τι, καὶ ἐν ὑποκειμένῳ ἐστὶν ἢ φύσις αἰεί.
 35 κατὰ φύσιω δὲ ταῦτά τε καὶ ὅσα τούτοις ὑπάρχει καθ'
 αὐτά, οἶον τῷ πυρὶ φέρεσθαι ἄνω· τοῦτο γὰρ φύσις μὲν οὐκ
 193^a ἔστιω οὐδ' ἔχει φύσιω, φύσει δὲ καὶ κατὰ φύσιω ἐστίν. τί μὲν

b 10 γῆ AT: γῆν E 11 ὕδωρ καὶ ἀέρα EV: ὕδωρ ἀήρ T ταῦτα
 . . . 12 φαμέν PS: secl. Prantl 12 ταῦτα VS et ut vid. E¹: τὰ
 ῥηθέντα E²Δ 13-14 τούτων . . . ἔχει EVAPT: τὰ μὲν γὰρ φύσει
 ὄντα πάντα φαίνεται ἔχοντα ἐν ἑαυτοῖς ἀρχὴν Δ 16 καὶ εἴ APST:
 ἢ E¹: καὶ E² 18 ὀρμὴν PPS: ἀρχὴν T γρ. S 19 λιθίνους
 ἢ γήινοισ εἶναι AT 20 καὶ om. FIPT 22 πρῶτως EFIJ²P:
 καὶ στάσεωσ ὡς I 21 τοῦ om. E 24 τις om. ET 25 καθότι
 πρῶτῳ J¹T κατὰ APST: om. E 26 τῆς ποιήσεωσ ἐν αὐτῷ F
 E 27 ἀπ' EFST: om. IJP 28 τῆς ποιήσεωσ ἐν αὐτῷ F
 32 τὸ ῥηθέν] τοῦτο S 33 ὅσα EFJPS: ὅσα τὴν IT πάντα
 ταῦτα ES: ταῦτα πάντα AP 36 πυρὶ] πυρὶ τὸ Δ 193^a I καὶ
 AP: om. E

οὖν ἔστιν ἡ φύσις, εἴρηται, καὶ τί τὸ φύσει καὶ κατὰ φύσιν.
ὡς δ' ἔστιν ἡ φύσις, πειρᾶσθαι δεικνύουσι γελοῖον· φανερόν
γὰρ ὅτι τοιαῦτα τῶν ὄντων ἔστιν πολλά. τὸ δὲ δεικνύουσι τὰ
φανερὰ διὰ τῶν ἀφανῶν οὐ δυναμένου κρίνειν ἔστι τὸ δι' αὐτὸ 5
καὶ μὴ δι' αὐτὸ γνώριμον (ὅτι δ' ἐνδέχεται τοῦτο πάσχειν, οὐκ
ἄδηλον· συλλογίζονται γὰρ ἂν τις ἐκ γενετῆς ὡν τυφλὸς
περὶ χρωμάτων), ὥστε ἀνάγκη τοῖς τοιοῦτοις περὶ τῶν ὀνομά-
των εἶναι τὸν λόγον, νοεῖν δὲ μηδέν. 9

δοκεῖ δ' ἡ φύσις καὶ ἡ 9
οὐσία τῶν φύσει ὄντων ἐνίοις εἶναι τὸ πρῶτον ἐνυπάρχον ἐκά- 10
στῳ, ἀρρῦθμιστον (ὄν) καθ' ἑαυτό, οἷον κλίνης φύσις τὸ ξύλον,
ἀνδριάτος δ' ὁ χαλκός. σημεῖον δὲ φησὶν Ἀντιφῶν ὅτι, εἴ
τις κατορύξειε κλίην καὶ λάβοι δύναμιν ἢ σηπεδῶν ὥστε
ἀνεῖναι βλαστόν, οὐκ ἂν γενέσθαι κλίην ἀλλὰ ξύλον, ὡς τὸ
μὲν κατὰ συμβεβηκὸς ὑπάρχον, τὴν κατὰ νόμον διάθεσιν 15
καὶ τὴν τέχνην, τὴν δ' οὐσίαν οὖσαν ἐκείνην ἢ καὶ διαμένει
ταῦτα πάσχουσα συνεχῶς. εἰ δὲ καὶ τούτων ἕκαστον πρὸς ἕτε-
ρόν τι ταῦτὸ τοῦτο πέπουθεν (οἷον ὁ μὲν χαλκὸς καὶ ὁ χρυσοὺς
πρὸς ὕδωρ, τὰ δ' ὅστ' αὐτὰ καὶ ξύλα πρὸς γῆν, ὁμοίως δὲ καὶ
τῶν ἄλλων ὀτιοῦν), ἐκεῖνο τὴν φύσιν εἶναι καὶ τὴν οὐσίαν αὐ- 20
τῶν. διὸ περὶ οἱ μὲν πῦρ, οἱ δὲ γῆν, οἱ δ' ἀέρα φασίν, οἱ δὲ
ὑδωρ, οἱ δ' ἔνια τούτων, οἱ δὲ πάντα ταῦτα τὴν φύσιν εἶ-
ναι τὴν τῶν ὄντων. ὁ γὰρ τις αὐτῶν ὑπέλαβε τοιοῦτον, εἴτε
ἐν εἴτε πλείω, τοῦτο καὶ τοσαῦτά φησὶν εἶναι τὴν ἅπασαν
οὐσίαν, τὰ δὲ ἄλλα πάντα πάθη τούτων καὶ ἕξεις καὶ δια- 25
θέσεις, καὶ τούτων μὲν ὀτιοῦν αἰδίου (οὐ γὰρ εἶναι μετα-
βολὴν αὐτοῖς ἐξ αὐτῶν), τὰ δ' ἄλλα γίνεσθαι καὶ φθει-
ρεσθαι ἀπειράκις. 28

ἔνα μὲν οὖν τρόπον οὕτως ἡ φύσις λέγεται, 28

^a 2 ἔστιν ἡ φύσις ES : ἡ φύσις ἔστιν IJ : φύσις ἔστιν F καὶ alt.
om. E¹ φύσιν] φύσιν ἔστιν S¹ 7 τυφλὸς ὡν F 9 νοεῖν δὲ
μηδέν ES : μηδέν δὲ νοεῖν Δ ἢ alt. om. F 10 οὐσία E²FIPS :
οὐσία ἢ J : E¹ dubium τῶν φύσει ὄντων ἔστι τὸ πρῶτον ἐνυπάρχον
in litura E² ἐνίοις εἶναι om. F 11 ὄν addidi (cf. M. 1014^b 28)
14 ἀφείναι T 15 κατὰ alt. E²AS : κατὰ τὸν E¹ νόμον]
ῥυθμὸν T γρ. P γρ. S 20 ἐκεῖνο E¹S : ἐκεῖνα E²AT 21 πῦρ . . .
γῆν EV : γῆν, οἱ δὲ πῦρ Δ 23 τὴν om. J¹ 24 φασιν Δ
25 καὶ pr. EIV : om. FJ 26 ὀτιοῦν E¹P : ὀτιοῦν εἶναι E²Δ
27 καὶ φθειρεσθαι AS : om. E 28 οὕτως ἡ φύσις ES : ἡ φύσις
οὕτω ΔP

ἡ πρώτη ἐκάστῳ ὑποκειμένη ὕλη τῶν ἐχόντων ἐν αὐτοῖς ἀρ-
 30 χὴν κινήσεως καὶ μεταβολῆς, ἄλλον δὲ τρόπον ἢ μορφήν
 καὶ τὸ εἶδος τὸ κατὰ τὸν λόγον. ὥσπερ γὰρ τέχνη λέγεται
 τὸ κατὰ τέχνην καὶ τὸ τεχνικόν, οὕτως καὶ φύσις τὸ κατὰ
 φύσιν [λέγεται] καὶ τὸ φυσικόν, οὔτε δὲ ἐκεῖ πῶ φαῖμεν ἂν
 ἔχειν κατὰ τὴν τέχνην οὐδέν, εἰ δυνάμει μόνον ἔστι κλίνη, μὴ
 35 πῶ δ' ἔχει τὸ εἶδος τῆς κλίνης, οὐδ' εἶναι τέχνην, οὔτ' ἐν
 τοῖς φύσει συνισταμένοις· τὸ γὰρ δυνάμει σὰρξ ἢ ὄστουν οὔτ'
 193^b ἔχει πῶ τὴν ἑαυτοῦ φύσιν, πρὶν ἂν λάβῃ τὸ εἶδος τὸ κατὰ
 τὸν λόγον, ᾧ ὀριζόμενοι λέγομεν τί ἐστι σὰρξ ἢ ὄστουν, οὔτε
 φύσει ἐστίν. ὥστε ἄλλον τρόπον ἢ φύσις ἂν εἴη τῶν ἐχόντων
 ἐν αὐτοῖς κινήσεως ἀρχὴν ἢ μορφήν καὶ τὸ εἶδος, οὐ χωρι-
 5 στὸν ὄν ἀλλ' ἢ κατὰ τὸν λόγον. (τὸ δ' ἐκ τούτων φύσις μὲν
 οὐκ ἔστιν, φύσει δέ, οἷον ἄνθρωπος.) καὶ μᾶλλον αὕτη φύσις
 τῆς ὕλης· ἕκαστον γὰρ τότε λέγεται ὅταν ἐντελεχεία ᾖ,
 μᾶλλον ἢ ὅταν δυνάμει. ἔτι γίνεταί ἄνθρωπος ἐξ ἀνθρώπου,
 ἀλλ' οὐ κλίνη ἐκ κλίνης· διὸ καὶ φασιν οὐ τὸ σχῆμα εἶναι
 10 τὴν φύσιν ἀλλὰ τὸ ξύλον, ὅτι γένοιτ' ἂν, εἰ βλαστάνοι, οὐ
 κλίνη ἀλλὰ ξύλον. εἰ δ' ἄρα τοῦτο φύσις, καὶ ἡ μορφή
 φύσις· γίνεταί γὰρ ἐξ ἀνθρώπου ἄνθρωπος. ἔτι δ' ἡ φύσις
 ἢ λεγομένη ὡς γένεσις ὁδὸς ἐστὶν εἰς φύσιν. οὐ γὰρ ὥσπερ
 ἢ ἰατρεισὶς λέγεται οὐκ εἰς ἰατρικὴν ὁδὸν ἀλλ' εἰς ὑγίειαν·
 15 ἀνάγκη μὲν γὰρ ἀπὸ ἰατρικῆς οὐκ εἰς ἰατρικὴν εἶναι τὴν ἰά-
 τρεισιν, οὐχ οὕτω δ' ἡ φύσις ἔχει πρὸς τὴν φύσιν, ἀλλὰ τὸ
 φνόμενον ἐκ τινὸς εἰς τὶ ἔρχεται ἢ φύεται. τί οὖν φύε-
 ται; οὐχὶ ἐξ οὗ, ἀλλ' εἰς ὅ. ἢ ἄρα μορφή φύσις. ἢ δὲ
 μορφή καὶ ἡ φύσις διχῶς λέγεται· καὶ γὰρ ἡ στέρησις εἰ-
 20 ὁδὸς πῶς ἐστίν. εἰ δ' ἔστιν στέρησις καὶ ἐναντίον τι περὶ τὴν
 ἀπλήν γένεσιν ἢ μὴ ἐστίν, ὕστερον ἐπισκεπτέον.

^a 29 ἀρχὴν κινήσεως EJPS : κινήσεως ἀρχὴν FI 32 κατὰ pr. APS :
 κατὰ τὴν E 33 λέγεται secl. Diels : om. S ἐκεῖ E¹V : ἐκεῖνό
 E²Λ πῶς FI φαμεν E 34 κατὰ HS : om. PT 36 οὐκ
 E ^b 1 πῶ F ἂν λάβῃ P : ἀναλάβῃ E : ἂν λάβῃ FI : ἢ λάβῃ J
 2 ᾧ E¹JV et ut vid. PT : ὁ E²FIS 6 αὕτη φύσις EPS : φύσις
 αὕτη Λ 9 διὸ φασὶ τὸ σχῆμα οὐκ E 10-11 ὅτι... ξύλον
 AS : om. E 11 φύσις scripsi, fort. cum PST : τέχνη Π : om.
 V, secl. Hamelin καὶ om. E² 12 γὰρ AS : γ' E ἢ APS :
 om. E 17 ἢ fecit E, leg. ut vid. T : ἢ AS τί οὖν φύεται
 J¹S : εἰς τί οὖν φύεται E²F¹J²P : om. E¹ 18 οὐχὶ εἰς τὸ ἐξ οὗ
 ἀλλ' εἰς τὸ εἰς ὁ IP ἄρα AS : om. E δὲ E¹PS : δὲ γ' E²Λ
 20 ἐστίν E²I¹J¹S : ἔστιν ἢ E¹F¹J²P τι FJVP : ὅτι E : om. I

2 Ἐπεὶ δὲ διώρισται ποσαχῶς ἡ φύσις, μετὰ τοῦτο θεωρητέον τίνοι διαφέρει ὁ μαθηματικὸς τοῦ φυσικοῦ (καὶ γὰρ ἐπίπεδα καὶ στερεὰ ἔχει τὰ φυσικὰ σώματα καὶ μήκη καὶ στιγμαί, περὶ ὧν σκοπεῖ ὁ μαθηματικὸς)· ἔτι εἰ ἡ 25 ἀστρολογία ἐτέρα ἢ μέρος τῆς φυσικῆς· εἰ γὰρ τοῦ φυσικοῦ τὸ τί ἐστὶν ἥλιος ἢ σελήνη εἰδέναι, τῶν δὲ συμβεβηκότων καθ' αὐτὰ μηδέν, ἄτοπον, ἄλλως τε καὶ ὅτι φαίνονται λέγοντες οἱ περὶ φύσεως καὶ περὶ σχήματος σελήνης καὶ ἡλίου, καὶ δὴ καὶ πότερον σφαιροειδῆς ἢ γῆ καὶ ὁ κόσμος ἢ οὐ. 30 περὶ τούτων μὲν οὖν πραγματεύεται καὶ ὁ μαθηματικὸς, ἀλλ' οὐχ ἢ φυσικοῦ σώματος πέρασ' ἕκαστον· οὐδὲ τὰ συμβεβηκότα θεωρεῖ ἢ τοιούτοις οὖσι συμβέβηκεν· διὸ καὶ χωρίζει· χωριστὰ γὰρ τῇ νοήσει κινήσεώς ἐστι, καὶ οὐδὲν διαφέρει, οὐδὲ γίνεταί ψεῦδος χωριζόντων. λαυθάνουσι δὲ τοῦτο ποι- 35 ούντες καὶ οἱ τὰς ἰδέας λέγοντες· τὰ γὰρ φυσικὰ χωρίζουσιν ἦττον ὄντα χωριστὰ τῶν μαθηματικῶν. γίνουτο δ' ἂν 194^a τοῦτο δῆλον, εἴ τις ἐκατέρων πειρῶτο λέγειν τοὺς ὄρους, καὶ αὐτῶν καὶ τῶν συμβεβηκότων. τὸ μὲν γὰρ περιττὸν ἔσται καὶ τὸ ἄρτιον καὶ τὸ εὐθὺ καὶ τὸ καμπύλον, ἔτι δὲ ἀριθμὸς καὶ γραμμὴ καὶ σχῆμα, ἄνευ κινήσεως, σὰρξ δὲ καὶ ὄστυον 5 καὶ ἄνθρωπος οὐκέτι, ἀλλὰ ταῦτα ὥσπερ ῥίσι σιμῆ ἀλλ' οὐχ ὡς τὸ καμπύλον λέγεται. δηλοῖ δὲ καὶ τὰ φυσικώτερα τῶν μαθημάτων, ὅσον ὀπτική καὶ ἁρμονική καὶ ἀστρολογία· ἀνάπαλι γὰρ τρόπον τιν' ἔχουσιν τῇ γεωμετρίᾳ. ἡ μὲν γὰρ γεωμετρία περὶ γραμμῆς φυσικῆς σκοπεῖ, ἀλλ' οὐχ ἢ φυ- 10 σική, ἢ δ' ὀπτική μαθηματικὴν μὲν γραμμὴν, ἀλλ' οὐχ ἢ μαθηματικὴ ἀλλ' ἢ φυσική.

ἔπει δ' ἡ φύσις διχῶς, τό τε 12

^b 22 ἡ φύσις] ἡ φύσις λέγεται E²AS: λέγεται ἡ φύσις P
 23 μαθητικὸς E 24 φυσικὰ] φυσικὰ καὶ E¹ 25 μαθητικὸς E εἰ
 Susemihl: δ' J²P: δ' εἰ Basiliensis: om. EFIJ 27 ἡ AP:
 καὶ EV δὲ E¹AP: τε E² 29 σελήνης καὶ ἡλίου EIJV: ἡλίου
 καὶ σελήνης FST 30 δὴ καὶ om. E¹T: δὴ E²I ἡ γῆ καὶ ὁ
 κόσμος AST: ὁ κόσμος καὶ ἡ γῆ EV 31 μὲν οὖν τούτων I μαθη-
 τικὸς E 36 οἱ περὶ τὰς F 194^a I μαθητικῶν E 3 ἔστι
 FT 4 ἔτι δὲ] αἷτια E² 6 οὐκέτι AP: οὐκ αἷτια in litura
 E ταῦτα AP: αὐτὰ E 8 μαθημάτων IJ²P: μαθητῶν E¹:
 μαθηματικῶν E²FJ¹ 9 ἔχουσι τρόπον τινὰ F ἡ... IO γεωμετρία
 E²FJPS Olympiodorus: om. E¹: ἀλλ' ἡ μὲν γεωμετρία IV
 II μαθητικὴν E 12 ἐπεὶ EJS: ἐπειδὴ FIT δὲ καὶ ἡ F

εἶδος καὶ ἡ ὕλη, ὡς ἂν εἰ περὶ σιμότητος σκοποῦμεν τί ἐστίν,
 οὕτω θεωρητέον· ὥστ' οὐτ' ἄνευ ὕλης τὰ τοιαῦτα οὔτε κατὰ τὴν
 15 ὕλην. καὶ γὰρ δὴ καὶ περὶ τούτου ἀπορήσειεν ἂν τις,
 ἐπεὶ δύο αἱ φύσεις, περὶ ποτέρας τοῦ φυσικοῦ. ἢ περὶ τοῦ ἐξ
 ἀμφοῦν; ἀλλ' εἰ περὶ τοῦ ἐξ ἀμφοῦν, καὶ περὶ ἐκατέρας.
 πότερον οὖν τῆς αὐτῆς ἢ ἄλλης ἐκατέραν γνωρίζειν; εἰς μὲν
 γὰρ τοὺς ἀρχαίους ἀποβλέψαντι δόξειεν ἂν εἶναι τῆς ὕλης
 20 (ἐπὶ μικρὸν γάρ τι μέρος Ἐμπεδοκλῆς καὶ Δημόκριτος τοῦ
 εἶδους καὶ τοῦ τί ἦν εἶναι ἠψαντο)· εἰ δὲ ἡ τέχνη μιμεῖται
 τὴν φύσιν, τῆς δὲ αὐτῆς ἐπιστήμης εἰδέναί τὸ εἶδος καὶ τὴν
 ὕλην μέχρι του (οἶον ἰατροῦ ὑγίειαν καὶ χολὴν καὶ φλέγμα,
 ἐν οἷς ἡ ὑγίεια, ὁμοίως δὲ καὶ οἰκοδόμου τό τε εἶδος τῆς
 25 οἰκίας καὶ τὴν ὕλην, ὅτι πλίνθοι καὶ ξύλα· ὡσαύτως δὲ
 καὶ ἐπὶ τῶν ἄλλων), καὶ τῆς φυσικῆς ἂν εἴη τὸ γνωρίζειν
 ἀμφοτέρας τὰς φύσεις. ἔτι τὸ οὐ ἔνεκα καὶ τὸ τέλος τῆς
αὐτῆς, καὶ ὅσα τούτων ἔνεκα. ἢ δὲ φύσις τέλος καὶ οὐ ἔνε-
 30 κα (ὧν γὰρ συνεχοῦς τῆς κινήσεως οὔσης ἔστι τι τέλος,
 τοῦτο (τὸ) ἔσχατον καὶ τὸ οὐ ἔνεκα· διὸ καὶ ὁ ποιητῆς
 γελοῖως προήχθη εἰπεῖν “ἔχει τελευτήν, ἥσπερ οὔνεκ' ἐγένε-
 νετο”. βούλεται γὰρ οὐ πᾶν εἶναι τὸ ἔσχατον τέλος, ἀλλὰ
 τὸ βέλτιστον)· ἐπεὶ καὶ ποιούσιν αἱ τέχναι τὴν ὕλην αἱ μὲν
 ἀπλῶς αἱ δὲ εὐεργόν, καὶ χρώμεθα ὡς ἡμῶν ἔνεκα πάν-
 35 των ὑπαρχόντων (ἐσμὲν γὰρ πῶς καὶ ἡμεῖς τέλος· διχῶς
 γὰρ τὸ οὐ ἔνεκα· εἴρηται δ' ἐν τοῖς περὶ φιλοσοφίας). δύο
 194^b δὲ αἱ ἄρχουσαι τῆς ὕλης καὶ γνωρίζουσαι τέχναι, ἡ τε
 χρωμένη καὶ τῆς ποιητικῆς ἢ ἀρχιτεκτονικῆς. διὸ καὶ ἡ
 χρωμένη ἀρχιτεκτονικῆ πῶς, διαφέρει δὲ ἢ ἢ μὲν τοῦ εἶ-
 5 δους γνωριστικῆ, [ἢ ἀρχιτεκτονικῆ,] ἢ δὲ ὡς ποιητικῆ, τῆς
 ὕλης· ὁ μὲν γὰρ κυβερνήτης ποῖόν τι τὸ εἶδος τοῦ πηδαλίου

^a 13 σιμότητος ΔΡΤ: σιμοῦ Ε τί ἐστίν σκοποῦμεν ΔΡ 15 τού-
 του Ε¹VPST: τούτου διχῶς Ε²Λ: τούτου ἴσως Bonitz 16 ἐπειδὴ
 FT 17 εἰ] αἰεῖ Ε 19 ἀποβλέψαντι ΔΡ: βλέψαντι Ε ἂν
 om. F 24 ὑγίεια ΔVT: ὑγίειν ἄπερ ὡς ὕλη Ε 27 ἀμφοτέρας
 om. F 28 φύσις τὸ τέλος οὐ F 29 τι ἐστὶ Ι τέλος, ...
 30 ἔσχατον scripsi, fort. habuit S: τέλος, τοῦτο ἔσχατον Ε¹VP: τέλος
 τῆς κινήσεως, τοῦτο ἔσχατον Ε²Λ: ἔσχατον, τοῦτο τέλος ci. AP, legit
 fort. T 30 καὶ εὐριπίδης ὁ F ^b 1 δὲ Ε]²T: δὴ Ι]¹: δὲ
 καὶ Ρ: δὴ καὶ F καὶ FP: καὶ αἰ ΕΙJ 3 ἢ om. F 4 [ἢ
 ἀρχιτεκτονικῆ] ἢ δὲ Prantl¹: ἢ δὲ, ἢ ἀρχιτεκτονικῆ vel ἢ δὲ ἀρχιτεκτονικῆ
 ci. Prantl: ἢ pr. sup. lin. habet, ἢ alt. erasit E

γνωρίζει καὶ ἐπιτάττει, ὁ δ' ἐκ ποίου ξύλου καὶ ποίων κινήσεων ἔσται. ἐν μὲν οὖν τοῖς κατὰ τέχνην ἡμεῖς ποιούμεν τὴν ὕλην τοῦ ἔργου ἕνεκα, ἐν δὲ τοῖς φυσικοῖς ὑπάρχει οὐσα. ἔτι τῶν πρὸς τι ἢ ὕλη· ἄλλω γὰρ εἶδει ἄλλη ὕλη. 9

μέχρι δὴ 9
πόσου τὸν φυσικὸν δεῖ εἰδέναι τὸ εἶδος καὶ τὸ τί ἐστίν; ἢ 10
ὡσπερ ἱατρὸν νεῦρον ἢ χαλκία χαλκόν, μέχρι τοῦ τίνος
[γὰρ] ἕνεκα ἕκαστον, καὶ περὶ ταῦτα ἃ ἐστὶ χωριστὰ μὲν εἶ-
δει, ἐν ὕλῃ δέ; ἄνθρωπος γὰρ ἄνθρωπον γεννᾷ καὶ ἥλιος.
πῶς δ' ἔχει τὸ χωριστὸν καὶ τί ἐστίν, φιλοσοφίας ἔργον
διορίσαι τῆς πρώτης. 15

- 3 Διωρισμένων δὲ τούτων ἐπισκεπτέον περὶ τῶν αἰτίων, ποῖά τε καὶ πόσα τὸν ἀριθμὸν ἐστίν. ἐπεὶ γὰρ τοῦ εἰδέναι χάρις ἢ πραγματεία, εἰδέναι δὲ οὐ πρότερον ολόμεθα ἕκαστον πρὶν ἂν λάβωμεν τὸ διὰ τί περὶ ἕκαστον (τοῦτο δ' ἐστὶ τὸ λαβεῖν τὴν πρώτην αἰτίαν), δῆλον ὅτι καὶ ἡμῖν τοῦτο ποιη- 20
τέον καὶ περὶ γενέσεως καὶ φθορᾶς καὶ πάσης τῆς φυσικῆς μεταβολῆς, ὅπως εἰδότες αὐτῶν τὰς ἀρχὰς ἀνάγειν εἰς αὐτὰς πειρώμεθα τῶν ζητουμένων ἕκαστον. ἕνα μὲν οὖν τρόπον αἴτιον λέγεται τὸ ξξ οὗ γίγνεται τι ἐνυπάρχοντος, οἷον ὁ χαλκὸς τοῦ ἀνδριάντος καὶ ὁ ἄργυρος τῆς φιάλης καὶ τὰ 25
τούτων γένη· ἄλλον δὲ τὸ εἶδος καὶ τὸ παράδειγμα, τοῦτο δ' ἐστὶν ὁ λόγος ὁ τοῦ τί ἦν εἶναι καὶ τὰ τούτου γένη (οἷον τοῦ διὰ πασῶν τὰ δύο πρὸς ξν, καὶ ὅλως ὁ ἀριθμὸς) καὶ τὰ μέρη τὰ ἐν τῷ λόγῳ. ἔτι ὅθεν ἢ ἀρχὴ τῆς μεταβολῆς ἢ πρώτη ἢ τῆς ἡρεμήσεως, οἷον ὁ βουλεύσας αἴτιος, καὶ ὁ πα- 30

194^b 23—195^b 21 = *Met. Δ. 2*

^b 6 καὶ alt. EJP: καὶ ἐκ FI 7 κατὰ AP: κατὰ τὴν E 9 τι
ἢ E²F¹I²J²PS: τῇ E¹: τι J¹ ἄλλω... ὕλη post IO ἐστίν F
IO τὸν om. F II ἱατρὸν EFJS: τὸν ἱατρὸν IT ἢ ES:
καὶ AV τοῦ τίνος scripsi: του τίνος E¹J: τοῦ εἰδέναι τίνος F:
τίνος, τίνος S: τίνος ἕνεκα, τίνος γρ. A: του. τίνος Aldina: του. τίνος
Jaeger 12 γὰρ seclusi: habent PS γρ. A ἃ AS et sup. lin.
E¹ εἶδη JS 13 καὶ ὁ ἥλιος F 14-15 φιλοσοφίας...
πρώτης IS: φιλοσοφίας τῆς πρώτης διορίσαι ἔργον E²FJ: τῆς πρώτης
ἔργον φιλοσοφίας διορίσαι T: φιλοσοφίας τῆς πρώτης ἐστίν E¹V
17 ἐπειδὴ τοῦ S 18 ἢ] τὰ φυσικὰ ἢ I 21 καὶ tert. ES:
καὶ περὶ AP 22 αὐτῶν τὰς ἀρχὰς APS: τὰς ἀρχὰς αὐτῶν E
26 ἄλλο I 27 ὁ alt. EIJP: om. FTM οἷον τὸν διὰ E 30 ἢ
fecit E²

τῆρ τοῦ τέκνου, καὶ ὅλως τὸ ποιοῦν τοῦ ποιουμένου καὶ τὸ μετα-
βάλλον τοῦ μεταβαλλομένου. ἔτι ὡς τὸ τέλος· τοῦτο δ' ἐστὶν
τὸ οὐ ἔνεκα, οἷον τοῦ περιπατεῖν ἢ ὑγίεια· διὰ τί γὰρ περι-
πατεῖ; φαιμέν “ἵνα ὑγιαίνῃ”, καὶ εἰπόντες οὕτως οἰόμεθα ἀπο-
35 δεδωκέναι τὸ αἴτιον. καὶ ὅσα δὴ κινήσαντος ἄλλου μεταξὺ
γίγνεται τοῦ τέλους, οἷον τῆς ὑγείας ἢ ἰσχυασία ἢ ἡ κάθαρ-
195^a σις ἢ τὰ φάρμακα ἢ τὰ ὄργανα· πάντα γὰρ ταῦτα τοῦ
τέλους ἔνεκά ἐστιν, διαφέρει δὲ ἀλλήλων ὡς ὄντα τὰ μὲν
3 ἔργα τὰ δ' ὄργανα.

3 τὰ μὲν οὖν αἴτια σχεδὸν τοσαυταχῶς
λέγεται, συμβαίνει δὲ πολλαχῶς λεγομένων τῶν αἰτίων καὶ
5 πολλὰ τοῦ αὐτοῦ αἴτια εἶναι, οὐ κατὰ συμβεβηκός, οἷον τοῦ
ἀνδριάντος καὶ ἢ ἀνδριανοποιικῆ καὶ ὁ χαλκός, οὐ καθ'
ἕτερόν τι ἀλλ' ἢ ἀνδριάς, ἀλλ' οὐ τὸν αὐτὸν τρόπον, ἀλλὰ
τὸ μὲν ὡς ὕλη τὸ δ' ὡς ὄθεν ἢ κίνησις. ἐστὶν δέ τινα καὶ
ἀλλήλων αἴτια, οἷον τὸ πονεῖν τῆς εὐεξίας καὶ αὕτη τοῦ
10 πονεῖν· ἀλλ' οὐ τὸν αὐτὸν τρόπον, ἀλλὰ τὸ μὲν ὡς τέλος
τὸ δ' ὡς ἀρχὴ κινήσεως. ἔτι δὲ τὸ αὐτὸ τῶν ἐναντίων
ἐστίν· ὁ γὰρ παρὸν αἴτιον τοῦδε, τοῦτο καὶ ἀπὸν αἰτιώμεθα
ἐνίοτε τοῦ ἐναντίου, οἷον τὴν ἀπουσίαν τοῦ κυβερνήτου τῆς τοῦ
πλοίου ἀνατροπῆς, οὗ ἦν ἢ παρουσία αἰτία τῆς σωτηρίας.]
15 ἅπαντα δὲ τὰ ῥῖν εἰρημένα αἴτια εἰς τέτταρας πίπτει τρόπους
τοὺς φανερωτάτους. τὰ μὲν γὰρ στοιχεῖα τῶν συλλαβῶν καὶ
ἢ ὕλη τῶν σκευαστῶν καὶ τὸ πῦρ καὶ τὰ τοιαῦτα τῶν σω-
μάτων καὶ τὰ μέρη τοῦ ὄλου καὶ αἱ ὑποθέσεις τοῦ συμπε-
ράσματος ὡς τὸ ἐξ οὗ αἰτία ἐστίν, τούτων δὲ τὰ μὲν ὡς τὸ
20 ὑποκείμενον, οἷον τὰ μέρη, τὰ δὲ ὡς τὸ τί ἦν εἶναι, τὸ τε
ὄλον καὶ ἢ σύνθεσις καὶ τὸ εἶδος· τὸ δὲ σπέρμα καὶ ὁ
λα- τρὸς καὶ ὁ βουλεύσας καὶ ὅλως τὸ ποιοῦν, πάντα
ὄθεν ἢ ἀρχὴ τῆς μεταβολῆς ἢ στάσεως· τὰ δ' ὡς τὸ

^b 31 τοῦ pr. om. I 34 ὑγιαίνῃ EJS: ὑγιάνῃ FI 36 γένηται
E ἰσχυασία I 195^a I ἢ τὰ φάρμακα E²AMVST: om. E¹ γὰρ
ΠT: om. Sussemihl et fort. P 4 λέγεται om. F 6 καὶ
om. Λ ἀνδριανοποιικῆ E et fecit J¹: ἀνδριανοποιητικῆ FI οὐ
AM: ταῦτα δὲ οὐ E 8 κίνησις E²AM: κινήσις ἐστίν E¹ 9 τῆς]
αἴτιον τῆς Λ 12 ἐστίν EFJM: ἐστὶν αἴτιον I 13 τῆς τοῦ sup.
lin. E¹ 15 τρόπους πίπτει AMPT: πίπτει τόπους Bekker
17 ἢ om. E σκευαστῶν AMPS: κατασκευαστῶν E 23 στάσεως
E¹MVS: στάσεως ἢ κινήσεως E²AP τὰ HMS¹: τὸ PSP δ'
APS: δ' ἄλλα E

τέλος καὶ τὰγαθὸν τῶν ἄλλων· τὸ γὰρ οὐ ἐνεκα βέλτιστον
καὶ τέλος τῶν ἄλλων ἐθέλει εἶναι· διαφερέτω δὲ μηδὲν εἰ- 25
πεὺν αὐτὸ ἀγαθὸν ἢ φαινόμενον ἀγαθόν. 26

τὰ μὲν οὖν αἷτια 26
ταῦτα καὶ τοσαῦτά ἐστι τῶ¹ εἶδει· τρόποι δὲ τῶν αἰτίων
ἀριθμῶ μὲν εἰσὶ πολλοί, κεφαλαιούμενοι δὲ καὶ οὗτοι ἐλάτ-
τους. λέγεται γὰρ αἷτια πολλαχῶς, καὶ αὐτῶν τῶν ὁμοει-
δῶν προτέρως καὶ ὑστέρωσ ἄλλο ἄλλου, οἷον ὑγείας ἰατρὸς 30
καὶ τεχνίτης, καὶ τοῦ διὰ πασῶν τὸ διπλάσιον καὶ ἀριθ-
μός, καὶ αἰεὶ τὰ περιέχοντα πρὸς τὰ καθ' ἕκαστον. | ἔτι δ'
ὡς τὸ συμβεβηκὸς καὶ τὰ τούτων γένη, οἷον ἀνδριάντος ἄλ-
λως Πολύκλειτος καὶ ἄλλως ἀνδριαντοποιός, ὅτι συμβέβηκε
τῶ ἀνδριαντοπιῶ τὸ Πολυκλείτω εἶναι. καὶ τὰ περιέχοντα δὲ 35
τὸ συμβεβηκός, οἷον εἰ ὁ ἄνθρωπος αἷτιος εἴη ἀνδριάντος ἢ
ὄλως ζῶον. ἐστι δὲ καὶ τῶν συμβεβηκῶτων ἄλλα ἄλλων 195^b
πορρώτερον καὶ ἐγγύτερον, οἷον εἰ ὁ λευκὸς καὶ ὁ μουσικὸς αἷ-
τιος λέγοιτο τοῦ ἀνδριάντος. | πάντα δὲ καὶ τὰ οἰκείως λεγό-
μενα καὶ τὰ κατὰ συμβεβηκός τὰ μὲν ὡς δυνάμενα λέ-
γεται τὰ δ' ὡς ἐνεργούντα, οἷον τοῦ οἰκοδομῆσθαι οἰκίαν | οἰ- 5
κοδόμος ἢ οἰκοδομῶν οἰκοδόμος. | ὁμοίως δὲ λεχθήσεται καὶ
ἐφ' ὧν αἷτια τὰ αἷτια τοῖς εἰρημένους, οἷον τοῦ δι' ἀνδριάν-
τος ἢ ἀνδριάντος ἢ ὄλως εἰκόνας, καὶ χαλκοῦ τοῦδε ἢ
χαλκοῦ ἢ ὄλως ὕλης· καὶ ἐπὶ τῶν συμβεβηκῶτων ὡσαύ-
τως. | ἔτι δὲ συμπλεκόμενα καὶ ταῦτα κάκεια λεχθήσεται, 10
οἷον οὐ Πολύκλειτος οὐδὲ ἀνδριαντοποιός, ἀλλὰ Πολύκλειτος
ἀνδριαντοποιός. | ἀλλ' ὅμως ἅπαντα ταῦτά ἐστι τὸ μὲν πλη-
θος ἕξ, λεγόμενα δὲ διχῶς· ἢ γὰρ ὡς τὸ καθ' ἕκαστον,

^a 24-5 τὸ . . . ἄλλων E²AMPST: om. E¹ 25-6 μηδὲν . . .
ἀγαθόν] αὐτὸ μηδὲν εἰπεῖν ἀγαθόν FI: μηδὲν αὐτὸ εἰπεῖν ἀγαθόν JM:
μηδὲν ἀγαθόν αὐτὸ εἰπεῖν T 27 ταῦτα] τοιαῦτα I 29 γὰρ
EIJMP: γὰρ τὰ FT 30 ἄλλο ἄλλου EIS: ἄλλου ἄλλο
FJ ὑγείας ὁ ἰατρὸς FIMPT 31 καὶ pr.] καὶ ὁ IJP καὶ
tert. E¹M: καὶ ὁ E²AP 32 περιέχοντα AV: om. E τὸ IJP:
τῶ F ἕκαστα I 33 et 34 ἄλλος I 36 ἀνδριάντος εἴη E
^b I ὄλως τὸ ζῶον I 2 καὶ ὁ μουσικὸς E²AMVPST: om. E¹
3 πάντα EFV: παρὰ πάντα IJMPS 5 οἰκίαν E²AV: om.
E¹M ὁ οἰκοδόμος A 6 ἢ EJMS: ἢ ὁ FI ante οἰκοδόμος
erasit J ὁ δειχθήσεται F 7 τοῦδε AMP τού AMP:
om. E 8 ἢ ἀνδριάντος sup. lin. E¹ ἢ alt. EMVP: ἢ καὶ A
9 ἢ] ἢ καὶ F II οἷον . . . ἀνδριαντοποιός in mg. J¹ οὐδὲ . . .
Πολύκλειτος om. I

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Β

ἢ ὡς τὸ γένος, ἢ ὡς τὸ συμβεβηκός, ἢ ὡς τὸ γένος τοῦ
 15 συμβεβηκότος, ἢ ὡς συμπλεκόμενα ταῦτα ἢ ὡς ἀπλῶς
 λεγόμενα· πάντα δὲ ἢ ἐνεργοῦντα ἢ κατὰ δύναμιν. | δια-
 φέρει δὲ τοσοῦτον, ὅτι τὰ μὲν ἐνεργοῦντα καὶ τὰ καθ' ἕκα-
 στον ἅμα ἔστι καὶ οὐκ ἔστι | καὶ ὦν αἴτια, οἷον ὄδ' ὁ λα-
 τρεύων τῷδε τῷ ὑγιαζομένῳ καὶ ὄδε ὁ οἰκοδομῶν τῷδε
 20 τῷ οἰκοδομουμένῳ, τὰ δὲ κατὰ δύναμιν οὐκ αἰεί. φθεί-
 21 ρεται γὰρ οὐχ ἅμα ἢ οἰκία καὶ ὁ οἰκοδόμος.

21 δεῖ δ' αἰεί
 τὸ αἴτιον ἐκάστου τὸ ἀκρότατον ζητεῖν, ὥσπερ καὶ ἐπὶ τῶν
 ἄλλων (οἷον ἄνθρωπος οἰκοδομεῖ ὅτι οἰκοδόμος, ὁ δ' οἰκο-
 δόμος κατὰ τὴν οἰκοδομικήν· τοῦτο τοίνυν πρότερον τὸ αἴ-
 25 τιον, καὶ οὕτως ἐπὶ πάντων)· ἔτι τὰ μὲν γένη τῶν γενῶν,
 τὰ δὲ καθ' ἕκαστον τῶν καθ' ἕκαστον (οἷον ἀνδριαντο-
 ποὺς μὲν ἀνδριάντος, ὀδὶ δὲ τουδί)· καὶ τὰς μὲν δυνάμεις
 τῶν δυνατῶν, τὰ δ' ἐνεργοῦντα πρὸς τὰ ἐνεργούμενα. ὅσα
 μὲν οὖν τὰ αἴτια καὶ ὄν τρόπον αἴτια, ἔστω ἡμῖν διωρισμένα
 30 ἴκανῶς.

Λέγεται δὲ καὶ ἡ τύχη καὶ τὸ αὐτόματον τῶν αἰτίων, 4
 καὶ πολλὰ καὶ εἶναι καὶ γίνεσθαι διὰ τύχην καὶ διὰ τὸ
 αὐτόματον· τίνα οὖν τρόπον ἐν τούτοις ἐστὶ τοῖς αἰτίοις ἡ τύχη
 καὶ τὸ αὐτόματον, καὶ πότερον τὸ αὐτὸ ἢ τύχη καὶ τὸ
 35 αὐτόματον ἢ ἕτερον, καὶ ὅλως τί ἐστὶν ἡ τύχη καὶ τὸ αὐ-
 τόματον, ἐπισκεπτέον. ἔνιοι γὰρ καὶ εἰ ἔστιν ἢ μὴ ἀποροῦσιν·
 196^a οὐδὲν γὰρ δὴ γίνεσθαι ἀπὸ τύχης φασίν, ἀλλὰ πάντων εἶναι
 τι αἴτιον ὀρισμένον ὅσα λέγομεν ἀπὸ ταυτομάτου γίνεσθαι
 ἢ τύχης, οἷον τοῦ ἐλθεῖν ἀπὸ τύχης εἰς τὴν ἀγοράν, καὶ
 5 ἀγοράσαι ἐλθόντα· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν ἀπὸ
 τύχης λεγομένων αἰεί τι εἶναι λαβεῖν τὸ αἴτιον, ἀλλ' οὐ τύ-
 χην, ἐπεὶ εἴ γέ τι ἦν ἡ τύχη, ἄτοπον ἂν φανείη ὡς ἀλη-

^b 15 ὡς alt. ΠΜ: om. S 16 ἢ pr. om. J¹ 18 αἴτια fecit E
 18 et 19 ὁ ΔΤ: om. E 20 τὰ E²ΔΡST: τὸ E¹ 23 ἄνθρωπος
 scripsi, leg. fort. P: ἄνθρωπος PS 24 κατὰ] ὅτι κατὰ ES 26 ἕκα-
 στον EPT: ἕκαστα Δ ἕκαστον EP: ἕκαστα Δ 27 ὄδε δὲ τοῦδε E¹
 32 διὰ AST: διὰ τὴν E: καὶ διὰ F διὰ om. I 34 ἢ om. IJT
 35 ἢ . . . αὐτόματον] αὐτόματον καὶ ἢ τύχη EV 36 εἰ καὶ I
 196^a I δὴ om. Λ 2 τι om. FT λεγόμενα I ταυτομάτου FIS:
 αὐτομάτου EJ 3 ἢ] καὶ F καὶ καταλαβεῖν εἰς τὴν ἀγοράν I
 5 ἐλθόντα ἀγοράσαι Λ 6 λεγομένων ΔVPST: λέγομεν E²: om. E¹

θῶς, καὶ ἀπορήσειεν ἂν τις διὰ τί ποτ' οὐδεὶς τῶν ἀρχαίων
σοφῶν τὰ αἷτια περὶ γενέσεως καὶ φθορᾶς λέγων περὶ τύ-
χης οὐδὲν διώρισε, ἀλλ' ὡς ἔοικεν, οὐδὲν ᾠοντο οὐδ' ἐκέλευοι εἶ- 10
ναι ἀπὸ τύχης. ἀλλὰ καὶ τοῦτο θαυμαστόν· πολλὰ γὰρ
καὶ γίγνεται καὶ ἔστι ἀπὸ τύχης καὶ ἀπὸ ταυτομάτου, ἃ
οὐκ ἀγνοοῦντες ὅτι ἔστι ἐπαυενεγκεῖν ἕκαστον ἐπὶ τι αἷτιον τῶν
γιγνομένων, καθάπερ ὁ παλαιὸς λόγος εἶπεν ὁ ἀναιρῶν τὴν
τύχην, ὅμως τούτων τὰ μὲν εἶναι φασι πάντες ἀπὸ τύχης 15
τὰ δ' οὐκ ἀπὸ τύχης· διὸ καὶ ἀμῶς γέ πως ἦν ποιητέον αὐ-
τοῖς μνεῖαν. ἀλλὰ μὴν οὐδ' ἐκέλευον γέ τι ᾠοντο εἶναι τὴν
τύχην, οἷον φιλίαν ἢ νεῖκος ἢ νοῦν ἢ πῦρ ἢ ἄλλο γέ τι τῶν
τοιούτων. ἄτοπον οὖν εἶτε μὴ ὑπελάμβανον εἶναι εἶτε οἰόμε-
νοι παρέλειπον, καὶ ταῦτ' ἐνόητε χρώμενοι, ὥσπερ Ἐμπε- 20
δοκλῆς οὐκ ἀεὶ τὸν ἀέρα ἀνωτάτω ἀποκρίνεσθαι φησιν, ἀλλ'
ὅπως ἂν τύχη. λέγει γοῦν ἐν τῇ κοσμοποιίᾳ ὡς “οὔτω συνέ-
κυρσε θέων τοτέ, πολλάκι δ' ἄλλως”. καὶ τὰ μόρια τῶν
ζῶων ἀπὸ τύχης γενέσθαι τὰ πλείστα φησιν. 24

εἰσὶ δέ τινες 24

οἳ καὶ τοῦρανοῦ τοῦδε καὶ τῶν κόσμων πάντων αἰτιῶνται τὸ 25
αὐτόματον· ἀπὸ ταυτομάτου γὰρ γενέσθαι τὴν δύνην καὶ
τὴν κίνησιν τὴν διακρίνασαν καὶ καταστήσασαν εἰς ταύτην
τὴν τάξιν τὸ πᾶν. καὶ μάλα τοῦτό γε αὐτὸ θαυμάσαι ἄξιον· λέ-
γοντες γὰρ τὰ μὲν ζῶα καὶ τὰ φυτὰ ἀπὸ τύχης μήτε
εἶναι μήτε γίγνεσθαι, ἀλλ' ἦτοι φύσιν ἢ νοῦν ἢ τι τοιούτου 30
ἕτερον εἶναι τὸ αἷτιον (οὐ γὰρ ὅ τι ἔτυχεν ἐκ τοῦ σπέρματος
ἐκάστου γίγνεται, ἀλλ' ἐκ μὲν τοῦ τοιουδὶ ἐλαία ἐκ δὲ τοῦ
τοιουδὶ ἄνθρωπος), τὸν δ' οὐρανὸν καὶ τὰ θειώτατα τῶν φα-
νερῶν ἀπὸ τοῦ αὐτομάτου γενέσθαι, τοιαύτην δ' αἷτιαν μη-

^a 8 καὶ] κἂν E διὰ τί ποτ'] τί δήποτε A 12 ἀπὸ . . . ταυτο-
μάτου ΠΤ: secl. Torstrik ἃ οὐκ fecit E 13 ἔστιν] ἐστι, δεῖν
εἰ δ' fecit E ἐπενεγκεῖν F τῶν γιγνομένων] ᾠρισμένων Torstrik
14 εἶπεν om. fort. S, secl. Diels 15 ὁμοίως E 18 νοῦν ἢ πῦρ EVT:
πῦρ ἢ νοῦν Δ 20 παρέλειπον EFJP: παρέλιπον IST 21 ἀνωτάτω
ἀποκρίνεσθαι ES: ἀποκρίνεσθαι ἀνωτάτω Δ 22 οὖν ἐν F 23 τοτέ
Torstrik: τότε Π 24 φησιν ΔS: φησὶν οὗτος E 25 κόσμων
E¹PST: κοσμικῶν E²ΔV ἀπάντων S 26 γενέσθαι Torstrik:
γίγνεσθαι ΠP φασι τὴν I 28 γε αὐτὸ om. E¹: γε om.
T λέγοντας FJ 29 γὰρ om. F: τὸ J²: τὸ γὰρ E²J¹ 30 ἢ
νοῦν] ἦντιν' οὖν E² τι EIJPS: om. FT 32 ἐλαίαν I
33 ἄνθρωπον I θειώτατα PS: θειώτερα Π 34 γενέσθαι E²ΔS:
γίγνεσθαι E¹ δ' om. E¹

35 δεμίαν εἶναι ὅταν τῶν ζώων καὶ τῶν φυτῶν. καίτοι εἰ οὕτως
 ἔχει, τοῦτ' αὐτὸ ἄξιον ἐπιστάσεως, καὶ καλῶς ἔχει λεχ-
 196^b θῆναί τι περὶ αὐτοῦ. πρὸς γὰρ τῷ καὶ ἄλλως ἄτοπον εἶναι
 τὸ λεγόμενον, ἔτι ἀτοπώτερον τὸ λέγειν ταῦτα ὀρώντας ἐν
 μὲν τῷ οὐρανῷ οὐδὲν ἀπὸ ταυτομάτου γιγνόμενον, ἐν δὲ τοῖς
 οὐκ ἀπὸ τύχης πολλὰ συμβαίνοντα ἀπὸ τύχης· καίτοι εἰκός
 5 γε ἦν τοῦναντίον γίγνεσθαι.

5 εἰσὶ δὲ τινες οἷς δοκεῖ εἶναι μὲν
 αἰτία ἡ τύχη, ἀθλος δὲ ἀνθρωπίνῃ διανοίᾳ ὡς θεῖόν τι οὕσα
 καὶ δαιμονιώτερον. ὥστε σκεπτέον καὶ τί ἐκάτερον, καὶ εἰ
 ταυτὸν ἢ ἕτερον τό τε αὐτόματον καὶ ἡ τύχη, καὶ πῶς εἰς
 τὰ διωρισμένα αἴτια ἐμπίπτουσιν.

10 Πρῶτον μὲν οὖν, ἐπειδὴ ὀρώμεν τὰ μὲν αἰεὶ ὡσαύτως 5
 γιγνόμενα τὰ δὲ ὡς ἐπὶ τὸ πολὺ, φανερὸν ὅτι οὐδετέρου τούτων
 αἰτία ἡ τύχη λέγεται οὐδὲ τὸ ἀπὸ τύχης, οὔτε τοῦ ἕξ ἀνάγκης
 καὶ αἰεὶ οὔτε τοῦ ὡς ἐπὶ τὸ πολὺ. ἀλλ' ἐπειδὴ ἔστιν ἃ γίγνε-
 ται καὶ παρὰ ταῦτα, καὶ ταῦτα πάντες φασὶν εἶναι ἀπὸ
 15 τύχης, φανερὸν ὅτι ἔστι τι ἡ τύχη καὶ τὸ αὐτόματον· τὰ
 τε γὰρ τοιαῦτα ἀπὸ τύχης καὶ τὰ ἀπὸ τύχης τοιαῦτα
 ὄντα ἴσμεν. τῶν δὲ γιγνομένων τὰ μὲν ἕνεκά του γίγνεται
 τὰ δ' οὐ (τούτων δὲ τὰ μὲν κατὰ προαίρεσιν, τὰ δ' οὐ κατὰ
 προαίρεσιν, ἄμφω δ' ἐν τοῖς ἕνεκά του), ὥστε δηλον ὅτι καὶ
 20 ἐν τοῖς παρὰ τὸ ἀναγκαῖον καὶ τὸ ὡς ἐπὶ τὸ πολὺ ἔστιν ἕνια
 περὶ ἃ ἐνδέχεται ὑπάρχειν τὸ ἕνεκά του. ἔστι δ' ἕνεκά του
 ὅσα τε ἀπὸ διανοίας ἂν πραχθεῖη καὶ ὅσα ἀπὸ φύσεως.
 τὰ δὴ τοιαῦτα ὅταν κατὰ συμβεβηκὸς γένηται, ἀπὸ τύ-
 χης φημὲν εἶναι (ὥσπερ γὰρ καὶ ὃν ἔστι τὸ μὲν καθ' αὐτὸ

196^b 21-5 = Met. K. 1065^a 26-30

^a 35 εἰ] γε εἰ I	36 τοῦτ' E ¹ S: τοῦτό γε E ² AP	αὐτὸ E ¹ AP:
ταῦτο E ² : αὐτῶν S	^b I τοῦτου S: αὐτοῦ τοῦτου J	ἄτοπον AS:
ἄλογον EVP	2 ὀρώντα E	4 τύχης pr. FIS: τύχης εἶναι
EJ	5 γε om. E ¹ S	γενέσθαι E ² IJS
μὲν εἶναι αἰτία S ¹ : αἰτία μὲν εἶναι S ^o T: εἶναι μέντοι P		εἶναι αἰτία μὲν E:
αὐτὸ E	τε om. F	II τὸ AP: om. E
om. F	τὸ ὡς F	ὅτι] ὡς F
F	ταῦτα πάντες ES: πάντες ταῦτα Λ	13 καὶ
τύχης om. F	17 του om. E ¹	20 παρὰ] περὶ FJ ²
AS: om. EP	22 τε om. FPST	14 περὶ
Torstrik, fort. T	23 γένηται ΠMP: γένηται αἰτία Torstrik,	16 καὶ... τὸ tert.
fort. T	24 ὄν] ο E ¹	

τὸ δὲ κατὰ συμβεβηκός, οὕτω καὶ αἴτιον ἐνδέχεται εἶναι, 25
οἶον οἰκίας καθ' αὐτὸ μὲν αἴτιον τὸ οἰκοδομικόν, κατὰ συμ-
βεβηκός δὲ τὸ λευκὸν ἢ τὸ μουσικόν· τὸ μὲν οὖν καθ' αὐτὸ
αἴτιον ὠρισμένον, τὸ δὲ κατὰ συμβεβηκός ἀόριστον· ἄπειρα
γὰρ ἂν τῷ ἐνὶ συμβαίῃ). καθάπερ οὖν ἐλέχθη, ὅταν ἐν τοῖς
ἐνεκά του γιγνομένοις τοῦτο γένηται, τότε λέγεται ἀπὸ ταυ- 30
τομάτου καὶ ἀπὸ τύχης (αὐτῶν δὲ πρὸς ἄλληλα τὴν διαφο-
ρὰν τούτων ὑστερον διοριστέον· νῦν δὲ τοῦτο ἔστω φανερόν, ὅτι
ἄμφω ἐν τοῖς ἐνεκά του ἔστιν)· οἶον ἐνεκα τοῦ ἀπολαβεῖν τὸ ἀρ-
γύριον ἦλθεν ἂν κομιζόμενον τὸν ξρανον, εἰ ἦδει· ἦλθε δ' οὐ τού-
του ἐνεκα, ἀλλὰ συνέβη αὐτῷ ἐλθεῖν, καὶ ποιῆσαι τοῦτο τοῦ κο- 35
μίσασθαι ἐνεκα· τοῦτο δὲ οὐθ' ὡς ἐπὶ τὸ πολὺ φοιτῶν εἰς τὸ
χωρίον οὐτ' ἐξ ἀνάγκης· ἔστι δὲ τὸ τέλος, ἢ κομιδῆ, οὐ τῶν ἐν 197^a
αὐτῷ αἰτίων, ἀλλὰ τῶν προαιρετῶν καὶ ἀπὸ διανοίας· καὶ
λέγεται γε τότε ἀπὸ τύχης ἐλθεῖν, εἰ δὲ προελόμενος καὶ
τούτου ἐνεκα ἢ αἰεὶ φοιτῶν ἢ ὡς ἐπὶ τὸ πολὺ [κομιζόμε-
νος], οὐκ ἀπὸ τύχης. δῆλον ἄρα ὅτι ἡ τύχη αἰτία κατὰ 5
συμβεβηκός ἐν τοῖς κατὰ προαίρεσιν τῶν ἐνεκά του. διὸ
περὶ τὸ αὐτὸ διάνοια καὶ τύχη· ἢ γὰρ προαίρεσις οὐκ ἄνευ
διανοίας. 8

ἀόριστα μὲν οὖν τὰ αἴτια ἀνάγκη εἶναι ἀφ' ὧν 8
ἂν γένοιτο τὸ ἀπὸ τύχης. ὅθεν καὶ ἡ τύχη τοῦ ἀορίστου εἶναι
δοκεῖ καὶ ἄδηλος ἀνθρώπῳ, καὶ ἔστιν ὡς οὐδὲν ἀπὸ τύχης 10
δόξειεν ἂν γίνεσθαι. πάντα γὰρ ταῦτα ὀρθῶς λέγεται,
εὐλόγως. ἔστιν μὲν γὰρ ὡς γίγνεται ἀπὸ τύχης· κατὰ συμ-
βεβηκός γὰρ γίγνεται, καὶ ἔστιν αἴτιον ὡς συμβεβηκός ἢ
τύχη· ὡς δ' ἀπλῶς οὐδενός· οἶον οἰκίας οἰκοδόμος μὲν αἰ-

197^a 5-14 = 1065^a 30-35

^b 29 τῷ ἐν τῷ F 30 του γιγνομένοις om. E¹ τότε] το
E¹ τοῦ ταυτομάτου J 31 αὐτὴν F 34 κομιζόμενου
JPST: κομιζόμενος E¹: κομισαμένου E²: κομισόμενος FI γρ. P
35 αὐτῷ om. APS του κομισασθαι ἐνεκα IPS: secl. Bonitz
197^a I ἔστι] ἔτι fecit E 2 προαιρετῶν καὶ IPS: ἀπροαιρετῶν
καὶ οὐκ γρ. I V γρ. A 3 γε τότε] τὸ E καὶ om. E¹S 4 κομι-
ζόμενος secl. Torstrik, om. fort. PT 6 τοῖς E¹AMS: τοῖς ἐπ'
ἔλαττον E²P τῶν ΠM: om. S 9 ἀπὸ AMPST: ἀπὸ τῆς E
καὶ] δοκεῖ ΔT του ἀορίστου (ἀρίστου I) IIS: ἀρίστος P 10 δοκεῖ
om. ΔT ἀπὸ τύχης οὐδὲν I 12 ὅτι εὐλόγως APS ὡς] ὡς
οὐδὲν Torstrik

- 15 τιος, κατὰ συμβεβηκός δὲ αὐλητής, καὶ τοῦ ἐλθόντα κο-
 μίσασθαι τὸ ἀργύριον, μὴ τούτου ἕνεκα ἐλθόντα, ἄπειρα τὸ
 πλήθος· καὶ γὰρ ἰδεῖν τινα βουλόμενος καὶ διώκων καὶ φεύγων
 καὶ θεασόμενος. καὶ τὸ φάναι εἶναι τι παράλογον τὴν τύχην ὀρ-
 θῶς· ὁ γὰρ λόγος ἢ τῶν ἀεὶ ὄντων ἢ τῶν ὡς ἐπὶ τὸ πολὺ, ἢ δὲ
 20 τύχῃ ἐν τοῖς γιγνομένοις παρὰ ταῦτα. ὥστ' ἐπεὶ ἀόριστα
 τὰ οὕτως αἷτια, καὶ ἡ τύχῃ ἀόριστον. ὅμως δ' ἐπ' ἐνίων
 ἀπορήσειεν ἂν τις, ἅρ' οὖν τὰ τυχόντα αἷτι' ἂν γένοιτο τῆς
 τύχης· οἷον ὑγίειας ἢ πνεύμα ἢ εἰλησις, ἀλλ' οὐ τὸ ἀποκε-
 κάρθαι· ἔστιν γὰρ ἄλλα ἄλλων ἐγγύτερα τῶν κατὰ συμ-
 25 βεβηκός αἷτιών. τύχῃ δὲ ἀγαθὴ μὲν λέγεται ὅταν ἀγα-
 θόν τι ἀποβῆῃ, φαῦλη δὲ ὅταν φαῦλόν τι, εὐτυχία δὲ
 καὶ δυστυχία ὅταν μέγεθος ἔχοντα ταῦτα· διὸ καὶ τὸ παρὰ
 μικρὸν κακὸν ἢ ἀγαθὸν λαβεῖν μέγα ἢ εὐτυχεῖν ἢ ἀτυ-
 χεῖν ἐστίν, ὅτι ὡς ὑπάρχον λέγει ἢ διάνοια· τὸ γὰρ παρὰ
 30 μικρὸν ὥσπερ οὐδὲν ἀπέχειν δοκεῖ. ἔτι ἀβέβαιον ἢ εὐτυχία
 εὐλόγως· ἡ γὰρ τύχῃ ἀβέβαιος· οὔτε γὰρ ἀεὶ οὐθ' ὡς ἐπὶ
 τὸ πολὺ οἷόν τ' εἶναι τῶν ἀπὸ τύχης οὐθέν. ἔστι μὲν οὖν ἄμφω
 αἷτια, καθάπερ εἴρηται, κατὰ συμβεβηκός—καὶ ἡ τύχῃ
 καὶ τὸ αὐτόματον—ἐν τοῖς ἐνδεχομένοις γίνεσθαι μὴ ἀπλῶς
 35 μῆδ' ὡς ἐπὶ τὸ πολὺ, καὶ τούτων ὅσ' ἂν γένοιτο ἕνεκά του.

Διαφέρει δ' ὅτι τὸ αὐτόματον ἐπὶ πλείον ἐστι· τὸ μὲν 6
 γὰρ ἀπὸ τύχης πᾶν ἀπὸ ταυτομάτου, τοῦτο δ' οὐ πᾶν
 197^b ἀπὸ τύχης. ἡ μὲν γὰρ τύχῃ καὶ τὸ ἀπὸ τύχης ἐστὶν ὅσοις
 καὶ τὸ εὐτυχεῖν ἂν ὑπάρξειεν καὶ ὅλως πρᾶξις. διὸ καὶ

197^a 25-7 = 1065^a 35-^b 1

^a 17 φεύγων καὶ θεασόμενος SP: φεύγων καὶ θεασόμενος T: θεασό-
 μενος καὶ φεύγων FI: θεασόμενος φεύγων J: φεύγων EV 18 εἶναι
 τι φάναι F: εἶναι φάναι τι IJ: εἶναι φάναι S 20 ταῦτα ΔΡ:
 ταῦτα E ἐπειδὴ E²IJ 21 ὅμως E²ΔPS: ὁμοίως E¹
 22 γένοιτο ἂν S 23 εἰλησις S: εἰλησις EIJ: εἰλις F: εἰλη-
 θήρησις PT ἀποκεκαάρθαι I 25 τύχῃ ΔPS: εὐτυχία δὲ ἐστὶν
 ὅταν ὡς προείλετο ἀποβῆῃ, ἀτυχία δ' ὅταν παρὰ τὴν προαίρεσιν. τύχῃ ET
 27 περὶ F 28 κακὸν ἢ ἀγαθὸν PPS: ἀγαθὸν ἢ κακὸν P¹ et ut
 vid. T λαβεῖν μέγα ΔPS: μέγα λαβεῖν E εὐτυχεῖν ἢ ἀτυχεῖν
 EVS: ἀτυχεῖν ἢ εὐτυχεῖν P¹ et ut vid. T: εὐτυχεῖν ἢ δυστυχεῖν PP:
 δυστυχεῖν ἢ εὐτυχεῖν Δ 29 ἐστίν ΔΡ: ἐστίν τι E περὶ F
 32 ἄμφω ΔVPS: om. E 35 ὅσ' ἂν γένοιτο EFJPS: ὅσ' ἂν
 γένοιτο ἐν τοῖς I: ἐν τοῖς Torstrik, fort. T 37 πᾶν pr. EJ²VST:
 om. FIJ¹ ^b 1 ἐστὶν EFJT: ἐστὶν ἐν IP

ἀνάγκη περὶ τὰ πρακτὰ εἶναι τὴν τύχην (σημείον δ' ὅτι
δοκεῖ ἦτοι ταῦτόν εἶναι τῇ εὐδαιμονίᾳ ἢ εὐτυχίᾳ ἢ ἐγγύς,
ἢ δ' εὐδαιμονία πράξις τις· εὐπραξία γάρ), ὥσθ' ὀπόσοις 5
μὴ ἐνδέχεται πράξαι, οὐδὲ τὸ ἀπὸ τύχης τι ποιῆσαι. καὶ
διὰ τοῦτο οὔτε ἀψυχον οὐδὲν οὔτε θηρίον οὔτε παιδίον οὐδὲν ποιεῖ
ἀπὸ τύχης, ὅτι οὐκ ἔχει προαίρεσιν· οὐδ' εὐτυχία οὐδ' ἀτυ-
χία ὑπάρχει τούτοις, εἰ μὴ καθ' ὁμοιότητα, ὥσπερ ἔφη
Πρώταρχος εὐτυχεῖς εἶναι τοὺς λίθους ἐξ ὧν οἱ βωμοί, ὅτι 10
τιμῶνται, οἱ δὲ ὁμόζυγες αὐτῶν καταπατοῦνται. τὸ δὲ
πάσχειν ἀπὸ τύχης ὑπάρξει πως καὶ τούτοις, ὅταν ὁ πρατ-
των τι περὶ αὐτὰ πράξῃ ἀπὸ τύχης, ἄλλως δὲ οὐκ ἔστιν· τὸ
δ' αὐτόματον καὶ τοῖς ἄλλοις ζῴοις καὶ πολλοῖς τῶν ἀψύ-
χων, οἷον ὁ ἵππος αὐτόματος, φαμέν, ἦλθεν, ὅτι ἐσώθη 15
μὲν ἐλθὼν, οὐ τοῦ σωθῆναι δὲ ἔνεκα ἦλθε· καὶ ὁ τρίπους αὐτό-
ματος κατέπεσεν· ἔστη μὲν γὰρ τοῦ καθῆσθαι ἔνεκα, ἀλλ'
οὐ τοῦ καθῆσθαι ἔνεκα κατέπεσεν. ὥστε φανερόν ὅτι ἐν τοῖς
ἀπλῶς ἔνεκά του γιγνομένοις, ὅταν μὴ τοῦ συμβάντος ἔνεκα γέ-
νηται ὧν ἔξω τὸ αἴτιον, τότε ἀπὸ τοῦ αὐτομάτου λέγομεν· ἀπὸ 20
τύχης δέ, τούτων ὅσα ἀπὸ τοῦ αὐτομάτου γίνεται τῶν προαι-
ρετῶν τοῖς ἔχουσι προαίρεσιν. σημείον δὲ τὸ μάτην, ὅτι λέγε-
ται ὅταν μὴ γένηται τὸ ἔνεκα ἄλλου ἐκείνου ἔνεκα, οἷον εἰ τὸ
βαδίσαι λαπάξεως ἔνεκά ἐστιν, εἰ δὲ μὴ ἐγένετο βαδίσαντι,
μάτην φαμέν βαδίσαι καὶ ἡ βάδισις ματαία, ὡς τοῦτο δὴν 25
τὸ μάτην, τὸ πεφυκὸς ἄλλου ἔνεκα, ὅταν μὴ περαίνῃ ἐκείνο
οὐ ἔνεκα ἦν καὶ ἐπεφύκει, ἐπεὶ εἴ τις λούσασθαι φαίῃ μάτην ὅτι
οὐκ ἐξέλιπεν ὁ ἥλιος, γελοῖος ἂν εἴη· οὐ γὰρ ἦν τοῦτο ἐκεί-
νου ἔνεκα. οὕτω δὴ τὸ αὐτόματον καὶ κατὰ τὸ ὄνομα ὅταν
αὐτὸ μάτην γένηται· κατέπεσεν γὰρ οὐ τοῦ πατάξαι ἔνεκεν 30

^b 3 τὴν APT: om. E 4 ἡ εὐτυχία om. FJ¹P 5 ὄσοις
AT 6 τὸ om. T, secl. Torstrik 12 ἀπὸ τύχης ὑπάρχει F:
ὑπάρξει ἀπὸ τύχης J: ὑπάρχει ἀπὸ τύχης P 13 ἀπὸ] τι ἀπὸ EJ²P
14 ἄλλοις PP¹S: ἀλόγοις APP καὶ om. I πολλοῖς EI¹PS:
om. FAT τῶν ἀψύχων EIVPS: τοῖς ἀψύχοις FJAT 17 ἔστη
AV: ἔστι E γὰρ (ἂν) Torstrik 19 του om. F 20 ὧν
PP: οὐ S 22 τοῖς PPS¹: ἐν τοῖς SPT 23 τὸ ... ἐκείνου
PP (ἄλλο ex ἄλλου fecit E): τῷ ἔνεκα ἄλλου ἐκείνου οὐ Prantl, fort.
ST: τὸ οὐ ἔνεκα ἄλλο ἐκείνου γρ. S: τὸ οὐ ἔνεκα, ἀλλ' ὁ ἐκείνου
Torstrik εἰ τὸ βαδίσαι ES: τὸ βαδίσαι εἰ Λ: τὸ βαδίσαι
Bekker 24 δὲ om. S 25 φαμέν EV: ἔφαμεν Λ 27 ἦν
καὶ om. EV: ἦν ἢ ST 28 ἐξέλιπεν APS: ἐξέλειπεν E 29 καὶ
om. Λ 30 οὐ] ὁ F

ὁ λίθος· ἀπὸ τοῦ αὐτομάτου ἄρα κατέπεσεν ὁ λίθος, ὅτι πέσοι ἂν ὑπὸ τινὸς καὶ τοῦ πατάξαι ἔνεκα.

32 μάλιστα δ' ἐστὶ χωριζόμενον τοῦ ἀπὸ τύχης ἐν τοῖς φύσει γιγνομένοις· ὅταν γὰρ γένηται τι παρὰ φύσιν, τότε οὐκ ἀπὸ τύχης
35 ἀλλὰ μᾶλλον ἀπὸ ταυτομάτου γεγονέναι φαμέν. ἐστὶ δὲ καὶ τοῦτο ἕτερον· τοῦ μὲν γὰρ ἔξω τὸ αἴτιον, τοῦ δ' ἐντός.

198^a τί μὲν οὖν ἐστὶν τὸ αὐτόματον καὶ τί ἢ τύχη, εἴρηται, καὶ τί διαφέρουσιν ἀλλήλων. τῶν δὲ τρόπων τῆς αἰτίας ἐν τοῖς ὅθεν ἢ ἀρχῇ τῆς κινήσεως ἐκάτερον αὐτῶν· ἢ γὰρ τῶν φύσει τι ἢ τῶν ἀπὸ διανοίας αἰτιῶν αἰεὶ ἐστὶν· ἀλλὰ τούτων
5 τὸ πλῆθος ἀόριστον. ἐπεὶ δ' ἐστὶ τὸ αὐτόματον καὶ ἡ τύχη αἴτια ὧν ἂν ἢ νοῦς γένοιτο αἴτιος ἢ φύσις, ὅταν κατὰ συμβεβηκὸς αἰτιῶν τι γένηται τούτων αὐτῶν, οὐδὲν δὲ κατὰ συμβεβηκὸς ἐστὶ πρότερον τῶν καθ' αὐτό, δηλοῦν ὅτι οὐδὲ τὸ κατὰ συμβεβηκὸς αἴτιον πρότερον τοῦ καθ' αὐτό. ὕστερον ἄρα τὸ
10 αὐτόματον καὶ ἡ τύχη καὶ νοῦ καὶ φύσεως· ὥστ' εἰ ὅτι μάλιστα τοῦ οὐρανοῦ αἴτιον τὸ αὐτόματον, ἀνάγκη πρότερον νοῦν αἴτιον καὶ φύσιν εἶναι καὶ ἄλλων πολλῶν καὶ τοῦδε τοῦ παντός.

Ἔστι δὲ ἐστὶν αἴτια, καὶ ὅτι τὸσαῦτα τὸν ἀριθμὸν ὅσα 7
15 φαμέν, δηλοῦν· τὸσαῦτα γὰρ τὸν ἀριθμὸν τὸ διὰ τί περιελήφεν· ἢ γὰρ εἰς τὸ τί ἐστὶν ἀνάγεται τὸ διὰ τί ἔσχατον, ἐν τοῖς ἀκινήτοις (οἷον ἐν τοῖς μαθήμασι· εἰς ὄρισμόν γὰρ τοῦ εὐθέως ἢ συμμετρου ἢ ἄλλον τινὸς ἀνάγεται ἔσχατον), ἢ εἰς τὸ κινήσαν πρῶτον (οἷον διὰ τί ἐπολέμησαν; ὅτι ἐσύ-

198^a 5-13 = 1065^b 2-4

^b 31 ὁ pr. om. F 32 ἔνεκα τοῦ πατάξαι S 33 τοῦ EJ²VPS^p:
τὸ FIJS¹ 34 τι om. EVP 36 δὲ HP: γὰρ S τοῦ ...
τοῦ] τὸ ... τὸ J ἔξω PP¹: ἔξωθεν PPS 198^a I τί alt. om. I
2 διαφέρει F τῶν ... αἰτίας J¹PS: τῆς δ' αἰτίας τῶν τρόπων (τὸν
τρόπον I) EIJ²: τὸν δὲ τρόπον τῆς αἰτίας F 3 ἐκατέρου IP 4 τι
ante αἰτιῶν S αἰτιῶν E¹PST: αἴτιον E²A 5 ἡ τύχη καὶ τὸ
αὐτόματον ST 6 ἢ pr. sup. lin. E¹ γένηται Torstrik 7 δὲ
PM: δὲ τῶν ci. Torstrik, fort. S 8 αὐτό, ὥστ' οὐδ' αἴτιον, δηλοῦν
EV (cf. M) 9 πρότερον F 12 αἴτιον καὶ φύσιν AS (cf. M):
καὶ φύσιν αἰτιῶν E¹: καὶ φύσιν αἴτιον E² 13 τοῦ ΛAPST: om.
E 14 ὅτι alt. EPS: ὅτι ἐστὶ A 17 γὰρ om. I

λησαν), ἢ τίνος ἕνεκα (ἵνα ἄρξωσιν), ἢ ἐν τοῖς γιγνομένοις ἢ 20
ἕλη.

ὅτι μὲν οὖν τὰ αἷτια ταῦτα καὶ τοσαῦτα, φανερόν· 21
ἐπεὶ δ' αἱ αἰτίαι τέτταρες, περὶ πασῶν τοῦ φυσικοῦ εἰδέναι,
καὶ εἰς πάσας ἀνάγων τὸ διὰ τί ἀποδώσει φυσικῶς, τὴν
ἕλην, τὸ εἶδος, τὸ κινήσαν, τὸ οὐ ἕνεκα. ἔρχεται δὲ τὰ τρία
εἰς [τὸ] ἐν πολλάκις· τὸ μὲν γὰρ τί ἐστὶ καὶ τὸ οὐ ἕνεκα ἐν 25
ἐστὶ, τὸ δ' ὅθεν ἢ κίνησις πρῶτον τῷ εἶδει ταῦτο τούτοις· ἄν-
θρωπος γὰρ ἄνθρωπον γεννᾷ—καὶ ὅλως ὅσα κινούμενα κινεῖ
(ὅσα δὲ μή, οὐκέτι φυσικῆς· οὐ γὰρ ἐν αὐτοῖς ἔχοντα κίνησιν
οὐδ' ἀρχὴν κινήσεως κινεῖ, ἀλλ' ἀκίνητα ὄντα· διὸ τρεῖς αἱ
πραγματεῖαι, ἢ μὲν περὶ ἀκινήτων, ἢ δὲ περὶ κινουμένων μὲν 30
ἀφθάρτων δέ, ἢ δὲ περὶ τὰ φθαρτά). ὥστε τὸ διὰ τί καὶ
εἰς τὴν ἕλην ἀνάγοντι ἀποδίδονται, καὶ εἰς τὸ τί ἐστίν, καὶ
εἰς τὸ πρῶτον κινήσαν. περὶ γενέσεως γὰρ μάλιστα τούτου
τὸν τρόπον τὰς αἰτίας σκοποῦσι, τί μετὰ τί γίγνεται, καὶ τί
πρῶτον ἐποίησεν ἢ τί ἔπαθεν, καὶ οὕτως αἰεὶ τὸ ἐφεξῆς. διτταὶ 35
δὲ αἱ ἀρχαὶ αἱ κινῶσαι φυσικῶς, ὧν ἡ ἑτέρα οὐ φυσικῆ· οὐ
γὰρ ἔχει κινήσεως ἀρχὴν ἐν αὐτῇ. τοιοῦτον δ' ἐστὶν εἴ τι κι- 198^b
νεῖ μὴ κινούμενον, ὥσπερ τό τε παντελῶς ἀκίνητον καὶ [τὸ]
πάντων πρῶτον καὶ τὸ τί ἐστίν καὶ ἡ μορφή· τέλος γὰρ καὶ
οὐ ἕνεκα· ὥστε ἐπεὶ ἡ φύσις ἕνεκά του, καὶ ταύτην εἰδέναι
δεῖ, καὶ πάντως ἀποδοτέον τὸ διὰ τί, ὅλον ὅτι ἐκ τούδε 5
ἀνάγκη τόδε (τὸ δὲ ἐκ τούδε ἢ ἀπλῶς ἢ ὡς ἐπὶ τὸ πολὺ),
καὶ εἰ μέλλει τοδὶ ἔσεσθαι (ὥσπερ ἐκ τῶν προτάσεων τὸ
συμπέρασμα), καὶ ὅτι τοῦτ' ἦν τὸ τί ἦν εἶναι, καὶ διότι βέλ-
τιον οὕτως, οὐχ ἀπλῶς, ἀλλὰ τὸ πρὸς τὴν ἐκάστου οὐσίαν.

^a 20 γιγνομένοις ΠΑ : γεννωμένοις PS 21 ταῦτα] τοιαῦτα I
22 αἱ om. AAS τὸν φυσικὸν fecit E 23 ἀποδώσει ὁ φυσικός E²
25 εἰ E¹ τὸ secl. Bonitz : om. PST ἕνεκα ἐν] ἕνεκα E¹V :
ἕνεκεν P 26 κίνησις πρῶτον τῷ fecit E² 27 γὰρ ES :
μὲν γὰρ Λ 30 ἀκινήτων EP : ἀκίνητον ΔS κινουμένων μὲν
ἀφθάρτων E¹P : κινούμενον μὲν ἀφθαρτον E²AS 31 τὰ om. J¹
32-3 τὸ . . . εἰς om. F 34 σκοποῦσι ΠP : ζητοῦσι A τί alt.
ΔVPST : om. E 35 ἐποίησαν F¹ τὸ ἐφεξῆς αἰεὶ S τῷ E
36 ἢ om. J¹ ^b I τοῦτο I 2 τό E²AVT : γὰρ τό E¹ τὸ
seclusi : habent AST : τοι E 3 καὶ ἢ] ἢ F 4 ἢ EFJS :
καὶ ἢ IP 5 καὶ FIVS : om. EP γρ. S, erasit J ὅτι om. F
6 τὸ ΔS : τόδε EP ἢ ὡς] ὡς F 8 βέλτιστον I

10 Λεκτέον δὴ πρῶτον μὲν διότι ἡ φύσις τῶν ἕνεκά του 8
 αἰτίων, ἔπειτα περὶ τοῦ ἀναγκαίου, πῶς ἔχει ἐν τοῖς φυσι-
 κοῖς· εἰς γὰρ ταύτην τὴν αἰτίαν ἀνάγουσι πάντες, ὅτι ἐπειδὴ
 τὸ θερμὸν τοιοῦδι πέφυκεν καὶ τὸ ψυχρὸν καὶ ἕκαστον δὴ τῶν
 τοιούτων, ταδὶ ἐξ ἀνάγκης ἐστὶ καὶ γίγνεται· καὶ γὰρ ἐὰν
 15 ἄλλην αἰτίαν εἴπωσι, ὅσον ἀψάμενοι χαίρειν ἑώσι, ὁ μὲν
 τὴν φιλιαν καὶ τὸ νεῖκος, ὁ δὲ τὸν νοῦν· ἔχει δ' ἀπορίαν τί
 κωλύει τὴν φύσιν μὴ ἕνεκά του ποιεῖν μηδ' ὅτι βέλτιον, ἀλλ'
 ὥσπερ ἕει ὁ Ζεὺς οὐχ ὅπως τὸν σῖτον αὐξήσῃ, ἀλλ' ἐξ
 ἀνάγκης (τὸ γὰρ ἀναχθὲν ψυχθῆναι δεῖ, καὶ τὸ ψυχθὲν
 20 ὕδωρ γενόμενον κατελθεῖν· τὸ δ' αὐξάνεσθαι τούτου γενομέ-
 νου τὸν σῖτον συμβαίνει), ὁμοίως δὲ καὶ εἴ τῳ ἀπόλλυται ὁ
 σῖτος ἐν τῇ ἄλω, οὐ τούτου ἕνεκα ἕει ὅπως ἀπόληται, ἀλλὰ
 τοῦτο συμβέβηκεν—ὥστε τί κωλύει οὕτω καὶ τὰ μέρη ἔχειν
 ἐν τῇ φύσει, οἷον τοὺς ὀδόντας ἐξ ἀνάγκης ἀνατεῖλαι τοὺς
 25 μὲν ἐμπροσθίους ὀξεῖς, ἐπιτηδείους πρὸς τὸ διαιρεῖν, τοὺς δὲ
 γομφίους πλατεῖς καὶ χρησίμους πρὸς τὸ λεαίνειν τὴν τροφήν,
 ἐπεὶ οὐ τούτου ἕνεκα γενέσθαι, ἀλλὰ συμπεσεῖν; ὁμοίως δὲ
 καὶ περὶ τῶν ἄλλων μερῶν, ἐν ὅσοις δοκεῖ ὑπάρχειν τὸ ἕνεκά
 του. ὅπου μὲν οὖν ἅπαντα συνέβη ὥσπερ κὰν εἰ ἕνεκά του ἐγί-
 30 γνετο, ταῦτα μὲν ἐσώθη ἀπὸ τοῦ αὐτομάτου συστάντα ἐπι-
 τηδείως· ὅσα δὲ μὴ οὕτως, ἀπόλετο καὶ ἀπόλλυται, κα-
 32 θάπερ Ἐμπεδοκλῆς λέγει τὰ βουγενῆ ἀνδρόσπρρα.

32 ὁ μὲν
 οὖν λόγος, ᾧ ἂν τις ἀπορήσειεν, οὗτος, καὶ εἴ τις ἄλλος
 τοιοῦτός ἐστιν· ἀδύνατον δὲ τούτου ἔχειν τὸν τρόπον. ταῦτα
 35 μὲν γὰρ καὶ πάντα τὰ φύσει ἢ αἰεὶ οὕτω γίγνεται ἢ ὡς ἐπὶ
 τὸ πολὺ, τῶν δ' ἀπὸ τύχης καὶ τοῦ αὐτομάτου οὐδέν. οὐ
 199^a γὰρ ἀπὸ τύχης οὐδ' ἀπὸ συμπτώματος δοκεῖ ἕειν πολλάκις
 τοῦ χειμῶνος, ἀλλ' ἐὰν ὑπὸ κύνα· οὐδὲ καύματα ὑπὸ κύνα,
 ἀλλ' ἂν χειμῶνος. εἰ οὖν ἢ ἀπὸ συμπτώματος δοκεῖ ἢ

^b 10 δὴ EJVPS: δὲ FIT 13 καὶ alt. EIJ²T: καὶ τὸ F: om.
 J¹ 14 γίγνεται ET: γίγνεται καὶ πέφυκε Δ ἐὰν] κὰν F
 18 αὐξῆσαι I 19 τὸ alt. sup. lin. E¹, om. J¹P 21 συμβαίνει
 τὸν σῖτον Δ 22 ἕειν I 28 ὅσοις AP: οἷς E 29 κὰν
 AP: καὶ ES 32 βουγενῆ] βουγενῆ καὶ F 33 φ] ὄν I
 ἄλλος AP: om. E 34 δὲ EJS: δὲ ταῦτα FI 35 οὕτως
 αἰεὶ F 36 οὐ] οὔτε Δ 199^a I οὔτε Δ 3 εἰ] ἢ I ἢ pr.
 P: τὰ ὄντα E² in rasura, ἢ ὡς τὰ sup. lin. additis: ἢ ὡς J²: om. FI¹

ἐνεκά του εἶναι, εἰ μὴ οἶόν τε ταῦτ' εἶναι μήτε ἀπὸ συμ-
πτώματος μήτ' ἀπὸ ταυτομάτου, ἐνεκά του ἂν εἴη. ἀλλὰ 5
μὴν φύσει γ' ἔστι τὰ τοιαῦτα πάντα, ὡς κὰν αὐτοὶ φαῖεν
οἱ ταῦτα λέγοντες. ἔστιν ἄρα τὸ ἐνεκά του ἐν τοῖς φύσει γι-
γνομένοις καὶ οὖσιν. 8

ἔτι ἐν ὅσοις τέλος ἔστι τι, τούτου ἐνεκα 8
πράττεται τὸ πρότερον καὶ τὸ ἐφεξῆς. οὐκοῦν ὡς πράττεται,
οὕτω πέφυκε, καὶ ὡς πέφυκεν, οὕτω πράττεται ἕκαστον, ἂν 10
μὴ τι ἐμποδίξῃ. πράττεται δ' ἐνεκά του· καὶ πέφυκεν ἄρα
ἐνεκά του. οἶον εἰ οἰκία τῶν φύσει γιγνομένων ἦν, οὕτως ἂν
ἐγίγνετο ὡς νῦν ὑπὸ τῆς τέχνης· εἰ δὲ τὰ φύσει μὴ μόνον
φύσει ἀλλὰ καὶ τέχνῃ γίγνοιτο, ὡσαύτως ἂν γίγνοιτο ἢ πέ-
φυκεν. ἐνεκα ἄρα θατέρου θάτερον. ὅλως δὲ ἡ τέχνη τὰ 15
μὲν ἐπιτελεῖ ἢ ἡ φύσις ἀδυνατεῖ ἀπεργάσασθαι, τὰ δὲ μι-
μεῖται. εἰ οὖν τὰ κατὰ τέχνην ἐνεκά του, δηλον ὅτι
καὶ τὰ κατὰ φύσιν· ὁμοίως γὰρ ἔχει πρὸς ἀλληλα
ἐν τοῖς κατὰ τέχνην καὶ ἐν τοῖς κατὰ φύσιν τὰ ὕστερα πρὸς
τὰ πρότερα. 20

μάλιστα δὲ φανερόν ἐπὶ τῶν ζώων τῶν ἄλλων, 20
ἢ οὔτε τέχνη οὔτε ζητήσαντα οὔτε βουλευσάμενα ποιεῖ· ὅθεν
διαποροῦσί τιμες πότερον νῶ ἢ τινι ἄλλῳ ἐργάζονται οἱ τ' ἀρ-
άχναι καὶ οἱ μύρμηκες καὶ τὰ τοιαῦτα. κατὰ μικρόν δ'
οὕτω προϊόντι καὶ ἐν τοῖς φυτοῖς φαίνεται τὰ συμφέροντα γι-
γνώμενα πρὸς τὸ τέλος, οἶον τὰ φύλλα τῆς τοῦ καρποῦ ἐνεκα 25
σκέπης. ὥστ' εἰ φύσει τε ποιεῖ καὶ ἐνεκά του ἡ χελιδὼν τὴν
νεοττιαν καὶ ὁ ἀράχνης τὸ ἀράχνιον, καὶ τὰ φυτὰ τὰ
φύλλα ἐνεκα τῶν καρπῶν καὶ τὰς ρίζας οὐκ ἄνω ἀλλὰ
κάτω τῆς τροφῆς, φανερόν ὅτι ἔστιν ἡ αἰτία ἡ τοι-
αύτη ἐν τοῖς φύσει γιγνομένοις καὶ οὖσιν. καὶ ἐπεὶ ἡ φύσις 30

^a 6 τ' E τὰ τοιαῦτα ΔS: ταῦτα E πάντα EJPS: γε πάντα
FI 8 ὅσοις ΠP¹T: οἷς APPS τι ἔστι ΔPS^{po}: ἔστι AS¹T
τούτου] τὸ ἐνεκά του, τούτου A 10 οὕτω alt. . . ἕκαστον hic EPS:
post II ἐμποδίξῃ Δ 12 ἐνεκά του VPS: τούτου ἐνεκα Δ:
τούτου ἐνεκά του E 13 τὰ φύσει FJ²V: om. EIJ¹ 15 δὲ
EJ²PT: τε FIJ¹S 16 ἐπιτελεῖ ἢ fecit E² ἀπεργάζεσθαι
FIJ¹T 17 κατὰ ΔS: κατὰ τὴν E 18 τὰ om. EJ¹ κατὰ
ΔS: κατὰ τὴν E ἔχει ΔV: ἔχει ἐν τοῖς E 19 πρὸς τὰ πρότερα
E²ΔS: om. E¹ 21 ποιεῖ διὸ ἀποροῦσι Δ 24 προϊόντα Δ et
fecit E 25 ἐνεκα ante τῆς Δ 26 ὥστ' εἰ] ὡς τῆ E ποιεῖν
J¹ τὴν] τὴν ητε περιφερῆ F 27 τὸ φύλλον E 29 κάτω
ἐνεκα τῆς Δ ἡ pr. om. F

διττή, ἢ μὲν ὡς ὕλη ἢ δ' ὡς μορφή, τέλος δ' αὕτη, τοῦ τέλους δὲ ἔνεκα τᾶλλα, αὕτη ἂν εἴη ἢ αἰτία, ἢ οὐ ἔνεκα.

ἀμαρτία δὲ γίνεταί καὶ ἐν τοῖς κατὰ τέχνην (ἔγραψε γὰρ οὐκ ὀρθῶς ὁ γραμματικός, καὶ ἐπότισεν [οὐκ ὀρθῶς] ὁ ἱατρὸς 35 τὸ φάρμακον), ὥστε δῆλον ὅτι ἐνδέχεται καὶ ἐν τοῖς κατὰ 199^b φύσιν. εἰ δὴ ἔστιν ἕνια κατὰ τέχνην ἐν οἷς τὸ ὀρθῶς ἔνεκά του, ἐν δὲ τοῖς ἀμαρτανομένοις ἔνεκα μὲν τιος ἐπιχειρεῖται ἀλλ' ἀποτυγχάνεται, ὁμοίως ἂν ἔχοι καὶ ἐν τοῖς φυσικοῖς, καὶ τὰ τέρατα ἀμαρτήματα ἐκείνου τοῦ ἔνεκά του. 5 καὶ ἐν ταῖς ἐξ ἀρχῆς ἄρα συστάσεσι τὰ βουγενῆ, εἰ μὴ πρὸς τινα ὄρον καὶ τέλος δυνατὰ ἦν ἐλθεῖν, διαφθειρομένης 7 ἂν ἀρχῆς τιὸς ἐγίγνετο, ὥσπερ νῦν τοῦ σπέρματος.

7 ἔτι
ἀνάγκη σπέρμα γενέσθαι πρῶτον, ἀλλὰ μὴ εὐθὺς τὰ ζῶα· 9 καὶ τὸ “οὐλοφυῆς μὲν πρῶτα” σπέρμα ἦν.

9 ἔτι καὶ ἐν τοῖς
10 φυτοῖς ἔνεστι τὸ ἔνεκά του, ἦττον δὲ διήρθρωται πότερον οὖν καὶ ἐν τοῖς φυτοῖς ἐγίγνετο, ὥσπερ τὰ βουγενῆ ἀνδρόπρωρα, οὕτω καὶ ἀμπελογενῆ ἐλαιόπρωρα, ἢ οὐ; ἀτοπον 13 γάρ· ἀλλὰ μὴν ἔδει γε, εἴπερ καὶ ἐν τοῖς ζῴοις.

13 ἔτι ἔδει
καὶ ἐν τοῖς σπέρμασι γίνεσθαι ὅπως ἔτυχεν· ὅλως δ' ἀναίρει 15 ὁ οὕτως λέγων τὰ φύσει τε καὶ φύσιν· φύσει γάρ, ὅσα ἀπὸ τιος ἐν αὐτοῖς ἀρχῆς συνεχῶς κινούμενα ἀφικνεῖται εἰς τι τέλος· ἀφ' ἐκάστης δὲ οὐ τὸ αὐτὸ ἐκάστοις οὐδὲ τὸ τυχόν, ἀεὶ μέντοι ἐπὶ τὸ αὐτό, ἂν μὴ τι ἐμποδίσῃ. τὸ δὲ οὐ ἔνεκα, καὶ ὁ τούτου ἔνεκα, γένοιτο ἂν καὶ ἀπὸ τύ- 20 χης, οἷον λέγομεν ὅτι ἀπὸ τύχης ἦλθεν ὁ ξένος καὶ λυσάμενος ἀπῆλθεν, ὅταν ὥσπερ ἔνεκα τούτου ἐλθὼν πράξῃ, μὴ ἔνεκα δὲ τούτου ἔλθῃ. καὶ τοῦτο κατὰ συμβεβηκός

^a 31 ὡς alt.] ὡς ἢ J 32 ἢ pr. ΔS: om. E 34 οὐκ ὀρθῶς alt. om. E¹: post ἱατρὸς P ^b 3 ἔχοι om. F 4 ἀμαρτήματα E²ΔS: om. E¹ του om. E¹ 7 ὥσπερ ... ἔτι fecit E² ἔτι APS: εἴ γ' Hamelin 8 πρῶτον μὲν ἀλλὰ I 9 πρῶτερον I 10 ἔνεστι ΔAP: ἔστι ES ἠρθρωται E πρῶτερον F 11 καὶ om. F τὰ om. Δ 12 καὶ ἀμπελογενῆ EJVAPS: ἀμπελογενῆ καὶ FI 13 γε om. E¹ 14 καὶ FJAS: om. EI ὥσπερ F δ' ΠT: τε S 15 ὁ om. I 17 εἰς ΠS^o: ἐπὶ SPT 19 ὁ sup. lin. E¹ καὶ EJP: om. FI 20 λυσάμενος γρ. I γρ. P: λουσάμενος ΠP γρ. S: λυτρωσάμενος S 21 ἀφήκε γρ. S του J 22 τούτου δ' FI: τὸν δ' J καὶ τοῦτο fecit E²

(ἡ γὰρ τύχη τῶν κατὰ συμβεβηκὸς αἰτίων, καθάπερ καὶ πρότερον εἶπομεν), ἀλλ' ὅταν τοῦτο αἰεὶ ἢ ὡς ἐπὶ τὸ πολὺ γένηται, οὐ συμβεβηκὸς οὐδ' ἀπὸ τύχης· ἐν δὲ τοῖς φυσικῶς αἰεὶ οὕτως, ἂν μὴ τι ἐμποδίσῃ. 25 26

ἄτοπον δὲ τὸ μὴ οἶεσθαι ἕνεκά του γίνεσθαι, εἰ μὴ ἴδωσι τὸ κωοῦν βουλευσάμενον. καίτοι καὶ ἡ τέχνη οὐ βουλευέται· καὶ εἰ ἐνήν ἐν τῷ ξύλῳ ἢ ναυπηγική, ὁμοίως ἂν τῇ φύσει ἐποίηε· ὥστ' εἰ ἐν τῇ τέχνῃ ἔνεστι τὸ ἕνεκά του, καὶ ἐν τῇ φύσει. μάλιστα δὲ δῆλον, ὅταν τις λατρεύῃ αὐτὸς ἑαυτόν· τούτῳ γὰρ ἔοικεν ἡ φύσις. ὅτι μὲν οὖν αἰτία ἡ φύσις, καὶ οὕτως ὡς ἕνεκά του, φανερόν. 26

9 Τὸ δ' ἐξ ἀνάγκης πότερον ἐξ ὑποθέσεως ὑπάρχει ἢ καὶ ἀπλῶς; νῦν μὲν γὰρ οἴονται τὸ ἐξ ἀνάγκης εἶναι ἐν τῇ γενέσει ὥσπερ ἂν εἴ τις τὸν τοῖχον ἐξ ἀνάγκης γεγενῆσθαι νομίζοι, ὅτι τὰ μὲν βαρέα κάτω πέφυκε φέρεσθαι τὰ δὲ κοῦφα ἐπιπολῆς, διὸ οἱ λίθοι μὲν κάτω καὶ τὰ θεμέλια, ἡ δὲ γῆ ἄνω διὰ κουφότητα, ἐπιπολῆς δὲ μάλιστα τὰ ξύλα· κουφότατα γάρ. ἀλλ' ὅμως οὐκ ἄνευ μὲν τούτων γέγονεν, οὐ μέντοι διὰ ταῦτα πλὴν ὡς δι' ὕλην, ἀλλ' ἕνεκα τοῦ κρύπτειν ἅττα καὶ σώζειν. ὁμοίως δὲ καὶ ἐν τοῖς ἄλλοις πᾶσι, ἐν ὅσοις τὸ ἕνεκά του ἔστιν, οὐκ ἄνευ μὲν τῶν ἀναγκαίων ἐχόντων τὴν φύσιν, οὐ μέντοι γε διὰ ταῦτα ἀλλ' ἢ ὡς ὕλην, ἀλλ' ἕνεκά του, οἷον διὰ τί ὁ πρίων τοιοσδί; ὅπως τοδὶ καὶ ἕνεκα τουδὶ. τοῦτο μέντοι τὸ οὐ ἕνεκα ἀδύνατον γενέσθαι, ἂν μὴ σιδηροῦς ἢ· ἀνάγκη ἄρα σιδηροῦν εἶναι, εἰ πρίων ἔσται καὶ τὸ ἔργον αὐτοῦ. ἐξ ὑποθέσεως δὲ τὸ ἀναγκαῖον, ἀλλ' οὐχ ὡς τέλος· ἐν γὰρ τῇ ὕλῃ τὸ ἀναγκαῖον, τὸ δ' οὐ ἕνεκα ἐν 200^a 10

^b 23 ἡ . . . συμβεβηκὸς om. E¹ 24 ἀλλ' ὅταν om. E¹ ἢ fecit E γίνηται Δ 25 οὐ] οὐ κατὰ J²S 26 οἶεσθαι καὶ ἕνεκά S¹ 27 εἰ μὴ εἶδωσ ἢ fecit E² κοινούν I 28 βούλεται J¹ εἰ E¹VPS : γὰρ εἰ E²Δ 29 τῇ E²ΔP : om. E¹ 30 τῇ alt. om. E¹ φύσει] φύσει ἔνεστι Δ : φύσει ἔτι ἔστι E² 200^a I ἂν om. E¹T γεγενῆσθαι ἐξ ἀνάγκης Δ : ἐξ ἀνάγκης T 2 ὀνομάζοι E 3 κοῦφα ΔT : κοῦφα ἐξ E 4 διὰ EIJP : διὰ τὴν FT 7 ἅττα FPT : αὐτὰ E²J : om. E¹I 8 ἐν ὅσοις om. S ὅσοις fecit E² τὸ ΔPS : om. E 9 φύσιν . . . γε fecit E² γε om. FS ὡς δι' ὕλην S 10 τοιοσδί ΔP : τοιοῦτος E 11 τὸ οὐ et 12 ἢ fecit E

15 τῷ λόγῳ.

15 ἔστι δὲ τὸ ἀναγκαῖον ἐν τε τοῖς μαθήμασι καὶ ἐν τοῖς κατὰ φύσιν γιγνομένοις τρόπον τινα παραπλησίως· ἐπεὶ γὰρ τὸ εὐθὺ τοδί ἐστιν, ἀνάγκη τὸ τρίγωνον δύο ὀρθαῖς ἴσας ἔχειν· ἀλλ' οὐκ ἐπεὶ τοῦτο, ἐκεῖνο· ἀλλ' εἴ γε τοῦτο μὴ ἐστίν, οὐδὲ τὸ εὐθὺ ἐστίν. ἐν δὲ τοῖς γιγνομένοις ἕνεκά του ἀνάπαυ, 20 εἰ τὸ τέλος ἐστὶ ἢ ἐστὶ, καὶ τὸ ἔμπροσθεν ἐστὶ ἢ ἐστίν· εἰ δὲ μὴ, ὥσπερ ἐκεῖ μὴ ὄντος τοῦ συμπεράσματος ἢ ἀρχῆ οὐκ ἐστὶ, καὶ ἐνταῦθα τὸ τέλος καὶ τὸ οὐ ἕνεκα. ἀρχὴ γὰρ καὶ αὕτη, οὐ τῆς πράξεως ἀλλὰ τοῦ λογισμοῦ (ἐκεῖ δὲ τοῦ λογισμοῦ· πράξεις γὰρ οὐκ εἰσίν). ὥστ' εἴ ἐστὶ οἰκία, ἀνάγκη 25 ταῦτα γενέσθαι ἢ ὑπάρχειν, ἢ εἶναι [ἢ] ὅλως τὴν ὕλην τὴν ἕνεκά του, οἷον πλίνθους καὶ λίθους, εἰ οἰκία· οὐ μέντοι διὰ ταῦτά ἐστὶ τὸ τέλος ἀλλ' ἢ ὡς ὕλην, οὐδ' ἐστὶ διὰ ταῦτα. ὅλως μέντοι μὴ ὄντων οὐκ ἐστὶ οὐθ' ἢ οἰκία οὐθ' ὁ πρίων, ἢ μὲν εἰ μὴ οἱ λίθοι, ὁ δ' εἰ μὴ ὁ σίδηρος· οὐδὲ γὰρ ἐκεῖ αἱ 30 ἀρχαί, εἰ μὴ τὸ τρίγωνον δύο ὀρθαί.

30 φανερόν δὴ ὅτι τὸ ἀναγκαῖον ἐν τοῖς φυσικοῖς τὸ ὡς ὕλη λεγόμενον καὶ αἱ κινήσεις αἱ ταύτης. καὶ ἄμφω μὲν τῷ φυσικῷ λεκτέαι αἱ αἰτίαι, μᾶλλον δὲ ἢ τίνος ἕνεκα· αἴτιον γὰρ τοῦτο τῆς ὕλης, ἀλλ' οὐχ αὕτη τοῦ τέλους· καὶ τὸ τέλος τὸ οὐ ἕνεκα, καὶ ἢ 35 ἀρχὴ ἀπὸ τοῦ ὀρισμοῦ καὶ τοῦ λόγου, ὥσπερ ἐν τοῖς κατὰ 200^b τέχνην, ἐπεὶ ἢ οἰκία τοιούδε, τάδε δεῖ γενέσθαι καὶ ὑπάρχειν ἐξ ἀνάγκης, καὶ ἐπεὶ ἢ ὑγίεια τοδί, τάδε δεῖ γενέσθαι ἐξ ἀνάγκης καὶ ὑπάρχειν—οὕτως καὶ εἰ ἄνθρωπος τοδί, ταδί· εἰ δὲ ταδί, ταδί. ἴσως δὲ καὶ ἐν τῷ λόγῳ ἐστὶν τὸ

^a 15-16 καὶ . . . φύσιν E²AP: om. E¹ 17 τοδί ἐστίν fecit
 E² ὀρθαῖς F ἴσας E²APS: om. E 18 ἐπεὶ V: ἐπὶ E:
 εἰ APST ἀλλ' εἴ γε τ fecit E² 19 οὐδὲ . . . ἐστίν om. E¹
 ἀνάπαυ om. E¹V 20 τὸ om. E¹ καὶ om. AP 21 τοῦ
 συμπεράσματος E²AV: om. E¹ 23 ἀλλὰ E¹IJ²P: δὲ ἀλλὰ
 E²FJ¹ 24 ἀνάγκη ταῦτα EFP: ταῦτα ἀνάγκη IJ 25 ἢ
 seclusi, om. P: ἢ καὶ E 27 ὕλην Aldina: ὕλης fecit E²: ὕλη
 IJ: ἢ ὕλη F 28 οὐδ' ἢ . . . οὐδ' FI 30 ὀρθαῖς AS 32 αἱ
 alt. om. F 33 τίνος PST: τινὸς Π 34 οὐκ αὕτη I τὸ
 alt.] τοῦ E ἢ EFP: om. IJ ^b I ἢ Δ et sup. lin. E¹: om. T
 γενέσθαι E²AT: γίγνεσθαι E¹ ὑπάρχειν I καὶ] ἢ J¹ 2 γενέσθαι
 FIT: γίγνεσθαι EJ 3 τοδί E²AV: om. E¹ST 4 ταδί alt.
 HS: τοδί ut vid. T τὰ ἀναγκαῖα I

αναγκαῖον. ὀρισαμένω γὰρ τὸ ἔργον τοῦ πρίειν ὅτι διαίρεσις 5
 τοιαδί, αὕτη γ' οὐκ ἔσται, εἰ μὴ ἔξει ὀδόντας τοιουσδί· οὔτοι
 δ' οὗ, εἰ μὴ σιδηροῦς. ἔστι γὰρ καὶ ἐν τῷ λόγῳ ἕνια μόρια
 ὡς ὕλη τοῦ λόγου.

Γ.

I Ἐπεὶ δ' ἡ φύσις μὲν ἔστιν ἀρχὴ κινήσεως καὶ μετα-
 βολῆς, ἡ δὲ μέθοδος ἡμῖν περὶ φύσεώς ἐστι, δεῖ μὴ λαν-
 θάνειν τί ἐστι κίνησις· ἀναγκαῖον γὰρ ἀγνοουμένης αὐτῆς ἀγ-
 νοεῖσθαι καὶ τὴν φύσιν. διορισαμένοις δὲ περὶ κινήσεως πει- 15
 ρατέον τὸν αὐτὸν ἐπελθεῖν τρόπον περὶ τῶν ἐφεξῆς. δοκεῖ δ'
 ἡ κίνησις εἶναι τῶν συνεχῶν, τὸ δ' ἀπειρον ἐμφαίνεται πρῶ-
 τον ἐν τῷ συνεχεῖ· διὸ καὶ τοῖς ὀριζομένοις τὸ συνεχὲς συμ-
 βαίνει προσχρήσασθαι πολλάκις τῷ λόγῳ τῷ τοῦ ἀπείρου,
 ὡς τὸ εἰς ἀπειρον διαιρετὸν συνεχὲς ὄν. πρὸς δὲ τούτοις ἄνευ 20
 τόπου καὶ κενοῦ καὶ χρόνου κίνησιν ἀδύνατον εἶναι. δῆλον οὖν
 ὡς διὰ τε ταῦτα, καὶ διὰ τὸ πάντων εἶναι κοινὰ καὶ κα-
 θόλου ταῦτα, σκεπτέον προχειρισαμένοις περὶ ἐκάστου
 τούτων (ὑστέρα γὰρ ἡ περὶ τῶν ἰδίων θεωρία τῆς περὶ τῶν
 κοινῶν ἐστι)· καὶ πρῶτον, καθάπερ εἴπαμεν, περὶ κινήσεως. 25
 ἔστι δὴ [τι] τὸ μὲν ἐντελεχεία μόνον, τὸ δὲ δυνάμει καὶ ἐν-
 τελεχεία, τὸ μὲν τὸδε τι, τὸ δὲ τοσούνδε, τὸ δὲ τοιούνδε, καὶ
 τῶν ἄλλων τῶν τοῦ ὄντος κατηγοριῶν ὁμοίως. τοῦ δὲ πρὸς

200^b 26-8 = 1065^b 5-7

^b 5 ὀρισαμένω F et fort. PST: ὀρισάμενοι E: ὀρισαμένον IJ:
 ὀρισαμένον Prantl πρίειν HT: πρίονος ut vid. S 6 γ' scripsi:
 δ' Π 7 οὗ om. EI 8 τοῦ erasit E
 Tit. φυσικῆς ἀκρόσεως γ' περὶ ἀπείρου E: φυσικῶν γ' I 12 καὶ
 EIJPST: καὶ στάσεως καὶ FV 13 ἐστι om. E¹V δεῖ...
 14 κίνησις om. EV 14-16 ἀναγκαῖον... ἐφεξῆς] ἀναγκαῖον πρῶτον
 μὲν εἰπεῖν τί ἐστι κίνησις, ἔπειτα τοῦτο διορισαμένους περὶ τῶν ἐφεξῆς τὸν
 αὐτὸν ἐπελθεῖν τρόπον V et in litura E 18 συμβαίνει] ἀνάγκη P:
 συμβαίνει ἀνάγκη E 19 προσχρήσθαι IJ ἀπείρου, ὡς τὸ εἰς om. E
 21 κίνησιν ἀδύνατον FPS: ἀδύνατον κίνησιν Δ 22 τε E²APS: om. E¹
 23 ταῦτα S: πᾶσι E: ταῦτα πᾶσι ΔP 25 καὶ πρῶτον] πρῶτον
 δὲ Δ εἴπομεν FI 26 τι τὸ μὲν ΔS et fecit E: τὸ μὲν MP
 μόνον om. γρ. S τὸ ΠM(A^b)APST Porphyrius: τὸ δὲ δυνάμει, τὸ
 M(EJ), Spengel 27 τὸ δὲ alt. om. F 28 τῶν pr. E¹J¹S (cf.
 M): ἐπὶ τῶν E²F¹J²

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Γ

τι τὸ μὲν καθ' ὑπεροχὴν λέγεται καὶ κατ' ἔλλειψιν, τὸ δὲ
 30 κατὰ τὸ ποιητικὸν καὶ παθητικόν, καὶ ὅλως κινήτικόν τε
 καὶ κινήτόν· τὸ γὰρ κινήτικόν κινήτικόν τοῦ κινήτου καὶ τὸ κινή-
 τητὸν κινήτόν ὑπὸ τοῦ κινήτικού. οὐκ ἔστι δὲ κινήσις παρὰ τὰ
 πράγματα· μεταβάλλει γὰρ αἰεὶ τὸ μεταβάλλον ἢ κατ'
 οὐσίαν ἢ κατὰ ποσὸν ἢ κατὰ ποιὸν ἢ κατὰ τόπον, κοινὸν δ'
 35 ἐπὶ τούτων οὐδὲν ἔστι λαβεῖν, ὡς φαμέν, ὃ οὔτε τότε οὔτε πο-
 201^a σὸν οὔτε ποιὸν οὔτε τῶν ἄλλων κατηγορημάτων οὐθέν· ὥστ' οὐδὲ
 κινήσις οὐδὲ μεταβολὴ οὐθενὸς ἔσται παρὰ τὰ εἰρημένα, μη-
 θενός γε ὄντος παρὰ τὰ εἰρημένα. ἕκαστον δὲ διχῶς ὑπάρ-
 χει πᾶσι, οἷον τὸ τότε (τὸ μὲν γὰρ μορφῇ αὐτοῦ, τὸ δὲ
 5 στέρησις), καὶ κατὰ τὸ ποιόν (τὸ μὲν γὰρ λευκὸν τὸ δὲ
 μέλαν), καὶ κατὰ τὸ ποσὸν τὸ μὲν τέλειον τὸ δ' ἀτελές.
 ὁμοίως δὲ καὶ κατὰ τὴν φορὰν τὸ μὲν ἄνω τὸ δὲ κάτω,
 ἢ τὸ μὲν κοῦφον τὸ δὲ βαρύ. ὥστε κινήσεως καὶ μεταβο-
 9 λῆς ἔστιν εἶδη τοσαῦτα ὅσα τοῦ ὄντος.

9 διηρημένον δὲ καθ'
 10 ἕκαστον γένος τοῦ μὲν ἐντελεχείᾳ τοῦ δὲ δυνάμει, ἢ τοῦ δυ-
 νάμει ὄντος ἐντελεχείᾳ, ἢ τοιοῦτον, κινήσις ἔστιν, οἷον τοῦ μὲν
 ἀλλοιωτοῦ, ἢ ἀλλοιωτόν, ἀλλοίωσις, τοῦ δὲ αὐξητοῦ καὶ τοῦ
 ἀντικειμένου φθιτοῦ (οὐδὲν γὰρ ὄνομα κοινὸν ἐπ' ἀμφῶν) αὔ-
 ξησις καὶ φθίσις, τοῦ δὲ γενητοῦ καὶ φθαρτοῦ γένεσις καὶ
 15 φθορά, τοῦ δὲ φορητοῦ φορά. ὅτι δὲ τοῦτο ἔστιν ἢ κινήσις,
 ἐντεῦθεν δῆλον. ὅταν γὰρ τὸ οἰκοδομητόν, ἢ τοιοῦτον αὐτὸ

200^b 32—201^a 19 = 1065^b 7—20

^b 29 λέγεται . . . ἔλλειψιν] καὶ ἔλλειψιν λέγεται Δ : λέγεται καὶ ἔλλει-
 ψιν P 30 τὸ om. E : τό τε F κινήτικόν τε καὶ κινήτόν AV :
 κινήτόν τε καὶ κινήτικόν E 31 τὸ μὲν γὰρ F 32 δὲ EFJ
 Ammonius Stephanus : δέ τις IS 33 αἰεὶ τὸ μεταβάλλον AS^c :
 τὸ μεταβάλλον αἰεὶ E : τὸ μεταβάλλον SP 34 ποσὸν ἢ κατὰ S :
 ποσὸν ἢ E : τὸ ποσὸν ἢ κατὰ τὸ Δ 35—201^a 1 ἔστι . . . οὔτε alt.
 APS : om. E 35 ἔφαμεν I 201^a 2 οὔτε Λ 3 εἰρημένα]
 εἰρημένα ὃ οὔτε τότε οὔτε ποσὸν οὔτε ποιὸν ἔστι λαβεῖν ὡς φαμέν (cf.
 200^b 35—201^a 1) E 6 μὲν FIM : μὲν γὰρ EJ 8 ὥστε PS :
 ὥστε καὶ A 10—11 ἢ . . . ἐντελεχεία Π γρ. S : τὴν . . . ἐνέργειαν
 S (cf. M) 11 τοιοῦτον E γρ. ST : τοιοῦτόν ἐστι IJMPS : τι
 τοιοῦτόν ἐστι F κινήσις ἔστιν Π γρ. S : λέγω κινήσιν MS^p : λέγω
 κινήσιν εἶναι S¹ 12 ἢ fecit E² 14 γενητοῦ EJS : γεννητοῦ
 FI γένεσις fecit E 15 τοῦ . . . ἔστιν] ὅτι δ' ἐστὶ τοῦτο F
 16 αὐτόν E¹

λέγομεν εἶναι, ἐντελεχεία ἧ, οἰκοδομεῖται, καὶ ἔστιν τοῦτο οἰκοδόμησις· ὁμοίως δὲ καὶ μάθησις καὶ ἰατρεισις καὶ κύλισις καὶ ἄλλισις καὶ ἄδρυνσις καὶ γήρανσις. | ἐπεὶ δ' ἐνιαυτὰ καὶ δυνάμει καὶ ἐντελεχεία ἐστίν, οὐχ ἅμα δὲ ἢ οὐ 20 κατὰ τὸ αὐτό, ἀλλ' οἷον θερμὸν μὲν ἐντελεχεία ψυχρὸν δὲ δυνάμει, πολλὰ ἤδη ποιήσει καὶ πείσεται ὑπ' ἀλλήλων· ἅπαν γὰρ ἔσται ἅμα ποιητικὸν καὶ παθητικόν. ὥστε καὶ τὸ κωοῦν φυσικῶς κινήτόν· πᾶν γὰρ τὸ τοιοῦτον κινεῖ κινούμενον καὶ αὐτό. δοκεῖ μὲν οὖν τισιν ἅπαν κινεῖσθαι τὸ κιν- 25 νοῦν, οὐ μὴν ἀλλὰ περὶ τούτου μὲν ἐξ ἄλλων ἔσται δῆλον ὅπως ἔχει (ἔστι γὰρ τι κωοῦν καὶ ἀκίνητον), ἢ δὲ τοῦ δυνάμει ὄντος (ἐντελέχεια), ὅταν ἐντελεχεία ὄν ἐνεργῇ οὐχ ἢ αὐτὸ ἀλλ' ἢ κινήτόν, κίνησις ἐστίν. | λέγω δὲ τὸ ἢ ὡδί. ἔστι γὰρ ὁ χαλκός δυνάμει ἀνδριάς, ἀλλ' ὅμως οὐχ ἢ τοῦ χαλκοῦ ἐντελέ- 30 χεῖα, ἢ χαλκός, κίνησις ἐστίν· οὐ γὰρ τὸ αὐτὸ τὸ χαλκῶ εἶναι καὶ δυνάμει τι [κινήτῳ], ἐπεὶ εἰ ταῦτόν ἦν ἀπλῶς καὶ κατὰ τὸν λόγον, ἦν ἂν ἢ τοῦ χαλκοῦ, ἢ χαλκός, ἐντελέχεια κίνησις· οὐκ ἔστιν δὲ ταῦτόν, ὡς εἴρηται (δῆλον δ' ἐπὶ τῶν ἐναντίων· τὸ μὲν γὰρ δύνασθαι ὑγιαίνειν καὶ δύ- 35 νασθαι κάμνειν ἕτερον—καὶ γὰρ ἂν τὸ κάμνειν καὶ τὸ ὑγι- 201^b αίνειν ταῦτόν ἦν— τὸ δὲ ὑποκείμενον καὶ τὸ ὑγιαίνειν καὶ τὸ νοσοῦν, εἴθ' ὑγρότης εἴθ' αἷμα, ταῦτόν καὶ ἔν). ἐπεὶ δ' οὐ ταῦτόν, ὥσπερ οὐδὲ χρῶμα ταῦτόν καὶ ὄρατόν, ἢ τοῦ δυνατοῦ,

201^a 27—202^a 3 = 1065^b 22—1066^a 26

^a 18 ὁμοίως . . . μάθησις in mg. E¹ καὶ μάθησις om. F: καὶ ἢ μάθησις I 19 ἄδρυνσις (ἄνθρωπις I¹) καὶ γήρανσις PSP: γήρανσις καὶ ἄδρυνσις S¹ (cf. M) 19—27 ἐπεὶ . . . δε] συμβαίνει δὲ κινεῖσθαι ὅταν ἢ ἐντελέχεια ἢ [immo ἢ ἐντελέχεια ἢ] αὐτή, καὶ οὔτε πρότερον οὐθ' ὕστερον. ἢ δὴ ex M ci. Diels 20 ταῦτὰ AS: ταῦτα E 21—2 ἐντελεχεία . . . δυνάμει VST: δυνάμει . . . ἐντελεχεία A et fecit E² 26 οὐκ οὖν ἀλλὰ F μὲν τούτου F: μὲν τούτων J: μὲν οὖν τούτων I 27 ὅπως ἔχει IP: πῶς ἔχει FJ: om. E κινούν EV: τῶν κινούντων AS δὲ IP Aspasius: δὴ MT Porphyrius 28 ἐντελέχεια Aldina: om. ΠMAPS Aspasius Porphyrius οὐχ . . . 29 κινήτόν γρ. I γρ. A Aspasius: ἢ (ἦτοι fort. A) αὐτὸ ἢ ἄλλο ἢ κινήτόν EFJAP Porphyrius: ἢ αὐτὸ κινήτόν I: οὐχ ἢ αὐτὸ ἀλλ' ἢ ἄλλο γρ. P, ut vid. T 29 ἢ alt. . . ὁ] ἢ ἔστι γὰρ ὡδί ὁ E ὡδε MS 31 τῷ E² αὐτῷ τῷ F: αὐτὸ E¹MST: αὐτῷ E² 32 κινήτῳ om. MS ἦν] ἢ E 33 καὶ ΔMV: ἢ E ἦν ἂν E²AM: om. E¹P 34 κίνησις] κίνησις ἂν ἦν E¹P: κίνησις τις M ὥσπερ A

5 ἢ δυνατόν, ἐντελέχεια φανερόν ὅτι κίνησις ἐστίν.

5 ὅτι μὲν οὖν ἐστὶν αὕτη, καὶ ὅτι συμβαίνει τότε κινεῖσθαι ὅταν ἡ ἐντελέχεια ἢ αὐτή, καὶ οὔτε πρότερον οὔτε ὕστερον, δηλον· ἐνδέχεται γὰρ ἕκαστον ὅτε μὲν ἐνεργεῖν ὅτε δὲ μὴ, οἷον τὸ οἰκοδομητόν, καὶ ἡ τοῦ οἰκοδομητοῦ ἐνέργεια, ἢ οἰκοδομητόν, οἰκοδόμησις ἐστίν (ἢ γὰρ οἰκοδόμησις ἢ ἐνέργεια [τοῦ οἰκοδομητοῦ] ἢ ἡ οἰκία· ἀλλ' ὅταν οἰκία ἢ, οὐκέτ' οἰκοδομητόν ἐστίν· οἰκοδομεῖται δὲ τὸ οἰκοδομητόν· ἀνάγκη οὖν οἰκοδόμησιν τὴν ἐνέργειαν εἶναι)· ἢ δ' οἰκοδόμησις κίνησις τις. ἀλλὰ μὴν ὁ αὐτὸς ἐφαρμόσει λόγος καὶ ἐπὶ τῶν ἄλλων 15 κινήσεων.

Ἔστι δὲ καλῶς εἴρηται, δηλον καὶ ἐξ ὧν οἱ ἄλλοι 2 περὶ αὐτῆς λέγουσιν, καὶ ἐκ τοῦ μὴ ῥάδιον εἶναι διορίσαι ἄλλως αὐτήν. | οὔτε γὰρ τὴν κίνησιν καὶ τὴν μεταβολὴν ἐν ἄλλω γένει θεῖναι δύναται· ἂν τις, δηλόν τε σκοποῦσιν ὡς τι 20 θέασιν αὐτὴν ἐνιοι, ἐτερότητα καὶ ἀνισότητα καὶ τὸ μὴ οὐ φάσκοντες· εἶναι τὴν κίνησιν· ὧν οὐδὲν ἀναγκαῖον κινεῖσθαι, οὔτ' ἂν ἕτερα ἢ οὔτ' ἂν ἄνισα | οὔτ' ἂν οὐκ ὄντα· ἀλλ' οὐδ' ἡ μεταβολὴ οὔτ' εἰς ταῦτα οὔτ' ἐκ τούτων μᾶλλον ἐστίν ἢ ἐκ τῶν ἀντικειμένων. | αἴτιον δὲ τοῦ εἰς ταῦτα τιθέναι ὅτι ἀόριστόν 25 τι δοκεῖ εἶναι ἢ κινήσεις, τῆς δὲ ἐτέρας συστοιχίας αἱ ἀρχαὶ διὰ τὸ στερητικαὶ εἶναι ἀόριστοι· οὔτε γὰρ | τὸδε οὔτε τοιούδε οὐδεμία αὐτῶν ἐστίν, [ὅτι] οὐδὲ τῶν ἄλλων κατηγοριῶν. | τοῦ δὲ δοκεῖν ἀόριστον εἶναι τὴν κίνησιν αἴτιον· ὅτι οὔτε εἰς δύναμιν 201^b 6-7 = 1065^b 20-22

^b 5 ὅτι] τὸ E¹ ἐστίν ΔV: ἐστίν εἰ δὲ μὴ τὸ αὐτὸ ἀλλ' ὡς χρῶμα τὸ αὐτὸ καὶ ὁρατόν, ἡ δυνάμει ἐστίν, τὴν τοῦ δυνατοῦ ἢ δυνατὸν ἐντελέχειαν εἶναι λέγω κίνησιν E (cf. ^b 3-5) 5-15 ὅτι... κινήσεων om. γρ. A 6 αὕτη AMS: τοῦτο P: αὕτη τοῦτο E ἢ et 7 ἢ om. F 7 αὕτη FI δηλον AMT: φανερόν E 8 γὰρ] μὲν γὰρ F τὸ om. E 9 καὶ] ἢ οἰκοδομητόν καὶ M et fort. T ἐνέργεια AMS: ἐντελέχεια E 10 γὰρ EV: γὰρ τοῦτο ἐστίν FI: γὰρ τοῦτ' ἐστίν ἢ J ἢ IJT: om. EF τοῦ οἰκοδομητοῦ ET: om. AM 11 ἢ om. FIJ¹ ἐστίν Δ 12 οὖν] ἄρα IJM: ἄρα τὴν F 13 τις AM: τίς ἐστίν E 17-20 καὶ... ἐνιοι Π (cf. M): om. T 18-19 οὔτε... τις om. γρ. A 18 καὶ τὴν μεταβολὴν om. J: τὴν om. S 19 θεῖναι ΠM: τιθέναι S δὲ AMPS 20 αὐτὴν ἐνιοι EPS: ἐνιοι αὐτὴν Δ 22 ἢ] ἢ οὔτ' ἂν ἕτερα E ἂν alt. om. FIP 23 ἢ ἐκ EJ²P: ἢ FIJ¹S 25 τι ΠP^oP: om. P¹T 26 τοιούδε EFJM: τοσόνδε IPT 27 ἐστίν om. ΔM ὅτι om. MVT, secl. Bonitz

τῶν ὄντων | οὔτε εἰς ἐνέργειαν ἔστιν θείναι αὐτήν· οὔτε γὰρ τὸ δυνατὸν ποσὸν εἶναι | κινεῖται ἐξ ἀνάγκης οὔτε τὸ ἐν- 30
 εργεῖα ποσόν, | ἢ τε κίνησις ἐνέργεια μὲν εἶναι τις δοκεῖ, 10. Weltschickel
Längsstellung
und vermittelte
Bewegung
Red. d. Bg.
 ἀτελεῆς δέ· αἴτιον δ' ὅτι ἀτελεῆς τὸ δυνατόν, οὗ ἔστιν ἐνέρ-
 γεια. | καὶ διὰ τοῦτο δὴ χαλεπὸν αὐτὴν λαβεῖν τί ἔστιν· ἢ
 γὰρ εἰς στέρησιν ἀναγκαῖον θείναι ἢ εἰς δύναμιν ἢ εἰς ἐνέρ-
 γειαν ἀπλήν, τούτων δ' οὐδὲν φαίνεται ἐνδεχόμενον. | λείπεται 35
 τοίνυν ὁ εἰρημένος τρόπος, ἐνέργειαν μὲν τινα εἶναι, τοιαύτην 202^a
 δ' ἐνέργειαν οἷαν εἶπαμεν, χαλεπὴν μὲν ἰδεῖν, ἐνδεχομένην
 δ' εἶναι.

κινεῖται δὲ καὶ τὸ κινουόν | ὥσπερ εἴρηται | πᾶν, τὸ 3 P.
 δυνάμει ὃν κινήτῳ, καὶ οὗ ἢ ἀκωησία ἡρεμία ἐστίν (ᾧ γὰρ
 ἢ κίνησις ὑπάρχει, τούτου ἢ ἀκωησία ἡρεμία). τὸ γὰρ πρὸς 5
 τοῦτο ἐνεργεῖν, ἢ τοιοῦτον, αὐτὸ τὸ κινεῖν ἐστὶ· τοῦτο δὲ ποιεῖ
 θίξει, ὥστε ἅμα καὶ πάσχει· διὸ | ἢ κίνησις ἐντελέχεια τοῦ
 κινήτου, ἢ κινήτῳ, συμβαίνει δὲ τοῦτο θίξει τοῦ κινήτου, ὥσθ'
 ἅμα καὶ πάσχει. εἶδος δὲ αἰεὶ οἴσεται τι τὸ κινουόν, ἥτοι τό-
 δε ἢ τοιούδε ἢ τισόνδε, ὃ ἔσται ἀρχὴ καὶ αἴτιον τῆς κινή- 10
 σεως, ὅταν κινή, οἷον ὁ ἐντελεχέα ἄνθρωπος ποιεῖ ἐκ τοῦ
 δυνάμει ὄντος ἀνθρώπου ἀνθρώπου.

3 Καὶ τὸ ἀπορούμενον δὲ φανερόν, ὅτι ἐστὶν ἡ κίνησις ἐν
 τῷ κινήτῳ· ἐντελέχεια γάρ ἐστι τούτου [καὶ] ὑπὸ τοῦ κινήτου.
 καὶ ἡ τοῦ κινήτου δὲ ἐνέργεια οὐκ ἄλλη ἐστίν· δεῖ μὲν γὰρ 15
 εἶναι ἐντελέχειαν ἀμφοῖν· κινήτῳ μὲν γὰρ ἔστιν τῷ δύνα-
 σθαι, κινουόν δὲ τῷ ἐνεργεῖν, ἀλλ' ἔστω ἐνεργητικὸν τοῦ κινήτου,

202^a 13-21 = 1066^a 26-34

^b 29 οὐδὲ F αὐτήν IJ¹M: αὐτὴν ἀπλῶς EFJ² 30 ποσὸν
 εἶναι EM: εἶναι ποσὸν Λ ἐνεργεῖν ἄποσον E 31 εἶναι
 τις δοκεῖ S: εἶναι δοκεῖ τις E¹M: τις εἶναι δοκεῖ Λ: εἶναι δοκεῖ E²
 32 ἔστιν AM: ἔστιν ἡ E 33 αὐτὴ E ἢ AP: εἰ E
 202^a I τοίνυν] δὴ E 2 εἶπομεν FIPT et fecit E ἰδεῖν
 fecit E 3 εἶναι ΛV: εἶναι ὅτι δὲ καλῶς εἴρηται δῆλον. οὐ γὰρ
 αὐτὴν κίνησιν καὶ τὴν μεταβολὴν ἐν ἄλλῳ γένοιθαι θείναι δύναται· ἂν τις, ἢ τε
 κίνησις ἐνέργεια μὲν εἶναι δοκεῖ τις, ἀτελεῆς δέ· αἴτιον δὲ ὅτι ἀτελεῆς τὸ
 δυνατόν E (cf. 201^b 16-19, 31-2) πᾶν] εἰ πᾶν Prantl 4 κινήτῳ
 E¹FIAS: κινήτῳ E²JV γρ. A Aspasius 5 τούτου S: τούτῳ Π
 8-9 συμβαίνει . . . πάσχει secl. Prantl 8 δὲ om. F ὥσθ' . . .
 9 πάσχει E²AS: om. E¹V 9 τι AS: om. EVPT 10 ἢ
 τισόνδε E²ΔVS: om. E¹ 11 κινή] μὴ ἢ in rasura E¹ 14 ἐστὶ . . .
 κινήτου in rasura E τούτου] τοῦ κινήτου Andronicus καὶ om.
 MVPS: habent Π Andronicus τοῦ κινήτου] τούτου J Andronicus
 16 κινήτῳ I 16 et 17 τῷ] τὸ fecit E

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Γ

ὥστε ὁμοίως μία ἢ ἀμφοῖν ἐνέργεια ὥσπερ τὸ αὐτὸ διά-
στημα ἐν πρὸς δύο καὶ δύο πρὸς ἓν, καὶ τὸ ἀναντες καὶ τὸ
20 κάταντες· ταῦτα γὰρ ἐν μὲν ἔστιν, ὁ μέντοι λόγος οὐχ εἰς·
21 ὁμοίως δὲ καὶ ἐπὶ τοῦ κινουόντος καὶ κινουμένου.

21 ἔχει δ' ἀπορίαν
λογικὴν· ἀναγκαῖον γὰρ ἴσως εἶναι τινα ἐνέργειαν τοῦ
ποιητικοῦ καὶ τοῦ παθητικοῦ· τὸ μὲν δὴ ποίησις, τὸ δὲ πά-
θησις, ἔργον δὲ καὶ τέλος τοῦ μὲν ποίημα, τοῦ δὲ πάθος.
25 ἔπει οὖν ἀμφω κινήσεις, εἰ μὲν ἕτεραι, ἐν τίνι; ἢ γὰρ ἀμ-
φω ἐν τῷ πάσχοντι καὶ κινουμένῳ, ἢ ἡ μὲν ποίησις ἐν τῷ
ποιοῦντι, ἢ δὲ πάθησις ἐν τῷ πάσχοντι (εἰ δὲ δεῖ καὶ ταύ-
την ποίησιν καλεῖν, ὁμώνυμος ἂν εἴη). ἀλλὰ μὴν εἰ τοῦτο, ἢ
κίνησις ἐν τῷ κινουόντι ἔσται (ὁ γὰρ αὐτὸς λόγος ἐπὶ κινουόντος
30 καὶ κινουμένου), ὥστ' ἢ πᾶν τὸ κινουὸν κινήσεται, ἢ ἔχον κίνησιν
οὐ κινήσεται. εἰ δ' ἀμφω ἐν τῷ κινουμένῳ καὶ πάσχοντι,
καὶ ἡ ποίησις καὶ ἡ πάθησις, καὶ ἡ διδασίς καὶ ἡ μάθη-
σις δύο οὔσαι ἐν τῷ μαθάνοντι, πρῶτον μὲν ἡ ἐνέργεια ἢ
ἐκάστου οὐκ ἐν ἐκάστῳ ὑπάρξει, εἴτα ἄτοπον δύο κινήσεις ἅμα
35 κωεῖσθαι· τίνες γὰρ ἔσονται ἀλλοιώσεις δύο τοῦ ἐνὸς καὶ εἰς
ἐν εἶδος; ἀλλ' ἀδύνατον. ἀλλὰ μία ἔσται ἡ ἐνέργεια. ἀλλ'
202^b ἄλογον δύο ἐτέρων τῷ εἶδει τὴν αὐτὴν καὶ μίαν εἶναι ἐνέρ-
γειαν· καὶ ἔσται, εἴπερ ἡ διδασίς καὶ ἡ μάθησις τὸ αὐτὸ καὶ
ἡ ποίησις καὶ ἡ πάθησις, καὶ τὸ διδάσκειν τῷ μαθάνειν
τὸ αὐτὸ καὶ τὸ ποιεῖν τῷ πάσχειν, ὥστε τὸν διδάσκοντα ἀν-
5 ἀγκη ἔσται πάντα μαθάνειν καὶ τὸν ποιοῦντα πάσχειν.

5 ἢ
οὔτε τὸ τὴν ἄλλου ἐνέργειαν ἐν ἐτέρῳ εἶναι ἄτοπον (ἔστι γὰρ
ἡ διδασίς ἐνέργεια τοῦ διδασκαλικοῦ, ἐν τινι μέντοι, καὶ οὐκ
ἀποτεμμημένη, ἀλλὰ τοῦδε ἐν τῷδε), οὔτε μίαν δυοῖν κωλύει οὔθην

^a 19 πρὸς δύο F 22 τινα εἶναι F τοῦ EJT: ἄλλην τοῦ
FIV 23 καὶ ἄλλην τοῦ I δὴ] γὰρ FI: γε J 25 ἔπει
IJ et fecit E: εἰ FP ἕτεραι APS: ἕτεραι εἰσιν E 26 ἐν ...
κινουμένῳ in rasura E² καὶ ποιουμένῳ S ἢ] ἢ ἐν τῷ ποιοῦντι
καὶ διατιθέντι ἢ V γρ. S et ut vid. T 34 ἐκάστου] ἐν ἐκάστῳ F
δύο] τὸ δύο FS: τὰς δύο I 35 τίνες ... ἐνὸς post 36 ἀδύνα-
τον transponenda vel τίνες legendum ci. A ^b 2 ἢ ... μάθησις
ES: ἡ μάθησις καὶ ἡ (ἢ om. I) διδασίς AP 7 ἐν τινι] ἔστι γρ.
S καὶ om. F 8 ἀποτεμμημένη EFIS et fecit J¹: ἀποτεμμη-
μένως γρ. S κωλύει ... 9 εἶναι pr. AS: τὴν αὐτὴν εἶναι κωλύει E

τὴν αὐτὴν εἶναι (μὴ ὡς τῷ εἶναι τὸ αὐτό, ἀλλ' ὡς ὑπάρχει τὸ δυνάμει ὄν πρὸς τὸ ἐνεργεῖν), οὐτ' ἀνάγκη τὸν διδάσκοντα μαθάνειν, οὐδ' εἰ τὸ ποιεῖν καὶ πάσχειν τὸ αὐτό ἐστίν, μὴ μέντοι ὥστε τὸν λόγον εἶναι ἓνα τὸν (τὸ) τί ἦν εἶναι λέγοντα, οἷον ὡς λώπιον καὶ ἱμάτιον, ἀλλ' ὡς ἡ ὁδὸς ἢ Ἡθήβηθεν Ἀθήναζε καὶ ἡ Ἀθήνηθεν εἰς Θήβας, ὥσπερ εἴρηται καὶ πρότερον; οὐ γὰρ ταῦτὰ πάντα ὑπάρχει τοῖς ὄψωσοῦν τοῖς αὐτοῖς, ἀλλὰ μόνον οἷς τὸ εἶναι τὸ αὐτό. οὐ μὴν ἀλλ' οὐδ' εἰ ἡ διδασκαλία τῆ μαθήσει τὸ αὐτό, καὶ τὸ μαθάνειν τῷ διδάσκειν, ὥσπερ οὐδ' εἰ ἡ διάστασις μία τῶν διεστηκότων, καὶ τὸ δίστασθαι ἐνθένθε ἐκείσε κακέϊθεν δεῦρο ἐν καὶ τὸ αὐτό. ὅλως δ' εἰπέω οὐδ' ἡ διδασκαλία τῆ μαθήσει οὐδ' ἡποίησις τῆ παθήσει τὸ αὐτό κυρίως, ἀλλ' ὅτι ὑπάρχει ταῦτα, ἡ κίνησις· τὸ γὰρ τοῦδε ἐν τῷδε καὶ τὸ τοῦδε ὑπὸ τοῦδε ἐνέργειαν εἶναι ἕτερον τῷ λόγῳ.

τί μὲν οὖν ἐστὶν κίνησις εἴρηται καὶ καθόλου καὶ κατὰ μέρος· οὐ γὰρ ἄδηλον πῶς ὀρισθῆσεται τῶν εἰδῶν ἕκαστον αὐτῆς· ἀλλοίωσις μὲν γὰρ ἢ τοῦ ἀλλοιωτοῦ, ἢ ἀλλοιωτόν, ἐντελέχεια. ἔτι δὲ γνωριμώτερον, ἢ τοῦ δυνάμει ποιητικοῦ καὶ παθητικοῦ, ἢ τοιοῦτον, ἀπλῶς τε καὶ πάλιν καθ' ἕκαστον, ἢ οἰκοδόμησις ἢ λάτρευσις. τὸν αὐτὸν δὲ λεχθήσεται τρόπον καὶ περὶ τῶν ἄλλων κινήσεων ἐκάστης.

- 4 Ἐπεὶ δ' ἐστὶν ἡ περὶ φύσεως ἐπιστήμη περὶ μεγέθη καὶ κίνησις καὶ χρόνον, ὧν ἕκαστον ἀναγκαῖον ἢ ἀπειρον ἢ πεπερασμένον εἶναι, εἰ καὶ μὴ πᾶν ἐστὶν ἀπειρον ἢ πεπερασμένον, οἷον πάθος ἢ στιγμή (τῶν γὰρ τοιούτων ἴσως οὐδὲν ἀναγκαῖον ἐν θατέρῳ τούτων εἶναι), προσήκον ἂν εἴη τὸν περὶ φύσεως πραγματευόμενον θεωρῆσαι περὶ ἀπείρου, εἰ ἐστὶν

^b 9 τῷ scripsi: τὸ Π αὐτό, ὡς λώπιον καὶ ἱμάτιον, ἀλλ' I
 10 δυνάμει ὄν AP: δυνάμενον EV: δυνάμει S II ποιεῖν καὶ πάσχειν
 EVP: ποιεῖν καὶ τὸ πάσχειν S: πάσχειν καὶ τὸ ποιεῖν Λ 12 ὥστε
 scripsi: ὡς Π εἶναι ἓνα IJV: om. EF τὸν τὸ Bonitz: τὸν IJ:
 τὸ E: om. F 13 οἷον ὡς] οἷον Λ: ὡς Bekker λώπιον καὶ
 ἱμάτιον EV: τῷ λώπιον καὶ ἱματίῳ Λ 15 ὑπάρχει E²AP: ὑπάρξει
 E¹ 16 οὐ μὴν erasit E, om. P 17 διδάσκειν EP: διδάσκειν
 τὸ αὐτό Λ οὐδ' εἰ] οὐδέ E² 20 et 21 ἢ] ὡς I 21 τοῦδε
 E²FIVPS: τόδε E¹: τόδε τοῦδε J ἐν τῷδε καὶ AVPS: om. E
 τὸ τοῦδε AVP: τοῦδε E: τόδε S 23 ἐστίν] ἢ F εἴρηται hic
 EP: post 24 μέρος Λ 24 πῶς IP: ὡς EFJS 27 ἢ]
 ὅτι E (add. ἢ sup. lin. E¹): τι ἢ J² 28 δὲ EFJ²S: om. IJ¹
 30 μεγέθη τε καὶ F

ἢ μή, καὶ εἰ ἔστιν, τί ἔστιν. σημείον δ' ὅτι ταύτης τῆς ἐπιστή-
 203^a μης οἰκεία ἢ θεωρία ἢ περὶ αὐτοῦ· πάντες γὰρ οἱ δοκοῦντες ἀξιο-
 λόγως ἠφθαι τῆς τοιαύτης φιλοσοφίας πεποιήνται λόγου
 περὶ τοῦ ἀπείρου, καὶ πάντες ὡς ἀρχὴν τινα τιθέασιν τῶν ὄν-
 των, οἱ μὲν, ὥσπερ οἱ Πυθαγόρειοι καὶ Πλάτων, καθ' αὐτό,
 5 οὐχ ὡς συμβεβηκός τιμι ἐτέρῳ ἀλλ' οὐσίαν αὐτὸ ὄν τὸ ἀπει-
 ρον. πλὴν οἱ μὲν Πυθαγόρειοι ἐν τοῖς αἰσθητοῖς (οὐ γὰρ χω-
 ριστὸν ποιοῦσιν τὸν ἀριθμὸν), καὶ εἶναι τὸ ἔξω τοῦ οὐρανοῦ ἀπει-
 ρον, Πλάτων δὲ ἔξω μὲν οὐδὲν εἶναι σῶμα, οὐδὲ τὰς ιδέας,
 διὰ τὸ μηδὲ πού εἶναι αὐτάς, τὸ μέντοι ἀπειρον καὶ ἐν τοῖς
 10 αἰσθητοῖς καὶ ἐν ἐκείναις εἶναι· καὶ οἱ μὲν τὸ ἀπειρον εἶναι
 τὸ ἄρτιον (τοῦτο γὰρ ἐναπολαμβανόμενον καὶ ὑπὸ τοῦ περιτ-
 τοῦ περαινώμενον παρέχει τοῖς ὄσι τὴν ἀπειρίαν· σημείον
 δ' εἶναι τούτου τὸ συμβαῖνον ἐπὶ τῶν ἀριθμῶν· περιτιθεμένων
 γὰρ τῶν γνωμόνων περὶ τὸ ἐν καὶ χωρὶς ὅτε μὲν ἄλλο ἀεὶ
 15 γίγνεται τὸ εἶδος, ὅτε δὲ ἔν), Πλάτων δὲ δύο τὰ ἀπειρα,
 16 τὸ μέγα καὶ τὸ μικρόν.

16 οἱ δὲ περὶ φύσεως πάντες [ἀεὶ]
 ὑποτιθέασιν ἑτέραν τινα φύσιν τῷ ἀπείρῳ τῶν λεγομένων
 στοιχείων, οἷον ὕδωρ ἢ ἀέρα ἢ τὸ μεταξὺ τούτων. τῶν δὲ πε-
 περασμένα ποιούντων στοιχεῖα οὐθεὶς ἀπειρα ποιεῖ· ὅσοι δ'
 20 ἀπειρα ποιοῦσι τὰ στοιχεῖα, καθάπερ Ἀναξαγόρας καὶ Δη-
 μόκριτος, ὁ μὲν ἐκ τῶν ὁμοιομερῶν, ὁ δ' ἐκ τῆς πανσπερ-
 μίας τῶν σχημάτων, τῇ ἀφῆι συνεχῆς τὸ ἀπειρον εἶναι
 φασίν· καὶ ὁ μὲν ὅτιοῦν τῶν μορίων εἶναι μίγμα ὁμοίως τῷ
 παντὶ διὰ τὸ ὄρᾶν ὅτιοῦν ἐξ ὄτουοῦν γιγνόμενον· ἐντεῦθεν γὰρ
 25 ἔοικε καὶ ὁμοῦ ποτὲ πάντα χρήματα φάναι εἶναι, οἷον ἦδε

^b 36 ταύτης hic AST, post 203^a 1 θεωρία E² (expunctum), post ἐπιστήμης P 203^a 1 ἢ . . . περὶ αὐτοῦ IJS : ἢ περὶ αὐτὸ θεωρία in litura E² : ἢ θεωρία περὶ αὐτοῦ F : ἢ θεωρία PT οἱ δοκοῦντες om. F 2 ἠφθαι fecit E : locus pluribus 3 τοῦ AS : om. ET τινα . . . 4 αὐτό om. F 3 ὄντων καὶ οἱ I 4 μὲν] μὲν οὖν J 5 τιμι ἐτέρῳ ἀλλ' ὡς οὐσίαν . . . ἀπειρον fecit E 7 ποιοῦσιν ΔΡΡ : εἶναι λέγουσιν EP¹ τὸ] δὲ FP οὐρανοῦ τὸ ἀπειρον FS 8 οὐδὲ F 9 εἶναι αὐτάς AS : αὐτὰς εἶναι E 10 ἐκείναις FJS : ἐκείνοις EI εἶναι alt. om. F 11 γὰρ E²AS : γὰρ τὸ E¹ 12 παρέχει EF 14 γιγνόμενων J¹ 16 ἅπαντες ἀεὶ Λ : ἀεὶ πάντες E : πάντες VPS 18 τὸ] τι S δὲ om. E¹ 22 εἶναι τὸ ἀπειρον F 23 ὅτιοῦν μόριον E²IJPS μίγμα ὁμοίως EP : ὁμοίως μίγμα Λ 24 γιγνό- μενον E²ΔΡ : γενόμενον E¹ 25 post καὶ habent IJ et sup. lin. E τὸ ἅπαντα IJ et sup. lin. E : om. F φάναι χρήματα F : τὰ φάναι E¹

ἡ σὰρξ καὶ τὸδε τὸ ὄστουν, καὶ οὕτως ὀτιοῦν· καὶ πάντα ἄρα· καὶ ἅμα τοίνυν· ἀρχὴ γὰρ οὐ μόνον ἐν ἐκάστῳ ἔστι τῆς διακρίσεως, ἀλλὰ καὶ πάντων. ἐπεὶ γὰρ τὸ γιγνόμενον ἐκ τοῦ τοιοῦτου γίνεταί σώματος, πάντων δ' ἔστι γένεσις πλὴν οὐχ ἅμα, καὶ τινα ἀρχὴν δεῖ εἶναι τῆς γενέσεως, αὕτη δ' ἐστίν 30 μία, οἷον ἐκεῖνος καλεῖ νοῦν, ὃ δὲ νοῦς ἀπ' ἀρχῆς τινος ἐργάζεται νοήσας· ὥστε ἀνάγκη ὁμοῦ ποτε πάντα εἶναι καὶ ἀρξασθαί ποτε κινούμενα. Δημόκριτος δ' οὐδὲν ἕτερον ἐξ ἑτέρου γίνεσθαι τῶν πρώτων φησίν· ἀλλ' ὅμως γε αὐτῷ τὸ κοινὸν σῶμα πάντων ἐστὶν ἀρχή, μεγέθει κατὰ μόρια καὶ σχή- 203^b ματι διαφέρου.

ὅτι μὲν οὖν προσήκουσα τοῖς φυσικοῖς ἢ θεωρία, δῆλον ἐκ τούτων. εὐλόγως δὲ καὶ ἀρχὴν αὐτὸ τιθέασι πάντες· οὔτε γὰρ μάτην οἶόν τε αὐτὸ εἶναι, οὔτε ἄλλην ὑπάρχειν αὐτῷ 5 δύναμιν πλὴν ὡς ἀρχὴν· ἅπαντα γὰρ ἢ ἀρχὴ ἢ ἐξ ἀρχῆς, τοῦ δὲ ἀπείρου οὐκ ἔστιν ἀρχή· εἴη γὰρ ἂν αὐτοῦ πέρασ. ἔτι δὲ καὶ ἀγένητον καὶ ἀφθαρτον ὡς ἀρχή τις οὔσα· τό τε γὰρ γενόμενον ἀνάγκη τέλος λαβεῖν, καὶ τελευτὴ πάσης ἔστιν φθορᾶς. διό, καθάπερ λέγομεν, οὐ ταύτης ἀρχή, ἀλλ' αὕτη τῶν 10 ἄλλων εἶναι δοκεῖ καὶ περιέχειν ἅπαντα καὶ πάντα κυβερνᾶν, ὡς φασιν ὅσοι μὴ ποιούσι παρὰ τὸ ἄπειρον ἄλλας αἰτίας, οἷον νοῦν ἢ φιλίαν· καὶ τοῦτ' εἶναι τὸ θεῖον· ἀθάνατον γὰρ καὶ ἀνώλεθρον, ὥσπερ φησὶν Ἀναξίμανδρος καὶ οἱ πλεῖστοι τῶν φυσιολόγων.

15

τοῦ δ' εἶναι τι ἄπειρον ἢ πίστις ἐκ πέντε 15 μάλιστ' ἂν συμβαίνοι σκοποῦσιν, ἐκ τε τοῦ χρόνου (οὔτος γὰρ ἄπειρος) καὶ ἐκ τῆς ἐν τοῖς μεγέθεσι διαιρέσεως (χρῶνται γὰρ καὶ οἱ μαθηματικοὶ τῷ ἀπείρῳ)· ἔτι τῷ οὕτως ἂν μό- 2
3
ως μὴ ὑπολείπειν γένεσιν καὶ φθοράν, εἰ ἄπειρον εἴη ὅθεν

^a 26 ἄρα] καὶ ἄρα E 28 τοῦ om. I 30 εἶναι δεῖ Λ
31 οἷον] ὄν E² Λ 32 πάντα ποτὲ I 34 φησίν] φύσεων F γε
EP: om. Λ αὐτῷ JP: αὐτῶν E: αὐτὸ FIV I πάντων EP:
ἀπάντων Λ ἀρχή om. E¹ κατὰ τὰ μόρια I 5 γὰρ πάντες
μάτην E οἶόν τε αὐτὸ FI et fecit J¹: αὐτὸ οἶονται EV: αὐτὸ οἶόν
τε Bekker αὐτῷ ὑπάρχειν Λ 7 ἂν om. I 8 ἀγένητον
EJS: ἀγέννητον FI 9 τέλος λαβεῖν EP: λαβεῖν τέλος Λ
10 διόπερ καθὰ I 13 οἰονοῦν E 14 ὥσπερ AS: ὡς E φησὶν]
φησὶν ὁ F 15 τι] τὸ S¹ ἐκ πέντε om. F 16 συμβαίνει
E 18 μαθητικοὶ E μόνῳ J¹ 19 ἐπιλείπειν S γένεσιν] τῆν
γένεσιν FST εἰ . . . 20 γιγνόμενον om. E 19 εἴη] ἢ F

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Γ

20 ἀφαιρείται τὸ γιγνόμενον· ἔτι τῷ τὸ πεπερασμένον αἰεὶ πρὸς
 4 τι περαίνειν, ὥστε ἀνάγκη μὴδὲν εἶναι πέρασ, εἰ αἰεὶ πε-
 ραίνειν ἀνάγκη ἕτερον πρὸς ἕτερον. μάλιστα δὲ καὶ κυ-
 5 ριώτατον, ὃ τὴν κοινὴν ποιεῖ ἀπορίαν πᾶσι· διὰ γὰρ τὸ ἐν
τῇ νοήσει μὴ ὑπολείπειν καὶ ὁ ἀριθμὸς δοκεῖ ἀπειρος εἶναι
 25 καὶ τὰ μαθηματικὰ μεγέθη καὶ τὸ ἔξω τοῦ οὐρανοῦ. ἀπείρου
 δ' ὄντος τοῦ ἔξω, καὶ σῶμα ἀπειρον εἶναι δοκεῖ καὶ κόσμου·
 τί γὰρ μᾶλλον τοῦ κενοῦ ἐνταῦθα ἢ ἐνταῦθα; ὥστ' εἴπερ μο-
 ναχοῦ, καὶ πανταχοῦ εἶναι τὸν ὄγκον. ἅμα δ' εἰ καὶ ἔστι κε-
 νὸν καὶ τόπος ἀπειρος, καὶ σῶμα εἶναι ἀναγκαῖον·
 30 ἐνδέχασθαι γὰρ ἢ εἶναι οὐδὲν διαφέρει ἐν τοῖς αἰδίοις.

30 ἔχει
 δ' ἀπορίαν ἢ περὶ τοῦ ἀπείρου θεωρία· καὶ γὰρ μὴ εἶναι τι-
 θεμένοις πόλλ' ἀδύνατα συμβαίνει καὶ εἶναι. ἔτι δὲ ποτέ-
 ρως ἔστιν, πότερον ὡς οὐσία ἢ ὡς συμβεβηκὸς καθ' αὐτὸ φύσει
 τινί; ἢ οὐδετέρως, ἀλλ' οὐδὲν ἦττον ἔστιν ἀπειρον ἢ ἀπειρα
 204^a τῷ πλήθει; μάλιστα δὲ φυσικοῦ ἔστιν σκέψασθαι εἰ ἔστι μέ-
 γεθος αἰσθητὸν ἀπειρον. πρώτον οὖν διοριστέον ποσαχῶς λέγε-
ται τὸ ἀπειρον. ἓνα μὲν διὰ τὸν τρόπον τὸ ἀδύνατον διελθεῖν τῷ
 μὴ πεφυκέναι διεῖναι, ὥσπερ ἡ φωνὴ ἀόρατος· ἄλλως δὲ
 5 τὸ διεξοδὸν ἔχον ἀτελεύτητον, ἢ ὁ μόγις, ἢ ὁ πεφυκὸς
 ἔχειν μὴ ἔχει διεξοδὸν ἢ πέρασ. ἔτι ἀπειρον ἅπαν ἢ κατὰ
 πρόσθεσιν ἢ κατὰ διαίρεσιν ἢ ἀμφοτέρως.

Χωριστὸν μὲν οὖν εἶναι τὸ ἀπειρον τῶν αἰσθητῶν, αὐτὸ 5
 τι ὃν ἀπειρον, οὐχ οἶόν τε. εἰ γὰρ μήτε μέγεθός ἐστιν μήτε
 10 πλήθος, ἀλλ' οὐσία αὐτὸ ἔστι τὸ ἀπειρον καὶ μὴ συμβεβη-
 κός, ἀδιαίρετον ἔσται (τὸ γὰρ διαίρετόν ἢ μέγεθος ἔσται ἢ
 πλήθος)· εἰ δὲ τοιοῦτον, οὐκ ἀπειρον, εἰ μὴ ὡς ἡ φωνὴ
 ἀόρατος. ἀλλ' οὐχ οὕτως οὔτε φασὶν εἶναι οἱ φάσκουτες εἶναι

204^a 3-14 = 1066^a 35-^b 7

^b 20 τῷ om. E τὸ om. F 21 μὴδὲν ΛΤ: μὴδὲ E 25 μαθη-
 τικὰ E 29 σῶμα EP: σῶμα ἀπειρον ΛVS ἀναγκαῖον εἶναι ΔΡ
 30 τὸ γὰρ ἐνδέχασθαι ΔST ἢ] τοῦ ΔST εἶναι] εἶναι ἢ fecit E
 31 μὴ] καὶ μὴ I 33 ἢ om. E¹ ὡς om. Bekker 34 μηδετέρως
 AS ἢ EJV: καὶ FIS 204^a I φυσικῶ J ἔστιν σκέψασθαι
 ΠΡ: ἐπισκέψασθαι ST 2 οὖν om. F 4 ἢ] δ' ἢ E 5 μόγις
 ΠS: μόλις MPT 10 ἀλλ' οὐσία] οὐσία δὲ ΔM 11-12 διαίρε-
 τὸν . . . πλήθος ΛΤ: μέγεθος καὶ τὸ πλήθος διαίρετόν E 12 τοιοῦτον]
 ἀδιαίρετον ΔMS 13 εἶναι pr. om. I

τὸ ἄπειρον οὐτε ἡμεῖς ζητοῦμεν, ἀλλ' ὡς ἀδιεξίτητον. εἰ δὲ
κατὰ συμβεβηκὸς ἔστιν τὸ ἄπειρον, οὐκ ἂν εἶη στοιχείον τῶν 15
ὄντων, ἢ ἄπειρον, ὥσπερ οὐδὲ τὸ ἄορατον τῆς διαλέκτου, καί-
τοι ἢ φωνή ἔστιν ἄορατος. ἔτι πῶς ἐνδέχεται εἶναι τι αὐτὸ
ἄπειρον, εἴπερ μὴ καὶ ἀριθμὸν καὶ μέγεθος, ὧν ἔστι καθ'
αὐτὸ πάθος τι τὸ ἄπειρον; ἔτι γὰρ ἦττον ἀνάγκη ἢ τὸν
ἀριθμὸν ἢ τὸ μέγεθος. // φανερόν δὲ καὶ ὅτι οὐκ ἐνδέχεται εἶ- 20
ναι τὸ ἄπειρον ὡς ἐνεργεία ὃν καὶ ὡς οὐσίαν καὶ ἀρχήν·
ἔσται γὰρ ὅτι οὖν αὐτοῦ ἄπειρον τὸ λαμβανόμενον, εἰ μεριστόν
(τὸ γὰρ ἀπεῖρφ εἶναι καὶ ἄπειρον τὸ αὐτό, εἴπερ οὐσία τὸ
ἄπειρον καὶ μὴ καθ' ὑποκειμένον), ὥστ' ἢ ἀδιαίρετον ἢ εἰς
ἄπειρα διαιρετόν· πολλὰ δ' ἄπειρα εἶναι τὸ αὐτὸ ἀδύνα- 25
τον (ἀλλὰ μὴν ὥσπερ ἀέρος ἀῆρ μέρος, οὕτω καὶ ἄπειρον
ἀπεῖρου, εἴ γε οὐσία ἔστι καὶ ἀρχή)· ἀμεριστόν ἄρα καὶ ἀδιαί-
ρετον. ἀλλ' ἀδύνατον τὸ ἐντελεχεῖα ὃν ἄπειρον· ποσὸν γάρ
τι εἶναι ἀναγκαῖον. κατὰ συμβεβηκὸς ἄρα ὑπάρχει τὸ
ἄπειρον. ἀλλ' εἰ οὕτως, εἴρηται ὅτι οὐκ ἐνδέχεται αὐτὸ λέ- 30
γεω ἀρχήν, ἀλλ' ᾧ συμβέβηκε, τὸν ἀέρα ἢ τὸ ἄρτιον.
ὥστε ἀτόπως ἂν ἀποφαίνωτο οἱ λέγοντες οὕτως ὥσπερ
οἱ Πυθαγόρειοι φασιν· ἅμα γὰρ οὐσίαν ποιοῦσι τὸ ἄπειρον
καὶ μερίζουσιν. 34

ἀλλ' ἴσως αὕτη μὲν [ἔστι] καθόλου ἢ ζήτη- 34
σις, εἰ ἐνδέχεται ἄπειρον καὶ ἐν τοῖς μαθηματικοῖς 35

204^a 14-17 = 1066^b 9-11 17-19 = 1066^b 7-9 20-31
= 1066^b 11-21 34^{-b} 8 = 1066^b 21-6

^a14 ἀδιεξίτητον PST: ἀδιεξίτητον E: ἀδιέξοδον AM εἰ δὲ
APST: ἔτι εἰ EM 15 τῶν ὄντων στοιχείον I 16 ἢ] ἢ δ' I οὐδὲ
E²AMT: om. E¹ 17 εἶναι τι αὐτὸ EP: αὐτὸ εἶναι τι Δ 18 μὴ
καὶ AM: καὶ μὴ E 19 αὐτὰ E ἔτι . . . 20 μέγεθος om. E¹
20 εἶναι ΠΤ: οὐσίαν εἶναι PS 21 ἐνεργεία ὃν ΔS: ἐνεργείαν ὃν
E: ἐνεργείαν T: ἐντελεχεῖα ὃν P ἀρχήν ΔMVS: ἀρχήν, ἀλλ' ἦττον
ἢ τὸν ἀριθμὸν καὶ μέγεθος. ἔτι ἀδύνατον οὐσίαν εἶναι τὸ ἄπειρον ἐντε-
λεχεῖα ὄντος τοῦ ἀπεῖρου (cf. ^a19-21) E 25 ἄπειρα] ἄπειρα
ἀδιαίρετα E¹ πολλὰ δ' AMS: ἔτι πολλὰ E ἄπειρα τὸ αὐτὸ εἶναι
ἀδύνατον E: εἶναι ἄπειρον τὸ αὐτὸ ἀδύνατον S: εἶναι τὸ αὐτὸ ἀδύνατον
ἄπειρον M 26 ἀλλὰ μὴν ὥσπερ] ὥσπερ γὰρ MVP et ut vid. T
ἀῆρ μέρος ἀέρος F 27 γε E²AP: om. E¹M ἔστι E²AMP:
om. E¹ 30 αὐτὸ] τὸ αὐτὸ F 31 ᾧ] ἐκείνο ᾧ ΔM et fecit
E¹ ἢ om. E¹ ἄρτιον AMV: ἄρτιον ἂν λέγοιτο ἀρχή E 32 οὕτως
ὥσπερ] ἐκείνο καθάπερ Δ 34 ἴσως APS: γὰρ E ἔστι AS:
ἂν εἶη EP: om. M ἢ AMPS: om. E ζήτησις EMVS: ζήτησις
μᾶλλον AP 35 ἄπειρον] τὸ ἄπειρον E²Δ

204^b εἶναι καὶ ἐν τοῖς νοητοῖς καὶ μηδὲν ἔχουσι μέγεθος· ἡμεῖς δ' ἐπισκοποῦμεν περὶ τῶν αἰσθητῶν καὶ περὶ ὧν ποιούμεθα τὴν μέθοδον, ἅρ' ἔστιν ἐν αὐτοῖς ἢ οὐκ ἔστι σῶμα ἄπειρον ἐπὶ τὴν αὐξήσιν. λογικῶς μὲν οὖν σκοπούμενοις ἐκ τῶν τοι-
 5 ῶνδε δόξειεν ἂν οὐκ εἶναι· εἰ γὰρ ἔστι σώματος λόγος τὸ ἐπιπέδω ὠρισμένον, οὐκ ἂν εἴη σῶμα ἄπειρον, οὔτε νοητὸν οὔτε αἰσθητὸν (ἀλλὰ μὴν οὐδ' ἀριθμὸς οὕτως ὡς κεχωρισμένος καὶ ἄπειρος· ἀριθμητὸν γὰρ ἀριθμὸς ἢ τὸ ἔχον ἀριθμὸν· εἰ οὖν τὸ ἀριθμητὸν ἐνδέχεται ἀριθμῆσαι, καὶ διεξελθεῖν ἂν
 10 εἴη δυνατὸν τὸ ἄπειρον)· φυσικῶς δὲ μᾶλλον θεωροῦσιν ἐκ τῶνδε. οὔτε γὰρ σύνθετον οἶόν τε εἶναι οὔτε ἄπλοῦν. σύνθετον μὲν οὖν οὐκ ἔσται τὸ ἄπειρον σῶμα, εἰ πεπερασμένα τῷ πλήθει τὰ στοιχεῖα. ἀνάγκη γὰρ πλείω εἶναι, καὶ ἰσάζειν αἰετὰναυτία, καὶ μὴ εἶναι ἐν αὐτῶν ἄπειρον (εἰ γὰρ
 15 ὀποσφoῦν λείπεται ἢ ἐν ἐνὶ σῶματι δύναμις θατέρου, οἷον εἰ τὸ πῦρ πεπέρανται, ὃ δ' ἄηρ ἄπειρος, ἔστιν δὲ τὸ ἴσον πῦρ τοῦ ἴσου ἀέρος τῇ δυνάμει ὀποσαπλασιουοῦν, μόνον δὲ ἀριθμὸν τινα ἔχον, ὅμως φανερόν ὅτι τὸ ἄπειρον ὑπερβαλεῖ καὶ φθερεῖ τὸ πεπερασμένον)· ἕκαστον δ' ἄπειρον εἶναι ἀδύνατον·
 20 σῶμα μὲν γὰρ ἔστιν τὸ πάντη ἔχον διάστασιν, ἄπειρον δὲ τὸ ἀπεράντως διεστηκός, ὥστε τὸ ἄπειρον σῶμα πανταχῆ ἔσται
 22 διεστηκός εἰς ἄπειρον.

22 ἀλλὰ μὴν οὐδὲ ἐν καὶ ἄπλοῦν εἶναι σῶμα ἄπειρον ἐνδέχεται, οὔτε ὡς λέγουσί τινες τὸ παρὰ τὰ στοιχεῖα, ἐξ οὗ ταῦτα γεννώσιν, οὔθ' ἄπλως. εἰσὶν γὰρ τι-
 25 νες οἱ τοῦτο ποιοῦσι τὸ ἄπειρον, ἀλλ' οὐκ ἀέρα ἢ ὕδωρ, ὅπως μὴ τᾶλλα φθείρηται ὑπὸ τοῦ ἀπίρου αὐτῶν· ἔχουσι γὰρ

204^b 10-24 = 1066^b 26-36

^b I καὶ alt.] καὶ ἐν τοῖς Λ ἡμεῖς δ' ἐπισκοποῦμεν fecit E
 3 ἐν . . . ἔστι AS : ἢ οὐκ ἔστιν ἐν αὐτοῖς E 4 ἐπὶ] περὶ Moreliana
 4 τῶν τοιῶνδε] τῶνδε F 5 λόγος τὸ fecit E² 6 ἐπιπέδω ΠΤ :
 ἐπιπέδοις MS 7 οὐδ' EFP : οὔτε IJ 8 γὰρ EFIJ¹P : γὰρ ὁ
 J²MS 9 διεξελθεῖν EIJPS : διελθεῖν FT 11 τῶνδε δῆλον.
 οὔτε MV τε εἶναι AM : εἶναι τὸ ἄπειρον σῶμα EV 12 ἔστι FP
 13 στοιχεῖα εἴη. ἀνάγκη FP 15 ὀποσφoῦν EJV : ὀπωσοῦν FI
 16 πεπέρασαι FI 18 ὑπερβάλλει καὶ φθείρει IJ et fecit E
 20 μὲν om. FIM 21 πανταχοῦ F : παντῆ MP ἔσται IJMS :
 ἔστιν E : om. F 22 εἰς AS : καὶ εἰς E εἶναι om. F 23 ἐν-
 δέχεται τὸ ἄπειρον σῶμα Λ : τὸ ἄπειρον σῶμα ἐνδέχεται P 25
 ποιοῦσι AP : ποιοῦντες E ὅπως IJP : ὡς EF

πρὸς ἄλληλα ἐναντίωσι, οἶον ὁ μὲν ἀήρ ψυχρός, τὸ δ' ὕδωρ ὑγρόν, τὸ δὲ πῦρ θερμόν· ὦν εἰ ἦν ἐν ἄπειρον, ἐφθαρτο ἂν ἦδη τᾶλλα· νῦν δ' ἕτερον εἶναι φασιν ἐξ οὗ ταῦτα. ἀδύνατον δ' εἶναι τοιοῦτον, οὐχ ὅτι ἄπειρον (περὶ τούτου μὲν γὰρ 30 κοινὸν τι λεκτέον ἐπὶ παντὸς ὁμοίως, καὶ ἀέρος καὶ ὕδατος καὶ ὄπουον), ἀλλ' ὅτι οὐκ ἔστιν τοιοῦτον σῶμα αἰσθητὸν παρὰ τὰ καλούμενα στοιχεῖα· ἅπαντα γὰρ ἐξ οὗ ἔστι, καὶ διαλύεται εἰς τοῦτο, ὥστε ἦν ἂν ἐνταῦθα παρὰ ἀέρα καὶ πῦρ καὶ γῆν καὶ ὕδωρ· φαίνεται δ' οὐδέν. οὐδὲ δὴ πῦρ οὐδ' ἄλλο τι 35 τῶν στοιχείων οὐδὲν ἄπειρον ἐνδέχεται εἶναι. ὅλως γὰρ καὶ 205^a χωρὶς τοῦ ἄπειρον εἶναι τι αὐτῶν, ἀδύνατον τὸ πᾶν, κἂν ἦ πεπερασμένον, ἢ εἶναι ἢ γίγνεσθαι ἐν τι αὐτῶν, ὥσπερ Ἡράκλειτός φησι ἅπαντα γίγνεσθαι ποτε πῦρ (ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τοῦ ἐνός, οἶον ποιούσι παρὰ τὰ στοιχεῖα οἱ φυσικοί)· 5 πάντα γὰρ μεταβάλλει ἐξ ἐναντίου εἰς ἐναντίον, οἶον ἐκ θερμοῦ εἰς ψυχρόν. 7

δεῖ δὲ κατὰ παντὸς ἐκ τῶνδε σκοπεῖν, εἰ ἐνδέχεται ἢ οὐκ ἐνδέχεται εἶναι [σῶμα ἄπειρον αἰσθητόν]. ὅτι δὲ ὅλως ἀδύνατον εἶναι σῶμα ἄπειρον αἰσθητόν, ἐκ τῶνδε δῆλον. πέφυκε γὰρ πᾶν τὸ αἰσθητόν που εἶναι, καὶ ἔστιν τόπος τις 10 ἐκάστου, καὶ ὁ αὐτὸς τοῦ μορίου καὶ παντός, οἶον ὄλης τε τῆς γῆς καὶ βώλου μιᾶς, καὶ πυρὸς καὶ σπιωθήρος. ὥστε εἰ μὲν ὁμοειδές, ἀκίνητον ἔσται ἢ αἰεὶ οἰσθήσεται· καίτοι ἀδύνατον (τί γὰρ μᾶλλον κάτω ἢ ἄνω ἢ ὀπουοῦν; λέγω δὲ οἶον, εἰ βῶλος εἶη, ποῦ αὕτη κινήθησεται ἢ ποῦ μενεῖ; ὁ γὰρ 15 τόπος ἄπειρος τοῦ συγγενοῦς αὐτῇ σώματος. πότερον οὖν καθέξει τὸν ὅλον τόπον; καὶ πῶς; τίς οὖν ἢ ποῦ ἢ μονῆ καὶ

204^b 32—205^a 7 = 1066^b 36—1067^a 7 205^a 10—26 = 1067^a 7—20

^b 27—8 ψυχρός (ψυχροῦς E) . . . ὑγρόν ΠPST: ὑγρός . . . ψυχρόν
 ci. S 28 ὦν] ὡς T 29 ἂν om. F φασιν εἶναι τὸ ἐξ Λ
 30 μὲν om. F 33 καλούμενα στοιχεῖα ΔT: στοιχεῖα καλούμενα
 E ἅπαν IT: ἅπαν μὲν F 35 τι EP: om. F, post 205^a 1
 εἶναι ponunt IJ 205^a 2 τὸ ΔM: om. E κἂν ἢ ΔM: ἢ καὶ E
 4 φησι δὲ ἅπαντα E 6 πᾶν MP ἐναντίον ΔP: ἐναντία E
 7 κατὰ] περὶ E²FIPS ἐκ] καὶ ἐκ ΔVPS 8 ἢ οὐκ ἐνδέχεται
 om. F εἶναι . . . αἰσθητόν F: σῶμα εἶναι ἄπειρον αἰσθητόν IJ:
 εἶναι ἄπειρον S: εἶναι E 9 εἶναι . . . αἰσθητόν ΠP: secl. Prantl
 12 βώλου μιᾶς ES: μιᾶς βώλου ΔT 14 ὀπουοῦν MV Bonitz: ποῦ
 EIJ: ὀπουοῦν F 16 αὐτῆς EM 17 ἢ EFP: καὶ IJ ἢ om. F

ἡ κίνησις αὐτῆς; ἢ πανταχοῦ μενεῖ; οὐ κινήσεται ἄρα. ἢ
 πανταχοῦ κινήσεται; οὐκ ἄρα στήσεται· εἰ δ' ἀνόμοιον τὸ
 20 πᾶν, ἀνόμοιοι καὶ οἱ τόποι· καὶ πρῶτον μὲν οὐχ ἐν τῷ
 σῶμα τοῦ παντὸς ἀλλ' ἢ τῷ ἄπτεσθαι· ἔπειτα ἦτοι πεπε-
 ρασμένα ταῦτ' ἔσται ἢ ἄπειρα τῷ εἶδει. πεπερασμένα μὲν
 οὖν οὐχ οἷόν τε (ἔσται γὰρ τὰ μὲν ἄπειρα τὰ δ' οὐ, εἰ τὸ πᾶν
 ἄπειρον, οἷον τὸ πῦρ ἢ τὸ ὕδωρ· φθορὰ δὲ τὸ τοιοῦτον τοῖς
 25, 29 ἐναντίοις [καθάπερ εἴρηται πρότερον])· [καὶ... κάτω]· εἰ δ' ἄπειρα
 30 καὶ ἀπλά, καὶ οἱ τόποι ἄπειροι, καὶ ἔσται ἄπειρα τὰ στοιχεῖα· εἰ δὲ
 τοῦτ' ἀδύνατον καὶ πεπερασμένοι οἱ τόποι, καὶ τὸ ὅλον [πε-
 περάνθαι ἀναγκαῖον]· ἀδύνατον γὰρ μὴ ἀπαρτίξω τὸν τό-
 πον καὶ τὸ σῶμα· οὔτε γὰρ ὁ τόπος ὁ πᾶς μείζων ἢ ὅσον
 ἐνδέχεται τὸ σῶμα εἶναι (ἅμα δ' οὐδ' ἄπειρον ἔσται τὸ
 35 σῶμα ἔτι), οὔτε τὸ σῶμα μείζων ἢ ὁ τόπος· ἢ γὰρ κενὸν
 205^{b1, a25} ἔσται τι ἢ σῶμα οὐδαμοῦ πεφυκὸς εἶναι. (καὶ διὰ τοῦτ' οὐθεῖς
 τὸ ἐν καὶ ἄπειρον πῦρ ἐποίησεν οὐδὲ γῆν τῶν φυσιολόγων, ἀλλ'
 ἢ ὕδωρ ἢ ἀέρα ἢ τὸ μέσον αὐτῶν, ὅτι τόπος ἐκατέρου δηλὸς ἦν
 διωρισμένος, ταῦτα δ' ἐπαμφοτερίζει τῷ ἄνω καὶ κάτω.)

205^b

Ἀναξαγόρας δ'
 2 ἀτόπως λέγει περὶ τῆς τοῦ ἀπείρου μονῆς· στηρίζω γὰρ
 αὐτὸ αὐτὸ φησιν τὸ ἄπειρον· τοῦτο δέ, ὅτι ἐν αὐτῷ (ἄλλο
 γὰρ οὐδὲν περιέχει), ὡς ὅπου ἂν τι ἦ, πεφυκὸς ἐνταῦθα εἶ-
 5 ναι. τοῦτο δ' οὐκ ἀληθές· εἴη γὰρ ἂν τί που βιά καὶ οὐχ οὐ
 πέφυκεν. εἰ οὖν ὅτι μάλιστα μὴ κινεῖται τὸ ὅλον (τὸ γὰρ
 αὐτῷ στηριζόμενον καὶ ἐν αὐτῷ ὄν ἀκίνητον εἶναι ἀνάγκη),
 ἀλλὰ διὰ τί οὐ πέφυκε κινεῖσθαι, λεκτέον. οὐ γὰρ ἰκανὸν τὸ

205^a 29-32 = 1067^a 20-23

^a 18 αὐτῆ E¹ οὐ... 19 στήσεται AMP: om. E 19 ἀνόμοιον
 ΠΜ: ἀνομοειδὲς S 20 πᾶν AMP: ἅπαν E 21 τῷ AM:
 τοῦ E 22 ἔσται AM: ἐστίν E πεπερασμένα μὲν οὖν EFMP:
 καὶ πεπερασμένα μὲν IJ 23 εἰ] ἢ J 25 καθάπερ... πρότερον
 om. EM καὶ... 29 κάτω hic ΠPST: post ^b I εἶναι ponenda ci.
 Pacius: ante καὶ lacunam statuit Hayduck 30 ἀπλά ΔMPS:
 τὰ ἀπλά E ἔσται post στοιχεῖα F 31 καὶ alt. AM:
 ὥστε καὶ EV ἀναγκαῖον πεπεράνθαι M: om. E 34 σῶμα
 EP: σῶμα ἅμα Δ οὐδ' APST: om. E 35 ἔτι EP: om. Δ
 25 τοῦτο θεῖς E¹ 26 ἐν καὶ ἄπειρον EIJP: ἄπειρον καὶ ἐν F: ἄπειρον
 T 27 ἢ pr. om. E²T ^b 3 αὐτῷ αὐτῷ E² et ut vid. T
 4 οὐδὲ E περιέχειν T et ut vid. PS, Bonitz: περιέχει Π εἶναι
 APS: ἐν E 6 κινῆται J γὰρ] γὰρ ἐν APS

οὕτως εἰπόντα ἀπηλλάχθαι· εἴη γὰρ ἂν καὶ ὅτι οὐκ ἔχει ἀλλαχῆ
 κινεῖσθαι οὐ κινούμενον, ἀλλὰ πεφυκέναι οὐδὲν κωλύει· ἐπεὶ καὶ 10
 ἡ γῆ οὐ φέρεται, οὐδ' εἰ ἄπειρος ἦν, εἰργμένη μέντοι ὑπὸ τοῦ μέ-
 σου· ἀλλ' οὐχ ὅτι οὐκ ἔστιν ἄλλο οὗ ἐνεχθήσεται, μένειεν
 ἂν [ἐπὶ τοῦ μέσου], ἀλλ' ὅτι πέφυκεν οὕτω. καίτοι ἐξείη ἂν
 λέγειω ὅτι στηρίζει αὐτήν. εἰ οὖν μηδ' ἐπὶ τῆς γῆς τοῦτο αἰ-
 τιον ἀπείρου οὐσης, ἀλλ' ὅτι βάρος ἔχει, τὸ δὲ βαρὺ μένει 15
 ἐπὶ τοῦ μέσου, ἡ δὲ γῆ ἐπὶ τοῦ μέσου, ὁμοίως ἂν καὶ τὸ ἀπει-
 ρον μένοι ἐν αὐτῷ διὰ τιν' ἄλλην αἰτίαν, καὶ οὐχ ὅτι ἀπει-
 ρον καὶ στηρίζει αὐτὸ ἑαυτό. ἅμα δὲ δῆλον ὅτι κἂν ὅτιοῦν
 μέρος δέοι μένειν· ὡς γὰρ τὸ ἀπειρον ἐν ἑαυτῷ μένει στη-
 ρίζον, οὕτως κἂν ὅτιοῦν ληφθῆ μέρος ἐν ἑαυτῷ μενεῖ· τοῦ 20
 γὰρ ὅλου καὶ τοῦ μέρους ὁμοειδεῖς οἱ τόποι, οἶον ὅλης γῆς
 καὶ βώλου κάτω καὶ παντὸς πυρὸς καὶ σπιυθῆρος ἄνω. ὥστε
 εἰ τοῦ ἀπείρου τόπος τὸ ἐν αὐτῷ, καὶ τοῦ μέρους ὁ αὐτός.
 μενεῖ ἄρα ἐν ἑαυτῷ. 24

ὅλως δὲ φανερόν ὅτι ἀδύνατον ἀπειρον 24
 ἅμα λέγειν σῶμα καὶ τόπον τινὰ εἶναι τοῖς σώμασιν, 25
 εἰ πᾶν σῶμα αἰσθητὸν ἢ βάρος ἔχει ἢ κουφότητα, καὶ εἰ
 μὲν βαρὺ, ἐπὶ τὸ μέσον ἔχει τὴν φορὰν φύσει, εἰ δὲ κου-
 φον, ἄνω· ἀνάγκη γὰρ καὶ τὸ ἀπειρον, ἀδύνατον δὲ ἢ
 ἅπαν ὀποτεροῦν ἢ τὸ ἡμισυ ἑκάτερον πεπονθῆναι· πῶς γὰρ
 διελεῖς; ἢ πῶς τοῦ ἀπείρου ἔσται τὸ μὲν ἄνω τὸ δὲ κάτω, 30
 ἢ ἔσχατον καὶ μέσον; ἔτι πᾶν σῶμα αἰσθητὸν ἐν τόπῳ, τόπου
 δὲ εἶδη καὶ διαφοραὶ τᾶνω καὶ κάτω καὶ ἔμπροσθεν καὶ
 ὀπισθεν καὶ δεξιὸν καὶ ἀριστερόν· καὶ ταῦτα οὐ μόνον πρὸς
 ἡμᾶς καὶ θέσει, ἀλλὰ καὶ ἐν αὐτῷ τῷ ὅλῳ διώρισται.

205^b 24—206^a 7 = 1067^a 23—33

^b 9—10 ὅτι . . . κινεῖσθαι EPST: ὅτιοῦν ἄλλο Λ 11 εἰργμένη
 AP: ἡργμένη fecit E ὑπὸ S: ἀπὸ Π 12 μένη F: μένειεν IJ
 13 ἐπὶ τοῦ μέσου om. E et fort. S ὅτι E¹VT: ὅτι οὐ E²A λέγειν
 ἂν I 16 ἢ . . . μέσου om. I 17 ἐν EFS: ἂν ἐν IJ τῆς
 fecit E² 18 ἑαυτό E¹FPS: αὐτό J²: αὐτῷ E²J¹ et ut vid. T: αὐτῷ I
 20 μένει EFS 23 τὸ ἐν αὐτῷ ΔS: om. E 24 μένει E
 ἀπειρον ἅμα ES: ἅμα ἀπειρον IJM: ἅμα F: τὸ ἀπειρον ἅμα P
 28 ἀπειρον σῶμα, ἀδύνατον IJ ἢ ἀπαν] εἶναι πᾶν corr. E: ἢ πᾶν MS
 30 διέλης fecit E τὸ μὲν ἄνω ἔσται I 31 καὶ MVPS: ἢ Π 32 τᾶνω καὶ κάτω om. J¹ καὶ alt.] τὸ IJ²: καὶ τὸ F
 καὶ ἔμπροσθεν ET: καὶ τὸ ἔμπροσθεν F: τὸ πρόσθεν IJ
 34 θέσει ἔστιν ἀλλὰ E²IJ

35 ἀδύνατον δ' ἐν τῷ ἀπείρῳ εἶναι ταῦτα. ἀπλῶς δ' εἰ ἀδύνατον
 206^a τόπον ἄπειρον εἶναι, ἐν τόπῳ δὲ πᾶν σῶμα, ἀδύνατον ἄπει-
 ρον [τι] εἶναι σῶμα. ἀλλὰ μὴν τό γε πού ἐν τόπῳ, καὶ τὸ
 ἐν τόπῳ πού. εἰ οὖν μηδὲ ποσὸν οἶόν τ' εἶναι τὸ ἄπειρον—πο-
 σὸν γὰρ τί ἔσται, οἶον δίπηχον ἢ τρίπηχον· ταῦτα γὰρ ση-
 5 μαίνει τὸ ποσόν—οὕτω καὶ τὸ ἐν τόπῳ ὅτι πού, τοῦτο δὲ ἢ
 ἄνω ἢ κάτω ἢ ἐν ἄλλῃ τινὶ διαστάσει τῶν ἕξ, τούτων δ'
 ἕκαστον πέρασ τί ἐστίν. ὅτι μὲν οὖν ἐνεργεία οὐκ ἐστὶ σῶμα
 ἄπειρον, φανερὸν ἐκ τούτων.

Ἔστι δ' εἰ μὴ ἔστιν ἄπειρον ἀπλῶς, πολλὰ ἀδύνατα 6
 10 συμβαίνει, δῆλον. τοῦ τε γὰρ χρόνου ἔσται τις ἀρχὴ καὶ τε-
 λευτή, καὶ τὰ μεγέθη οὐ διαιρετὰ εἰς μεγέθη, καὶ ἀριθμὸς
 οὐκ ἔσται ἄπειρος. ὅταν δὲ διωρισμένων οὕτως μηδετέρως φαί-
 νηται ἐνδέχασθαι, διαιτητοῦ δεῖ, καὶ δῆλον ὅτι πῶς μὲν ἔστιν
 πῶς δ' οὐ. λέγεται δὴ τὸ εἶναι τὸ μὲν δυνάμει τὸ δὲ ἐντε-
 15 λεχείᾳ, καὶ τὸ ἄπειρον ἔστι μὲν προσθέσει ἔστι δὲ καὶ διαι-
 ρήσει. τὸ δὲ μέγεθος ὅτι μὲν κατ' ἐνεργείαν οὐκ ἔστιν ἄπειρον,
 εἴρηται, διαιρέσει δ' ἐστίν· οὐ γὰρ χαλεπὸν ἀνελεῖν τὰς ἀτό-
 μους γραμμὰς· λείπεται οὖν δυνάμει εἶναι τὸ ἄπειρον. οὐ δέ
 δὲ τὸ δυνάμει ὄν λαμβάνειν, ὥσπερ εἰ δυνατὸν τοῦτ' ἀνδρι-
 20 ἀντα εἶναι, ὡς καὶ ἔσται τοῦτ' ἀνδριάς, οὕτω καὶ ἄπειρον
 ὃ ἔσται ἐνεργείᾳ· ἀλλ' ἐπεὶ πολλαχῶς τὸ εἶναι, ὥσπερ ἢ
 ἡμέρα ἔστι καὶ ὁ ἀγὼν τῷ ἀεὶ ἄλλο καὶ ἄλλο γίνεσθαι,
 οὕτω καὶ τὸ ἄπειρον (καὶ γὰρ ἐπὶ τούτων ἔστι καὶ δυνάμει
 καὶ ἐνεργείᾳ· Ὀλύμπια γὰρ ἔστι καὶ τῷ δύνασθαι τὸν ἀγῶνα
 25 γίνεσθαι καὶ τῷ γίνεσθαι)· ἄλλως δ' ἐν τε τῷ χρόνῳ δῆλον
 [τὸ ἄπειρον] καὶ ἐπὶ τῶν ἀνθρώπων, καὶ ἐπὶ τῆς διαιρέσεως

^b 35 ἀπείρῳ σώματι εἶναι EMVPS εἰ om. E 206^a I τὸ
 τόπον I ἄπειρον εἶναι EMS: εἶναι ἄπειρον AP πᾶν APS: πᾶν
 τὸ E 2 τι εἶναι EF: εἶναί τι IP: εἶναι ST 3 πόσον γὰρ Δ
 4 δίπηχον ἢ τρίπηχον AVPST: τρίπηχον ἢ δίπηχον E 5 καὶ τὸ ΔS:
 καὶ E: οὐδὲ Bonitz ἐν AST: om. E ἢ om. F 6 ἄνω ἢ κάτω
 ΔMVST: κάτω ἢ ἄνω E τοῦ E 7 οὐκ ἔστι σῶμα EFS: σῶμα
 οὐκ ἔστιν IJ 8 τούτων] τῶν εἰρημένων F 9 ἀπλῶς] μηδὲ ἄλλως
 P¹: μηδαμῶς PP II εἰς μέγεθος Δ 12 διωρισμένων οὕτως
 E²AP: ὠρίσωμεν οὕτως καὶ E¹ φαίνεται F 14 δὴ] δὲ F τὸ
 pr. om. S 15 καὶ alt. om. F διαιρέσει E¹FJ²PST: ἀφαιρέσει
 E²IJ¹V 17 αὐτομάτους F 19 τουτί S 20 τοῦτ' ΔS: om. E
 καὶ ἄπειρον EP: καὶ ἄπειρόν τι F: τι καὶ ἄπειρον IJS 21 ἢ om.
 EIJ 22 ἔστι om. S 23-5 καὶ γὰρ . . . τῷ γίνεσθαι ΔP:
 om. E 23 καὶ ult. om. F 25 ἄλλως δ' ΔS: καὶ ἄλλως δὲ
 P: καὶ ἄλλως τε E τε EIS: om. FJ 26 τὸ ἄπειρον ΔP: om. E

τῶν μεγεθῶν. ὅλως μὲν γὰρ οὕτως ἔστιν τὸ ἄπειρον, τῷ αἰεὶ ἄλλο καὶ ἄλλο λαμβάνεσθαι, καὶ τὸ λαμβανόμενον μὲν αἰεὶ εἶναι πεπερασμένον, ἀλλ' αἰεὶ γε ἕτερον καὶ ἕτερον·

[ἔτι τὸ εἶναι πλεοναχῶς λέγεται, ὥστε 29^a τὸ ἄπειρον οὐ δεῖ λαμβάνειν ὡς τόδε τι, οἷον ἄνθρωπον ἢ 30 οἰκίαν, ἀλλ' ὡς ἡ ἡμέρα λέγεται καὶ ὁ ἀγών, οἷς τὸ εἶναι οὐχ ὡς οὐσία τις γέγονεν, ἀλλ' αἰεὶ ἐν γενέσει ἢ φθορᾷ, πεπερασμένον, ἀλλ' αἰεὶ γε ἕτερον καὶ ἕτερον·] ἀλλ' ἐν τοῖς μεγέθεσιν ὑπομένοντος τοῦ ληφθέντος [τοῦτο συμβαί- 206^b νει], ἐπὶ δὲ τοῦ χρόνου καὶ τῶν ἀνθρώπων φθειρομένων οὕτως ὥστε μὴ ἐπιλείπειν. 3

τὸ δὲ κατὰ πρόσθεσιν τὸ αὐτὸ ἐστὶ πως καὶ 3 τὸ κατὰ διαίρεσιν· ἐν γὰρ τῷ πεπερασμένῳ κατὰ πρόσθεσιν γίνεταί ἀντεστραμμένως· ἢ γὰρ διαιρούμενον ὁράται εἰς 5 ἄπειρον, ταύτῃ προστιθέμενον φανέεται πρὸς τὸ ὄρισμένον. ἐν γὰρ τῷ πεπερασμένῳ μεγέθει ἂν λαβῶν τις ὄρισμένον προσλαμβάνῃ τῷ αὐτῷ λόγῳ, μὴ τὸ αὐτὸ τι τοῦ ὅλου μέγεθος περιλαμβάνων, οὐ διέξεισι τὸ πεπερασμένον· ἐὰν δ' οὕτως αὔξη τὸν λόγον ὥστε αἰεὶ τι τὸ αὐτὸ περιλαμβάνειν μέ- 10 γεθος, διέξεισι, διὰ τὸ πᾶν πεπερασμένον ἀναιρεῖσθαι ὄψοῦν ὄρισμένῳ. ἄλλως μὲν οὖν οὐκ ἔστιν, οὕτως δ' ἔστι τὸ ἄπειρον, δυνάμει τε καὶ ἐπὶ καθαιρέσει (καὶ ἐντελεχεία δὲ ἔστιν, ὡς τὴν ἡμέραν εἶναι λέγομεν καὶ τὸν ἀγῶνα)· καὶ δυνάμει οὕτως ὡς ἡ ὕλη, καὶ οὐ καθ' αὐτό, ὡς τὸ πεπερασμέ- 15 νον. καὶ κατὰ πρόσθεσιν δὴ οὕτως ἄπειρον δυνάμει ἔστιν, ὁ

^a 28 καὶ . . . τὸ E²APS: ἄλλο E¹ μὲν αἰεὶ πεπερασμένον εἶναι
 ASP: μὲν αἰεὶ πεπερασμένον S^o: εἶναι μὲν αἰεὶ πεπερασμένον P 29^a ἔτι
 (ὅτι E²) . . . λέγεται EVPS: om. Λ γρ. Α γρ. Ρ γρ. S ὥστε . . .
 33 ἕτερον PPS: om. γρ. Α γρ. Ρ γρ. S 30 τῷ] τὸ ἐπ' S οὐδεὶς
 λαμβάνει E 31 ἢ IJST: om. EF οἷς] á fecit E 32 τις
 om. ἢ F²IJS: καὶ EF¹ 33 πεπερασμένον IJS: εἰ
 πεπερασμένον fecit E: εἰ καὶ πεπερασμένον F γε EIJS^o: om. FS^o
 ἐν EIP: ἐν μὲν FJ ^b I τοῦτο συμβαίνει AP: om. E 2 τοῦ . . .
 ἀνθρώπων EP: τῶν ἀνθρώπων καὶ τοῦ χρόνου Λ οὕτως E²AS: om.
 E¹ 3 ἐπιλείπειν E¹S: ὑπολείπειν E²A ἐστὶ πως EP: πῶς
 ἐστὶ S: πῶς ἐστὶ Λ 4 κατὰ alt.] τὸ κατὰ Laas 6 αὕτη E¹
 7 ἐν γὰρ ANPST: ἐὰν ἐν E ἂν AP: om. E τις AP: τί E
 8 τι sup. lin. E¹ τοῦ ὅλου μέγεθος FS: μέγεθος τῷ ὄλῳ E¹:
 μέγεθος τῷ λόγῳ E²IJP: τοῦ λόγου μέρος γρ. S 9 διέξεισι fecit E
 τὸ om. F II πᾶν τὸ IJ 12 ἄλλως . . . ἔστιν AP: om. E
 13 καὶ ἐπὶ καθαιρέσει secl. Stözlze δὲ ἔστιν AS: ἐντελεχεία δὲ ἐστίν
 Prantl 14 λέγομεν εἶναι F 15 ὡς τὸ om. EPS

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Γ

ταὐτὸ λέγομεν τρόπον τινα εἶναι τῷ κατὰ διαίρεσιν· αἰεὶ μὲν γάρ τι ἕξω ἔσται λαμβάνειν, οὐ μέντοι ὑπερβαλεῖ παντὸς μεγέθους, ὥσπερ ἐπὶ τὴν διαίρεσιν ὑπερ-
 20 βάλλει παντὸς ὠρισμένου καὶ αἰεὶ ἔσται ἔλαττον. ὥστε δὲ παν-
 τὸς ὑπερβάλλειν κατὰ τὴν πρόσθεσιν, οὐδὲ δυνάμει οἶόν τε εἶναι, εἴπερ μὴ ἔστι κατὰ συμβεβηκὸς ἐντελεχεία ἄπειρον, ὥσπερ φασὶν οἱ φυσιολόγοι τὸ ἕξω σῶμα τοῦ κόσμου, οὗ ἡ οὐσία ἢ ἀήρ ἢ ἄλλο τι τοιοῦτον, ἄπειρον εἶναι. ἀλλ' εἰ μὴ
 25 οἶόν τε εἶναι ἄπειρον ἐντελεχεία σῶμα αἰσθητὸν οὕτω, φανε-
 ρὸν ὅτι οὐδὲ δυνάμει ἂν εἴη κατὰ πρόσθεσιν, ἀλλ' ἢ ὥσπερ εἴρηται ἀντεστραμμένως τῇ διαιρέσει, ἐπεὶ καὶ Πλάτων διὰ τοῦτο δύο τὰ ἄπειρα ἐποίησεν, ὅτι καὶ ἐπὶ τὴν αὔξην δοκεῖ ὑπερβάλλειν καὶ εἰς ἄπειρον ἵνα καὶ ἐπὶ τὴν καθαίρεσιν.
 30 ποιήσας μέντοι δύο οὐ χρῆται· οὔτε γὰρ ἐν τοῖς ἀριθμοῖς τὸ ἐπὶ τὴν καθαίρεσιν ἄπειρον ὑπάρχει (ἢ γὰρ μονὰς ἐλάχι-
 στον), οὔτε (τὸ) ἐπὶ τὴν αὔξην (μέχρι γὰρ δεκάδος ποιεῖ τὸν ἀριθ-
 33 μόν).
 33 συμβαίνει δὲ τοῦναντίον εἶναι ἄπειρον ἢ ὡς λέγουσιν.
 207^a οὐ γὰρ οὐ μὴδὲν ἕξω, ἀλλ' οὐ αἰεὶ τι ἕξω ἔστι, τοῦτο ἄπειρόν ἐστι. σημεῖον δέ· καὶ γὰρ τοὺς δακτυλίους ἀπίρους λέγουσι τοὺς μὴ ἔχοντας σφενδόνην, ὅτι αἰεὶ τι ἕξω ἔστι λαμβάνειν, καθ' ὁμοιότητα μὲν τινα λέγοντες, οὐ μέντοι κυρίως· δεῖ
 5 γὰρ τοῦτό τε ὑπάρχειν καὶ μὴδέ ποτε τὸ αὐτὸ λαμβά-
 νεσθαι· ἐν δὲ τῷ κύκλῳ οὐ γίγνεται οὕτως, ἀλλ' αἰεὶ τὸ ἐφεξῆς μόνον ἕτερον. ἄπειρον μὲν οὖν ἔστιν οὐ κατὰ τὸ ποσὸν λαμβάνουσιν αἰεὶ τι λαμβάνειν ἔστιν ἕξω. οὐ δὲ μὴδὲν ἕξω, τοῦτ' ἔστι τέλειον καὶ ὄλον· οὕτω γὰρ ὀριζόμεθα τὸ ὄλον, οὐ
 10 μὴδὲν ἄπεστιν, οἶον ἄνθρωπον ὄλον ἢ κιβώτιον. ὥσπερ δὲ

^b 17 εἶναι τρόπον τινα F 18 τι αὐτοῦ Δ ἐστὶ
 F ὑπερβάλλει ΔΡ 19 παντὸς EPST: παντὸς ὠρισμένου ΔV
 an ὑπερβαλεῖ? 20 αἰεὶ EV: om. Δ 21 τὴν om. F 22 ἔσται
 E 23 ὡς J¹ ἕξωθεν E 24 ἢ pr. et εἶναι om. FI 25 εἶναι
 ἄπειρον om. E 28 δύο τὰ ἄπειρα EPT: ἄπειρα δύο Δ καὶ
 om. F 29 καὶ alt. om. F 32 τὸ PST, Bywater: om. Π
 ἐπὶ] περὶ E γὰρ om. F 33 ἄπειρον εἶναι ST ἢ ΔΡST:
 om. E 207^a 3 τι FIPS: τι ἄλλο ET: om. J ἕξω λαμβάνειν
 ἐστὶ E: ἔστιν ἕξω λαμβάνειν IJ 7 οὖν τοῦτ' ἐστὶν ΔΡ τὸ
 E²IJS: om. E1FPT 8 λαβεῖν E²AT: om. S οὐ πρὸς τὰ
 μέρη μὴθὲν ἄπεστιν ἕξω I 10 ὄλον post κιβώτιον F κιβώτιον
 AST: κιβωτόν E δὲ om. F: δὲ καὶ E

τὸ καθ' ἕκαστον, οὕτω καὶ τὸ κυρίως, οἷον τὸ ὅλον οὐ μηδέν
 ἔστιν ἕξω· οὐ δ' ἔστιν ἀπουσία ἕξω, οὐ πᾶν, ὅ τι ἂν ἀπῆ.
 ὅλον δὲ καὶ τέλειον ἢ τὸ αὐτὸ πάμπαν ἢ σύνεγγυς τὴν
 φύσιν. τέλειον δ' οὐδὲν μὴ ἔχον τέλος· τὸ δὲ τέλος
 πέρας. διὸ βέλτιον οἰητέον Παρμενίδην Μελλίσσου εἰρηκέναι 15
 ὁ μὲν γὰρ τὸ ἄπειρον ὅλον φησίν, ὁ δὲ τὸ ὅλον πεπεράν-
 θαι, “μεσσόθεν ἰσοπαλές”. οὐ γὰρ λίνου λίνῳ συνάπτει ἔστιν
 τῷ ἅπαντι καὶ ὅλῳ τὸ ἄπειρον, ἐπεὶ ἐντευθέν γε λαμβά-
 νουσι τὴν σεμνότητα κατὰ τοῦ ἀπείρου, τὸ πάντα περιέχει
 καὶ τὸ πᾶν ἐν ἑαυτῷ ἔχει, διὰ τὸ ἔχειν τινα ὁμοιότητα 20
 τῷ ὅλῳ. ἔστι γὰρ τὸ ἄπειρον τῆς τοῦ μεγέθους τελειότητος
 ὕλη καὶ τὸ δυνάμει ὅλον, ἐντελεχεία δ' οὐ, διαιρετὸν δ' ἐπί-
 τε τὴν καθαίρεσιν καὶ τὴν ἀντεστραμμένην πρόσθεσιν, ὅλον
 δὲ καὶ πεπερασμένον οὐ καθ' αὐτὸ ἀλλὰ κατ' ἄλλο· καὶ
 οὐ περιέχει ἀλλὰ περιέχεται, ἢ ἄπειρον. διὸ καὶ ἄγνωστον 25
 ἢ ἄπειρον· εἶδος γὰρ οὐκ ἔχει ἢ ὕλη. ὥστε φανερὸν ὅτι
 μᾶλλον ἐν μορίου λόγῳ τὸ ἄπειρον ἢ ἐν ὅλου· μόριον γὰρ
 ἢ ὕλη τοῦ ὅλου ὥσπερ ὁ χαλκὸς τοῦ χαλκοῦ ἀνδριάντος,
 ἐπεὶ εἴ γε περιέχει ἐν τοῖς αἰσθητοῖς, καὶ ἐν τοῖς νοητοῖς τὸ
 μέγα καὶ τὸ μικρὸν ἔδει περιέχειν τὰ νοητά. ἄτοπον δὲ 30
 καὶ ἀδύνατον τὸ ἄγνωστον καὶ ἀόριστον περιέχειν καὶ
 ὀρίζειν.

7 Κατὰ λόγον δὲ συμβαίνει καὶ τὸ κατὰ πρόσθεσιν μὲν
 μὴ εἶναι δοκεῖν ἄπειρον οὕτως ὥστε παντὸς ὑπερβάλλειν με-
 γέθους, ἐπὶ τὴν διαίρεσιν δὲ εἶναι (περιέχεται γὰρ ἢ ὕλη 35
 ἐντὸς καὶ τὸ ἄπειρον, περιέχει δὲ τὸ εἶδος)· εὐλόγως δὲ καὶ 207^b
 τὸ ἐν μὲν τῷ ἀριθμῷ εἶναι ἐπὶ μὲν τὸ ἐλάχιστον πέρας ἐπὶ δὲ

^a 12 ὅ τι E 13 τὸ ὅλον AST ἢ alt.] ἢ τὸ E 14 φύσιν]
 φύσιν ἔστιν Λ 16 τὸ ἄπειρον HS: ἄπειρον τὸ Bonitz et fort. PT
 17 συνάπτειν ἔστι EPS: ἔστι συνάπτειν Λ 18 γε] δὴ I 19 σεμ-
 νότητα fecit E πᾶν E² περιέχειν ET: περιέχον Λ 20 καὶ . . .
 ἑαυτῷ AT: om. EV ἔχειν T, Bonitz: ἔχον Λ: om. EV 21 τοῦ
 sup. lin. E¹ 22 ὕλη PPT: ἢ ὕλη S διαιρετὸν . . . 24
 ἄλλο HPST: secl. Stölzle 23 ἀντεστραμμένην E¹ 25 οὐ . . .
 περιέχεται FJ²VPST: οὐχ ὑπερέχει ἀλλὰ ὑπερέχεται EIJ¹ 26 ἢ
 ἄπειρον EIJP: om. FT 27 ὅλω EF¹ 29 περιέχει APPT:
 περιέχει E ἐν alt. om. I 31 τὸ om. E καὶ alt. EP: καὶ
 τὸ AS 33 μὲν] ὡς F 34 οὕτως ἄπειρον F 35 ἢ ES:
 ὡς ἢ Λ ^b I καὶ pr. AV: om. E 2 ἐν EI μὲν APST: om. E
 μὲν om. AP¹T

τὸ πλείον ἀεὶ παντὸς ὑπερβάλλειν πλήθους, ἐπὶ δὲ τῶν
 μεγεθῶν τοῦναντίον ἐπὶ μὲν τὸ ἔλαττον παντὸς ὑπερβάλλειν
 5 μεγέθους ἐπὶ δὲ τὸ μείζον μὴ εἶναι μέγεθος ἄπειρον. αἴτιον
 δ' ὅτι τὸ ἐν ἔστιν ἀδιαίρετον, ὃ τι περ ἂν ἐν ἧ (οἷον ἄνθρωπος
 εἰς ἄνθρωπος καὶ οὐ πολλοί), ὃ δ' ἀριθμὸς ἔστιν ἕνα πλείω καὶ
 πῶς ἄττα, ὥστ' ἀνάγκη στήναι ἐπὶ τὸ ἀδιαίρετον (τὸ γὰρ τρία
 καὶ δύο παρώνυμα ὀνόματά ἐστιν, ὁμοίως δὲ καὶ τῶν ἄλλων
 10 ἀριθμῶν ἕκαστος), ἐπὶ δὲ τὸ πλείον ἀεὶ ἔστι νοῆσαι ἄπειροι
 γὰρ αἱ διχοτομίαι τοῦ μεγέθους. ὥστε δυνάμει μὲν ἔστιν,
 ἐνεργείᾳ δ' οὐ ἄλλ' ἀεὶ ὑπερβάλλει τὸ λαμβανόμενον παν-
 τὸς ὀρισμένου πλήθους. ἀλλ' οὐ χωριστὸς ὁ ἀριθμὸς οὗτος
 [τῆς διχοτομίας], οὐδὲ μένει ἢ ἀπειρία ἀλλὰ γίγνεται, ὥσπερ
 15 καὶ ὁ χρόνος καὶ ὁ ἀριθμὸς τοῦ χρόνου. ἐπὶ δὲ τῶν μεγε-
 θῶν τοῦναντίον ἐστὶ διαιρεῖται μὲν γὰρ εἰς ἄπειρα τὸ συννε-
 χές, ἐπὶ δὲ τὸ μείζον οὐκ ἔστιν ἄπειρον. ὅσον γὰρ ἐνδέχε-
 ται δυνάμει εἶναι, καὶ ἐνεργείᾳ ἐνδέχεται τοσοῦτον εἶναι.
 ὥστε ἐπεὶ ἄπειρον οὐδὲν ἔστι μέγεθος αἰσθητόν, οὐκ ἐνδέχεται
 20 παντὸς ὑπερβολὴν εἶναι ὀρισμένου μεγέθους· εἴη γὰρ ἂν τι
 τοῦ οὐρανοῦ μείζον. τὸ δ' ἄπειρον οὐ ταῦτον ἐν μεγέθει καὶ
 κινήσει καὶ χρόνῳ, ὡς μία τις φύσις, ἀλλὰ τὸ ὕστερον
 λέγεται κατὰ τὸ πρότερον, οἷον κίνησις μὲν ὅτι τὸ μέγεθος
 ἐφ' οὗ κινεῖται ἢ ἀλλοιοῦται ἢ αὐξάνεται, ὁ χρόνος δὲ διὰ
 25 τὴν κίνησιν. νῦν μὲν οὖν χρώμεθα τούτοις, ὕστερον δὲ
 ἐροῦμεν καὶ τί ἔστιν ἕκαστον, καὶ διότι πᾶν μέγεθος
 27 εἰς μεγέθη διαιρετόν.
 27 οὐκ ἀφαιρεῖται δ' ὁ λόγος οὐδὲ τοὺς
 μαθηματικούς τὴν θεωρίαν, ἀναιρῶν οὕτως εἶναι ἄπειρον

207^b 21-5 = 1067^a 33-7

^b 3 τὸ πλείον EFT : τὸ πλείω J : τὰ πλείω I πάντως J δὲ
 om. F' 4 ἐλάχιστον F 6 περ AP : om. E ἐν fecit E¹
 7 εἰς ἄνθρωπος om. I ἕνα E¹FS : ἐνός IJP et fecit E 8 τὸ alt.
 ET : τὰ APS τρία καὶ δύο EPS : δύο καὶ τρία AVT 9 παρώνυμα
 E²APS : om. E¹ 10 ἐπὶ AP : ἐπεὶ E 13 πλῆθους] μεγέθους I
 οὗτος ὁ ἀριθμὸς IJPS 14 τῆς διχοτομίας seclusi, om. PS : τοῦ
 τῆς διχοτομίας E : ταύτης διχοτομίας V ἀλλὰ] ἀλλ' αἰὶ VPS
 18 εἶναι τοσοῦτον F 20 τις J 21 τὸ δ' E²AMPSS : δὲ τὸ
 E¹ κινήσει καὶ μεγέθει F 23 τὸ om. J¹ τὸ E¹VS : πρότερον
 E²A 26 ἐροῦμεν EV et ut vid. T : πειρασόμεθα λέγειν A τί
 ἔστιν AS : ὅτι E 28 μαθητικούς E an(τὸ) οὕτως? οὕτως
 εἶναι FIP : μὴ εἶναι οὕτως EV : οὕτω μὴ εἶναι J ἄπειρον] τὸ ἄπειρον
 FIT : τι ἄπειρον P

ὥστε ἐνεργεῖα εἶναι ἐπὶ τὴν αὐξησιν ἀδιεξίτητον· οὐδὲ γὰρ
 νῦν δέονται τοῦ ἀπειρου (οὐ γὰρ χρῶνται), ἀλλὰ μόνον εἶναι ὅσην 30
 ἂν βούλωνται πεπερασμένην· τῷ δὲ μεγίστῳ μεγέθει
 τὸν αὐτὸν ἔστι τετμηῆσθαι λόγον ὀηλικονοῦν μέγεθος ἕτερον.
 ὥστε πρὸς μὲν τὸ δεῖξαι ἐκείνοις οὐδὲν διοίσει τὸ [δ'] εἶναι ἐν
 τοῖς οὖσιω μεγέθεσιω. 34

ἐπεὶ δὲ τὰ αἷτια διήρηται τετρα- 34
 χῶς, φανερὸν ὅτι ὡς ὕλη τὸ ἀπειρον αἷτιόν ἐστι, καὶ ὅτι 35
 τὸ μὲν εἶναι αὐτῷ στέρησις, τὸ δὲ καθ' αὐτὸ ὑποκείμενον 208^a
 τὸ συνεχὲς καὶ αἰσθητόν. φαίνονται δὲ πάντες καὶ οἱ ἄλ-
 λοι ὡς ὕλη χρώμενοι τῷ ἀπειρῷ· διὸ καὶ ἄτοπον τὸ περι-
 ἔχον ποιεῖν αὐτὸ ἀλλὰ μὴ περιεχόμενον.

- 8 Λοιπὸν δ' ἐπελθεῖν καθ' οὗς λόγους τὸ ἀπειρον εἶναι δο- 5
 κεί οὐ μόνον δυνάμει ἀλλ' ὡς ἀφωρισμένον· τὰ μὲν γὰρ
 ἐστὶν αὐτῶν οὐκ ἀναγκαῖα, τὰ δ' ἔχει τινας ἑτέρας ἀληθεῖς
 ἀπαντήσεις. οὔτε γὰρ ἴνα ἢ γένεσις μὴ ἐπιλείπη, ἀναγκαῖον
 ἐνεργεῖα ἀπειρον εἶναι σῶμα αἰσθητόν· ἐνδέχεται γὰρ τὴν
 θατέρου φθορὰν θατέρου εἶναι γένεσιν, πεπερασμένου ὄντος τοῦ 10
 παντός. ἔτι τὸ ἀπτεσθαι καὶ τὸ πεπεράνθαι ἕτερον. τὸ μὲν
 γὰρ πρὸς τι καὶ τινός (ἄπτεται γὰρ πᾶν τινός), καὶ τῶν πε-
 περασμένων τινὲ συμβέβηκεν, τὸ δὲ πεπερασμένον οὐ πρὸς τι
 οὐδ' ἄψασθαι τῷ τυχόντι τοῦ τυχόντος ἔστιν. τὸ δὲ τῇ νοήσει
 πιστεύειν ἄτοπον· οὐ γὰρ ἐπὶ τοῦ πράγματος ἢ ὑπεροχῇ καὶ ἢ 15
 ἔλλειψις, ἀλλ' ἐπὶ τῆς νοήσεως. ἕκαστον γὰρ ἡμῶν νοήσειεν
 ἂν τις πολλαπλάσιον ἑαυτοῦ αὐξῶν εἰς ἀπειρον· ἀλλ' οὐ
 διὰ τοῦτο ἕξω [τοῦ ἄστεός] τίς ἐστὶν [ἦ] τοῦ τηλικούτου μεγέθους

^b 29 αὐξησιν EPT: αὐξην Λ ἀδιεξίτητον EF²JT: ὡς ἀδιεξίτητον
 F¹IVP 30 οὐ γὰρ EV et fort. ST: οὐδὲ F: οὐδὲ γὰρ IJ
 31 βούλωνται J πεπερασμένην AP: τὴν πεπερασμένην E
 33 ἐκείνοις EV: ἐκείνως AP δ' seclusi: habent PPS 34 οὖσιω
 E, litteris tribus deletis sequentibus: οὖσιω ἐστὶ FP: οὖσιν ἔσται IJS
 μεγέθεσιν APS: μεγέθεσιν οὐδὲν ἐστὶν ἀναγκαῖον EV, ἐστὶν quidem
 corr. in E 35 ὅτι] τι E ἐστὶν αἷτιον Bekker 208^a 1 αὐτῶν
 E στέρησις ἐστὶ τὸ AP 3 καὶ om. E 4 μὴ] μὴ τὸ ΔS
 5 δ'] δεῖ VP 6 ἀφωρισμένον ΔVPT: ἀφωρισμένον ἐπελθεῖν E
 7 ἑτέρας ἀληθεῖς EP: ἀληθεῖς ἑτέρας Λ: ἀληθεῖς T 8 ἢ ΔPT:
 fecit E ἐπιλείπει ἀνάγκη E 10 γένεσιν θατέρου εἶναι Λ τοῦ om. F
 12 τινός pr. AP: τινός ἀπτεται E κᾶν τῶν F 14 δὲ APS: δὲ ἐπὶ E
 16 ἂν ἡμῶν νοήσει Λ 17 ἑαυτοῦ om. E 18 τοῦ ἄστεος ΠPST:
 τοῦ ἄστερος γρ. Eudemus: om. γρ. P, Diels τί JS ἦ ΠPST:
 om. γρ. P, Diels τηλικούτου E¹PS: τηλικούδε E¹Λ

ὁ ἔχομεν, ὅτι νοεῖ τις, ἀλλ' ὅτι ἔστι· τοῦτο δὲ συμβέβηκεν.
 20 ὁ δὲ χρόνος καὶ ἡ κίνησις ἄπειρά ἐστι καὶ ἡ νόησις οὐχ
 ὑπομένοντος τοῦ λαμβανομένου. μέγεθος δὲ οὔτε τῇ καθαιρέ-
 σει οὔτε τῇ νοητικῇ αὐξήσει ἔστιν ἄπειρον. ἀλλὰ περὶ μὲν
 τοῦ ἀπείρου, πῶς ἔστι καὶ πῶς οὐκ ἔστι καὶ τί ἐστιν, εἴρηται.

Δ

Ὅμοίως δ' ἀνάγκη καὶ περὶ τόπου τὸν φυσικὸν ὥσπερ
 καὶ περὶ ἀπείρου γνωρίζειν, εἰ ἔστιν ἢ μή, καὶ πῶς ἔστι, καὶ
 τί ἐστιν. τὰ τε γὰρ οὗτα πάντες ὑπολαμβάνουσιν εἶναι που
 30 (τὸ γὰρ μὴ ὄν οὐδαμοῦ εἶναι· ποῦ γὰρ ἐστι τραγέλαφος ἢ
 σφίγξ;) καὶ τῆς κινήσεως ἡ κοινὴ μάλιστα καὶ κυριωτάτη
 32 κατὰ τόπον ἐστίν, ἣν καλοῦμεν φορὰν.

32 ἔχει δὲ πολλὰς
 ἀπορίας τί ποτ' ἐστὶν ὁ τόπος· οὐ γὰρ ταῦτόν φαίνεται θεω-
 ροῦσιν ἐξ ἀπάντων τῶν ὑπαρχόντων. ἔτι δ' οὐδ' ἔχομεν οὐδὲν
 35 παρὰ τῶν ἄλλων οὔτε προηπορημένον οὔτε προηπορημένον περὶ
 208^b 1 αὐτοῦ.

1 ὅτι μὲν ὄν ἔστιν ὁ τόπος, δοκεῖ δῆλον εἶναι ἐκ τῆς
 ἀντιμεταστάσεως· ὅπου γὰρ ἐστι νῦν ὕδωρ, ἐνταῦθα ἐξεληόν-
 τος ὥσπερ ἐξ ἀγγείου πάλιν ἀῆρ ἔνεστιν, ὅτε δὲ τὸν αὐτὸν
 τόπου τοῦτον ἄλλο τι τῶν σωμάτων κατέχει· τοῦτο δὴ τῶν
 5 ἐγγιγνομένων καὶ μεταβαλλόντων ἕτερον πάντων εἶναι δοκεῖ·
 ἐν ᾧ γὰρ ἀῆρ ἔστι νῦν, ὕδωρ ἐν τούτῳ πρότερον ἦν, ὥστε δῆ-
 λον ὡς ἦν ὁ τόπος τι καὶ ἡ χώρα ἕτερον ἀμφοῖν, εἰς ἣν
 καὶ ἐξ ἧς μετέβαλον. ἔτι δὲ αἱ φοραὶ τῶν φυσικῶν σω-
 μάτων καὶ ἀπλῶν, οἶον πυρὸς καὶ γῆς καὶ τῶν τοιούτων, οὐ
 10 μόνον δηλοῦσιν ὅτι ἐστὶ τι ὁ τόπος, ἀλλ' ὅτι καὶ ἔχει τιὰ

^a 21 ὑπολαμβάνομένου J 22 νοητῆ F ἀπειρον ΔΡ: om. E
 23 τοῦ om. E

Tit. φυσικῆς ἀκροάσεως δ. περὶ τόπου καὶ περὶ κενοῦ E: φυσικῶν δ
 GI 27 περὶ EFJPS: περὶ τοῦ GI 29 πάντα T 30 μή]
 τὸ μή E μηδαμοῦ F 31 κοινὴ IIS: πρώτη Eudemus γρ. S:
 κοινὴ καὶ πρώτη γρ. S καὶ om. F 33 τὰ αὐτὰ I ^b I ἔστιν
 ΔΡST: ἐστὶ τι EV 3 ἀῆρ ΔΡΤ: ἀῆρ ἐκεῖ E ὅτε scripsi, legit ut
 vid. P: ὅτε Π 4 τοῦτον τόπον I: τόπον FT κατέχει om. E δὴ
 EP: δὲ ΔV 5 πάντως I 6 ἐν τούτῳ πρότερον ὕδωρ F
 8 μετέβαλλον IJ: μετέβαλε S δέ] δὲ καὶ I: om. S φοραὶ
 FIJ^aPS: διαφοραὶ EGJ¹ 10 τίς G ὅτι καὶ] καὶ ὅτι F: ὁ καὶ G

δύναμιν. φέρεται γὰρ ἕκαστον εἰς τὸν αὐτοῦ τόπον μὴ κω-
 λυόμενον, τὸ μὲν ἄνω τὸ δὲ κάτω ταῦτα δ' ἐστὶ τόπου μέρη
 καὶ εἶδη, τὸ τε ἄνω καὶ τὸ κάτω καὶ αἱ λοιπαὶ τῶν ἕξ
 διαστάσεων. ἐστὶ δὲ τὰ τοιαῦτα οὐ μόνον πρὸς ἡμᾶς, τὸ ἄνω καὶ
 κάτω καὶ δεξιὸν καὶ ἀριστερόν· ἡμῖν μὲν γὰρ οὐκ αἰεὶ τὸ 15
 αὐτό, ἀλλὰ κατὰ τὴν θέσιν, ὅπως ἂν στραφῶμεν, γίνεται
 (διὸ καὶ ταῦτ' ὀλλάκις δεξιὸν καὶ ἀριστερόν καὶ ἄνω καὶ
 κάτω καὶ πρόσθεν καὶ ὀπισθεν), ἐν δὲ τῇ φύσει διώρισται χωρὶς
 ἕκαστον. οὐ γὰρ ὅτι ἔτυχεν ἐστὶ τὸ ἄνω, ἀλλ' ὅπου φέρεται
 τὸ πῦρ καὶ τὸ κοῦφον· ὁμοίως δὲ καὶ τὸ κάτω οὐχ ὅτι ἔτυχεν, 20
 ἀλλ' ὅπου τὰ ἔχοντα βάρος καὶ τὰ γεηρά, ὡς οὐ τῇ θέσει
 διαφέροντα μόνον ἀλλὰ καὶ τῇ δυνάμει. δηλοῖ δὲ καὶ τὰ
 μαθηματικά· οὐκ ὄντα γὰρ ἐν τόπῳ ὅμως κατὰ τὴν θέσιν
 τὴν πρὸς ἡμᾶς ἔχει δεξιὰ καὶ ἀριστερὰ ὡς τὰ μόνον
 λεγόμενα διὰ θέσιν, οὐκ ἔχοντα φύσει τούτων ἕκαστον. ἐτι 25
 οἱ τὸ κενὸν φάσκοντες εἶναι τόπον λέγουσιν· τὸ γὰρ κενὸν
 τόπος ἂν εἴη ἑστερημένος σώματος. 27

ὅτι μὲν οὖν ἐστὶ τι ὁ τό- 27
 πος παρὰ τὰ σώματα, καὶ πᾶν σῶμα αἰσθητὸν ἐν τόπῳ,
 διὰ τούτων ἂν τις ὑπολάβοι· δόξειε δ' ἂν καὶ Ἡσιόδου ὀρ-
 θῶς λέγειν ποιήσας πρῶτον τὸ χάος. λέγει γοῦν “ πάντων 30
 μὲν πρῶτιστα χάος γένητ', αὐτὰρ ἔπειτα γαῖ' εὐρύστερνος,”
 ὡς δέου πρῶτον ὑπάρξαι χώραν τοῖς οὐσι, διὰ τὸ νομίζειν,
 ὥσπερ οἱ πολλοί, πάντα εἶναι που καὶ ἐν τόπῳ. εἰ δ' ἐστὶ
 τοιοῦτο, θαυμαστή τις ἂν εἴη ἡ τοῦ τόπου δύναμις καὶ προ-
 τέρα πάντων· οὐ γὰρ ἄνευ τῶν ἄλλων οὐδὲν ἐστίν, ἐκεῖνο δ' 35
 ἄνευ τῶν ἄλλων, ἀνάγκη πρῶτον εἶναι· οὐ γὰρ ἀπόλλυται 209^a
 ὁ τόπος τῶν ἐν αὐτῷ φθειρομένων. 2

οὐ μὴν ἀλλ' ἔχει γε ἀπο- 2

^b II δύναμιν ὁ τόπος. φέρεται GIJ αὐτὸν F 13 τε et τὸ
 E²AS: om. E¹T 14-15 ἄνω . . . ἀριστερόν EPT: δεξιὸν καὶ τὸ
 ἀριστερόν καὶ τὸ ἄνω καὶ τὸ κάτω AV 15 μὲν et 16 τὴν om. F
 17 καὶ pr. om. A ἀριστερόν ἐστὶ καὶ A 18 τῇ δὲ E 19 ἐκά-
 τερον F¹ ἐστὶ τὸ ἄνω EGJP: τὸ ἄνω ἐστὶν FI 23 μαθητικά E
 24 τὴν om. E ὡς . . . 25 διὰ S, Diels (τὰ om. Laas): ὥστε μόνον
 νοεῖσθαι αὐτῶν (αὐτῶν νοεῖσθαι E) τὴν Π, ci. A, leg. ut vid. PT
 25 οὐκ ἔχοντα φύσει AVS et ut vid. T: ἀλλὰ μὴ ἔχειν φύσιν E
 28 περὶ F]² 30 γοῦν] γὰρ F: μὲν οὖν I: μὲν J 31 γένοιτ' F
 33 ἐστὶ AP: ἐστὶ τι E 34 ἢ APST: om. E προτέρα πάντων
 HS: πρώτη τῶν ἄλλων P 35 τῶν . . . ἐστίν] τῶν ἄλλων E: ἀδύνατον
 τι τῶν ἄλλων εἶναι FV ἐκεῖνο . . . 209^a I ἄλλων AV: om. E

ρίαν, εἰ ἔστι, τί ἐστι, πότερον ὄγκος τις σώματος ἢ τις ἑτέρα
 φύσις· ζητητέον γὰρ τὸ γένος αὐτοῦ πρῶτον. διαστήματα
 5 μὲν οὖν ἔχει τρία, μῆκος καὶ πλάτος καὶ βάθος, οἷς ὀρί-
 ζεται σῶμα πᾶν. ἀδύνατον δὲ σῶμα εἶναι τὸν τόπον· ἐν
 ταυτῷ γὰρ ἂν εἴη δύο σώματα. ἔτι εἴπερ ἔστι σώματος
 τόπος καὶ χώρα, δῆλον ὅτι καὶ ἐπιφανείας καὶ τῶν λοιπῶν
 περάτων· ὁ γὰρ αὐτὸς ἀρμύσει λόγος· ὅπου γὰρ ἦν πρότε-
 10 ρον τὰ τοῦ ὕδατος ἐπίπεδα, ἔσται πάλιν τὰ τοῦ ἀέρος.
 ἄλλὰ μὴν οὐδεμίαν διαφορὰν ἔχομεν στιγμῆς καὶ τόπου στιγ-
 μῆς, ὥστ' εἰ μὴδὲ ταύτης ἕτερόν ἐστιν ὁ τόπος, οὐδὲ τῶν ἄλ-
 λων οὐδενός, οὐδ' ἐστὶ τι παρ' ἑκαστον τούτων· ὁ τόπος, τί γὰρ
 ἂν ποτε καὶ θελήμεν εἶναι τὸν τόπον; οὔτε γὰρ στοιχείου οὔτ'
 15 ἐκ στοιχείων οἶόν τε εἶναι τοιαύτην ἔχοντα φύσιν, οὔτε τῶν σω-
 ματικῶν οὔτε τῶν ἀσωμάτων· μέγεθος μὲν γὰρ ἔχει, σῶ-
 μα δ' οὐδέν· ἔστι δὲ τὰ μὲν τῶν αἰσθητῶν στοιχεῖα
 σώματα, ἐκ δὲ τῶν νοητῶν οὐδὲν γίγνεται μέγεθος. ἔτι δὲ
 καὶ τίνος ἂν τις θείη τοῖς οὔσιω αἴτιον εἶναι τὸν τόπον; οὐδε-
 20 μία γὰρ αὐτῷ ὑπάρχει αἰτία τῶν τεττάρων· οὔτε γὰρ ὡς
 ὕλη τῶν ὄντων (οὐδὲν γὰρ ἐξ αὐτοῦ συνέστηκεν) οὔτε ὡς εἶδος
 καὶ λόγος τῶν πραγμάτων οὔτ' ὡς τέλος, οὔτε κινεῖ τὰ ὄντα.
 ἔτι δὲ καὶ αὐτὸς εἰ ἔστι τι τῶν ὄντων, πού ἔσται. ἢ γὰρ Ζή-
 νωνος ἀπορία ζητεῖ τινὰ λόγον· εἰ γὰρ πᾶν τὸ ὄν ἐν τόπῳ,
 25 δῆλον ὅτι καὶ τοῦ τόπου τόπος ἔσται, καὶ τοῦτο εἰς ἄπειρον.
 ἔτι ὥσπερ ἅπαν σῶμα ἐν τόπῳ, οὕτω καὶ ἐν τόπῳ
 ἅπαντι σῶμα· πῶς οὖν ἐροῦμεν περὶ τῶν αἰξανομένων; ἂν-

209^a 3 τί ἐστι om. J¹ ὄγκος FGIP : γὰρ ὄγκος E : ἔστιν ὄγκος
 J τις pr. EFGP : τινὸς IJ 5 μῆκους καὶ πλάτους καὶ βάθους
 EJ¹S : μῆκος καὶ βάθος καὶ πλάτος F : μῆκος πλάτος βάθος P 6 πᾶν
 AP : ἅπαν E τὸν τόπον εἶναι F 10 τοῦ pr. om. F 11 δια-
 φορὰν οὐδεμίαν ἔχομεν GIJ : διαφορὰ οὐδὲ μία F 12 ἕτερον . . .
 τόπος EP : ἐστὶν ὁ τόπος ἕτερον Δ 13 ἕκαστον] ἕτερον S 14 ποτε
 E²APS^o : om. E¹S¹ 15 ἐκ E²APS : ἑκαστον E¹ εἶναι] εἶναι
 τὸν τόπον EIP 17 ἔτι E²J δὲ sup lin. E¹J¹ αἰσθητῶν
 S : σωμάτων G in rasura, T : αἰσθητῶν σωμάτων EFIJ 18 οὐδέν
 EV : στοιχείων οὐδέν APS 19 τὸν τόπον αἴτιον εἶναι F εἶναι
 om. S 20 αἰτία ὑπάρχει αὐτῷ Δ οὔτε . . . 21 ὄντων ΔV :
 om. E 21 οὐδέν] οὐδέ J : οὐ F¹ 22 ὡς om. EV τὰ]
 τινε E² 23 ἢ ἔ APS : om. E εἰ E²APS : om. E¹ ἔστι
 τῶν ὄντων EIJPS^oT : τῶν ὄντων ἐστὶ S¹ πού scripsi cum PST :
 ποῦ edd. 25 ἄπειρον EVPT : ἄπειρον πρόβεισιν ΔS 26 ἔτι
 EGJVPS : ἔτι εἰ FI ἅπαν E²APS : πᾶν E¹ 27 ἅπαντι E²AP :
 παντὶ E¹ περὶ τῶν αἰξανομένων ἐροῦμεν S

ἀγκη γὰρ ἐκ τούτων συναύξεσθαι αὐτοῖς τὸν τόπον, εἰ μὴτ' ἐλάττων μῆτε μείζων ὁ τόπος ἐκάστου. διὰ μὲν οὖν τούτων οὐ μόνον τί ἐστιν, ἀλλὰ καὶ εἰ ἐστιν, ἀπορεῖν ἀναγκαῖον. 30

2 Ἐπεὶ δὲ τὸ μὲν καθ' αὐτὸ τὸ δὲ κατ' ἄλλο λέγεται, καὶ τόπος ὁ μὲν κοινός, ἐν ᾧ ἅπαντα τὰ σώματά ἐστιν, ὁ δ' ἴδιος, ἐν ᾧ πρῶτω (λέγω δὲ οἶον σὺ νῦν ἐν τῷ οὐρανῷ ὅτι ἐν τῷ ἀέρι οὗτος δ' ἐν τῷ οὐρανῷ, καὶ ἐν τῷ ἀέρι δὲ ὅτι ἐν τῇ γῆ, ὁμοίως δὲ καὶ ἐν ταύτῃ ὅτι ἐν τῷδε τῷ τόπῳ, 35 ὃς περιέχει οὐδὲν πλέον ἢ σέ), εἰ δὴ ἐστιν ὁ τόπος τὸ πρῶτον 209^b περιέχον ἕκαστον τῶν σωμάτων, πέρασ τι ἂν εἴη, ὥστε δόξειεν ἂν τὸ εἶδος καὶ ἡ μορφή ἐκάστου ὁ τόπος εἶναι, ᾧ ὀρίζεται τὸ μέγεθος καὶ ἡ ὕλη ἢ τοῦ μεγέθους· τοῦτο γὰρ ἐκάστου πέρασ. οὕτω μὲν οὖν σκοποῦσιν ὁ τόπος τὸ ἐκάστου εἶ- 5 δός ἐστιν· ἢ δὲ δοκεῖ ὁ τόπος εἶναι τὸ διάστημα τοῦ μεγέθους, ἢ ὕλη· τοῦτο γὰρ ἕτερον τοῦ μεγέθους, τοῦτο δ' ἐστὶ τὸ περιεχόμενον ὑπὸ τοῦ εἶδους καὶ ὀρισμένον, οἶον ὑπὸ ἐπιπέδου καὶ πέρατος, ἐστὶ δὲ τοιοῦτον ἡ ὕλη καὶ τὸ ἀόριστον· ὅταν γὰρ ἀφαιρεθῇ τὸ πέρασ καὶ τὰ πάθη τῆς σφαίρας, λεί- 10 πεται οὐδὲν παρὰ τὴν ὕλην. διὸ καὶ Πλάτων τὴν ὕλην καὶ τὴν χώραν ταυτὸ φησιν εἶναι ἐν τῷ Τιμαίῳ· τὸ γὰρ μεταληπτικὸν καὶ τὴν χώραν ἐν καὶ ταυτόν. ἄλλον δὲ τρόπον ἐκεῖ τε λέγων τὸ μεταληπτικὸν καὶ ἐν τοῖς λεγομένοις ἀγράφοις δόγμασιν, ὅμως τὸν τόπον καὶ τὴν χώραν τὸ 15 αὐτὸ ἀπεφήνατο. λέγουσι μὲν γὰρ πάντες εἶναι τι τὸν τόπον, τί δ' ἐστίν, οὗτος μόνος ἐπεχείρησεν εἰπεῖν. 17

εἰκότως δ' 17

ἐκ τούτων σκοποῦμένοις δόξειεν ἂν εἶναι χαλεπὸν γνωρίσαι τί ἐστιν ὁ τόπος, εἴπερ τούτων ὅποτερουοῦν ἐστίν, εἴτε ἡ ὕλη εἴτε τὸ εἶδος· ἄλλως τε γὰρ τὴν ἀκροτάτην ἔχει θέαν, καὶ χω- 20 ρὶς ἀλλήλων οὐ ῥάδιον γνωρίζειω. ἀλλὰ μὴν ὅτι γε ἀδύνα-

^a 28 συναύξεσθαι ES: συναυξάνεσθαι Δ τὸν τόπον αὐτοῖς Δ
32 καὶ] καὶ ὁ G 33 πρῶτως F δ' ὅτι οἶον E²IJ τῷ οἶον. E¹
34 δὲ om. FGIS ^b 1 ὅσπερ ἔχει G εἰ δὴ fecit E: εἰ δὲ P:
εἴπερ Γ 2 ἕκαστον τῶν σωμάτων APT: τῶν σωμάτων ἕκαστον E
4 ἢ alt. sup. lin. E¹ 6 τὸ APS: om. ET 7 ἢ ὕλη] ταύτη
ἢ ὕλη δόξει S 10 σφαίρας fecit E 11 καὶ pr. EJST: καὶ
ὁ FGIP 12 φασιν E² 14 ἐκέισε λέγων F λεγομένοις
E²AP: om. E¹T 16 ἅπαντες E²AT τὸν APT: om. E
19 ἢ om. FGJT 21 ῥάδιον EFIS: ῥάδιον αὐτὰ GP: ῥῥδιον
αὐτὴν J μὴν ΔVPST: μὴν καὶ E γε om. S

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Δ

του ὁποτερονοῦν τούτων εἶναι τὸν τόπον, οὐ χαλεπὸν ἰδεῖν. τὸ
 μὲν γὰρ εἶδος καὶ ἡ ὕλη οὐ χωρίζεται τοῦ πράγματος,
 τὸν δὲ τόπον ἐνδέχεται· ἐν ᾧ γὰρ ἦν ἡν, ἐν τούτῳ πάλιν
 25 ὕδωρ, ὡσπερ ἔφαμεν, γίνεται, ἀντιμεθισταμένων ἀλλήλοις τοῦ
 τε ὕδατος καὶ τοῦ ἀέρος, καὶ τῶν ἄλλων σωμάτων ὁμοίως,
 ὥστε οὔτε μόνον οὐθ' ἕξις ἀλλὰ χωριστὸς ὁ τόπος ἐκάστου
 ἐστί. καὶ γὰρ δοκεῖ τοιοῦτό τι εἶναι ὁ τόπος οἶον τὸ ἀγ-
 γεῖον (ἔστι γὰρ τὸ ἀγγεῖον τόπος μεταφορητός). τὸ δ' ἀγγεῖον
 30 οὐδὲν τοῦ πράγματός ἐστι. ἢ μὲν οὖν χωριστὸς [ἔστι] τοῦ πρά-
 γματος, ταύτη μὲν οὐκ ἔστι τὸ εἶδος· ἢ δὲ περιέχει, ταύτη
 δ' ἕτερος τῆς ὕλης. δοκεῖ δὲ αἰεὶ τὸ ὄν που αὐτό τε εἶναι
 τι καὶ ἕτερόν τι ἐκτὸς αὐτοῦ. (Πλάτωνι μέντοι λεκτέον, εἰ
 δεῖ παρεκβάντας εἰπεῖν, διὰ τί οὐκ ἐν τόπῳ τὰ εἶδη καὶ οἱ
 35 ἀριθμοί, εἴπερ τὸ μεθεκτικὸν ὁ τόπος, εἴτε τοῦ μεγάλου
 210^a καὶ τοῦ μικροῦ ὄντος τοῦ μεθεκτικοῦ εἴτε τῆς ὕλης, ὡσπερ
 ἐν τῷ Τιμαίῳ γέγραφευ.) ἔτι πῶς ἂν φέροιτο εἰς τὸν αὐτοῦ
 τόπον, εἰ ὁ τόπος ἡ ὕλη ἢ τὸ εἶδος; ἀδύνατον γὰρ οὐ μὴ
 κίνησις μηδὲ τὸ ἄνω ἢ κάτω ἐστί, τόπον εἶναι. ὥστε ζητη-
 5 τέος ἐν τοῖς τοιούτοις ὁ τόπος. εἰ δ' ἐν αὐτῷ ὁ τόπος (δεῖ
 γὰρ, εἴπερ ἡ μορφή ἢ ὕλη), ἔσται ὁ τόπος ἐν τόπῳ· με-
 ταβάλλει γὰρ ἅμα τῷ πράγματι καὶ κινεῖται καὶ τὸ
 εἶδος καὶ τὸ ἀόριστον, οὐκ αἰεὶ ἐν τῷ αὐτῷ ἀλλ' οὔπερ καὶ
 τὸ πρᾶγμα· ὥστε τοῦ τόπου ἔσται τόπος. ἔτι ὅταν ἐξ ἀέρος
 10 ὕδωρ γένηται, ἀπόλωλεν ὁ τόπος· οὐ γὰρ ἐν τῷ αὐτῷ τόπῳ
 τὸ γενόμενον σῶμα· τίς οὖν ἡ φθορά; ἐξ ὧν μὲν τοῖνον ἀναγ-
 καῖον εἶναι τι τὸν τόπον, καὶ πάλιν ἐξ ὧν ἀπορήσειεν ἂν
 τις αὐτοῦ περὶ τῆς οὐσίας, εἴρηται.

Μετὰ δὲ ταῦτα ληπτέον ποσαχῶς ἄλλο ἐν ἄλλῳ λέ- 3
 15 γεται. ἓνα μὲν δὴ τρόπον ὡς ὁ δάκτυλος ἐν τῇ χειρὶ καὶ

^b 23 οὐ sup. lin. E¹ 24 ἦν ἀήρ T: ἀήρ F 25 ὡς Δ
 ἔφαμεν EJVT: φημεν FGI 26 ἀέρος καὶ τοῦ (τοῦ om. F) ὕδατος Δ
 27 ἐκάστου ἐστί EJP: ἐστὶν ἐκάστου FGI: ἐκάστου T 28 καὶ
 γὰρ δοκεῖ APST: δοκεῖ γὰρ E τὸ EIJP: om. FG 30 ἐστὶ
 τοῦ πράγματος Δ: τοῦ πράγματός ἐστι E: τοῦ πράγματος PS 32 δ'
 om. FP, erasit J: γε S δέ] γὰρ γρ. S τὸ αἰεὶ I 210^a 3 ἢ
 E¹S: ἦν ἢ E²Δ 4 τῷ F¹ ἐστί om. S εἶναι τοῦτο ὥστε I
 ζητητέον εἰ ἐν F 5 τοῖς τοιούτοις EFGI¹S: τοῖτοις J²P αὐτῷ
 E¹FG¹IJ¹VPS: αὐτῷ E²G² 6 ἢ EFIJT: ἢ GPS ἢ EFIJ¹T:
 ἢ ἢ GJ²S: καὶ ἢ P 8 καὶ alt. om. E¹ 9 ἔσται ὁ τόπος G
 14 ταῦτα δὲ F ληπτέον ΔPS: λεκτέον EVT

ὅλως τὸ μέρος ἐν τῷ ὅλῳ. ἄλλον δὲ ὡς τὸ ὅλον ἐν τοῖς
μέρεσιν· οὐ γὰρ ἐστὶ παρὰ τὰ μέρη τὸ ὅλον. ἄλλον δὲ τρῶ-
πον ὡς ὁ ἄνθρωπος ἐν ζώῳ καὶ ὅλως εἶδος ἐν γένει. ἄλλον
δὲ ὡς τὸ γένος ἐν τῷ εἴδει καὶ ὅλως τὸ μέρος τοῦ εἶδους
ἐν τῷ λόγῳ. ἔτι ὡς ἡ ὑγίεια ἐν θερμοῖς καὶ ψυχροῖς 20
καὶ ὅλως τὸ εἶδος ἐν τῇ ὕλῃ. ἔτι ὡς ἐν βασιλείᾳ τὰ
τῶν Ἑλλήνων καὶ ὅλως ἐν τῷ πρώτῳ κινήτικῳ. ἔτι ὡς ἐν
τῷ ἀγαθῷ καὶ ὅλως ἐν τῷ τέλει· τοῦτο δ' ἐστὶ τὸ οὐ ἔνεκα.
πάντων δὲ κυριώτατον τὸ ὡς ἐν ἀγγείῳ καὶ ὅλως ἐν τόπῳ.

ἀπορήσειε δ' ἂν τις, ἄρα καὶ αὐτὸ τι ἐν ἑαυτῷ ἐνδέχεται 25
εἶναι, ἢ οὐδέν, ἀλλὰ πᾶν ἢ οὐδαμοῦ ἢ ἐν ἄλλῳ. διχῶς δὲ
τοῦτ' ἐστίν, ἢτοι καθ' αὐτὸ ἢ καθ' ἕτερον. ὅταν μὲν γὰρ ἢ
μόρια τοῦ ὅλου τὸ ἐν ᾧ καὶ τὸ ἐν τούτῳ, λεχθήσεται τὸ ὅλον
ἐν αὐτῷ· λέγεται γὰρ καὶ κατὰ τὰ μέρη, οἷον λευκὸς ὅτι
ἢ ἐπιφάνεια λευκή, καὶ ἐπιστήμων ὅτι τὸ λογιστικόν. ὁ 30
μὲν οὖν ἀμφορεὺς οὐκ ἐστὶ ἐν αὐτῷ, οὐδ' ὁ οἶνος· ὁ δὲ τοῦ
οἴνου ἀμφορεὺς ἐστὶ· ὅ τε γὰρ καὶ ἐν ᾧ, ἀμφοτέρα τοῦ αὐτοῦ
μόρια. οὕτω μὲν οὖν ἐνδέχεται αὐτὸ τι ἐν αὐτῷ εἶναι, πρῶ-
τως δ' οὐκ ἐνδέχεται. οἷον τὸ λευκὸν ἐν σώματι (ἢ ἐπιφά-
νεια γὰρ ἐν σώματι), ἢ δ' ἐπιστήμη ἐν ψυχῇ· κατὰ ταῦτα 210^b
δὲ αἱ προσηγορίαι μέρη ὄντα, ὡς γε ἐν ἀνθρώπῳ (ὁ δὲ ἀμ-
φορεὺς καὶ ὁ οἶνος χωρὶς μὲν ὄντα οὐ μέρη, ἅμα δέ· διὸ
ὅταν ἢ μέρη, ἐστὶ αὐτὸ ἐν αὐτῷ)· οἷον τὸ λευκὸν ἐν ἀν-
θρώπῳ ὅτι ἐν σώματι, καὶ ἐν τούτῳ ὅτι ἐν ἐπιφανείᾳ· ἐν 5
δὲ ταύτῃ οὐκέτι κατ' ἄλλο. καὶ ἕτερα γὰρ τῷ εἴδει ταῦτα,
καὶ ἄλλην φύσιν ἔχει ἐκάτερον καὶ δύναμιν, ἢ τ' ἐπιφά-
νεια καὶ τὸ λευκόν. οὕτε δὴ ἐπακτικῶς σκοποῦσιν οὐδὲν ὀρω-
μεν ἐν ἑαυτῷ κατ' οὐδένα τῶν διορισμῶν, τῷ τε λόγῳ δὴ-

^a 16 δὲ ΔΤ: δὲ τρόπον Ε 17 παρὰ . . . ὅλον ΑΣ: ὅλον παρὰ τὰ
μέρη Ε 18 ἐν τῷ ζώῳ F 20 τῷ ΕΓ¹J: τῷ τοῦ εἶδους FG²IP
ἢ ΕJS: om. FGI 23 ἐν ΑΣ: ὡς ἐν Ε 24 ἐν alt. EFGJSP:
τὸ ἐν IP: ὡς ἐν S¹ 25 τις εἰ ἄρα S 26 πᾶν EP¹T: πάντα
E²FIJ: om. G οὐδαμοῦ ἢ ἐν ἄλλῳ EIJP: οὐδαμῶς ἢ ἐν ἄλλῳ F:
ἐν ἄλλῳ ἢ οὐδαμοῦ G 28 τὸ pr. EJS: τό τ' FGI 29 τὰ E²IS:
om. E¹FGJ 30 τὸ AV: καὶ τὸ Ε 33 αὐτῷ FG 34 οἷον . . .
σώματι E²FGIJ²PS: om. E¹V: ἐν σώματι om. J¹ ἢ . . . ^b 1 σώματι
EGJPP: om. IP¹: ἢ om. F ^b 2 ὡς τε F 3 διὸ EGJ¹P:
διότι FJ² 4 ἢ AP: μὲν ἢ Ε αὐτὸ FGJT: αὐτὸς EI ἐν
alt.] ἐν τῷ E²GIJ 5 ἐν pr.] ἐν τῷ Α ἐν tert.] ἐν τῇ E²A
7 ἐκάτερα F 8 ὀρωμεν ἐν ἑαυτῷ EP: ἐν ἑαυτῷ (αὐτῷ G, αὐτῷ J)
ὀρωμεν Α 9 τῶν διορισμῶν AP: τὸν διορισμένον Ε

10 λον ὅτι ἀδύνατον· δεήσει γὰρ ἀμφότερα ἐκάτερον ὑπάρ-
 χειν, οἶον τὸν ἀμφορέα ἀγγεῖον τε καὶ οἶνον εἶναι καὶ τὸν
 οἶνον οἶνόν τε καὶ ἀμφορέα, εἴπερ ἐνδέχεται αὐτό τι ἐν
 αὐτῷ εἶναι. ὥστ' εἰ ὅτι μάλιστα ἐν ἀλλήλοις εἶεν, ὁ μὲν
 ἀμφορεὺς δέξεται τὸν οἶνον οὐχ ἢ αὐτὸς οἶνος ἀλλ' ἢ ἐκεῖ-
 15 νος, ὁ δ' οἶνος ἐνέσται ἐν τῷ ἀμφορεῖ οὐχ ἢ αὐτὸς ἀμ-
 φορεὺς ἀλλ' ἢ ἐκεῖνος. κατὰ μὲν οὖν τὸ εἶναι ὅτι ἕτερον,
 δῆλον· ἄλλος γὰρ ὁ λόγος τοῦ ἐν ᾧ καὶ τοῦ ἐν τούτῳ.
 ἀλλὰ μὴν οὐδὲ κατὰ συμβεβηκὸς ἐνδέχεται· ἅμα γὰρ
 δύο ἐν ταυτῷ ἔσται αὐτός τε γὰρ ἐν αὐτῷ ὁ ἀμφορεὺς
 20 ἔσται, εἰ οὐ ἢ φύσις δεκτικῆ, τοῦτ' ἐνδέχεται ἐν αὐτῷ εἶναι,
 21 καὶ ἔτι ἐκεῖνο οὐ δεκτικόν, οἶον, εἰ οἶνου, ὁ οἶνος.

21 ὅτι μὲν οὖν
 ἀδύνατον ἐν αὐτῷ τι εἶναι πρῶτως, δῆλον· ὁ δὲ Ζήνων
 ἠπόρει, ὅτι εἰ ὁ τόπος ἐστὶ τι, ἐν τινι ἔσται, λύειν οὐ χα-
 λεπόν· οὐδὲν γὰρ κωλύει ἐν ἄλλῳ εἶναι τὸν πρῶτον τό-
 25 πον, μὴ μέντοι ὡς ἐν τόπῳ ἐκείνῳ, ἀλλ' ὥσπερ ἢ μὲν
 ὑγίεια ἐν τοῖς θερμοῖς ὡς ἕξις, τὸ δὲ θερμὸν ἐν σώματι
 ὡς πάθος. ὥστε οὐκ ἀνάγκη εἰς ἄπειρον ἰέναι. ἐκεῖνο δὲ φα-
 νερόν, ὅτι ἐπεὶ οὐδὲν τὸ ἀγγεῖον τοῦ ἐν αὐτῷ (ἕτερον γὰρ τὸ
 πρῶτως ὅ τε καὶ ἐν ᾧ), οὐκ ἂν εἴη οὔτε ἢ ὕλη οὔτε τὸ εἶδος
 30 ὁ τόπος, ἀλλ' ἕτερον. ἐκείνου γάρ τι ταῦτα τοῦ ἐνόητος, καὶ
 ἢ ὕλη καὶ ἢ μορφή. ταῦτα μὲν οὖν ἔστω διηπορημένα.

Τί δέ ποτ' ἐστὶν ὁ τόπος, ᾧδ' ἂν γένοιτο φανερόν. λά- 4
 βωμεν δὲ περὶ αὐτοῦ ὅσα δοκεῖ ἀληθῶς καθ' αὐτὸ ὑπάρ-
 χειν αὐτῷ. ἀξιούμεν δὲ τὸν τόπον εἶναι πρῶτον μὲν περιέ-

^b 10 ἐκατέρῳ J 12 οἶνόν om. G αὐτό τι EFT : τι αὐτὸ GIJS
 15 ὁ δ'] καὶ ὁ I ἔσται FIS ἀμφορεὺς αὐτὸς AS 16 ἢ E¹
 ἐκεῖνος ἀμφορεὺς. κατὰ FGI οὖν om. F 17 ἄλλος APS: ἄλλως E
 τοῦ E²FGIS: ὁ τοῦ E¹J τοῦ E¹FJPS²T: ὁ τοῦ E²GIS¹ 18 μὴν
 E²AVST: δὴ E¹P 19 ἐν EFPS: σώματα ἐν GIJ ἔνεσται F
 τε AS: om. EP 20 et 22 αὐτῷ FG 21 ἐκείνου δεκτικόν
 E¹ ὁ sup. lin. E¹, om. F, erasit J 22 τι E²AVS: om. E¹
 πρῶτως εἶναι F 23 ὁ . . . τι GIJPS: ἔστι τι ὁ τόπος E: ὁ τόπος
 ἔσται τι F: ὁ τόπος ἔστι T ἐν τινι scripsi cum PST: ἐν τίνι
 ΠP¹ λύνει οὐ χαλεπὸν E²AVP: om. E¹ 24 ἄλλῳ E¹P: ἄλλῳ
 μὲν E²Λ πρῶτως EJVP 26 τοῖς om. E¹ST ἐν EFGS:
 om. IJ 27 εἰς EFJS: ἐπ' GI 28 οὐδὲ I τοῦ
 om. I αὐτῷ EVS: αὐτῷ FGIJ 29 οὐκ] διὸ οὐκ J ἢ et
 οὔτε om. G 32 δὴ G 33 αὐτὸ EFIJ²S: αὐτὸν GJ¹ 34 περιέ-
 χειν FI

χον ἐκεῖνο οὐδὲν τόπος ἐστί, καὶ μηδὲν τοῦ πράγματος, ἔτι 211^a
 τὸν πρῶτον μὴτ' ἐλάττω μήτε μείζω, ἔτι ἀπολείπεσθαι
 ἐκάστου καὶ χωριστόν εἶναι, πρὸς δὲ τούτοις πάντα τό-
 πον ἔχειν τὸ ἄνω καὶ κάτω, καὶ φέρεσθαι φύσει καὶ μέ-
 νειν ἐν τοῖς οἰκείοις τόποις ἕκαστον τῶν σωμάτων, τοῦτο δὲ 5
 ποιεῖν ἢ ἄνω ἢ κάτω. ὑποκειμένων δὲ τούτων τὰ λοιπὰ θεω-
 ρητέον. δεῖ δὲ πειρᾶσθαι τὴν σκέψιν οὕτω ποιεῖσθαι ὅπως
 τὸ τί ἐστὶν ἀποδοθήσεται, ὥστε τὰ τε ἀπορούμενα λύεσθαι,
 καὶ τὰ δοκοῦντα ὑπάρχειν τῷ τόπῳ ὑπάρχοντα ἔσται, καὶ
 ἔτι τὸ τῆς δυσκολίας αἴτιον καὶ τῶν περὶ αὐτὸν ἀπορημά- 10
 των ἔσται φανερόν· οὕτω γὰρ ἂν κάλλιστα δεικνύοιτο ἕκαστον.

πρῶτον μὲν οὖν δεῖ κατανοῆσαι ὅτι οὐκ ἂν ἐξηγείτο ὁ τόπος,
 εἰ μὴ κίνησις ἦν ἢ κατὰ τόπον· διὰ γὰρ τοῦτο καὶ τὸν
 οὐρανὸν μάλιστ' οἰόμεθα ἐν τόπῳ, ὅτι αἰεὶ ἐν κινήσει. ταύτης
 δὲ τὸ μὲν φορά, τὸ δὲ ἀΐξις καὶ φθίσις· καὶ γὰρ ἐν 15
 τῇ ἀΐξει καὶ φθίσει μεταβάλλει, καὶ ὃ πρότερον ἦν ἐν-
 ταῦθα, πάλιν μεθέστηκεν εἰς ἕλαττον ἢ μείζον. ἔστι δὲ κι-
 νούμενον τὸ μὲν καθ' αὐτὸ ἐνεργεία, τὸ δὲ κατὰ συμβεβη-
 κός· κατὰ συμβεβηκός δὲ τὸ μὲν ἐνδεχόμενον κινεῖσθαι
 καθ' αὐτό, οἷον τὰ μέρη τοῦ σώματος καὶ ὁ ἐν τῷ πλοίῳ 20
 ἦλος, τὰ δ' οὐκ ἐνδεχόμενα ἀλλ' αἰεὶ κατὰ συμβεβηκός,
 οἷον ἡ λευκότης καὶ ἡ ἐπιστήμη· ταῦτα γὰρ οὕτω μεταβέ-
 βληκε τὸν τόπον, ὅτι ἐν ᾧ ὑπάρχουσι μεταβάλλει. ἐπεὶ
 δὲ λέγομεν εἶναι ὡς ἐν τόπῳ ἐν τῷ οὐρανῷ, διότι ἐν τῷ ἀέρι
 οὗτος δὲ ἐν τῷ οὐρανῷ· καὶ ἐν τῷ ἀέρι δὲ οὐκ ἐν παντί, ἀλλὰ 25
 διὰ τὸ ἔσχατον αὐτοῦ καὶ περιέχον ἐν τῷ ἀέρι φαμέν εἶναι
 (εἰ γὰρ πᾶς ὁ ἀῆρ τόπος, οὐκ ἂν ἴσος εἴη ἐκάστου ὁ τόπος
 καὶ ἕκαστον, δοκεῖ δὲ γε ἴσος εἶναι, τοιοῦτος δ' ὁ πρῶτος
 ἐν ᾧ ἐστίν)· ὅταν μὲν οὖν μὴ διηρημένον ἢ τὸ περιέχον ἀλλὰ

211^a 1 μηδὲν εἶναι τοῦ πράγματος T : μηδὲν τοῦ πράγματος εἶναι E² A
 2 πρῶτον EFGJP : πρῶτον τόπον I ἐλάττω εἶναι μήτε IT ἔτι
 EVT γρ. P γρ. S : ἔτι μήτε AS : ἔτι μὴ P 3 εἶναι FPT : om. EGIJ
 4 καὶ τὸ κάτω CP 6 δὲ τῶν τοιούτων G 7 δέ] δὲ κατὰ κοινὸν οὖν
 τὸ οὕτως G¹ 10 περὶ αὐτὸν om. S αὐτὸ E² 13 ἦν
 E¹ FPST : τις ἦν E² GIJV 14 οἰόμεθα ἐν τόπῳ ET : ἐν τόπῳ
 οἰόμεθα AS 16 ὅπερ F 19 κατὰ . . . δέ] τοῦ δὲ κατὰ συμ-
 βεβηκός E² A τὰ μὲν ἐνδεχόμενα FG 20 μέρη F 22 ἢ
 pt.] ἢ τε fecit E 24 εἶναι om. F ἐν alt. ES : om. A
 25 ἅπαντι S 27 ἅπας GIJ et fecit E 28 δοκεῖ . . . εἶναι
 om. J¹ ἴσος εἶναι] ἴσος I : εἶναι V : om. GP δ' om. GJ¹ P

ποιήσει τὰ μόρια πάντα ἐν τῷ ὄλῳ ὅπερ ἄπαν τὸ ὕδωρ
ἐν τῷ ἀγγεῖῳ· ἅμα δὲ καὶ ὁ τόπος ἔσται μεταβάλλων·
ὥστ' ἔσται τοῦ τόπου τ' ἄλλος τόπος, καὶ πολλοὶ τόποι
ἅμα ἔσονται. οὐκ ἔστι δὲ ἄλλος ὁ τόπος τοῦ μορίου, ἐν ᾧ ²⁵
κινεῖται, ὅταν ὄλον τὸ ἀγγεῖον μεθίστηται, ἀλλ' ὁ αὐτός·
ἐν ᾧ γὰρ ἔστιν, ἀντιμεθίσταται ὁ ἀήρ καὶ τὸ ὕδωρ ἢ τὰ
μόρια τοῦ ὕδατος, ἀλλ' οὐκ ἐν ᾧ γίνονται τόπῳ, ὅς μέρος
ἔστί τοῦ τόπου ὅς ἐστι τόπος ὄλου τοῦ οὐρανοῦ. καὶ ἡ ὕλη δὲ
δόξειεν ἂν εἶναι τόπος, εἴ γε ἐν ἡρεμοῦντί τις σκοποῖη καὶ ³⁰
μὴ κεχωρισμένῳ ἀλλὰ συνεχεῖ. ὥσπερ γὰρ εἰ ἀλλοιοῦται,
ἔστι τι ὃ νῦν μὲν λευκὸν πάλαι δὲ μέλαν, καὶ νῦν μὲν
σκληρὸν πάλαι δὲ μαλακόν (διό φαμεν εἶναι τι τὴν ὕλην),
οὕτω καὶ ὁ τόπος διὰ τοιαύτης τινὸς εἶναι δοκεῖ φαντασίας,
πλὴν ἐκεῖνο μὲν διότι ὃ ἦν ἀήρ, τοῦτο νῦν ὕδωρ, ὁ δὲ τό- ³⁵
πος ὅτι οὐ ἦν ἀήρ, ἐνταῦθ' ἔστι νῦν ὕδωρ. ἀλλ' ἡ μὲν ὕλη,
ὥσπερ ἐλέχθη ἐν τοῖς πρότερον, οὔτε χωριστὴ τοῦ πράγματος ^{212^a}
οὔτε περιέχει, ὁ δὲ τόπος ἄμφω. 2

εἰ τοῖων μὴδὲν τῶν τριῶν ²
ὁ τόπος ἐστίν, μήτε τὸ εἶδος μήτε ἡ ὕλη μήτε διάστημα τι
ἀεὶ ὑπάρχον ἕτερον παρὰ τὸ τοῦ πράγματος τοῦ μεθιστα-
μένου, ἀνάγκη τὸν τόπον εἶναι τὸ λοιπὸν τῶν τεττά- ⁵
ρων, τὸ πέρασ τοῦ περιέχοντος σώματος (καθ' ὃ συνάπτει
τῷ περιεχομένῳ). λέγω δὲ τὸ περιεχόμενον σῶμα ^{6 a}
τὸ κινητὸν κατὰ φοράν. δοκεῖ δὲ μέγα τι εἶναι καὶ
χαλεπὸν ληφθῆναι ὁ τόπος διὰ τε τὸ παρεμφαίνεσθαι τὴν
ὕλην καὶ τὴν μορφήν, καὶ διὰ τὸ ἐν ἡρεμοῦντι τῷ περιέχοντι
γίνεσθαι τὴν μετάστασιν τοῦ φερομένου· ἐνδέχεσθαι γὰρ φαί- ¹⁰

^b 22 πάντα EGIJP^s: ἅπαντα FP¹ 23 καὶ . . . ἔσται EFPS:
ἔσται καὶ ὁ τόπος GIJ 24 τοῦ τόπου ἔσται S τοῦ] καὶ
τοῦ F: τέ τις τοῦ G τ' ἄλλος] ἄλλος FG: τις ἄλλος IPS: τέλος J
25 ὁ τόπος S: τόπος ὁ EGIJ: τόπος FP 26 τὸ ὄλον F 30 εἰ
. . . τις E²APS: ἐνηρεμοῦν E¹ 31 κεχωρισμένῳ ἀλλὰ συνεχεῖ
E¹FGIP: κεχωρισμένον ἀλλὰ συνεχές E²J (+ μεταβάλλοντι E¹)
32 τι] τοῦτο I: τι τοῦτο GJ 32 et 33 πάλαι EFJS: πάλιν GI
33 τι om. IJ¹ 34 δοκεῖ εἶναι GIJ 35 ὁ sup. lin. E¹ τοῦτο
. . . 36 ἀήρ om. G 36 οὗ] ἐν ᾧ G: οὗ νῦν I ὁ ἀήρ I νῦν
om. G 212^a I προτέροις F 2 τῶν τριῶν E¹FT: τούτων
τῶν τριῶν E²GIJ: τῶν τριῶν τούτων S 3 τὸ et ἡ om. corr. E, T
ἀεὶ τι F 4 ὑπάρχειν E 6-6 a καθ' . . . περιεχομένῳ VPST:
om. Π 6 a τὸ EGHIS: erasit J, om. P 7 μέγα τι εἶναι
EGIJPS: μέγα εἶναι τι F: τι μέγα εἶναι T 9 ἐνηρεμοῦν τῷ E¹

νεται εἶναι διάστημα μεταξὺ ἄλλο τι τῶν κινουμένων μεγε-
 θῶν. συμβάλλεται δέ τι καὶ ὁ ἀήρ δοκῶν ἀσώματος εἶναι·
 φαίνεται γὰρ οὐ μόνον τὰ πέρατα τοῦ ἀγγείου εἶναι ὁ τόπος,
 ἀλλὰ καὶ τὸ μεταξὺ ὡς κενὸν (ὄν). ἔστι δ' ὡσπερ τὸ ἀγγείου
 15 τόπος μεταφορητός, οὕτως καὶ ὁ τόπος ἀγγείου ἀμετακί-
 νητον. διὸ ὅταν μὲν ἐν κινουμένῳ κινήται καὶ μεταβάλλῃ
 τὸ ἐντός, οἶον ἐν ποταμῷ πλοίου, ὡς ἀγγείῳ χρῆται μάλ-
 λον ἢ τόπῳ τῷ περιέχοντι. βούλεται δ' ἀκίνητος εἶναι ὁ τό-
 πος· διὸ ὁ πᾶς μᾶλλον ποταμὸς τόπος, ὅτι ἀκίνητος ὁ
 20 πᾶς. ὥστε τὸ τοῦ περιέχοντος πέρασ ἀκίνητον πρῶτον, τοῦτ'
 ἔστιν ὁ τόπος. καὶ διὰ τοῦτο τὸ μέσον τοῦ οὐρανοῦ καὶ τὸ ἔσχα-
 τον τὸ πρὸς ἡμᾶς τῆς κύκλῳ φορᾶς δοκεῖ εἶναι τὸ μὲν ἄνω
 τὸ δὲ κάτω μάλιστα πᾶσι κυρίως, ὅτι τὸ μὲν αἰεὶ μένει,
 τοῦ δὲ κύκλῳ τὸ ἔσχατον ὡσαύτως ἔχον μένει. ὥστ' ἐπεὶ τὸ
 25 μὲν κοῦφον τὸ ἄνω φερόμενόν ἐστι φύσει, τὸ δὲ βαρὺ τὸ
 κάτω, τὸ μὲν πρὸς τὸ μέσον περιέχον πέρασ κάτω ἐστίν,
 καὶ αὐτὸ τὸ μέσον, τὸ δὲ πρὸς τὸ ἔσχατον ἄνω, καὶ αὐτὸ
 τὸ ἔσχατον· καὶ διὰ τοῦτο δοκεῖ ἐπίπεδόν τι εἶναι καὶ οἶον
 ἀγγείου ὁ τόπος καὶ περιέχον. ἔτι ἅμα τῷ πράγματι ὁ
 30 τόπος· ἅμα γὰρ τῷ πεπερασμένῳ τὰ πέρατα.

ᾧ μὲν οὖν σώματι ἔστι τι ἐκτὸς σῶμα περιέχον αὐτό, 5
 τοῦτο ἔστιν ἐν τόπῳ, ᾧ δὲ μή, οὐ. διὸ κὰν ὕδωρ γένηται τοι-
 οῦτο, τὰ μὲν μόρια κινήσεται αὐτοῦ (περιέχεται γὰρ ὑπ'
 ἀλλήλων), τὸ δὲ πᾶν ἔστι μὲν ὡς κινήσεται ἔστι δ' ὡς οὐ.
 35 ὡς μὲν γὰρ ὄλον, ἅμα τὸν τόπον οὐ μεταβάλλει, κύκλῳ
 212^b δὲ κινεῖται—τῶν μορίων γὰρ οὗτος ὁ τόπος—καὶ ἄνω μὲν
 καὶ κάτω οὐ, κύκλῳ δ' ἔνια· τὰ δὲ καὶ ἄνω καὶ κάτω, ὅσα

^a 14 κενὸν ὄν scripsi: ὄν κενόν S: κενόν Π 15 καὶ ES: om.
 AT 16 κινήται EFGJPS: τι κινήται IP^b μεταβάλλει fort. G
 17 ὡς] ὡς ἐν I 18 ἀκίνητος EGJJS: ἀκίνητον FP εἶναι ὁ
 τόπος EFPT: ὁ τόπος εἶναι GIJ 19 τόπος ἐστίν ὅτι IP ὁ πᾶς
 EFIJS: ἅπασ GP: ὁ ἅπασ J² 21 τὸ pr. om. I 24 κύκλῳ
 FGISP: κύκλου EJVP 25 ἐστι φύσει EFP: φύσει ἐστὶ GIJ
 27-8 ἄνω . . . καὶ pr. E²AVS: om. E¹ 28 τι] τε G 29 περι-
 ἔχων F πράγματι E¹FVT: πράγματι πως E²GIJPS 30 τῷ
 πεπερασμένῳ EFJ²V: om. GIJ¹PST πέρατα EFPVST: πέρατα καὶ
 ὁ τόπος GIJ 31 ὡς E² σῶμα] τὸ S^c: σῶμα τὸ S^p 32 ἐστίν
 ἐν τόπῳ EFPS: ἐν τόπῳ ἐστίν GIJ 35 ὡς FGIPS: ὥστε E:
 ἔσται J ^b I κινεῖται E¹VPST: κινήσεται E²Λ ὁ IP: om. ST
 2 ἔνια' τὰ] ἔνια' ἔνια P: ἔνια fort. S: τὰ γρ. S καὶ om. PT ἄνω
 καὶ κάτω EFPT: κάτω καὶ ἄνω GIJ

ἔχει πύκνωσιν καὶ μάνωσιν. ὥσπερ δ' ἐλέχθη, τὰ μὲν ἐστὶν ἐν τόπῳ κατὰ δύναμιν, τὰ δὲ κατ' ἐνέργειαν. διὸ ὅταν μὲν συνεχῆς ἦ τὸ ὁμοιομερές, κατὰ δύναμιν ἐν τόπῳ τὰ μέρη, 5 ὅταν δὲ χωρισθῆ μὲν ἄπτηται δ' ὥσπερ σωρός, κατ' ἐνέργειαν. καὶ τὰ μὲν κατ' αὐτά (οἶον πᾶν σῶμα ἢ κατὰ φορὰν ἢ κατ' αὐξήσιν κινήτων κατ' αὐτό που, ὃ δ' οὐρανός, ὥσπερ εἴρηται, οὐ που ὅλος οὐδ' ἐν τινι τόπῳ ἐστίν, εἴ γε μηδὲν αὐτὸν περιέχει σῶμα· ἐφ' ᾧ δὲ κινεῖται, ταύτῃ καὶ τόπος ἐστὶ τοῖς μορίοις· 10 ἕτερον γὰρ ἑτέρου ἐχόμενον τῶν μορίων ἐστίν)· τὰ δὲ κατὰ συμβεβηκός, οἶον ἢ ψυχὴ καὶ ὁ οὐρανός· τὰ γὰρ μόρια ἐν τόπῳ πως πάντα· ἐπὶ τῷ κύκλῳ γὰρ περιέχει ἄλλο ἄλλο. διὸ κινεῖται μὲν κύκλῳ τὸ ἄνω, τὸ δὲ πᾶν οὐ που. τὸ γὰρ που αὐτό τέ ἐστὶ τι, καὶ ἔτι ἄλλο τι δεῖ εἶναι παρὰ τοῦτο ἐν 15 ᾧ, ὃ περιέχει· παρὰ δὲ τὸ πᾶν καὶ ὅλον οὐδὲν ἐστὶν ἔξω τοῦ παντός, καὶ διὰ τοῦτο ἐν τῷ οὐρανῷ πάντα· ὃ γὰρ οὐρανὸς τὸ πᾶν ἴσως. ἐστὶ δ' ὁ τόπος οὐχ ὁ οὐρανός, ἀλλὰ τοῦ οὐρανοῦ τι τὸ ἔσχατον καὶ ἀπτόμενον τοῦ κινήτου σώματος [πέρας ἡρεμοῦν]. καὶ διὰ τοῦτο ἢ μὲν γῆ ἐν τῷ ὕδατι, τοῦτο δ' ἐν 20 τῷ ἀέρι, οὗτος δ' ἐν τῷ αἰθέρι, ὃ δ' αἰθήρ ἐν τῷ οὐρανῷ, ὃ δ' οὐρανὸς οὐκέτι ἐν ἄλλῳ. 22

φανερὸν δ' ἐκ τούτων ὅτι καὶ 22 αἱ ἀπορίαι πᾶσαι λύονται ἂν οὕτω λεγομένου τοῦ τόπου. οὔτε γὰρ συναύξεσθαι ἀνάγκη τὸν τόπον, οὔτε στιγμῆς εἶναι τόπον, οὔτε δύο σώματα ἐν τῷ αὐτῷ τόπῳ, οὔτε διάστημα τι 25 εἶναι σωματικόν (σῶμα γὰρ τὸ μεταξὺ τοῦ τόπου τὸ τυχόν, ἀλλ' οὐ διάστημα σώματος). καὶ ἐστὶν ὁ τόπος καὶ πού, οὐχ ὡς ἐν τόπῳ δέ, ἀλλ' ὡς τὸ πέρασ ἐν τῷ πεπερασμένῳ. οὐ γὰρ πᾶν τὸ ὄν ἐν τόπῳ, ἀλλὰ τὸ κινήτων σῶμα. καὶ φέρεται δὴ εἰς τὸν αὐτοῦ τόπον ἕκαστον εὐλόγως (ὃ γὰρ ἐφε- 30 ξῆς καὶ ἀπτόμενον μὴ βία, συγγενές· καὶ συμπεφυκότα

^b 3 δ' EFGJS: γὰρ T: om. I ἐλέγομεν fecit E 7 αὐτὰ
EJPST: αὐτὸ FGI κατ' ES: om. ΔP 10 δ' EJPS Maximus
13 τὸ EGIS περιέχει om. E¹ ἄλλο ἄλλω I 14 μὲν om.
IJP κύκλῳ μόνον τὸ GIP 16 ὃ περιέχει FGI¹VPS: περιέχεται
EJ² et ut vid. T ἔξωθεν Λ 18 ὁ pr. om. PSc 19 πέρασ
ἡρεμοῦν ΔP: om. EVST 21 οἶτος δ' ὁ δ' αἰθρ S 22 ὅτι
om. F 23 λύονται οὕτω PT 24 εἶναι τὸν τόπον I 25 οὐδὲ
GIT ἐν ΔT: ἐστὶν ἐν E τόπῳ om. F οὐδὲ GI: οὐ γὰρ T
28 δέ om. F 29 τὸ ὄν ἐν τόπῳ E²GIVPT: ἐν τόπῳ τὸ ὄν FS:
ἐν τόπῳ E¹ 30 ἕκαστον om. E ὃ FIPT: ᾧ EGJ

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Δ

μὲν ἀπαθῆ, ἀπτόμενα δὲ παθητικὰ καὶ ποιητικὰ ἀλλή-
λων)· καὶ μένει δὴ φύσει πᾶν ἐν τῷ οἰκίῳ τόπῳ
οὐκ ἀλόγως· καὶ γὰρ τὸ μέρος, τὸ δὲ ἐν [τῷ] τόπῳ ὡς
35 διαιρετὸν μέρος πρὸς ὄλον ἐστίν, ὅλον ὅταν ὕδατος κινήσῃ τις
213^a μόριον ἢ ἀέρος. οὕτω δὲ καὶ ἀήρ ἔχει πρὸς ὕδωρ· ὅλον ὕλη
γάρ, τὸ δὲ εἶδος, τὸ μὲν ὕδωρ ὕλη ἀέρος, ὁ δ' ἀήρ οἶον
ἐνεργεία τις ἐκείνου· τὸ γὰρ ὕδωρ δυνάμει ἀήρ ἐστιν, ὁ δ'
ἀήρ δυνάμει ὕδωρ ἄλλον τρόπον. διοριστέον δὲ περὶ τούτων
5 ὕστερον· ἀλλὰ διὰ τὸν καιρὸν ἀνάγκη μὲν εἰπεῖν, ἀσαφῶς
δὲ νῦν ῥηθὲν τότ' ἔσται σαφέστερον. εἰ οὖν τὸ αὐτὸ [ἢ] ὕλη
καὶ ἐντελέχεια (ὕδωρ γὰρ ἄμφω, ἀλλὰ τὸ μὲν δυνά-
μει τὸ δ' ἐντελεχείᾳ), ἔχοι ἂν ὡς μόριον πως πρὸς ὄλον.
διὸ καὶ τούτοις ἀφή ἔστιν· σύμφυσις δέ, ὅταν ἄμφω ἐνε-
10 γείᾳ ἐν γένωνται. καὶ περὶ μὲν τόπου, καὶ ὅτι ἔστι καὶ τί
ἐστιν, εἴρηται.

Τὸν αὐτὸν δὲ τρόπον ὑποληπτέον εἶναι τοῦ φυσικοῦ θεω- 6
ρῆσαι καὶ περὶ κενοῦ, εἰ ἔστιν ἢ μή, καὶ πῶς ἔστι, καὶ τί ἔστιν,
ὥσπερ καὶ περὶ τόπου· καὶ γὰρ παραπλησίαν ἔχει τὴν τε
15 ἀπιστίαν καὶ τὴν πίστιν διὰ τῶν ὑπολαμβάνομένων· οἶον γὰρ
τόπον τινὰ καὶ ἀγγεῖον τὸ κενὸν τιθέασιν οἱ λέγοντες, δοκεῖ
δὲ πλήρες μὲν εἶναι, ὅταν ἔχη τὸν ὄγκον οὗ δεκτικόν ἐστιν,
ὅταν δὲ στερηθῆ, κενόν, ὡς τὸ αὐτὸ μὲν ὄν κενὸν καὶ πλήρες
καὶ τόπον, τὸ δ' εἶναι αὐτοῖς οὐ ταυτὸ ὄν. ἀρξασθαι δὲ δεῖ
20 τῆς σκέψεως λαβοῦσιν ἃ τε λέγουσιν οἱ φάσκοντες εἶναι καὶ
πάλιν ἃ λέγουσιν οἱ μὴ φάσκοντες, καὶ τρίτον τὰς κοινὰς

^b 32 ποιητικὰ καὶ παθητικὰ VP et ut vid. ST 33 πᾶν om. PT
add. ἕκαστον post πᾶν E, post τόπῳ IJT 34 οὐκ . . . τόπῳ
om. G οὐκ ἀλόγως] εὐλόγως E²IJVP μέρος, τὸ δὲ scripti cum
PV : μέρος τότε EFIJ τῷ seclusi, om. P : ὄλω τῷ F : τῷ ὄλω
E²IJ 35 ὅταν] εἰ I κινήσῃ τι E²F : τις κινήσῃ GJ : τις
κινήσει I 213^a I ἀήρ E¹P : ὁ ἀήρ E²AS 2 γὰρ . . . ὕλη
E²AS : om. E¹ ἀέρος ὕλη F οἶον om. E¹ 3 γὰρ] δὲ I ἐστίν
ἀήρ GIJS 6 λεχθέν GIJ ἐστὶ E² ἢ seclusi, om. ut
vid. P² : habent ΠP¹ 7 καὶ E et ut vid. P² : καὶ ἢ ΔP¹ ὕδωρ
ΔP : ἔχει ὕδωρ E 9 δὲ ἐστίν ὅταν E¹ ἐνεργεία ἐγγένηται E²
10 γένηται F τόπου EGIJS : τοῦ τόπου FT 13 ἢ μή om. E²
καὶ πῶς ἐστὶ ΔPS : om. E καὶ ST : ἢ Π 14 γὰρ om. E¹
τὴν . . . 15 καὶ om. F : τε om. E¹P 16 τόπον τινὰ EGIJP : τινὰ
τόπον F : τόπον S 17 δ' εἶναι πλήρες μὲν GIJP 18 ὡς om.
E¹ κενὸν om. F 19 ταυτὸν. ἀρξασθαι IJ 20 τῆς
om. F λαβοῦσιν ex λαμβάνουσιν fecit J¹ : λαβοῦσιν G ἃ om. E¹
21 φάσκοντες εἶναι καὶ E²Δ κοινὰς δοξὰς περὶ αὐτῶν Δ : περὶ αὐτῶν
κοινὰς δόξας S

περὶ αὐτῶν δόξας. οἱ μὲν οὖν δεικνύναι πειρώμενοι ὅτι οὐκ ἔστιν, οὐχ ὃ βούλονται λέγειν οἱ ἄνθρωποι κενόν, τοῦτ' ἐξελέγχουσι, ἀλλ' (ὃ) ἁμαρτάνοντες λέγουσι, ὡσπερ' Ἀναξαγόρας καὶ οἱ τοῦτον τὸν τρόπον ἐλέγχοντες. ἐπιδεικνύουσι γὰρ ὅτι ἐστὶν τι 25 ὃ ἄῆρ, στρεβλοῦντες τοὺς ἀσκοὺς καὶ δεικνύντες ὡς ἰσχυρὸς ὃ ἄῆρ, καὶ ἐναπολαμβάνοντες ἐν ταῖς κλεψύδραις. οἱ δὲ ἄνθρωποι βούλονται κενόν εἶναι διάστημα ἐν ᾧ μηδέν ἐστι σῶμα αἰσθητόν· οἴομενοι δὲ τὸ ὄν ἅπαν εἶναι σῶμα φασίν, ἐν ᾧ ὅλως μηδέν ἐστι, τοῦτ' εἶναι κενόν, διὸ τὸ πλήρες ἀέρος 30 κενόν εἶναι. οὐκ οὖν τοῦτο δεῖ δεικνύναι, ὅτι ἐστὶ τι ὃ ἄῆρ, ἀλλ' ὅτι οὐκ ἔστι διάστημα ἕτερον τῶν σωμάτων, οὔτε χωριστὸν οὔτε ἐνεργεῖα ὄν, ὃ διαλαμβάνει τὸ πᾶν σῶμα ὥστε εἶναι μὴ συνεχές, καθάπερ λέγουσι Δημόκριτος καὶ Λεύκιππος καὶ ἕτεροι πολλοὶ τῶν φυσιολόγων, ἧ καὶ εἴ τι ἔξω τοῦ παντὸς 213^b σώματός ἐστιν ὄντος συνεχούς.

οὔτοι μὲν οὖν οὐ κατὰ θύρας 2 πρὸς τὸ πρόβλημα ἀπαντῶσι, ἀλλ' οἱ φάσκοντες εἶναι μᾶλλον. λέγουσι δ' ἐν μὲν ὅτι κίνησις ἢ κατὰ τόπον οὐκ ἂν εἴη (αὕτη δ' ἐστὶ φορὰ καὶ αὐξήσις)· οὐ γὰρ ἂν δοκεῖν εἶναι 5 κίνησις, εἰ μὴ εἴη κενόν· τὸ γὰρ πλήρες ἀδύνατον εἶναι δέξασθαι τι. εἰ δὲ δέξεται καὶ ἔσται δύο ἐν ταύτῳ, ἐνδέχοιτ' ἂν καὶ ὅποσαοῦν εἶναι ἅμα σώματα· τὴν γὰρ διαφοράν, δι' ἣν οὐκ ἂν εἴη τὸ λεχθέν, οὐκ ἔστιν εἰπεῖν. εἰ δὲ τοῦτο ἐνδέχεται, καὶ τὸ μικρότατον δέξεται τὸ μέγιστον· πολλὰ γὰρ 10 μικρὰ τὸ μέγα ἐστίν· ὥστε εἰ πολλὰ ἴσα ἐνδέχεται ἐν ταύτῳ εἶναι, καὶ πολλὰ ἄνισα. Μέλισσος μὲν οὖν καὶ δεικνύουσι ὅτι τὸ πᾶν ἀκίνητον ἐκ τούτων· εἰ γὰρ κινήσεται, ἀνάγκη εἶναι (φησί) κενόν, τὸ δὲ κενὸν οὐ τῶν ὄντων. ἓνα μὲν οὖν τρόπον ἐκ τούτων δεικνύουσι ὅτι ἔστιν τι κενόν, ἄλλον δ' ὅτι 15 φαίνεται ἓνα συνιόντα καὶ πιλούμενα, οἶον καὶ τὸν οἶνον

^a 23 οἱ ἄνθρωποι λέγειν E 24 ὃ PST Pacius: om. Π ἁμαρτάνουσι λέγοντες F 28 κενόν AP: λέγειν κενόν E μηδέν τί ἐστὶ F 29 ἅπαν ὄν I 30 διὸ τὸ E'FGI]V et ut vid. PST: διότι E²: διὸ J: οὐ δὴ τὸ Prantl 31 δεικνύναι δεῖ F: δεικνύναι J¹ 32-3 χωριστὸν . . . ὄν] ἀχώριστον αὐτῶν οὔτε χωριστὸν Porphyrius
^b I τι τῶν ἔξω E 4 ὅτι EGIPS: ὅτι ἢ FJ 5 δοκοῖν εἶναι κίνησις A 6 εἴη] ἢ F 7 τι om. Δ δέξαιτο Δ ἐστὶ GIJ 8 ἅμα εἶναι Δ γὰρ om. E¹ 10 μικρότατον δέξασθαι F 11 τὸ μέγα ἐστίν AST: ἐστὶ τὸ μέγα E 15 ἐκ τούτου ES: om. F τι] τὸ S 16 φαίνεται EFS: φαίνονται GIJ

- φασι δέχσθαι μετὰ τῶν ἀσκῶν τοὺς πίθους, ὡς εἰς τὰ ἐνόητα κενὰ συνιόντος τοῦ πυκνουμένου σώματος. ἔτι δὲ καὶ ἡ αὔξησις δοκεῖ πᾶσι γίνεσθαι διὰ κενοῦ· τὴν μὲν γὰρ τρο-
 20 φὴν σῶμα εἶναι, δύο δὲ σώματα ἀδύνατον ἅμα εἶναι. μαρτύριον δὲ καὶ τὸ περὶ τῆς τέφρας ποιοῦνται, ἢ δέχεται ἴσον ὕδωρ ὅσον τὸ ἀγγεῖον τὸ κενόν. εἶναι δ' ἔφασαν καὶ οἱ Πυθαγόρειοι κενόν, καὶ ἐπεισιέναι αὐτὸ τῷ οὐρανῷ ἐκ τοῦ ἀπείρου πνεύματος ὡς ἀναπνέοντι καὶ τὸ κενόν, ὃ διορίζει
 25 τὰς φύσεις, ὡς ὄντος τοῦ κενοῦ χωρισμοῦ τινὸς τῶν ἐφεξῆς καὶ [τῆς] διορίσεως· καὶ τοῦτ' εἶναι πρῶτον ἐν τοῖς ἀριθμοῖς· τὸ γὰρ κενὸν διορίζει τὴν φύσιν αὐτῶν. ἐξ ὧν μὲν οὖν οἱ μὲν φασιν εἶναι οἱ δ' οὐ φασι, σχεδὸν τοιαῦτα καὶ τοσαυτά ἐστιν.
- 30 Πρὸς δὲ τὸ ποτέρως ἔχει δεῖ λαβεῖν τί σημαίνει τοῦ-7 νομα. δοκεῖ δὴ τὸ κενὸν τόπος εἶναι ἐν ᾧ μηδέν ἐστι. τούτου δ' αἴτιον ὅτι τὸ ὄν σῶμα οἴονται εἶναι, πᾶν δὲ σῶμα ἐν τόπῳ, κενὸν δὲ ἐν ᾧ τόπῳ μηδέν ἐστι σῶμα, ὥστ' εἴ που μὴ ἔστι σῶμα, οὐδὲν εἶναι ἐνταῦθα. σῶμα δὲ πάλιν ἔπαν
 214^a οἴονται εἶναι ἀπτόν· τοιοῦτο δὲ ὃ ἂν ἔχη βάρος ἢ κουφότητα. συμβαίνει οὖν ἐκ συλλογισμοῦ τοῦτο εἶναι κενόν, ἐν ᾧ μηδέν ἐστι βαρὺ ἢ κοῦφον. ταῦτα μὲν οὖν, ὥσπερ εἵπομεν καὶ πρότερον, ἐκ συλλογισμοῦ συμβαίνει. ἄτοπον δὲ εἰ ἢ
 5 στιγμή κενόν· δεῖ γὰρ τόπον εἶναι ἐν ᾧ σώματος ἔστι διάστημα ἀπτοῦ. ἀλλ' οὖν φαίνεται λέγεσθαι τὸ κενὸν εἶνα μὲν τρόπον τὸ μὴ πλήρες αἰσθητοῦ σώματος κατὰ τὴν ἀφήν· αἰσθητὸν δ' ἐστὶ κατὰ τὴν ἀφήν τὸ βάρος ἔχον ἢ κουφότητα (διὸ κὰν ἀπορήσειε τις, τί ἂν φαίεν, εἰ ἔχοι τὸ διά-

^b 17 μετὰ τῶν ἀσκῶν δέχσθαι Δ 18 συνιόντος ΠΤ: συνιζάνοντος S
 19 δοκεῖ γίνεσθαι πᾶσιν FGJSP: πᾶσι δοκεῖ γίνεσθαι S¹
 20 εἶναι σῶμα Δ 21 ἢ] εἰ S 22 ἴσον om. F τὸ κενόν] κενὸν ὄν S: κενόν T 23 αὐτὸ EFIJT: αὐτῷ GP¹S Stobaeus 24 πνεύματος E²AP¹Stobaeus: πνεῦμα Tennemann: πνεῦμά τε Diels, fort. E ὡς] ὡς ἂν FGIP 26 τῆς PPS: secl. Bonitz 27 διορίζει F et fecit J ὧν μὲν] μὲν ὧν sed erasit F 28 φασι om. I σχεδὸν . . . 32 εἶναι sup. lituram. E² 28 τοιαῦτα καὶ (τε καὶ E²) τοσαῦτα E²FS: τοσαῦτα καὶ τοιαῦτα GIJ 29 ἐστιν om. E² 31 εἶναι om. F τοῦτο J 32 τὸ om. J οἶον τε E² 33 ἐστι om. G 34 οὐδὲν EGIJVS: κενόν F 214^a I οἶον τε EG εἶναι E 3 ἢ EVPST: τι ἢ Δ 5 ᾧ E¹FPS: ᾧ τόπῳ E²GIJ 7 μὴ πλήρες αἰσθητοῦ] πλήρες αἰσθητοῦ γρ. A γρ. S: πλήρες ἀναισθητοῦ γρ. A 8 αἰσθητὸν . . . ἀφήν om. E ἢ EP: καὶ Δ 9 ἀπορήσει E

στημα χρώμα ἢ ψόφον, πότερον κενόν ἢ οὐ; ἢ δῆλον ὅτι 10
 εἰ μὲν δέχοιτο σῶμα ἀπτόν, κενόν, εἰ δὲ μή, οὐ). ἄλ-
 λου δὲ τρόπον, ἐν ᾧ μὴ τόδε τι μηδ' οὐσία τις σωματική.
 διό φασίιν τινας εἶναι τὸ κενὸν τὴν τοῦ σώματος ὕλην (οἷπερ
 καὶ τὸν τόπον τὸ αὐτὸ τοῦτο), λέγοντες οὐ καλῶς· ἢ μὲν
 γὰρ ὕλη οὐ χωριστὴ τῶν πραγμάτων, τὸ δὲ κενὸν ζητοῦσιν 15
 ὡς χωριστόν. 16

ἐπεὶ δὲ περὶ τόπου διώρισται, καὶ τὸ κενὸν ἀν- 16
 ἀγκη τόπον εἶναι, εἰ ἔστω, ἐστερημένον σώματος, τόπος δὲ
 καὶ πῶς ἔστι καὶ πῶς οὐκ ἔστιν εἴρηται, φανερόν ὅτι οὕτω
 μὲν κενὸν οὐκ ἔστιν, οὔτε κεχωρισμένον οὔτε ἀχώριστον. τὸ γὰρ
 κενὸν οὐ σῶμα ἀλλὰ σώματος διάστημα βούλεται εἶναι 20
 διὸ καὶ τὸ κενὸν δοκεῖ τι εἶναι, ὅτι καὶ ὁ τόπος, καὶ διὰ
 ταυτά· ἦκει γὰρ δὴ ἡ κίνησις ἢ κατὰ τόπον καὶ τοῖς τὸν
 τόπον φάσκουσιν εἶναί τι παρὰ τὰ σώματα τὰ ἐπίπτοντα
 καὶ τοῖς τὸ κενόν. αἴτιον δὲ κινήσεως οἶονται εἶναι τὸ κενόν
 οὕτως ὡς ἐν ᾧ κινεῖται· τοῦτο δ' ἂν εἴη οἶον τὸν τόπον φασί 25
 τινας εἶναι. οὐδεμία δ' ἀνάγκη, εἰ κίνησις ἔστιν, εἶναι κενόν.
 ὅλως μὲν οὖν πάσης κινήσεως οὐδαμῶς, δι' ὃ καὶ Μέλισσον
 ἔλαθεν· ἀλλοιοῦσθαι γὰρ τὸ πλήρες ἐνδέχεται. ἀλλὰ δὴ
 οὐδὲ τὴν κατὰ τόπον κίνησιν· ἅμα γὰρ ἐνδέχεται ὑπεξίεναί
 ἀλλήλοις, οὐδενὸς ὄντος διαστήματος χωριστοῦ παρὰ τὰ σώ- 30
 ματα τὰ κινούμενα. καὶ τοῦτο δῆλον καὶ ἐν ταῖς τῶν συν-
 εχῶν δύναις, ὡσπερ καὶ ἐν ταῖς τῶν ὑγρῶν. ἐνδέχεται δὲ
 καὶ πυκνοῦσθαι μὴ εἰς τὸ κενὸν ἀλλὰ διὰ τὸ τὰ ἐνόητα ἐκ-
 πυρηνίζειν (οἶον ὕδατος συνθλιβομένον τὸν ἐνόητα ἀέρα), καὶ 214^b
 αὐξάνεσθαι οὐ μόνον εἰσιόντος τινὸς ἀλλὰ καὶ ἀλλοιώσει,

^a 11 κενόν EPS: κενόν εἶναι Λ 12 μὴ τόδε APST: μηδὲν
 τόδε E: μηδὲν P¹ τι] ἐστὶ IPT: τί ἐστὶν S 13 τῶν σωμάτων
 F 14 οὐ] ὡς E 15 σωμάτων F 16 ὡς χωριστόν AV
 et ut vid. PST: om. E 17 δὲ καὶ περὶ F 18 τῶν τῶν
 IPS τόπον ἀνάγκη εἶναι GIJP: τόπον εἶναι ἀνάγκη F 18 ἔστι
 καὶ πῶς om. E: πῶς om. F 19 κεχωρισμένον οὔτε ἀχώριστον
 AVPS: ἀχώριστον οὔτε κεχωρισμένον E: χωριστόν οὔτε κεχωρισμένον T
 20 βούλεται E'FP: βούλονται E²GIJVS 22 εἴκει E¹ δὴ ἢ
 fecit E 23 τὰ alt. om. E¹S 24 δὲ ΠΡΡ: δὲ τῆς P¹Γ τὸ
 κενὸν εἶναι F: τὸ κενὸν P 26 εἰ] εἶναι εἰ I ἔσται κίνησις
 F εἶναι καὶ κενόν G 27 κινήσεως οὐδαμῶς ἀπάσης G ἀπάσης
 E²FIJ 28 ἐνδέχεται τὸ πλήρες Λ 29 ὑπεξίεναί ἀλλήλοις
 ἐνδέχεται Λ 30 περὶ GJ² 31 τὰ om. E¹ 32 καὶ om. S
^b 1 θλιβομένου E¹ 2 αὐξάνεσθαι S

οιον εἰ ἐξ ὕδατος γίνονται ἀήρ. ὅλως δὲ ὁ τε περὶ τῆς ἀ-
 ξήσεως λόγος καὶ τοῦ εἰς τὴν τέφραν ἐγχεομένου ὕδατος
 5 αὐτὸς αὐτὸν ἐμποδίζει. ἡ γὰρ οὐκ αὐξάνεται ὀτιοῦν, ἡ οὐ
 σώματι, ἡ ἐνδέχεται δύο σώματα ἐν ταύτῳ εἶναι (ἀπο-
 ρίαν οὖν κοιῆν ἀξιοῦσι λύειν, ἀλλ' οὐ κενὸν δεικνύουσιν ὡς
 ἔστιν), ἡ πᾶν εἶναι ἀναγκαῖον τὸ σῶμα κενόν, εἰ πάντῃ αὐ-
 ξάνεται καὶ αὐξάνεται διὰ κενοῦ. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ
 10 τῆς τέφρας. ὅτι μὲν οὖν ἐξ ὧν δεικνύουσιν εἶναι τὸ κενὸν λυ-
 εῖν ῥάδιον, φανερόν.

“Ὅτι δ' οὐκ ἔστιν κενὸν οὕτω κεχωρισμένον, ὡς ἐνιοί φασι, 8
 λέγωμεν πάλιν. εἰ γὰρ ἔστιν ἐκάστου φορά τις τῶν ἀπλῶν
 σωμάτων φύσει, οἷον τῷ πυρὶ μὲν ἄνω τῇ δὲ γῆ κάτω
 15 καὶ πρὸς τὸ μέσον, δῆλον ὅτι οὐκ ἂν τὸ κενὸν αἴτιον εἴη τῆς
 φοράς. τίνας οὖν αἴτιον ἔσται τὸ κενόν; δοκεῖ γὰρ αἴτιον εἶναι
 κινήσεως τῆς κατὰ τόπον, ταύτης δ' οὐκ ἔστιν. ἔτι εἰ ἔστιν τι
 οἷον τόπος ἐστερημένος σώματος, ὅταν ἡ κενόν, ποῦ οἰσθήσε-
 ται τὸ εἰστέθεν εἰς αὐτὸ σῶμα; οὐ γὰρ δὴ εἰς ἅπαν. ὁ δ'
 20 αὐτὸς λόγος καὶ πρὸς τοὺς τὸν τόπον οἰομένους εἶναι τι κε-
 χωρισμένον, εἰς ὃν φέρεται πῶς γὰρ οἰσθήσεται τὸ ἐντε-
 θεν ἢ μενεῖ; καὶ περὶ τοῦ ἄνω καὶ κάτω καὶ περὶ τοῦ κενοῦ
 ὁ αὐτὸς ἀρμόσει λόγος εἰκότως· τὸ γὰρ κενὸν τόπον ποι-
 οῦσιν οἱ εἶναι φάσκοντες· καὶ πῶς δὴ ἐνέσται ἢ ἐν [τῷ] τόπῳ
 25 ἢ ἐν τῷ κενῷ; οὐ γὰρ συμβαίνει, ὅταν ὅλον τεθῆ ὡς ἐν
 κεχωρισμένῳ τόπῳ καὶ ὑπομένοντι σῶμά τι· τὸ γὰρ μέρος,
 ἂν μὴ χωρὶς τιθῆται, οὐκ ἔσται ἐν τόπῳ ἀλλ' ἐν τῷ ὅλῳ.
 28 ἔτι εἰ μὴ τόπος, οὐδὲ κενὸν ἔσται.

28

συμβαίνει δὲ τοῖς λέγου-

^b 3 γίνονται EGIJP: γένοιο FS 6 ἢ om. F 7 ἀξιοῦσι
 κοινήν AS ὡς] ὡς εἰ fecit E 8 τὸ σῶμα ἀναγκαῖον APS εἰ]
 ἡ fecit E¹ 10 ὅτι] οὕτω G τὸ κενὸν εἶναι AS 13 λέγομεν
 GIJ 15 εἴη αἴτιον A τῆς om. E 16 τὸ] κινήσεως τὸ
 IV 17 ἔστιν αἴτιον. ἔτι F 18 ἐστερημένος EFJPS: ἐστερη-
 μένον GI 19 ἐντεθέν FIP 20 τὸν τόπον] τόπους G οἰομένους
 εἶναι τι EPS: εἶναι τι οἰομένους A 21 δ IP φέρεται τὸ
 φερόμενον. πῶς F γὰρ ΔVPS: om. E τεθέν FGIAS 23 ὁ
 αὐτὸς ἀρμόσει λόγος EP: ὁ αὐτὸς λόγος ἀρμόσει F: ἀρμόσει ὁ αὐτὸς
 λόγος GIJ 24 δὴ E²FGIPS: δεῖ J: om. E¹ ἢ om. S τῷ
 seclusi, om. PS 25-7 οὐ . . . ὅλῳ PPT: om. γρ. S 25 ὅταν
 ὅλον τεθῆ om. F ὡς FGIS: om. EP: erasit J 26 τῷ
 ὅταν ὅλον τεθῆ καὶ F¹ σῶμά τι PPS² Pacius: σῶματι ΠP¹S^o
 27 ἐν pr. EJPS: ἐν τῷ FGI 28 μηδὲ E²A οὐδὲν GI
 συμβαίνει . . . 215^a I διαφορὰν om. γρ. A

σιν εἶναι κενὸν ὡς ἀναγκαῖον, εἴπερ ἔσται κίνησις, τοῦναντίον
 μᾶλλον, ἂν τις ἐπισκοπῆ, μὴ ἐνδέχασθαι μηδὲ ἐν κινεῖ- 30
 σθαι, εἴαν ἦ κενόν· ὥσπερ γὰρ οἱ διὰ τὸ ὅμοιον φάμενοι
 τὴν γῆν ἡρεμεῖν, οὕτω καὶ ἐν τῷ κενῷ ἀνάγκη ἡρεμεῖν· οὐ
 γὰρ ἔστιν οὐ μᾶλλον ἢ ἡττον κινήθησεται· ἦ γὰρ κενόν, οὐκ
 ἔχει διαφορὰν. ἐπειθ' ὅτι πᾶσα κίνησις ἢ βία ἢ 215^a
 κατὰ φύσιν. ἀνάγκη δὲ ἂν περ ἦ (ἦ) βίαιος, εἶναι καὶ τὴν
 κατὰ φύσιν (ἦ μὲν γὰρ βίαιος παρὰ φύσιν, ἦ δὲ
 παρὰ φύσιν ὑστέρᾳ τῆς κατὰ φύσιν)· ὥστ' εἰ μὴ κατὰ φύ-
 σιν ἔστιν ἐκάστῳ τῶν φυσικῶν σωμάτων κίνησις, οὐδὲ τῶν 5
 ἄλλων ἔσται κινήσεων οὐδεμία. ἀλλὰ μὴν φύσει γε πῶς
 ἔσται μηδεμιᾶς οὔσης διαφορᾶς κατὰ τὸ κενὸν καὶ τὸ ἄπει-
 ρον; ἦ μὲν γὰρ ἄπειρον, οὐδὲν ἔσται ἄνω οὐδὲ κάτω οὐδὲ
 μέσον, ἦ δὲ κενόν, οὐδὲν διάφορον τὸ ἄνω τοῦ κάτω (ὥσπερ
 γὰρ τοῦ μηδενοῦς οὐδεμία ἔστι διαφορὰ, οὕτω καὶ τοῦ κενοῦ· 10
 τὸ γὰρ κενὸν μὴ ὄν τι καὶ στέρησις δοκεῖ εἶναι). ἦ δὲ
 φύσει φορὰ διάφορος, ὥστε ἔσται φύσει διάφορα. ἦ οὖν
 οὐκ ἔστι φύσει οὐδαμοῦ οὐδενὶ φορὰ, ἦ εἰ τοῦτ' ἔστιν, οὐκ ἔστι
 κενόν. ἔτι νῦν μὲν κινεῖται τὰ ῥιπτούμενα τοῦ ὄσαντος οὐχ
 ἄπτομένοιο, ἦ δι' ἀντιπερίστασις, ὥσπερ ἐνιοὶ φασιν, ἦ διὰ 15
 τὸ ὠθεῖν τὸν ὠσθέντα ἀέρα θάπτω κίνησιν τῆς τοῦ ὠσθέντος
 φορᾶς ἢν φέρεται εἰς τὸν οἰκεῖον τόπον· ἐν δὲ τῷ κενῷ
 οὐδὲν τούτων ὑπάρχει, οὐδ' ἔσται φέρεσθαι ἀλλ' ἦ
 ὡς τὸ ὄχουμένον. ἔτι οὐδεὶς ἂν ἔχοι εἰπεῖν διὰ τί κινήθην στή-
 σεταί που· τί γὰρ μᾶλλον ἐνταῦθα ἢ ἐνταῦθα; ὥστε ἦ ἡρε- 20
 μήσει ἢ εἰς ἄπειρον ἀνάγκη φέρεσθαι, εἴαν μὴ τι ἐμπο-
 δίσῃ κρείττον. ἔτι νῦν μὲν εἰς τὸ κενὸν διὰ τὸ ὑπέκειν φέ-

^b 30 κινεῖσθαι μηδὲν ΔΤ 33 οὐκ om. G¹ ἦ FT et sup. lin.
 J: καὶ EGIJS οὐκ om. G¹ 215^a 1 ἐπειθ' EIVST: πρῶτον
 μὲν οὖν FG et erasum in J ὅτι AS: ὅτε ἦ E ἦ pr. AVS:
 πρῶτον μὲν ὅτι πᾶσα κίνησις ἦ E βία κινήθησεται ἦ F¹ 2 ἦ
 addidi: om. ΠPT τὴν om. F 3 ἦ... φύσιν om. G φύσιν
 ἐστίν, ἦ E ἦ δὲ παρὰ φύσιν om. J¹ 5 ἐκάστῳ post σωμάτων F
 6 κινήσεων ἔσται E 7 τὸ alt. om. E¹T 8 ἦ APT: εἰ fecit
 E ἄνω οὐδὲ κάτω EV: κάτω οὐδὲ ἄνω Λ 9 ἦ APT: εἰ fecit
 E διαφέρων E¹: διαφέρει F τὰ E κάτω τοῦ ἄνω Λ 10 ἔστι
 GJST: ἔσται FHI: om. E κενοῦ HPST: μὴ ὄντος EFGIJ
 11 γὰρ HST: δι' EFGIJP καὶ APST: καὶ ἦ E 12 φύσει
 alt. E¹V: τὰ φύσει E²ΔP 13 ἔσται I 9 ἦ APT: εἰ fecit F
 14 τὰ ῥιπτούμενα om. EP¹S¹ οὐχ AST: μὴ E 17 εἰς] ἐπί PT
 18 ὑπάρχει EVST: ἐνδέχεται ὑπάρχειν Λ ἔστι FH 22 ἔτι
 EHPS: ἔτι δι' EFGIJ

λόγον ᾧ ὑπερέχει· ἀνάγκη γὰρ τὸ ὑπερέχον διαιρέσθαι εἰς
 τε τὴν ὑπεροχὴν καὶ τὸ ὑπερεχόμενον, ὥστε ἔσται τὰ τέτ-
 ταρα ὅσῳ τε ὑπερέχει καὶ οὐδέν. διὸ οὐδὲ γραμμὴ στιγμαῖς
 ὑπερέχει, εἰ μὴ σύγκειται ἐκ στιγμῶν. ὁμοίως δὲ καὶ τὸ
 κενὸν πρὸς τὸ πλήρες οὐδένα οἶόν τε ἔχειν λόγον, ὥστε οὐδὲ 20
 τὴν κίνησιν, ἀλλ' εἰ διὰ τοῦ λεπτοτάτου ἐν τοσφῶδι τὴν τοσηνδε
 φέρεται, διὰ τοῦ κενοῦ παντὸς ὑπερβάλλει λόγου. 22

ἔστω γὰρ 22

τὸ Ζ κενόν, ἴσον δὲ [τῷ μεγέθει] τοῖς Β καὶ Δ. τὸ δὴ Α εἰ
 δίδεισι καὶ κινήσεται ἐν τινὶ μὲν χρόνῳ, τῷ ἐφ' οὗ Η, ἐν
 ἐλάττωι δὲ τοῦ ἐφ' οὗ Ε, τοῦτον ἔξει τὸν λόγον τὸ 25
 κενὸν πρὸς τὸ πλήρες. ἀλλ' ἐν τοσοῦτῳ χρόνῳ ὅσος ἐφ'
 οὗ τὸ Η, τοῦ Δ τὸ Α δίδεισι τὴν τὸ Θ. δίδεισι δέ γε κὰν
 ἢ τι λεπτότητι διαφέρουν τοῦ ἀέρος ἐφ' ᾧ τὸ Ζ ταύτην
 τὴν ἀναλογίαν ἣν ἔχει ὁ χρόνος ἐφ' ᾧ Ε πρὸς τὸν ἐφ' ᾧ
 Η. ἂν γὰρ ἢ τοσοῦτῳ λεπτότερον τὸ ἐφ' ᾧ Ζ σῶμα τοῦ 30
 Δ, ὅσῳ ὑπερέχει τὸ Ε τοῦ Η, ἀντεστραμμένως δίδεισι τῷ
 τάχει ἐν τῷ τοσοῦτῳ ὅσον τὸ Η, τὴν τὸ Ζ τὸ ἐφ' οὗ Α, ἐὰν 216^a
 φέρηται. ἐὰν τοίνυν μηδὲν ἢ σῶμα ἐν τῷ Ζ, ἔτι θάπτον. ἀλλ'
 ἦν ἐν τῷ Η. ὥστ' ἐν ἴσῳ χρόνῳ δίδεισι πλήρες τε ὄν καὶ κενόν.
 ἀλλ' ἀδύνατον. φανερόν τοίνυν ὅτι, εἰ ἔστι χρόνος ἐν ᾧ τοῦ
 κενοῦ ὅτιοῦν οἰσθήσεται, συμβήσεται τοῦτο τὸ ἀδύνατον· ἐν ἴσῳ 5
 γὰρ ληφθήσεται πλήρες τε ὄν διεξιέναι τι καὶ κενόν· ἔσται γάρ
 τι ἀνάλογον σῶμα ἕτερον πρὸς ἕτερον ὡς χρόνος πρὸς χρόνον.
 ὡς δ' ἐν κεφαλαίῳ εἰπέω, δήλον τὸ τοῦ συμβαίνουτος αἰτίου,
 ὅτι κινήσεως μὲν πρὸς κίνησιν πάσης ἔστι λόγος (ἐν χρόνῳ

^b 16 διαιρέσθαι τὸ ὑπερέχον Δ 17 καὶ εἰς τὸ FGIJ περιε-
 χόμενον G 19 ἐπεὶ I δὲ PS: δὴ ci. Cornford 22 ἔστω
 E²APS: τὸ E¹ 23 δὲ] δὲ καὶ G τῷ μεγέθει E²AP: om. E¹V
 24 ἐν... χρόνῳ EGHJP: μὲν ἐν τινὶ χρόνῳ F: ἐν τινὶ χρόνῳ μὲν I ἐν
 om. E¹J¹ 25 τοῦ E¹S: ἢ τῷ E²: ἢ τοῦ Α ἀφ' I ὧ G E]
 εἰ καὶ IJS 26 κενόν... πλήρες ΔV: πλήρες πρὸς τὸ κενόν ES ἀφ' I
 27 του] τῆς E²GJP γε EFGIJS^p: om. HS¹ 28 ἢ] εἰ G
 ταύτην τὴν] τὴν αὐτὴν H 29 ε EP: τὸ ε Α τὴν GI ᾧ τὸ
 η Δ 30 τοῦ AP: τοῦ ἐφ' οὗ E 216^a I τῷ om. FP, erasit
 J ὅσος E τὸ Z] ζ FGHIP 3 ἦν APS: ἢ E 4 τοίνυν]
 οὗν H ἔστι E¹JS: ἔσται E²FGHIV χρόνος E¹S: τις χρόνος
 E²ΔVP 5 οἰσθήσεται APS: οἰσθῆναι E τὸ sup. lin. J: δὲ
 E: om. IS 6 συμβήσεται vel λεχθήσεται ci. Bonitz ὄν om.
 EPS γὰρ AP: om. E 7 πρὸς ἕτερον FGHIP: om. EJ ὡς
 EIJP: ὡς ὁ FGH: ὥσπερ S 8 τοῦ om. E¹ αἰτίου ἔστιν ὅτι FP

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Δ

10 γάρ ἐστι, χρόνου δὲ παντὸς ἔστι πρὸς χρόνον, πεπερασμένων
11 ἀμφοῖν), κενοῦ δὲ πρὸς πλήρες οὐκ ἔστιν.

11 ἢ μὲν οὖν διαφέρουσι
δι' ὧν φέρονται, ταῦτα συμβαίνει, κατὰ δὲ τὴν τῶν φερο-
μένων ὑπεροχὴν τάδε· ὀρώμεν γὰρ τὰ μείζω ῥοπήν ἔχοντα
ἢ βάρους ἢ κουφότητος, εἰς τὰλλα ὁμοίως ἔχη [τοῖς σχή-
15 μασι], θάπτον φερόμενα τὸ ἴσον χωρίον, καὶ κατὰ λόγον ὄν
ἔχουσι τὰ μεγέθη πρὸς ἄλληλα. ὥστε καὶ διὰ τοῦ κενοῦ.
ἀλλ' ἀδύνατον· διὰ τίνα γὰρ αἰτίαν οἰσθήσεται θάπτον; ἐν
μὲν γὰρ τοῖς πλήρεσιν ἐξ ἀνάγκης· θάπτον γὰρ διαιρεῖ τῇ
ἰσχυί τὸ μείζον· ἢ γὰρ σχήματι διαιρεῖ, ἢ ῥοπή ἢν ἔχει
20 τὸ φερόμενον ἢ τὸ ἀφεθέν. ἰσοταχῆ ἄρα πάντ' ἔσται. ἀλλ'
21 ἀδύνατον.

21 ὅτι μὲν οὖν εἰ ἔστι κενόν, συμβαίνει τὸναντίον ἢ δι'
ὃ κατασκευάζουσιν οἱ φάσκοντες εἶναι κενόν, φανερόν ἐκ τῶν
εἰρημένων. οἱ μὲν οὖν οἴονται τὸ κενὸν εἶναι, εἴπερ ἔσται ἢ
κατὰ τόπον κίνησις, ἀποκεκριμένον καθ' αὐτό· τοῦτο δὲ ταῦ-
25 τόν ἔστι τῷ τὸν τόπον φάναι εἶναι τι κεχωρισμένον· τοῦτο δ'
26 ὅτι ἀδύνατον, εἴρηται πρότερον.

26 καὶ καθ' αὐτὸ δὲ σκοποῦσιν
φανερῆ ἂν τὸ λεγόμενον κενὸν ὡς ἀληθῶς κενόν. ὥσπερ γὰρ
εἰς ἐν ὕδατι τιθῆ τις κύβον, ἐκστήσεται τοσοῦτον ὕδωρ ὅσος ὁ
κύβος, οὕτω καὶ ἐν ἀέρι· ἀλλὰ τῇ αἰσθήσει ἀδηλον. καὶ
30 αἰεὶ δὴ ἐν παντὶ σώματι ἔχοντι μετάστασιν, ἐφ' ὃ πέφυκε
μεθίστασθαι, ἀνάγκη, ἂν μὴ συμπιλήται, μεθίστασθαι ἢ
κάτω αἰεὶ, εἰ κάτω ἢ φορὰ ὥσπερ γῆς, ἢ ἄνω, εἰ πῦρ,
ἢ ἐπ' ἄμφω, [ἢ] ὁποῖον ἂν τι ἢ τὸ ἐντιθέμενον· ἐν δὲ δὴ τῷ
κενῷ τοῦτο μὲν ἀδύνατον (οὐδὲν γὰρ σῶμα), διὰ δὲ τοῦ κύβου
35 τὸ ἴσον διάστημα διεληλυθέναι, ὅπερ ἦν καὶ πρότερον

^a 11 κενόν E² 12 οὗ EFGHI φέρεται F 13 τάδε I
ταῦτα I 14 τὰλλα P¹S: om. P², secl. Laas τοῖς σχήμασι
seclusi, om. S: habent PP 18 θάπτον ἐξ ἀνάγκης E τῇ] τι E
19 σχῆμα E² 20 ἔσται πάντα H ἀλλ' ἅμα δὲ A 21 ἔσται I
22 ἄ I 23 ἔστιν H 24 ἀποκρινόμενον Bekker (errore preli)
26 ἀδύνατον EFHIS: ἀδύνατον εἶναι GJ καὶ APST: om. E
σκοποῦντι S 27 κενόν om. F γὰρ ἐν ὕδατι ἂν θῆ Λ 28 ὅσον F
30 ὅ FP 31 μεθίστασθαι pr. EFHIJ: συνίστασθαι P et sup. lin. J¹
32 ἢ] εἰ I 33 ἢ om. S γρ. P Prantl: habet PP ὅποι γρ. P:
ὅσον ST εἴη FH 34 οὐδὲ FV κύβου] κενοῦ F 35 διελη-
λυθέναι] διεληλυθέναι δόξειεν E²Λ: διεληλυθέναι δόξειεν ἂν Corn-
ford

ἐν τῷ κενῷ, ὡσπερ ἂν εἰ τὸ ὕδωρ μὴ μεθίστατο τῷ ξυλίῳ 216^b
 κύβῳ μὴδ' ὁ ἀήρ, ἀλλὰ πάντῃ διήεσαν δι' αὐτοῦ. ἀλλὰ
 μὴν καὶ ὁ κύβος γε ἔχει τοσοῦτον μέγεθος, ὅσον κατέχει
 κενόν· ὁ εἰ καὶ θερμὸν ἢ ψυχρὸν ἔστιν ἢ βαρὺ ἢ κοῦφον,
 οὐδὲν ἦττον ἕτερον τῷ εἶναι πάντων τῶν παθημάτων ἔστί, καὶ 5
 εἰ μὴ χωριστόν· λέγω δὲ τὸν ὄγκον τοῦ ξυλίνου κύβου. ὥστ' εἰ
 καὶ χωρισθεῖη τῶν ἄλλων πάντων καὶ μῆτε βαρὺ μῆτε κοῦ-
 φον εἶη, καθέξει τὸ ἴσον κενὸν καὶ ἐν τῷ αὐτῷ ἔσται τῷ τοῦ
 τόπου καὶ τῷ τοῦ κενοῦ μέρει ἴσῳ ἑαυτῷ. τί οὖν διοίσει τὸ τοῦ
 κύβου σῶμα τοῦ ἴσου κενοῦ καὶ τόπου; καὶ εἰ δύο τοιαῦτα, διὰ 10
 τί οὐ καὶ ὀποσαοῦν ἐν τῷ αὐτῷ ἔσται; ἐν μὲν δὴ τοῦτο ἄτοπον
 καὶ ἀδύνατον. ἔτι δὲ φανερόν ὅτι τοῦτο ὁ κύβος ἔξει καὶ
 μεθιστάμενος, ὃ καὶ τὰ ἄλλα σώματα πάντ' ἔχει. ὥστ' εἰ
 τοῦ τόπου μὴδὲν διαφέρει, τί δεῖ ποιεῖν τόπον τοῖς σώμασιν
 παρὰ τὸν ἐκάστου ὄγκον, εἰ ἀπαθὲς ὁ ὄγκος; οὐδὲν γὰρ συμ- 15
 βάλλεται, εἰ ἕτερον περὶ αὐτὸν ἴσον διάστημα τοιοῦτον εἶη.
 [ἔτι δεῖ δηλὸν εἶναι οἶον κενὸν ἐν τοῖς κινουμένοις. νῦν δ' οὐδα-
 μου ἐντὸς τοῦ κόσμου· ὁ γὰρ ἀήρ ἔστιν τι, οὐ δοκεῖ δέ γε—οὐδὲ
 τὸ ὕδωρ, εἰ ἦσαν οἱ ἰχθύες σιδηροῖ· τῇ ἀφῆ γὰρ ἢ κρίσις
 τοῦ ἄπτοῦ.] ὅτι μὲν τοῖνυν οὐκ ἔστι κεχωρισμένον κενόν, ἐκ τού- 20
 των ἔστί δηλόν.

- 9 Εἰσὶν δὲ τινες οἱ διὰ τοῦ μανοῦ καὶ πυκνοῦ οἴονται φα-
 νερόν εἶναι ὅτι ἔστι κενόν. εἰ μὲν γὰρ μὴ ἔστι μανὸν καὶ
 πυκνόν, οὐδὲ συνιέναι καὶ πιλεῖσθαι οἶόν τε· εἰ δὲ τοῦτο μὴ
 εἶη, ἢ ὅλως κίνησις οὐκ ἔσται, ἢ κυμανεῖ τὸ ὕλον, ὡσπερ 25
 ἔφη Ξοῦθος, ἢ εἰς ἴσον ἀεὶ (δεῖ) μεταβάλλειν ἀέρα καὶ ὕδωρ
 (λέγω δὲ οἶον εἰ ἐξ ὕδατος κνάθου γέγονεν ἀήρ, ἅμα ἐξ ἴσου

^b 1 ἂν] γὰρ E 2 πάντῃ EHIJT: πάντα FG et sup. lin. J δι'
 om. E¹ 3 γε om. E²Λ 4 τὸ κενόν Λ καὶ EFIJ²P: om.
 GHJ¹ ἔστιν ἢ ψυχρὸν Δ: καὶ ψυχρὸν ἔστιν P 5 ἕτερον] 6 ἕτερον ἀλλὰ καὶ μάλλον I τὸ F: τοῦ P 7 πάντων τῶν ἄλλων Λ
 9 τῷ τοῦ om. E: τῷ I μέρει τῷ ἴσῳ H 11 κἂν E¹ ἐν om. F
 14 τοῦτο που Bekker (err. prel.) 15 ἀπαθὲς H 16 περὶ
 HS et ut vid. P: an παρὰ ? 17-20 ἔτι . . . ἀπτοῦ om. PST,
 secl. Bekker: habent ΠV Averroes 17 ἔτι] ἄλλως ἔτι GH:
 ὅτι J δεῖ] δὲ aut δὴ J¹ 19 σιδηροῖ] ὑγροῖ Bonitz γὰρ
 ἀφῆ I 21 ἔσται I 23 εἶναι ASP: om. E ἔστι κενόν
 EGIJPS: κενόν ἔστι F: ἐστί τι κενόν H 24 οὐδὲν E οἶόν
 τε καὶ πιλεῖσθαι F πιλοῦσθαι EI μὴ om. JP 25 εἶη, ἢ] ἢ E:
 ἢ ἢ F: εἶη I: ἢ JP 26 εἰς E²ΔVP: om. E¹ δεῖ
 Bonitz: om. ΠP 27 εἰ ΔP: om. E

αέρος ὕδωρ τοσοῦτον γεγενῆσθαι), ἢ κενὸν εἶναι ἐξ ἀνάγκης·
 συμπιεῖσθαι γὰρ καὶ ἐπεκτείνεσθαι οὐκ ἐνδέχεται ἄλ-
 30 λως. εἰ μὲν οὖν τὸ μανὸν λέγουσι τὸ πολλὰ κενὰ κεχωρι-
 σμένα ἔχον, φανερὸν ὡς εἰ μὴδὲ κενὸν ἐνδέχεται εἶναι χω-
 ριστὸν ὥσπερ μὴδὲ τόπον ἔχοντα διάστημα αὐτοῦ, οὐδὲ μανὸν
 οὕτως· εἰ δὲ μὴ χωριστόν, ἀλλ' ὅμως ἐνεῖναι τι κενόν, ἦττον
 μὲν ἀδύνατον, συμβαίνει δὲ πρῶτον μὲν οὐ πάσης κινήσεως
 35 αἴτιον τὸ κενόν, ἀλλὰ τῆς ἄνω (τὸ γὰρ μανὸν κούφον, διὸ
 217^a καὶ τὸ πῦρ μανὸν εἶναι φασιν), ἔπειτα κινήσεως αἴτιον οὐχ
 οὕτω τὸ κενόν ὡς ἐν φ, ἀλλ' ὥσπερ οἱ ἄσκοι τῷ φέρεσθαι αὐ-
 τοῖ ἄνω φέρουσι τὸ συνεχές, οὕτω τὸ κενὸν ἄνω φέρει. καίτοι
 πῶς οἶδον τε φορὰν εἶναι κενοῦ ἢ τόπου κενοῦ; κενοῦ γὰρ γίγνε-
 5 ται κενόν, εἰς ὃ φέρεται. ἔτι δὲ πῶς ἐπὶ τοῦ βαρέος ἀποδώ-
 σουσιν τὸ φέρεσθαι κάτω; καὶ δῆλον ὅτι εἰ ὅσῳ ἂν μανότε-
 ρον καὶ κενώτερον ἢ ἄνω οἰσθήσεται, εἰ ὅλως εἴη κενόν, τά-
 χιστ' ἂν φέροιτο. ἴσως δὲ καὶ τοῦτ' ἀδύνατον κινήθηναί· λό-
 γος δ' ὁ αὐτός, ὥσπερ ὅτι ἐν τῷ κενῷ ἀκίνητα πάντα, οὕτω
 10 καὶ τὸ κενόν ὅτι ἀκίνητον· ἀσύμβλητα γὰρ τὰ τάχη.

10 ἐπεὶ
 δὲ κενὸν μὲν οὐ φαμεν εἶναι, τὰ ἄλλα δ' ἠπόρηται ἀληθῶς,
 ὅτι ἢ κίνησις οὐκ ἔσται, εἰ μὴ ἔσται πύκνωσις καὶ μάνωσις,
 ἢ κυμανεῖ ὁ οὐρανός, ἢ αἰεὶ ἴσον ὕδωρ ἐξ αέρος ἔσται καὶ
 ἀἷρ ἐξ ὕδατος (δηλὸν γὰρ ὅτι πλείων ἀἷρ ἐξ ὕδατος γίγνε-
 15 ται· ἀνάγκη τοίνυν, εἰ μὴ ἔστι πύκνωσις, ἢ ἐξωθούμενον τὸ
 ἐχόμενον τὸ ἔσχατον κυμαίνειν ποιεῖν, ἢ ἄλλοθί που ἴσον
 μεταβάλλειν ἐξ αέρος ὕδωρ, ἵνα ὁ πᾶς ὄγκος τοῦ ὅλου ἴσος
 ἦ, ἢ μὴδὲν κινεῖσθαι· αἰεὶ γὰρ μεθισταμένου τοῦτο συμβήσε-
 ται, ἂν μὴ κύκλω περιίστηται· οὐκ αἰεὶ δ' εἰς τὸ κύκλω ἢ

^b 28 τοσοῦτον ὕδωρ F γεγενῆσθαι AP: γίγνεσθαι E 29 συμ-
 πιλοῦσθαι EI ἐπεκτείνεσθαι E¹S: συνεπεκτείνεσθαι E²Δ
 ἐνδέχεται EFIS: ἐνδέχεσθαι GIJ ἄλλως ante οὐκ F 31 μὴ
 GH εἶναι om. J 32 οὐδὲ F διάστημα APST: δια-
 στήματα E 35 αἴτιον] εἶναι F 217^a I εἶναι om. F
 2 αὐτὰ E 3 ἄνω φέρεϊ] ἀνωφερές I: ἀνώφορον P 4 τόπου E
 6 εἰ ὅτι I: ὅτι EGJ 7 καὶ κενώτερον om. G 9 ὅτι ὥσπερ
 ὅτι F ἐν] καὶ ἐν IP 10 ὅτι om. E¹ II οὐ φαμεν om. G¹
 12 ὅτι EHS: om. FGIJ 13 ὕδωρ ἐξ αέρος ἴσον H 15 ἔστι
 E²AS: ἔσται E¹ 16 ποιεῖ E που τὸ ἴσον I 17 ὕδωρ
 EFVP: εἰς ὕδωρ GHIJST 19 ἂν . . . περιίστηται om. I περι-
 ἰσταται H

φορά, ἀλλὰ καὶ εἰς εὐθύ· οἱ μὲν δὴ διὰ ταῦτα κενόν τι 20
 φαῖεν ἂν εἶναι, ἡμεῖς δὲ λέγομεν ἐκ τῶν ὑποκειμένων ὅτι
 ἔστιν ὕλη μία τῶν ἐναντίων, θερμοῦ καὶ ψυχροῦ καὶ τῶν ἄλ-
 λων τῶν φυσικῶν ἐναντιώσεων, καὶ ἐκ δυνάμει ὄντος ἐνεργεί-
 ας ὃν γίγνεται, καὶ οὐ χωριστὴ μὲν ἡ ὕλη, τὸ δ' εἶναι ἔτε-
 ρον, καὶ μία τῷ ἀριθμῷ, εἰ ἔτυχε, χροιάς καὶ θερμοῦ 25
 καὶ ψυχροῦ. 26

ἔστι δὲ καὶ σῶματος ὕλη καὶ μεγάλου καὶ 26
 μικροῦ ἢ αὐτῆ. δῆλον δέ· ὅταν γὰρ ἐξ ὕδατος ἀῆρ γένηται,
 ἢ αὐτῆ ὕλη οὐ προσλαβοῦσά τι ἄλλο ἐγένετο, ἀλλ' ὃ ἦν
 δυνάμει, ἐνεργεία ἐγένετο, καὶ πάλιν ὕδωρ ἐξ ἀέρος ὡσαύ-
 τως, ὅτε μὲν εἰς μέγεθος ἐκ μικρότητος, ὅτε δ' εἰς μικρό- 30
 τητα ἐκ μεγέθους. ὁμοίως τοίνυν κὰν ὁ ἀῆρ πολλὸς ὢν ἐν ἐλάττονι
 γίγνεται ὄγκῳ καὶ ἐξ ἐλάττονος μείζων, ἢ δυνάμει οὔσα ὕλη
 γίγνεται ἄμφω. ὥσπερ γὰρ καὶ ἐκ ψυχροῦ θερμὸν καὶ ἐκ
 θερμοῦ ψυχρὸν ἢ αὐτῆ, ὅτι ἦν δυνάμει, οὕτω καὶ ἐκ θερμοῦ
 μᾶλλον θερμὸν, οὐδενὸς γενομένου ἐν τῇ ὕλη θερμοῦ ὃ οὐκ ἦν 217^b
 θερμὸν ὅτε ἦττον ἦν θερμὸν, ὥσπερ γε οὐδ' ἢ τοῦ μείζονος
 κύκλον περιφέρεια καὶ κυρτότης ἐὰν γίγνεται ἐλάττονος κύ-
 κλου, (ἢ) ἢ αὐτῆ οὔσα ἢ ἄλλη, ἐν οὐθενὶ ἐγγέγονε τὸ κυρτὸν ὃ ἦν οὐ
 κυρτὸν ἀλλ' εὐθύ (οὐ γὰρ τῷ διαλείπειν τὸ ἦττον ἢ τὸ μᾶλλον 5
 ἔστιν)· οὐδ' ἔστι τῆς φλογὸς λαβεῖν τι μέγεθος ἐν ᾧ οὐ καὶ θερ-
 μότης καὶ λευκότης ἔνεστιν. οὕτω τοίνυν καὶ ἡ πρότερον θερμότης
 (πρὸς) τὴν ὕστερον. ὥστε καὶ τὸ μέγεθος καὶ ἡ μικρότης τοῦ αἰσθη-
 τοῦ ὄγκου οὐ προσλαβοῦσης τι τῆς ὕλης ἐπεκτείνεται, ἀλλ' ὅτι δυ-
 νάμει ἔστιν ὕλη ἀμφοῖν· ὥστ' ἔστι τὸ αὐτὸ πυκνὸν καὶ μα- 10
 νόν, καὶ μία ὕλη αὐτῶν. ἔστι δὲ τὸ μὲν πυκνὸν βαρὺ, τὸ

^a 20 μὲν διὰ τοιαῦτα F καινόν I 21 δὲ om. F λέγομεν
 FGHJPS: λέγομεν EIV 23 ἐνεργεία E²AT: om. E¹ 24 τὸ
 EFGJT: τῷ H1 26 δὲ FHIPT: δ' εἰ E: δὴ GJ 27 ἀῆρ
 ἐξ ὕδατος I γένηται APS: γίνηται E 28 ἄλλο τι Δ 30 συμ-
 κρότητος ὅτι G 31 τοίνυν] δὲ H δ EFST: om. GIJP
 32 γίγνεται E¹: γένηται F οὔσα γίνεται ὕλη Λ: ὕλη οὔσα γίνεται S
 33 γὰρ E²AT: γε E¹V ἐκ θερμοῦ ψυχρὸν καὶ ἐκ ψυχροῦ θερμὸν H
^b 1 μηδενὸς γενομένου F 2 γε EFIJPS: γὰρ GH οὐδ'] καὶ P
 3 γένηται GHI 4 ἢ ἢ scripsi: habent ut vid. PPS: ἢ EFGHJP¹:
 ἢ I γέγνευ FGH 6 οὐ γὰρ ἔστι F μέγεθος τι F οὐ
 om. G¹ λευκότης καὶ θερμότης ἐστίν G 8 πρὸς τὴν scripsi,
 leg. fort. S: τῇ E¹GHIJ: τῆς E²F καὶ pr. om. H 10 ἐστίν
 ἢ ὕλη Δ

δὲ μανὸν κοῦφον. [ἔτι ὡσπερ ἡ τοῦ κύκλου περιφέρεια συναγομένη εἰς ἑλαττον οὐκ ἄλλο τι λαμβάνει τὸ κοῖλον, ἀλλ' ὁ ἦν συνήχθη, καὶ τοῦ πυρὸς ὃ τι ἂν τις λάβῃ πᾶν ἔσται
 15 θερμόν, οὕτω καὶ τὸ πᾶν συναγωγὴ καὶ διαστολὴ τῆς αὐ-
 τῆς ὕλης.] δύο γὰρ ἔστιν ἐφ' ἑκατέρου, τοῦ τε πυκνοῦ καὶ
 τοῦ μανοῦ· τό τε γὰρ βαρὺ καὶ τὸ σκληρὸν πυκνὰ δοκεῖ
 εἶναι, καὶ τᾶναντία μανὰ τό τε κοῦφον καὶ τὸ μαλακόν·
 διαφωνεῖ δὲ τὸ βαρὺ καὶ τὸ σκληρὸν ἐπὶ μολίβδου καὶ σι-
 20 δήρου.

20 ἔκ δὴ τῶν εἰρημένων φανερόν ὡς οὐτ' ἀποκεκριμένον
 κενὸν ἔστιν, οὐθ' ἀπλῶς οὐτ' ἐν τῷ μανῷ, οὔτε δυνάμει, εἰ μὴ
 τις βούλεται πάντως καλεῖν κενὸν τὸ αἴτιον τοῦ φέρεσθαι.
 οὕτω δ' ἡ τοῦ βαρέος καὶ κούφου ὕλη, ἥ τοιαύτη, εἴη ἂν τὸ
 κενόν· τὸ γὰρ πυκνὸν καὶ τὸ μανὸν κατὰ ταύτην τὴν ἐναν-
 25 τίωσιν φορᾶς ποιητικά, κατὰ δὲ τὸ σκληρὸν καὶ μαλακὸν
 πάθους καὶ ἀπαθείας, καὶ οὐ φορᾶς ἀλλ' ἑτεροιώσεως μάλ-
 λον. καὶ περὶ μὲν κενοῦ, πῶς ἔστι καὶ πῶς οὐκ ἔστι, διω-
 ρίσθω τὸν τρόπον τοῦτον.

Ἐχόμενον δὲ τῶν εἰρημένων ἔστιν ἐπελθεῖν περὶ χρόνου· 10
 30 πρῶτον δὲ καλῶς ἔχει διαπορῆσαι περὶ αὐτοῦ καὶ διὰ τῶν
 ἐξωτερικῶν λόγων, πότερον τῶν ὄντων ἔστιν ἢ τῶν μὴ ὄντων,
 εἶτα τίς ἢ φύσις αὐτοῦ. ὅτι μὲν οὖν ἢ ὅλως οὐκ ἔστιν ἢ μό-
 λισ καὶ ἀμυδρῶς, ἐκ τῶνδ' εἰς τις ἂν ὑποπτεύσειεν. τὸ μὲν
 γὰρ αὐτοῦ γέγονε καὶ οὐκ ἔστιν, τὸ δὲ μέλλει καὶ οὐπω ἔστιν.
 218^a ἐκ δὲ τούτων καὶ ὁ ἄπειρος καὶ ὁ ἀεὶ λαμβανόμενος χρό-
 νος σύγκειται. τὸ δ' ἐκ μὴ ὄντων συγκείμενον ἀδύνατον ἂν
 3 εἶναι δόξειε μετέχειν οὐσίας.

3

πρὸς δὲ τούτοις παντὸς μερι-

^b 12-16 ἔτι . . . ὕλης PPS: om. T γρ. G γρ. S 14 ἦν sup. lin.
 E¹ καὶ] οὕτω καὶ Λ ἔστι GHI et post θερμόν F 15 συναγωγὴ
 καὶ διαστολὴ ES: συναγωγὴ καὶ διαστολὴ Λ 16 ἐφ' FGHJP:
 ἀφ' EIVS 17 γὰρ om. H¹ 19 τὸ alt. AP: om. E μολίβδου
 E¹FHIJPT: μολύβδου E²GS 20 ὡς ΔT: ὅτι E 21 οὐτ'
 ἐν ΔP: οὐθέν E 22 πάντως καλεῖν κενὸν AVT: καλεῖν τι κενὸν
 παντὸς E 23 ἂν εἴη F 24 τὸ alt. om. E 27 διωρίσθω
 ΔST: διωρίζεται E 28 τοῦτον τὸν τρόπον FT 29 περὶ τοῦ
 χρόνου H 30 διαπορῆσαι J 31 λόγων om. fort. S 32 αὐτῶν
 F ἢ pr. E¹S: om. E²Λ μόλις EST: μόγις Δ 33 τις ἂν
 GHIJVP: τις ἂν καὶ E: ἂν τις TS^o: τις F 218^a 2 ἂν εἶναι
 δόξειε EGHJS: δόξειεν ἂν F: εἶναι δόξειε I 3 μετέχειν E¹PHS:
 μετέχειν ποτὲ E²FGJ: ποτὲ μετέχειν I

στοῦ, ἄνπερ ἦ, ἀνάγκη, ὅτε ἔστω, ἦτοι πάντα τὰ μέρη
 εἶναι ἢ ἕνια· τοῦ δὲ χρόνου τὰ μὲν γέγονε τὰ δὲ μέλλει, 5
 ἔστι δ' οὐδέν, ὄντος μεριστοῦ. τὸ δὲ νῦν οὐ μέρος· μετρεῖ τε
 γὰρ τὸ μέρος, καὶ συγκεῖσθαι δεῖ τὸ ὄλον ἐκ τῶν μερῶν·
 ὁ δὲ χρόνος οὐ δοκεῖ συγκεῖσθαι ἐκ τῶν νῦν. ἔτι δὲ τὸ νῦν,
 ὃ φαίνεται διορίζειν τὸ παρελθὸν καὶ τὸ μέλλον, πότερον
 ἐν καὶ ταυτὸν αἰεὶ διαμένει ἢ ἄλλο καὶ ἄλλο, οὐ ῥάδιον 10
 ἰδεῖν. εἰ μὲν γὰρ αἰεὶ ἕτερον καὶ ἕτερον, μηδὲν δ' ἐστὶ τῶν
 ἐν τῷ χρόνῳ ἄλλο καὶ ἄλλο μέρος ἅμα (ὃ μὴ περιέχει,
 τὸ δὲ περιέχεται, ὥσπερ ὁ ἐλάττων χρόνος ὑπὸ τοῦ πλείονος),
 τὸ δὲ νῦν μὴ ὄν πρότερον δὲ ὄν ἀνάγκη ἐφθάρθαι ποτέ,
 καὶ τὰ νῦν ἅμα μὲν ἀλλήλοις οὐκ ἔσται, ἐφθάρθαι δὲ 15
 ἀνάγκη αἰεὶ τὸ πρότερον. ἐν αὐτῷ μὲν οὖν ἐφθάρθαι οὐχ
 οἶόν τε διὰ τὸ εἶναι τότε, ἐν ἄλλῳ δὲ νῦν ἐφθάρθαι τὸ
 πρότερον νῦν οὐκ ἐνδέχεται. ἔστω γὰρ ἀδύνατον ἐχόμενα
 εἶναι ἀλλήλων τὰ νῦν, ὥσπερ στιγμῆν στιγμῆς. εἴπερ οὖν ἐν
 τῷ ἐφεξῆς οὐκ ἐφθάρθαι ἀλλ' ἐν ἄλλῳ, ἐν τοῖς μεταξὺ 20
 [τοῖς] νῦν ἀπέροις οὔσιν ἅμα ἂν εἴη· τοῦτο δὲ ἀδύνατον. ἀλλὰ
 μὴν οὐδ' αἰεὶ τὸ αὐτὸ διαμένει δυνατόν· οὐδενὸς γὰρ διαι-
 ρετοῦ πεπερασμένου ἐν πέρασ ἔστω, οὔτε ἂν ἐφ' ἐν ἢ συνεχῆς
 οὔτε ἂν ἐπὶ πλείῳ· τὸ δὲ νῦν πέρασ ἐστίν, καὶ χρόνον ἔστι
 λαβεῖν πεπερασμένον. ἔτι εἰ τὸ ἅμα εἶναι κατὰ χρόνον καὶ 25
 μήτε πρότερον μήτε ὕστερον τὸ ἐν τῷ αὐτῷ εἶναι καὶ ἐνὶ [τῷ]
 νῦν ἔστω, εἰ τὰ τε πρότερον καὶ τὰ ὕστερον ἐν τῷ νῦν τῷδί
 ἐστίν, ἅμα ἂν εἴη τὰ ἔτος γενόμενα μυριστὸν τοῖς γε-

^a 4-5 ἦτοι . . . ἕνια EP : ἦτοι ἕνια ἢ πάντα τὰ μέρη εἶναι ASPT :
 ἢ πάντα τὰ μέρη ἢ ἕνια εἶναι S^c 6 μετρεῖ τε FH²ISP : μετρεῖται
 H¹JAPS^o : μετρεῖ E²G : E¹ incertum 7 μέρος] μέρος, τὸ δὲ νῦν
 οὐ μετρεῖ F 8 οὐ om. F 9 διορί-
 ζειν E²AVS et ut vid. T : ὀρίζειν E¹ 10 ἢ (ἀεὶ) Torstrik οὐ]
 ὁ E 11 συνιδεῖν H 12 ὃ μὴ περιέχει ἅμα H 14 τότε
 E¹HPS 15 καὶ . . . ἅμα E²APS : om. E¹ οὐκ ἔσται ἀλλήλοις
 διεφθάρθαι H 16 E²APS : om. E¹ 17 ἀνάγκη . . . πρότερον
 E²AP : αἰεὶ ἀνάγκη τὸ πρότερον S : ἀνάγκη E¹ οὖν om. I οὐχ] τὸ
 νῦν οὐχ H 17 οἶόν τ' αἰεὶ διὰ H : οἰονται διὰ J¹ τότε E²AVS :
 om. E¹ 18 ἔστω E²APS : ἐστίν V : E¹ incertum 19 στιγμῆν
 EPST : στιγμῆ Ἀ 21 τοῖς seclusi : om. S et fort. P 24 ἂν om. F
 26 καὶ ἐνὶ [τῷ] Diels, καὶ ἐνὶ fort. T : καὶ ἐν τῷ H²S^c : καὶ ἐνὶ τῷ ci.
 Bonitz : omittendum ci. Bonitz, fort. cum PS 27 γέ H :
 om. S 28 πρότερα καὶ τὰ ὕστερα F ἐν] γινόμενα ἐν S 28 τὰ
 εἰς ἔτος E²AS γινόμενα PPSPT : γενησόμενα S^c : γενησόμενα ἢ
 γενόμενα Diels μυριστὸν ante γενόμενα F γινομένοις FPS

νομένοις τήμερον, καὶ οὔτε πρότερον οὔτε ὕστερον οὐδὲν ἄλλο
30 ἄλλου.

30 περὶ μὲν οὖν τῶν ὑπαρχόντων αὐτῷ τοσαύτ' ἔστω διη-
πορημένα· τί δ' ἔστιν ὁ χρόνος καὶ τίς αὐτοῦ ἢ φύσις, ὁμοίως
ἔκ τε τῶν παραδεδομένων ἀδηλόν ἔστω, καὶ περὶ ὧν τυγχά-
νομεν διεληλυθότες πρότερον. οἱ μὲν γὰρ τὴν τοῦ ὄλου κίνη-
218^b σιν εἶναι φασιν, οἱ δὲ τὴν σφαῖραν αὐτήν. καίτοι τῆς πε-
ριφορᾶς καὶ τὸ μέρος χρόνος τίς ἐστι, περιφορὰ δέ γε οὔ-
μέρος γὰρ περιφορᾶς τὸ ληφθέν, ἀλλ' οὐ περιφορὰ. ἔτι δ'
εἰ πλείους ἦσαν οἱ οὐρανοί, ὁμοίως ἂν ἦν ὁ χρόνος ἢ ὅτουοῦν
5 αὐτῶν κίνησις, ὥστε πολλοὶ χρόνοι ἅμα. ἢ δὲ τοῦ ὄλου
σφαῖρα ἔδοξε μὲν τοῖς εἰποῦσι εἶναι ὁ χρόνος, ὅτι ἔν τε
τῷ χρόνῳ πάντα ἐστὶν καὶ ἐν τῇ τοῦ ὄλου σφαίρᾳ· ἔστιν δ'
εὐηθικώτερον τὸ εἰρημένον ἢ ὥστε περὶ αὐτοῦ τὰ ἀδύνατα
ἐπισκοπεῖν. ἐπεὶ δὲ δοκεῖ μάλιστα κίνησις εἶναι καὶ μετα-
10 βολή τις ὁ χρόνος, τοῦτ' ἂν εἴη σκεπτέον. ἢ μὲν οὖν ἐκάστου
μεταβολῆ καὶ κίνησις ἐν αὐτῷ τῷ μεταβάλλοντι μόνον
ἐστίν, ἢ οὐ ἂν τύχη ὄν αὐτὸ τὸ κινούμενον καὶ μεταβάλλον·
ὁ δὲ χρόνος ὁμοίως καὶ πανταχοῦ καὶ παρὰ πᾶσιν. ἔτι δὲ
μεταβολῆ μὲν ἐστὶ θάπτων καὶ βραδυτέρα, χρόνος
15 δ' οὐκ ἔστιν· τὸ γὰρ βραδὺ καὶ ταχὺ χρόνῳ ὄρισται, ταχὺ
μὲν τὸ ἐν ὀλίγῳ πολὺ κινούμενον, βραδὺ δὲ τὸ ἐν πολλῷ
ὀλίγον· ὁ δὲ χρόνος οὐχ ὄρισται χρόνῳ, οὔτε τῷ ποσός τις
εἶναι οὔτε τῷ ποιός. ὅτι μὲν τοίνυν οὐκ ἔστιν κίνησις, φανερόν·
μηδὲν δὲ διαφερέτω λέγειν ἡμῖν ἐν τῷ παρόντι κίνησις ἢ
20 μεταβολήν.

Ἄλλὰ μὴν οὐδ' ἄνευ γε μεταβολῆς· ὅταν γὰρ μηδὲν II

^a 29 ἄλλο ἄλλου οὐδὲν H 30 ἔστω διηπορημένα EGIJPS:
ἔσται διηπορημένα F: εἰρήσθω H 31 αὐτοῦ ἢ φύσις EGIJP:
αὐτῷ ἢ φύσις F: ἢ φύσις αὐτοῦ HS 32 τε PP: om. S ἀδηλόν
ἣτις ἐστίν E¹ ^b 3 μέρος . . . περιφορὰ om. I γὰρ] δὲ
τῆς sup. lin. J¹ λεχθέν EV et sup. lin. J¹ δ' EGHJJP: om.
FT 4 οἱ om. S ὅτιοῦν H 6 εἰποῦσιν ΔP: ἐπιποῦσιν E
τε om. FP 7 χρόνῳ τὰ πάντα IP 8 ἢ om. H 9 κινήσις
τις εἶναι H 10 τοῦ τε ἂν σκεπτέον G 11 ἐαυτῷ H μόνον
ἐστίν EHPST: ἔστι μόνον FGIJ 13 καὶ pr. EFGIJT: om. HS
δὲ E²ΔPST: δὲ καὶ E¹ 14 ἐστὶ E¹PST: ἐστὶ πᾶσα E²ΔV
15 βραδὺ καὶ τὸ ταχὺ I: τάχῃ καὶ (καὶ τὸ P) βραδὺ VPST 19 δὲ
ΔVP: om. E 21 ἀλλ' οὐ μὴν οὐδ' G γε om. S μηδὲν
αὐτοὶ EGIJPS^e1T: αὐτοὶ μηδὲν H: αὐτοὶ μηθέν F: αὐτοὶ μὴ SP

αὐτοὶ μεταβάλλωμεν τὴν διάνοιαν ἢ λάθωμεν μεταβάλλουτες, οὐ δοκεῖ ἡμῖν γεγονέναι χρόνος, καθάπερ οὐδὲ τοῖς ἐν Σαρδοῖι μυθολογουμένοις καθεύδειν παρὰ τοῖς ἥρωσιν, ὅταν ἐγερθῶσι· συνάπτουσι γὰρ τῷ πρότερον νῦν τὸ ὕστερον 25 νῦν καὶ ἐν ποιούσιν, ἐξαιροῦντες διὰ τὴν ἀναισθησίαν τὸ μεταξύ. ὥσπερ οὖν εἰ μὴ ἦν ἕτερον τὸ νῦν ἀλλὰ ταῦτὸ καὶ ἐν, οὐκ ἂν ἦν χρόνος, οὕτως καὶ ἐπεὶ λαμβάνει ἕτερον ὄν, οὐ δοκεῖ εἶναι τὸ μεταξὺ χρόνος. εἰ δὴ τὸ μὴ οἶεσθαι εἶναι χρόνον τότε συμβαίνει ἡμῖν, ὅταν μὴ ὀρίσωμεν μηδεμίαν 30 μεταβολήν, ἀλλ' ἐν ἐνὶ καὶ ἀδιαιρέτῳ φαίνεται ἡ ψυχὴ μένειν, ὅταν δ' αἰσθώμεθα καὶ ὀρίσωμεν, τότε φαινομένη γεγονέναι χρόνον, φανερόν ὅτι οὐκ ἔστιν ἄνευ κινήσεως καὶ μεταβολῆς χρόνος. ὅτι μὲν οὖν οὔτε κίνησις οὔτ' ἄνευ κινήσεως ὁ χρόνος 219^a ἐστὶ, φανερόν· ληπτέον δέ, ἐπεὶ ζητοῦμεν τί ἐστὶν ὁ χρόνος, ἐντεῦθεν ἀρχομένοις, τί τῆς κινήσεως ἐστίν. ἅμα γὰρ κινήσεως αἰσθανόμεθα καὶ χρόνον· καὶ γὰρ ἔαν ἦ σκότος καὶ μηδὲν διὰ τοῦ σώματος πάσχωμεν, κινήσεις δέ τις ἐν τῇ 5 ψυχῇ ἐνῆ, εὐθὺς ἅμα δοκεῖ τις γεγονέναι καὶ χρόνος. ἀλλὰ μὴν καὶ ὅταν γε χρόνος δοκῇ γεγονέναι τις, ἅμα καὶ κινήσις τις δοκεῖ γεγονέναι. ὥστε ἤτοι κινήσις ἢ τῆς κινήσεως τί ἐστὶν ὁ χρόνος. ἐπεὶ οὖν οὐ κίνησις, ἀνάγκη τῆς κινήσεως τι εἶναι αὐτόν.

10

ἐπεὶ δὲ τὸ κινούμενον κινεῖται ἕκ τι- 10 νος εἰς τι καὶ πᾶν μέγεθος συνεχές, ἀκολουθεῖ τῷ μεγέθει ἢ κινήσει· διὰ γὰρ τὸ τὸ μέγεθος εἶναι συνεχές καὶ ἡ κινήσις ἐστὶν συνεχής, διὰ δὲ τὴν κίνησιν ὁ χρόνος· ὅση γὰρ ἡ

^b 22 μεταβάλλωμεν EFGIJP S: μεταβάλλωμεν H 23 χρόνος EJPST: ὁ χρόνος FGHI 24 ἐν FPT: ἐν τῇ GHIJ: om. E 25 τὸ . . . τῷ ASΓ 26 τὸ μέσον I 27 ἀλλὰ E²AV: ἀλλὰ καὶ E¹ ἐν καὶ ταυτόν H 28 χρόνος EGIJST: ὁ χρόνος FH ἐπεὶ λαμβάνοι G: ἐπιλαμβάνει E 29 δὲ E² εἶναι om. EG, sup. lin. J 30 ὀρίσωμεν Δ et fort. S: ὀρίζωμεν E 31 ἐν om. H φαίνεται GH 32 δ' om. E¹ 33 ἄνευ . . . μεταβολῆς EFGJS: ἄνευ μεταβολῆς καὶ κινήσεως T: μεταβολῆς καὶ κινήσεως ἄνευ H: ἄνευ κινήσεως I 219^a I χρόνος pr.] ὁ χρόνος FI 2 ἐπεὶ E¹HS: ἐπειδὴ E²FGIJ τις E¹ ὁ om. F 3 ἀρχόμενοι E¹P τι] εἰ τι Torstrik ἔσται E: ὁ χρόνος ἐστίν H: ἐστίν ὁ χρόνος P 6 δοκεῖ τις EGIJP: δοκεῖ τι F: τις δοκεῖ HS: δοκεῖ T 7 ὅταν καὶ S γε om. FHST δοκῇ γεγονέναι EGHJT: δοκῇ γενέσθαι I: γενέσθαι δοκῇ F 8 τις om. H δοκεῖ ET: φαίνεται AS 9-10 ἐστίν . . . τι om. G ἐπεὶ E¹HJ²S: ἐπειδὴ E²FGIJ¹ 10 εἶναι τι HS 12 τὸ alt. om. E²FGJ 13 διὰ . . . χρόνος HVST: om. EFGIJ et ut vid. P

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ Δ

κίνησις, τοσούτος καὶ ὁ χρόνος αἰεὶ δοκεῖ γεγονέναι. τὸ δὲ
 15 πρότερον καὶ ὕστερον ἐν τόπῳ πρῶτόν ἐστιν. ἐνταῦθα μὲν δὴ
 τῇ θέσει· ἐπεὶ δ' ἐν τῷ μεγέθει ἔστι τὸ πρότερον καὶ ὕστερον,
 ἀνάγκη καὶ ἐν κινήσει εἶναι τὸ πρότερον καὶ ὕστερον, ἀνά-
 λογον τοῖς ἐκεῖ. ἀλλὰ μὴν καὶ ἐν χρόνῳ ἔστιν τὸ πρότερον
 καὶ ὕστερον διὰ τὸ ἀκολουθεῖν αἰεὶ θατέρῳ θάτερον αὐτῶν. ἔστι
 20 δὲ τὸ πρότερον καὶ ὕστερον ἐν τῇ κινήσει ὃ μὲν ποτε
 ὄν κίνησις [ἐστιν]· τὸ μέντοι εἶναι αὐτῷ ἕτερον καὶ οὐ κίνησις.
 ἀλλὰ μὴν καὶ τὸν χρόνον γε γνωρίζομεν ὅταν ὀρίσωμεν
 τὴν κίνησι, τῷ πρότερον καὶ ὕστερον ὀρίζοντες· καὶ τότε φα-
 μὲν γεγονέναι χρόνον, ὅταν τοῦ προτέρου καὶ ὑστέρου ἐν τῇ
 25 κινήσει αἰσθησιμὴν λάβωμεν. ὀρίζομεν δὲ τῷ ἄλλο καὶ ἄλλο
 ὑπολαβεῖν αὐτά, καὶ μεταξύ τι αὐτῶν ἕτερον· ὅταν γὰρ
 ἕτερα τὰ ἄκρα τοῦ μέσου νοήσωμεν, καὶ δύο εἴπη ἢ ψυχῇ
 τὰ νῦν, τὸ μὲν πρότερον τὸ δ' ὕστερον, τότε καὶ τοῦτο φα-
 μὲν εἶναι χρόνον· τὸ γὰρ ὀριζόμενον τῷ νῦν χρόνος εἶναι
 30 δοκεῖ· καὶ ὑποκείσθω. ὅταν μὲν οὖν ὡς ἐν τὸ νῦν αισθανώ-
 μεθα, καὶ μὴ ἦτοι ὡς πρότερον καὶ ὕστερον ἐν τῇ κινήσει ἢ
 ὡς τὸ αὐτὸ μὲν προτέρου δὲ καὶ ὑστέρου τιωός, οὐ δοκεῖ χρό-
 νος γεγονέναι οὐδεὶς, ὅτι οὐδὲ κίνησις. ὅταν δὲ τὸ πρότερον
 219^b καὶ ὕστερον, τότε λέγομεν χρόνον· τοῦτο γὰρ ἔστιν ὁ χρόνος,
 2 ἀριθμὸς κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον.

2 οὐκ ἄρα κί-
 νησις ὁ χρόνος ἀλλ' ἢ ἀριθμὸν ἔχει ἢ κίνησις. σημείον δέ·
 τὸ μὲν γὰρ πλείον καὶ ἕλαττον κρίνομεν ἀριθμῷ, κίνησις δὲ
 5 πλείω καὶ ἐλάττω χρόνῳ· ἀριθμὸς ἄρα τις ὁ χρόνος. ἐπεὶ
 δ' ἀριθμὸς ἔστι διχῶς (καὶ γὰρ τὸ ἀριθμούμενον καὶ τὸ ἀριθ-

^a 14 καὶ APS : om. E αἰεὶ om. S δὴ EHAPT : δὲ VS : δὲ δὴ
 FGIJ 16 ἐπειδὴ δὲ T : ἐπειδὴ S ἔστι APST : om. E πρῶτον
 GJ¹ καὶ EFGIJS : καὶ τὸ HPT 17 καὶ alt.] καὶ τὸ H 18 ἐν]
 ἐν τῷ IP ἔστιν om. H 19 καὶ] καὶ τὸ HP 20 καὶ] καὶ τὸ
 GHIJP ἐν τῇ κινήσει om. P ἐν HST : αὐτῶν ἐν EFGIJ : τὸ
 ἐν Torstrik ποτε ὄν APS : πρότερον E 21 ἔστιν seclisit
 Torstrik, om. S et ut vid. P^b : habent PP^c 22 γε om. I
 23 τῷ EFGV : τὸ HIJPT 25 τῷ] τῷ ἄλλο καὶ G 26 αὐτά]
 αὐτὸ EFGP 29 εἶναι alt. E²AP : om. E¹ 30 αισθανώμεθα τὸ
 νῦν F 31 τοι E : ἢ fecit J ὡς] ὡς τὸ GHIJ καὶ] καὶ τὸ H
 32 μὲν EGIJ¹PS : μὲν οὐ FJ² : μὴ H δὲ καὶ ὑστέρου AVPPS : καὶ
 ὑστέρου P¹ : om. E γεγονέναι χρόνος F 33 τὸ om. G
^b I καὶ] καὶ τὸ E 2 τὸ om. JS 3 ἢ PPT : ἢ ἢ Torstrik
 6 δ'] δ' ὁ E²GP ἔστι sup. lin. E¹ ἀριθμητὸν καὶ τὸ ἀριθμούμενον
 H τὸ PPS : secl. Jackson ἀριθμητὸν FGIJP : ἀριθμοῦν E

μητὸν ἀριθμὸν λέγομεν, καὶ ᾧ ἀριθμοῦμεν), ὁ δὲ χρόνος ἐστὶν τὸ ἀριθμοῦμενον καὶ οὐχ ᾧ ἀριθμοῦμεν. ἔστι δ' ἕτερον ᾧ ἀριθμοῦμεν καὶ τὸ ἀριθμοῦμενον. καὶ ὡσπερ ἡ κίνησις αἰεὶ ἄλλη καὶ ἄλλη, καὶ ὁ χρόνος (ὁ δ' ἅμα πᾶς χρόνος ὁ αὐτός· τὸ 10 γὰρ νῦν τὸ αὐτὸ ὅ ποτ' ἦν—τὸ δ' εἶναι αὐτῷ ἕτερον—τὸ δὲ νῦν τὸν χρόνον ὀρίζει, ἢ πρότερον καὶ ὕστερον). τὸ δὲ νῦν ἔστι μὲν ὡς τὸ αὐτό, ἔστι δ' ὡς οὐ τὸ αὐτό· ἢ μὲν γὰρ ἐν ἄλλῳ καὶ ἄλλῳ, ἕτερον (τοῦτο δ' ἦν αὐτῷ τὸ νῦν (εἶναι)), ὁ δὲ ποτε ὄν ἐστι τὸ νῦν, τὸ αὐτό. ἀκολουθεῖ γάρ, ὡς ἐλέχθη, τῷ μὲν 15 μεγέθει ἢ κίνησις, ταύτῃ δ' ὁ χρόνος, ὡς φαμεν· καὶ ὁμοίως δὴ τῇ στιγμῇ τὸ φερόμενον, ᾧ τὴν κίνησιν γνωρίζομεν καὶ τὸ πρότερον ἐν αὐτῇ καὶ τὸ ὕστερον. τοῦτο δὲ ὁ μὲν ποτε ὄν τὸ αὐτό (ἢ στιγμῇ γὰρ ἢ λίθος ἢ τι ἄλλο τοιοῦτόν ἐστι), τῷ λόγῳ δὲ ἄλλο, ὡσπερ οἱ σοφισταὶ λαμβάνουσιν ἕτερον τὸ 20 Κορίσκον ἐν Λυκείῳ εἶναι καὶ τὸ Κορίσκον ἐν ἀγορᾷ. καὶ τοῦτο δὴ τῷ ἄλλοθι καὶ ἄλλοθι εἶναι ἕτερον· τῷ δὲ φερομένῳ ἀκολουθεῖ τὸ νῦν, ὡσπερ ὁ χρόνος τῇ κινήσει (τῷ γὰρ φερομένῳ γνωρίζομεν τὸ πρότερον καὶ ὕστερον ἐν κινήσει, ἢ δ' ἀριθμητὸν τὸ πρότερον καὶ ὕστερον, τὸ νῦν ἔστιν) 25 ὥστε καὶ ἐν τούτοις ὁ μὲν ποτε ὄν νῦν ἐστι, τὸ αὐτό (τὸ πρότερον γὰρ καὶ ὕστερόν ἐστι τὸ ἐν κινήσει), τὸ δ' εἶναι ἕτερον (ἢ ἀριθμητὸν γὰρ τὸ πρότερον καὶ ὕστερον, τὸ νῦν ἔστιν). καὶ

b 7 δὲ EHIJ 8 τὸ . . . οὐχ] οὐχ ὁ ἀριθμοῦμενος, ἀλλ' γρ. ἔστι . . . 9 ἀριθμοῦμενον post b 7 ἀριθμοῦμεν
 Aspasius ὁ G transp. Torstrik: ἔστι . . . ἀριθμοῦμεν om. J¹ 8 ᾧ om. E¹: οὐχ ᾧ
 Aspasius 9 καὶ pr.] ἀλλὰ Aspasius 10 καὶ ἄλλη EFHJ²PPSP²:
 om. GIJ¹P¹S¹ πᾶς χρόνος] πᾶς vel χρόνος πᾶς Torstrik τὸ] ὁ E²
 11 ἦν] ὄν Torstrik 12 ὀρίζει Torstrik: μετρεῖ ΠVPS: διαιρεῖ
 Gottschlich: secl. Prantl: an μερίζει? ὕστερον AS: ὕστερον ὀρίζει
 EV Prantl 13 ἔστι . . . αὐτό om. G γὰρ om. H 14 καὶ
 ἄλλῳ om. G νῦν εἶναι vel εἶναι ci. Bonitz: habuit ut vid. P:
 νῦν Π δ . . . 15 νῦν E¹ incertum 14 ὁ GHIJ¹PS: ἢ E²F²J²
 ποτε HJ²PS: ὁ ποτε E²F: ὁποῦτε GIJ¹ 15 ἐστὶ τὸ νῦν] τὸ νῦν
 ἐστὶ S: ἐστὶ P ἀκολουθεῖ. . . 16 φαμεν secl. Torstrik (cf. 220^b
 24-6): habent PPST 15 ὡσπερ E²AP 17 τῇ στιγμῇ ΠPST:
 στιγμῇ E: secl. Torstrik 18 ταύτῃ H τὸ om. G δὴ
 E²FGHIJ² ὄν ἐστὶ τὸ H 20 τὸ AP: om. E 22 τοῦτον
 ut vid. P 24-5 ἐν . . . ὕστερον om. G 24 ἐν] ἐν τῇ
 HS 25 ἢ APS: εἰ E καὶ FGIJPS: καὶ τὸ EH τὸ
 FGH IPT: om. ES, erasit J 26 ὥστε . . . τοῖσι om. F
 τὸ αὐτό ἐστὶ F τὸ alt. EH IP et sup. lin. J¹: om. FG 27 καὶ]
 ἢ FG IJP τὸ AP: om. EV ἐν] ἐν τῇ H τὸ FG IJP:
 τῷ H: om. E 28 τὸ νῦν ἔστιν GIJP: ἐστὶ τὸ νῦν F: νῦν
 ἐστὶ EH

γνώριμον δὲ μάλιστα τοῦτ' ἔστιν· καὶ γὰρ ἡ κίνησις διὰ τὸ
 30 κινούμενον καὶ ἡ φορὰ διὰ τὸ φερόμενον· τόδε γάρ τι τὸ
 φερόμενον, ἡ δὲ κίνησις οὐ. ἔστι μὲν οὖν ὡς τὸ αὐτὸ τὸ νῦν
 αἰεὶ, ἔστι δ' ὡς οὐ τὸ αὐτό· καὶ γὰρ τὸ φερόμε-
 33 νον.

33 φανερόν δὲ καὶ ὅτι εἴτε χρόνος μὴ εἴη, τὸ νῦν οὐκ ἂν
 220^a εἴη, εἴτε τὸ νῦν μὴ εἴη, χρόνος οὐκ ἂν εἴη· ἅμα γὰρ ὥσπερ
 τὸ φερόμενον καὶ ἡ φορὰ, οὕτως καὶ ὁ ἀριθμὸς ὁ τοῦ φερο-
 μένου καὶ ὁ τῆς φορᾶς. χρόνος μὲν γὰρ ὁ τῆς φορᾶς ἀρι-
 θμὸς, τὸ νῦν δὲ ὡς τὸ φερόμενον, οἶον μονὰς ἀριθμοῦ. καὶ
 5 συνεχῆς τε δὴ ὁ χρόνος τῷ νῦν, καὶ διήρηται κατὰ τὸ νῦν·
 ἀκολουθεῖ γὰρ καὶ τοῦτο τῇ φορᾷ καὶ τῷ φερομένῳ. καὶ
 γὰρ ἡ κίνησις καὶ ἡ φορὰ μία τῷ φερομένῳ, ὅτι ἓν (καὶ
 οὐχ ὅ ποτε οὖν—καὶ γὰρ ἂν διαλίποι—ἀλλὰ τῷ λόγῳ)· καὶ
 ὀρίζει δὲ τὴν πρότερον καὶ ὕστερον κίνησιν τοῦτο. ἀκολουθεῖ
 10 δὲ καὶ τοῦτό πως τῇ στιγμῇ· καὶ γὰρ ἡ στιγμή καὶ συνέχει
 τὸ μῆκος καὶ ὀρίζει· ἔστι γὰρ τοῦ μὲν ἀρχῆ τοῦ δὲ τελευτῆ.
 ἀλλ' ὅταν μὲν οὕτω λαμβάνη τις ὡς δυσὶ χρώμενος τῇ μιᾷ,
 ἀνάγκη ἴστασθαι, εἰ ἔσται ἀρχῆ καὶ τελευτῆ ἢ αὐτῇ στιγμῇ·
 τὸ δὲ νῦν διὰ τὸ κινεῖσθαι τὸ φερόμενον αἰεὶ ἕτερον. ὥσθ' ὁ
 15 χρόνος ἀριθμὸς οὐχ ὡς τῆς αὐτῆς στιγμῆς, ὅτι ἀρχῆ καὶ
 τελευτῆ, ἀλλ' ὡς τὰ ἔσχατα τῆς γραμμῆς μᾶλλον—καὶ οὐχ
 ὡς τὰ μέρη, διὰ τε τὸ εἰρημένον (τῇ γὰρ μέσῃ στιγμῇ ὡς
 δυσὶ χρήσεται, ὥστε ἡρεμεῖν συμβήσεται), καὶ ἔτι φανερόν

^b 29 τοῦτ'.] τὸ νῦν τοῦτ' H 31 ὡς τὸ] ὥστε E τὸ νῦν EVP :
 νῦν S : τὸ νῦν λεγόμενον FGJ : νῦν λεγόμενον I : λεγόμενον τὸ νῦν H
 32 αἰεὶ om. S τὸ alt. EFGHJSP : καὶ τὸ IPS¹ 220^a 1 εἴη
 alt. AP : ἔσται E χρόνος EJP : ὁ χρόνος FGHI 2 ὁ pr.
 om. F 4 δὲ νῦν H 5 τῷ] τῶν E 6 καὶ pr. om. G,
 sup. lin. J¹ καὶ γὰρ . . . 7 φερομένῳ om. G 7 γὰρ] γὰρ καὶ
 E καὶ alt. om. H 8 διαλείποι GIJP ἅμα ex ἀλλὰ fecerunt
 EJ τῷ] καὶ τῷ F 9 ὀρίζει δὲ scripsi, fort. habuit S : ὀρίζει
 δὴ HIP : γὰρ ὀρίζει FGJT et fecit E τὴν . . . κίνησιν GH²IJP et
 in lit. E : τὴν προτέραν καὶ ὕστεραν κίνησιν FT : τῇ πρότερον καὶ
 ὕστερον κινήσει H¹ τοῦτο] καὶ συνέχει Torstrik 10 καὶ
 γὰρ ἡ στιγμή E²AP : om. E¹ 12 ὡς FHIJ²P : om. EGJ¹
 13 ἔστιν J²P ἀρχῆ καὶ τελευτῆ FGHIP : ἡ ἀρχῆ καὶ τελευτῆ J :
 ἡ ἀρχῆ καὶ ἡ τελευτῆ E 14 αἰεὶ om. S 15 ὅτι ἡ ἀρχῆ J
 16 τῆς γραμμῆς PP, Torstrik : τῆς αὐτῆς EFGHJ¹P¹ : τῆς αὐτῆς
 γραμμῆς T : τῆς I : an omissenda? 17 τε APS : om. E ὡς
 FHIPS et sup. lin. J : om. EG

ὅτι οὐδὲν μόριον τὸ νῦν τοῦ χρόνου, οὐδ' ἡ διαίρεσις τῆς κινή-
σεως, ὡσπερ οὐδ' ἡ στιγμή τῆς γραμμῆς· αἱ δὲ γραμμαὶ 20
αἱ δύο τῆς μιᾶς μόρια. † ἢ μὲν οὖν πέρας τὸ νῦν, οὐ χρόνος,
ἀλλὰ συμβέβηκεν· ἢ δ' ἀριθμῶν, ἀριθμὸς †· τὰ μὲν γὰρ πέ-
ρατα ἐκείνου μόνον ἐστὶν οὐ ἐστὶν πέρατα, ὁ δ' ἀριθμὸς ὁ τῶνδε
τῶν ἵππων, ἢ δεκάς, καὶ ἄλλοθι. ὅτι μὲν τοίνυν ὁ χρόνος
ἀριθμὸς ἐστὶν κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον, καὶ 25
συνεχῆς (συνεχοῦς γάρ), φανερόν.

12 Ἐλάχιστος δὲ ἀριθμὸς ὁ μὲν ἀπλῶς ἐστὶν ἢ δυάς· τὶς
δὲ ἀριθμὸς ἐστὶ μὲν ὡς ἐστὶν, ἐστὶ δ' ὡς οὐκ ἐστὶν, οἶον γραμ-
μῆς ἐλάχιστος πλήθει μὲν ἐστὶν αἱ δύο ἢ ἡ μία, μεγέθει
δ' οὐκ ἐστὶν ἐλάχιστος· ἀεὶ γὰρ διαιρεῖται πᾶσα γραμμῆ. 30
ὥστε ὁμοίως καὶ χρόνος· ἐλάχιστος γὰρ κατὰ μὲν ἀριθ-
μὸν ἐστὶν ὁ εἷς ἢ οἱ δύο, κατὰ μέγεθος δ' οὐκ ἐστὶν. 32

φανερόν 32

δὲ καὶ ὅτι ταχὺς μὲν καὶ βραδὺς οὐ λέγεται, πολὺς δὲ 220^b
καὶ ὀλίγος καὶ μακρὸς καὶ βραχύς. ἢ μὲν γὰρ συνεχῆς,
μακρὸς καὶ βραχύς, ἢ δὲ ἀριθμὸς, πολὺς καὶ ὀλίγος. τα-
χὺς δὲ καὶ βραδὺς οὐκ ἐστὶν· οὐδὲ γὰρ ἀριθμὸς ᾧ ἀριθμοῦ-
μεν ταχὺς καὶ βραδὺς οὐδεῖς. 5

καὶ ὁ αὐτὸς δὲ πανταχοῦ 5

ἄμα· πρότερον δὲ καὶ ὕστερον οὐχ ὁ αὐτός, ὅτι καὶ ἡ με-
ταβολὴ ἢ μὲν παροῦσα μία, ἢ δὲ γεγεννημένη καὶ ἡ μέλ-

^a 19 οὐδὲν EGJAS Aspasius Porphyrius: οὐδὲ FHIPT μό-
ριον . . . διαίρεσις EF²GHIJ T Porphyrius: μόριον τὸ χρόνον τῆς
κινήσεως οὐδ' ἡ διαίρεσις F¹: μέρος ὁ χρόνος A Aspasius: μόριον ὁ
χρόνος P τῆς κινήσεως om. F¹ 20 ἡ στιγμή HA Aspasius:
αἱ στιγμαὶ EFGIJ T Porphyrius τῆς et 21 αἱ EGHIS: om. FJ
21 χρόνος PPS: χρόνου Torstrik 22 ἀριθμῶν, ἀριθμὸς damnavit
Torstrik ἀριθμῶν EFGHIAPS^c: ἀριθμῶν J: ἀριθμῶν ci. A
ἀριθμὸς om. PS^c 23 μόνου G οὐ EFGJP: πέρατα οὐ
HI δ'] γὰρ S ὁ om. EJPST: τῶν F 25 καὶ] καὶ τὸ I καὶ
om. G 26 γὰρ] μὲν γὰρ F 27-8 δυάς . . . δ' ὡς supra
lituram E² 28 δε] δε ὁ G ἔστι μὲν ὡς ἐστὶν IJ P et in lit. E:
ἐστὶν, ἐστὶ μὲν ὡς F: ἐστὶ μὲν ὡς (ἐστὶν sup. lin. addito in G) GHJ
γραμμῆ J¹ 29 πλήθει] ἀριθμὸς πλήθει H ἢ ἡ μία om. fort. T:
ἢ om. F 31 καὶ] καὶ ὁ FH γὰρ κατὰ μὲν] μὲν κατὰ I 32 ὁ
AP: οἶον E¹: οἶον ὁ E²V οἱ om. E¹FP ^b I δὲ EFGHJS:
δὴ V: δε δὴ I ὅτι EIS: διότι FGHJ βραδὺς μὲν καὶ ταχὺς H
2-3 ἢ . . . βραχύς om. G 2 γὰρ om. I 3 ἢ] ὁ G 4 δὲ
om. G γὰρ E²APS: γὰρ ὁ E¹ ᾧ ἀριθμοῦμεν ΠΡ: om. T, secl.
Torstrik 5 οὐδὲ εἷς H δὲ AST: δὴ EP 6 πρότερος
δὲ καὶ ὕστερος GPT

λουσα ἕτερα, ὁ δὲ χρόνος ἀριθμὸς ἐστὶν οὐχ ᾧ ἀριθμοῦμεν
 ἀλλ' ὁ ἀριθμοῦμενος, οὗτος δὲ συμβαίνει πρότερον καὶ ὕστε-
 10 ρον ἀεὶ ἕτερος· τὰ γὰρ νῦν ἕτερα. ἔστι δὲ ὁ ἀριθμὸς εἰς μὲν
 καὶ ὁ αὐτὸς ὁ τῶν ἑκατὸν ἵππων καὶ ὁ τῶν ἑκατὸν ἀνθρώ-
 πων, ὧν δ' ἀριθμὸς, ἕτερα, οἱ ἵπποι τῶν ἀνθρώπων. ἔτι ὡς
 ἐνδέχεται κίνησις εἶναι τὴν αὐτὴν καὶ μίαν πάλιν καὶ πά-
 14 λιν, οὕτω καὶ χρόνον, οἷον ἐνιαυτὸν ἢ ἕαρ ἢ μετόπωρον.

14 οὐ
 15 μόνον δὲ τὴν κίνησις τῷ χρόνῳ μετροῦμεν, ἀλλὰ καὶ τῇ κι-
 νήσει τὸν χρόνον διὰ τὸ δρῖζεσθαι ὑπ' ἀλλήλων· ὁ μὲν γὰρ
 χρόνος δρῖζει τὴν κίνησις ἀριθμὸς ὧν αὐτῆς, ἡ δὲ κίνησις
 τὸν χρόνον. καὶ λέγομεν πολὺν καὶ ὀλίγον χρόνον τῇ κινήσει
 μετροῦντες, καθάπερ καὶ τῷ ἀριθμητῷ τὸν ἀριθμὸν, οἷον τῷ
 20 ἐνὶ ἵππῳ τὸν τῶν ἵππων ἀριθμὸν. τῷ μὲν γὰρ ἀριθμῷ τὸ
 τῶν ἵππων πλῆθος γνωρίζομεν, πάλιν δὲ τῷ ἐνὶ ἵππῳ τὸν
 τῶν ἵππων ἀριθμὸν αὐτόν. ὁμοίως δὲ καὶ ἐπὶ τοῦ χρόνου καὶ
 τῆς κινήσεως· τῷ μὲν γὰρ χρόνῳ τὴν κίνησις, τῇ δὲ κινήσει
 τὸν χρόνον μετροῦμεν. καὶ τοῦτ' εὐλόγως συμβέβηκεν· ἀκο-
 25 λουθεῖ γὰρ τῷ μὲν μεγέθει ἡ κίνησις, τῇ δὲ κινήσει ὁ χρό-
 νος, τῷ καὶ ποσὰ καὶ συνεχῆ καὶ διαιρητὰ εἶναι· διὰ μὲν
 γὰρ τὸ τὸ μέγεθος εἶναι τοιοῦτον ἡ κίνησις ταῦτα πέπονθεν,
 διὰ δὲ τὴν κίνησις ὁ χρόνος. καὶ μετροῦμεν καὶ τὸ μέγεθος
 τῇ κινήσει καὶ τὴν κίνησις τῷ μεγέθει· πολλὴν γὰρ εἶναι
 30 φαμεν τὴν ὁδόν, ἂν ἡ πορεία πολλή, καὶ ταύτην πολ-
 λήν, ἂν ἡ ὁδὸς [ἡ] πολλή· καὶ τὸν χρόνον, ἂν ἡ κίνησις,
 32 καὶ τὴν κίνησις, ἂν ὁ χρόνος.

32 ἐπεὶ δ' ἐστὶν ὁ χρόνος μέτρον
 221^a κινήσεως καὶ τοῦ κινεῖσθαι, μετρεῖ δ' οὗτος τὴν κίνησις τῷ ὀρί-

^b 9 συμβαίνει] συμβαίνει κατὰ τὸ ΙΤ ὕστερον καὶ πρότερον Η
 10 τὰ . . . ἔστι fecit E μὲν om. E¹ ΙΙ καὶ ὁ τῶν] καὶ τῶν G I :
 τῶν τε H 12 δ'] δ' ὁ H οἱ ἵπποι τῶν ΔS : οἷον ἵππων καὶ E
 14 χρόνον ἐνδέχεται οἷον ΔT 18 καὶ alt.] ἡ Δ χρόνον om. H
 19 καὶ om. F ἀριθμῷ JP τὸν] ἡ fecit J οἷον . . . 20 ἀριθμὸν
 om. I 20-2 τῷ . . . αὐτόν om. H 21 ἐνὶ] ἐν E¹ τὸν
 αὐτῶν ἀριθμὸν. ὁμοίως EV 22 δὲ om. H τις F καὶ τῆς
 GHIJV : om. EF 25 μὲν EGH]PST : om. FI 27 τὸ
 alt. om. EFI εἶναι om. GH τρισσοῦτον καὶ ἡ H 29 φαμεν
 εἶναι GHIJS : φαμεν T 30 ἡ EFGHSPT : ἡ I : ἡ ἡ JS^c καὶ . . .
 31 πολλή] om. G 30 ταύτην φαμεν εἶναι πολλήν H 31 ἡ
 om. SPT 32 τὴν . . . χρόνος pr.] ὁ χρόνος τὴν κίνησις A γρ. S
 ἐστὶν post 221^a I κινήσεως I 221^a I οὕτως FGIJ ὀρίσθαι G

σαι τινα κίνησις ἢ καταμετρήσει τὴν ὄλην (ὥσπερ καὶ τὸ μῆκος ὁ πῆχυς τῷ ὀρίσαι τι μέγεθος ὃ ἀναμετρήσει τὸ ὅλον), καὶ ἔστιν τῇ κινήσει τὸ ἐν χρόνῳ εἶναι τὸ μετρεῖσθαι τῷ χρόνῳ καὶ αὐτὴν καὶ τὸ εἶναι αὐτῆς (ἅμα γὰρ τὴν κί- 5 νησιω καὶ τὸ εἶναι τῆς κινήσεως μετρεῖ, καὶ τοῦτ' ἔστιν αὐτῇ τὸ ἐν χρόνῳ εἶναι, τὸ μετρεῖσθαι αὐτῆς τὸ εἶναι), δῆλον ὅτι καὶ τοῖς ἄλλοις τοῦτ' ἔστι τὸ ἐν χρόνῳ εἶναι, τὸ μετρεῖσθαι αὐτῶν τὸ εἶναι ὑπὸ τοῦ χρόνου. τὸ γὰρ ἐν χρόνῳ εἶναι δυοῖν ἔστιν θάτερον, ἐν μὲν τὸ εἶναι τότε ὅτε ὁ χρόνος ἔστιν, 10 ἐν δὲ ὥσπερ ἓνια λέγομεν ὅτι ἐν ἀριθμῷ ἔστιν. τοῦτο δὲ σημαίνει ἦτοι ὡς μέρος ἀριθμοῦ καὶ πάθος, καὶ ὅλως ὅτι τοῦ ἀριθμοῦ τι, ἢ ὅτι ἔστιν αὐτοῦ ἀριθμός. ἐπεὶ δ' ἀριθμὸς ὁ χρόνος, τὸ μὲν νῦν καὶ τὸ πρότερον καὶ ὅσα τοιαῦτα οὕτως ἐν χρόνῳ ὡς ἐν ἀριθμῷ μονὰς καὶ τὸ περιττὸν καὶ ἄρτιον (τὰ μὲν 15 γὰρ τοῦ ἀριθμοῦ τι, τὰ δὲ τοῦ χρόνου τί ἔστιν)· τὰ δὲ πράγματα ὡς ἐν ἀριθμῷ τῷ χρόνῳ ἐστίν. εἰ δὲ τοῦτο, περιέχεται ὑπὸ χρόνου ὥσπερ (καὶ τὰ ἐν ἀριθμῷ ὑπ' ἀριθμοῦ) καὶ τὰ ἐν τόπῳ ὑπὸ τόπου. φανερὸν δὲ καὶ ὅτι οὐκ ἔστιν τὸ ἐν χρόνῳ εἶναι τὸ εἶναι ὅτε ὁ χρόνος ἔστιν, ὥσπερ οὐδὲ τὸ ἐν κινήσει εἶναι οὐδὲ τὸ ἐν τόπῳ 20 ὅτε ἡ κίνησις καὶ ὁ τόπος ἔστιν. εἰ γὰρ ἔσται τὸ ἐν τιμῷ οὕτω, πάντα τὰ πράγματα ἐν ὁμοῦν ἔσται, καὶ ὁ οὐρανὸς ἐν τῇ κέγχρῳ· ὅτε γὰρ ἡ κέγχρος ἔστιν, ἔστι καὶ ὁ οὐρανός. ἀλλὰ τοῦτο μὲν συμβέβηκεν, ἐκεῖνο δ' ἀνάγκη παρακολουθεῖν, καὶ τῷ ὄντι ἐν χρόνῳ εἶναι τινα χρόνον ὅτε κακεῖνο ἔστιν, καὶ τῷ ἐν κινήσει 25 ὄντι εἶναι τότε κίνησις. 26

ἐπεὶ δὲ ἔστιν ὡς ἐν ἀριθμῷ τὸ ἐν χρόνῳ, 26

^a 2 καταμετρήσαι I τὴν . . . 3 ἀναμετρήσει om. F 2 ὁ πῆχυς τὸ μῆκος HIJ 3 ὅ] καὶ G ὀρίσαι EGST: ὀρίσθαι FHIJ 4 τὸ alt.] τῷ G 5-7 τῷ . . . μετρεῖσθαι om. F 5 αὐτῆς E²FGHIJ²VST: αὐτῆν E¹: αὐτῇ J¹P 6 τῆς κινήσεως Torstrik, fort. AST: τῇ κινήσει Π μετρεῖ om. E αὐτῇ om. H 7 δῆλον AST Damascius: δῆλον δὲ EFGIJP: δὲ δῆλον H: δῆλον δὲ Bonitz 9 αὐτοῖς I 10 δυεῖν E: δυοῖν γὰρ G ὁ EGHT: om. FIJS 11 δὲ pr. EST: δὲ τὸ Δ 12 ἦτοι] τὸ ἦ E ὅτε G 13 δ'] δ' ἔστιν E 14 ὅσα] ὅσα ἄλλα H 15 μονὰς τε καὶ H καὶ τὸ ἄρτιον FH 16 τι] ὅτι E 17 τῷ χρόνῳ τι ἔστιν I: ἐν τῷ χρόνῳ ἐστίν, ὅτι τοῦ εἶναι αὐτῶν ὁ ἀριθμὸς ὁ χρόνος ἐστίν Torstrik: οἱ δέκα ἵπποι fort. PST ὑπὸ . . . 18 ἀριθμοῦ ex ST scripsi: ὑπ' (ὑπὸ τοῦ H) ἀριθμοῦ ὥσπερ Π: ὑπὸ χρόνου ὥσπερ Torstrik 18 ὑπὸ τοῦ τόπου AST 19 ὅτι καὶ G ὁ E²ΔPPT: om. E¹P¹S 21 ὅτε] εἶναι ὅτε H ἢ om. E: γὰρ ἢ G¹ 23 ἔστι post οὐρανός HI: om. F 25 χρόνῳ τὸ εἶναι H

ληφθήσεται τις πλείων χρόνος παντός τοῦ ἐν χρόνῳ ὄντος·
 διὸ ἀνάγκη πάντα τὰ ἐν χρόνῳ ὄντα περιέχεσθαι ὑπὸ χρόνου,
 ὡσπερ καὶ τᾶλλα ὅσα ἐν τιῷ ἐστιν, οἷον τὰ ἐν τόπῳ ὑπὸ
 30 τοῦ τόπου. καὶ πάσχει δὴ τι ὑπὸ τοῦ χρόνου, καθάπερ καὶ
 λέγειν εἰώθαμεν ὅτι κατατῆκε ὁ χρόνος, καὶ γηράσκει
 πάνθ' ὑπὸ τοῦ χρόνου, καὶ ἐπιλανθάνεται διὰ τὸν χρόνον, ἀλλ'
 221^b οὐ μεμάθηκεν, οὐδὲ νέον γέγονεν οὐδὲ καλόν· φθορᾶς γὰρ αἰ-
 τιος καθ' ἑαυτὸν μᾶλλον ὁ χρόνος· ἀριθμὸς γὰρ κινήσεως,
 ἣ δὲ κίνησις ἐξίστησι τὸ ὑπάρχον· ὥστε φανερόν ὅτι τὰ αἰεὶ
 ὄντα, ἣ αἰεὶ ὄντα, οὐκ ἔστιν ἐν χρόνῳ· οὐ γὰρ περιέχεται ὑπὸ
 5 χρόνου, οὐδὲ μετρεῖται τὸ εἶναι αὐτῶν ὑπὸ τοῦ χρόνου· ση-
 μείον δὲ τούτου ὅτι οὐδὲ πάσχει οὐδὲν ὑπὸ τοῦ χρόνου ὡς
 οὐκ ὄντα ἐν χρόνῳ. ἐπεὶ δ' ἔστιν ὁ χρόνος μέτρον κινήσεως,
 ἔσται καὶ ἡρεμίας μέτρον [κατὰ συμβεβηκός]· πᾶσα γὰρ
 ἡρεμία ἐν χρόνῳ. οὐ γὰρ ὡσπερ τὸ ἐν κινήσει ὄν ἀνάγκη κι-
 10 νεῖσθαι, οὕτω καὶ τὸ ἐν χρόνῳ· οὐ γὰρ κίνησις ὁ χρόνος,
 ἀλλ' ἀριθμὸς κινήσεως, ἐν ἀριθμῷ δὲ κινήσεως ἐνδέχεται εἶ-
 ναι καὶ τὸ ἡρεμοῦν. οὐ γὰρ πᾶν τὸ ἀκίνητον ἡρεμεῖ, ἀλλὰ
 τὸ ἐστερημένον κινήσεως πεφυκὸς δὲ κινεῖσθαι, καθάπερ εἴρη-
 ται ἐν τοῖς πρότερον. τὸ δ' εἶναι ἐν ἀριθμῷ ἔστιν τὸ εἶναι τινα
 15 ἀριθμὸν τοῦ πράγματος, καὶ μετρεῖσθαι τὸ εἶναι αὐτοῦ τῷ
 ἀριθμῷ ἐν ᾧ ἔστιν, ὡστ' εἰ ἐν χρόνῳ, ὑπὸ χρόνου. μετρήσει
 δ' ὁ χρόνος τὸ κινούμενον καὶ τὸ ἡρεμοῦν, ἣ τὸ μὲν κινούμενον τὸ
 δὲ ἡρεμοῦν· τὴν γὰρ κίνησιν αὐτῶν μετρήσει καὶ τὴν ἡρεμίαν,
 πόση τις. ὥστε τὸ κινούμενον οὐχ ἀπλῶς ἔσται μετρητὸν ὑπὸ χρό-
 20 νου, ἣ ποσόν τί ἐστιν, ἀλλ' ἣ ἢ κίνησις αὐτοῦ ποσῆ. ὥστε ὅσα
 μήτε κινεῖται μήτ' ἡρεμεῖ, οὐκ ἔστιν ἐν χρόνῳ· τὸ μὲν γὰρ ἐν
 χρόνῳ εἶναι τὸ μετρεῖσθαι ἔστι χρόνῳ, ὁ δὲ χρόνος κινήσεως

^a 28 τὰ om. E ὑπὸ] ὑπὸ τοῦ FHI 29 ἔστω E 30 καὶ om. F
 πάσχει EGHVPS : πάσχειν FIJ καθάπερ... 31 εἰώθαμεν om. F
 30 καὶ om. E¹ 32 πάνθ' AS : πᾶν E καὶ... χρόνον] οὐδὲ μετρεῖται
 τὸ εἶναι αὐτοῦ ὑπὸ τοῦ χρόνου F ^b 1 αἴτιος APST : αἴτιον E 3 τὰ
 AST : om. E 4 ὑπὸ τοῦ χρόνου F 5 οὐδὲ... χρόνου om. G
 6 τούτοις E 7 ἐν] ἐν τῷ I 8 κατὰ συμβεβηκός E² APS : om.
 E¹ VAT γρ. P 10 τὸ ἐν] ἐν τῷ I γὰρ] γὰρ ἢ I 12 ἡρεμοῦν] ἡρεμείν F
 15 αὐτοῦ AS : αὐτῶ E 16 εἰ... ὑπὸ AV : καὶ ἐν χρόνῳ τὸ ὑπὸ χρόνου
 καὶ μέρος E 18 μετρήσει om. S 19 ἔστιν E χρόνῳ F¹ : τοῦ
 χρόνου E² H 20 ἣ... ἔστιν om. E¹ V ἣ ἢ] ἣ I : ἣ S ποσῆ τις.
 ὡστ' HS 21 μήτε EGI] PPS : μή FHP¹ οὐκ APS : οὐδὲ E μὲν
 om. F 22 εἶναι... χρόνῳ E² AP : om. E¹ : εἶναι om. S ἔστι τὸ
 μετρεῖσθαι FGIJS : τὸ μετρεῖσθαι P

καὶ ἡρεμίας μέτρον.

23

φανερὸν οὖν ὅτι οὐδὲ τὸ μὴ ὄν ἔσται πᾶν ἐν 23
 χρόνῳ, οἶον ὅσα μὴ ἐνδέχεται ἄλλως, ὥσπερ τὸ τὴν διά-
 μετρον εἶναι τῇ πλευρᾷ σύμμετρον. ὅλως γάρ, εἰ μέτρον 25
 μὲν ἔστι κινήσεως ὁ χρόνος καθ' αὐτό, τῶν δ' ἄλλων κατὰ
 συμβεβηκός, δῆλον ὅτι ὦν τὸ εἶναι μετρεῖ, τούτοις ἅπασιν
 ἔσται τὸ εἶναι ἐν τῷ ἡρεμεῖν ἢ κινεῖσθαι. ὅσα μὲν οὖν φθαρτὰ
 καὶ γενητὰ καὶ ὅλως ὅτε μὲν ὄντα ὅτε δὲ μὴ, ἀνάγκη ἐν
 χρόνῳ εἶναι (ἔστιν γὰρ χρόνος τις πλείων, ὃς ὑπερέξει τοῦ τε 30
 εἶναι αὐτῶν καὶ τοῦ μετροῦντος τὴν οὐσίαν αὐτῶν) τῶν δὲ μὴ ὄντων
 ὅσα μὲν περιέχει ὁ χρόνος, τὰ μὲν ἦν, οἶον "Ομηρός ποτε
 ἦν, τὰ δὲ ἔσται, οἶον τῶν μελλόντων τι, ἐφ' ὀπότερα περι- 222^a
 ἔχει· καὶ εἰ ἐπ' ἄμφω, ἄμφοτέρα [καὶ ἦν καὶ ἔσται]· ὅσα
 δὲ μὴ περιέχει μηδαμῆ, οὔτε ἦν οὔτε ἔστιν οὔτε ἔσται. ἔστι δὲ τὰ
 τοιαῦτα τῶν μὴ ὄντων, ὅσων τάντικείμενα αἰεὶ ἔστιν, οἶον τὸ
 ἀσύμμετρον εἶναι τὴν διάμετρον αἰεὶ ἔστι, καὶ οὐκ ἔσται τοῦτ' 5
 ἐν χρόνῳ. οὐ τοίωον οὐδὲ τὸ σύμμετρον· διὸ αἰεὶ οὐκ ἔστιν, ὅτι
 ἐναντίον τῷ αἰεὶ ὄντι. ὅσων δὲ τὸ ἐναντίον μὴ αἰεὶ, ταῦτα
 δὲ δύναται καὶ εἶναι καὶ μὴ, καὶ ἔστιν γένεσις καὶ φθορὰ
 αὐτῶν.

- 13 Τὸ δὲ νῦν ἔστιν συνέχεια χρόνου, ὥσπερ ἐλέχθη· συνέχει 10
 γὰρ τὸν χρόνον τὸν παρεληλυθότα καὶ ἐσόμενον, καὶ
 πέρας χρόνου ἔστί· ἔστι γὰρ τοῦ μὲν ἀρχή, τοῦ δὲ τελευτή.
 ἀλλὰ τοῦτ' οὐχ ὥσπερ ἐπὶ τῆς στιγμῆς μενούσης φανερόν.
 διαιρεῖ δὲ δυνάμει. καὶ ἦ μὲν τοιοῦτο, αἰεὶ ἕτερον τὸ νῦν,
 ἦ δὲ συνδεῖ, αἰεὶ τὸ αὐτό, ὥσπερ ἐπὶ τῶν μαθηματικῶν 15

^b 23 καὶ] ἔστι καὶ H 24 μὴ om. E ἀλλ' E 25 ὅλως
 μὲν γὰρ H 26 μὲν om. GJ²P ἔστι ὁ χρόνος κινήσεως FGIJ :
 κινήσεως ἔστι ὁ χρόνος H 28 ἔστι F 29 γενητὰ FI μὴ]
 μὴ ὄντα H 30 ὅς] ὅσων H ὑπάρξει I 30-31 τοῦ
 ... καὶ om. S 30 τε om. ΔΤ 31 αὐτῶν alt. EVST : om. E²Λ
 222^a I οἶον E²AVPS : om. E¹ τι om. S 2 καὶ εἰ ... ἔσται E²FGHIJ P¹
 (ἄμφω om. H) : om. E¹ : καὶ ἦν καὶ ἔσται seclusi, om. VPP ὅσα] ὦν
 E²GHIP 3 περιέχει E²ΔP : om. E¹ μηδὲν H : om. E¹ οὔτε
 ἔστιν om. I ἔστι] ἔτι T 4 μὴ sup. lin. E¹ 5 ἔσται H 6 σύμ-
 μετρον] σύμμετρον εἶναι H διὸ ... ὅτι] διότι T, Torstrik 8 δὲ om. F
 καὶ pr. om. E μὴ] μὴ εἶναι E 11 τὸν χρόνον om. F παρελη-
 λυθότα EGT : παρελθόντα FHIJ ἐρχόμενον χρόνον καὶ F
 12 πέρας E¹V γρ. S : ὅρος ST : ὅλως πέρας E²Λ ἔστίιν
 om. E¹

γραμμῶν (οὐ γὰρ ἡ αὐτὴ αἰεὶ στιγμή τῇ νοήσει· διαιρούντων
 γὰρ ἄλλη καὶ ἄλλη· ἢ δὲ μία, ἡ αὐτὴ πάντη)—οὕτω καὶ τὸ
 νῦν τὸ μὲν τοῦ χρόνου διαίρεσις κατὰ δύναμιν, τὸ δὲ πέρασ
 ἀμφοῖν καὶ ἐνόησις· ἔστι δὲ ταῦτὸ καὶ κατὰ ταῦτὸ ἡ διαί-
 20 ρεσις καὶ ἡ ἔνωσις, τὸ δ' εἶναι οὐ ταῦτό. τὸ μὲν οὖν οὕτω λέ-
 γεται τῶν νῦν, ἄλλο δ' ὅταν ὁ χρόνος ὁ τούτου ἐγγὺς ᾖ.
 ἤξει νῦν, ὅτι τήμερον ἤξει· ἢκει νῦν, ὅτι ἦλθε τήμερον. τὰ
 δ' ἐν Ἰλίῳ γέγονεν οὐ νῦν, οὐδ' ὁ κατακλυσμός [γένεον] νῦν·
 καίτοι συνεχῆς ὁ χρόνος εἰς αὐτά, ἀλλ' ὅτι οὐκ ἐγγύς. τὸ δὲ
 25 ποτέ χρόνος ὀρισμένους πρὸς τὸ πρότερον νῦν, οἷον ποτέ ἐλή-
 φθη Τροία, καὶ ποτέ ἔσται κατακλυσμός· δεῖ γὰρ πεπε-
 ράνθαι πρὸς τὸ νῦν. ἔσται ἄρα ποσὸς τις ἀπὸ τοῦδε χρόνος
 εἰς ἐκεῖνο, καὶ ἦν εἰς τὸ παρελθόν. εἰ δὲ μηδεὶς χρόνος
 ὅς οὐ ποτε, πᾶς ἂν εἴη χρόνος πεπερασμένος. ἄρ' οὖν ὑπο-
 30 λεῖψαι; ἢ οὐ, εἴπερ αἰεὶ ἔστι κίνησις; ἄλλος οὖν ἢ ὁ αὐτὸς
 πολλάκις; δῆλον ὅτι ὡς ἂν ἡ κίνησις, οὕτω καὶ ὁ χρόνος·
 εἰ μὲν γὰρ ἡ αὐτὴ καὶ μία γίγνεται ποτε, ἔσται καὶ χρόνος
 εἰς καὶ ὁ αὐτός, εἰ δὲ μή, οὐκ ἔσται. ἐπεὶ δὲ τὸ νῦν τελευτῇ
 222^b καὶ ἀρχῇ χρόνου, ἀλλ' οὐ τοῦ αὐτοῦ, ἀλλὰ τοῦ μὲν παρήκουτος
 τελευτῇ, ἀρχῇ δὲ τοῦ μέλλοντος, ἔχει ἂν ὥσπερ ὁ κύκλος
 ἐν τῷ αὐτῷ πως τὸ κυρτὸν καὶ τὸ κοῖλον, οὕτως καὶ ὁ χρό-
 νος αἰεὶ ἐν ἀρχῇ καὶ τελευτῇ. καὶ διὰ τοῦτο δοκεῖ αἰεὶ ἔτε-
 5 ρος· οὐ γὰρ τοῦ αὐτοῦ ἀρχῇ καὶ τελευτῇ τὸ νῦν· ἄμα γὰρ
 ἂν καὶ κατὰ τὸ αὐτὸ τάναντία ἂν εἴη. καὶ οὐχ ὑπολείψει

^a 16-17 οὐ . . . γὰρ] ἢ μὲν ἔν, ταύτη αἰεὶ μία ἡ στιγμή, τῇ νοήσει δὲ
 διαιρούντων αἰεὶ γρ. P 16 οὐ γὰρ EGHJ et in ras. F: ἢ μὲν P
 αἰεὶ E¹HVP: μία αἰεὶ E²F: αἰεὶ μία GIJ διαιρούντων γὰρ
 E²AV: καὶ αἰεὶ διαιρούντων E¹: διαιρούντων αἰεὶ P 17 καὶ ἄλλη
 FPT: om. EGHJJA πάντη om. G οὕτω δὲ καὶ H 19 ταῦτό
 alt. E²FGIJPS: αὐτὸ E¹H 20 οὖν GHIJVST: om. EF
 21 τὸ ex τῶν fecit E ἄλλο δ' ὅταν] τὸ δ' ἄλλως fecit E ὁ
 pr. om. GJ ἦ] ἢ ἔστιν fecit E 22 ἤξει γὰρ νῦν H ἤξει, καὶ
 ἢκει H ἢκει H 23 οὐ γέγονε S οὐδ' . . . νῦν om. EV: οὐδ' ὁ
 κατακλυσμός S γέγονε secl. Torstrik, om. T: ἔσται H 24 ὁ
 EPST: ἔστι H: om. FGIJ εἰς αὐτά] εἰς ὁ αὐτός H 25 πρότερον
 secl. Bonitz 26 ἡ τροία F 27 τοῦδε ὁ χρόνος F 28 εἰς pr.
 HP: καὶ εἰς EFIJ: om. G μηδεὶς EHJPS: μὴ εἰς F: μηδὲ εἰς GI
 30 ὁ om. H 31 ὅτι] δ' ὅτι H: οὖν J ἂν εἴη ἢ F
 32 καὶ alt. EVT: om. A 33 ἐπεὶ δὲ AP: ἐπειδὴ E: ἐπεὶ γὰρ T
^b I ἀρχῇ τοῦ χρόνου F 33 τὸ alt. om. H 6 ἂν secl.
 Bonitz κατὰ om. S τάναντία ἂν EV et ut vid. PS: τὰ
 ἀντικείμενα ΔΤ

δη· αἰεὶ γὰρ ἐν ἀρχῇ.

7

τὸ δ' ἤδη τὸ ἐγγύς ἐστι τοῦ παρόν- 7
τος νῦν ἀτόμου μέρος τοῦ μέλλοντος χρόνου (πότε βαδίζεις;
ἤδη, ὅτι ἐγγύς ὁ χρόνος ἐν ᾧ μέλλει), καὶ τοῦ παρεληλυ-
θότος χρόνου τὸ μὴ πόρρω τοῦ νῦν (πότε βαδίζεις; ἤδη βε- 10
βάδικα). τὸ δὲ Ἴλιον φάναι ἤδη ἐαλωκέναι οὐ λέγομεν, ὅτι
λίαν πόρρω τοῦ νῦν. καὶ τὸ ἄρτι τὸ ἐγγύς τοῦ παρόντος
νῦν [τὸ] μόριον τοῦ παρελθόντος. πότε ἦλθες; ἄρτι, ἐὰν ἦ
ὁ χρόνος ἐγγύς τοῦ ἐνεστώτος νῦν. πάλαι δὲ τὸ πόρρω. τὸ
δ' ἐξαίφνης τὸ ἐν ἀναισθητῷ χρόνῳ διὰ μικρότητα ἐκστάν· 15
μεταβολὴ δὲ πᾶσα φύσει ἐκστατικόν. ἐν δὲ τῷ χρόνῳ πάντα
γίγνεται καὶ φθίρεται· διὸ καὶ οἱ μὲν σοφώτατον ἔλεγον, ὁ
δὲ Πυθαγόρειος Πάρων ἀμαθέστατον, ὅτι καὶ ἐπιλανθάνονται
ἐν τούτῳ, λέγων ὀρθότερον. δῆλον οὖν ὅτι φθορᾶς μᾶλλον
ἔσται καθ' αὐτὸν αἴτιος ἢ γενέσεως, καθάπερ ἐλέχθη καὶ 20
πρότερον (ἐκστατικὸν γὰρ ἢ μεταβολὴ καθ' αὐτήν), γενέσεως
δὲ καὶ τοῦ εἶναι κατὰ συμβεβηκός. σημεῖον δὲ ἱκανὸν ὅτι
γίγνεται μὲν οὐδὲν ἄνευ τοῦ κινεῖσθαι πῶς αὐτὸ καὶ πράττειν,
φθίρεται δὲ καὶ μηδὲν κινούμενον. καὶ ταύτην μάλιστα λέ-
γειν εἰώθαμεν ὑπὸ τοῦ χρόνου φθοράν. οὐ μὴν ἀλλ' οὐδὲ ταύ- 25
την ὁ χρόνος ποιεῖ, ἀλλὰ συμβαίνει ἐν χρόνῳ γίγνεσθαι καὶ
ταύτην τὴν μεταβολήν. ὅτι μὲν οὖν ἔστιν ὁ χρόνος καὶ τί,
καὶ ποσαχῶς λέγεται τὸ νῦν, καὶ τί τὸ ποτὲ καὶ τὸ ἄρτι
καὶ τὸ ἤδη καὶ τὸ πάλαι καὶ τὸ ἐξαίφνης, εἴρηται.

14 Τούτων δ' ἡμῖν οὕτω διωρισμένων φανερόν ὅτι πᾶσα 30
μεταβολὴ καὶ ἅπαν τὸ κινούμενον ἐν χρόνῳ. τὸ γὰρ θάπτον

^b 8 βαδίσεις GH : δὴ βαδίζεις F : βαδίξει T 9 παρελθόντος
FGHIT 10 βαδίσεις EGIJS : βαδίσεις FH 11 δὲ
FGIJST : δὲ τὸ EH 12 λίαν πόρρω EHT : πόρρω λίαν FGIJS
13 τὸ om. ST, Bonitz ἦλθεν G 14 ἐγγύς APST : ὁ ἐγγύς
E 15 ἀναισθητῷ EFGIJT : ἀνεπαισθητῷ HS διὰ μικρότητα
E²AS : διὰ μικρότητα PT γρ. S : om. E¹V ἐκστάν FG²IJPT γρ.
S : om. EG¹HVS 16 ἐκστατικῇ F πανθ' ἃ Torstrik
18 παρὼν ci. S 20 ἐστίν ST κατ' αὐτὸν E 22 ἱκανὸν
γίνεται μὲν γὰρ οὐδὲν H 23 μηδὲν G 24 δὲ] γὰρ G
25 εἰώθαμεν E²AT : εἴωθα E¹ οὐ μὴν E²APT : om. E¹ 27 καὶ
τί FGIJT : καὶ τίς E : om. H 28 λέγεται HT : τί τε E : λέγομεν
FGIJ τὸ ult. AT : om. E 29 τὸ pr. EFJT : τί τὸ GHI τὸ alt.
FHIT : om. EGJ 30 ὡδε H διωρισμένων HPT : διηρημημένων
FGJ et in lit. E : διηρημένων I πᾶσα μεταβολὴ EPST : ἅπασα ἢ
μεταβολὴ H : ἅπασαν μεταβολὴν FGIJ 31 ἐν χρόνῳ FV : ἀνάγκη
κινεῖσθαι ἐν χρόνῳ APT : ἐν χρόνῳ ἐστίν S¹

καὶ βραδύτερον κατὰ πᾶσάν ἐστιν μεταβολήν (ἐν πᾶσι γὰρ οὕτω φαίνεται). λέγω δὲ θάττον κινεῖσθαι τὸ πρότερον μετα-
 223^a βάλλον εἰς τὸ ὑποκείμενον κατὰ τὸ αὐτὸ διάστημα καὶ ὁμα-
 λήν κίνησιν κινούμενον (οἶον ἐπὶ τῆς φορᾶς, εἰ ἄμφω κατὰ
 τὴν περιφερῆ κινεῖται ἢ ἄμφω κατὰ τὴν εὐθεΐαν· ὁμοίως δὲ
 καὶ ἐπὶ τῶν ἄλλων). ἀλλὰ μὴν τό γε πρότερον ἐν χρόνῳ ἐστὶ
 5 πρότερον γὰρ καὶ ὕστερον λέγομεν κατὰ τὴν πρὸς τὸ νῦν ἀπό-
 στασιν, τὸ δὲ νῦν ὄρος τοῦ παρήκοντος καὶ τοῦ μέλλοντος· ὥστ'
 ἐπεὶ τὰ νῦν ἐν χρόνῳ, καὶ τὸ πρότερον καὶ ὕστερον, ἐν χρόνῳ
 ἔσται· ἐν ᾧ γὰρ τὸ νῦν, καὶ ἡ τοῦ νῦν ἀπόστασις. (ἐναντίως
 δὲ λέγεται τὸ πρότερον κατὰ τε τὸν παρεληλυθότα χρόνον
 10 καὶ τὸν μέλλοντα· ἐν μὲν γὰρ τῷ παρεληλυθότι πρότερον
 λέγομεν τὸ πορρώτερον τοῦ νῦν, ὕστερον δὲ τὸ ἐγγύτερον, ἐν
 δὲ τῷ μέλλοντι πρότερον μὲν τὸ ἐγγύτερον, ὕστερον δὲ τὸ
 πορρώτερον.) ὥστε ἐπεὶ τὸ μὲν πρότερον ἐν χρόνῳ, πάσῃ δ'
 ἀκολουθεῖ κινήσει τὸ πρότερον, φανερόν ὅτι πᾶσα μεταβολή
 15 καὶ πᾶσα κίνησις ἐν χρόνῳ ἐστίν.

ἄξιον δ' ἐπισκέψεως καὶ πῶς ποτε ἔχει ὁ χρόνος πρὸς
 τὴν ψυχὴν, καὶ διὰ τί ἐν παντὶ δοκεῖ εἶναι ὁ χρόνος, καὶ
 ἐν γῆ καὶ ἐν θαλάττῃ καὶ ἐν οὐρανῷ. ἢ ὅτι κινήσεώς τι πά-
 θος ἢ ἕξις, ἀριθμὸς γε ὢν, ταῦτα δὲ κινητὰ πάντα (ἐν τόπῳ
 20 γὰρ πάντα), ὁ δὲ χρόνος καὶ ἡ κίνησις ἅμα κατὰ τε δύνα-
 μιν καὶ κατ' ἐνέργειαν; πότερον δὲ μὴ οὐσης ψυχῆς εἴη ἂν
 ὁ χρόνος ἢ οὐ, ἀπορήσειεν ἂν τις. ἀδύνατον γὰρ ὄντος εἶναι
 τοῦ ἀριθμησόντος ἀδύνατον καὶ ἀριθμητόν τι εἶναι, ὥστε δη-
 λον ὅτι οὐδ' ἀριθμὸς. ἀριθμὸς γὰρ ἢ τὸ ἠριθμημένον ἢ τὸ
 25 ἀριθμητόν. εἰ δὲ μηδὲν ἄλλο πέφυκεν ἀριθμεῖν ἢ ψυχὴ καὶ
 ψυχῆς νοῦς, ἀδύνατον εἶναι χρόνον ψυχῆς μὴ οὐσης, ἀλλ'

^b 32 κατὰ] καὶ G ἐν ἀπάσαις H 223^a 2 οἶον E²AVP : om.
 E¹ εἰ] ἢ J 3 περιφέρειαν HP 4 γε EGHJJP : om.
 FT 7 καὶ τὸ] δηλονότι καὶ τὰ H καὶ] καὶ τὰ H 8 νῦν
 ἐστι καὶ H 9 τε om. J¹ χρόνον καὶ τὸν μέλλοντα AP^p : καὶ
 τὸν μέλλοντα χρόνον EP¹ 13 τὸ AP : om. E 15 πᾶσα
 om. H 17 δοκεῖ ἐν ἅπαντι H ὁ om. FGJP καὶ]
 οἶον καὶ H 18 ἐν alt. om. F ἐν om. FGJ ἢ E²FGHJP :
 om. E¹IT διότι I 19 κινεῖ τὰ fecit E 20 χρόνος EFGHJST :
 τόπος IP γρ. A ἢ om. J 21 ψυχῆς ET : τῆς ψυχῆς AS
 22 εἶναι om. F 24 οὐδ'] οὐδ' ὁ G ἀριθμούμενον F :
 ἀριθμημένον J 25 ἀριθμεῖν ἢ ψυχὴ EHT : ἢ ψυχὴ ἀριθμεῖν
 FGIJ

ἢ τοῦτο ὃ ποτε ὄν ἔστιν ὁ χρόνος, οἷον εἰ ἐνδέχεται κίνησιν εἶ-
ναι ἄνευ ψυχῆς. τὸ δὲ πρότερον καὶ ὕστερον ἐν κινήσει ἔστιν·
χρόνος δὲ ταῦτ' ἔστιν ἢ ἀριθμητὰ ἔστιν.

29

ἀπορήσειε δ' ἂν τις 29

καὶ ποίας κινήσεως ὁ χρόνος ἀριθμός. ἢ ὅποιασούνη; καὶ γὰρ 30
γίγνεται ἐν χρόνῳ καὶ φθίρεται καὶ αὐξάνεται καὶ ἀλλοι-
οῦται καὶ φέρεται· ἢ οὖν κινήσις ἔστι, ταύτη ἔστιν
ἐκάστης κινήσεως ἀριθμός. διὸ κινήσεώς ἔστιν ἀπλῶς ἀριθμὸς
συνεχοῦς, ἀλλ' οὐ τινός. ἀλλ' ἔστι νῦν κεκινήσθαι καὶ ἄλλο 223^b
ᾧ ἐκατέρας τῆς κινήσεως εἴη ἂν ἀριθμός. ἕτερος οὖν χρόνος
ἔστιν, καὶ ἅμα δύο ἴσοι χρόνοι ἂν εἶεν· ἢ οὐ; ὁ αὐτὸς γὰρ
χρόνος καὶ εἰς ὁ ἴσος καὶ ἅμα· εἶδει δὲ καὶ οἱ μὴ ἅμα· εἰ
γὰρ εἶεν κύνες, οἱ δ' ἵπποι, ἐκότεροι δ' ἐπτά, ὁ αὐτὸς ἀρι- 5
θμός. οὕτω δὲ καὶ τῶν κινήσεων τῶν ἅμα περαινομένων ὁ αὐ-
τὸς χρόνος, ἀλλ' ἢ μὲν ταχεῖα ἴσως ἢ δ' οὐ, καὶ ἢ μὲν
φορὰ ἢ δ' ἀλλοίωσις· ὁ μέντοι χρόνος ὁ αὐτός, εἴπερ καὶ
[ὁ ἀριθμὸς] ἴσος καὶ ἅμα, τῆς τε ἀλλοιώσεως καὶ τῆς
φορᾶς. καὶ διὰ τοῦτο αἱ μὲν κινήσεις ἕτεραι καὶ χωρὶς, ὁ 10
δὲ χρόνος πανταχοῦ ὁ αὐτός, ὅτι καὶ ὁ ἀριθμὸς εἰς καὶ ὁ
αὐτὸς πανταχοῦ ὁ τῶν ἴσων καὶ ἅμα.

12

ἐπεὶ δ' ἔστι φορὰ 12

καὶ ταύτης ἢ κύκλω, ἀριθμεῖται δ' ἕκαστον ἐνὶ τινι συγγενεί,

^a 27 ἢ FGHJ²VP: ἀεὶ E: om. J¹ ὄν ΠP: om. S ὁ ΠP^oS:
om. P¹ εἶναι om. F 28 δέ] τε H 29 χρόνος ΔPS:
ὁ χρόνος E 30 ἀριθμὸς ὁ χρόνος HS: ἀριθμὸς ἔστιν ὁ χρόνος P
ποιασούνη J 31 ἐν χρόνῳ om. I καὶ φθίρεται om. EFG:
ante καὶ ἀλλοιοῦται H αὐξεται GH 32 καὶ EV: ἐν χρόνῳ
καὶ Λ φθίρεται E¹ ἢ] εἰ E 33 ἔστιν ἀπλῶς
ἀριθμὸς EPS: ἀπλῶς ἀριθμὸς ἔστι Λ ^b I κινεῖσθαι GP²:
καὶ κινεῖσθαι HS ἄλλο E²F¹GPS: ἄλλα E¹HIJ: ἄλλως F²
2 ὄν ... τῆς] ὥστε καὶ ἕτερας Torstriek: an ὥσθ' ἐκατέρας τῆς (fort. P)?
3 χρόνοι ἴσοι H ἢ οὐ ΔV: om. corr. E αὐτὸς EFHS: ἅπας
GIJ γρ. E 4 καὶ ... ἴσος καὶ scripsi: καὶ ἴσος καὶ E¹: καὶ ἴσος
καὶ πᾶς E²: εἰς ὁμοίως καὶ FGIJ γρ. E: εἰς καὶ ἴσος καὶ πᾶς H: ὁ
ἴσος καὶ πᾶς S^o: πᾶς καὶ εἰς ὁ ἴσος καὶ Torstriek: ὁ καὶ ἴσος καὶ By-
water: πᾶς ὁ ἴσος καὶ Carteron καὶ E²ΔPS: om. E¹ 5 εἶεν
FGIJP: οἱ μὲν εἶεν E: εἶεν οἱ μὲν H 6 δὲ om. E¹H: δὴ
Torstriek 9 ὁ ἀριθμὸς seclusi φορᾶς καὶ τῆς ἀλλοιώσεως
H II πανταχῇ H 12 πανταχοῦ ΔPS: πανταχῇ E
καὶ om. J¹ ἔστι] ἔστι τῶν κινήσεων πρώτῃ ἢ Torstriek: πρώτῃ
ἔστι Prantl 13 ἐνὶ E¹FGHP: ἐν E²IJ τινι E²AVPP: om.
E¹P¹T

μονάδες μονάδι, ἵπποι δ' ἵππων, οὕτω (δὲ) καὶ ὁ χρόνος χρόνων
 15 τινὶ ὠρισμένῳ, μετρεῖται δ', ὡσπερ εἶπομεν, ὃ τε χρόνος κινῆσει καὶ ἡ κινήσις χρόνῳ (τοῦτο δ' ἐστίν, ὅτι ὑπὸ τῆς ὠρισμένης κινήσεως χρόνῳ μετρεῖται τῆς τε κινήσεως τὸ ποσὸν καὶ τοῦ χρόνου)—εἰ οὖν τὸ πρῶτον μέτρον πάντων τῶν συγγενῶν, ἢ κυκλοφορία ἢ ὀμαλῆς μέτρον μάλιστα, ὅτι ὁ ἀριθμὸς ὁ ταύτης γνωριμώτατος. ἀλλοίωσις μὲν οὖν οὐδὲ αὐξήσις οὐδὲ γένεσις οὐκ εἰσὶν ὀμαλεῖς, φορὰ δ' ἐστίν. διὸ καὶ δοκεῖ ὁ χρόνος εἶναι ἢ τῆς σφαίρας κινήσις, ὅτι ταύτη μετροῦνται αἱ ἄλλαι κινήσεις καὶ ὁ χρόνος ταύτη τῇ κινήσει. διὰ δὲ τοῦτο καὶ τὸ εἰωθὸς λέγεσθαι συμβαίνει· φασὶν γὰρ κύκλον εἶναι τὰ ἀνθρώπινα πράγματα, καὶ τῶν ἄλλων τῶν κινήσιων ἐχόντων φυσικὴν καὶ γένεσιν καὶ φθοράν. τοῦτο δέ, ὅτι ταῦτα πάντα τῷ χρόνῳ κρίνεται, καὶ λαμβάνει τελευτήν καὶ ἀρχὴν ὡσπερ ἂν εἰ κατὰ τινα περίοδον. καὶ γὰρ ὁ χρόνος αὐτὸς εἶναι δοκεῖ κύκλος τις· τοῦτο δὲ πάλιν δοκεῖ, 30 διότι τοιαύτης ἐστὶ φορᾶς μέτρον καὶ μετρεῖται αὐτὸς ὑπὸ τοιαύτης. ὥστε τὸ λέγειν εἶναι τὰ γιγνόμενα τῶν πραγμάτων κύκλον τὸ λέγειν ἐστίν τοῦ χρόνου εἶναι τινα κύκλον· τοῦτο δέ, ὅτι μετρεῖται τῇ κυκλοφορίᾳ· παρὰ γὰρ τὸ μέτρον οὐδὲν 224^a ἄλλο παρεμφαίνεται τῷ μετρούμενῳ, ἀλλ' ἢ πλείω μέτρα 2 τὸ ὄλον.

2 λέγεται δὲ ὀρθῶς καὶ ὅτι ἀριθμὸς μὲν ὁ αὐτὸς ὁ τῶν προβάτων καὶ τῶν κυνῶν, εἰ ἴσος ἑκάτερος, δεκάς δὲ οὐχ ἡ αὐτὴ οὐδὲ δέκα τὰ αὐτά, ὡσπερ οὐδὲ τρίγωνα τὰ αὐτά 5 τὸ ἰσόπλευρον καὶ τὸ σκαληνές, καίτοι σχημά γε ταυτό, ὅτι τρίγωνα ἄμφω· ταυτὸ γὰρ λέγεται οὐ μὴ διαφέρει διαφορᾷ,

^b 14 μονάδες μονάδες μονάδι J δ' om. H δὲ add. Torstrik ὁ
 APST: om. E ὠρισμένῳ τινὶ χρόνῳ H 16 ὑπὸ E²AP^p γρ. S: om. E¹VAP¹S 17 τε GHIJP: δὲ E: om. F 18 ἀπάντων H
 19 ὀμαλῆ I ὁ om. EPS 21 ὀμαλῆς E² 22 ὁ om. F σφαίρας
 ἢ κινήσις F 27 πάντα ταῦτα PPS: πάντα E¹VP¹T 29 αὐτὸς
 om. H εἶναι post τις F 30 φορᾶς ἐστὶ FGIJ αὐτὸς] ὁ
 αὐτὸς G 31 τοιαύτης φορᾶς. ὡς τὸ E 32 τὸ . . . κύκλον οἰν.
 H ἐστὶ τὸ τοῦ F τινα εἶναι I 33 τὸ μετροῦν F 224^a I τῷ
 μετρούμενῳ Torstrik: τὸ μετρούμενον ΠΡ ἢ (ὅτι) Torstrik
 2-15 λέγεται . . . ἵπποι secl. Cornford 2 ὅτι EGJS: ὅτι ὁ
 FHIP ὁ alt. APS: om. E 3 καὶ ὁ τῶν H 4 οὐδὲ . . .
 αὐτά om. F 5 τὸ alt. AP: om. E σκαληνές GJ¹P: σκαληνόν
 FHJ²S: σκαληνες αλλα E 6 διαφέρει J

ἀλλ' οὐχὶ οὗ διαφέρει, οἷον τρίγωνον τριγώνου (τριγώνου) δια-
φορᾷ διαφέρει· τοιγαροῦν ἕτερα τρίγωνα· σχήματος δέ οὗ,
ἀλλ' ἐν τῇ αὐτῇ διαιρέσει καὶ μιᾷ· σχῆμα γὰρ τὸ μὲν
τοιόνδε κύκλος, τὸ δὲ τοιόνδε τρίγωνον, τούτου δέ τὸ μὲν τοι- 10
όνδε ἰσόπλευρον, τὸ δὲ τοιόνδε σκαληνές· σχῆμα μὲν οὖν τὸ
αὐτό, καὶ τοῦτο τρίγωνον, τρίγωνον δ' οὐ τὸ αὐτό· καὶ
ἀριθμὸς δὴ ὁ αὐτός (οὐ γὰρ διαφέρει ἀριθμοῦ διαφορᾷ
ὁ ἀριθμὸς αὐτῶν), δεκάς δ' οὐχ ἡ αὐτή· ἐφ' ὧν γὰρ λέγεται,
διαφέρει· τὰ μὲν γὰρ κύνες, τὰ δ' ἵπποι· καὶ περὶ μὲν 15
χρόνου καὶ αὐτοῦ καὶ τῶν περὶ αὐτὸν οἰκείων τῇ σκέψει εἴ-
ρηται.

E

Μεταβάλλει δὲ τὸ μεταβάλλον πᾶν τὸ μὲν κατὰ
συμβεβηκός, οἷον ὅταν λέγωμεν τὸ μουσικὸν βαδίζειν, ὅτι
ᾧ συμβέβηκεν μουσικῶ εἶναι, τοῦτο βαδίζει· τὸ δὲ τῷ τού-
του τι μεταβάλλειν ἀπλῶς λέγεται μεταβάλλειν, οἷον ὅσα
λέγεται κατὰ μέρη (ὑγιάζεται γὰρ τὸ σῶμα, ὅτι ὁ ὀφ- 25
θαλμὸς ἢ ὁ θώραξ, ταῦτα δὲ μέρη τοῦ ὅλου σώματος)· ἔστι
δέ τι ὃ οὔτε κατὰ συμβεβηκός κινεῖται οὔτε τῷ ἄλλο τι
τῶν αὐτοῦ, ἀλλὰ τῷ αὐτὸ κινεῖσθαι πρῶτον· καὶ τοῦτ' ἔστι
τὸ καθ' αὐτὸ κινητόν, κατ' ἄλλην δὲ κίνησιω ἕτερον, οἷον ἀλ-
λοιωτόν, καὶ ἀλλοιώσεως ὑγιαντόν ἢ θερμαντόν ἕτερον· | ἔστι 30
δὲ καὶ ἐπὶ τοῦ κινουέντος ὡσαύτως· τὸ μὲν γὰρ κατὰ συμ-
βεβηκός κινεῖ, τὸ δὲ κατὰ μέρος τῷ τῶν τούτου τι, τὸ δὲ
καθ' αὐτὸ πρῶτον, οἷον ὁ μὲν ἱατρὸς ἰᾶται, ἢ δὲ χεὶρ πλήτ-
τει· ἐπεὶ δ' ἔστι μὲν τι τὸ κινεῖν πρῶτον, ἔστι δέ τι τὸ κινού-

224^a 21-^b I = 1067^b I-9

^a 7 τρίγωνον om. E¹ (τριγώνου) Torstrik, fort. S διαφορὰ F
8 σχήματα F: σχῆμα I δέ] δέ γε E²GHJ: δὲ σχήματος I 9 γάρ
ἔστι τὸ H 11 σκαληνόν FHJ²S μὲν om. H 12 τοῦτο τρίγωνον
scripsi, fort. hab. PS: τὸ τρίγωνον E: τοῦτο, τρίγωνον γάρ Δ καὶ
FP: καὶ ὁ EGHJ 13 δὲ HP 16 εἴρηται μεταβάλλει δὲ
τὸ μεταβάλλον E

Tit. φυσικῆς ἀκρόσεως τὸ ε. περὶ μεταβολῆς E: φυσικῶν πέμπτον
I 22 οἷον ὅταν fecit E: ὅταν S ante τὸ literas quatuor dele-
tas E τὸ E F J M S T: τὸν HI 23 μουσικῶ εἶναι E²AS: εἶναι
μουσικῶ T: μουσικῶ E¹ 24 τι om. E¹ 27 δὲ M: δὴ F: δὲ δὴ EHIJ
31 κατὰ AM: om. E 32 κινεῖν H τῶν om. F 33 πλήσσει FIJ

35 μενον, ἔτι ἐν ϕ , ὁ χρόνος, καὶ παρὰ ταῦτα ἐξ οὗ καὶ εἰς
 224^b ὅ—πᾶσα γὰρ κίνησις ἐκ τινος καὶ εἰς τι· ἕτερον γὰρ τὸ πρῶ-
 τον κινούμενον καὶ εἰς ὃ κινεῖται καὶ ἐξ οὗ, οἶον τὸ ξύλον
 καὶ τὸ θερμόν καὶ τὸ ψυχρόν· τούτων δὲ τὸ μὲν θ , τὸ δ'
 εἰς θ , τὸ δ' ἐξ οὗ—ἡ δὴ κίνησις δῆλον ὅτι ἐν τῷ ξύλῳ, οὐκ
 5 ἐν τῷ εἶδει· οὔτε γὰρ κινεῖ οὔτε κινεῖται τὸ εἶδος ἢ ὁ τό-
 πος ἢ τὸ τοσόνδε, ἀλλ' ἔστι κινούν καὶ κινούμενον καὶ εἰς ὃ
 κινεῖται. μᾶλλον γὰρ εἰς ὃ ἢ ἐξ οὗ κινεῖται ὀνομάζε-
 ται ἢ μεταβολή. διὸ καὶ ἡ φθορὰ εἰς τὸ μὴ ὄν μετα-
 βολή ἐστίν· καίτοι καὶ ἐξ ὄντος μεταβάλλει τὸ φθειρόμενον·
 10 καὶ ἡ γένεσις εἰς ὄν, καίτοι καὶ ἐκ μὴ ὄντος.

10 τί μὲν οὖν ἐστίν
 ἡ κίνησις, εἴρηται πρότερον· τὰ δὲ εἶδη καὶ τὰ πάθη καὶ ὁ
 τόπος, εἰς ἃ κινούνται τὰ κινούμενα, ἀκίνητά ἐστίν, οἶον ἡ
 ἐπιστήμη καὶ ἡ θερμότης. καίτοι ἀπορήσειεν ἄν τις, εἰ τὰ
 πάθη κινήσεις, ἢ δὲ λευκότης πάθος· ἔσται γὰρ εἰς κίνησιν
 15 μεταβολή. ἀλλ' ἴσως οὐχ ἡ λευκότης κίνησις, ἀλλ' ἡ λεύκαν-
 σις. ἔστιν δὲ καὶ ἐν ἐκείνοις καὶ τὸ κατὰ συμβεβηκὸς καὶ τὸ
 κατὰ μέρος καὶ [τὸ] κατ' ἄλλο καὶ τὸ πρῶτως καὶ μὴ
 κατ' ἄλλο, οἶον τὸ λευκαίνόμενον εἰς μὲν τὸ νοούμενον μετα-
 βάλλει κατὰ συμβεβηκός (τῷ γὰρ χρώματι συμβέβηκε
 20 νοεῖσθαι), εἰς δὲ χρῶμα ὅτι μέρος τὸ λευκὸν τοῦ χρώμα-
 τος (καὶ εἰς τὴν Εὐρώπην ὅτι μέρος αἱ Ἀθηναί τῆς Εὐρώ-
 πης), εἰς δὲ τὸ λευκὸν χρῶμα καθ' αὐτό. πῶς μὲν οὖν καθ'
 αὐτὸ κινεῖται καὶ πῶς κατὰ συμβεβηκός, καὶ πῶς κατ'
 ἄλλο τι καὶ πῶς τῷ αὐτὸ πρῶτον, καὶ ἐπὶ κινούντος καὶ
 25 ἐπὶ κινουμένου, δῆλον, καὶ ὅτι ἡ κίνησις οὐκ ἐν τῷ εἶδει ἀλλ'
 ἐν τῷ κινουμένῳ καὶ κινήτῳ κατ' ἐνέργειαν. ἡ μὲν οὖν κατὰ
 συμβεβηκός μεταβολὴ ἀφείσθω· ἐν ἅπασί τε γὰρ ἐστὶ καὶ

224^b 11-16 = 1067^b 9-12

^b 1 πρῶτως H 4 δὴ HI γρ. A γρ. S: δὲ EFJS γρ. A 6 τὸ
 AS: om. E καὶ HIJ²S: om. EFJ¹ καὶ FHIS: om. EJ
 7 εἰς ὃ om. E¹ 8 καὶ om. EHJ 9 καὶ om. F 10 ὄν] ὃ I
 καὶ alt. om. FIJT 11 ἢ om. F τὰ alt. ΔT: om. E 14 κίνησις
 E γὰρ] δὲ F κίνησιν ἢ μεταβολή H 15 ἀλλ' ἢ λεύκανσις
 E²AS: om. E¹ 16 ἔσται I 17 [τὸ] Bonitz κατ' . . .
 πρῶτως] κατὰ πρῶτον E: πρῶτως H καὶ τὸ μὴ EHIJ 18 ἄλλον
 E 23-4 καὶ alt. . . . τι om. E 24 καὶ . . . πρῶτον secl.
 Bonitz, om. fort. T τῷ Prantl: τὸ E²A: E¹ incertum 25 ἐπὶ
 om. E 27 ἅπασί HS^c: πᾶσι SP γὰρ τε EH

αἰεὶ καὶ πάντων· ἡ δὲ μὴ κατὰ συμβεβηκὸς οὐκ ἐν ἅπασιν, ἀλλ' ἐν τοῖς ἐναντίοις καὶ τοῖς μεταξὺ καὶ ἐν ἀντιφάσει· τούτου δὲ πίστις ἐκ τῆς ἐπαγωγῆς. ἐκ δὲ τοῦ μεταξὺ μετα- 30
βάλλει· χρήται γὰρ αὐτῷ ὡς ἐναντίῳ ὄντι πρὸς ἑκάτερον·
ἔστι γὰρ πῶς τὸ μεταξὺ τὰ ἄκρα. διὸ καὶ τοῦτο πρὸς ἐκεῖνα
κάκεῖνα πρὸς τοῦτο λέγεται πῶς ἐναντία, οἷον ἡ μέση ὀξεία
πρὸς τὴν ὑπάτην καὶ βαρεῖα πρὸς τὴν νητήν, καὶ τὸ φαιδὸν
λευκὸν πρὸς τὸ μέλαν καὶ μέλαν πρὸς τὸ λευκόν. 35

ἐπεὶ δὲ 35

πᾶσα μεταβολὴ ἔστω ἐκ τινος εἰς τι (δηλοῖ δὲ καὶ τοῦνομα· 225^a
μετ' ἄλλο γὰρ τι καὶ τὸ μὲν πρότερον δηλοῖ, τὸ δ' ὕστερον),
μεταβάλλοι ἂν τὸ μεταβάλλον τετραχῶς· ἢ γὰρ ἐξ ὑπο-
κειμένου εἰς ὑποκείμενον, ἢ ἐξ ὑποκειμένου εἰς μὴ ὑποκει-
μενον, ἢ οὐκ ἐξ ὑποκειμένου εἰς ὑποκείμενον, ἢ οὐκ ἐξ ὑπο- 5
κειμένου εἰς μὴ ὑποκείμενον· λέγω δὲ ὑποκείμενον τὸ κα-
ταφάσει δηλούμενον. ὥστε ἀνάγκη ἐκ τῶν εἰρημένων τρεῖς
εἶναι μεταβολάς, τὴν τε ἐξ ὑποκειμένου εἰς ὑποκείμενον,
καὶ τὴν ἐξ ὑποκειμένου εἰς μὴ ὑποκείμενον, καὶ τὴν ἐκ μὴ
ὑποκειμένου εἰς ὑποκείμενον. ἢ γὰρ οὐκ ἐξ ὑποκειμένου εἰς 10
μὴ ὑποκείμενον οὐκ ἔστιν μεταβολὴ διὰ τὸ μὴ εἶναι κατ' ἀν-
τίθεσιν· οὔτε γὰρ ἐναντία οὔτε ἀντιφάσις ἔστιν. ἢ μὲν οὖν οὐκ
ἐξ ὑποκειμένου εἰς ὑποκείμενον μεταβολὴ κατ' ἀντίφασιν γέ-
νεσις ἔστιν, ἢ μὲν ἀπλῶς ἀπλή, ἢ δὲ τὶς τινός (οἷον ἡ μὲν
ἐκ μὴ λευκοῦ εἰς λευκὸν γένεσις τούτου, ἢ δ' ἐκ τοῦ μὴ ὄντος 15
ἀπλῶς εἰς οὐσίαν γένεσις ἀπλῶς, καθ' ἣν ἀπλῶς γίνεσθαι καὶ
οὐ τί γίνεσθαι λέγομεν)· ἢ δ' ἐξ ὑποκειμένου εἰς οὐχ ὑποκει-

224^b 28-30 = 1067^b 12-14
1068^b 15225^a 3—226^a 16 = 1067^b 14—

^b 28 πάντων APS: πάντως E 29 τοῖς alt. FJS: ἐν τοῖς EHI: om. M 30 μεταβάλλει] βάλλει E¹: μεταβάλλει ὡς ἐξ ἐναντίου H 3I ὄντι] τινὶ E² 33 ὡς E, fort. corr. ὀξεία . . . 34 νήτην E'S: βαρεῖα πρὸς τὴν νήτην καὶ ὀξεία πρὸς τὴν (τὴν om. F) ὑπάτην E'A 225^a I πᾶσι om. F¹ ἔστιν om. FS δὲ AS: γὰρ E 3 ἂν] δ' ἂν E¹ 4 ἐξ] οὐκ ἐξ HIJM: ἐξ οὐχ ST μὴ om. S: οὐχ AMT 5 οὐκ om. MST: μὴ FH εἰς] εἰς οὐχ FMS: εἰς μὴ T οὐκ ἐξ EMT: ἐξ οὐχ FS: ἐξ HIJ 6 μὴ om. MT: οὐχ S δὲ EMT: δὲ τὸ AS 10 οὐκ ἐξ] μὴ ἐξ A: ἐξ οὐχ M 11 μὴ pr. EM: οὐχ A 12 οὔτε ἐν ἀντιφάσει S οὐκ ἐξ EFJM: ἐξ οὐχ S: ἐκ μὴ H: ἐξ I 14 ἔστιν om. I ἀπλή om. S τις τινός ΠM: τις S 15 μὴ pr. om. I 17 τὶ om. E²

μενον φθορά, ἀπλῶς μὲν ἢ ἐκ τῆς οὐσίας εἰς τὸ μὴ εἶναι,
 τὶς δὲ ἢ εἰς τὴν ἀντικειμένην ἀπόφασιν, καθάπερ ἐλέχθη
 20 καὶ ἐπὶ τῆς γενέσεως.

20 εἰ δὴ τὸ μὴ ὄν λέγεται πλεοναχῶς,
 καὶ μήτε τὸ κατὰ σύνθεσιν ἢ διαίρεσιν ἐνδέχεται κινεῖσθαι
 μήτε τὸ κατὰ δύναμιν, τὸ τῷ ἀπλῶς κατ' ἐνέργειαν ὄντι
 ἀντικείμενον (τὸ μὲν γὰρ μὴ λευκὸν ἢ μὴ ἀγαθὸν ὅμως ἐν-
 δέχεται κινεῖσθαι κατὰ συμβεβηκός, εἴη γὰρ ἄν) ἄνθρωπος τὸ
 25 μὴ λευκόν· τὸ δ' ἀπλῶς μὴ τόδε οὐδαμῶς), ἀδύνατον [γὰρ]
 τὸ μὴ ὄν κινεῖσθαι (εἰ δὲ τοῦτο, καὶ τὴν γένεσιν κίνησιν εἶ-
 ναι· γίνεται γὰρ τὸ μὴ ὄν· εἰ γὰρ καὶ ὅτι μάλιστα κατὰ
 συμβεβηκός γίνεται, ἀλλ' ὅμως ἀληθὲς εἰπεῖν ὅτι ὑπάρχει
 τὸ μὴ ὄν κατὰ τοῦ γιγνομένου ἀπλῶς)—ὁμοίως δὲ καὶ τὸ ἡρε-
 30 μείν. ταῦτά τε δὴ συμβαίνει δυσχερῆ [τῷ κινεῖσθαι τὸ μὴ
 ὄν] καὶ εἰ πάν τὸ κινούμενον ἐν τόπῳ, τὸ δὲ μὴ ὄν οὐκ ἔστιν
 ἐν τόπῳ· εἴη γὰρ ἄν που. οὐδὲ δὴ ἢ φθορὰ κίνησις· ἐναντίον
 μὲν γὰρ κινήσει ἢ κίνησις ἢ ἡρεμία, ἢ δὲ φθορὰ γενέσει ἐναν-
 τίου. ἐπεὶ δὲ πᾶσα κίνησις μεταβολὴ τις, μεταβολαὶ δὲ
 35 τρεῖς αἰ εἰρημέναι, τούτων δὲ αἰ κατὰ γένεσιν καὶ φθορὰν
 225^b οὐ κινήσεις, αὗται δ' εἰσὶν αἰ κατ' ἀντίφασιν, ἀνάγκη τὴν
 ἐξ ὑποκειμένου εἰς ὑποκείμενον μεταβολὴν κίνησιν εἶναι μό-
 νην. τὰ δ' ὑποκείμενα ἢ ἐναντία ἢ μεταξὺ (καὶ γὰρ ἢ στέ-
 ρησις κείσθω ἐναντίον), καὶ δηλοῦται καταφάσει, τὸ γυμνὸν
 5 καὶ νωδὸν καὶ μέλαν.

5 εἰ οὖν αἰ κατηγορίαι διήρηνται οὐσία
 καὶ ποιότητι καὶ τῷ πῶν [καὶ τῷ ποτὲ] καὶ τῷ πρὸς τι καὶ
 τῷ ποσῶ καὶ τῷ ποιεῖν ἢ πάσχειν, ἀνάγκη τρεῖς εἶναι κι-
 νήσεις, τὴν τε τοῦ ποιοῦ καὶ τὴν τοῦ ποσοῦ καὶ τὴν κατὰ
 τόπον.

^a 18 ἢ om. E 19 ἢ om. F 20 δὲ E² 23 γὰρ
 om. H ἀγαθὸν ὄν ὅμως H 24 ἄν M(EJ) Bekker: om.
 ΠΜ(A^b) 25 γὰρ om. M(JT)T 26 εἶναι κίνησιν F
 30 ταῦτα Jaeger τε om. I, erasit J: δὲ E, Jaeger δὴ EHM:
 δὴ πάντα FIJ τῷ . . . 31 ὄν om. EHJM 31 ἔστιν om. S
 33 ἢ pr. IST: ἢ EH: om. FJM τῇ δὲ φθορὰ γένεσις S
^b I εἰσὶν om. I αἰ FJM: καὶ EHI 2 μόνην EHMS: μόνον FIJ
 4 καταφάσει ΛΜ: καταφυσιν E τὸ λευκὸν καὶ τὸ γυμνὸν καὶ τὸ μέλαν
 H γυμνὸν EFIJMST: ψυχρὸν vel τυφλὸν Bonitz 5 νωδὸν
 M(EJ): λευκὸν EFIJM(A^b)S 6 τῷ πῶν ΔS: τόπῳ EM καὶ τῷ
 ποτὲ om. EHMS: τῷ om. I 7 τῷ pr. om. EH 8 ποιῶν EΗ
 (cf. M): ποσοῦ FIJ τὴν om. I ποσοῦ EΗ (cf. M): ποιῶν FIJ

2 Κατ' οὐσίαν δ' οὐκ ἔστι κίνησις διὰ τὸ μηδὲν εἶναι οὐσία 10
 τῶν ὄντων ἐναντίον. οὐδὲ δὴ τοῦ πρὸς τι· ἐνδέχεται γὰρ θατέρου
 μεταβάλλοντος (ἀληθεύεσθαι καὶ μὴ) ἀληθεύεσθαι θάτερον μηδὲν
 μεταβάλλον, ὥστε κατὰ συμβεβηκὸς ἢ κίνησις αὐτῶν. οὐδὲ
 δὴ ποιῶντος καὶ πάσχοντος, ἢ κινουμένου καὶ κινουίντος, ὅτι
 οὐκ ἔστι κινήσεως κίνησις οὐδὲ γένεσεως γένεσις, οὐδ' ὅλως μετα- 15
 βολῆς μεταβολή. πρῶτον μὲν γὰρ διχῶς ἐνδέχεται κινήσεως
 εἶναι κίνησις, ἢ ὡς ὑποκειμένου (οἶον ἄνθρωπος κινεῖται ὅτι
 ἐκ λευκοῦ εἰς μέλαν μεταβάλλει· ἀρά γε οὕτω καὶ ἡ κίνησις ἢ
 θερμαίνεται ἢ ψύχεται ἢ τόπον ἀλλάττει ἢ αὐξάνεται
 ἢ φθίνει; τοῦτο δὲ ἀδύνατον· οὐ γὰρ τῶν ὑποκειμένων τι ἢ 20
 μεταβολή), ἢ τῷ ἕτερον τι ὑποκείμενον ἐκ μεταβολῆς με-
 ταβάλλει εἰς ἕτερον εἶδος [οἶον ἄνθρωπος ἐκ νόσου εἰς ὑγί-
 εϊαν]. ἀλλ' οὐδὲ τοῦτο δυνατὸν πλὴν κατὰ συμβεβηκός· αὐτὴ
 γὰρ ἡ κίνησις ἐξ ἄλλου εἶδους εἰς ἄλλο ἐστὶ μεταβολή (οἶον
 ἀνθρώπου ἐκ νόσου εἰς ὑγίειαν)· καὶ ἡ γένεσις δὲ καὶ ἡ φθορά 25
 ὡσαύτως, πλὴν αἱ μὲν εἰς ἀντικείμενα ὠδί, ἢ δὲ ὠδί, ἢ κίνησις.
 ἅμα οὖν μεταβάλλει ἐξ ὑγείας εἰς νόσον καὶ ἐξ αὐτῆς ταύτης τῆς
 μεταβολῆς εἰς ἄλλην. δῆλον δὴ ὅτι ὅταν νοσήσῃ, μεταβεβηκὸς
 ἔσται εἰς ὅποιον οὖν (ἐνδέχεται γὰρ ἡρεμεῖν), καὶ ἔτι εἰς μὴ τὴν τυ-
 χούσαν αἰεὶ, κἀκείνη ἐκ τινος εἰς τι ἕτερον ἔσται, ὥστε καὶ ἡ ἀντι- 30
 κειμένη ἔσται ὑγίανσις· ἀλλὰ τῷ συμβεβηκέναι, οἶον
 ἐξ ἀναμνήσεως εἰς λήθην μεταβάλλει, ὅτι ᾧ ὑπάρχει, ἐκείνω

^b 11 τοῦ M(A^b): τῷ FHI: om. EJM(EJ)S 12 μεταβάλ-
 λοντος . . . μὴ scripsi, cum AT ut vid.: μεταβάλλοντος IIS: μετα-
 βάλλοντος μηδὲν M(A^b): μηδὲν μεταβάλλοντος M(EJ): μεταβάλλοντος
 μὴ Schwegler 14 ἢ EM: οὐδὲ παντὸς ΔΑΣ καὶ AMS:
 om. E 15 μεταβολῆς μεταβολή S: μεταβολή μεταβολῆς Π
 17 ἄνθρωπος scripsi: ὁ ἄνθρωπος EHM: ἄνθρωπος FIJ 18 ἀρά
 γε om. EH: ὥστε M 19 ἀλλάττει EM: μεταλλάττει Λ 21 ἐκ]
 εἶναι ἐκ I 22 οἶον . . . ὑγίειαν hic ΠM: post μεταβολή ^b 24 collo-
 cavi, ut vid. cum S 23 αὐτὴ E² et ut vid. S: αὐτὴ E¹Λ: ἅπασι
 M(A^b): πᾶσα M(EJ) 24 εἶδους FIJS: om. EHM 24-5 οἶον
 . . . ὑγίειαν hic collocavi: post εἶδος ^b 22 ΠM 25 ἀνθρώπου
 scripsi: ἀνθρώπου M: ἀνθρώπους S(F): ἀνθρώπος IIS (cett.) ἢ pr.
 Λ: γὰρ ἢ E 26 ἢ δὲ ὠδί M(A^b)S: ἢ ὠδί E²M(EJ)P: om.
 Λ: E¹ incertum ἢ κίνησις EM(A^b)S: ἢ δὲ κίνησις H: ἢ δὲ κίνησις
 οὐχ ὁμοίως FI: οὐ κινήσεις M(EJ) 28 δ' FJ νόσημα E²
 30 αἰεὶ EFJM: δεῖ γὰρ H: om. I κἀκείνη FIJM: κἀκείνην EHS
 ἔσται E¹M: om. E²AS καὶ EFHIS: om. JM 31 ὑγίανσις
 FMS: ἢ ὑγίανσις EHIJ οἶον EHM: οἶον εἰ FIJ 32-3 ὅτι
 . . . μεταβάλλει om. F

33 μεταβάλλει ὅτε μὲν εἰς ἐπιστήμην ὅτε δ' εἰς ἄγνοιαν.

33

ἔτι

εἰς ἄπειρον βαδιεῖται, εἰ ἔσται μεταβολῆς μεταβολὴ καὶ

35 γενέσεως γενέσεις. ἀνάγκη δὴ καὶ τὴν προτέραν, εἰ ἡ ὑστέρα

226^a ἔσται, οἷον εἰ ἡ ἀπλή γένεσις ἐγγλυτέ ποτε, καὶ τὸ γιγνόμενον

ἐγγλυτέ, ὥστε οὐπω ἦν τὸ γιγνόμενον ἀπλῶς, ἀλλὰ τι γιγνόμε-

νον γιγνόμενον ἦδη, καὶ πάλιν τοῦτ' ἐγγλυτέ ποτε, ὥστ' οὐκ ἦν

πω τότε γιγνόμενον γιγνόμενον. ἐπεὶ δὲ τῶν ἀπείρων οὐκ ἔστω

5 τι πρῶτον, οὐκ ἔσται τὸ πρῶτον, ὥστ' οὐδὲ τὸ ἐχόμενον· οὔτε γί-

γνεσθαι οὖν οὔτε κινεῖσθαι οἷον τε οὔτε μεταβάλλειν οὐδέν. ἔτι τοῦ

αὐτοῦ κίνησις ἢ ἐναντία (καὶ ἔτι ἡρέμησις), καὶ γένεσις καὶ φθορά,

ὥστε τὸ γιγνόμενον γιγνόμενον ὅταν γένηται γιγνόμενον, τότε

φθειρέται· οὔτε γὰρ εὐθύς γιγνόμενον οὐθ' ὕστερον· εἶναι γὰρ

10 δεῖ τὸ φθειρόμενον. ἔτι ὕλην δεῖ ὑπεῖναι καὶ τῷ γιγνομένῳ

καὶ τῷ μεταβάλλουτι. τίς οὖν ἔσται—ὥσπερ τὸ ἀλλοιωτὸν

σῶμα ἢ ψυχὴ, οὕτω τί τὸ γιγνόμενον κίνησις ἢ γένεσις; καὶ

πάλιν τί εἰς ὃ κινεῖται; δεῖ γὰρ εἶναι [τι] τὴν τοῦδε ἐκ τοῦδε

εἰς τόδε κίνησις [καὶ μὴ κίνησις] ἢ γένεσις. ἅμα δὲ πῶς καὶ

15 ἔσται; οὐ γὰρ ἔσται μάθησις ἢ τῆς μαθήσεως γένεσις, ὥστ'

οὐδὲ γενέσεως γένεσις, οὐδέ τις τιός. ἔτι εἰ τρία εἶδη κινή-

σεώς ἔστω, τούτων τιὰ ἀνάγκη εἶναι καὶ τὴν ὑποκειμένην φύσιν

καὶ εἰς ἃ κινεῖται, οἷον τὴν φθορὰν ἀλλοιοῦσθαι ἢ φέρεσθαι.

^b 33 ἄγνοιαν Smith, fort. PSP: ὑγίειαν PMS¹ ἔτι EHM: ἔτι δ' FIJS 35 ἢ EHJ²M: om. FIJ¹ ὑστεραία I 226^a 2 τὸ FJM(A^b): om. EHIM(EJ) γρ. A Aspasius γιγνόμενον . . . γιγνόμενον] ἦδη, ἀλλὰ γινόμενον ἦν γρ. A τι γιγνόμενον ΔM(E) γρ. A γρ. S: γιγνόμενον τι M(A^b): γιγνόμενον E Aspasius: τι γιγνόμενον ἀπλῶς M(J) 3 γιγνόμενον Bonitz: τότε γιγνόμενον fecit E: καὶ γιγνόμενον FIJ: ἢ γιγνόμενον M(A^b): ἢ γενόμενον M(EJ): om. H γρ. A γρ. S Aspasius ἦδη ΠM(A^b) γρ. A γρ. S Aspasius: εἰ δὴ M(EJ) 4 γιγνόμενον alt. E¹: om. E²ΔM ἐπεὶ ΠM: ἐπὶ S δὲ E²ΔM: δὴ E¹ οὐκ ἔστιν τι πρῶτον om. F 5 τι om. EJM(EJ)S οὐκ . . . πρῶτον om. M(A^b)S οὔτε et 6 οὔτε pr.] οὔτε τὸ S 8 γιγνόμενον alt. E¹: om. E²ΔM γένηται E¹FJM: γίγνηται E²HIS 9 an γιγνόμενον γιγνόμενον? 10 ὕλην δεῖ EJP: δεῖ ὕλην FHIMS I I τῷ om. EM 12 σῶμα E¹HM: ἢ σῶμα E²FIJS τί FJM(JA^b)S: τι (sed erasum) καὶ M(E): δὴ E²I: om. E¹H 13 τί EMS: τι Δ τι om. M(A^b)S τοῦδε pr.] τοῦ E¹ 14 καὶ . . . γένεσις] ἢ γένεσις E²HIS: καὶ μὴ κίνησις E¹, fort. T: μὴ κίνησις MP γρ. A: μὴ κίνησις ἢ γένεσις FJ πῶς καὶ E γρ. S: καὶ πῶς Δ γρ. S 16 γένεσις γενέσεως H: γενέσεως γένεσις γένεσις Prantl τινός E²HJ²S: om. E¹FJ¹ 17 τι E² καὶ om. FIJ 18 κινεῖται I οἷον om. E¹H¹J¹S: οἷον ἀνάγκη F

ὅλως δὲ ἐπεὶ κινεῖται [τὸ κινούμενον] πᾶν τριχῶς, ἢ κατὰ
 συμβεβηκὸς ἢ τῷ μέρος τι ἢ [τῷ] καθ' αὐτό, κατὰ συμβε- 20
 βηκὸς μόνον ἂν ἐνδέχοιτο μεταβάλλειν τὴν μεταβολήν, οἷον
 εἰ ὁ ὑγιαζόμενος τρέχει ἢ μανθάνει τὴν δὲ κατὰ συμβε-
 βηκὸς ἀφεύμεν πάλαι. 23

ἐπεὶ δὲ οὔτε οὐσίας οὔτε τοῦ πρὸς τι 23
 οὔτε τοῦ ποιεῖν καὶ πάσχειν, λείπεται κατὰ τὸ ποῖον καὶ τὸ
 ποσὸν καὶ τὸ ποῦ κίνησις εἶναι μόνον· ἐν ἐκάστῳ γὰρ ἔστι τού- 25
 των ἐναντίωσις. ἢ μὲν οὖν κατὰ τὸ ποῖον κίνησις ἀλλοίωσις
 ἔστω· τοῦτο γὰρ ἐπέξυκται κοινὸν ὄνομα. λέγω δὲ τὸ ποῖον
 οὐ τὸ ἐν τῇ οὐσίᾳ (καὶ γὰρ ἡ διαφορὰ ποιότητος) ἀλλὰ τὸ
 παθητικόν, καθ' ὃ λέγεται πάσχειν ἢ ἀπαθὲς εἶναι. ἢ δὲ
 κατὰ τὸ ποσὸν τὸ μὲν κοινὸν ἀνώνυμος, καθ' ἑκάτερον δ' 30
 αὔξισις καὶ φθίσις, ἢ μὲν εἰς τὸ τέλειον μέγεθος αὔξισις,
 ἢ δ' ἐκ τούτου φθίσις. ἢ δὲ κατὰ τόπον καὶ τὸ κοινὸν καὶ
 τὸ ἴδιον ἀνώνυμος, ἔστω δὲ φορὰ καλουμένη τὸ κοινόν· καί-
 τοι λέγεται γε ταῦτα φέρεσθαι μόνον κυρίως, ὅταν μὴ ἐφ'
 αὐτοῖς ἢ τὸ στήναι τοῖς μεταβάλλουσι τὸν τόπον, καὶ ὅσα 35
 μὴ αὐτὰ ἑαυτὰ κινεῖ κατὰ τόπον. ἢ δ' ἐν τῷ αὐτῷ εἶδει 226^b
 μεταβολὴ ἐπὶ τὸ μᾶλλον καὶ ἥττον ἀλλοίωσις ἔστιν· ἢ γὰρ
 ἐξ ἐναντίου ἢ εἰς ἐναντίον κίνησις ἔστιν, ἢ ἀπλῶς ἢ πῆ· ἐπὶ
 μὲν γὰρ τὸ ἥττον ἰούσα εἰς τὸ ἐναντίον λεχθήσεται μεταβάλ-
 λειν, ἐπὶ δὲ τὸ μᾶλλον ὡς ἐκ τὸ ἐναντίου εἰς αὐτό. 5
 διαφέρει γὰρ οὐδὲν πῆ μεταβάλλειν ἢ ἀπλῶς, πλὴν πῆ
 δεήσει τὰναντία ὑπάρχειν· τὸ δὲ μᾶλλον καὶ ἥττόν ἐστι
 τὸ πλεόν ἢ ἔλαττον ἐνυπάρχειν τοῦ ἐναντίου καὶ μῆ. 8

ὅτι 8

226^a 23-9 = 1068^b 15-20

^a 19 τὸ κινούμενον E²AS: om. E¹ ἢ EHS: ἢ τῷ FIJ 20 τῷ]
 τὸ E τῷ seclusi, om. S: τὸ E² 21 μόνως FIJS: μὲν E:
 μέντοι T οἷον] εἰ συμβαίνει τιτὶ τροχάσαντι ὑγιαίνειν οἷον γρ. A
 γρ. S 22 ὁ ὑγιαζόμενος AS: ὑγιαζόμενός τις E τρέχει ἢ
 μανθάνει I 24 καὶ alt.] κατὰ T: καὶ κατὰ F τὸ AST: om. E
 28 ποῖον FJMS 30 ἀνώνυμον Λ ἐκάτερον FIJT: ἕτερον EH
 31 τέλειον IIS: πλείον T 32 ἴδιον καὶ τὸ κοινὸν IJ 33 ἀνώ-
 νυμοι I 34 φέρεσθαί γε ταῦτα H: γε φέρεσθαι ταῦτα I: φέρεσθαι ταῦτα
 FJ μόνον FIJST: μόνον EH ἐφ' ἑαυτοῖς FHT: ἐπ' αὐτοῖς I
^b 1 μῆ AS: om. E 2 ἢ APS 3 ἢ pr. om. APS 5 εἰς
 τὸ αὐτό Moreliana 8 τῷ Λ et ut vid. PS τοῦ ἐναντίου ἐν-
 υπάρχειν Λ μῆ] μῆ ἐνυπάρχειν πῆ I: μῆ ἐνυπάρχειν τοῦ ἐναντίου πῆ E

10 μὲν οὖν αὐταὶ τρεῖς μόναι κινήσεις εἰσὶν, ἐκ τούτων δὴ-
 15 λον· ἀκίνητον δ' ἐστὶ τό τε ὄλως ἀδύνατον κινήθῃναι, ὥσπερ
 ὁ ψόφος ἀόρατος, καὶ τὸ ἐν πολλῷ χρόνῳ μόλις κινούμε-
 νον ἢ τὸ βραδέως ἀρχόμενον, ὃ λέγεται δυσκίνητον, καὶ τὸ
 πεφυκὸς μὲν κινεῖσθαι καὶ δυνάμενον, μὴ κινούμενον δὲ τότε
 20 ὅτε πέφυκε καὶ οὐ καὶ ὥς, ὅπερ ἡρεμεῖν καλῶ τῶν ἀκινή-
 25 των μόνον· ἐναντίον γὰρ ἡρεμία κινήσει, ὥστε στέρησις ἂν εἴη
 τοῦ δεκτικοῦ. τί μὲν οὖν ἐστι κίνησις καὶ τί ἡρεμία, καὶ πόσαι
 μεταβολαὶ καὶ ποῖαι κινήσεις, φανερόν ἐκ τῶν εἰρημένων.

Μετὰ δὲ ταῦτα λέγωμεν τί ἐστὶν τὸ ἅμα καὶ χωρὶς, 3
 καὶ τί τὸ ἄπτεσθαι, καὶ τί τὸ μεταξὺ καὶ τί τὸ ἐφεξῆς
 20 καὶ τί τὸ ἐχόμενον καὶ συνεχές, καὶ τοῖς ποίοις ἕκαστον
 τούτων ὑπάρχειν πέφυκεν. ἅμα μὲν οὖν λέγω ταῦτ' εἶναι
 23, 227^a 7 ἐν ἐτέρῳ, ἄπτεσθαι δὲ ὧν τὰ ἄκρα ἅμα. (ἐπεὶ δὲ πᾶσα
 μεταβολὴ ἐν τοῖς ἀντικειμένοις, τὰ δ' ἀντικείμενα τὰ τε
 ἐναντία καὶ τὰ κατὰ ἀντίφασιν, ἀντιφάσεως δ' οὐδὲν ἀνά
 10, 226^b 26 μέσον, φανερόν ὅτι ἐν τοῖς ἐναντίοις ἔσται τὸ μεταξὺ. | ἐν ἐλα-
 26, 27 χίστοις δ' ἐστὶ τὸ μεταξὺ τρισίν· ἔσχατον μὲν γὰρ | ἐστὶ τῆς
 27, 23 μεταβολῆς τὸ ἐναντίον, | μεταξὺ δὲ εἰς ὃ πέφυκε πρότερον
 ἀφικνεῖσθαι τὸ μεταβάλλον ἢ εἰς ὃ ἔσχατον μεταβάλλει κατὰ
 25, 27 φύσιν συνεχῶς μεταβάλλον. [ἐν... ἐναντίον.] | συνεχῶς δὲ κινεῖ-
 ται τὸ μῆθεν ἢ ὅτι ὀλίγιστον διαλείπουν τοῦ πράγματος—μὴ τοῦ
 χρόνου (οὐδὲν γὰρ κωλύει διαλείποντα, καὶ εὐθὺς δὲ μετὰ τὴν
 30 ὑπάτην φθέγγασθαι τὴν νεάτην) ἀλλὰ τοῦ πράγματος ἐν ᾧ
 κινεῖται. τοῦτο δὲ ἐν τε ταῖς κατὰ τὸπον καὶ ἐν ταῖς ἄλ-

226^b 10-16 = 1068^b 20-25

21-5 = 26-30

^b 11 μόλις ET: μόλις Λ 12 ἢ τὸ E²AM(A^b)ST: τὸ M(E): ὁ τι
 M(J): om. E¹ τὸ om. I 16 ἐστὶ om. F 17 πόσαι FI
 18 λέγομεν I καὶ τί τὸ χωρὶς I 20 καὶ τί τὸ συνεχές HI 21 λέγω
 ES: λέγεται Λ 22 τόπω ἐστὶ πρώτῳ (πρώτων E²) E²FJS: πρώτῳ ἐστὶ
 τόπω H: ἐστὶ τόπω πρώτον I: τόπω ἐστὶν E¹: τόπω πρώτῳ (πρώτων
 A^b) M 23 ἐτέρῳ] ἐτέρῳ τόπω I 227^a 7-10 ἐπεὶ... μεταξὺ
 hic collocavi cum T: post 227^a 6 ἄπτεται PMS: post 226^b 32 φανερόν
 ci. Prantl 8 τε om. E 9 τὰ κατὰ ἀντίφασιν] ἀντιφάσις EMT
 226^b 26-7 ἐν... ἐναντίον hic collocandum ci. Cornford: post 25
 μεταβάλλον PST 26 ἐστὶ τὸ μεταξὺ om. fort. S 23 πρότερον
 MT: πρώτον PS 24 μεταβάλλει E²AMS: μεταβάλλειν E¹ 26-7
 ἐν... ἐναντίον ante ^b 23 μεταξὺ collocavi 28 ἢ om. E¹ ὅτι]
 τὸ AS ὀλιγοστόν E¹ μὴ IP: ἢ S et ut vid. T 29 γὰρ κωλύει
 FHS: κωλύει γὰρ EIJ 31 δὲ om. E²H καὶ... ἄλλαις om. IT

lais μεταβολαῖς φανερόν. ἐναντίον δὲ κατὰ τόπον τὸ κατ' εὐθείαν ἀπέχον πλείστον· ἢ γὰρ ἐλαχίστη πεπέρανται, μέτρον δὲ τὸ πεπερασμένον. ἐφεξῆς δὲ οὐ μετὰ τὴν ἀρχὴν ὄντος ἢ θέσει ἢ εἶδει ἢ ἄλλῳ τιwι οὕτως ἀφορισθέντος 35 μὴδὲν μεταξύ ἔστι τῶν ἐν ταύτῳ γένει καὶ οὐ ἐφεξῆς ἔστιν 227^a (λέγω δ' οἷον γραμμῆ γραμμῆς ἢ γραμμαί, ἢ μονάδος μονάς ἢ μονάδες, ἢ οἰκίας οἰκία· ἄλλο δ' οὐδὲν κωλύει μεταξὺ εἶναι). τὸ γὰρ ἐφεξῆς τιwι ἐφεξῆς καὶ ὑστερόν τι· οὐ γὰρ τὸ ἐν ἐφεξῆς τοῖν δυοῖν, οὐδ' ἢ νομηνία τῇ δευτέρᾳ ἐφεξῆς, 5 ἀλλὰ ταύτ' ἐκείνοις. ἐχόμενον δὲ ὃ ἂν ἐφεξῆς ὄν ἄπτηται. 6 [ἐπεὶ . . . μεταξύ.] τὸ δὲ συνεχὲς ἔστι μὲν ὅπερ ἐχόμενόν τι, 10 λέγω δ' εἶναι συνεχὲς ὅταν ταῦτὸ γένηται καὶ ἐν τὸ ἐκατέρου πέρασ οἷς ἄπτονται, καὶ ὥσπερ σημαίνει τοῦνομα, συνέχηται. τοῦτο δ' οὐχ οἷον τε δυοῖν ὄντων εἶναι τοῖν ἐσχάτων. τούτου δὲ διωρισμένου φανερόν ὅτι ἐν τούτοις ἔστι τὸ συνεχές, ἐξ ὧν ἐν τι πέφυκε γίνεσθαι κατὰ τὴν σύναψιν. καὶ ὡς ποτε 15 γίνεται τὸ συνέχον ἔν, οὕτω καὶ τὸ ὅλον ἔσται ἔν, οἷον ἢ γόμφῳ ἢ κόλλῃ ἢ ἀφῆ ἢ προσφύσει.

17

φανερόν δὲ καὶ ὅτι 17

πρῶτον τὸ ἐφεξῆς ἔστι· τὸ μὲν γὰρ ἀπτόμενον ἐφεξῆς ἀνάγκη εἶναι, τὸ δ' ἐφεξῆς οὐ πᾶν ἄπτεσθαι (διὸ καὶ ἐν προτέροις τῷ λόγῳ τὸ ἐφεξῆς ἔστιν, οἷον ἐν ἀριθμοῖς, ἀφῆ δ' 20 οὐκ ἔστιν), καὶ εἰ μὲν συνεχές, ἀνάγκη ἄπτεσθαι, εἰ δ' ἄπτεται, οὕτω συνεχές· οὐ γὰρ ἀνάγκη ἐν εἶναι αὐτῶν τὰ ἄκρα, εἰ ἅμα εἶεν· ἀλλ' εἰ ἔν, ἀνάγκη καὶ ἅμα. ὥστε ἢ σύμφυσις ὑστάτη κατὰ τὴν γένεσιν· ἀνάγκη γὰρ ἄψασθαι εἰ συμφύσεται τὰ ἄκρα, τὰ δὲ ἀπτόμενα οὐ πάντα συμπέ- 25

226^b 32—227^a 31 = 1068^b 30—1069^a 14

^b 32 μεταβολαῖς] κινήσει F 35 ὄντος E¹JMS: μόνον ὄντος
E²HIA εἶδει EHJMPS: φύσει FIT οὕτως] οὐ E 227^a I ἔστιν
ἐφεξῆς F 2 μονάς μονάδος S 3 οἰκία] οἰκίας E¹: an οἰκία
ἢ οἰκία? δ' om. E²: E¹ incertum εἶναι μεταξύ I 5 ἐφεξῆς
τὸ ἐν H τῶν δύο EM νεομηνία F τῇ δευτέρᾳ scripsi: τῆς
δευτέρας Π 6 ἐκείνοις ES: ἐκείνων Λ ὄν hic FIJMPS, post
ἄπτηται H: om. E 7—10 ἐπεὶ . . . μεταξύ post 226^b 23 ἅμα collocavi
10 μὲν om. I 12 συνέχονται M 13 τῶν ἐσχάτων E 14 δὲ om.
E¹ 15 τὴν om. F σύναψιν ΠM: συναφήν S ὥσπερ ποτε FH
16 συνέχον E¹FS: συνεχές E²HII ἢ] εἰ H 18 ἀνάγκη ἐφεξῆς
ΛT 19 ἐν EHJS: ἐν τοῖς FI 21 μὲν] μὲν οὐν H 23 εἶεν
et ἔν om. E 24 τῆν] τῆν τε E ἄψασθαι EI 25 πάντως EH

φυκεν· ἐν οἷς δὲ μὴ ἔστιν ἀφή, δηλον ὅτι οὐκ ἔστιν οὐδὲ
 σύμφυσις ἐν τούτοις. ὥστ' εἰ ἔστι στιγμή καὶ μονὰς οἷας λέ-
 γουσι κεχωρισμένας, οὐχ οἶόν τε εἶναι μονάδα καὶ στιγμήν
 τὸ αὐτό· ταῖς μὲν γὰρ ὑπάρχει τὸ ἄπτεσθαι, ταῖς δὲ μο-
 30 νάσιν τὸ ἐφεξῆς, καὶ τῶν μὲν ἐνδέχεται εἶναι τι μεταξὺ
 (πᾶσα γὰρ γραμμὴ μεταξὺ στιγμῶν), τῶν δ' οὐκ ἀνάγκη·
 οὐδὲ γὰρ μεταξὺ δυάδος καὶ μονάδος. τί μὲν οὖν ἔστι τὸ
 ἅμα καὶ χωρὶς, καὶ τί τὸ ἄπτεσθαι, καὶ τί τὸ μεταξὺ
 227^b καὶ τὸ ἐφεξῆς, καὶ τί τὸ ἐχόμενον καὶ τὸ συνεχές, καὶ τοῖς
 ποίοις ἕκαστον τούτων ὑπάρχει, εἴρηται.

Μία δὲ κίνησις λέγεται πολλαχῶς· τὸ γὰρ ἐν πολ- 4
 λαχῶς λέγομεν. γένει μὲν οὖν μία κατὰ τὰ σχήματα τῆς
 5 κατηγορίας ἐστί (φορὰ μὲν γὰρ πάση φορᾷ τῷ γένει μία,
 ἀλλοίωσις δὲ φορᾶς ἑτέρα τῷ γένει), εἶδει δὲ μία, ὅταν τῷ
 γένει μία οὔσα καὶ ἐν ἀτόμῳ εἶδει ᾗ. οἶον χρώματος μὲν
 εἰσὶ διαφοραὶ—τοιγαροῦν ἄλλη τῷ εἶδει μέλανσις καὶ λεύ-
 κανσις [πᾶσα οὖν λεύκανσις πάση λευκάνσει ἢ αὐτῇ κατ'
 10 εἶδος ἔσται καὶ πᾶσα μέλανσις μελάνσει]—λευκότητος δ' οὐ-
 κέτι· διὸ τῷ εἶδει μία λεύκανσις λευκάνσει πάση. εἰ δ' ἔστιν
 ἄτθ' ἃ καὶ γένη ἅμα καὶ εἶδη ἐστίν, δηλον ὡς ἔστιν ὡς εἶδει μία
 ἔσται, ἀπλῶς δὲ μία εἶδει οὔ, οἶον ἢ μάθησις, εἰ ἢ ἐπιστήμη
 εἶδος μὲν ὑπολήψεως, γένος δὲ τῶν ἐπιστημῶν. ἀπορήσειε
 15 δ' ἂν τις εἰ εἶδει μία (ἢ) κίνησις, ὅταν ἐκ τοῦ αὐτοῦ τὸ αὐτὸ εἰς
 τὸ αὐτὸ μεταβάλλῃ, οἶον ἢ μία στιγμή ἐκ τοῦδε τοῦ τόπου
 εἰς τόνδε τὸν τόπον πάλιν καὶ πάλιν. εἰ δὲ τοῦτ', ἔσται ἢ
 κυκλοφορία τῇ εὐθυφορίᾳ ἢ αὐτῇ καὶ ἢ κύλισις τῇ βαδίσει.
 ἢ διώρισταί, τὸ ἐν ᾧ ἂν ἕτερον ἢ τῷ εἶδει, ὅτι ἑτέρα ἢ κίνησις,

^a 26 οὐκ ἔστιν om. H 27 εἰ om. E²: εἴ τις I λέγουσι] λέγουσιν εἶναι I 31 πασης γὰρ γραμμῆς μεταξὺ στιγμή γρ. S μεταξὺ δύο στιγμῶν H 32 μεταξὺ γὰρ οὐδὲν E οὐδὲ scripsi cum T: οὐδὲν Λ δυάδος καὶ μονάδος EIIIJT: μονάδος καὶ δυάδος FS ^b I τὸ pr. om. E τὸ ult. om. FIJ τοῖς om. H 4 τὰ om. E 6 ἑτέρας E¹ εἶδει AST: τῷ εἶδει E 7 ἀτόμου εἶδει οἶον E 9-10 πᾶσα... μελάνσει seclusi (cf. ^bII διὸ... πάση) 9 πᾶσα δ' οὖν EH 10-11 λευκότητος... πάση om. γρ. S: λευκότητος δ' οὐκέτι ante 9 πᾶσα collocandum ci. Cornford 10 οὐκ ἔστιν EI et fort. S: οὐκ ἔσται H et fort. S 11 τῷ πῶς H: πῶς S: ἀπλῶς ci. Cornford πάση om. S εἰ... 16 τοῦδε E²AST: δὲ E¹ 12 ὡς ἔστιν E², fort. ST: ἔστιν H: οὖν IJ²: om. FJ¹ 13 εἶδει μία H ἢ alt. om. F 15 ἢ addidi ex S εἰς τὸ αὐτὸ τὸ αὐτὸ F 16 ἢ] εἰ ἢ H 18 τῇ εὐθυφορίᾳ E²AS: om. E¹ καὶ] τῷ εἶδει καὶ fort. ST 19 ἢ διώ- ρισται E²AS: ὄρισται E¹ τῷ εἶδει om. fort. S ἢ HS: om. EFIJ

τὸ δὲ περιφερὲς τοῦ εὐθέως ἕτερον τῷ εἶδει;

20

γένοι μὲν οὖν καὶ 20

εἶδει κίνησις μία οὕτως, ἀπλῶς δὲ μία κίνησις ἢ τῇ οὐσίᾳ
μία καὶ τῷ ἀριθμῷ· τίς δ' ἢ τοιαύτη, δῆλον διελομένοις.
τρία γὰρ ἔστι τὸν ἀριθμὸν περὶ ἃ λέγομεν τὴν κίνησιν, ὃ καὶ
ἐν ᾧ καὶ ὅτε. λέγω δ' ὅτι ἀνάγκη εἶναι τι τὸ κινούμενον,
οἶον ἄνθρωπον ἢ χρυσόν, καὶ ἐν τινι τοῦτο κινεῖσθαι, οἶον ἐν 25
τόπῳ ἢ ἐν πάθει, καὶ ποτέ· ἐν χρόνῳ γὰρ πάν κινεῖται.
τούτων δὲ τὸ μὲν εἶναι τῷ γένοι ἢ τῷ εἶδει μίαν ἔστιν ἐν τῷ
πράγματι ἐν ᾧ κινεῖται, τὸ δ' ἐχομένην ἐν τῷ χρόνῳ,
τὸ δ' ἀπλῶς μίαν ἐν ἅπασιν τούτοις· καὶ ἐν ᾧ γὰρ ἐν δεῖ
εἶναι καὶ ἄτομον, οἶον τὸ εἶδος, καὶ τὸ ὅτε, οἶον τὸν χρόνον 30
εἶνα καὶ μὴ διαλείπειν, καὶ τὸ κινούμενον ἐν εἶναι μὴ κατὰ
συμβεβηκός, ὥσπερ τὸ λευκὸν μελαίνεσθαι καὶ Κορίσκον βα-
δίξειν (ἐν δὲ Κορίσκος καὶ λευκόν, ἀλλὰ κατὰ συμβεβηκός),
μηδὲ κοινόν· εἴη γὰρ ἂν ἅμα δύο ἀνθρώπους ὑγιάζεσθαι τὴν 228^a
αὐτὴν ὑγίανσιν, οἶον ὀφθαλμίας· ἀλλ' οὐ μία αὕτη, ἀλλ'
εἶδει μία. τὸ δὲ Σωκράτη τὴν αὐτὴν μὲν ἀλλοίωσιν ἀλλοι-
οῦσθαι τῷ εἶδει, ἐν ἄλλῳ δὲ χρόνῳ καὶ πάλιν ἐν ἄλλῳ, εἰ
μὲν ἐνδέχεται τὸ φθαρὲν πάλιν ἐν γίγνεσθαι τῷ ἀριθμῷ, εἴη 5
ἂν καὶ αὕτη μία, εἰ δὲ μή, ἢ αὐτὴ μὲν, μία δ' οὐ· ἔχει
δ' ἀπορίαν ταύτη παραπλησίαν καὶ πότερον μία ἢ ὑγίεια
καὶ ὅλως αἱ ἕξεις καὶ τὰ πάθη τῇ οὐσίᾳ εἰσὶν ἐν τοῖς σώ-
μασιν· κινούμενα γὰρ φαίνεται τὰ ἔχοντα καὶ ρέοντα. εἰ δὴ
ἢ αὕτη καὶ μία ἢ ἔωθεν καὶ νῦν ὑγίεια, διὰ τί οὐκ ἂν καὶ 10
ὅταν διαλιπὼν λάβῃ πάλιν τὴν ὑγίειαν, καὶ αὕτη κάκεινη
μία τῷ ἀριθμῷ ἂν εἴη; ὁ γὰρ αὐτὸς λόγος· πλὴν τοσοῦτον
διαφέρει, ὅτι εἰ μὲν δύο, δι' αὐτὸ τοῦτο, ὡς τῷ ἀριθμῷ,
καὶ τὰς ἐνεργείας ἀνάγκη (μία γὰρ ἀριθμῷ ἐνέργεια ἐνὸς

^b 23 κίνησιν μίαν ὁ H 24 δ' ὅτι HI: δ' F 25 ἐν] ἢ
ἐν EH 26 ὁπότε E γὰρ] δὲ F 27 μία EH ἐν om. F
28 τὸ PS: τὸ δὲ τῷ ὑποκειμένῳ μίαν ἐν τῷ πράγματι ὃ κινεῖται, τὸ
Bonitz ἐχομένην scripsi, fort. cum PS: ἐχόμενον ἦν Π: τῷ ὅτε
μίαν εἶναι Bonitz 29 γὰρ ἐν ᾧ FIJ ἐν om. E²: E¹ incertum
30 καὶ αὐτὸ I οἶον om. FI, erasit J 31 εἶναι] on E²
228^a 1 ἂν om. FJ ἅμα om. S 2 ὑγίειαν H ὀφθαλμίας F
3 σωκράτη τὴν μὲν αὐτὴν H 6 αὕτη] ἢ αὐτὴ F οὐχί S
10 μία] μία ὑγίεια F 11 λάβῃ καὶ πάλιν Λ 12 πλὴν E²AS:
om. E¹ 13 εἰ αἰ μὲν ἕξεις δύο F¹ δι' . . . ὡς] οὕτως γρ. A δι'
E¹HJS: τὸ E²F: om. I ὡς γὰρ τῷ H 14 καὶ EH γρ. A:
μία καὶ FIJP ἐνεργείας Hayduck: ἕξεις ΠPST γρ. A

15 ἀριθμῶ)· εἰ δ' ἡ ἕξις μία, ἴσως οὐκ ἂν τῷ δόξειέ πω μία
καὶ ἡ ἐνέργεια εἶναι (ὅταν γὰρ παύσῃται βαδίζων, οὐκέτι
ἔστιν ἡ βάδισις, πάλιν δὲ βαδίζοντος ἔσται). εἰ δ' οὖν μία
καὶ ἡ αὐτή, ἐνδέχοιτ' ἂν τὸ αὐτὸ καὶ ἔν καὶ φθείρεσθαι
19 καὶ εἶναι πολλάκις.

19 αὐται μὲν οὖν εἰσιν αἱ ἀπορίαι ἕξω τῆς
20 νῦν σκέψεως· ἐπεὶ δὲ συνεχῆς πᾶσα κίνησις, τὴν τε ἀπλῶς
μίαν ἀνάγκη καὶ συνεχῆ εἶναι, εἴπερ πᾶσα διαιρετή, καὶ
εἰ συνεχῆς, μίαν. οὐ γὰρ πᾶσα γένοιτ' ἂν συνεχῆς πάση,
ὡσπερ οὐδ' ἄλλο οὐδὲν τῷ τυχόντι τὸ τυχόν, ἀλλ' ὅσων ἐν
τὰ ἔσχατα. ἔσχατα δὲ τῶν μὲν οὐκ ἔστι, τῶν δ' ἔστιν ἄλλα
25 τῷ εἶδει καὶ ὁμώνυμα· πῶς γὰρ ἂν ἄψαιτο ἢ ἐν γένοιτο
τὸ ἔσχατον γραμμῆς καὶ βαδίσεως; ἐχόμενα μὲν οὖν εἶεν
ἂν καὶ αἱ μὴ αἱ αὐταὶ τῷ εἶδει μηδὲ τῷ γένει (δραμῶν γὰρ
ἂν τις πυρέξειεν εὐθύς), καὶ οἶον ἢ λαμπὰς (ἢ) ἐκ διαδοχῆς
φορὰ ἐχομένη, συνεχῆς δ' οὐ. κείμενα γὰρ τὸ συνεχές, ὧν
30 τὰ ἔσχατα ἐν. ὥστ' ἐχόμενα καὶ ἐφεξῆς εἰσὶ τῷ τὸν χρό-
νον εἶναι συνεχῆ, συνεχῆς δὲ τῷ τὰς κινήσεις· τοῦτο δ',
228^b ὅταν ἐν τὸ ἔσχατον γένηται ἀμφοῖν. διὸ ἀνάγκη τὴν αὐτὴν
εἶναι τῷ εἶδει καὶ ἐνὸς καὶ ἐν ἐνὶ χρόνῳ τὴν ἀπλῶς συνεχῆ
κίνησιν καὶ μίαν, τῷ χρόνῳ μὲν, ὅπως μὴ ἀκινησία με-
ταξὺ ἢ (ἐν τῷ διαλείποντι γὰρ ἠρεμεῖν ἀνάγκη· πολλαὶ οὖν
5 καὶ οὐ μία ἡ κίνησις, ὧν ἔστιν ἠρεμία μεταξύ, ὥστε εἴ τις
κίνησις στάσει διαλαμβάνεται, οὐ μία οὐδὲ συνεχῆς· δια-
λαμβάνεται δέ, εἰ μεταξύ χρόνος)· τῆς δὲ τῷ εἶδει μὴ
μιάς, καὶ εἰ μὴ διαλείπεται [ὁ χρόνος], ὁ μὲν [γὰρ] χρόνος
εἷς, τῷ εἶδει δ' ἡ κίνησις ἄλλη· τὴν μὲν γὰρ μίαν ἀνάγκη

^a 15 ἴσως et πω om. S 16 ἡ om. F 17 ἔσται S ἐστὶν
H δ' om. A 18 καὶ αὐτῆ Hayduck καὶ ἐν om. H: ἐν E
19 οὖν FHIS: om. EJ 22 μίαν E¹T: μία E²AS 25 ἄψαιτο F
26 μὲν om. H 27 αἱ μὴ αἱ scripsi: μὴ αἱ EJ: αἱ μὴ FHIST
28 ἡ addidi ex T 29 φορὰς γενομένη (vel γενομένης), συνεχῶς
γρ. S οὐ] οὐκ ἔστι FJ γὰρ om. E¹ τὸ om. FI 30 ἐχόμενα
FI 31 συνεχές E²FHI: συνεχῆς ut vid. S, Bonitz ^b I γίνηται
F 2 τῷ εἶδει εἶναι ΔΤ 3 μεταξύ] ἐν τῷ μεταξύ F: ἐν τῷ
μεταξὺ τι HI 4 οὖν] μὲν οὖν H 5 εἴ] ἢ H et fecit J¹: ἡ
fecit E 6 οὔτε μία οὔτε FIJ 7 δέ om. F 8 μιάς οὐ, καὶ
FHIJ² ὁ pr. . . γὰρ] μὲν E¹: ὁ E²: ὁ (om. H¹) χρόνος, ὁ μὲν
γὰρ A: ὁ χρόνος, ὁ μὲν Bonitz 9 εἷς om. E δ' εἶδει A ἡ κίνησις
om. EFJ ἄλλο H καὶ τῷ εἶδει ἀνάγκη H

καὶ τῷ εἶδει μίαν εἶναι, ταύτην δ' ἀπλῶς μίαν οὐκ ἀνάγκη. 10
 τίς μὲν οὖν κίνησις ἀπλῶς μία, εἴρηται· ἔτι δὲ λέγεται μία
 καὶ ἡ τέλειος, ἕαν τε κατὰ γένος ἕαν τε κατ' εἶδος ἢ ἕαν
 τε κατ' οὐσίαν, ὡσπερ καὶ ἐπὶ τῶν ἄλλων τὸ τέλειον καὶ
 ὅλον τοῦ ἐνός. ἔστι δ' ὅτε καὶ ἀτελής ἢ μία λέγεται, ἕαν
 μόνον ἢ συνεχῆς. 15

ἔτι δ' ἄλλως παρὰ τὰς εἰρημένας λέγεται 15
 μία κίνησις ἢ ὁμαλής. ἡ γὰρ ἀνώμαλος ἔστιν ὡς οὐ δοκεῖ
 μία, ἀλλὰ μάλλον ἢ ὁμαλής, ὡσπερ ἡ εὐθεία· ἡ γὰρ
 ἀνώμαλος διαιρητή. ἔοικε δὲ διαφέρειν ὡς τὸ μάλλον καὶ
 ἦττον. ἔστιν δὲ ἐν ἀπάσῃ κινήσει τὸ ὁμαλῶς ἢ μή· καὶ γὰρ
 ἂν ἀλλοιοῖτο ὁμαλῶς, καὶ φέροιτο ἐφ' ὁμαλοῦ οἶον κύκλου 20
 ἢ εὐθείας, καὶ περὶ αὐξήσῃ ὡσαύτως καὶ φθίσῃ. ἀνωμαλία
 δ' ἔστιν διαφορὰ ὅτε μὲν ἐφ' ᾧ κινεῖται (ἀδύνατον γὰρ ὁμα-
 λὴν εἶναι τὴν κίνησιν μὴ ἐπὶ ὁμαλῶ μεγέθει, οἶον ἢ τῆς
 κεκλασμένης κίνησις ἢ ἢ τῆς ἕλικος ἢ ἄλλου μεγέθους, ὧν
 μὴ ἐφαρμόττει τὸ τυχὸν ἐπὶ τὸ τυχὸν μέρος) ἢ δὲ οὔτε 25
 ἐν τῷ ὁ οὔτ' ἐν τῷ πότε οὔτε ἐν τῷ εἰς ὅ, ἀλλ' ἐν τῷ ὡς. ταχυ-
 τῆτι γὰρ καὶ βραδυτῆτι ἐνίστε διώρισται· ἥς μὲν γὰρ τὸ
 αὐτὸ τάχος, ὁμαλής, ἥς δὲ μή, ἀνώμαλος. διὸ οὐκ εἶδη
 κινήσεως οὐδὲ διαφοραὶ τάχος καὶ βραδυτής, ὅτι πάσαις
 ἀκολουθεῖ ταῖς διαφόροις κατ' εἶδος. ὥστε οὐδὲ βαρύτης καὶ 30
 κουφότης ἢ εἰς τὸ αὐτό, οἶον γῆς πρὸς αὐτὴν ἢ πυρὸς πρὸς
 αὐτό. μία μὲν οὖν ἢ ἀνώμαλος τῷ συνεχῆς (εἶναι), ἦττον δέ, ὅπερ 229^a
 τῇ κεκλασμένῃ συμβαίνει φορᾶ· τὸ δ' ἦττον μίξις αἰεὶ τοῦ
 ἐναντίου. εἰ δὲ πάσαν τὴν μίαν ἐνδέχεται καὶ ὁμαλὴν εἶναι

^b 10 μίαν καὶ τῷ εἶδει I τὴν αὐτὴν E¹ δ' om. E ἀπλῶς
 εἶναι μίαν οὐκ ἀνάγκη IJ : οὐκ ἀνάγκη ἀπλῶς μίαν εἶναι F 11-220^a 6
 τίς . . . ἐφαρμόττειν hic APST : post 231^a 2 ἡρέμισις E 11 οὖν]
 οὖν ἢ I δὲ APS : om. E 12 ἕαν . . . γένος E²AS : om. E¹
 13 καὶ τὸ ὅλον H 15 μόνον ἢ AS : ἢ μόνον E δ'] δὲ καὶ F
 16 ὁμαλής E²AS : ὁμαλῶς E¹ ἢ . . . 17 ὁμαλής om. H 18 δὴ E¹
 20 ὁμαλοῦ E²AS : ὁμαλῶ A Porphyrius : ὁμαλλῶ E¹ κύκλω ἢ
 εὐθεία A Porphyrius 21 αὐξήν FI ἀνωμαλία E et
 ut vid. T : ἀνωμαλίας AS 22 ὅτι E ὧν E¹ : οὐ ST
 ὁμαλῶς F 23 ὁμαλεῖ F 24 ἢ ἢ] ἢ F 25 ἐπὶ τὸ τυχόν
 E²AS : om. E¹ ἢ E¹F I J¹ : ὅτε E²H J² 26 ὁ scripsi : ο E¹ : ποῦ
 E²AS ἐν τῷ εἰς ὁ I et ut vid. S : εἰς ὁ FH J et fecit E 27 γὰρ
 alt. om. E 28 οὐδ' H 31 τὸ om. F αὐτὴν] αὐτὴν γῆν H
 229^a 1 αὐτὸ πῶρ μία H εἶναι addidi ex T 2 μίξις PP : μίξει
 ST αἰεὶ om. T 3 ὁμαλῆ E²FJ

καὶ μὴ, οὐκ ἂν εἶησαν αἱ ἐχόμεναι αἱ μὴ κατ' εἶδος αἱ αὐται
 5 μία καὶ συνεχῆς· πῶς γὰρ ἂν εἶη ὁμαλῆς ἢ ἐξ ἀλλοιω-
 σεως συγκεκμημένη καὶ φορᾶς; δέοι γὰρ ἂν ἐφαρμόττειν.

*Ἐτι δὲ διοριστέον ποία κινήσεις ἐναντία κινήσει, καὶ περὶ 5
 μουῆς δὲ τὸν αὐτὸν τρόπον. διαιρετέον δὲ πρῶτον πότερον
 ἐναντία κινήσεις ἢ ἐκ τοῦ αὐτοῦ τῆ εἰς τὸ αὐτὸ (οἶον ἢ ἐξ ὑγι-
 10 είας τῆ εἰς ὑγίειαν), οἶον καὶ γένεσις καὶ φθορὰ δοκεῖ, ἢ ἢ
 ἐξ ἐναντίων (οἶον ἢ ἐξ ὑγιείας τῆ ἐκ νόσου), ἢ ἢ εἰς ἐναντία
 (οἶον ἢ εἰς ὑγίειαν τῆ εἰς νόσον), ἢ ἢ ἐξ ἐναντίου τῆ εἰς ἐναν-
 τίων (οἶον ἢ ἐξ ὑγιείας τῆ εἰς νόσον), ἢ ἢ ἐξ ἐναντίου εἰς ἐναν-
 15 τίων τῆ ἐξ ἐναντίου εἰς ἐναντίον (οἶον ἢ ἐξ ὑγιείας εἰς νόσον
 τῆ ἐκ νόσου εἰς ὑγίειαν). ἀνάγκη γὰρ ἢ ἕνα τινὰ τούτων εἶναι
 τῶν τρόπων ἢ πλείους· οὐ γὰρ ἔστιν ἄλλως ἀντιτιθέναι. ἔστι
 δ' ἢ μὲν ἐξ ἐναντίου τῆ εἰς ἐναντίον οὐκ ἐναντία, οἶον ἢ ἐξ
 ὑγιείας τῆ εἰς νόσον· ἢ αὐτὴ γὰρ καὶ μία. τὸ μέντοι γ' εἶ-
 ναι οὐ ταῦτ' αὐταῖς, ὥσπερ οὐ ταῦτ' οὐ ἐξ ὑγιείας μετα-
 20 βάλλειν καὶ τὸ εἰς νόσον. οὐδ' ἢ ἐξ ἐναντίου τῆ ἐξ ἐναντίου·
 ἅμα μὲν γὰρ συμβαίνει ἐξ ἐναντίου καὶ εἰς ἐναντίον ἢ με-
 ταξύ—ἀλλὰ περὶ τούτου μὲν ὕστερον ἐροῦμεν, ἀλλὰ μᾶλλον
 τὸ εἰς ἐναντίον μεταβάλλειν δόξειεν ἂν εἶναι αἴτιον τῆς ἐναν-
 τιώσεως ἢ τὸ ἐξ ἐναντίου· ἢ μὲν γὰρ ἀπαλλαγὴ ἐναντιό-
 25 τητος, ἢ δὲ λήψις. καὶ λέγεται δ' ἐκάστη εἰς ὃ μεταβάλ-
 λει μᾶλλον ἢ ἐξ οὔ, οἶον ὑγίανσις ἢ εἰς ὑγίειαν, νόσανσις
 27 δ' ἢ εἰς νόσον.

27
 27 λείπεται δὴ ἢ εἰς ἐναντία καὶ ἢ εἰς ἐναντία
 ἐξ ἐναντίων. τάχα μὲν οὖν συμβαίνει τὰς εἰς ἐναντία καὶ ἐξ

^a 4 καὶ . . . αἱ alt.] οὐκ ἂν εἶησαν αἱ ἐχόμεναι καὶ Cornford αἱ
 AS: om. E ἐχόμεναι . . . αὐταὶ scripsi, fort. cum PS: μὴ
 κατ' εἶδος ἐχόμεναι αὐταὶ (αὐταὶ J, καὶ αὐταὶ I) Π 5 μία ΔΤ:
 ἢ μία E 7 κινήσει ἐναντία H 8 δὲ pr. om. E: δὴ F
 9 ἢ alt. om. E 10 γένεσις φθορὰ H ἢ om. E¹H 11-12 ἢ ἢ
 (ἢ om. I) . . . ἐναντίον EHIJPS: om. F 13 οἶον . . . νόσον
 E¹IJPS: om. E²FH ἢ alt. E²AT: om. E¹ εἰς ἐναντίον
 om. I 14 τῆ om. E¹ 15 τινὰ om. S εἶναι τούτων F
 16 ἀντιτιθέναι AS: ἀντιτείναι E 18 γ' om. FIJ 19 οὐ κατ.]
 οὐ τὸ E: οὐδὲ H τὸ FIJS: ὄν EH 21 μὲν om. IS καὶ
 ante ἐξ F 22 τούτου μὲν EHP: μὲν τούτου IJ: μὲν τούτων F
 23 αἴτιον εἶναι FIJ: αἴτιον H 24 ἀπαλλαγὴ] ἀπαλλαγὴ ἐξ FIJ
 ἐναντιώσεως H 26 ὑγίανσις ἢ εἰς om. E νόσωσις E¹: νοσωδὴς
 E² 27 ἢ alt. om. E¹ ἢ E²AS: ἢ ἐξ ἐναντίων καὶ ἢ E¹ εἰς
 ἐναντία om. H 28 ἐξ] καὶ ἐξ I τάχα . . . 29 ἐναντίων om. F¹
 28 τὰς FHIS: τὰ EJ

ἐναντίων εἶναι, ἀλλὰ τὸ εἶναι ἴσως οὐ ταυτό, λέγω δὲ τὸ εἰς ὑγίειαν τῷ ἐκ νόσου καὶ τὸ ἐξ ὑγείας τῷ εἰς νόσον. ἐπεὶ 30 δὲ διαφέρει μεταβολὴ κινήσεως (ἢ ἔκ τινος γὰρ ὑποκειμένου εἰς τι ὑποκείμενον μεταβολὴ κινήσεως ἐστίν), ἢ ἐξ ἐναντίου εἰς ἐναντίον τῇ ἐξ ἐναντίου εἰς ἐναντίον κινήσεις ἐναντία, οἷον 229^b ἢ ἐξ ὑγείας εἰς νόσον τῇ ἐκ νόσου εἰς ὑγίειαν. δῆλον δὲ καὶ ἐκ τῆς ἐπαγωγῆς ὅποια δοκεῖ τὰ ἐναντία εἶναι· τὸ νοσᾶν γὰρ τῷ ὑγιᾶν καὶ τὸ μαθάνειν τῷ ἀπαθᾶν μὴ δι' αὐτοῦ (εἰς ἐναντία γὰρ ὥσπερ γὰρ ἐπιστήμην, 5 ἔστι καὶ ἀπάτην καὶ δι' αὐτοῦ κτᾶσθαι καὶ δι' ἄλλου), καὶ ἡ ἄνω φορὰ τῇ κάτω (ἐναντία γὰρ ταῦτα ἐν μήκει), καὶ ἡ εἰς δεξιὰ τῇ εἰς ἀριστερά (ἐναντία γὰρ ταῦτα ἐν πλάτει), καὶ ἡ εἰς τὸ ἔμπροσθεν τῇ εἰς τὸ ὀπίσθεν (ἐναντία γὰρ καὶ ταῦτα). ἢ δ' εἰς ἐναντίον μόνον οὐ κινήσεις ἀλλὰ μεταβολή, 10 οἷον τὸ γίνεσθαι λευκὸν μὴ ἔκ τινος. καὶ ὅσοις δὲ μὴ ἔστιν ἐναντία, ἢ ἐξ αὐτοῦ τῇ εἰς αὐτὸ μεταβολὴ ἐναντία· διὸ γενεσις φθορᾶ ἐναντία καὶ ἀποβολὴ λήψει· αὐταὶ δὲ μεταβολαὶ μὲν, κινήσεις δ' οὐ. τὰς δ' εἰς τὸ μεταξὺ κινήσεις, ὅσοις τῶν ἐναντίων ἔστι μεταξὺ, ὡς εἰς ἐναντία πως θετέον· 15 ὡς ἐναντίῳ γὰρ χρῆται τῷ μεταξὺ ἢ κινήσει, ἔφ' ὁπότερα ἂν μεταβάλλῃ, οἷον ἐκ φαιοῦ μὲν εἰς τὸ λευκὸν ὡς ἐκ μέλανος, καὶ ἐκ λευκοῦ εἰς φαιὸν ὡς εἰς μέλαν, ἐκ δὲ μέλανος εἰς φαιὸν ὡς εἰς λευκὸν τὸ φαιόν· τὸ γὰρ μέσον πρὸς ἑκάτερον λέγεται πως ἑκάτερον τῶν ἄκρων, καθάπερ εἴρηται 20 καὶ πρότερον. κινήσεις μὲν δὴ κινήσει ἐναντία οὕτως ἢ ἐξ ἐναντίου εἰς ἐναντίον τῇ ἐξ ἐναντίου εἰς ἐναντίον.

6 Ἐπεὶ δὲ κινήσει οὐ μόνον δοκεῖ κινήσεις εἶναι ἐναντία ἀλλὰ καὶ ἡρεμία, τοῦτο διοριστέον. ἀπλῶς μὲν γὰρ ἐναντίον

^a 29 δὲ τῷ I 30 καὶ . . . νόσον om. E¹ τῷ I τὸ E²
 31 διαφέρει E² γὰρ ἔκ τινος H ^b I τῇ . . . ἐναντίον om. E¹
 2 ἢ om. E 3 ποία H et fort. E¹ 4 γὰρ τῷ ὑγιᾶν om.
 E 5 μὴ δι' αὐτοῦ] ἰφ' ἑτέρου S 6 ἔστιν οὕτω καὶ E² Δ
 7 ταύτη E 9 τὸ om. H εἰς τὸ om. EH 10 ταῦτα ἐν
 βάθει. ἢ fecit F 11 γενέσθαι S μὴ] καὶ μὴ I καὶ EHIPS :
 om. FJ δὲ om. EPS ἔστιν] ἔστι τι I 12 ἐναντία ET :
 ἐναντίον APS τῇ om. ET : καὶ H ταυτὸ I 14 κινήσεις
 δ' E¹ 15 εἰς om. E 17 μεταβάλλῃ AS : μεταβάλλῃ E ἐκ
 μέλανος] μέλαν E 18 ἐκ om. J ὡς εἰς μέλαν om. E ἐκ δέ]
 καὶ ἐκ I 20 πως λέγεται H ἑκάτερον om. FHI 21 καὶ AS :
 om. E ἢ om. E¹ 22 τῇ . . . ἐναντίον om. E¹T 23 εἶναι
 om. S 24-5 ἀπλῶς . . . κινήσεις om. E¹ 24-5 κινήσεις ἐναντίον H

25 κίνησις κινήσει, ἀντίκειται δὲ καὶ ἡρεμία (στέρησις γάρ, ἔστι
 δ' ὡς καὶ ἡ στέρησις ἐναντία λέγεται), ποιά δὲ ποιά, οἶον
 τῆ κατὰ τόπον ἢ κατὰ τόπον. ἀλλὰ τοῦτο νῦν λέγεται
 ἀπλῶς· πότερον γὰρ τῆ ἐνταῦθα μονῆ ἢ ἐκ τούτου ἢ ἡ εἰς
 τοῦτο κίνησις ἀντίκειται; δῆλον δὲ ὅτι, ἐπεὶ ἐν δυσίν ἡ κίνη-
 30 σις ὑποκειμένοις, τῆ μὲν ἐκ τούτου εἰς τὸ ἐναντίον ἢ ἐν τούτῳ
 μονῆ, τῆ δ' ἐκ τοῦ ἐναντίου εἰς τοῦτο ἢ ἐν τῷ ἐναντίῳ. ἅμα δὲ
 καὶ ἀλλήλαις ἐνανταί αὐται· καὶ γὰρ ἀτοπον, εἰ κινήσεις
 230^a μὲν ἐνανταί εἰσίν, ἡρεμία δ' ἀντικείμεναι οὐκ εἰσίν. εἰσὶν δὲ
 αἱ ἐν τοῖς ἐναντίοις, οἶον ἢ ἐν ὑγιείᾳ τῆ ἐν νόσῳ ἡρεμία
 (κινήσει δὲ τῆ ἐξ ὑγιείας εἰς νόσον· τῆ γὰρ ἐκ νόσου εἰς ὑγι-
 εἰαν ἄλογον—ἡ γὰρ εἰς αὐτὸ κίνησις ἐν ᾧ ἔστηκεν, ἡρέμησις
 5 μᾶλλον ἔστιν, ἢ συμβαίνει γε ἅμα γίνεσθαι τῆ κινήσει—
 ἀνάγκη δὲ ἢ ταύτην ἢ ἐκείνην εἶναι)· οὐ γὰρ ἢ γ' ἐν λευκό-
 τητι ἡρεμία ἐναντία τῆ ἐν ὑγιείᾳ. ὅσοις δὲ μὴ ἔστιν ἐναντία,
 τούτων μεταβολῆ μὲν ἔστιν ἀντικείμενη ἢ ἐξ αὐτοῦ τῆ εἰς
 αὐτό, κίνησις δ' οὐκ ἔστιν, οἶον ἢ ἐξ ὄντος τῆ εἰς ὄν, καὶ
 10 μονῆ μὲν τούτων οὐκ ἔστιν, ἀμεταβλησία δέ. καὶ εἰ μὲν τι
 εἶη ὑποκείμενον, ἢ ἐν τῷ ὄντι ἀμεταβλησία τῆ ἐν τῷ μὴ
 ὄντι ἐναντία. εἰ δὲ μὴ ἔστι τι τὸ μὴ ὄν, ἀπορήσειεν ἂν τις
 τίνι ἐναντία ἢ ἐν τῷ ὄντι ἀμεταβλησία, καὶ εἰ ἡρεμία ἔστιν.
 εἰ δὲ τοῦτο, ἢ οὐ πᾶσα ἡρεμία κινήσει ἐναντία, ἢ ἡ γένεσις
 15 καὶ φθορὰ κίνησις. δῆλον τοίνυν ὅτι ἡρεμία μὲν οὐ λεκτέα,
 εἰ μὴ καὶ αὐται κινήσεις, ὅμοιον δέ τι καὶ ἀμεταβλησία·
 ἐναντία δὲ ἢ οὐδενὶ ἢ τῆ ἐν τῷ μὴ ὄντι ἢ τῆ φθορῷ· αὕτη
 18 γὰρ ἐξ αὐτῆς, ἢ δὲ γένεσις εἰς ἐκείνην.

18 ἀπορήσειε δ' ἂν τις

^b 25 καὶ] καὶ ἢ I 26 δ' E²APS : om. E¹ ποιά δὲ ποιά scripsi
 cum P : ποιά δὲ ποία EFHIST : ποία δὲ ποία J οἶον] ἢ H 27 κατὰ
 τὸν τόπον J ἢ κατὰ τόπον E²AS : om. E¹ νῦν] μὲν P : μὲν νῦν I
 28 ἐνταῦθα scripsi : ἐνταυθοῖ II : ἐνταυθι ci. Cornford ἢ om. E
 31 ἢ om. EF 29 ἐπειδὴ FH 29-30 ὑποκειμένοις ἢ κινήσις H
 31 δὲ ἐναντία ἀλλήλαις H 32 αὐται sup. lin. E ἀτοπον ἢ
 κίνησις E¹ 230^a 2 ἢ om. IJ¹ ἐν alt. om. E¹ 4 αὐτὸ EFHJS :
 ταῦτο IP 5 ἢ scripsi : ἢ II γε om. E 6 δὲ om. E¹ ἢ pr. om.
 E¹ γ' om. H 7 μηδέν H ἐναντία E¹F IJA γρ. S : ἐναντίον
 E²HS 8 τούτων A γρ. S : ὄν A γρ. S : om. E γρ. S 9-10 οἶον
 . . . ἔστιν om. H 9 εἰς τὸ μὴ ὄν E¹ καὶ om. EJA 10 καὶ εἰ
 μὲν AS : om. E τι εἶη fecit E II ἢ E²AS : οἶον ἢ E¹ τῆ . . .
 13 ἀμεταβλησία om. F 13 εἰ E²FHIS : om. E¹ 15 καὶ]

διὰ τί ἐν μὲν τῇ κατὰ τόπον μεταβολῇ εἰσι καὶ κατὰ φύ-
 σιν καὶ παρὰ φύσιν καὶ μοναὶ καὶ κινήσεις, ἐν δὲ ταῖς ἄλ- 20
 λαις οὐ, οἷον ἀλλοίωσις ἢ μὲν κατὰ φύσιν ἢ δὲ παρὰ
 φύσιν (οὐδὲν γὰρ μᾶλλον ἢ ὑγίανσις ἢ ἢ ὑόσανσις κατὰ
 φύσιν ἢ παρὰ φύσιν, οὐδὲ λεύκανσις ἢ μέλανσις)· ὁμοίως
 δὲ καὶ ἐπ' αὐξήσεως καὶ φθίσεως (οὔτε γὰρ αὐται ἀλλή- 25
 λαις ἐναντῖαι ὡς φύσει ἢ δὲ παρὰ φύσιν, οὐτ' αὐξήσις αὐξή-
 σει)· καὶ ἐπὶ γενέσεως δὲ καὶ φθορᾶς ὁ αὐτὸς λόγος· οὔτε
 γὰρ ἢ μὲν γένεσις κατὰ φύσιν ἢ δὲ φθορὰ παρὰ φύσιν
 (τὸ γὰρ γηρᾶν κατὰ φύσιν), οὔτε γένεσις ὄρωμεν τὴν μὲν
 κατὰ φύσιν τὴν δὲ παρὰ φύσιν. ἢ εἰ ἔστιν τὸ βίαιον παρὰ 30
 φύσιν, καὶ φθορὰ ἂν εἴη φθορᾶ ἐναντία ἢ βίαιος ὡς παρὰ
 φύσιν οὔσα τῇ κατὰ φύσιν; ἂρ' οὖν καὶ γενέσεις εἰσὶν ἐνῆαι
 βίαιοι καὶ οὐχ εἰμαρμέναι, αἷς ἐναντῖαι αἱ κατὰ φύσιν,
 καὶ αὐξήσεις βίαιοι καὶ φθίσεις, οἷον αὐξήσεις αἱ τῶν ταχῶν 230^b
 διὰ τρυφήν ἢ βῶντων, καὶ οἱ σῖτοι οἱ ταχῶν ἀδρυνόμενοι καὶ
 μὴ πιληθέντες; ἐπὶ δ' ἀλλοιώσεως πῶς; ἢ ὡσαύτως; εἴεν
 γὰρ ἂν τινες βίαιοι, αἱ δὲ φυσικαί, οἷον οἱ ἀφιέμενοι μὴ ἐν
 κρισίμοις ἡμέραις, οἱ δ' ἐν κρισίμοις· οἱ μὲν οὖν παρὰ φύ- 5
 σιν ἡλλοιώνται, οἱ δὲ κατὰ φύσιν. ἔσονται δὲ καὶ φθοραὶ
 ἐναντῖαι ἀλλήλαις, οὐ γενέσει. καὶ τί γε κωλύει ἔστιν ὡς;
 καὶ γὰρ εἰ ἢ μὲν ἡδεῖα ἢ δὲ λυπηρὰ εἴη· ὥστε οὐχ ἀπλῶς
 φθορὰ φθορᾶ ἐναντία, ἀλλ' ἢ ἢ μὲν τοιαυτὴ ἢ δὲ τοιαυτὴ
 αὐτῶν ἔστιν. 10

ὅλως μὲν οὖν ἐναντῖαι κινήσεις καὶ ἡρεμίαι τὸν 10
 εἰρημένον τρόπον εἰσίν, οἷον ἢ ἄνω τῇ κάτω· τόπου γὰρ ἐναν-
 τιώσεις αὐται. φέρεται δὲ τὴν μὲν ἄνω φορὰν φύσει τὸ

^a 19 καὶ HIJS: om. EF κατὰ... 20 παρὰ] παρὰ φύσιν καὶ κατὰ H: κατὰ E 22 μᾶλλον] ἄλλο J ἢ utrumque om. F νόσωσις fort. E¹ 24 γὰρ om. EIJ¹ ἐναντῖαι ἀλλήλαις H 25 ἢ δὲ E²IJ¹ST: ἢ E¹FHJ² 28 ἢ γὰρ γήρανσις EH γήρας FS: γηράσκειν T γένεσιν ἢ γήρανσιν ὄρωμεν H 29 ἢ εἰ] εἰ δὲ FI: εἰ δὲ JT 31 οὖν PPT: οὐ Gaye 32 αἱ κατὰ φύσιν ἐναντῖαι F ^b 3 εἴεν ET: εἴησαν Λ 4 ἂν om. I τινες EHT: αἱ μὲν τινες FIJ οἱ om. F 5 τ' E²F οὖν om. Λ 6 δὲ HIJS: δὲ EFT καὶ φθοραὶ ἐναντῖαι scripsi: αἱ φθοραὶ ἐναντῖαι EP: ἐναντῖαι αἱ φθοραὶ FIJ: ἐναντῖαι φθοραὶ H: ἐναντῖαι καὶ φθοραὶ T 7 οὐ EFIJP: καὶ T: καὶ οὐ H γένεσει Gaye: γενέσει EFIJPST: γενέσει μόνον H: γενέσεις Moreliana δὲ H ὡς E¹PS: γὰρ ὡς E²Λ 9 ἢ om. E¹ ἢ pr. om. J¹ 10 οὖν] οὖν αἱ H κινήσις ἡρεμία E¹ 12 αὐται AST: αὐται. καθόλου δὲ πρώτως ταῦτα καὶ κυρίως ὑπάρχει EP (cf. ^b 21 adnot.) μὲν et φορὰν AS: om. E

πῦρ, τὴν δὲ κάτω ἢ γῆ· καὶ ἐναντία γ' αὐτῶν αἱ φοραί. τὸ
 δὲ πῦρ ἄνω μὲν φύσει, κάτω δὲ παρὰ φύσιν· καὶ ἐναντία
 15 γε ἢ κατὰ φύσιν αὐτοῦ τῆ παρὰ φύσιν. καὶ μοναὶ δ' ὡς-
 αὐτῶς· ἢ γὰρ ἄνω μονὴ τῆ ἄνωθεν κάτω κινήσει ἐναντία.
 γίνεται δὲ τῆ γῆ ἢ μὲν μονὴ ἐκείνη παρὰ φύσιν, ἢ δὲ κί-
 νησις αὕτη κατὰ φύσιν. ὥστε κινήσει μονὴ ἐναντία ἢ παρὰ
 φύσιν τῆ κατὰ φύσιν τοῦ αὐτοῦ· καὶ γὰρ ἢ κινήσις ἢ τοῦ
 20 αὐτοῦ ἐναντία οὕτως· ἢ μὲν γὰρ κατὰ φύσιν [ἔσται] αὐτῶν,
 ἢ ἄνω ἢ ἢ κάτω, ἢ δὲ παρὰ φύσιν. ἔχει δ' ἀπορίαν εἰ
 ἔστιν πάσης ἡρεμίας τῆς μὴ αἰεὶ γένεσις, καὶ αὕτη τὸ ἴστα-
 σθαι. τοῦ δὴ παρὰ φύσιν μένοντος, οἷον τῆς γῆς ἄνω, εἴη
 ἂν γένεσις. ὅτε ἄρα ἐφέρετο ἄνω βία, ἴστατο. ἀλλὰ τὸ
 25 ἴστάμενον αἰεὶ δοκεῖ φέρεσθαι θάπτον, τὸ δὲ βία τοῦναντίον. οὐ
 γενόμενον ἄρα ἡρεμοῦν ἔσται ἡρεμοῦν. ἔτι δοκεῖ τὸ ἴστασθαι ἢ
 ὄλως εἶναι τὸ εἰς τὸν αὐτοῦ τόπον φέρεσθαι ἢ συμβαίνειν
 ἅμα. ἔχει δ' ἀπορίαν εἰ ἐναντία ἢ μονὴ ἢ ἐνταῦθα τῆ ἐν-
 τεῦθεν κινήσει· ὅταν γὰρ κινήται ἐκ τουδὶ καὶ ἀποβάλλη,
 30 ἔτι δοκεῖ ἔχειν τὸ ἀποβαλλόμενον, ὥστ' εἰ αὕτη ἢ ἡρεμία ἐναν-
 τία τῆ ἐντεῦθεν εἰς τοῦναντίον κινήσει, ἅμα ὑπάρξει τὰναντία.
 ἢ πῆ ἡρεμεί, εἰ ἔτι μένει, ὄλως δὲ τοῦ κινουμένου τὸ μὲν
 231^a ἐκεῖ, τὸ δ' εἰς ὃ μεταβάλλει; διὸ καὶ μᾶλλον κινήσις κι-
 νήσει ἐναντίον ἢ ἡρέμησις. καὶ περὶ μὲν κινήσεως καὶ ἡρε-
 μίας, πῶς ἑκάτερα μία, καὶ τίνες ἐναντίαί τίσιν, εἴ-
 ρηται.

5 [ἀπορήσειε δ' ἂν τις καὶ περὶ τοῦ ἴστασθαι, εἰ καὶ ὅσαι

^b 13 γ' E²HS: om. E¹FIJ αἱ E²AS: om. E¹ διαφοραὶ J¹
 15 γε om. S καὶ αἱ S 16 κάτω om. E 17 ἐκείνη ἢ ἄνω παρὰ H
 18 αὐτῆ H: om. E¹ μονὴ E²AST: μόνον E¹ 18-19 ἢ κατὰ φύσιν
 τῆ τοῦ αὐτοῦ παρὰ φύσιν F 20 ἔσται om. S: post αὐτῶν FIJ 21 ἢ
 ἄνω ἢ κάτω S φύσιν] φύσιν. καθόλου δὲ καὶ πρώτως ταῦτα κυρίως
 ὑπάρχει E²H γρ. S (cf. ^b 12 adn.) 24 ὅτε ἄρα] ὁ γὰρ E¹: ὅτε I
 τὸ μὲν Λ 26 γιγνώμενον E² ἔσται τὸ ἡρεμοῦν E² ἔτι E²AS:
 τι E¹: εἰ Prantl δοκεῖ λέγεσθαι τὸ I ἴστασθαι E¹FIJ: ἴστασθαι
 κυρίως λέγεσθαι ἐπὶ τοῦ κατὰ φύσιν E²HAS, etiam εἰς τὸν οἰκείον τόπον
 ἰόντος ἀλλ' (ἀλλ' om. S) οὐκ ἐπὶ τοῦ παρὰ φύσιν HAS 27 τὸ E²AP:
 τὸν E¹ συμβαίνειν E²APS: συμβαίνει E¹ 28 ἢ μονὴ ἐνταῦθα F:
 μονὴ ἢ ἐνταῦθα E: ἢ ἐνταῦθα μονὴ HS ἐνταῦθα H¹ 29 τουδὶ ἢ
 καὶ FIJ ἀποβάλλη... 30 τὸ om. E¹ 30 εἰ om. E¹ αὕτη ἢ
 scripsi: αὕτη ἢ IJ: ἢ αὕτη EFH: αὕτη Moreliana 32 ἢ EFIJ²P:
 ἢ J¹: εἰ HS πῆ scripsi cum PS: πῆ II εἰ E²FIP: ἢ HJ¹S: ἢ J¹:
 E¹ incertum 231^a I μεταβάλλει E²AS: μετέβαλλεν E¹ 2 καὶ
 alt.] ἢ I 3 πῶς EIJS: καὶ πῶς FH ἑκάτερα AS: ἑκάτερον E
 5-17 ἀπορήσειε... ἀντίκειται EFIJAS: om. HT γρ. A γρ. S Porphyrius

παρὰ φύσιν κινήσεις, ταύταις ἔστιν ἡρεμία ἀντικειμένη. εἰ μὲν οὖν μὴ ἔσται, ἀποπον· μένει γάρ, βία δέ. ὥστε ἡρεμοῦν τι ἔσται οὐκ αἰεὶ ἄνευ τοῦ γενέσθαι. ἀλλὰ δῆλον ὅτι ἔσται ὥσπερ γὰρ κινεῖται παρὰ φύσιν, καὶ ἡρεμοίη ἂν τι παρὰ φύσιν. ἐπεὶ δ' ἔστιν ἐνίοις κινήσεις κατὰ φύσιν καὶ παρὰ 10 φύσιν, οἶον πυρὶ ἢ ἄνω κατὰ φύσιν ἢ δὲ κάτω παρὰ φύσιν, πότερον αὕτη ἐναντία ἢ ἡ τῆς γῆς; αὕτη γὰρ φέρεται κατὰ φύσιν κάτω. ἢ δῆλον ὅτι ἄμφω, ἀλλ' οὐχ ὡσαύτως, ἀλλ' ἢ μὲν κατὰ φύσιν ὡς κατὰ φύσιν οὔσης τῆς αὐτοῦ· ἢ δ' ἄνω τοῦ πυρὸς τῇ κάτω, ὡς ἢ κατὰ φύσιν οὔσα τῇ παρὰ 15 φύσιν οὔση. ὁμοίως δὲ καὶ ταῖς μοναῖς. ἴσως δ' ἡρεμία κινήσεις πῃ ἀντίκειται.]

Z.

I Εἰ δ' ἐστὶ συνεχῆς καὶ ἀπτόμενον καὶ ἐφεξῆς, ὡς διώρισταί πρότερον, συνεχῆ μὲν ὦν τὰ ἔσχατα ἔν, ἀπτόμενα δ' ὦν ἅμα, ἐφεξῆς δ' ὦν μηδὲν μεταξὺ συγγενές, ἀδύνατον ἐξ ἀδιαιρέτων εἶναι τι συνεχές, οἶον γραμμὴν ἐκ 25 στιγμῶν, εἴπερ ἢ γραμμὴ μὲν συνεχές, ἢ στιγμὴ δὲ ἀδιαίρετον. οὔτε γὰρ ἔν τὰ ἔσχατα τῶν στιγμῶν (οὐ γάρ ἐστι τὸ μὲν ἔσχατον τὸ δ' ἄλλο τι μόριον τοῦ ἀδιαιρέτου), οὔθ' ἅμα τὰ ἔσχατα (οὐ γάρ ἐστιν ἔσχατον τοῦ ἀμεροῦς οὐδέν· ἕτερον γὰρ τὸ ἔσχατον καὶ οὐ ἔσχατον). ἔτι δ' ἀνάγκη ἦτοί συνεχεῖς εἶναι τὰς στιγμαὶς ἢ ἀπτομένας ἀλλήλων, ἐξ ὧν ἐστι 30 τὸ συνεχές· ὁ δ' αὐτὸς λόγος καὶ ἐπὶ πάντων τῶν ἀδιαιρέτων. συνεχεῖς μὲν δὴ οὐκ ἂν εἶεν διὰ τὸν εἰρημένον λόγον· 231^b ἄπτεται δ' ἅπαν ἢ ὅλον ὅλου ἢ μέρος μέρους ἢ ὅλου μέρος. ἐπεὶ δ' ἀμερῆς τὸ ἀδιαίρετον, ἀνάγκη ὅλον ὅλου ἄπτεσθαι.

^a 6 καὶ παρὰ E 9 ἡρεμοίη E²IS: ἡρεμοί FHJ: E¹ incertum
 10 κινήσεις ἐνίοις F 11 πῦρ J 12 αὕτη pr.] αὐτῆς E 14 μὲν] μὲν ὡς FJ² ὡς om. FJ οὔσα F τῆς αὐτοῦ· ἢ δ' scripsi, legit ut vid. S: τῆσδ' αὐτοῦ· ἢ (ἢ J, om. E) Π 15 ὡς ἢ AS: οὐσ E τῇ AS: om. E 17 πῃ om. E¹ post ἀντίκειται add. Λ 230^b 29—231^a 3 ὅταν . . . εἰρηται: add. S ^a2—3 περὶ . . . εἰρηται: om. EV Tit. περὶ κινήσεως τῶν εἰς γ τὸ β—ζῆ E: φυσικῶν ἔκτον I 21 εἰ EFHJKS¹: ἐπεὶ IS^c 24 ἀδύνατον ἐξ om. F¹ γραμμὴ E¹ 25 μὲν γραμμὴ H δὲ στιγμὴ H 28 ἔσχατον οὐδὲν (vel οὐθὲν) τοῦ ἀμεροῦς ΚΛ: οὐδὲν ἔσχατον τοῦ ἀμεροῦς T 29 οὐ E²KAS: οὐκ E¹ δ' om. FJ¹KS 30 τὰ E ^b 2 μέρος alt.] μέρους F

ὄλον δ' ὄλον ἀπτόμενον οὐκ ἔσται συνεχές. τὸ γὰρ συνεχές
 5 ἔχει τὸ μὲν ἄλλο τὸ δ' ἄλλο μέρος, καὶ διαιρεῖται εἰς
 οὕτως ἕτερα καὶ τόπῳ κεχωρισμένα. ἀλλὰ μὴν οὐδὲ ἐφεξῆς
 ἔσται στιγμή στιγμή ἢ τὸ νῦν τῷ νῦν, ὥστ' ἐκ τούτων εἶναι τὸ
 μήκος ἢ τὸν χρόνον· ἐφεξῆς μὲν γάρ ἐστιν ὦν μηθέν ἐστι με-
 ταξὺ συγγενές, στιγμῶν δ' αἰεὶ [τὸ] μεταξὺ γραμμῆ καὶ τῶν
 10 νῦν χρόνος. ἔτι διαιροῦτ' ἂν εἰς ἀδιαίρετα, εἴπερ ἐξ ὦν ἐστιν
 ἐκάτερον, εἰς ταῦτα διαιρεῖται· ἀλλ' οὐθὲν ἦν τῶν συνεχῶν
 εἰς ἀμερῆ διαιρετόν. ἄλλο δὲ γένος οὐχ οἶόν τ' εἶναι μεταξὺ
 [τῶν στιγμῶν καὶ τῶν νῦν οὐθέν]. ἢ γὰρ [ἔσται, δῆλον ὡς ἦτοι]
 ἀδιαίρετον ἔσται ἢ διαιρετόν, καὶ εἰ διαιρετόν, ἢ εἰς ἀδιαί-
 15 ρετα ἢ εἰς αἰεὶ διαιερέτᾳ· τοῦτο δὲ συνεχές. φανερόν δὲ καὶ
 ὅτι πᾶν συνεχές διαιρετόν εἰς αἰεὶ διαιερέτᾳ· εἰ γὰρ εἰς ἀδι-
 αίρετα, ἔσται ἀδιαίρετον ἀδιαιρέτου ἀπτόμενον· ἐν γὰρ τὸ
 18 ἔσχατον καὶ ἄπτεται τῶν συνεχῶν.

18 τοῦ δ' αὐτοῦ λόγου
 μέγεθος καὶ χρόνον καὶ κίνησιν ἐξ ἀδιαιρέτων συγκεῖσθαι,
 20 καὶ διαιρεῖσθαι εἰς ἀδιαίρετα, ἢ μηθέν. δῆλον δ' ἐκ τῶνδε.
 εἰ γὰρ τὸ μέγεθος ἐξ ἀδιαιρέτων σύγκειται, καὶ ἡ κίνησις
 ἢ τούτου ἐξ ἴσων κινήσεων ἔσται ἀδιαιρέτων, οἷον εἰ τὸ ΑΒΓ
 ἐκ τῶν ΑΒΓ ἐστὶν ἀδιαιρέτων, ἢ κίνησις ἐφ' ἧς ΔΕΖ, ἢν
 ἐκινήθη τὸ Ω ἐπὶ τῆς ΑΒΓ, ἕκαστον τὸ μέρος ἔχει ἀδιαί-
 25 ρετον. εἰ δὴ παρούσης κινήσεως ἀνάγκη κινεῖσθαι τι, καὶ εἰ
 κινεῖται τι, παρεῖναι κίνησιν, καὶ τὸ κινεῖσθαι ἔσται ἐξ ἀδι-
 αιρέτων. τὸ μὲν δὴ Α ἐκινήθη τὸ Ω τὴν τὸ Δ κινούμενον κί-
 νησιν, τὸ δὲ Β τὴν τὸ Ε, καὶ τὸ Γ ὡσαύτως τὴν τὸ Ζ. εἰ
 δὴ ἀνάγκη τὸ κινούμενον ποθὲν ποι μὴ ἅμα κινεῖσθαι καὶ

^b 4 ἔστι Κ 6 ἕτερα Ε¹ F J K S : διαιερέτᾳ Ε² H I P 7 στιγμή
 Ε² S P : στιγμής Ε¹ K A S¹ τῷ Ε F I J K T : τῶν Η : τοῦ Camotiana
 8 μηθέν τι ἐστὶ F 9 τὸ seclusi : om. S 10 διαιροῦτ' K A S :
 δὲ διαιροῦντ' Ε 13 τῶν . . . οὐθέν om. E et ut vid. S ἢ E et
 ut vid. S : εἰ Κ A ἔσται . . . ἦτοι om. E et ut vid. S 14 ἀδιαί-
 ρετον ἢ διαιρετόν ἔσται F : διαιρετόν ἢ ἀδιαίρετον ἔσται H I J K εἰ . . .
 εἰς] ἢ Ε ἀδιαίρετα fecit E 15 ἢ . . . διαιερέτᾳ Ε² F² H I J K P S P :
 om. S¹ : αἰεὶ om. Ε¹ F¹ 16 ἀδιαίρετα] ἀδιαίρετον F : ἀδιαίρετα
 διαιροῦτο (διαιροῦντο Ε¹) τὸ συνεχές Ε Η J² 18 λόγος Ε I S : λόγος
 καὶ F H J K 19 κίνησιν καὶ χρόνον Η S 22 ἢ (ἐπὶ) Bywater,
 fort. S T τὸ μὲν α F γ μέγεθος ἐκ Η 23 ἔστιν] ἐστὶν
 μερῶν Ε Η ἢ] καὶ ἢ F K Δ] ἢ δ Ε Η J 24 Γ] γ διαστάσεως
 Ε F H τὸ om. Ε² Κ A 25 δὴ Ε H I J K P : δὲ F 27 τὸ
 ult. om. Ε¹ 28 β δὲ F τὸ ult. om. I J

κεκωῆσθαι οὐ ἐκινεῖτο ὅτε ἐκινεῖτο (οἶον εἰ Θήβαζε τι βα- 30
 δίζει, ἀδύνατον ἅμα βαδίζειν Θήβαζε καὶ βεβαδικέναι
 Θήβαζε), τὴν δὲ τὸ Α τὴν ἀμερῇ ἐκινεῖτο τὸ Ω, ἢ ἢ τὸ Δ 232^a
 κινήσεις παρῆν· ὥστ' εἰ μὲν ὕστερον διεληλύθει ἢ διήει, διαιρετὴ
 ἂν εἴη (ὅτε γὰρ διήει, οὔτε ἠρέμει οὔτε διεληλύθει, ἀλλὰ
 μεταξὺ ἦν), εἰ δ' ἅμα διέρχεται καὶ διελήλυθε, τὸ βαδίζον,
 ὅτε βαδίζει, βεβαδικὸς ἐκεῖ ἔσται καὶ κεκωημένον οὐ κινεῖ- 5
 ται. εἰ δὲ τὴν μὲν ὅλην τὴν ΑΒΓ κινεῖται τι, καὶ ἡ κίνη-
 σις ἦν κινεῖται τὰ ΔΕΖ ἔστι, τὴν δ' ἀμερῇ τὴν Α οὐθὲν κιν-
 εῖται ἀλλὰ κεκίνηται, εἴη ἂν ἡ κίνηση οὐκ ἐκ κινήσεων
 ἀλλ' ἐκ κινήματων καὶ τῷ κεκωῆσθαι τι μὴ κινούμενον· τὴν
 γὰρ Α διελήλυθεν οὐ διεξίον. ὥστε ἔσται τι βεβαδικέναι μη- 10
 δέποτε βαδίζον· ταύτην γὰρ βεβαδίκεν οὐ βαδίζον ταύτην.
 εἰ οὖν ἀνάγκη ἢ ἠρεμεῖν ἢ κινεῖσθαι πάν, ἠρεμεῖ καθ'
 ἕκαστον τῶν ΑΒΓ, ὥστ' ἔσται τι συνεχῶς ἠρεμοῦν ἅμα καὶ
 κινούμενον. τὴν γὰρ ΑΒΓ ὅλην ἐκινεῖτο καὶ ἠρέμει ὅτιοῦν μέ-
 ρος, ὥστε καὶ πᾶσαν. καὶ εἰ μὲν τὰ ἀδιαίρετα τῆς ΔΕΖ 15
 κινήσεις, κινήσεως παρουσίας ἐνδέχουτ' ἂν μὴ κινεῖσθαι ἀλλ'
 ἠρεμεῖν· εἰ δὲ μὴ κινήσεις, τὴν κίνηση μὴ ἐκ κινήσεων εἶναι.
 ὁμοίως δ' ἀνάγκη τῷ μήκει καὶ τῇ κινήσει ἀδιαίρετον εἶναι
 τὸν χρόνον, καὶ συγκεῖσθαι ἐκ τῶν νῦν ὄντων ἀδιαίρετων· εἰ
 γὰρ πᾶσα διαιρετός, ἐν τῷ ἐλάττονι δὲ τὸ ἰσοταχὲς δίεισιν 20
 ἔλαττον, διαιρετὸς ἔσται καὶ ὁ χρόνος. εἰ δ' ὁ χρόνος διαι-
 ρετὸς ἐν ᾧ φέρεται τι τὴν Α, καὶ ἡ τὸ Α ἔσται διαιρετή.

2 Ἐπεὶ δὲ πάν μέγεθος εἰς μεγέθη διαιρετόν (δεδείκται

^b 30 οὐ ἐκινεῖτο EIJ²ST: om. FJ¹K et in lacuna H ὅτε ἐκι-
 νεῖτο EFHJKP: om. IST τις F: ἔτι K 232^a 1 δὴ HIK
 ἢ . . . Δ om. E: ἢ om. J¹K 2 διεληλύθει Bonitz, fort. ST: τὸ
 διελήλυθεν Π 3 διήει] διήει οὔτε γὰρ διήει E¹ 4 ἐλήλυθε F
 βαδίζον, ὅτε βαδίζει] βαδίζει vel βαδίζειν H 5 ἔσται ἐκεῖ HK
 6 κινῆται E¹ 7 τὰ] ἢ E²H 8 εἰτ' ἂν E οὐκ . . . 9 ἀλλ' KAS:
 om. E 8 κινήσεως H 9 τῷ scripsi: τὸ EJKP: τῶν S: τοῦ T:
 om. FHI κεκωῆσθαι E²AST: κινεῖσθαι E¹K 10 Α om. E¹
 βεβαδικέναι τι H 12 ἢ pr. om. I: ἅπαν ἢ F πάν om. FIJ¹K
 καθ' E²FJKT: δὲ καθ' E¹HI 15 τῆς] τὰς E¹: τὰ E²HK
 16 κινήσις E¹ 17 κινήσεις E²FHJKS: κίνησις E¹: κινήσεις
 εἰς I 19 τὸν] καὶ τὸν E²HI 20 πᾶσα διαιρετός E²HI²K
 γρ. S: πᾶς διαιρετός E¹J: ἅπας διαιρετός γρ. I γρ. JA γρ. S: πᾶσα
 ἀδιαίρετος FI¹: πᾶς ἀδιαίρετος γρ. I Aspasius: πᾶσ' ἢ Α διαιρετός
 ci. Cornford ἐν . . . δέ] καὶ ἐν τῷ ἐλάττονι K 21 καὶ ὁ χρόνος
 ἔσται διαιρετός K 22 ἐν EHK²: ἔσται ἐν FIJ τι om. S
 23 μεγέθη HIKS: μέγεθος EFJ

γὰρ ὅτι ἀδύνατον ἐξ ἀτόμων εἶναι τι συνεχές, μέγεθος δ'
 25 ἐστὶν ἅπαν συνεχές), ἀνάγκη τὸ θάπτον ἐν τῷ ἴσῳ χρόνῳ μεί-
 ζον καὶ ἐν τῷ ἐλάττονι ἴσον καὶ ἐν τῷ ἐλάττονι πλείον κινεῖ-
 σθαι, καθάπερ ὀρίζονται τινες τὸ θάπτον. ἔστω γὰρ τὸ ἐφ' ᾧ Α
 τοῦ ἐφ' ᾧ Β θάπτον. ἐπεὶ τοίνυν θάπτόν ἐστιν τὸ πρότερον μετα-
 βάλλον, ἐν ᾧ χρόνῳ τὸ Α μεταβέβληκεν ἀπὸ τοῦ Γ εἰς τὸ Δ,
 30 οἶον τῷ ΖΗ, ἐν τούτῳ τὸ Β οὕτω ἔσται πρὸς τῷ Δ, ἀλλ' ἀπο-
 λείψει, ὥστε ἐν τῷ ἴσῳ χρόνῳ πλείον διείσιν τὸ θάπτον. ἀλλὰ
 μὴν καὶ ἐν τῷ ἐλάττονι πλείον· ἐν ᾧ γὰρ τὸ Α γεγένηται
 πρὸς τῷ Δ, τὸ Β ἔστω πρὸς τῷ Ε τὸ βραδύτερον ὄν. οὐκοῦν ἐπεὶ
 232^b τὸ Α πρὸς τῷ Δ γεγένηται ἐν ἅπαντι τῷ ΖΗ χρόνῳ, πρὸς
 τῷ Θ ἔσται ἐν ἐλάττονι τούτου· καὶ ἔστω ἐν τῷ ΖΚ. τὸ μὲν
 οὖν ΓΘ, ὃ διελήλυθε τὸ Α, μείζόν ἐστι τοῦ ΓΕ, ὃ δὲ χρό-
 νος ὁ ΖΚ ἐλάττων τοῦ παντὸς τοῦ ΖΗ, ὥστε ἐν ἐλάττονι
 5 μείζον διείσιν. φανερόν δὲ ἐκ τούτων καὶ ὅτι τὸ θάπτον ἐν
 ἐλάττονι χρόνῳ διείσιν τὸ ἴσον. ἐπεὶ γὰρ τὴν μείζω ἐν ἐλάτ-
 τονι διέρχεται τοῦ βραδυτέρου, αὐτὸ δὲ καθ' αὐτὸ λαμβαν-
 νόμενον ἐν πλείονι χρόνῳ τὴν μείζω τῆς ἐλάττονος, οἶον τὴν
 ΑΜ τῆς ΑΞ, πλείων ἂν εἴη ὁ χρόνος ὁ ΠΡ, ἐν ᾧ τὴν
 10 ΑΜ διέρχεται, ἢ ὁ ΠΣ, ἐν ᾧ τὴν ΑΞ. ὥστε εἰ ὁ ΠΡ
 χρόνος ἐλάττων ἐστὶν τοῦ Χ, ἐν ᾧ τὸ βραδύτερον διέρχε-
 ται τὴν ΑΞ, καὶ ὁ ΠΣ ἐλάττων ἔσται τοῦ ἐφ' ᾧ Χ· τοῦ
 γὰρ ΠΡ ἐλάττων, τὸ δὲ τοῦ ἐλάττονος ἔλαττον καὶ αὐτὸ
 ἔλαττον. ὥστε ἐν ἐλάττονι κινήσεται τὸ ἴσον. ἔτι δ' εἰ πᾶν
 15 ἀνάγκη ἢ ἐν ἴσῳ ἢ ἐν ἐλάττονι ἢ ἐν πλείονι κινεῖ-
 σθαι, καὶ τὸ μὲν ἐν πλείονι βραδύτερον, τὸ δ' ἐν ἴσῳ ἰσο-
 ταχές, τὸ δὲ θάπτον οὔτε ἰσοταχές οὔτε βραδύτερον, οὐτ' ἂν

^a 24 συνεχές] μέγεθος E¹HI μέγεθος . . . 25 συνεχές om. J¹
 26 ἐν E²KAS: om. F¹ ἴσον . . . ἐλάττονι om. FJKS πλείον
 IS 27 ᾧ τὸ α IJK 28 ἐφ' ᾧ] ἐφ' ᾧ τὸ Η: om. E¹ 30 τῷ
 pr.] τὸ J: ἐν τῷ E²FI 32 πλείον FHJK: τὸ πλείον E: πλείον
 τούτου I 33^{-b1} τὸ . . . Δ om. K 33 ἔσται FJ τὸ om. E
 ὄν om. FIJS ^b 2 ἔστω E²FHJKS: ἔσται E¹I 3 θ EHIJS: δ
 FK A om. E¹: πρώτον J¹ ἔστι om. K 5 μείζον διείσιν ES:
 διείσιν μείζον ΚΑ δὴ E 6 ἐπειδὴ FIJK τὴν om. E¹
 ἐν om. I 11-12 τοῦ . . . ἔσται om. K 11 χ E¹J¹ et ut vid.
 S: πχ E²FHIJ²K 12 X] πχ FK τὸ E² 13 αὐτὸ
 E²KAS: αὐτοῦ E¹ 14 κινήσεται ΚΑ 15 ἢ] μὲν ἢ Δ:
 μέρος ἢ Κ ἴσῳ χρόνῳ ἢ Aldina ἐν alt. om. EJ 16 καὶ om. I
 ἰσοταχές KAPST: ὁμοταχές E 17-18 ἐν ἴσῳ ἂν ΚΑ

ἐν ἴσῳ οὐτ' ἐν πλείονι κινούτο τὸ θάττον. λείπεται οὖν ἐν ἐλάττονι, ὥστ' ἀνάγκη καὶ τὸ ἴσον μέγεθος ἐν ἐλάττονι χρόνῳ διείναι τὸ θάττον.

20

ἐπεὶ δὲ πᾶσα μὲν κίνησις ἐν χρόνῳ καὶ ἐν ἅπαντι χρόνῳ δυνατὸν κινήθηναι, πᾶν δὲ τὸ κινούμενον ἐνδέχεται καὶ θάττον κινεῖσθαι καὶ βραδύτερον, ἐν ἅπαντι χρόνῳ ἔσται τὸ θάττον κινεῖσθαι καὶ βραδύτερον. τούτων δ' οὐτων ἀνάγκη καὶ τὸν χρόνον συνεχῆ εἶναι. λέγω δὲ συνεχῆς τὸ διαιρετὸν εἰς αἰεὶ διαιρετά· τούτου γὰρ ὑποκειμένου τοῦ συνεχῶς, ἀνάγκη συνεχῆ εἶναι τὸν χρόνον. ἐπεὶ γὰρ δέδεικται ὅτι τὸ θάττον ἐν ἐλάττονι χρόνῳ δίεισι τὸ ἴσον, ἔστω τὸ μὲν ἐφ' ᾧ A θάττον, τὸ δ' ἐφ' ᾧ B βραδύτερον, καὶ κεκινήσθω τὸ βραδύτερον τὸ ἐφ' ᾧ ΓΔ μέγεθος ἐν τῷ ΖΗ χρόνῳ. δῆλον τοίνυν ὅτι τὸ θάττον ἐν ἐλάττονι τούτου κινήσεται τὸ αὐτὸ μέγεθος· καὶ κεκινήσθω ἐν τῷ ΖΘ. πάλιν δ' ἐπεὶ τὸ θάττον ἐν τῷ ΖΘ διελήλυθεν τὴν ὅλην τὴν ΓΔ, τὸ βραδύτερον ἐν τῷ αὐτῷ χρόνῳ τὴν ἐλάττω δίεισι· ἔστω οὖν ἐφ' ἧς ΓΚ. ἐπεὶ δὲ τὸ βραδύτερον τὸ Β ἐν τῷ ΖΘ χρόνῳ τὴν ΓΚ διελήλυθεν, τὸ θάττον ἐν ἐλάττονι δίεισι, ὥστε πάλιν διαιρεθῆσεται ὁ ΖΘ χρόνος. τούτου δὲ διαιρουμένου καὶ τὸ ΓΚ μέγεθος διαιρεθῆσεται κατὰ τὸν αὐτὸν λόγον. εἰ δὲ τὸ μέγεθος, καὶ ὁ χρόνος. καὶ αἰεὶ τοῦτ' ἔσται μεταλαμβάνουσι ἀπὸ τοῦ θάττονος τὸ βραδύτερον καὶ ἀπὸ τοῦ βραδυτέρου τὸ θάττον, καὶ τῷ ἀποδεδειγμένῳ χρωμένοις· διαιρήσει γὰρ τὸ μὲν θάττον τὸν χρόνον, τὸ δὲ βραδύτερον τὸ μῆκος. εἰ οὖν αἰεὶ μὲν ἀντιστρέφειν ἀληθές, ἀντιστρεφομένου δὲ αἰεὶ γίγνεται διαίρεσις, φανερὸν ὅτι πᾶς χρόνος ἔσται συνεχῆς. ἅμα δὲ δῆλον καὶ ὅτι μέγεθος ἅπαν ἐστὶ συνεχῆς· τὰς αὐτὰς γὰρ καὶ τὰς ἴσας διαιρέσεις ὁ χρόνος διαιρεῖται καὶ τὸ μέγεθος.

ἔτι δὲ καὶ ἐκ τῶν εἰωθότων λόγων λέγεσθαι φανερὸν ὡς εἴπερ ὁ χρόνος ἐστὶ συνεχῆς, ὅτι καὶ τὸ μέγεθος, εἴπερ ἐν

^b 18 ἐν alt. om. F 19 ὥστ' . . . ἐλάττονι om. K¹ 20 δὲ εἰ πᾶσα K 22 καὶ pr. om. H ἐν . . . 23 βραδύτερον om. I¹
23 ἔξειστι H 26 εἶναι om. H 27 τὸ pr. om. E¹H τὸ ult. om. IJ¹ 28 κινείσθω IST 30 κινήσεται E²KAST
31-2 πάλιν . . . ΖΘ om. I 31 ἐπὶ E² 33 ἔστω EHIJST:
ἔσται FK 233^a I ἧς τὸ γκ E ἐπὶ E² II ὅτι καὶ S
12 διαιρέσεις E²KAS : αἰρέσεις E¹ ὅ τε χρόνος καὶ τὸ μέγεθος διαιρεῖται KAS 14 ἐν KAT : καὶ ἐν E

15 τῷ ἡμίσει χρόνῳ ἤμισυ διέρχεται καὶ ἀπλῶς ἐν τῷ ἐλάτ-
 τῳ ἐλαττον· αἱ γὰρ αὐτὰ διαιρέσεις ἔσονται τοῦ χρόνου
 καὶ τοῦ μεγέθους. καὶ εἰ ὀποτερουοῦν ἄπειρον, καὶ θάτερον,
 καὶ ὡς θάτερον, καὶ θάτερον, οἷον εἰ μὲν τοῖς ἐσχάτοις
 ἄπειρος ὁ χρόνος, καὶ τὸ μῆκος τοῖς ἐσχάτοις, εἰ δὲ τῇ
 20 διαιρέσει, τῇ διαιρέσει καὶ τὸ μῆκος, εἰ δὲ ἀμφοῖν,
 21 ἀμφοῖν καὶ τὸ μέγεθος.

21 διὸ καὶ ὁ Ζήνωνος λόγος
 ψεῦδος λαμβάνει τὸ μὴ ἐνδέχεσθαι τὰ ἄπειρα διελεῖν ἢ
 ἄψασθαι τῶν ἀπείρων καθ' ἕκαστον ἐν πεπερασμένῳ χρόνῳ.
 διχῶς γὰρ λέγεται καὶ τὸ μῆκος καὶ ὁ χρόνος ἄπειρον, καὶ
 25 ὅλως πᾶν τὸ συνεχές, ἦτοι κατὰ διαίρεσιν ἢ τοῖς ἐσχά-
 τοις. τῶν μὲν οὖν κατὰ τὸ ποσὸν ἀπείρων οὐκ ἐνδέχεται ἄψα-
 σθαι ἐν πεπερασμένῳ χρόνῳ, τῶν δὲ κατὰ διαίρεσιν ἐνδέ-
 χεται· καὶ γὰρ αὐτὸς ὁ χρόνος οὕτως ἄπειρος. ὥστε ἐν τῷ
 ἀπείρῳ καὶ οὐκ ἐν τῷ πεπερασμένῳ συμβαίνει διέναι τὸ
 30 ἄπειρον, καὶ ἄπτεσθαι τῶν ἀπείρων τοῖς ἀπείροις, οὐ τοῖς
 πεπερασμένοις. οὔτε δὴ τὸ ἄπειρον οἷον τε ἐν πεπερασμένῳ
 χρόνῳ διελεῖν, οὔτ' ἐν ἀπείρῳ τὸ πεπερασμένον· ἀλλ' ἐάν
 τε ὁ χρόνος ἄπειρος ἦ, καὶ τὸ μέγεθος ἔσται ἄπειρον, ἐάν τε
 τὸ μέγεθος, καὶ ὁ χρόνος. ἔστω γὰρ πεπερασμένον μέγεθος
 35 ἐφ' οὗ AB, χρόνος δὲ ἄπειρος ἐφ' ᾧ Γ· ἐλήφθω δέ τι τοῦ
 233^b χρόνου πεπερασμένον, ἐφ' ᾧ ΓΔ. ἐν τούτῳ οὖν δίεισι τι
 τοῦ μεγέθους, καὶ ἔστω διεληλυθὸς ἐφ' ᾧ BE. τοῦτο δὲ ἢ
 καταμετρήσει τὸ ἐφ' ᾧ AB, ἢ ἔλλειψει, ἢ ὑπερβαλεῖ·
 διαφέρει γὰρ οὐθέν· εἰ γὰρ αἰεὶ τὸ ἴσον τῷ BE μέγεθος ἐν
 5 ἴσῳ χρόνῳ δίεισιν, τοῦτο δὲ καταμετρεῖ τὸ ὅλον, πεπερασμέ-
 νος ἔσται ὁ πᾶς χρόνος ἐν ᾧ διήλθεν· εἰς ἴσα γὰρ διαιρηθή-
 σεται καὶ τὸ μέγεθος. ἔτι δ' εἰ μὴ πᾶν μέγεθος ἐν

^a 18 καὶ θάτερον om. E¹ τοῖς EHJKPS : ἐν τοῖς FI 20 τῇ
 διαιρέσει E²KAS : om. E¹T ἀμφοῖν E¹T : ἀμφοῖν ὁ χρόνος E²ΚΛ
 21 τὸ μῆκος F 22 διελεῖν E¹ 24-7 διχῶς . . . χρόνῳ om. F
 24 καὶ pr. om. H ὁ χρόνος καὶ τὸ μῆκος HK ἄπειρος E 25 ἦτοι]
 ἢ τῷ FK : ἢ τὸ HI 26 τὸ ΚΑΤ : om. E 29 τὰ ἄπειρα F
 31 οὔτε E²ST : οὐδὲ E¹ΚΑ δὴ οὖν τὸ F 32 οὔτ' ST : οὐδ' Π
 33-4 μέγεθος . . . τὸ om. K¹ 35 οὗ I δέ ET : δὴ ΚΑ πεπερασ-
 μένου τοῦ χρόνου F ^b 2 ᾧ] φ τὸ E δέ EFHKPS : δὴ IJ
 3 ὑπερβάλλει E² : ὑπερβάλλει J 4 τὸ E 5 καταμετρήσει H
 τὸ ΠPST : τι Prantl 6 χρόνος πᾶς F εἰς E²KAST : om. E¹
 7 καὶ E¹AT Aspasius : ὡς καὶ E²KAS¹ ἔτι . . . II χρόνος ΠST :
 secl. Prantl

ἀπείρω χρόνῳ δίεισι, ἀλλ' ἐνδέχεται τι καὶ ἐν πεπερασμένῳ διελθεῖν, οἷον τὸ ΒΕ, τοῦτο δὲ καταμετρήσει τὸ πᾶν, καὶ τὸ ἴσον ἐν ἴσῳ δίεισι, ὥστε πεπερασμένος ἔσται καὶ ὁ 10 χρόνος. ὅτι δ' οὐκ ἐν ἀπείρω δίεισι τὸ ΒΕ, φανερόν, εἰ ληφθεῖ ἐπὶ θάτερα πεπερασμένος ὁ χρόνος· εἰ γὰρ ἐν ἐλάττονι τὸ μέρος δίεισι, τοῦτο ἀνάγκη πεπεράνθαι, θατέρου γε πέρατος ὑπάρχοντος. ἡ αὐτὴ δὲ ἀπόδειξις καὶ εἰ τὸ μὲν μῆκος ἄπειρον ὁ δὲ χρόνος πεπερασμένος. 15

φα-15

νερὸν οὖν ἐκ τῶν εἰρημένων ὡς οὔτε γραμμὴ οὔτε ἐπίπεδον οὔτε ὄλως τῶν συνεχῶν οὐθέν ἐσται ἄτομον, οὐ μόνον διὰ τὸ νῦν λεχθέν, ἀλλὰ καὶ ὅτι συμβήσεται διαιρεῖσθαι τὸ ἄτομον. ἐπεὶ γὰρ ἐν ἅπαντι χρόνῳ τὸ θάττον καὶ βραδύτερον ἔστι, τὸ δὲ θάττον πλείον διέρχεται ἐν τῷ ἴσῳ χρόνῳ, 20 ἐνδέχεται δὲ καὶ διπλάσιον καὶ ἡμιόλιον διέναι μῆκος (εἴη γὰρ ἂν οὗτος ὁ λόγος τοῦ τάχους), ἐννεχθῶ οὖν τὸ θάττον ἡμιόλιον ἐν τῷ αὐτῷ χρόνῳ, καὶ διηρήσθω τὰ μεγέθη τὸ μὲν τοῦ θάττονος εἰς τρία ἄτομα, ἐφ' ὧν ΑΒ ΒΓ ΓΔ, τὸ δὲ τοῦ βραδυτέρου εἰς δύο, ἐφ' ὧν ΕΖ ΖΗ. οὐκοῦν 25 καὶ ὁ χρόνος διαιρεθήσεται εἰς τρία ἄτομα· τὸ γὰρ ἴσον ἐν τῷ ἴσῳ χρόνῳ δίεισι. διηρήσθω οὖν ὁ χρόνος εἰς τὰ ΚΛ ΛΜ ΜΝ. πάλιν δ' ἐπεὶ τὸ βραδύτερον ἐνήνεται τὴν ΕΖΗ, καὶ ὁ χρόνος τμηθήσεται δίχα. διαιρεθήσεται ἄρα τὸ ἄτομον, καὶ τὸ ἀμερές οὐκ ἐν ἀτόμῳ δίει- 30 σι ἀλλ' ἐν πλείονι. φανερόν οὖν ὅτι οὐδὲν ἐστί τῶν συνεχῶν ἀμερές.

3 Ἀνάγκη δὲ καὶ τὸ νῦν τὸ μὴ καθ' ἕτερον ἀλλὰ καθ' αὐτὸ καὶ πρῶτον λεγόμενον ἀδιαίρετον εἶναι, καὶ ἐν ἅπαντι

^b 8 τι om. H 9 διελθεῖν] χρόνῳ διελθεῖν E τοῦτο . . . II BE om. K 12 θάτερα EHIJKS: θάτερον FT ἐν om. F 14 γέ] γάρ F πεπερασμένου E¹ 17 οὔτε FHJKT: οὔτε τι E: om. I ἐστιν F 18 καὶ διότι I: ὅτι H: ὅτι καὶ T συμβαίνει H 19 τὸ βραδυτέρον ἐστί καὶ τὸ θάττον H καὶ] καὶ τὸ I 20 τῷ E²KAT: om. E¹ 21 δὲ EIKS: om. FHT, erasit J 23 τὸ ES: τὰ ΚΛ 24 εἰς . . . ΓΔ scripsi, legit ut vid S: ἐφ' ᾧ (ὧν H) αβγδ (αβ βγ γδ FH) εἰς τρία ἄτομα II 25-6 τὸ . . . ἄτομα om. F¹ 25 τὸ ES: τὰ F²HIJK ζ alt. E²F²HS: om. E¹IJK 26 τὸ E²KAT: om. E¹ 27 τὰ om. E: τὴν FK 28 κλ λμ μν E²FHS: κλμν E¹IJK δ' om. H. 29 εἰς ζη E²FHKS 31 πλείοσι H: πλείοι τοῦ θάττονος E¹ τῶν συνεχῶν ἐστὶν H 33 τὸ alt. om. J¹ 34 αὐτὸν E¹ πρῶτως PS εἶναι om. EIJK

35 τὸ τοιοῦτο χρόνῳ ἐνυπάρχειν. ἔστιν γὰρ ἔσχατόν τι τοῦ γε-
 234^a γονότος, οὗ ἐπὶ τάδε οὐθέν ἐστι τοῦ μέλλοντος, καὶ πάλιν
 τοῦ μέλλοντος, οὗ ἐπὶ τάδε οὐθέν ἐστι τοῦ γεγονότος· ὁ δὴ φα-
 μεν ἀμφοῖν εἶναι πέρασ. τοῦτο δὲ ἐὰν δειχθῆ ὅτι τοιοῦτόν ἐστιν
 [καθ' αὐτό] καὶ ταυτόν, ἅμα φανερόν ἐσται καὶ ὅτι ἀδιαίρε-
 5 τόν. ἀνάγκη δὴ τὸ αὐτὸ εἶναι τὸ νῦν τὸ ἔσχατον ἀμφοτέ-
 ρων τῶν χρόνων· εἰ γὰρ ἕτερον, ἐφεξῆς μὲν οὐκ ἂν εἶη θά-
 τερον θατέρῳ διὰ τὸ μὴ εἶναι συνεχῆς ἐξ ἡμερῶν, εἰ δὲ χω-
 ρις ἑκάτερον, μεταξύ ἐσται χρόνος· πᾶν γὰρ τὸ συνεχῆς
 τοιοῦτον ὥστ' εἶναι τι συνώνυμον μεταξύ τῶν περάτων. ἀλλὰ
 10 μὴν εἰ χρόνος τὸ μεταξύ, διαιρετόν ἐσται· πᾶς γὰρ χρόνος
 δέδεικται ὅτι διαιρετός. ὥστε διαιρετόν τὸ νῦν. εἰ δὲ διαιρε-
 τόν τὸ νῦν, ἐσται τι τοῦ γεγονότος ἐν τῷ μέλλοντι καὶ τοῦ
 μέλλοντος ἐν τῷ γεγονότι· καθ' ὃ γὰρ ἂν διαιρεθῆ, τοῦτο
 διοριεῖ τὸν παρήκοντα καὶ τὸν μέλλοντα χρόνον. ἅμα δὲ
 15 καὶ οὐκ ἂν καθ' αὐτὸ εἶη τὸ νῦν, ἀλλὰ καθ' ἕτερον· ἢ γὰρ
 διαίρεσις οὐ καθ' αὐτό. πρὸς δὲ τούτοις τοῦ νῦν τὸ μὲν τι γε-
 γονὸς ἐσται τὸ δὲ μέλλον, καὶ οὐκ αἰεὶ τὸ αὐτὸ γεγονὸς ἢ
 μέλλον. οὐδὲ δὴ τὸ νῦν τὸ αὐτό· πολλαχῆ γὰρ διαιρετὸς
 ὁ χρόνος. ὥστ' εἰ ταῦτα ἀδύνατον ὑπάρχειν, ἀνάγκη
 20 τὸ αὐτὸ εἶναι τὸ ἐν ἑκατέρῳ νῦν. ἀλλὰ μὴν εἰ ταυτό, φα-
 νερόν ὅτι καὶ ἀδιαίρετον· εἰ γὰρ διαιρετόν, πάλιν ταῦτα
 συμβήσεται ἂ καὶ ἐν τῷ πρότερον. ὅτι μὲν τοῖον ἐστί τι ἐν
 τῷ χρόνῳ ἀδιαίρετον, ὃ φαμεν εἶναι τὸ νῦν, δῆλόν ἐστιν ἐκ
 τῶν εἰρημένων· ὅτι δ' οὐθέν ἐν τῷ νῦν κινεῖται, ἐκ τῶνδε φα-
 25 νερόν ἐστιν. εἰ γὰρ, ἐνδέχεται καὶ θάπτον κινεῖσθαι
 καὶ βραδύτερον. ἐστω δὴ τὸ νῦν ἐφ' ᾧ N, κενωθήσθω
 δ' ἐν αὐτῷ τὸ θάπτον τὴν AB. οὐκοῦν τὸ βραδύτερον ἐν τῷ
 αὐτῷ ἐλάττω τῆς AB κινήσεται, οἷον τὴν AG. ἐπεὶ δὲ

^b 35 τὸ om. FJK γὰρ] γὰρ τὸ E 234^a 1-2 οὗ . . . γεγονότος
 om. K: καὶ . . . γεγονότος om. I¹ 2 φαμεν H et ut vid. S:
 ἔφαμεν FIJK: ἔφαμεν ἐν E 4 καθ' αὐτό om. E¹IS αὐτόν J
 διότι E² ἀδιαίρετόν ἐστιν E 5 δὲ F τῶν χρόνων ἀμφοτέρων
 H 8 ἐστιν ὁ χρόνος H ἅπαν E 9 τι om. H 10 εἰ] εἰ ὁ
 FH διαιρετός ΚΑ 13 ἂν ΚΑΡ: ἂν τι E 14 διοριεῖ
 IS: ὀριεῖ EFHJK 16 οὐ EFIJ¹KS¹: τὸ ut vid. P: οὐ τὸ J²: οὐ
 τοῦ S^p: om. H γρ. S τι] τοι F 18 τὸ pr. om. S αὐτὸ ΚΑΣ:
 αὐτὸ ἅμα ET 19 ὑπάρχειν] ὑπάρχειν τῷ (τὸ K) νῦν FIJK
 22 προτέρῳ FIJ² 23 διαιρετόν I 25 γὰρ] γὰρ ἐστιν E²ΚΑ
 κινεῖσθαι καὶ θάπτον H 26 καὶ ET: ἐν αὐτῷ καὶ ΚΑ 27 τ' I
 28 ἐπὶ E¹

τὸ βραδύτερον ἐν ὄλῳ τῷ νῦν κενύηται τὴν ΑΓ, τὸ θάττον
ἐν ἐλάττονι τούτου κινήθησεται, ὥστε διαιρεθήσεται τὸ νῦν. 30
ἀλλ' ἦν ἀδιαίρετον. οὐκ ἄρα ἔστιν κινεῖσθαι ἐν τῷ νῦν. 31

ἀλλὰ 31

μὴν οὐδ' ἡρεμεῖν· ἡρεμεῖν γὰρ λέγομεν τὸ πεφυκὸς κινεῖ-
σθαι μὴ κινούμενον ὅτε πέφυκεν καὶ οὐ καὶ ὡς, ὥστ' ἐπεὶ
ἐν τῷ νῦν οὐθέν πέφυκε κινεῖσθαι, δῆλον ὡς οὐδ' ἡρεμεῖν. ἔτι
δ' εἰ τὸ αὐτὸ μὲν ἔστι τὸ νῦν ἐν ἀμφοῖν τοῖν χρόνοις, ἐνδέ- 35
χεται δὲ τὸν μὲν κινεῖσθαι τὸν δ' ἡρεμεῖν ὅλον, τὸ δ' ὅλον 234^b
κινούμενον τὸν χρόνον ἐν ὄψοις κινήθησεται τῶν τούτου καθ'
ὃ πέφυκε κινεῖσθαι, καὶ τὸ ἡρεμοῦν ὡσαύτως ἡρεμήσει, συμ-
βήσεται τὸ αὐτὸ ἅμα ἡρεμεῖν καὶ κινεῖσθαι· τὸ γὰρ αὐτὸ
ἔσχατον τῶν χρόνων ἀμφοτέρων, τὸ νῦν. ἔτι δ' ἡρεμεῖν μὲν 5
λέγομεν τὸ ὁμοίως ἔχον καὶ αὐτὸ καὶ τὰ μέρη νῦν καὶ
πρότερον· ἐν δὲ τῷ νῦν οὐκ ἔστι τὸ πρότερον, ὥστ' οὐδ' ἡρεμεῖν.
ἀνάγκη ἄρα καὶ κινεῖσθαι τὸ κινούμενον ἐν χρόνῳ καὶ ἡρε-
μεῖν τὸ ἡρεμοῦν.

4 Τὸ δὲ μεταβάλλον ἅπαν ἀνάγκη διαιρετὸν εἶναι. ἐπεὶ 10
γὰρ ἕκ τινος εἰς τι πᾶσα μεταβολή, καὶ ὅταν μὲν ἦ ἐν
τούτῳ εἰς ὃ μετέβαλλεν, οὐκέτι μεταβάλλει, ὅταν δὲ ἐξ οὗ
μετέβαλλεν, καὶ αὐτὸ καὶ τὰ μέρη πάντα, οὕτω μεταβάλλει
(τὸ γὰρ ὡσαύτως ἔχον καὶ αὐτὸ καὶ τὰ μέρη οὐ μεταβάλ-
λει), ἀνάγκη οὖν τὸ μὲν τι ἐν τούτῳ εἶναι, τὸ δ' ἐν θατέρῳ 15
τοῦ μεταβάλλοντος· οὔτε γὰρ ἐν ἀμφοτέροις οὔτ' ἐν μηδετέρῳ
δυνατόν. λέγω δ' εἰς ὃ μεταβάλλει τὸ πρῶτον κατὰ τὴν
μεταβολήν, οἷον ἐκ τοῦ λευκοῦ τὸ φαιόν, οὐ τὸ μέλαν· οὐ
γὰρ ἀνάγκη τὸ μεταβάλλον ἐν ὀποτέρω εἶναι τῶν ἄκρων.
φανερὸν οὖν ὅτι πᾶν τὸ μεταβάλλον ἔσται διαιρετόν. 20

κίνησις δ' ἔστιν διαιρετὴ διχῶς, ἕνα μὲν τρόπον τῷ
χρόνῳ, ἄλλον δὲ κατὰ τὰς τῶν μερῶν τοῦ κινουμένου κινή-

^a 30 ἐν om. J τούτου KAS: om. E 32 λέγομεν IST: ἐλέγομεν EFHJK
^b 1 τὸ E²HJ τὸ E²HJ τὸ E²KAP: τὸν E¹ 34 ὡς EST: ὅτι KA
4 ἡρεμεῖν ἅμα K 5 ἀμφοτέρων τῶν χρόνων K 3 κενεῖσθαι J
HKT 8 ἡρεμεῖν τὸ E²KAST: om. E¹ 10 διαιρετὸν ἀνάγκη F
11 γὰρ καὶ ἕκ FJK καὶ om. I 12 μετέβαλεν E²FHI: μετα-
βάλλει fort. ST 13 μετέβαλεν E²FHI: μεταβάλλει Bonitz,
fort. ST οὕτω scripsi: οὐ Π 14 ἔχειν H 16 ἀμφοτέρω
F μηδετέρῳ ὅλον δυνατόν I 17 δ' KAS: δὲ τὸ E 18 τὸ
pr.] τὸν E¹ 19 ὀποτέρω E

σεις, οἷον εἰ τὸ ΑΓ κινεῖται ὅλον, καὶ τὸ ΑΒ κινήσεται
καὶ τὸ ΒΓ. ἔστω δὲ τοῦ μὲν ΑΒ ἢ ΔΕ, τοῦ δὲ ΒΓ ἢ ΕΖ
25 κινήσεις τῶν μερῶν. ἀνάγκη δὴ τὴν ὅλην, ἐφ' ἧς ΔΖ, τοῦ
ΑΓ εἶναι κίνησιν. κινήσεται γὰρ κατὰ ταύτην, ἐπέπερ ἐκά-
τερον τῶν μερῶν κινεῖται καθ' ἑκατέραν· οὐθὲν δὲ κινεῖται
κατὰ τὴν ἄλλου κίνησιν· ὥστε ἡ ὅλη κίνησις τοῦ ὅλου ἐστὶν
μεγέθους κινήσις. ἔτι δ' εἰ πᾶσα μὲν κίνησις τινός, ἡ δ' ὅλη
30 κίνησις ἢ ἐφ' ἧς ΔΖ μήτε τῶν μερῶν ἐστὶν μηδετέρου (μέρους
γὰρ ἑκατέρα) μήτ' ἄλλου μηδενός (οὐ γὰρ ὅλη ὅλου, καὶ
τὰ μέρη τῶν μερῶν· τὰ δὲ μέρη τῶν ΑΒ ΒΓ καὶ
οὐδένων ἄλλων· πλειόνων γὰρ οὐκ ἦν μία κίνησις), κἂν ἡ ὅλη
κίνησις εἴη τοῦ ΑΒΓ μεγέθους. ἔτι δ' εἰ ἐστὶν ἄλλη
35 τοῦ ὅλου κίνησις, οἷον ἐφ' ἧς ΘΙ, ἀφαιρεθήσεται ἀπ' αὐτῆς
235^a ἡ ἐκατέρων τῶν μερῶν κίνησις· αὗται δ' ἴσαι ἔσονται ταῖς
ΔΕ ΕΖ· μία γὰρ ἐνός κίνησις. ὥστ' εἰ μὲν ὅλη διαιρεθή-
σεται ἢ ΘΙ εἰς τὰς τῶν μερῶν κινήσεις, ἴση ἔσται ἢ ΘΙ τῇ
ΔΖ· εἰ δ' ἀπολείπει τι, οἷον τὸ ΚΙ, αὕτη οὐδενός ἐστὶ κί-
5 νησις (οὔτε γὰρ τοῦ ὅλου οὔτε τῶν μερῶν διὰ τὸ μίαν εἶναι
ἐνός, οὔτε ἄλλου οὐθενός· ἡ γὰρ συνεχῆς κίνησις ἐστὶ συνεχῶν
τινῶν), ὡσαύτως δὲ καὶ εἰ ὑπερβάλλει κατὰ τὴν διαίρεσιν·
ὥστ' εἰ τοῦτο ἀδύνατον, ἀνάγκη τὴν αὐτὴν εἶναι καὶ ἴσην.
αὕτη μὲν οὖν ἡ διαίρεσις κατὰ τὰς τῶν μερῶν κινήσεις ἐστίν,
10 καὶ ἀνάγκη παντὸς εἶναι τοῦ μεριστοῦ αὐτῆν· ἄλλη δὲ κατὰ
τὸν χρόνον· ἐπεὶ γὰρ ἅπαντα κίνησις ἐν χρόνῳ, χρόνος δὲ
πᾶς διαιρετός, ἐν δὲ τῷ ἐλάττωνι ἐλάττων ἡ κίνησις, ἀνάγκη
13 πᾶσαν κίνησιν διαιρεῖσθαι κατὰ τὸν χρόνον.

13

ἐπεὶ δὲ πᾶν τὸ

^b 23 γ ΚΑΣ: βγΕ καὶ] καὶ τὸ αἰβ κινήσεται ὅλον καὶ Ε κινήσεται Η
24 δὴ om. Ε 25 δὲ Ι ἧς ἢ δζ ΚΑ 27 ἑτέραν Κ 28 τὴν
τοῦ ἄλλου Ι μεγέθους ἐστὶ Η 29 δ' εἰ] δὴ Ε¹ πᾶσα Ε] ² S:
ἅπαντα FHIJ² K 30 ἢ ἐφεξῆς J: ἐφ' ἧς ἢ FK μέρος γὰρ Ε¹ J
31 ἐκατέρου F ὅλη Ε¹ IS: ἢ ὅλη Ε² FHJKP 32 μέρη alt.]
μέρη τοῦ δζ Ε² ΚΑ ΑΒ ΒΓ PST, Prantl: αβγ Π 33 οὐδένων]
οὐκ ΚΑ κἂν ἢ] καὶ Η ἢ ὅλη fecit Ε 34 εἴη ES: εἴη ἂν HIJK:
om. F β EFIJS: om. HK εἰ EIS: εἰ μὲν FHJK ἄλλη
τοῦ ὅλου κίνησις ES: τοῦ ὅλου κίνησις ἄλλη ΚΑ 35 ἧς] ἧς ἢ J
I om. I¹ 235^a 2 E alt. FHKP: om. EIJ 3 εἰς . . . ΘΙ
om. I τὴν . . . κίνησιν F κινήσεις . . . 4 ἔσται om. Ε
4 ἀπολείπει F ἔσται FIJS: ἐστὶ HK 5 τοῦ Ε² ΚΑΣ:
om. Ε¹ εἶναι τοῦ ἐνός Ε² ΚΑΣ 6 ἔσται Ι 7 δὲ Ε² ΚΑΣ:
δὴ Ε¹ ὑπερβάλοι Ι ΙΙ πᾶσα FS

κινούμενον ἐν τινι κινεῖται καὶ χρόνον τινά, καὶ παντὸς ἔστι κίνησις, ἀνάγκη τὰς αὐτὰς εἶναι διαιρέσεις τοῦ τε χρόνου¹⁵ καὶ τῆς κινήσεως καὶ τοῦ κινεῖσθαι καὶ τοῦ κινουμένου καὶ ἐν ᾧ ἡ κίνησις (πλὴν οὐ πάντων ὁμοίως ἐν οἷς ἡ κίνησις, ἀλλὰ τοῦ μὲν τόπου καθ' αὐτό, τοῦ δὲ ποιοῦ κατὰ συμβεβηκός). εἰλήφθω γὰρ ὁ χρόνος ἐν ᾧ κινεῖται ἐφ' ᾧ A, καὶ ἡ κίνησις ἐφ' ᾧ B. εἰ οὖν τὴν ὅλην ἐν τῷ παντὶ χρόνῳ κεκίνηται, ἐν 20 τῷ ἡμίσει ἐλάττω, καὶ πάλιν τούτου διαιρεθέντος ἐλάττω ταύτης, καὶ αἰεὶ οὕτως. ὁμοίως δὲ καί, εἰ ἡ κίνησις διαιρετή, καὶ ὁ χρόνος διαιρετός· εἰ γὰρ τὴν ὅλην ἐν τῷ παντί, τὴν ἡμίσειαν ἐν τῷ ἡμίσει, καὶ πάλιν τὴν ἐλάττω ἐν τῷ ἐλάττωι. τὸν αὐτὸν δὲ τρόπον καὶ τὸ κινεῖσθαι διαιρεθήσεται. ἔστω 25 γὰρ ἐφ' ᾧ Γ τὸ κινεῖσθαι. κατὰ δὴ τὴν ἡμίσειαν κίνησιν ἐλαττον ἔσται τοῦ ὅλου, καὶ πάλιν κατὰ τὴν τῆς ἡμισείας ἡμίσειαν, καὶ αἰεὶ οὕτως. ἔστι δὲ καὶ ἐκθέμενον τὸ καθ' ἑκατέραν τῶν κινήσεων κινεῖσθαι, οἷον κατὰ τε τὴν ΔΓ καὶ τὴν ΓΕ, λέγειν ὅτι τὸ ὅλον ἔσται κατὰ τὴν ὅλην (εἰ γὰρ ἄλλο, 30 πλείω ἔσται κινεῖσθαι κατὰ τὴν αὐτὴν κίνησιν), ὥσπερ ἐδείξαμεν καὶ τὴν κίνησιν διαιρετὴν εἰς τὰς τῶν μερῶν κινήσεις οὕσαν· ληφθέντος γὰρ τοῦ κινεῖσθαι καθ' ἑκατέραν συνεχῆς ἔσται τὸ ὅλον. ὥσαύτως δὲ δειχθήσεται καὶ τὸ μῆκος διαιρετόν, καὶ ὅλως πᾶν ἐν ᾧ ἔστιν ἡ μεταβολή (πλὴν ἕνια 35 κατὰ συμβεβηκός, ὅτι τὸ μεταβάλλον ἔστιν διαιρετόν)· ἐνὸς γὰρ διαιρουμένου πάντα διαιρεθήσεται. καὶ ἐπὶ τοῦ πεπερασμένα εἶναι ἢ ἄπειρα ὁμοίως ἔξει κατὰ πάντων. ἠκολούθηκεν 235^b δὲ μάλιστα τὸ διαιρεῖσθαι πάντα καὶ ἄπειρα εἶναι ἀπὸ τοῦ μεταβάλλοντος· εὐθύς γὰρ ἐνυπάρχει τῷ μεταβάλλοντι τὸ διαιρετόν καὶ τὸ ἄπειρον. τὸ μὲν οὖν διαιρετόν δέδεικται πρότερον, τὸ δ' ἄπειρον ἐν τοῖς ἐπομένοις ἔσται δῆλον. 5

5 Ἐπεὶ δὲ πᾶν τὸ μεταβάλλον ἐκ τινος εἰς τι μετα-

^a 14 τινι] χρόνῳ H κινεῖται E²KAS: κινήσεται E¹ ἔστι E²H¹IJKS: ἔστιν ἢ E¹: ἔσται κινουμένου F 15 διαιρέσεις εἶναι FH 17 πλὴν . . . κίνησις om. I 18 τόπον J¹S: ποσοῦ EFH¹I²KT, ci. A: an τόπου καὶ τοῦ ποσοῦ? εἰλήφθω . . . ^b I πάντων om. T 18-22 εἰλήφθω . . . οὕτως ΠS: secl. Prantl 22 εἰ KAS: om. E 23 ἐν τῷ om. E¹: ἐν om. E² 25-8 ἔστω . . . οὕτως ΠS: secl. Prantl 26 δὴ om. E¹ 27 τὴν] τῆς J 28 ἐτέραν E 29 δγ KAS: γδ E 30 Γ] τρίτην E¹ 34 ἔσται] καὶ S 36 τὸ om. E¹ ^b I ἠκολούθηκεν E¹J¹P: ἠκολούθησε FHKT 3 τὸ om. J 4 τὸ pr. om. I 6 δὲ E²KAST: om. E¹ ἔκ τινος E²KAPST: om. E¹

βάλλει, ἀνάγκη τὸ μεταβεβληκός, ὅτε πρῶτον μεταβέ-
 βληκεν, εἶναι ἐν ᾧ μεταβέβληκεν. τὸ γὰρ μεταβάλλον, ἐξ
 οὐ μεταβάλλει, ἐξίσταται ἢ ἀπολείπει αὐτό, καὶ ἤτοι ταῦτόν
 10 ἔστι τὸ μεταβάλλειν καὶ τὸ ἀπολείπειν, ἢ ἀκολουθεῖ τῷ μετα-
 βάλλειν τὸ ἀπολείπειν. εἰ δὲ τῷ μεταβάλλειν τὸ ἀπολείπειν,
 τῷ μεταβεβληκέναι τὸ ἀπολελοιπέναι· ὁμοίως γὰρ ἐκάτερον
 ἔχει πρὸς ἐκάτερον. ἐπεὶ οὖν μία τῶν μεταβολῶν ἢ κατ' ἀντί-
 φασιν, ὅτε μεταβέβληκεν ἐκ τοῦ μὴ ὄντος εἰς τὸ ὄν, ἀπολέ-
 15 λειπεν τὸ μὴ ὄν. ἔσται ἄρα ἐν τῷ ὄντι· πᾶν γὰρ ἀνάγκη ἢ
 εἶναι ἢ μὴ εἶναι. φανερόν οὖν ὅτι ἐν τῇ κατ' ἀντίφασιν με-
 ταβολῇ τὸ μεταβεβληκός ἔσται ἐν ᾧ μεταβέβληκεν. εἰ δ'
 ἐν ταύτῃ, καὶ ἐν ταῖς ἄλλαις· ὁμοίως γὰρ ἐπὶ μιᾶς καὶ
 τῶν ἄλλων. ἔτι δὲ καὶ καθ' ἐκάστην λαμβάνουσι φανερόν, εἴπερ
 20 ἀνάγκη τὸ μεταβεβληκός εἶναι πού ἢ ἐν τινι. ἐπεὶ γὰρ ἐξ
 οὐ μεταβέβληκεν ἀπολέλοιπεν, ἀνάγκη δ' εἶναι πού, ἢ ἐν
 τούτῳ ἢ ἐν ἄλλῳ ἔσται. εἰ μὲν οὖν ἐν ἄλλῳ, οἷον ἐν τῷ Γ,
 τὸ εἰς τὸ Β μεταβεβληκός, πάλιν ἐκ τοῦ Γ μεταβάλλει
 εἰς τὸ Β· οὐ γὰρ ἦν ἐχόμενον τὸ Β, ἢ δὲ μεταβολὴ συ-
 25 νεχής. ὥστε τὸ μεταβεβληκός, ὅτε μεταβέβληκεν, μεταβάλ-
 λει εἰς ὃ μεταβέβληκεν. τοῦτο δ' ἀδύνατον· ἀνάγκη ἄρα τὸ
 μεταβεβληκός εἶναι ἐν τούτῳ εἰς ὃ μεταβέβληκεν. φανερόν
 οὖν ὅτι καὶ τὸ γεγονός, ὅτε γέγονεν, ἔσται, καὶ τὸ ἐφθαρ-
 μένον οὐκ ἔσται· καθόλου τε γὰρ εἴρηται περὶ πάσης με-
 30 ταβολῆς, καὶ μάλιστα δῆλον ἐν τῇ κατ' ἀντίφασιν.

30 ὅτι
 μὲν τοίνυν τὸ μεταβεβληκός, ὅτε μεταβέβληκε πρῶτον, ἐν
 ἐκείνῳ ἔστί, δῆλον· ἐν ᾧ δὲ πρώτῳ μεταβέβληκεν τὸ μετα-
 βεβληκός, ἀνάγκη ἄτομον εἶναι. λέγω δὲ πρῶτον ὃ μὴ
 τῷ ἕτερόν τι αὐτοῦ εἶναι τοιοῦτόν ἐστιν. ἔστω γὰρ διαιρετόν τὸ
 35 ΑΓ, καὶ διηρήσθω κατὰ τὸ Β. εἰ μὲν οὖν ἐν τῷ ΑΒ μετα-
 βέβληκεν ἢ πάλιν ἐν τῷ ΒΓ, οὐκ ἂν ἐν πρώτῳ τῷ ΑΓ με-

^b 8 εἶναι . . . μεταβέβληκεν om. E¹ τὸ ΚΑΤ: τὸ μὲν Ε βάλ-
 λων I 9 ἤτοι] τοι E¹ 10 τὸ alt. EHIJS: om. FK
 11-12 εἰ . . . τῷ ES: τῷ δὲ ΚΛ 15 ἅπαν Ε ἢ om. FHK
 18 γὰρ] γὰρ καὶ F 19 καὶ E²FHJKS: om. E¹I 20 ἢ
 EF²IJKPS: ἐξ οὐ μεταβέβληκεν ἢ F¹HJ 22 τούτῳ ἢ ἐν ἄλλῳ
 ΚΑΣ: ἄλλῳ ἢ ἐν τούτῳ Ε εἰ μὲν οὖν ΚΑΡ: om. E 24 τὸ alt.
 Hayduck: τῷ ΠΡ συνεχής δὲ ἢ μεταβολή Α δὲ EP: γὰρ ΚΛ
 25 μεταβάλλει εἰς ὃ μεταβέβληκεν om. IJ¹ 27 ἐν om. E¹ 30 κατ'
 FHS: κατὰ τὴν EIJK 33 ἀνάγκη] πρῶτον ἀνάγκη I 36 τῷ Α] τὸ α F

ταβεβληκὸς εἶη. εἰ δ' ἐν ἐκατέρῳ μετέβαλλεν (ἀνάγκη γὰρ ἢ μεταβεβληκέναι ἢ μεταβάλλειν ἐν ἐκατέρῳ), κἂν ἐν τῷ 236^a ὄλφ μεταβάλλου· ἀλλ' ἦν μεταβεβληκός. ὁ αὐτὸς δὲ λόγος καὶ εἰ ἐν τῷ μὲν μεταβάλλει, ἐν δὲ τῷ μεταβέβληκεν· ἔσται γὰρ τι τοῦ πρώτου πρότερον· ὥστ' οὐκ ἂν εἶη διαιρετὸν ἐν ᾧ μεταβέβληκεν. φανερόν οὖν ὅτι καὶ τὸ ἐφθαρμένον καὶ τὸ γεγυῆς ἐν ἀτόμῳ τὸ μὲν ἐφθαρταὶ τὸ δὲ γεγυῆς.

λέγεται δὲ τὸ ἐν ᾧ πρώτῳ μεταβέβληκε διχῶς, τὸ 7 μὲν ἐν ᾧ πρώτῳ ἐπετελέσθη ἢ μεταβολή (τότε γὰρ ἀληθὲς εἰπεῖν ὅτι μεταβέβληκεν), τὸ δ' ἐν ᾧ πρώτῳ ἤρξατο μεταβάλλειν. τὸ μὲν οὖν κατὰ τὸ τέλος τῆς μεταβολῆς πρῶτον λεγόμενον ὑπάρχει τε καὶ ἔστω (ἐνδέχεται γὰρ ἐπιτελεσθῆναι μεταβολὴν καὶ ἔστι μεταβολῆς τέλος, ὃ δὴ καὶ δέδεικται ἀδιαίρετον ὃν διὰ τὸ πέρασ εἶναι)· τὸ δὲ κατὰ τὴν ἀρχὴν ὅλως οὐκ ἔστω· οὐ γὰρ ἔστιν ἀρχὴ μεταβολῆς, οὐδ' ἐν ᾧ πρώτῳ τοῦ χρόνου μετέβαλλεν. ἔστω γὰρ πρῶτον ἐφ' ᾧ 15 τὸ ΑΔ. τοῦτο δὴ ἀδιαίρετον μὲν οὐκ ἔστω· συμβήσεται γὰρ ἐχόμενα εἶναι τὰ νῦν. ἔτι δ' εἰ ἐν τῷ ΓΑ χρόνῳ παντὶ ἡρεμεῖ (κείσθω γὰρ ἡρεμοῦν), καὶ ἐν τῷ Α ἡρεμεῖ, ὥστ' εἰ ἀμερές ἐστι τὸ ΑΔ, ἅμα ἡρεμήσει καὶ μεταβεβληκὸς ἔσται· ἐν μὲν γὰρ τῷ Α ἡρεμεῖ, ἐν δὲ τῷ Δ μεταβέβληκεν. ἐπεὶ δ' 20 οὐκ ἔστιν ἀμερές, ἀνάγκη διαιρετὸν εἶναι καὶ ἐν ὄψοι τῶν τούτου μεταβεβληκέναι· διαιρεθέντος γὰρ τοῦ ΑΔ, εἰ μὲν ἐν μηδενίῳ μετέβληκεν, οὐδ' ἐν τῷ ὄλφ· εἰ δ' ἐν ἀμφοῖν μεταβάλλει καὶ ἐν τῷ παντί, εἴτ' ἐν θατέρῳ μεταβέβληκεν, οὐκ ἐν τῷ ὄλφ πρώτῳ. ὥστε ἀνάγκη ἐν ὄψοι μεταβεβλη- 25 κέναι. φανερόν τοίνυν ὅτι οὐκ ἔστιν ἐν ᾧ πρώτῳ μεταβέβληκεν· ἄπειροι γὰρ αἱ διαιρέσεις. οὐδὲ δὴ τοῦ μεταβεβληκός ἐστιν τι πρῶτον ὃ μεταβέβληκεν. ἔστω γὰρ τὸ ΔΖ πρῶτον μεταβεβληκὸς τοῦ ΔΕ· πᾶν γὰρ δέδεικται διαιρετὸν

^b 37 εἶη] η E¹ μετέβαλεν E²H 236^a 2 μεταβάλοι I δὲ om. H
3 τῷ δὲ H 7 λέγω fecit F ἤρξατο μεταβάλλειν F¹ 8 πρώτῳ
KAS: om. E ἐτελέσθη HIJK: ἐτελειώθη F¹ ἀληθὲς ἦν εἰπεῖν
F 9 ἐν ᾧ E²KAS: om. E¹ 10 οὐ E¹ λεγόμενον πρῶτον H
15 μετέβαλεν E²FK 16 τὸ om. HK δὴ om. E¹ 18 ἡρεμήσει I
20 μὲν om. H 21 εἶναι et τῶν om. E¹ 24 εἴτ' scripsi, fort. leg.
S: εἰ δ' Π 25 οὐδ' E² πρῶτον F¹ 28 ἔστι EHJS: ἔσται FIK
πρότερον S ΖΔ S 29 μεταβεβληκός E²KAS: μεταβεβληκός E¹

30 τὸ μεταβάλλον. ὁ δὲ χρόνος ἐν ᾧ τὸ ΔΖ μεταβέβληκεν ἔστω ἐφ' ᾧ ΘΙ. εἰ οὖν ἐν τῷ παντὶ τὸ ΔΖ μεταβέβληκεν, ἐν τῷ ἡμίσει ἔλαττον ἔσται τι μεταβεβληκὸς καὶ πρότερον τοῦ ΔΖ, καὶ πάλιν τούτου ἄλλο, κάκεινου ἕτερον, καὶ αἰεὶ οὕτως. ὥστ' οὐθὲν ἔσται πρῶτον τοῦ μεταβάλλοντος ὁ μεταβέβληκεν.

35 ὅτι μὲν οὖν οὔτε τοῦ μεταβάλλοντος οὔτ' ἐν ᾧ μεταβάλλει χρόνῳ πρῶτον οὐθέν ἐστιν, φανερόν ἐκ τῶν εἰρημένων·

236^b αὐτὸ δὲ ὁ μεταβάλλει ἢ καθ' ὁ μεταβάλλει, οὐκέθ' ὁμοίως ἕξει. τρία γάρ ἐστιν ἃ λέγεται κατὰ τὴν μεταβολήν, τό τε μεταβάλλον καὶ ἐν ᾧ καὶ εἰς ὁ μεταβάλλει, οἷον ὁ ἄνθρωπος καὶ ὁ χρόνος καὶ τὸ λευκόν. ὁ

5 μὲν οὖν ἄνθρωπος καὶ ὁ χρόνος διαιρετοί, περὶ δὲ τοῦ λευκοῦ ἄλλος λόγος. πλὴν κατὰ συμβεβηκὸς γε πάντα διαιρετά· ᾧ γὰρ συμβέβηκεν τὸ λευκὸν ἢ τὸ ποιόν, ἐκείνο διαιρετόν ἐστιν· ἐπεὶ ὅσα γε καθ' αὐτὰ λέγεται διαιρετά καὶ μὴ κατὰ συμβεβηκὸς, οὐδ' ἐν τούτοις ἔσται τὸ πρῶτον,

10 οἷον ἐν τοῖς μεγέθεσι. ἔστω γὰρ τὸ ἐφ' ᾧ AB μέγεθος, κευκῆσθω δ' ἐκ τοῦ Β εἰς τὸ Γ πρῶτον. οὐκοῦν εἰ μὲν ἀδιαίρετον ἔσται τὸ ΒΓ, ἀμερὲς ἀμεροῦς ἔσται ἐχόμενον· εἰ δὲ διαιρετόν, ἔσται τι τοῦ Γ πρότερον, εἰς ὁ μεταβέβληκεν, κάκεινου πάλιν ἄλλο, καὶ αἰεὶ οὕτως διὰ τὸ μηδέποτε ὑπολεί-

15 πειω τὴν διαίρεσιν. ὥστ' οὐκ ἔσται πρῶτον εἰς ὁ μεταβέβληκεν. ὁμοίως δὲ καὶ ἐπὶ τῆς τοῦ ποσοῦ μεταβολῆς· καὶ γὰρ αὕτη ἐν συνεχεῖ ἐστιν. φανερόν οὖν ὅτι ἐν μόνῃ τῶν κινήσεων τῇ κατὰ τὸ ποιὸν ἐνδέχεται ἀδιαίρετον καθ' αὐτὸ εἶναι.

Ἐπεὶ δὲ τὸ μεταβάλλον ἅπαν ἐν χρόνῳ μεταβάλλει, 6

20 λέγεται δ' ἐν χρόνῳ μεταβάλλειν καὶ ὡς ἐν πρώτῳ καὶ ὡς καθ' ἕτερον, οἷον ἐν τῷ ἐνιαυτῷ ὅτι ἐν τῇ ἡμέρᾳ μεταβάλλει, ἐν ᾧ πρώτῳ χρόνῳ μεταβάλλει τὸ μεταβάλλον, ἐν ὄτφου ἀνάγκῃ τούτου μεταβάλλειν. δῆλον μὲν οὖν καὶ ἐκ

^a 30 τὸ ΖΔ S : om. E¹ 31 παντὶ χρόνῳ τὸ Ι 32 ἐν om. J
 ἔσται τι scripsi : τι ἔσται S : ἔσται EH : ἔσται τὸ FIJK 34 πρῶτον
 E²KAS : om. E¹ ὁ . . . 35 μεταβάλλοντος om. F¹ ^b ἰ ὁ pr.
 PPS : εἰς ὁ Prantl ἢ . . . μεταβάλλει om. I οὐκέθ' KAS :
 οὐκέτι ὅτι E 3 τε om. E εἰς om. E²FHJK 5 διαιρετοί
 fecit E 7 ποιὸν ἢ τὸ λευκόν HK 8 διαιρετὰ λέγεται F
 9 καὶ . . . συμβεβηκὸς om. I 13 εἰς om. I 18 τὸ ΚΑΡ :
 om. E ἀδιαίρετον om. F¹ 21 ἐν τῷ E²KAS : om. E²
 22 πρώτως FK 23 τοῦτο E¹ οὖν om. F καὶ om. HK

τοῦ ὀρισμοῦ (τὸ γὰρ πρῶτον οὕτως ἐλέγομεν), οὐ μὴν ἀλλὰ καὶ ἐκ τῶνδε φανερόν. ἔστω γὰρ ἐν ᾧ πρώτῳ κινεῖται τὸ κινούμε- 25
νον ἐφ' ᾧ ΧΡ, καὶ διηρησθῶ κατὰ τὸ Κ· πᾶς γὰρ χρό-
νος διαιρετός. ἐν δὲ τῷ ΧΚ χρόνῳ ἦτοι κινεῖται ἢ οὐ κι-
νεῖται, καὶ πάλιν ἐν τῷ ΚΡ ὡσαύτως. εἰ μὲν οὖν ἐν μη-
δετέρῳ κινεῖται, ἡρεμοίη ἂν ἐν τῷ παντί (κινεῖσθαι γὰρ ἐν
μηθενὶ τῶν τούτου κινούμενον ἀδύνατον)· εἰ δ' ἐν θατέρῳ μόνῳ 30
κινεῖται, οὐκ ἂν ἐν πρώτῳ κινούτο τῷ ΧΡ· καθ' ἕτερον γὰρ
ἢ κίνησις. ἀνάγκη ἄρα ἐν ὄψοις τοῦ ΧΡ κινεῖσθαι. 32

δεδει- 32

γμένον δὲ τούτου φανερόν ὅτι πᾶν τὸ κινούμενον ἀνάγκη κει-
νῆσθαι πρότερον. εἰ γὰρ ἐν τῷ ΧΡ πρώτῳ χρόνῳ τὸ ΚΛ
κεκίνηται μέγεθος, ἐν τῷ ἡμίσει τὸ ὁμοταχῶς κινούμενον 35
καὶ ἅμα ἀρξάμενον τὸ ἡμισυ ἔσται κεκωμημένον. εἰ δὲ τὸ
ὁμοταχὲς ἐν τῷ αὐτῷ χρόνῳ κεκίνηται τι, καὶ θάτερον 237^a
ἀνάγκη ταυτὸ κεκωμηθῆναι μέγεθος, ὥστε κεκωμημένον ἔσται
τὸ κινούμενον. ἔτι δὲ εἰ ἐν τῷ παντί χρόνῳ τῷ ΧΡ κεκωμη-
σθαι λέγομεν, ἢ ὅλως ἐν ὄψοις χρόνῳ, τῷ λαβεῖν τὸ
ἔσχατον αὐτοῦ νῦν (τοῦτο γὰρ ἔστι τὸ ὀρίζον, καὶ τὸ μεταξὺ 5
τῶν νῦν χρόνος), κἂν ἐν τοῖς ἄλλοις ὁμοίως λέγοιτο κεκωμη-
σθαι. τοῦ δ' ἡμίσεος ἔσχατον ἢ διαίρεσις. ὥστε καὶ ἐν τῷ
ἡμίσει κεκωμημένον ἔσται καὶ ὅλως ἐν ὄψοις τῶν μερῶν· ἀεὶ
γὰρ ἅμα τῇ τομῇ χρόνος ἔστιν ὀρισμένος ὑπὸ τῶν νῦν. εἰ
οὖν ἅπας μὲν χρόνος διαιρετός, τὸ δὲ μεταξὺ τῶν νῦν χρό- 10
νος, ἅπαν τὸ μεταβάλλον ἄπειρα ἔσται μεταβεβληκός. ἔτι
δ' εἰ τὸ συνεχῶς μεταβάλλον καὶ μὴ φθαρὲν μηδὲ πεπαυ-
μένον τῆς μεταβολῆς ἢ μεταβάλλειν ἢ μεταβεβληκέναι
ἀναγκαῖον ἐν ὄψοις, ἐν δὲ τῷ νῦν οὐκ ἔστιν μεταβάλλειν,
ἀνάγκη μεταβεβληκέναι καθ' ἕκαστον τῶν νῦν· ὥστ' εἰ τὰ 15
νῦν ἄπειρα, πᾶν τὸ μεταβάλλον ἄπειρα ἔσται μεταβεβλη-
κός. 17

οὐ μόνον δὲ τὸ μεταβάλλον ἀνάγκη μεταβεβληκέναι, 17

^b 24 ἐλέγομεν KAS: λέγομεν E ἀλλὰ om. H: δὲ J¹: δὲ ἀλλὰ I
25 τῶνδὲ H 27 δὲ KAPS: δὲ E χκ KAS: κχ E 30 κινουμένων J
31 ἐκότερον FH¹ 32-3 ἀνάγκη... τούτου om. I 32 κινεῖσθαι
EP: κινεῖσθαι ΚΛ 237^a I τι om. I¹ καθ' ἕτερον E¹
4 ἐν] ἢ ἐν F αὐτοῦ τὸ ἔσχατον H 6 καὶ EJ¹ 8 καὶ om. E¹
10 τῷ ὄ ΚΛ 12 μὴ] μηδὲ I 14 ἐν ὄψοις ἀναγκαῖον H 15 τῶν
νῦν om. T: νῦν HK 16 ἔσται μεταβεβληκός ἄπειρα, deinde^a II-16 ἔτι
... μεταβεβληκός iterum F 17-18 μεταβεβληκέναι... ἀνάγκη om. I

ἀλλὰ καὶ τὸ μεταβεβληκὸς ἀνάγκη μεταβάλλειν πρότερον· ἅπαν γὰρ τὸ ἐκ τινος εἰς τι μεταβεβληκὸς ἐν χρόνῳ
 20 μεταβέβληκεν. ἔστω γὰρ ἐν τῷ νῦν ἐκ τοῦ Α εἰς τὸ Β μεταβεβληκός. οὐκοῦν ἐν μὲν τῷ αὐτῷ νῦν ἐν ᾧ ἔστιν ἐν τῷ Α, οὐ μεταβέβληκεν (ἅμα γὰρ ἂν εἴη ἐν τῷ Α καὶ ἐν τῷ Β)· τὸ γὰρ μεταβεβληκός, ὅτε μεταβέβληκεν, ὅτι οὐκ ἔστιν ἐν τούτῳ, δέδεικται πρότερον· εἰ δ' ἐν ἄλλῳ, μεταξὺ ἔσται
 25 χρόνος· οὐ γὰρ ἦν ἐχόμενα τὰ νῦν. ἐπεὶ οὖν ἐν χρόνῳ μεταβέβληκεν, χρόνος δ' ἅπας διαιρετός, ἐν τῷ ἡμίσει ἄλλο ἔσται μεταβεβληκός, καὶ πάλιν ἐν τῷ ἐκείνου ἡμίσει ἄλλο, καὶ αἰεὶ οὕτως· ὥστε μεταβάλλοι ἂν πρότερον. ἔτι δ' ἐπὶ τοῦ μεγέθους φανερώτερον τὸ λεχθὲν διὰ τὸ συνεχὲς εἶναι τὸ μέγεθος ἐν ᾧ μεταβάλλει τὸ μεταβάλλον. ἔστω γὰρ τι μεταβεβληκός ἐκ τοῦ Γ εἰς τὸ Δ. οὐκοῦν εἰ μὲν ἀδιαίρετόν ἐστι τὸ ΓΔ, ἀμερὲς ἀμερούς ἔσται ἐχόμενον· ἐπεὶ δὲ τοῦτο ἀδύνατον, ἀνάγκη μέγεθος εἶναι τὸ μεταξὺ καὶ εἰς ἄπειρα διαιρετόν· ὥστ' εἰς ἐκεῖνα μεταβάλλει πρότερον. ἀνάγκη ἄρα πᾶν τὸ μεταβεβληκός μεταβάλλειν πρότερον. ἡ γὰρ αὐτὴ ἀποδείξεις
 35 23^b καὶ ἐν τοῖς μὴ συνεχέσω, οἷον ἔν τε τοῖς ἐναντίοις καὶ ἐν ἀντιφάσει· ληψόμεθα γὰρ τὸν χρόνον ἐν ᾧ μεταβέβληκεν, καὶ πάλιν ταῦτ' ἐροῦμεν. ὥστε ἀνάγκη τὸ μεταβεβληκὸς μεταβάλλειν καὶ τὸ μεταβάλλον μεταβεβληκῆναι, καὶ
 5 ἔσται τοῦ μὲν μεταβάλλειν τὸ μεταβεβληκῆναι πρότερον, τοῦ δὲ μεταβεβληκῆναι τὸ μεταβάλλειν, καὶ οὐδέποτε ληφθήσεται τὸ πρῶτον. αἰτίων δὲ τούτου τὸ μὴ εἶναι ἀμερὲς ἀμερούς ἐχόμενον· ἄπειρος γὰρ ἡ διαίρεσις, καθάπερ ἐπὶ
 9 τῶν ἀἰξανομένων καὶ καθαιρουμένων γραμμῶν.
 9 φανερόν οὖν
 10 ὅτι καὶ τὸ γεγονὸς ἀνάγκη γίγνεσθαι πρότερον καὶ τὸ γιγνώμενον γεγονέναι, ὅσα διαιρετὰ καὶ συνεχῆ, οὐ μέντοι αἰεὶ

^a 20 μεταβέβληκεν E²KAS : μεταβέβληκεν aB E¹ 21 ἐν alt. om. J
 22 ἐν alt. KAS : om. E 23 ὅτε KAS : ὁ E : ἐξ οὗ μεταβέβληκεν, ὅτε ci. Cornford 24 ταῦτ' S 26 χρόνος δὲ πᾶς FHJ : πᾶς δὲ χρόνος KS : δὲ πᾶς χρόνος T 27 ἡμίσει ἐκείνου F 28 μεταβάλλοι F ἐπὶ E²KAP : om. E¹ 30 τι FP : τὸ EHIJK
 31 ἔσται E 33 διαιρετόν E²KAS : διαιρετόν ed E¹ 35 γὰρ ἡ E^b1 ἐν ult.] ἐν τῇ I 5 ἔστι KAT 7 πρῶτον EHIJKS : πρότερον FT 8 ἄπειρος E¹S : ἐπ' ἄπειρον E²KAT 9 γραμμῶν E²KAST : om. E¹ 10 πρότερον] ποτε H 11 ὅσα διαιρετὰ E²KAPST : ἀδιαίρετα E¹

ὁ γίνεταί, ἀλλ' ἄλλο ἐνόησε, οἷον τῶν ἐκείνου τι, ὥσπερ τῆς οἰκίας τὸν θεμέλιον. ὁμοίως δὲ καὶ ἐπὶ τοῦ φθειρομένου καὶ ἐφθαρμένου· εὐθὺς γὰρ ἐνυπάρχει τῷ γιγνομένῳ καὶ τῷ φθειρομένῳ ἄπειρόν τι συνεχεῖ γε ὄντι, καὶ οὐκ ἔστιν οὔτε γί- 15
γνεσθαι μὴ γεγυῖται οὔτε γεγυῖται μὴ γιγνόμενόν τι, ὁμοίως δὲ καὶ ἐπὶ τοῦ φθειρομένου καὶ ἐπὶ τοῦ ἐφθάρθαι· αἰεὶ γὰρ ἔσται τοῦ μὲν φθειρομένου τὸ ἐφθάρθαι πρότερον, τοῦ δ' ἐφθάρθαι τὸ φθειρομένου. φανερόν οὖν ὅτι καὶ τὸ γεγυῖται ἀνάγκη γίνεσθαι πρότερον καὶ τὸ γιγνόμενον γεγυῖται· πᾶν γὰρ μέ- 20
γεθος καὶ πᾶς χρόνος αἰεὶ διαιρετά. ὥστ' ἐν φ' ἂν ἦ, οὐκ ἂν εἶη ὡς πρῶτον.

7 Ἐπεὶ δὲ πᾶν τὸ κινούμενον ἐν χρόνῳ κινεῖται, καὶ ἐν τῷ πλείονι μείζον μέγεθος, ἐν τῷ ἀπείρῳ χρόνῳ ἀδύνατόν ἐστιν πεπερασμένην κινεῖσθαι, μὴ τὴν αὐτὴν αἰεὶ καὶ τῶν ἐκέ- 25
νης τι κινούμενον, ἀλλ' ἐν ἅπαντι ἅπασαν. ὅτι μὲν οὖν εἴ τι ἰσοταχῶς κινεῖτο, ἀνάγκη τὸ πεπερασμένον ἐν πεπερασμένῳ κινεῖσθαι, δῆλον (ληφθέντος γὰρ μορίου ὃ καταμετρήσει τὴν ὅλην, ἐν ἴσοις χρόνοις τοσοῦτοις ὅσα τὰ μόρια ἐστίν, τὴν ὅλην κεκίνηται, ὥστ' ἐπεὶ ταῦτα πεπεραστοὶ καὶ τῷ πό- 30
σον ἕκαστον καὶ τῷ ποσᾷ ἅπαντα, καὶ ὁ χρόνος ἂν εἶη πεπερασμένος· τοσαυτάκις γὰρ ἔσται τοσοῦτος, ὅσος ὁ τοῦ μορίου χρόνος πολλαπλασιασθεὶς τῷ πλήθει τῶν μορίων)· ἀλλὰ δὴ καὶ μὴ ἰσοταχῶς, διαφέρει οὐθέν. ἔστω γὰρ ἐφ' ἧς τὸ AB διάστημα πεπερασμένον, ὃ κεκίνηται 35
ἐν τῷ ἀπείρῳ, καὶ ὁ χρόνος ἄπειρος ἐφ' οὗ τὸ ΓΔ. εἰ δὴ 238^a
ἀνάγκη πρότερον ἕτερον ἐτέρου κεκινήσθαι (τοῦτο δὲ δῆλον, ὅτι τοῦ χρόνου ἐν τῷ προτέρῳ καὶ ὑστέρῳ ἕτερον κεκίνηται· αἰεὶ γὰρ ἐν τῷ πλείονι ἕτερον ἔσται κεκινημένον, ἕάν τε ἰσο-
ταχῶς ἕάν τε μὴ ἰσοταχῶς μεταβάλλῃ, καὶ ἕάν τε ἐπι- 5
τεῖνῃ ἢ κίνησις ἕάν τε ἀνιῇ ἕάν τε μένῃ, οὐθέν ἦτορ), εἰλήφθω

^b 12 ἀλλὰ καὶ ἄλλο F: ἀλλ' ἄλλο τι I οἷον] ὥσπερ F
13 φθειρομένου καὶ om. S 14 τῷ alt. om. ΚΑ 15 συνεχῆς J'
16 γεγυῖται H 19 καὶ om. E 20 γεγυῖται E 21 ἦ]
εἶη H 22 πρῶτον AS: πρῶτος K: πρῶτον E 25 πεπερασ-
μένον K 26 ἐν] ἐν τῷ FK πᾶσαν E 29 χρόνοις ES:
τοῖς χρόνοις ΚΑ τοσοῦτοις om. HS 30 ἐπεὶ] E πεπέ-
ραται F: πεπεραστοὶ ΗΙΚ τὸ E ποσῶ I 31 τὸ E
34 μὴ EJS: εἰ μὴ FHIK διαφέρει I 35 AB S, Bonitz: α
καὶ τὸ β Π δ] ου E 238^a I τὸ om. E 2 ἐτέρου om. J'
5 μεταβάλλῃ I

δὴ τι τοῦ ΑΒ διαστήματος, τὸ ΑΕ, ὃ καταμετρήσει τὴν
 ΑΒ. τοῦτο δὴ τοῦ ἀπείρου ἔν τινι ἐγένετο χρόνῳ· ἐν ἀπείρῳ
 γὰρ οὐχ οἶόν τε· τὸ γὰρ ἅπαν ἐν ἀπείρῳ. καὶ πάλιν ἕτε-
 10 ρον δὴ ἐὰν λάβω ὅσον τὸ ΑΕ, ἀνάγκη ἐν πεπερασμένῳ
 χρόνῳ· τὸ γὰρ ἅπαν ἐν ἀπείρῳ. καὶ οὕτω δὴ λαμβάνων,
 ἐπειδὴ τοῦ μὲν ἀπείρου οὐθεν ἔστι μόριον ὃ καταμετρήσει (ἀδύ-
 νατον γὰρ τὸ ἀπείρου εἶναι ἐκ πεπερασμένων καὶ ἴσων καὶ
 15 ἀνίσων, διὰ τὸ καταμετρηθήσεσθαι τὰ πεπερασμένα πλήθει
 καὶ μεγέθει ὑπὸ τινος ἐνός, ἐὰν τε ἴσα ἢ ἐὰν τε ἄνισα,
 ὠρισμένα δὲ τῷ μεγέθει, οὐθεν ἦττον), τὸ δὲ διάστημα τὸ πε-
 περασμένον ποσοῖς τοῖς ΑΕ μετρεῖται, ἐν πεπερασμένῳ ἂν
 χρόνῳ τὸ ΑΒ κινῶτο (ὡσαύτως δὲ καὶ ἐπὶ ἡρεμῆσεως)· ὥστε
 οὔτε γίνεσθαι οὔτε φθείρεσθαι οἶόν τε ἀεὶ τι τὸ αὐτὸ καὶ ἔν.
 20 ὁ αὐτὸς δὲ λόγος καὶ ὅτι οὐδ' ἐν πεπερασμένῳ χρόνῳ ἀπει-
 ρον οἶόν τε κινεῖσθαι οὐδ' ἡρεμίζεσθαι, οὐθ' ὀμαλῶς κινούμενον
 οὔτ' ἀνωμάλως. ληφθέντος γὰρ τινος μέρους ὃ ἀναμετρήσει
 τὸν ὅλον χρόνον, ἐν τούτῳ ποσόν τι διέξεισιν τοῦ μεγέθους καὶ
 οὐχ ὅλον (ἐν γὰρ τῷ παντὶ τὸ ὅλον), καὶ πάλιν ἐν τῷ ἴσῳ
 25 ἄλλο, καὶ ἐν ἐκάστῳ ὁμοίως, εἴτε ἴσον εἴτε ἄνισον τῷ ἐξ
 ἀρχῆς· διαφέρει γὰρ οὐδέν, εἰ μόνον πεπερασμένον ἕκα-
 στον· δηλον γὰρ ὡς ἀναιρουμένον τοῦ χρόνου τὸ ἀπείρου οὐκ
 ἀναιρεθήσεται, πεπερασμένης τῆς ἀφαιρέσεως γιγνομένης καὶ
 τῷ ποσῷ καὶ τῷ ποσάκισ· ὥστ' οὐ δίεισιν ἐν πεπερασμένῳ
 30 χρόνῳ τὸ ἀπείρου. οὐδέν τε διαφέρει τὸ μέγεθος ἐπὶ θάτερα
 ἢ ἐπ' ἀμφοτέρα εἶναι ἀπείρου· ὁ γὰρ αὐτὸς ἔσται λόγος.
 ἀποδοδειγμένων δὲ τούτων φανερόν ὅτι οὐδὲ τὸ πεπερασμένον
 μέγεθος τὸ ἀπείρου ἐνδέχεται διελθεῖν ἐν πεπερασμένῳ
 διὰ τὴν αὐτὴν αἰτίαν· ἐν γὰρ τῷ μορίῳ τοῦ χρόνου πεπερασ-
 35 μένον δίεισι, καὶ ἐν ἐκάστῳ ὡσαύτως, ὥστ' ἐν τῷ παντὶ πε-

^a 7 τὸ om. HK 8 τούτου E 10 ἂν λαβῶν E 13 τὸ
 om. I 14 πλήθει καὶ μεγέθει EHKPS: πλήθει καὶ μεγέθει FI
 15 ἢ . . . ἄνισα om. E¹ 17 ποσοῖς PP: πεπερασμένοις ποσοῖς
 Bonitz τῶν K μετρεῖται E²HIJ²KP: μετρήσεται E¹: μετρεῖσθαι
 J¹ χρόνῳ ἂν F 18-19 ὥστε . . . ἐν PS: secl. Prantl 19 τι
 om. F 21 τὸ E 22 δ] τοῦ χρόνου ὃ I 25 εἴτε alt.]
 ἔσται E 26 γὰρ] δὲ H οὐδενὶ μόνον E¹ πεπερασμένον] τι
 πεπερασμένον F: πεπερασμένον τι HIJK 27 γὰρ] πεπερασμένον
 E¹ οὐκ om. F 28 ἀνδιαιρεθήσεται E: συναναιρεθήσεται F
 29 ἐν τῷ F 30 δὲ E¹ θάτερα ἢ ἐπ' ἀμφοτέρα E²FIJKS: ἀμφοτέρα
 ἢ ἐπὶ θάτερα H: θάτερα E 31 ἀπείρου om. E¹ 32 δεδειγμένων S
 34 διὰ] χρόνῳ διὰ ΚΔ 35 ἐν pr. om. F παντὶ] παντὶ τὸ F

πεπερασμένον. ἐπεὶ δὲ τὸ πεπερασμένον οὐ δίδεισι τὸ ἄπειρον ἐν πεπερασμένῳ χρόνῳ, δῆλον ὡς οὐδὲ τὸ ἄπειρον τὸ πεπε- 238^b
 ρασμένον· εἰ γὰρ τὸ ἄπειρον τὸ πεπερασμένον, ἀνάγκη καὶ
 τὸ πεπερασμένον διέναι τὸ ἄπειρον. οὐδὲν γὰρ διαφέρει ὅπο-
 τερονοῦν εἶναι τὸ κινούμενον· ἀμφοτέρως γὰρ τὸ πεπερασμέ-
 νον δίδεισι τὸ ἄπειρον. ὅταν γὰρ κινήται τὸ ἄπειρον ἐφ' 5
 ᾧ τὸ Α, ἔσται τι αὐτοῦ κατὰ τὸ Β τὸ πεπερασμένον, οἷον τὸ
 ΓΔ, καὶ πάλιν ἄλλο καὶ ἄλλο, καὶ αἰεὶ οὕτως. ὥσθ' ἅμα
 συμβήσεται τὸ ἄπειρον κεκινήσθαι τὸ πεπερασμένον καὶ τὸ
 πεπερασμένον διεληλυθέναι τὸ ἄπειρον· οὐδὲ γὰρ ἴσως δυ-
 νατὸν ἄλλως τὸ ἄπειρον κινήθῃαι τὸ πεπερασμένον ἢ τῷ 10
 τὸ πεπερασμένον διέναι τὸ ἄπειρον, ἢ φερόμενον ἢ ἀναμε-
 τροῦν. ὥστ' ἐπεὶ τοῦτ' ἀδύνατον, οὐκ ἂν διότι τὸ ἄπειρον τὸ
 πεπερασμένον. ἀλλὰ μὴν οὐδὲ τὸ ἄπειρον ἐν πεπερασμένῳ
 χρόνῳ τὸ ἄπειρον δίδεισιν· εἰ γὰρ τὸ ἄπειρον, καὶ τὸ πε-
 περασμένον· ἐνυπάρχει γὰρ τῷ ἀπέριφ τὸ πεπερασμένον. 15
 ἔτι δὲ καὶ τοῦ χρόνου ληφθέντος ἢ αὐτῇ ἔσται ἀποδείξεις.

ἐπεὶ δ' οὔτε τὸ πεπερασμένον τὸ ἄπειρον οὔτε τὸ ἄπειρον
 τὸ πεπερασμένον οὔτε τὸ ἄπειρον τὸ ἄπειρον ἐν πεπερασμένῳ
 χρόνῳ κινεῖται, φανερόν ὅτι οὐδὲ κίνησις ἔσται ἄπειρος ἐν πε-
 περασμένῳ χρόνῳ· τί γὰρ διαφέρει τὴν κίνησιν ἢ τὸ μέγεθος 20
 ποιεῖν ἄπειρον; ἀνάγκη γάρ, εἰ ὅποτερονοῦν, καὶ θάτερον εἶ-
 ναι ἄπειρον· πᾶσα γὰρ φορὰ ἐν τόπῳ.

8 Ἐπεὶ δὲ πᾶν ἢ κινεῖται ἢ ἡρεμεῖ τὸ πεφυκὸς ὅτε πέ-
 φυκε καὶ οὐ καὶ ὡς, ἀνάγκη τὸ ἰστάμενον ὅτε ἴσταται κινεῖ-
 σθαι· εἰ γὰρ μὴ κινεῖται, ἡρεμήσει, ἀλλ' οὐκ ἐνδέχεται ἡρε- 25
 μίξεσθαι τὸ ἡρεμοῦν. τούτου δ' ἀποδεδειγμένου φανερόν ὅτι
 καὶ ἐν χρόνῳ ἴστασθαι ἀνάγκη (τὸ γὰρ κινούμενον ἐν χρόνῳ
 κινεῖται, τὸ δ' ἰστάμενον δέδεικται κινούμενον, ὥστε ἀνάγκη
 ἐν χρόνῳ ἴστασθαι)· ἔτι δ' εἰ τὸ μὲν θάττον καὶ βραδύτερον
 ἐν χρόνῳ λέγομεν, ἴστασθαι δ' ἔστω θάττον καὶ βραδύτερον. 30

^a 36 δὲ] οὖν ΗΚ ^b 1 πεπερασμένον χρόνῳ. εἰ F 3 ὅποτερον
 ΗΚ 6 τὸ tert. om. ΚΛ 7 καὶ ἄλλο om. S ὡσαύτως Η
 10 τὸ ἄπειρον ἄλλως ΗΚ 10-11 ἢ τῷ πεπερασμένῳ E¹ 11 διελη-
 λυθέναι Η 12 ταῦτ' ΗΙJ ἀδύνατα Η 14 εἰ γὰρ om. E¹
 15 ἐνυπάρχει . . . πεπερασμένον om. Η 16 ἢ E² KAS : γὰρ ἢ E¹
 17 τὸ pr. om. F οὔτε] δίδεισιν οὔτε KAS 18 τὸ ἄπειρον alt.
 om. E¹, erasit J 21 εἰ om. FHJ¹K 23 ἢ pr. om. J¹ 29 εἰ
 KAS : om. EP 30 ἐν . . . βραδύτερον om. K¹ δ' ἔστιν
 fecit E

ἐν ᾧ δὲ χρόνῳ πρώτῳ τὸ ἰστάμενον ἴσταται, ἐν ὄψοις ἀνάγκη
 τούτου ἴστασθαι. διαιρεθέντος γὰρ τοῦ χρόνου εἰ μὲν ἐν μηδε-
 τέρῳ τῶν μερῶν ἴσταται, οὐδ' ἐν τῷ ὅλῳ, ὥστ' οὐκ ἂν ἴσταιτο
 τὸ ἰστάμενον· εἰ δ' ἐν θατέρῳ, οὐκ ἂν ἐν πρώτῳ τῷ ὅλῳ ἴσταιτο·
 35 καθ' ἕτερον γὰρ ἐν τούτῳ ἴσταται, καθάπερ ἐλέχθη καὶ
 ἐπὶ τοῦ κινουμένου πρότερον. ὥσπερ δὲ τὸ κινούμενον οὐκ ἔστιν
 239^a ἐν ᾧ πρώτῳ κινεῖται, οὕτως οὐδ' ἐν ᾧ ἴσταται τὸ ἰστάμενον·
 οὔτε γὰρ τοῦ κινεῖσθαι οὔτε τοῦ ἴστασθαι ἐστὶν τι πρῶτον. ἔστω
 γὰρ ἐν ᾧ πρώτῳ ἴσταται ἐφ' ᾧ τὸ AB. τοῦτο δὴ ἀμερὲς
 μὲν οὐκ ἐνδέχεται εἶναι (κίνησις γὰρ οὐκ ἔστιν ἐν τῷ ἀμερεῖ
 5 διὰ τὸ κεκωῆσθαι τι ἂν αὐτοῦ, τὸ δ' ἰστάμενον δέδεικται κινούμε-
 νον)· ἀλλὰ μὴν εἰ διαιρετόν ἐστιν, ἐν ὄψοις αὐτοῦ τῶν μερῶν
 ἴσταται· τοῦτο γὰρ δέδεικται πρότερον, ὅτι ἐν ᾧ πρώτῳ ἴστα-
 ται, ἐν ὄψοις τῶν ἐκείνου ἴσταται. ἐπεὶ οὖν χρόνος ἐστὶν ἐν
 ᾧ πρώτῳ ἴσταται, καὶ οὐκ ἄτομον, ἅπας δὲ χρόνος εἰς
 10 ἄπειρα μεριστός, οὐκ ἔσται ἐν ᾧ πρώτῳ ἴσταται.

10 οὐδὲ δὴ τὸ
 ἡρεμοῦν ὅτε πρῶτον ἡρέμησεν ἔστιν. ἐν ἀμερεῖ μὲν γὰρ οὐκ
 ἡρέμησεν διὰ τὸ μὴ εἶναι κίνησιν ἐν ἀτόμῳ, ἐν ᾧ δὲ τὸ ἡρε-
 μεῖν, καὶ τὸ κινεῖσθαι (τότε γὰρ ἔφαμεν ἡρεμεῖν, ὅτε καὶ
 ἐν ᾧ πεφυκὸς κινεῖσθαι μὴ κινεῖται τὸ πεφυκός)· ἔτι δὲ
 15 καὶ τότε λέγομεν ἡρεμεῖν, ὅταν ὁμοίως ἔχη νῦν καὶ πρό-
 τερον, ὡς οὐχ ἐνί τινι κρίνοντες ἀλλὰ δυοῖν τοῖν ἐλαχί-
 στου· ὥστ' οὐκ ἔσται ἐν ᾧ ἡρεμεῖ ἀμερὲς. εἰ δὲ μεριστόν,
 χρόνος ἂν εἴη, καὶ ἐν ὄψοις αὐτοῦ τῶν μερῶν ἡρεμήσει. τὸν
 αὐτὸν γὰρ τρόπον δειχθήσεται ὅν καὶ ἐπὶ τῶν πρότερον·
 20 ὥστ' οὐθὲν ἔσται πρῶτον. τούτου δ' αἰτίων ὅτι ἡρεμεῖ μὲν καὶ
 κινεῖται πᾶν ἐν χρόνῳ, χρόνος δ' οὐκ ἔστι πρῶτος οὐδὲ μέ-
 γεθος οὐδ' ὅλως συνεχὲς οὐδέν· ἅπαν γὰρ εἰς ἄπειρα μεριστόν.

^b 31 δὲ om. E¹P πρώτῳ EIJPS : πρώτως FHK τὸ ἰστάμενον
 ΠΡ : om. S ἰστάμενον fecit E¹ : ἡρεμιζόμενον E² 32 τούτου
 τοῦ J¹ εἰ μὴ ἐν F 33 ἴσταιτο] ἴστα E : ἴσταται FH¹J
 34 τῷ E²JPS : om. E¹FH¹K ἴστατο E²H¹I 35 ἀλλὰ καθ'
 E² ἕτερον EFP : ἐκάτερον HIJKS γὰρ om. E 239^a 1 πρώτως
 H 2 πρότερον H 5 ἂν E¹P : om. E²KAS 7 πρώτῳ EIJS :
 πρώτως FHK 8 τῶν om. I οὖν ὁ IJ 9 πρώτῳ
 EFIJS : πρώτως HK ἄτομον KAS : ἄτομος E δὲ KAS : γὰρ E
 10 ἔστιν F πρώτως H οὐδὲ E²KAP : οὐ E¹ 11 μὲν om.
 HK 13-15 ὅτε . . . ἡρεμεῖν om. F 14 κινῆται K 15 τότε
 om. E¹T 17 ἐν οἷς I 19 προτέρων HIK 22 ἄπειρον S

ἐπεὶ δὲ πᾶν τὸ κινούμενον ἐν χρόνῳ κινεῖται καὶ ἕκ τινος εἰς
 τι μεταβάλλει, ἐν ᾧ χρόνῳ κινεῖται καθ' αὐτὸν καὶ μὴ τῷ
 ἐν ἐκείνου τιμῇ, ἀδύνατον τότε κατὰ τι εἶναι πρῶτον τὸ κινού- 25
 μενον. τὸ γὰρ ἡρεμεῖν ἐστὶν τὸ ἐν τῷ αὐτῷ εἶναι χρόνον τιμῇ
 καὶ αὐτὸ καὶ τῶν μερῶν ἕκαστον. οὕτως γὰρ λέγομεν ἡρε-
 μεῖν, ὅταν ἐν ἄλλῳ καὶ ἄλλῳ τῶν νῦν ἀληθὲς ἢ εἰπεῖν ὅτι
 ἐν τῷ αὐτῷ καὶ αὐτὸ καὶ τὰ μέρη. εἰ δὲ τοῦτ' ἐστὶ τὸ ἡρε-
 μεῖν, οὐκ ἐνδέχεται τὸ μεταβάλλον κατὰ τι εἶναι ὅλον κατὰ 30
 τὸν πρῶτον χρόνον· ὁ γὰρ χρόνος διαιρετὸς ἅπας, ὥστε ἐν
 ἄλλῳ καὶ ἄλλῳ αὐτοῦ μέρει ἀληθὲς ἐστὶ εἰπεῖν ὅτι ἐν ταυτῷ
 ἐστὶν καὶ αὐτὸ καὶ τὰ μέρη. εἰ γὰρ μὴ οὕτως ἀλλ' ἐν ἐνὶ
 μόνῳ τῶν νῦν, οὐκ ἐστὶν χρόνον οὐδένα κατὰ τι, ἀλλὰ κατὰ
 τὸ πέρασ τοῦ χρόνου. ἐν δὲ τῷ νῦν ἐστὶν μὲν αἰεὶ κατὰ τι μὲν 35
 ὄν, οὐ μέντοι ἡρεμεῖ· οὔτε γὰρ κινεῖσθαι οὔτ' ἡρεμεῖν ἐστὶν ἐν 239^b
 τῷ νῦν, ἀλλὰ μὴ κινεῖσθαι μὲν ἀληθὲς ἐν τῷ νῦν καὶ εἶναι
 κατὰ τι, ἐν χρόνῳ δ' οὐκ ἐνδέχεται εἶναι κατὰ τι ἡρεμοῦν·
 συμβαίνει γὰρ τὸ φερόμενον ἡρεμεῖν.

- 9 Ζήνων δὲ παραλογίζεται· εἰ γὰρ αἰεὶ, φησίν, ἡρε- 5
 μεῖ πᾶν [ἢ κινεῖται] ὅταν ἢ κατὰ τὸ ἴσον, ἐστὶν δ' αἰεὶ τὸ
 φερόμενον ἐν τῷ νῦν, ἀκίνητον τὴν φερομένην εἶναι οἰστόν.
 τοῦτο δ' ἐστὶ ψεῦδος· οὐ γὰρ σύγκειται ὁ χρόνος ἐκ τῶν νῦν
 τῶν ἀδιαιρέτων, ὥσπερ οὐδ' ἄλλο μέγεθος οὐδέν. τέττα-
 ρες δ' εἰσὶν οἱ λόγοι περὶ κινήσεως Ζήνωνος οἱ παρέχοντες τὰς 10
 δυσκολίας τοῖς λύουσι, πρῶτος μὲν ὁ περὶ τοῦ μὴ κινεῖ-
 σθαι διὰ τὸ πρότερον εἰς τὸ ἡμισυ δεῖν ἀφικέσθαι τὸ φε-
 ρόμενον ἢ πρὸς τὸ τέλος, περὶ οὗ διείλομεν ἐν τοῖς πρότε-
 ρον λόγοις. δεύτερος δ' ὁ καλούμενος Ἀχιλλεύς· ἐστὶ δ'

^a 24 αὐτὸ EFHJKPS ᾧτ ἐν E¹HIJ et fort. S: τῶν ἐν E²: τῶν
 FK: τῷ ἐν τῶν fort. S, Gaye 25 πρῶτον εἶναι I 26 τῷ ἐν
 τῷ J χρόνῳ εἶναι τινα EK: χρόνον τιμῇ εἶναι I 28 καὶ HIJKS:
 καὶ ἐν EF τῷ ΚΛ 29 τῷ αὐτῷ KAS: ᾧ τοῦτο E 32 καὶ ἐν
 ἄλλῳ FJ εἰπεῖν ἐστὶν F 33 ἐν om. F: ἐφ' E² 34 τῷ E²ΚΛ
 35 μὲν ὄν Prantl: μένον IP: μόνον ut vid. ST ^b I ἡρεμεῖν E
 2 μὴ] μὴν F¹ ἐν τῷ νῦν ἀληθὲς καὶ κατὰ τι εἶναι H 3 τι scripsi: τὸ
 E¹KAPS: τι τὸ E² 4 γὰρ καὶ τὸ I 5 ἢ E¹ 6 ἢ κινεῖται PPS:
 om. T, secl. Zeller: an οὐ κινεῖται? ante ὅταν retento ἢ κιν. add.
 οὐ κινεῖται δὲ Emminger, οὐδὲν δὲ κινεῖται Diels, καὶ μὴ κινεῖται Cornford,
 ἡρεμεῖ δὲ Lachelier αἰεὶ IST: om. P 7 ἐν τῷ νῦν EHIJKPS:
 κατὰ τὸ ἴσον fort. T: ἐν τῷ νῦν τῷ (τῷ om. Zeller) κατὰ τὸ ἴσον fecit
 F, Zeller: ἐν τῷ νῦν, πᾶν δὲ κατὰ τὸ ἴσον ἐν τῷ νῦν Diels 9 τῶν
 ES: om. ΚΛ 10 οἱ KAST: om. E 12 δεῖν εἰς τὸ ἡμισυ
 πρότερον H 13 ἐν om. I προτέροις S: πρόσθεν ΚΛ

15 οὗτος, ὅτι τὸ βραδύτατον οὐδέποτε καταληφθήσεται θέον
 ὑπὸ τοῦ ταχίστου· ἐμπροσθεν γὰρ ἀναγκαῖον ἔλθειν τὸ διω-
 κόν ὅθεν ὠρμησεν τὸ φεῦγον, ὥστε αἰεὶ τι προέχει ἀνα-
 καῖον τὸ βραδύτερον. ἔστιν δὲ καὶ οὗτος ὁ αὐτὸς λόγος τῷ
 διχοτομεῖν, διαφέρει δ' ἐν τῷ διαιρεῖν μὴ δίχα τὸ προσ-
 20 λαμβανόμενον μέγεθος. τὸ μὲν οὖν μὴ καταλαμβάνε-
 σθαι τὸ βραδύτερον συμβέβηκεν ἐκ τοῦ λόγου, γίνεται δὲ
 παρὰ ταῦτο τῇ διχοτομίᾳ (ἐν ἀμφοτέροις γὰρ συμβαίνει
 μὴ ἀφικνεῖσθαι πρὸς τὸ πέρασ διαιρουμένον πως τοῦ με-
 γέθους· ἀλλὰ πρόσκειται ἐν τούτῳ ὅτι οὐδὲ τὸ τάχιστον
 25 τετραγωδημένον ἐν τῷ διώκει τὸ βραδύτατον), ὥστ' ἀν-
 άγκη καὶ τὴν λύσιν εἶναι τὴν αὐτήν. τὸ δ' ἀξιοῦν ὅτι τὸ
 προέχον οὐ καταλαμβάνεται, ψεῦδος· ὅτε γὰρ προέχει,
 οὐ καταλαμβάνεται· ἀλλ' ὅμως καταλαμβάνεται, εἴ-
 περ δώσει διεξιέναι τὴν πεπερασμένην. οὗτοι μὲν οὖν οἱ δύο
 30 λόγοι, τρίτος δ' ὁ νῦν ῥηθείς, ὅτι ἡ οἰστὸς φερομένη ἔστηκεν.
 συμβαίνει δὲ παρὰ τὸ λαμβάνειν τὸν χρόνον συγκεῖσθαι ἐκ
 τῶν νῦν· μὴ διδομένου γὰρ τούτου οὐκ ἔσται ὁ συλλογισ-
 33 μός.

33 τέταρτος δ' ὁ περὶ τῶν ἐν τῷ σταδίῳ κινουμένων ἐξ
 ἐναντίας ἴσων ὄγκων παρ' ἴσους, τῶν μὲν ἀπὸ τέλους τοῦ
 35 σταδίου τῶν δ' ἀπὸ μέσου, ἴσῳ τάχει, ἐν ᾧ συμβαίνει
 240^a οἶεται ἴσον εἶναι χρόνον τῷ διπλασίῳ τὸν ἥμισυν. ἔστι δ' ὁ
 παραλογισμὸς ἐν τῷ τὸ μὲν παρὰ κινούμενον τὸ δὲ παρ'
 ἡρεμοῦν τὸ ἴσον μέγεθος ἀξιοῦν τῷ ἴσῳ τάχει τὸν ἴσον φέρε-
 σθαι χρόνον· τοῦτο δ' ἐστὶ ψεῦδος. οἷον ἔστρωσαν οἱ ἐστῶτες
 5 ἴσοι ὄγκοι ἐφ' ὧν τὰ ΑΑ, οἱ δ' ἐφ' ὧν τὰ ΒΒ ἀρχόμε-
 νοι ἀπὸ τοῦ μέσου, ἴσοι τὸν ἀριθμὸν τούτοις ὄντες καὶ
 τὸ μέγεθος, οἱ δ' ἐφ' ὧν τὰ ΓΓ ἀπὸ τοῦ ἐσχάτου, ἴσοι τὸν
 ἀριθμὸν ὄντες τούτοις καὶ τὸ μέγεθος, καὶ ἰσοταχεῖς τοῖς Β.

^b 15 βραδύτατον EST: βραδύτερον ΚΑ 17 προσέχειν E¹
 23 τούτου E 24 ἐν om. HK 25 βραδύτερον FHK 26 καὶ
 om. F εἶναι ἐκατέρων τὴν E τὸ alt. om. HK 29 δεήσει
 E² οἱ λόγοι δύο FI: δύο λόγοι S: λόγοι δύο HJK 32 διδο-
 μένου ΚΑΤ: δεδομένου E 33 τῷ EST: om. ΚΑ 34 ὄγκος I
 ἀπὸ] ἀπὸ τοῦ FIP 35 ἀπὸ] ἀπὸ τοῦ FHIJ²KP 240^a 1 ἥμισυν F
 3 ἰσοτάχει E¹ 5 τὰ E²KAPS: τὸ E¹ aa EP: aaa FHJK:
 aaaa I: a S τὰ E²KAPS: om. E¹ ββ EP: ββββ F: β
 HIJKS ἄρχονται E 6 μέσου EHIJ¹ et fort. S: μέσου τῶν
 a FJ²K 7 γ KAS ἐσχάτου] ἐσχάτου β A: ἐσχάτου τῶν β F
 8 τούτοις ὄντες FHK τοῖς] τῷ K

συμβαίνει δὴ τὸ πρῶτον Β ἅμα ἐπὶ τῷ ἐσχάτῳ εἶναι καὶ τὸ πρῶτον Γ, παρ' ἄλληλα κινουμένων. συμβαίνει δὲ τὸ 10 Γ παρὰ πάντα [τὰ Β] διεξεληλυθέναι, τὸ δὲ Β παρὰ τὰ ἡμίση· ὥστε ἡμισυ εἶναι τὸν χρόνον· ἴσον γὰρ ἑκάτερόν ἐστιν παρ' ἕκαστον. ἅμα δὲ συμβαίνει τὸ πρῶτον Β παρὰ πάντα τὰ Γ παρεληλυθέναι· ἅμα γὰρ ἔσται τὸ πρῶτον Γ καὶ τὸ πρῶτον Β ἐπὶ τοῖς ἐναντίοις ἐσχάτοις, [ἴσον χρόνον παρ' ἕκαστον 15 γινόμενον τῶν Β ὅσον περ τῶν Α, ὡς φησιν,] διὰ τὸ ἀμφότερα ἴσον χρόνον παρὰ τὰ Α γίνεσθαι. ὁ μὲν οὖν λόγος οὗτός ἐστιν, συμβαίνει δὲ παρὰ τὸ εἰρημένον ψεῦδος.

οὐδὲ δὴ κατὰ τὴν ἐν τῇ ἀντιφάσει μεταβολὴν οὐθὲν ἡμῖν ἔσται ἀδύνατον, οἷον εἰ ἐκ τοῦ μὴ λευκοῦ εἰς τὸ λευκὸν μετα- 20βάλλει καὶ ἐν μηδετέρῳ ἐστίν, ὡς ἅρα οὔτε λευκὸν ἔσται οὔτε οὐ λευκόν· οὐ γὰρ εἰ μὴ ὅλον ἐν ὁποτέρῳ ἐστιν, οὐ λεχθήσεται λευκὸν ἢ οὐ λευκόν· λευκὸν γὰρ λέγομεν ἢ οὐ λευκὸν οὐ τῷ ὅλον εἶναι τοιοῦτον, ἀλλὰ τῷ τὰ πλείστα ἢ τὰ κυριώτατα μέρη· οὐ ταῦτ' ὁ δ' ἐστὶν μὴ εἶναι τε ἐν τούτῳ καὶ 25 μὴ εἶναι ἐν τούτῳ ὅλον. ὁμοίως δὲ καὶ ἐπὶ τοῦ ὄντος καὶ ἐπὶ τοῦ μὴ ὄντος καὶ τῶν ἄλλων τῶν κατ' ἀντίφασιν· ἔσται μὲν γὰρ ἐξ ἀνάγκης ἐν θατέρῳ τῶν ἀντικειμένων, ἐν οὐδετέρῳ δ' ὅλον αἰεὶ. πάλιν δ' ἐπὶ τοῦ κύκλου καὶ ἐπὶ τῆς σφαίρας καὶ ὅλως τῶν ἐν αὐτοῖς κινουμένων, ὅτι συμβήσεται 30 αὐτὰ ἡρεμεῖν· ἐν γὰρ τῷ αὐτῷ τόπῳ χρόνον τιτὰ ἔσται καὶ αὐτὰ καὶ τὰ μέρη, ὥστε ἡρεμήσει ἅμα καὶ κινήσεται. πρῶτον μὲν γὰρ τὰ μέρη οὐκ ἔστιν ἐν τῷ αὐτῷ οὐθένα χρό-

^a 9 πρῶτον Β Ε²ΚΑΣ: β πρῶτον Ε¹ ἐσχάτῳ γ εἶναι fecit H
 10 γ ἐπὶ τῷ ἐσχάτῳ β παρ' Η δὲ τὸ Ε'FΗJKAS: δὴ τὰ Ε²Ι
 11 τὰ Β seclusi: habent ΗΙ: β Ε¹: τὰ α Ε²FJKAPS διεξεληλυ-
 θέναι ΕFΙJKP: διεληλυθέναι HAS τὸ ΕAS: τὰ ΚΑΡ δὲ
 ΕFΗJ²ΚAPS: om. ΙJ¹ 12 ἡμίση ΠΑ: ἡμίση Α S ἡμισυ F:
 καὶ ἡμισυ Η ἴσα Η 13 ἕκαστον ΚΑΣ: ἕκαστον αὐτῶν Ε τὸ
 πρῶτον scripsi: τὸ α Ε: τὰ ΚΑΣ 14-15 παρεληλυθέναι (ἅμα . . .
 ἐσχάτοις), ἴσον Lachelier 14 ἔσται ΕJAS: ἔστι FHIK 15-16
 ἴσον . . . φησι seclusi, ante τὸ ^a 11 collocanda ci. Α: habent ΠS
 16 τὸ γινόμενον Ε τῶν Γ, ὅσον περ (τὸ Γ) Lachelier περι FK
 α ΚΛΑ: αα Ε 17 παρὰ τὰ] κατὰ τὸ Α α ΚΛΑ: αα Ε
 19 τῇ om. Η ἀντιφάσει Ε²ΚΑΣ: φάσει Ε¹ 21 ἔσται Ι:
 εἶναι Η 24 εἶναι ὅλον Ε τὰ alt. om. ΚΑ κυριώτερα Η
 25 τε om. Κ 26 ἐν] τοῦτο ἐν Ε ὄντος . . . 27 μὴ Ε²FΙJKPS:
 μὴ ὄντος καὶ ἐπὶ τοῦ Η: om. Ε¹ 27 καὶ ἐπὶ τῶν Ε τῶν alt.
 om. Κ 29 δ' alt. HS: om. ΕFΙJK 30 ὅλως om. S 31 αὐτῷ
 om. Ι ἐστὶ FK 33 τῷ om. J

240^b νον, εἶτα καὶ τὸ ὅλον μεταβάλλει αἰεὶ εἰς ἕτερον· οὐ γὰρ ἢ αὐτὴ ἐστὶν ἢ ἀπὸ τοῦ Α λαμβανομένη περιφέρεια καὶ ἢ ἀπὸ τοῦ Β καὶ τοῦ Γ καὶ τῶν ἄλλων ἐκάστου σημείων, πλὴν ὡς ὁ μουσικὸς ἄνθρωπος καὶ ἄνθρωπος, ὅτι συμβέβηκεν.
 5 ὥστε μεταβάλλει αἰεὶ ἢ ἑτέρα εἰς τὴν ἑτέραν, καὶ οὐδέποτε ἡρεμήσει. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῆς σφαίρας καὶ ἐπὶ τῶν ἄλλων τῶν ἐν αὐτοῖς κινουμένων.

Ἀποδεδειγμένων δὲ τούτων λέγομεν ὅτι τὸ ἡμέρες οὐκ 10 ἐνδέχεται κινεῖσθαι πλὴν κατὰ συμβεβηκός, οἷον κινουμένου τοῦ σώματος ἢ τοῦ μεγέθους τῷ ἐνυπάρχειν, καθάπερ ἂν εἰ τὸ ἐν τῷ πλοίῳ κινεῖτο ὑπὸ τῆς τοῦ πλοίου φορᾶς ἢ τὸ μέρος τῆ τοῦ ὅλου κινήσει. (ἡμέρες δὲ λέγω τὸ κατὰ ποσὸν ἀδιαίρετον.) καὶ γὰρ αἱ τῶν μερῶν κινήσεις ἑτεραί εἰσι κατ' αὐτά τε τὰ μέρη καὶ κατὰ τὴν τοῦ ὅλου κίνησιν.
 15 ἴδοι δ' ἂν τις ἐπὶ τῆς σφαίρας μάλιστα τὴν διαφορὰν· οὐ γὰρ ταῦτόν τάχος ἐστὶ τῶν τε πρὸς τῷ κέντρῳ καὶ τῶν ἐκτὸς καὶ τῆς ὄλης, ὡς οὐ μίᾳς οὔσης κινήσεως. καθάπερ οὖν εἵπομεν, οὕτω μὲν ἐνδέχεται κινεῖσθαι τὸ ἡμέρες ὡς ὁ ἐν τῷ πλοίῳ καθήμενος τοῦ πλοίου θέοντος, καθ' αὐτὸ δ'
 20 οὐκ ἐνδέχεται. μεταβαλλέτω γὰρ ἐκ τοῦ ΑΒ εἰς τὸ ΒΓ, εἴτ' ἐκ μεγέθους εἰς μέγεθος εἴτ' ἐξ εἴδους εἰς εἶδος εἶτε κατ' ἀντίφασιν· ὁ δὲ χρόνος ἔστω ἐν ᾧ πρώτῳ μεταβάλλει ἐφ' οὗ Δ. οὐκοῦν ἀνάγκη αὐτὸ καθ' ὃν μεταβάλλει χρόνον ἢ ἐν τῷ ΑΒ εἶναι ἢ ἐν τῷ ΒΓ, ἢ τὸ μὲν τι αὐτοῦ ἐν
 25 τούτῳ τὸ δ' ἐν θατέρῳ· πᾶν γὰρ τὸ μεταβάλλον οὕτως εἶχεν. ἐν ἐκατέρῳ μὲν οὖν οὐκ ἔσται τι αὐτοῦ· μεριστὸν γὰρ ἂν εἴη. ἀλλὰ μὴν οὐδ' ἐν τῷ ΒΓ· μεταβεβληκὸς γὰρ ἔσται, ὑπόκειται δὲ μεταβάλλειν. λείπεται δὴ αὐτὸ ἐν τῷ ΑΒ εἶναι, καθ' ὃν μεταβάλλει χρόνον. ἡρεμήσει ἄρα τὸ

^b 1 τὸ om. E¹ αἰεὶ om. I γὰρ αἰεὶ ἢ Γ 4 ὡς E²ΚΑΡS :
 om. E¹ καὶ ἄνθρωπος EFHJKP : om. S : καὶ om. I 5 τὴν
 om. F 6 τῆς om. S 7 ἐπὶ EHIJKS^p : om. FS¹ 8 λέγομεν
 E¹ΚΑΤ : λέγομεν E²S 9 κινουμένου τοῦ σώματος EST : τοῦ
 σώματος κινουμένου ΚΛ 10 τῷ JS : τῶν E¹ : τὸ Η : τοῦ E²FIK :
 om. T ἐνυπάρχειν E¹S : ἐν ᾧ ὑπάρχει E²ΚΑ : ᾧ ἐνυπάρχει T
 12 κατὰ EFS : κατὰ τὸ HIJK 14 κατ' αὐτὰ FHKC : καθ' αὐτὰ E :
 κατὰ ταῦτά ΙJ 15 τις καὶ ἐπὶ FK 16 ἐστὶ ES : ἔσται ΚΛ
 17 οὐ] οὐδὲ F 18 εἶπον HIJK μὲν] μὲν οὖν I κινεῖσθαι
 om. H 19 δ' ES : γὰρ ΚΛ 20 μεταβάλλεται K 22 πρώτως
 H 24 αὐτῷ F 26 οὖν om. H 27 ἐν ΚΑS : αὐτὸ ἐν
 E 28 αὐτὸν τῷ E

γὰρ ἐν τῷ αὐτῷ εἶναι χρόνον τινὰ ἡρεμεῖν ἦν. ὥστ' οὐκ ἐν- 30
δέχεται τὸ ἀμερὲς κινεῖσθαι οὐδ' ὅλως μεταβάλλειν· μο-
ναχῶς γὰρ ἂν οὕτως ἦν αὐτοῦ κίνησις, εἰ ὁ χρόνος ἦν ἐκ
τῶν νῦν· αἰεὶ γὰρ ἐν τῷ νῦν κεκωημένον ἂν ἦν καὶ μετα-
βεβληκός, ὥστε κινεῖσθαι μὲν μηδέποτε, κεκωησθαι δ' αἰεὶ. 241^a
τοῦτο δ' ὅτι ἀδύνατον, δέδεικται καὶ πρότερον· οὔτε γὰρ ὁ
χρόνος ἐκ τῶν νῦν οὔθ' ἡ γραμμὴ ἐκ στιγμῶν οὔθ' ἡ κίνησις
ἐκ κωημάτων· οὐθὲν γὰρ ἄλλο ποιεῖ ὁ τοῦτο λέγων ἢ τὴν
κίνησιν ἐξ ἀμερῶν, καθάπερ ἂν εἰ τὸν χρόνον ἐκ τῶν νῦν 5
ἢ τὸ μῆκος ἐκ στιγμῶν. 6

ἔτι δὲ καὶ ἐκ τῶνδε φανερόν ὅτι 6
οὔτε στιγμήν οὔτ' ἄλλο ἀδιαίρετον οὐθὲν ἐνδέχεται κινεῖσθαι.
ἅπαν γὰρ τὸ κινούμενον ἀδύνατον πρότερον μείζον κινήθηναι
αὐτοῦ, πρὶν ἢ ἴσον ἢ ἕλαττον. εἰ δὴ τοῦτο, φανερόν ὅτι
καὶ ἡ στιγμή ἕλαττον ἢ ἴσον κινήθησεται πρῶτον. ἐπεὶ δὲ 10
ἀδιαίρετος, ἀδύνατον ἕλαττον κινήθηναι πρότερον· ἴσην ἄρα
αὐτῇ. ὥστε ἔσται ἡ γραμμὴ ἐκ στιγμῶν· αἰεὶ γὰρ ἴσην κι-
νουμένη τὴν πᾶσαν γραμμὴν στιγμή καταμετρήσει. εἰ δὲ
τοῦτο ἀδύνατον, καὶ τὸ κινεῖσθαι τὸ ἀδιαίρετον ἀδύνατον.

ἔτι δ' εἰ ἅπαν ἐν χρόνῳ κινεῖται, ἐν δὲ τῷ νῦν μηθέν, ἅπας 15
δὲ χρόνος διαιρετός, εἴη ἂν τις χρόνος ἐλάττων ὄψοῦν τῶν
κινουμένων ἢ ἐν ᾧ κινεῖται ὅσον αὐτό. οὗτος μὲν γὰρ ἔσται
χρόνος ἐν ᾧ κινεῖται διὰ τὸ πᾶν ἐν χρόνῳ κινεῖσθαι, χρό-
νος δὲ πᾶς διαιρετός δέδεικται πρότερον. εἰ δ' ἄρα στιγμή
κινεῖται, ἔσται τις χρόνος ἐλάττων ἢ ἐν ᾧ αὐτὴν ἐκινήθη. ἀλλὰ 20
ἀδύνατον· ἐν γὰρ τῷ ἐλάττωνι ἕλαττον ἀνάγκη κινεῖσθαι.
ὥστε ἔσται διαιρετὸν τὸ ἀδιαίρετον εἰς τὸ ἕλαττον, ὥσπερ καὶ
ὁ χρόνος εἰς τὸν χρόνον. μοναχῶς γὰρ ἂν κινεῖτο τὸ ἀμε-
ρὲς καὶ ἀδιαίρετον, εἰ ἦν ἐν τῷ νῦν κινεῖσθαι δυνατὸν τῷ

^b 30 χρόνον εἶναι ΚΛ 32 κίνησις EJS : ἡ κίνησις FHIK
241^a 2 καὶ om. ΚΛ 3 ἐκ τῶν στιγμῶν F 6 μῆκος ES :
μέγεθος ΚΛ 7 στιγμή IK ἄλλο om. F οὐδὲν ἀδιαίρετον
Κ 9 πρὶν ἂν ἢ FIJK 11 ἀδιαίρετον E ἐλάττονα I ἴση E
12 αὐτῇ J : αὐτῇ FHIK ἴση K κινουμένην E 13 στιγμήν E
14 τὸ alt. KAS : om. E 15 ἔτι εἰ πᾶν PST ἐν alt.] εἰ E πᾶς
KAS 16 ἂν τις EFHIPS : τις ἂν JK ὅσοῦν ΚΛ 17 ἢ
ES : om. ΚΑΡ ὅσον . . . 18 κινεῖται om. ΗΚ 17 αὐτό]
αὐτὸ κεκίνηται J 19 δ' om. FHJK 20 ἢ EPT : om. ΚΑ
αὐτὴν scripsi, fort. PT : αὐτῇ FHK : αὐτῇ EIJ 22 διαιρετὸν τὸ
διαιρετὸν E 23 εἰς] πρὸς E γὰρ FHJKT : om. EI ἂν] ἄρα I

25 ἀτόμῳ· τοῦ γὰρ αὐτοῦ λόγου ἐν τῷ νῦν κινεῖσθαι καὶ
26 ἀδιαίρετόν τι κινεῖσθαι.

26 μεταβολὴ δ' οὐκ ἔστιν οὐδεμία ἄπει-
ρος· ἅπαντα γὰρ ἦν ἕκ τινος εἰς τι, καὶ ἡ ἐν ἀντιφάσει
καὶ ἡ ἐν ἐναντίοις. ὥστε τῶν μὲν κατ' ἀντιφάσιν ἢ φάσιν
καὶ ἡ ἀπόφασις πέρασ (οἶον γενέσεως μὲν τὸ ὄν, φθορᾶς
30 δὲ τὸ μὴ ὄν), τῶν δ' ἐν τοῖς ἐναντίοις τὰ ἐναντία· ταῦτα
γὰρ ἄκρα τῆς μεταβολῆς, ὥστε καὶ ἀλλοιώσεως πάσης
(ἐξ ἐναντίων γὰρ τιῶν ἢ ἀλλοιώσεως), ὁμοίως δὲ καὶ αὐ-
ξήσεως καὶ φθίσεως· αὐξήσεως μὲν γὰρ τὸ πέρασ τοῦ
24I^b κατὰ τὴν οἰκείαν φύσιν τελείου μεγέθους, φθίσεως δὲ ἡ
τούτου ἕκστασις. ἡ δὲ φορὰ οὕτω μὲν οὐκ ἔσται πεπερα-
σμένη· οὐ γὰρ πάντα ἐν ἐναντίοις· ἀλλ' ἐπειδὴ τὸ ἀδύνα-
τον τμηθῆναι οὕτω, τῷ μὴ ἐνδέχασθαι τμηθῆναι (πλεονα-
5 ὥς γὰρ λέγεται τὸ ἀδύνατον), οὐκ ἐνδέχεται τὸ οὕτως
ἀδύνατον τέμνεσθαι, οὐδὲ ὅλως τὸ ἀδύνατον γενέσθαι γίνε-
σθαι, οὐδὲ τὸ μεταβαλεῖν ἀδύνατον ἐνδέχου' ἂν μετα-
βάλλειν εἰς ὃ ἀδύνατον μεταβαλεῖν. εἰ οὖν τὸ φερόμενον
μεταβάλλοι εἰς τι, καὶ δυνατόν ἔσται μεταβαλεῖν. ὥστ'
10 οὐκ ἄπειρος ἡ κίνησις, οὐδ' οἰσθήσεται τὴν ἄπειρον· ἀδύνα-
τον γὰρ διελθεῖν αὐτήν. ὅτι μὲν οὖν οὕτως οὐκ ἔστιν ἄπει-
ρος μεταβολὴ ὥστε μὴ ὀρίσθαι πέρασι, φανερόν. ἀλλ' εἰ
οὕτως ἐνδέχεται ὥστε τῷ χρόνῳ εἶναι ἄπειρον τὴν αὐτὴν
οὔσαν καὶ μίαν, σκεπτέον. μὴ μίᾳ μὲν γὰρ γιγνομένης οὐ-
15 θεν ἴσως κωλύει, οἶον εἰ μετὰ τὴν φορὰν ἀλλοιώσις εἴη
καὶ μετὰ τὴν ἀλλοίωσιν αὐξήσις καὶ πάλιν γένεσις· οὕτω
γὰρ αἰεὶ μὲν ἔσται τῷ χρόνῳ κίνησις, ἀλλ' οὐ μία διὰ τὸ
μὴ εἶναι μίαν ἐξ ἁπασῶν. ὥστε δὲ γίνεσθαι μίαν, οὐκ ἐν-
δέχεται ἄπειρον εἶναι τῷ χρόνῳ πλὴν μίᾳς· αὕτη δ' ἔστιν
20 ἡ κύκλω φορὰ.

^a 27 ἅπαν E¹ 28 ἐν om. E¹ φάσις] κατάφασις H et fecit F
29 ἡ om. HIJK 31 καὶ] ἐξ K πάσης om. I 33 τὸ πέρασ ΠΤ : πέρασ
τὸ Prantl ^b 2 ἕκτασις E ἔστι F 3 πάντα EJT : ἅπαντα FHJK
ἐν om. J¹ ἐπεὶ HKT τὸ om. F 4 οὕτω, τῷ] οὕτω vel οὐ
τῷ E¹ : τῷ E²T πολλαχῶς FHJK 7 μεταβάλλειν EAP
8 μεταβαλεῖν KS : μεταβάλλειν EAP 9 μεταβάλλει I μετα-
βαλεῖν KS : μεταβάλλειν EL 10 ἄπειρος ἔσται ἡ K τὴν om. E
II οὐκ ἔστιν οὕτως F ἄπειρος ἢ μεταβολὴ I 13 ἐνδέχαιτο K τῷ
FIJ¹PST : ἔστιν ἐν τινι E : om. HK οὔσαν τὴν αὐτὴν F 15 τὴν
om. ST 19 εἶναι ἄπειρον H ἔστιν] ἄρα K 20 ἡ κύκλω
IT : ἡ κύκλω μία E : ἡ μία ἢ κύκλω FHJK (ἡ μία erasit J)

H.

Ι "Απαν τὸ κινούμενον ὑπὸ τινος ἀνάγκη κινεῖσθαι εἰ μὲν γὰρ ἐν ἑαυτῷ μὴ ἔχει τὴν ἀρχὴν τῆς κινήσεως, 35 φανερόν ὅτι ὑφ' ἐτέρου κινεῖται (ἄλλο γὰρ ἔσται τὸ κινουόν). εἰ δ' ἐν αὐτῷ, ἔστω [τὸ] εἰλημμένον ἐφ' οὗ τὸ AB ὁ κινεῖται καθ' αὐτό, ἀλλὰ μὴ (τῷ τῶν) τούτου τι κινεῖσθαι. πρῶτον μὲν οὖν τὸ ὑπολαμβάνειν τὸ AB ὑφ' ἑαυτοῦ κινεῖσθαι διὰ τὸ ὅλον τε κινεῖσθαι καὶ ὑπ' οὐδενὸς τῶν 40 ἕξωθεν ὁμοίον ἔστιν ὡσπερ εἰ τοῦ ΚΛ κινουόντος τὸ ΛΜ καὶ αὐτοῦ κινουμένου εἰ μὴ φάσκοι τις τὸ ΚΜ κινεῖσθαι ὑπὸ τινος, διὰ τὸ μὴ φανερόν εἶναι πότερον τὸ κινουόν καὶ πότερον τὸ κινούμενον· εἶτα τὸ μὴ ὑπὸ τινος κινούμενον οὐκ ἀνάγκη παύσασθαι κινούμενον τῷ ἄλλο ἡρεμεῖν, ἀλλ' 35 242^a εἴ τι ἡρεμεῖ τῷ ἄλλο πεπαύσθαι κινούμενον, ἀνάγκη ὑπὸ τινος αὐτὸ κινεῖσθαι. τούτου δ' εἰλημμένου πᾶν τὸ κινούμενον κινήσεται ὑπὸ τινος. ἐπεὶ γὰρ εἰληπται [τὸ] κινούμενον ἐφ' ᾧ τὸ AB, ἀνάγκη διαιρετὸν αὐτὸ εἶναι· πᾶν γὰρ τὸ κινούμενον διαιρετόν. διηρήσθω δὴ κατὰ τὸ 40 Γ. τοῦ δὴ ΓΒ μὴ κινουμένου οὐ κινήσεται τὸ AB· εἰ γὰρ κινήσεται, δῆλον ὅτι τὸ ΑΓ κινουόν· ἂν τοῦ ΓΒ ἡρεμουόντος, ὥστε οὐ καθ' αὐτὸ κινήσεται καὶ πρῶτον. ἀλλ' ὑπέκειτο καθ' αὐτὸ κινεῖσθαι καὶ πρῶτον. ἀνάγκη ἄρα τοῦ ΓΒ μὴ κινουμένου ἡρεμεῖν τὸ AB. ὁ δὲ ἡρεμεῖ 45 μὴ κινουμένου τινός, ὠμολόγηται ὑπὸ τινος κινεῖσθαι, ὥστε πᾶν ἀνάγκη τὸ κινούμενον ὑπὸ τινος κινεῖσθαι· ἀεὶ γὰρ ἔσται τὸ κινούμενον διαιρετόν, τοῦ δὲ μέρους μὴ κινουμένου ἀνάγκη καὶ τὸ ὅλον ἡρεμεῖν. 49

ἐπεὶ δὲ πᾶν τὸ κινούμενον ἀνάγκη κινεῖσθαι ὑπὸ τινος, ἐάν γέ τι κινήται 50

241^b 34-8 = 241^b 24-7 39-44 = 27-33 44-242^a 38 = 33-242^a 5 242^a 38-49 = 242^a 5-15 49-54 = 15-20

Tit. Ἀριστοτέλους περὶ κινήσεως τῶν εἰς $\bar{\gamma}$ τὸ $\bar{\alpha}$ $\bar{\zeta}$ $\bar{\eta}$: ἀριστοτέλους φυσικῆς ἀκροάσεως $\bar{\eta}$ b: Ἀριστοτέλους φυσικῆς ἀκροάσεως Βιβλίον Ζον c
^b 34 ἀνάγκη ὑπὸ τινος S 37 αὐτῷ Spengel: αὐτῷ Σ ἔσται c τὸ seclusi: om. P 38 τῷ τῶν S, Spengel: τῷ PP: τῶν P¹: om. Σ
 41 εἰ] ἡ c j y 42 εἰ secl. Bekker φάσκοι . . . KM] textum alterum 241^b 31-242^a 4 ὑπολαμβάνειν . . . κινούμενον fere habent c j y KM S, Prantl: ΛΜ Σ 242^a 37 δ' scripsi: γὰρ Σ 38 τὸ seclusi: om. S 42 ΓΒ] αβ c: ΒΓ Moreliana 46 ὠμολόγητο c j y 47 ἀεὶ μὲν γὰρ S 50 ὑπὸ τινος κινεῖσθαι S γε κινεῖσθαι y

τὴν ἐν τόπῳ κίνησιν ὑπ' ἄλλου κινουμένου, καὶ πάλιν τὸ
 κινῶν ὑπ' ἄλλου κινουμένου κινῆται ἀκείνο ὑφ' ἐτέρου
 καὶ ἀεὶ οὕτως, ἀνάγκη εἶναι τι τὸ πρῶτον κινῶν, καὶ μὴ
 βαδίζειν εἰς ἄπειρον· μὴ γὰρ ἔστω, ἀλλὰ γενέσθω ἄπει-
 55 ρον. κινείσθω δὴ τὸ μὲν Α ὑπὸ τοῦ Β, τὸ δὲ Β ὑπὸ
 τοῦ Γ, τὸ δὲ Γ ὑπὸ τοῦ Δ, καὶ ἀεὶ τὸ ἐχόμενον ὑπὸ τοῦ
 ἐχομένου. ἐπεὶ οὖν ὑπόκειται τὸ κινῶν κινούμενον κινεῖν,
 ἀνάγκη ἅμα γίνεσθαι τὴν τοῦ κινουμένου καὶ τὴν τοῦ
 κινούντος κίνησιν (ἅμα γὰρ κινεῖ τὸ κινῶν καὶ κινεῖται
 60 τὸ κινούμενον)· φανερὸν (οὖν) ὅτι ἅμα ἔσται τοῦ Α καὶ τοῦ
 Β καὶ τοῦ Γ καὶ ἐκάστου τῶν κινούντων καὶ κινουμένων
 ἢ κινήσεις. εἰλήφθω οὖν ἡ ἐκάστου κίνησις, καὶ ἔστω τοῦ
 μὲν Α ἐφ' ἧς Ε, τοῦ δὲ Β ἐφ' ἧς Ζ, τῶν (δὲ) ΓΔ ἐφ' ὧν
 ΗΘ. εἰ γὰρ ἀεὶ κινεῖται ἕκαστον ὑφ' ἐκάστου, ὅμως ἔσται
 65 λαβεῖν μίαν ἐκάστου κίνησιν τῷ ἀριθμῷ· πᾶσα γὰρ κίνη-
 σις ἔκ τινος εἰς τι, καὶ οὐκ ἄπειρος τοῖς ἐσχάτοις· λέγω
 δὴ ἀριθμῷ μίαν κίνησιν τὴν ἐκ τοῦ αὐτοῦ εἰς τὸ αὐτὸ
 τῷ ἀριθμῷ ἐν τῷ αὐτῷ χρόνῳ τῷ ἀριθμῷ γιγνομένην.
 ἔστι γὰρ κίνησις καὶ γένει καὶ εἶδει καὶ ἀριθμῷ ἢ αὐτῆ,
 242^b 35 γένει μὲν ἢ τῆς αὐτῆς κατηγορίας, οἷον οὐσίας ἢ ποιότητος, εἶδει
 δὲ (ἢ) ἐκ τοῦ αὐτοῦ τῷ εἶδει εἰς τὸ αὐτὸ τῷ εἶδει, οἷον ἐκ λευκοῦ
 εἰς μέλαν ἢ ἐξ ἀγαθοῦ εἰς κακὸν ἀδιάφορον τῷ εἶδει· ἀρι-
 θμῷ δὲ ἢ ἐξ ἐνὸς τῷ ἀριθμῷ (εἰς ἐν τῷ ἀριθμῷ) ἐν τῷ αὐτῷ χρό-
 νῳ, οἷον ἐκ τοῦδε τοῦ λευκοῦ εἰς τὸδε τὸ μέλαν, ἢ ἐκ τοῦδε τοῦ
 40 τόπου εἰς τόνδε, ἐν τῷδε τῷ χρόνῳ· εἰ γὰρ ἐν ἄλλῳ, οὐκέτι
 ἔσται ἀριθμῷ μία κίνησις, ἀλλ' εἶδει. εἴρηται δὲ περὶ
 42 τούτων ἐν τοῖς πρότερον.
 42 εἰλήφθω δὲ καὶ ὁ χρόνος ἐν

$$242^a 54-66 = 242^a 20-32 = {}^b 8-19$$

$$66-b 42 = 32-b 8$$

$${}^b 42-53$$

^a 51 κινουμένου ΣS: κινούμενον Spengel
 Spengel κινεῖται c j y²: κινεῖσθαι y¹
 δὲ c j y 55 δὴ Moreliana: δὲ Σ 56 Γ alt.] δ c j 58 ἅμα
 ΣS: δ' ἅμα Prantl 59 κινεῖ om. c: κινεῖται Moreliana 60 οὖν
 add. Spengel: fort. habuit S ὅτι om. c j y 63 δὲ add. Spengel
 64 ὁμοίως γρ. P ^b 36 ἢ add. Prantl ex S εἰς ... εἶδει y
 S: om. bc j 37 ἢ c j y S: om. b ἀδιάφορον] μὴ διάφορον P:
 εἰς ἢ ἀδιάφορον S, Spengel 38 εἰς ... ἀριθμῷ add. Prantl
 42 τούτου y δὴ Spengel

ὧ κελίηται τὴν αὐτοῦ κίνησιw τὸ A, καὶ ἔστω ἐφ' ὧ K. πεπερασμένης δ' οὔσης τῆς τοῦ A κινήσεως καὶ ὁ χρόνος ἔσται πεπερασμένος. ἐπεὶ δὴ ἄπειρα τὰ κινουόμενα καὶ τὰ 45 κινούμενα, καὶ ἡ κίνησις ἢ EZHΘ ἢ ἐξ ἀπασῶν ἄπειρος ἔσται· ἐνδέχεται μὲν γὰρ ἴσην εἶναι τὴν τοῦ A καὶ τοῦ B καὶ τὴν τῶν ἄλλων, ἐνδέχεται δὲ μείζους τὰς τῶν ἄλλων, ὥστε εἴ τε ἴσαι εἴ τε μείζους, ἀμφοτέρως ἄπειρος ἢ ὅλη· λαμβάνομεν γὰρ τὸ ἐνδεχόμενον. ἐπεὶ δ' ἅμα κινεῖται καὶ τὸ A 50 καὶ τῶν ἄλλων ἕκαστον, ἢ ὅλη κίνησις ἐν τῷ αὐτῷ χρόνῳ ἔσται καὶ ἡ τοῦ A· ἢ δὲ τοῦ A ἐν πεπερασμένῳ· ὥστε εἴη ἂν ἄπειρος ἐν πεπερασμένῳ, τοῦτο δ' ἀδύνατον. 53

οὕτω 53

μὲν οὖν δόξειεν ἂν δεδεῖχθαι τὸ ἐξ ἀρχῆς, οὐ μὴν ἀποδείκνυται διὰ τὸ μηδὲν δείκνυσθαι ἀδύνατον· ἐνδέχεται 55 γὰρ ἐν πεπερασμένῳ χρόνῳ ἄπειρον εἶναι κίνησιw, μὴ ἐνὸς ἀλλὰ πολλῶν. ὅπερ συμβαίνει καὶ ἐπὶ τούτων· ἕκαστον γὰρ κινεῖται τὴν ἑαυτοῦ κίνησιw, ἅμα δὲ πολλὰ κινεῖσθαι οὐκ ἀδύνατον. ἀλλ' εἰ τὸ κινεῖν πρῶτως κατὰ τόπον καὶ σωματικὴν κίνησιw ἀνάγκη ἢ ἄπτεσθαι ἢ συνεχῆς εἶναι 60 τῷ κινουμένῳ, καθάπερ ὀρώμεν ἐπὶ πάντων, ἀνάγκη τὰ κινούμενα καὶ τὰ κινουόμενα συνεχῆ εἶναι ἢ ἄπτεσθαι ἀλλήλων, ὥστ' εἶναι τι ἐξ ἀπάντων ἔν. τοῦτο δὲ εἴτε πεπερασμένον εἴτε ἄπειρον, οὐδὲν διαφέρει πρὸς τὰ νῦν· πάντως γὰρ ἡ κίνησις ἔσται ἄπειρος ἀπείρων ὄντων, εἴπερ 65 ἐνδέχεται καὶ ἴσας εἶναι καὶ μείζους ἀλλήλων· ὁ γὰρ ἐνδέχεται, ληψόμεθα ὡς ὑπάρχον. εἰ οὖν τὸ μὲν ἐκ τῶν ABΓΔ (ἢ πεπερασμένον ἢ) ἄπειρόν τί ἐστίν, κινεῖται δὲ τὴν EZHΘ κίνησιw ἐν τῷ χρόνῳ τῷ K, οὗτος δὲ πεπέρανται, συμβαίνει ἐν πεπερασμένῳ χρόνῳ ἄπειρον διεῖναι ἢ τὸ πεπερασμένον ἢ 70

242^b 53-9 = 242^b 20-24 59-243^a 31 = 24-243^a 2

^b 43 αὐτοῦ scripsi : αὐτοῦ Σ 44 τοῦ] τὸ b 45 ante ἐπεὶ
 addit y textum alterum 242^b 12-13 καὶ... ἕκαστον δὴ scripsi :
 δὲ Σ ἄπειρα] ἄρα y 48 ἐνδέχεται... ἄλλων om. cj : ἐν-
 δέχεται δὲ μείζους j sed erasum 49 εἴ] εἰς c j y τε ἴσαι εἴ Σ :
 αἰεὶ Σ : τε αἰεὶ ἴσαι εἴ Spengel 50 καὶ om. Prantl 52-3 ὥστε
 ... πεπερασμένῳ om. b¹ 53 ἐν] ἐν τῷ c 59 εἰ om. y
 πρῶτον S 64 τὸ Moreliana πρῶτως c 66 καὶ pr.
 om. c j y 68 ἢ πεπερασμένον ἢ addidi ἄπειρον ΣΣ : τῶν ἀπείρων
 Prantl

τὸ ἄπειρον. ἀμφοτέρως δὲ ἀδύνατον· ὥστε ἀνάγκη ἵστα-
σθαι καὶ εἶναι τι πρῶτον κινουῦν καὶ κινούμενον. οὐδὲν
γὰρ διαφέρει τὸ συμβαίνειν ἐξ ὑποθέσεως τὸ ἀδύνατον·
243^a 30 ἢ γὰρ ὑπόθεσις εἰληπται ἐνδεχομένη, τοῦ δ' ἐνδεχομένου
τεθέντος οὐδὲν προσήκει γίγνεσθαι διὰ τοῦτο ἀδύνατον.

Τὸ δὲ πρῶτον κινουῦν, μὴ ὡς τὸ οὐ ἔνεκεν, ἀλλ' ὅθεν 2
ἢ ἀρχῇ τῆς κινήσεως, ἅμα τῷ κινουμένῳ ἐστί (λέγω δὲ
τὸ ἅμα, ὅτι οὐδὲν ἐστὶν αὐτῶν μεταξύ). τοῦτο γὰρ κοι-
35 νὸν ἐπὶ παντὸς κινουμένου καὶ κινουντός ἐστιν. ἐπεὶ δὲ
τρεις αἱ κινήσεις, ἢ τε κατὰ τόπον καὶ ἢ κατὰ τὸ ποιὸν
καὶ ἢ κατὰ τὸ ποσόν, ἀνάγκη καὶ τὰ κινουόμενα τρία
εἶναι, τό τε φέρον καὶ τὸ ἀλλοιοῦν καὶ τὸ αὔξον ἢ
φθίνον. πρῶτον οὖν εἴπωμεν περὶ τῆς φορᾶς· πρώτη
40 γὰρ αὕτη τῶν κινήσεων.

II

ἅπαν δὴ τὸ φερόμενον
ἢ ὑφ' ἑαυτοῦ κινεῖται ἢ ὑπ' ἄλλου. ὅσα μὲν οὖν αὐτὰ ὑφ'
αὐτῶν κινεῖται, φανερόν ἐν τούτοις ὅτι ἅμα τὸ κινούμενον καὶ
τὸ κινουῦν ἐστιν· ἐνυπάρχει γὰρ αὐτοῖς τὸ πρῶτον κινουῦν, ὥστ'
15 οὐδὲν ἐστὶν ἀναμεταξύ· ὅσα δ' ὑπ' ἄλλου κινεῖται, τετραχῶς
ἀνάγκη γίγνεσθαι· τέτταρα γὰρ εἶδη τῆς ὑπ' ἄλλου φορᾶς,
ἔλξις, ὄσις, ὄχρησις, δύνησις. ἅπασαι γὰρ αἱ κατὰ τόπον
κινήσεις ἀνάγονται εἰς ταύτας· ἢ μὲν γὰρ ἔπωσις ὄσις τίς
ἐστὶν, ὅταν τὸ ἀφ' αὐτοῦ κινουῦν ἐπακολουθοῦν ὠθῆ, ἢ δ' ἄπω-
20 σις, ὅταν μὴ ἐπακολουθῆ κινήσαν, ἢ δὲ ῥίψις, ὅταν σφο-
243^b δροτεράν ποιήσῃ τὴν ἀφ' αὐτοῦ κίνησιν τῆς κατὰ φύσιν φο-
ρᾶς, καὶ μέχρι τοσοῦτου φέρηται ἕως ἀν κρατῆ ἢ κίνησις.
πάλιν ἢ δίωσις καὶ σύνωσις ἄπωσις καὶ ἔλξις εἰσὶν· ἢ μὲν
γὰρ δίωσις ἄπωσις (ἢ γὰρ ἀφ' αὐτοῦ ἢ ἀπ' ἄλλου ἐστὶν ἢ
5 ἄπωσις), ἢ δὲ σύνωσις ἔλξις (καὶ γὰρ πρὸς αὐτὸ καὶ πρὸς

243^a 32-40 = 243^a 3-11 11-15 = 21-3 15-20 = 23-8
20-^b 2 = 244^a 21-4 ^b 3-16 = 243^b 24-9

^b 72 καὶ alt. om. c : μὴ ut vid. S : οὐ Gaye 243^a 31 διὰ τοῦτο
γίνεσθαι S 32 πρῶτον bS : πρώτως c j y 37 καὶ alt. om. c j y
τρία πρῶτων εἶναι y 38 φέρον καὶ τὸ yS : om. bcj 12 ἢ pr.]
ἢ αὐτὸ S 14 πρώτως y 16 τετάρτης ἤδη τῆς b 17 ὄσις om. c
19 ἀφ' αὐτοῦ ex S scripsi : ἀπ' αὐτοῦ S ἐπακολουθοῦν c j y S : ἐπακό-
λουθον b 20 δὲ Basiliensis : δὴ S ^b 1 ἀφ' αὐτοῦ scripsi
ἀπ' αὐτοῦ S 4 ἀφ' αὐτοῦ S, Spengel : ἀπ' αὐτοῦ S

ἄλλο ἢ ἔλξις). ὥστε καὶ ὅσα τούτων εἶδη, οἷον σπάθησις καὶ κέρκισις· ἢ μὲν γὰρ σύνωσις, ἢ δὲ δῖωσις. ὁμοίως δὲ καὶ αἱ ἄλλαι συγκρίσεις καὶ διακρίσεις—ἅπασαι γὰρ ἔσονται διώσεις ἢ συνώσεις—πλὴν ὅσαι ἐν γενέσει καὶ φθορᾷ εἰσω. ἅμα δὲ φανερόν ὅτι οὐδ' ἔστιν ἄλλο τι γένος κινήσεως ¹⁰ ἢ σύγκρισις καὶ διάκρισις· ἅπασαι γὰρ διανεμόνται εἰς τινὰς τῶν εἰρημένων. ἔτι δ' ἢ μὲν εἰσπνοὴ ἔλξις, ἢ δ' ἐκπνοὴ ὤσις. ὁμοίως δὲ καὶ ἡ πτύσις, καὶ ὅσαι ἄλλαι διὰ τοῦ σώματος ἢ ἐκκριτικαὶ ἢ ληπτικαὶ κινήσεις· αἱ μὲν γὰρ ἔλξεις εἰσίν, αἱ δ' ἀπώσεις. δεῖ δὲ καὶ τὰς ἄλλας τὰς κατὰ τόπον ἀν- ¹⁵ ἀγειν· ἅπασαι γὰρ πίπτουσι εἰς τέσσαρας ταύτας. τούτων δὲ πάλω ἢ ὄχησις καὶ ἡ δύνησις εἰς ἔλξιν καὶ ὤσιω. ἢ μὲν γὰρ ὄχησις κατὰ τούτων τινὰ τῶν τριῶν τρόπων ἐστίν (τὸ μὲν γὰρ ὄχούμενον κινεῖται κατὰ συμβεβηκός, ὅτι ἐν κινουμένῳ ἐστὶν ἢ ἐπὶ κινουμένου τινός, τὸ δ' ὄχουόν ὀχεῖ ἢ ἐλκόμενον ἢ ²⁰ ὠθούμενον ἢ διωούμενον, ὥστε κοινή ἐστὶν ἅπασῶν τῶν τριῶν ἢ ^{244^a} ὄχησις)· ἢ δὲ δύνησις σύγκειται ἐξ ἔλξεώς τε καὶ ὤσεως· ἀνάγκη γὰρ τὸ διωοῦν τὸ μὲν ἔλκει τὸ δ' ὠθεῖν· τὸ μὲν γὰρ ἀφ' αὐτοῦ τὸ δὲ πρὸς αὐτὸ ἄγει. ὥστ' εἰ τὸ ὠθοῦν καὶ τὸ ἔλκον ἅμα τῷ ὠθουμένῳ καὶ τῷ ἐλκομένῳ, φανερόν ὅτι ⁵ τοῦ κατὰ τόπον κινουμένου καὶ κινουόντος οὐδέν ἐστι μεταξύ.

ἀλλὰ μὴν τοῦτο δῆλον καὶ ἐκ τῶν ὀρισμῶν· ὤσις μὲν γὰρ ἐστὶν ἢ ἀφ' αὐτοῦ ἢ ἀπ' ἄλλου πρὸς ἄλλο κίνησις, ἔλξις δὲ ἢ ἀπ' ἄλλου πρὸς αὐτὸ ἢ πρὸς ἄλλο, ὅταν θάπτων ἢ κίνησις ἢ [τοῦ ἔλκοντος] τῆς χωρίζουσας ἀπ' ἀλλήλων τὰ συνεχῆ· ¹⁰ οὕτω γὰρ συνεφέλκεται θάτερον. (τάχα δὲ δόξειεν ἂν εἶναί τις ἔλξις καὶ ἄλλως· τὸ γὰρ ξύλον ἔλκει τὸ πῦρ οὐχ οὕτως. τὸ δ' οὐθὲν διαφέρει κινουμένου τοῦ ἔλκοντος ἢ μένοντος ἔλκειω· ὅτε μὲν γὰρ ἔλκει οὐ ἔστι, ὅτε δὲ οὐ ἦν.) ἀδύνατον δὲ ἢ ἀφ' αὐτοῦ πρὸς ἄλλο ἢ ἀπ' ἄλλου πρὸς αὐτὸ κινεῖν ¹⁵

243^b 17—244^a 2 = 243^a 28—^b 23 244^a 2-6 = 243^b 29—244^a 18
7-9 = 244^a 19-21 8-11 = 243^b 23-4

^b 8 αἱ om. y ¹⁰ οὐδὲν y ¹¹ ἢ S, Prantl: ἢ Σ ¹⁵ an δεῖ δη? ¹⁷ ὄχησις cj καὶ ἢ ... ¹⁸ ὄχησις om. y ¹⁸ ὄχησις cj
²⁰ ὠθοῦν cly ἔχει b 244^a 4 αὐτὸ P, Spengel: αὐτὸν jy: αὐτὸν bc 5 τῷ alt. om. S 9-10 ὅταν... συνεχῆ om. γρ A 9 αὐτὸ Moreliana: αὐτὸ Σ θάπτων scripsi cum S: θάπτων Σ ¹⁰ τοῦ ἔλκοντος seclusi, om. S τῆς χωρίζουσας bS: ἢ χωρίζουσα cly: ἢ ἢ χωρίζουσα Gaye: μὴ χωρὶς οὐσα Diels ἀπ' ... συνεχῆ ΣS: secl. Diels
¹² τὸ πῦρ S dett.: om. Σ ¹⁵ δὲ ἢ c αὐτὸ Moreliana: αὐτὸ Σ

244^b μὴ ἀπτόμενον, ὥστε φανερόν ὅτι τοῦ κατὰ τόπον κινουμένου
2 καὶ κινουόντος οὐδέν ἐστι μεταξύ.

2

ἀλλὰ μὴν οὐδὲ τοῦ ἀλλοιου-

μένου καὶ τοῦ ἀλλοιουόντος. τοῦτο δὲ δῆλον ἐξ ἐπαγωγῆς· ἐν

ἅπασιν γὰρ συμβαίνει ἅμα εἶναι τὸ ἔσχατον ἀλλοιούν καὶ

5 τὸ πρῶτον ἀλλοιούμενον· (ὑπόκειται γὰρ ἡμῖν τὸ τὰ ἀλλοιού-

5a μενα κατὰ τὰς παθητικὰς καλουμένας ποιότητας πάσχοντα

5b ἀλλοιούσθαι). ἅπαν γὰρ σῶμα σώματος διαφέρει τοῖς αἰσθη-

5c τοῖς ἢ πλείσιν ἢ ἐλάττοσιν ἢ τῷ μᾶλλον καὶ ἥττον τοῖς

5d αὐτοῖς· ἀλλὰ μὴν καὶ ἀλλοιοῦται τὸ ἀλλοιούμενον ὑπὸ τῶν

εἰρημένων. ταῦτα γὰρ ἐστὶ πάθη τῆς ὑποκειμένης ποιότητος·

ἢ γὰρ θερμαινόμενον ἢ γλυκαωόμενον ἢ πυκνούμενον ἢ ξηραινό-

μενον ἢ λευκαωόμενον ἀλλοιοῦσθαί φαμεν, ὁμοίως τὸ τε ἄψυχον

καὶ τὸ ἔμψυχον λέγοντες, καὶ πάλιν τῶν ἐμψύχων τὰ τε μὴ

10 αἰσθητικὰ τῶν μερῶν καὶ αὐτὰς τὰς αἰσθήσεις. ἀλλοιοῦνται γὰρ

πως καὶ αἱ αἰσθήσεις· ἢ γὰρ αἴσθησις ἢ κατ' ἐνέργειαν κίνησις

ἐστὶ διὰ τοῦ σώματος, πασχούσης τι τῆς αἰσθήσεως. καθ' ὅσα

μὲν οὖν τὸ ἄψυχον ἀλλοιοῦται, καὶ τὸ ἔμψυχον, καθ' ὅσα δὲ

τὸ ἔμψυχον, οὐ κατὰ ταῦτα πάντα τὸ ἄψυχον (οὐ γὰρ ἀλλοι-

15 οῦται κατὰ τὰς αἰσθήσεις)· καὶ τὸ μὲν λαμβάνει, τὸ δ' οὐ

245^a λαμβάνει πάσχον. οὐδὲν δὲ κωλύει καὶ τὸ ἔμψυχον λαμβά-

νειν, ὅταν μὴ κατὰ τὰς αἰσθήσεις γίγνηται ἢ ἀλλοίωσις. εἴ-

περ οὖν ἀλλοιοῦται τὸ ἀλλοιούμενον ὑπὸ τῶν αἰσθητῶν, ἐν

ἅπασιν γε τούτοις φανερόν ὅτι ἅμα ἐστὶ τὸ ἔσχατον ἀλλοιοῦν

5 καὶ τὸ πρῶτον ἀλλοιούμενον· τῷ μὲν γὰρ συνεχῆς ὁ ἀήρ,

τῷ δ' ἀέρι τὸ σῶμα. πάλιν δὲ τὸ μὲν χρῶμα τῷ φωτί,

τὸ δὲ φῶς τῇ ὄψει. τὸν αὐτὸν δὲ τρόπον καὶ ἡ ἀκοὴ καὶ ἡ

ὄσφρησις· πρῶτον γὰρ κινοῦν πρὸς τὸ κινούμενον ὁ ἀήρ. καὶ

244^b 1-2 = 244^a 24-5 2-12 = ^a 25-^b 27 12-245^a 2

= ^b 27-245^a 20 245^a 2-10 = 20-26

^b 2-3 ἀλλὰ . . . ἐπαγωγῆς ΣΣ : ὁμοίως δὲ κἂν εἴ τι ἐστὶ ποιητικὸν καὶ γεννητικὸν τοῦ ποιοῦ, καὶ τοῦτο ἀνάγκη ποιεῖν ἀπτόμενον βαρὺ κοῦφον γρ.

A 5 πρῶτον AS, Spengel : om. Σ ὑπόκειται . . . 5b ἀλλοιούσθαι addidi ex S : ὑπόκειται . . . παθητικὰς λεγομένας ποιότητας πάσχοντα ἀλλοιούσθαι· τὸ γὰρ ποῖον ἀλλοιοῦται τῷ αἰσθητὸν εἶναι, αἰσθητὰ δ' ἐστίν, οἷς διαφέρουσι τὰ σώματα ἀλλήλων ex S addenda ci. Prantl (cf. ^a 27-^b 16) 5b-d ἅπαν . . . ἀλλοιούμενον H et ut vid. S : om. Σ 6 τῆς ὑποκειμένης HΣS : τοῖς ὑποκειμένοις Spengel : τοῦ ὑποκειμένου Prantl 8 τὸ τε scripsi : τε τὸ Σ : τὸ H 11 πως ΣS : om. H 12 τοῦ ΣS : om. H 14 ταῦτα om. H 245^a 8 πρῶτον γὰρ] τῷ πρῶτον κινοῦντι· τὸ γὰρ πρῶτον H

ἐπὶ τῆς γεύσεως ὁμοίως· ἅμα γὰρ τῇ γεύσει ὁ χυμός.
ὡσαύτως δὲ καὶ ἐπὶ τῶν ἀψύχων καὶ ἀναισθητῶν. ὥστ' οὐ- 10
δὲν ἔσται μεταξὺ τοῦ ἀλλοιουμένου καὶ τοῦ ἀλλοιούντος. 11

οὐδὲ 11

μὴν τοῦ αὐξανομένου τε καὶ αὐξοντος· αὐξάνει γὰρ τὸ πρῶ-
τον αὖξον προσγιγνόμενον, ὥστε ἐν γίγνεσθαι τὸ ὅλον. καὶ
πάλιν φθίνει τὸ φθίνον ἀπογιγνόμενον τιῶς τῶν τοῦ φθίνοντος.
ἀνάγκη οὖν συνεχῆς εἶναι καὶ τὸ αὖξον καὶ τὸ φθίνον, τῶν 15
δὲ συνεχῶν οὐδὲν μεταξύ. φανερόν οὖν ὅτι τοῦ κινουμένου καὶ
τοῦ κινούντος πρώτου καὶ ἐσχάτου πρὸς τὸ κινούμενον οὐδὲν 245^b
ἔστιν ἀνὰ μέσον.

- 3 "Οτι δὲ τὸ ἀλλοιούμενον ἅπαν ἀλλοιοῦται ὑπὸ τῶν αἰ-
σθητῶν, καὶ ἐν μόνοις ὑπάρχει τούτοις ἀλλοίωσις ὅσα καθ'
αὐτὰ λέγεται πάσχειν ὑπὸ τῶν αἰσθητῶν, ἐκ τῶνδε θεωρη- 5
τέον. τῶν γὰρ ἄλλων μάλιστ' ἂν τις ὑπολάβοι ἐν τε τοῖς σχή-
μασι καὶ ταῖς μορφαῖς καὶ ἐν ταῖς ἕξεσι καὶ ταῖς τούτων
λήψεσι καὶ ἀποβολαῖς ἀλλοίωσις ὑπάρχει· ἐν οὐδετέροις δ'
ἔστιν. τὸ μὲν γὰρ σχηματιζόμενον καὶ ῥυθμιζόμενον ὅταν ἐπι-
τελεσθῆ, οὐ λέγομεν ἐκεῖνο ἐξ οὗ ἔστιν, οἷον τὸν ἀνδριάντα χαλ- 10
κὸν ἢ τὴν πυραμίδα κηρὸν ἢ τὴν κλίνην ξύλον, ἀλλὰ παρω-
νυμιάζοντες τὸ μὲν χαλκοῦν, τὸ δὲ κήρινον, τὸ δὲ ξύλινον. τὸ
δὲ πεπονθὸς καὶ ἡλλοιωμένον προσαγορεύομεν· ὑγρὸν γὰρ
καὶ θερμὸν καὶ σκληρὸν τὸν χαλκὸν λέγομεν καὶ τὸν κηρὸν
(καὶ οὐ μόνον οὕτως, ἀλλὰ καὶ τὸ ὑγρὸν καὶ τὸ θερμὸν 15
χαλκὸν λέγομεν), ὁμωνύμως τῷ πάθει προσαγορεύοντες τὴν
ῦλην. ὥστ' εἰ κατὰ μὲν τὸ σχῆμα καὶ τὴν μορφὴν οὐ λέγεται 246^a

245^a 11-14 = 245^a 26-9 16-^b 2 = 29-^b 18 ^b 3-9 = ^b 19-
24 9-246^a I = 24-246^a 22 246^a I-4 = 22-5

^a 10 καὶ alt. ΣS: καὶ τῶν H 11 ἀλλοιουμένου... ἀλλοιούντος ΣS:
ἀλλοιούντος καὶ τοῦ ἀλλοιουμένου H οὐδέ] οὐδὲ μὴν τοῦ αὐξανομένου
καὶ τοῦ ἀλλοιούντος οὐδὲ c 12 καὶ αὐξάνοντος H 13 ἐν om. H
16 οὖν] δὲ y ^b I τὸ ΣP: τι H 3 πᾶν S 4-5 καὶ...
αἰσθητῶν HbS: om. c, j 5 αὐτὰ πάσχει S 6 τε om. S
7 ταῖς om. S: ἐν ταῖς bcj ἐν om. S καὶ] καὶ ἐν c: ἢ S
8 οὐδετέροις H 9 καὶ ῥυθμιζόμενον om. Σ 12 τὸ pr. et alt.] τὸν Σ
13-14 ὑγρὸν... σκληρὸν HIT: κηρὸν γὰρ καὶ ὑγρὸν καὶ σκληρὸν καὶ
θερμὸν Σ 14 καὶ τὸν κηρὸν λέγομεν I: λέγομεν καὶ τὸ ξύλον ST
15 καὶ alt. om. y καὶ alt. ... 16 χαλκὸν] χαλκὸν καὶ τὸ θερμὸν ξύλον S
16-246^a I λέγομεν... ῦλην] ὁμωνύμως λέγοντες τῷ πάθει HI¹
246^a I μὲν κατὰ H καὶ om. Bekker (an casu?) οὐ] μὴ H

- τὸ γεγονός ἐν ᾧ ἐστὶ τὸ σχῆμα, κατὰ δὲ τὰ πάθη καὶ τὰς ἀλλοιώσεις λέγεται, φανερόν ὅτι οὐκ ἂν εἶεν αἱ γενέσεις ἀλλοιώσεις. ἔτι δὲ καὶ εἰπεῖν οὕτως ἄτοπον ἂν δόξειεν, ἢ ἀλλοιωθῆναι τὸν ἄνθρωπον ἢ τὴν οἰκίαν ἢ ἄλλο ὅτιοῦν τῶν γεγενημένων· ἀλλὰ γίνεσθαι μὲν ἴσως ἕκαστον ἀναγκαῖον ἀλλοιουμένου τινός, οἷον τῆς ὕλης πυκνουμένης ἢ μαυρουμένης ἢ θερμαινομένης ἢ ψυχομένης, οὐ μὲντοι τὰ γιγνώμενά γε ἀλλοιοῦνται, οὐδ' ἢ γένεσις αὐτῶν ἀλλοιώσις ἐστίν.
- 10 ἀλλὰ μὴν οὐδ' αἱ ἕξεις οὐθ' αἱ τοῦ σώματος οὐθ' αἱ τῆς ψυχῆς ἀλλοιώσεις. αἱ μὲν γὰρ ἀρεταὶ αἱ δὲ κακίαι τῶν ἕξεων· οὐκ ἐστὶ δὲ οὔτε ἡ ἀρετὴ οὔτε ἡ κακία ἀλλοιώσις, ἀλλ' ἡ μὲν ἀρετὴ τελείωσις τις (ὅταν γὰρ λάβῃ τὴν αὐτοῦ ἀρετήν, τότε λέγεται τελείων ἕκαστον—τότε γὰρ ἐστὶ μάλιστα
- 15 [τὸ] κατὰ φύσιν—ὡσπερ κύκλος τέλειος, ὅταν μάλιστα γένηται κύκλος καὶ ὅταν βέλτιστος), ἡ δὲ κακία φθορὰ τούτου καὶ ἕκστασις· ὡσπερ οὖν οὐδὲ τὸ τῆς οἰκίας τελείωμα λέγομεν ἀλλοίωσιν (ἄτοπον γὰρ εἰ ὁ θριγκὸς καὶ ὁ κέραμος ἀλλοιώσις, ἢ εἰ θριγκουμένη καὶ κεραμουμένη ἀλλοιοῦνται ἀλλὰ
- 20 μὴ τελειοῦνται ἢ οἰκία), τὸν αὐτὸν τρόπον καὶ ἐπὶ τῶν ἀρετῶν καὶ τῶν κακιῶν καὶ τῶν ἐχόντων ἢ λαμβανόντων· αἱ
- 246^b μὲν γὰρ τελειώσεις αἱ δὲ ἕκστασεις εἰσὶν, ὡστ' οὐκ ἀλλοιώσεις.
- 3 ἔτι δὲ καὶ φαμεν ἀπάσας εἶναι τὰς ἀρετὰς ἐν τῷ πρὸς τι πῶς ἔχειν. τὰς μὲν γὰρ τοῦ σώματος, οἷον ὑγίειαν
- 5 καὶ εὐεξίαν, ἐν κράσει καὶ συμμετρῷ θερμῶν καὶ ψυχρῶν τίθεμεν, ἢ αὐτῶν πρὸς αὐτὰ τῶν ἐντὸς ἢ πρὸς τὸ περιέχον· ὁμοίως δὲ καὶ τὸ κάλλος καὶ τὴν ἰσχὺν καὶ τὰς ἄλλας

246^a 4-6 = 246^a 25-6 8-12 = 28-30 12-17 = ^b 27-
247^a 20 17-20 = 246^a 26-8 ^b 3-14 = ^a 30-^b 27

^a 3 γενέσεις HS: γενέσεις αὐται IS 4 εἰπεῖν οὕτως ISΣ: οὕτως εἰπεῖν H 5 ἢ ἀλλοιωθῆναι τὸν ἄνθρωπον] ἢ ἀλλοιοῦσθαι τὸν ἄνθρωπον Σ: ἢ τὸν ἄνθρωπον ἢ ἀλλοιωθῆναι I 6 γίνεσθαι IS: γενέσθαι HΣ ἴσως om. S
9 γε om. I ἀλλοιοῦνται I: ἀλλοιοῦτε c 10-11 ἀλλὰ... ἀλλοιώσεις BHIS: om. c j y 13 τις] τις ἐστίν bcj γὰρ om. c j 14 ἕκαστον τέλειον I γὰρ] γὰρ καὶ I μάλιστα ἐστὶ HI: μάλιστα y 15 τὸ seclusi, om. ST 16 καὶ ὅταν βέλτιστος an omittenda?: βέλτιστος Σ 17 οὔτε Σ 18 κέραμος ἀλλοιώσεις HI 19 εἰ] ἢ HI: εἰ ἢ j καὶ] ἢ I 20 ἢ om. HI αὐτὸν δὴ τρόπον y ^b I καὶ ἐπὶ τῶν HI καὶ ἐπὶ τῶν H 3 πάσας I εἶναι om. I 5 ψυχρῶν ἢ θερμῶν HI 6 αὐτῶν] αὐτὰ Hc j y αὐτὰ b ἢ] καὶ H

ἀρετὰς καὶ κακίας. ἐκάστη γὰρ ἐστὶ τῷ πρὸς τι πὼς ἔχειν,
καὶ περὶ τὰ οἰκεία πάθη εὖ ἢ κακῶς διατίθησι τὸ ἔχον·
οἰκεία δ' ὑφ' ὧν γίνεσθαι καὶ φθείρεσθαι πέφυκεν. ἐπεὶ οὖν 10
τὰ πρὸς τι οὔτε αὐτὰ ἐστὶν ἀλλοιώσεις, οὔτε ἔστιν αὐτῶν ἀλ-
λοιώσεις οὐδὲ γέनेσις οὐδ' ὅλως μεταβολὴ οὐδεμία, φανερόν
ὅτι οὔθ' αἱ ἕξεις οὔθ' αἱ τῶν ἕξεων ἀποβολαὶ καὶ λήψεις
ἀλλοιώσεις εἰσὶν, ἀλλὰ γίνεσθαι μὲν ἴσως αὐτὰς καὶ
φθείρεσθαι ἀλλοιουμένων τῶν ἀνάγκη, καθάπερ καὶ τὸ εἶ- 15
δος καὶ τὴν μορφήν, οἶον θερμῶν καὶ ψυχρῶν ἢ ξηρῶν καὶ
ὕγρῶν, ἢ ἐν οἷς τυγχάνουσιν οὖσαι πρώτοις. περὶ ταῦτα γὰρ
ἐκάστη λέγεται κακία καὶ ἀρετὴ, ὑφ' ὧν ἀλλοιοῦσθαι πέ-
φυκε τὸ ἔχον· ἢ μὲν γὰρ ἀρετὴ ποιεῖ ἢ ἀπαθὲς ἢ ὠδὶ
παθητικόν, ἢ δὲ κακία παθητικόν ἢ ἐναντίως ἀπαθές. 20

ὁμοίως 20

δὲ καὶ ἐπὶ τῶν τῆς ψυχῆς ἕξεων· ἅπασαι γὰρ καὶ αὐταὶ 247^a
τῷ πρὸς τι πὼς ἔχειν, καὶ αἱ μὲν ἀρεταὶ τελειώσεις, αἱ
δὲ κακίαι ἐκστάσεις. ἔτι δὲ ἢ μὲν ἀρετὴ εὖ διατίθησι πρὸς τὰ
οἰκεία πάθη, ἢ δὲ κακία κακῶς. ὥστ' οὐδ' αὐταὶ ἔσονται
ἀλλοιώσεις· οὐδὲ δὴ αἱ ἀποβολαὶ καὶ αἱ λήψεις αὐτῶν. 5
γίνεσθαι δ' αὐτὰς ἀναγκαῖον ἀλλοιουμένου τοῦ αἰσθητικοῦ μέ-
ρους. ἀλλοιωθήσεται δ' ὑπὸ τῶν αἰσθητῶν· ἅπασα γὰρ ἢ ἠθικὴ
ἀρετὴ περὶ ἡδονὰς καὶ λύπας τὰς σωματικὰς, αὐταὶ δὲ ἢ
ἐν τῷ πράττειν ἢ ἐν τῷ μεμνήσθαι ἢ ἐν τῷ ἐλπίζειν. αἱ
μὲν οὖν ἐν τῇ πράξει κατὰ τὴν αἴσθησίν εἰσι, ὥστ' ὑπ' αἰ- 10
σθητοῦ τινὸς κινεῖσθαι, αἱ δ' ἐν τῇ μνήμῃ καὶ ἐν τῇ ἐλ-
πίδι ἀπὸ ταύτης εἰσὶν· ἢ γὰρ οἷα ἔπαθον μεμνημένοι ἡδονται,
ἢ ἐλπίζοντες οἷα μέλλουσιν. ὥστ' ἀνάγκη πάσαν τὴν τοιαύτην
ἡδονὴν ὑπὸ τῶν αἰσθητῶν γίνεσθαι. ἐπεὶ δ' ἡδονῆς καὶ λύ-
πης ἐγγιγνομένης καὶ ἢ κακία καὶ ἢ ἀρετὴ ἐγγίγνεται (περὶ 15

246^b 19-20 = 247^a 22-3
= 23-8247^a 5-7 = 20-22

7-13

^b 8 ἐστι] ἐν S II ἔστιν αὐτῶν HS: αὐτῶν ἐστὶν IS 12 οὔτε S
οὔθ' S ὅλως HIS: ὅλως οὐδὲ S 15 καὶ et I 6 ἢ om. S 17 πρώτοις
HIS^{SP}: πρώτως S^c 19 ἢ pr. HIS: om. S ὠδὶ HIS: ὡς
δεῖ S 20 ἢ ἐναντίως HIS: μὲν ἐναντίως καὶ S 247^a 1 γὰρ]
μὲν γὰρ y 2 τελειώσεις εἰσὶν αἱ HI 3 δὲ om. HI [πρὸς]
τὸ ἔχον πρὸς I 5 αἱ pr. om I: καὶ c j y 7 ἀλλοιωθήσεται
S S: ἀλλοιοῦται HI ἢ om. Hy 9 ἢ pr.] τι ἢ S II κινεῖσθαι
om. HI ἐν alt. om. S 12 εἰσὶν om. I 13 μένουσι H

ταύτας γάρ εἰσιν), αἱ δ' ἡδοναὶ καὶ αἱ λύπαι ἀλλοιώσεις τοῦ αἰσθητικοῦ, φανερόν ὅτι ἀλλοιουμένου τινὸς ἀνάγκη καὶ ταύτας ἀποβάλλειν καὶ λαμβάνειν. ὥσθ' ἡ μὲν γένεσις αὐτῶν μετ' ἀλλοιώσεως, αὐταὶ δ' οὐκ εἰσὶν ἀλλοιώσεις.

- 247^b ἀλλὰ μὴν οὐδ' αἱ τοῦ νοητικοῦ μέρους ἕξεις ἀλλοιώσεις, οὐδ' ἔστιν αὐτῶν γένεσις. πολὺ γὰρ μάλιστα τὸ ἐπιστήμον ἐν τῷ πρὸς τι πὼς ἔχειν λέγομεν. ἔτι δὲ καὶ φανερόν ὅτι οὐκ ἔστιν αὐτῶν γένεσις· τὸ γὰρ κατὰ δυνάμιν ἐπιστήμον οὐδὲν αὐτὸ 5 κινήθην ἀλλὰ τῷ ἄλλο ὑπάρξει γίνεταί ἐπιστήμον. ὅταν γὰρ γένηται τὸ κατὰ μέρος, ἐπίσταται πὼς τὰ καθόλου τῷ ἐν μέρει. πάλιν δὲ τῆς χρήσεως καὶ τῆς ἐνεργείας οὐκ ἔστι γένεσις, εἰ μὴ τις καὶ τῆς ἀναβλέψεως καὶ τῆς ἀφῆς οἰεταί γένεσιν εἶναι· τὸ γὰρ χρῆσθαι καὶ τὸ ἐνεργεῖν ὅμοιον τούτοις. ἡ 10 δ' ἐξ ἀρχῆς λήψις τῆς ἐπιστήμης γένεσις οὐκ ἔστιν οὐδ' ἀλλοίωσις· τῷ γὰρ ἠρεμῆσαι καὶ στήναι τὴν διάνοιαν ἐπίστασθαι καὶ φρονεῖν λεγόμεθα, εἰς δὲ τὸ ἠρεμεῖν οὐκ ἔστι γένεσις· ὅλως γὰρ οὐδεμίᾳ μεταβολῆς, καθάπερ εἴρηται πρότερον. ἔτι δ' ὥσπερ ὅταν ἐκ τοῦ μεθύειν ἢ καθεύδειν ἢ νοσεῖν εἰς τὰναντία μεταστῆ τις, οὗ 15 φαμεν ἐπιστήμονα γεγενῆσθαι πάλιν (καίτοι ἀδύνατος ἦν τῇ ἐπιστήμῃ χρῆσθαι πρότερον), οὕτως οὐδ' ὅταν ἐξ ἀρχῆς λαμβάνῃ τὴν ἕξιν· τῷ γὰρ καθίστασθαι τὴν ψυχὴν ἐκ τῆς φυσικῆς ταραχῆς φρόνιμόν τι γίνεταί καὶ ἐπιστήμον. διὸ καὶ τὰ παιδία οὔτε μαθάνειν δύνανται οὔτε κατὰ τὰς αἰσθήσεις 248^a ὁμοίως κρίνειν τοῖς πρεσβυτέροις· πολλὴ γὰρ ἡ ταραχὴ καὶ ἡ κίνησις. καθίσταται δὲ καὶ ἠρεμίζεται πρὸς ἕνια μὲν ὑπὸ τῆς φύσεως αὐτῆς, πρὸς ἕνια δ' ὑπ' ἄλλων, ἐν ἀμ-

247^b 1 - 248^a 9 = 247^a 28 - 248^b 28

^a 16 αἱ alt. om. HI 18 ὥσθ' H1bS: ἔτι cjy 19 αὕτη (αὐτὴ S) δ' οὐκ ἔστιν ἀλλοίωσις S ^b 1 αἱ (om. cjy) τοῦ νοητικοῦ (νοητοῦ S) μέρους ἕξεις ἀλλοιώσεις H2SPT: τῷ νοητικῷ μέρει αἱ ἕξεις ἀλλοιώσεις I: ἡ τοῦ νοητικοῦ μέρους ἕξεις ἀλλοιώσεις S¹ 2 αὐτῶν IT: αὐτῆς ἀλλοίωσις οὐδέ S μάλιστα om. I: μάλλον S 4 τὸ γὰρ] ὅτι τὸ HI οὐδέ I 5 ὑπάρξει Bekker errore preli 6 τὰ HIAT: τῇ SPS τῷ HIAT: τὸ cjy: τὲ b: τὰ PS 8 καὶ alt.] τε καὶ b οἰοίτο HI 9 τὸ γὰρ χρῆσθαι S: τὸ γὰρ οἰεσθαι HI: om. S 10 οὐκ] μὲν οὐκ HS: μὲν οὖν οὐκ I οὐδ' ἀλλοίωσις S: om. HI 11 τὸ cj] γὰρ] δὲ γρ. S ἠρεμῆσαι I 12 λέγομεν HI ὅλως] γενέσεως S οὐδεμία μεταβολὴ HIS 13 ὅταν om. S 15 ἀδύνατον c ἦν] ἡ c: ἡ y 16 οὕτως] ὅταν cjy 17 ἠθικῆς cj 18 ἀρετῆς S γένηται c 19 δύνανται I 248^a I κρίνει I 2 δέ] γὰρ I ἠρεμίζεται HIS: ἠρεμίζει S πρὸς . . . 3 αὐτῆς HIS: om. S

φοτέροις δὲ ἀλλοιουμένων τιῶν τῶν ἐν τῷ σώματι, καθά-
περ ἐπὶ τῆς χρήσεως καὶ τῆς ἐνεργείας, ὅταν νήφων γένη- 5
ται καὶ ἐγερθῆ. φανερόν οὖν ἐκ τῶν εἰρημένων ὅτι τὸ ἀλλοι-
οῦσθαι καὶ ἡ ἀλλοίωσις ἐν τε τοῖς αἰσθητοῖς γίνεται καὶ ἐν
τῷ αἰσθητικῷ μορίῳ τῆς ψυχῆς, ἐν ἄλλῳ δ' οὐδενὶ πλὴν
κατὰ συμβεβηκός.

- 4 Ἀπορήσειε δ' ἂν τις πότερόν ἐστι κίνησις πᾶσα πάση 10
συμβλητῇ ἢ οὐ. εἰ δὴ ἐστὶν πᾶσα συμβλητῇ, καὶ ὁμοταχῆς
τὸ ἐν ἴσῳ χρόνῳ ἴσον κινούμενον, ἔσται περιφερῆς τις ἴση
εὐθεία, καὶ μείζων δὴ καὶ ἐλάττων. ἔτι ἀλλοίωσις καὶ
φορὰ τις ἴση, ὅταν ἐν ἴσῳ χρόνῳ τὸ μὲν ἀλλοιωθῆ τὸ δ'
ἐνεχθῆ. ἔσται ἄρα ἴσον πάθος μήκει. ἀλλ' ἀδύνατον. ἀλλ' 15
ἄρα ὅταν ἐν ἴσῳ ἴσον κινήθῃ, τότε ἰσοταχῆς, ἴσον δ' οὐκ
ἔστιν πάθος μήκει, ὥστε οὐκ ἔστιν ἀλλοίωσις φορᾶ ἴση οὐδ'
ἐλάττων, ὥστ' οὐ πᾶσα συμβλητῇ; 18

ἐπὶ δὲ τοῦ κύκλου 18
καὶ τῆς εὐθείας πῶς συμβήσεται; ἀτοπὸν τε γὰρ εἰ μὴ
ἔστιν κύκλῳ ὁμοίως τουτὶ κινεῖσθαι καὶ τουτὶ ἐπὶ τῆς εὐ- 20
θείας, ἀλλ' εὐθὺς ἀνάγκη ἢ θάττον ἢ βραδύτερον, ὥσπερ
ἂν εἰ κάταντες, τὸ δ' ἄναντες· οὐδὲ διαφέρει οὐδὲν τῷ
λόγῳ, εἴ τίς φησὶν ἀνάγκην εἶναι θάττον εὐθὺς ἢ βραδύ-
τερον κινεῖσθαι· ἔσται γὰρ μείζων καὶ ἐλάττων ἢ περιφερῆς
τῆς εὐθείας, ὥστε καὶ ἴση. εἰ γὰρ ἐν τῷ Α χρόνῳ 25
τὴν Β διελήλυθε τὸ δὲ τὴν Γ, μείζων ἂν εἴη ἢ Β τῆς Γ· οὕτω 248^b
γὰρ τὸ θάττον ἐλέγετο. οὐκοῦν καὶ εἰ ἐν ἐλάττονι ἴσον, θάτ-
τον· ὥστ' ἔσται τι μέρος τοῦ Α ἐν φ τὸ Β τοῦ κύκλου τὸ
ἴσον δίεισι καὶ τὸ Γ ἐν ὅλῳ τῷ Α [τὴν Γ]. ἀλλὰ μὴν εἰ

^a 4 τῷ HIS: om. Σ 5 ἐγέρσεως καὶ det. τῆς om. I 7 ἐν]
ἢ ἐν Σ 8 μέρει HI 11 ὁμοιοταχῆς EI 12 ἐν] ἐν τῷ F ἴσον
secl. Prantl ἴση καὶ εὐθεία K 14 φθορά E¹ ἴση] καὶ H τὸ
alt. EHS: τι τὸ FJK 15 ἴσον τὸ πάθος F 16 ἄρα Bonitz:
ἄρα EF¹HIJK: om. F² ἴσον ἐν ἴσῳ I 17 ἔσται I πάθος πᾶν
μήκει FJK² 19 τῆς EHIJ²KS: om. FJ¹ τε om. H 20 τουτὶ
alt. Fy: τοῦτο cett. 22 ἂν FΣS: om. EHIJK οὐδὲ scripsi:
οὐδὲν EK: ἔτι οὐδὲ cj: ἔτι οὐδὲν Λ: ἔτι δὲ by οὐδὲν Σ: οὐδ' ἐν
EHIJK: om. F 23 φησιν EΣ: φήσει K: φήσειεν Λ ἀνάγκη
EK ἢ om. E ^b I τὴν] τὸ μὲν τὴν FHIK²S διελήλυθε . . .
β om. E διελήλυθε HISS: διήλυθε FJK τὴν . . . β om. K¹
μείζων J 3 ὥστ' ἔσται] εἰς τε E¹: ἔσται E²: ὥστε K τὸ pr.
E²AS: om. E¹K τὸ ἴσον δίεισι F²Σ: τὸ ἴσον δίεισι τὸ ἴσον F¹:
δίεισι EHIJKS 4 τὸ E¹ τὴν Γ seclusi: habent IIS

5 ἔστιν συμβλητά, συμβαίνει τὸ ἄρτι ῥηθέν, ἕσση εὐθείαν εἶναι κύκλω. ἀλλ' οὐ συμβλητά· οὐδ' ἄρα αἱ κινήσεις, ἀλλ' ὅσα μὴ συνώνυμα, πάντ' ἀσύμβλητα. οἷον διὰ τί οὐ συμβλητὸν πότερον ὀξύτερον τὸ γραφεῖον ἢ ὁ οἶνος ἢ ἡ νήτη; ὅτι ὁμώνυμα, οὐ συμβλητά· ἀλλ' ἢ νήτη τῇ παρανήτῃ συμ-
 10 βλητῇ, ὅτι τὸ αὐτὸ σημαίνει τὸ ὄξ' ἐπ' ἀμφοῖν. ἄρ' οὖν οὐ ταυτὸν τὸ ταχὺ ἐνταῦθα κάκεϊ, πολὺ δ' ἔτι ἦττον ἐν ἀλ-
 12 λοιώσει καὶ φορᾷ;

12 ἢ πρῶτον μὲν τοῦτο οὐκ ἀληθές, ὥς εἰ μὴ ὁμώνυμα συμβλητά; τὸ γὰρ πολὺ τὸ αὐτὸ σημαίνει ἐν ὕδατι καὶ ἀέρι, καὶ οὐ συμβλητά. εἰ δὲ μή, τό γε διπλά-
 15 σιον ταυτό (δύο γὰρ πρὸς ξν), καὶ οὐ συμβλητά. ἢ καὶ ἐπὶ τούτων ὁ αὐτὸς λόγος; καὶ γὰρ τὸ πολὺ ὁμώνυμον. ἀλλ' ἐνίων καὶ οἱ λόγοι ὁμώνυμοι, οἷον εἰ λέγοι τις ὅτι τὸ πολὺ τὸ τοσοῦτον καὶ ἔτι, ἄλλο τὸ τοσοῦτον· καὶ τὸ ἴσον ὁμώνυμον, καὶ τὸ ἐν δέ, εἰ ἔτυχε, εὐθὺς ὁμώνυμον.
 20 εἰ δὲ τοῦτο, καὶ τὰ δύο, ἐπεὶ διὰ τί τὰ μὲν συμβλητά
 21 τὰ δ' οὐ, εἴπερ ἦν μία φύσις;

21 ἢ ὅτι ἐν ἄλλω πρώτῳ δεκ-
 τικῶ; ὁ μὲν οὖν ἵππος καὶ ὁ κύων συμβλητά, πότερον λευ-
 κότερον (ἐν ᾧ γὰρ πρώτῳ, τὸ αὐτό, ἢ ἐπιφάνεια), καὶ
 κατὰ μέγεθος ὡσαύτως· ὕδωρ δὲ καὶ φωνὴ οὐ· ἐν ἄλλω
 25 γάρ. ἢ δῆλον ὅτι ἔσται οὕτω γε πάντα ἐν ποιεῖν, ἐν ἄλλω
 249^a δὲ ἕκαστον φάσκειν εἶναι, καὶ ἔσται ταυτὸ (τὸ) ἴσον καὶ γλυκὺ
 καὶ λευκόν, ἀλλ' ἄλλο ἐν ἄλλω; ἔτι δεκτικὸν οὐ τὸ τυχόν

^b 5-6 συμβαίνει . . . συμβλητά om. F¹ 5 εἶναι εὐθείαν HS
 6 ἀλλ' ἀλλ' ἄρα γε γρ. S: an ἀλλ' ἄρα? 7 συνώνυμα, πάντ' ἀσύμβλητα
 scripsi: συνώνυμα πάντα συμβλητά E¹: συνώνυμα ἅπαντα (πάντα E²)
 ἀσύμβλητα E²HΣ γρ. S: ὁμώνυμα πάντα (ἅπαντα AS) συμβλητά FJK
 AS: ὁμώνυμα πάντα ἀσύμβλητα I συμβλητὸν τὸ πότερον E 8 γρά-
 φιον E¹ ὁ οἶνος ΠΤ: τὸ ὄξος S ὅτι] ὅτι γὰρ E²FHIJ 9 ὁμό-
 νυμον EIK συμβλητὸν K τῇ KAS: om. E συμ-
 βλητῇ ΣS: συμβλητὸν EKΛ 10 σημαίνει HIS: συμβαίνει EFJK
 14 καὶ ἐν ἀέρι H 16 τὸ] καὶ τὸ F 18 τὸ om. S τὸ ΔS:
 om. EK ἔτι] εἴ τι E: ἔτι (ἔτι καὶ b) τὸ διπλάσιον τόσον Σ ἄλλο
 τὸ τοσοῦτον] ὅτι διπλάσιον τόσου. ἀλλὰ τὸ τοσοῦτον καὶ τὸ διπλάσιον ci.
 Shute ἀλλὰ H1Σ τὸ τοσοῦτον om. F: τὸ om. EJ 19 ὁμό-
 νυμα ci. Shute ante καὶ fort. addendum ex S καὶ τὸ διπλάσιον
 21 ἦν om. I ἄλλω τρόπῳ πρώτῳ E¹ 23 τῶ αὐτῶ I καὶ
 om. EK 24 κατὰ] κατὰ τὸ FHIS καὶ ἢ φωνῇ F 25 γε
 οὕτω FJ ποιεῖν ἐν K ἐν om. K 249^a I τὸ addidi 2 ἄλλ'
 om. E² ἄλλο om. KA ἄλλω] ἄλλω καὶ ἄλλω I

(τοῦ τυχόντος) ἐστίν, ἀλλ' ἐν ἐνὸς τὸ πρῶτον.

ἀλλ' ἄρα οὐ μόνον 3
 δεῖ τὰ συμβλητὰ μὴ ὁμώνυμα εἶναι ἀλλὰ καὶ μὴ ἔχειν δια-
 φοράν, μήτε ὁ μήτε ἐν ᾧ; λέγω δὲ οἶον χρῶμα ἔχει δια- 5
 ρεσιν· τοιγαροῦν οὐ συμβλητὸν κατὰ τοῦτο (οἶον πότερον κε-
 χρωμάτισται μάλλον, μὴ κατὰ τὶ χρῶμα, ἀλλ' ἢ χρῶμα),
 ἀλλὰ κατὰ τὸ λευκόν. οὕτω καὶ περὶ κίνησιν ὁμοταχῆς τῷ
 ἐν ἴσῳ χρόνῳ κινεῖσθαι ἴσον τοσουδί· εἰ δὴ τοῦ μήκους ἐν τῷδὶ
 τὸ μὲν ἠλλοιώθη τὸ δ' ἠνέχθη, ἴση ἄρα αὕτη ἢ ἀλλοίωσις 10
 καὶ ὁμοταχῆς τῇ φορά; ἀλλ' ἀποπον. αἴτιον δ' ὅτι ἡ κί-
 νησις ἔχει εἶδη, ὥστ' εἰ τὰ ἐν ἴσῳ χρόνῳ ἐνεχθέντα ἴσον
 μήκος ἰσοταχῆ ἔσται, ἴση ἢ εὐθεία καὶ ἢ περιφερῆς. πό-
 τερον οὖν αἴτιον, ὅτι ἢ φορά γένος ἢ ὅτι ἢ γραμμῆ γένος;
 ὁ μὲν γὰρ χρόνος ὁ αὐτός, ἂν δὲ τῷ εἶδει ἢ ἄλλα, καὶ ἐκεῖνα 15
 εἶδει διαφέρει. καὶ γὰρ ἢ φορά εἶδη ἔχει, ἂν ἐκεῖνο ἔχη
 εἶδη ἐφ' οὗ κωεῖται (ὅτε δὲ ἐὰν ᾧ, οἶον εἰ πόδες, βάδισις,
 εἰ δὲ πτέρυγες, πτήσις. ἢ οὐ, ἀλλὰ τοῖς σχήμασιν ἢ φορά
 ἄλλη); ὥστε τὰ ἐν ἴσῳ ταῦτὸ μέγεθος κινούμενα ἰσοταχῆ,
 τὸ αὐτὸ δὲ καὶ ἀδιάφορον εἶδει καὶ κινήσει ἀδιάφορον 20
 ὥστε τοῦτο σκεπτέον, τίς διαφορὰ κινήσεως. καὶ σημαίνει ὁ
 λόγος οὗτος ὅτι τὸ γένος οὐχ ἐν τι, ἀλλὰ παρὰ τοῦτο λαν-
 θάνει πολλά, εἰσὶν τε τῶν ὁμωνυμιῶν αἱ μὲν πολὺν ἀπέχου-
 σαι, αἱ δὲ ἔχουσαι τινα ὁμοιότητα, αἱ δ' ἔγγυς ἢ γένει ἢ
 ἀναλογία, διὸ οὐ δοκοῦσιν ὁμωνυμίαι εἶναι οὕσαι. πότε οὖν 25
 ἕτερον τὸ εἶδος, ἐὰν ταῦτὸ ἐν ἄλλῳ, ἢ ἂν ἄλλο ἐν ἄλλῳ;

^a 3 τοῦ τυχόντος addidi ex S ἐν AS: om. EK 4 δεῖ] δὴ H
 5 ἐν ᾧ] τὸ ἐν ᾧ FJ: ἐν οἷς S ἔχει διαφορὰν ἢ διαίρεσιν H 6 οὐ
 om. E κέχρωσται H 8 ἀλλὰ FIJKS: ἀλλ' ἢ E: ἀλλ' ἢ H
 καὶ om. H τῷ... 9 κινεῖσθαι scripsi: τὸ... κινεῖσθαι EIK: τὸ...
 κινήθην FHJ]S et ut vid. S 9 τοσουδέ FHJ εἰ δὴ EIKS: ἐπεὶ H:
 om. FJ 10 τὸ pr. EHIKS: εἰ δὲ τὸ FJ] δὴ E ἄρα om. F¹
 12 ἐν τῷ ἴσῳ FJ κινήθέντα μήκος ἴσον H 13 ἢ alt. om. F
 14 ὅτι ἐστὶν ἢ EIKS ἢ AS: om. EK 15 ὁ alt. ... ἐκεῖνα
 scripsi ex S: ὁ αὐτός· ἂν δὲ τῷ εἶδει ἢ, καὶ ἐπ' ἐκεῖνα A: αἰεὶ (ὁ αὐτός
 αἰεὶ FJ γρ. A) ἄτομος τῷ (ἂν δὲ τῷ E², ἐν δὲ τῷ K) εἶδει ἢ ἄμα κἀκεῖνα
 (ἐκεῖνα E¹F, om. K) EKA γρ. A 16 εἶδει] εἰ E¹ εἶδη ἔχη H
 17 ὅτε scripsi: ὅτε EFJ¹KΣ: ὅτι S: ἔτι HIJ² ἐὰν (ἂν K) δι' οὐ
 I²KS: ἐν ᾧ E²F]: E¹ incertum εἰ] οἱ I 18 δὲ om. FHJ οὐδ' E¹
 19 ἴσῳ] ἴσῳ χρόνῳ E²FIJ 20 καὶ om. A: τὸ E² ἀδιάφορον
 EHIJ]S: διάφορον FK ἀδιάφορον εἶδει ὥστε FJ 21 τοῦτο
 om. S ὁ] γε ὁ F 22 πᾶλλὰ λανθάνει S 23 δὲ F
 ὁμωνύμων E¹S 24 αἱ δὲ ἔχουσαι KAS: om. E ὁμοιότητα τινα H
 25 οὐδὲ I πότερον K 26 ταῦτα K ἂν om. E²IK

καὶ τίς ὄρος; ἢ τῷ κρωοῦμεν ὅτι ταῦτον τὸ λευκὸν καὶ τὸ
 γλυκὺ ἢ ἄλλο—ὅτι ἐν ἄλλῳ φαίνεται ἕτερον, ἢ ὅτι ὄλως
 29 οὐ ταυτό;

29 περὶ δὲ δὴ ἀλλοιώσεως, πῶς ἔσται ἰσοταχῆς
 30 ἐτέρα ἐτέρα; εἰ δὴ ἔστι τὸ ὑγιάζεσθαι ἀλλοιοῦσθαι, ἔστι τὸν
 μὲν ταχὺ τὸν δὲ βραδέως ἰαθῆναι, καὶ ἅμα τινάς, ὥστ'
 249^b ἔσται ἀλλοίωσις ἰσοταχῆς· ἐν ἴσῳ γὰρ χρόνῳ ἡλλοιώθη.
 ἀλλὰ τί ἡλλοιώθη; τὸ γὰρ ἴσον οὐκ ἔστιν ἐνταῦθα λεγό-
 μενον, ἀλλ' ὡς ἐν τῷ ποσῷ ἰσότης, ἐνταῦθα ὁμοιότης.
 ἀλλ' ἔστω ἰσοταχὲς τὸ ἐν ἴσῳ χρόνῳ τὸ αὐτὸ μεταβάλλον.
 5 πότερον οὖν ἐν ᾧ τὸ πάθος ἢ τὸ πάθος δεῖ συμβάλλειν; ἐν-
 ταῦθα μὲν δὴ ὅτι ὑγίεια ἢ αὐτῆ, ἔστιν λαβεῖν ὅτι οὔτε μᾶλ-
 λον οὔτε ἥττον ἀλλ' ὁμοίως ὑπάρχει. εἰ δὲ τὸ πάθος ἄλλο
 ἢ, οἷον ἀλλοιοῦται τὸ λευκαινόμενον καὶ τὸ ὑγιαζόμενον,
 10 εἶδη ποιεῖ ἀλλοιώσεως, καὶ οὐκ ἔστι μία ὥσπερ οὐδ' αἱ φο-
 ραί. ὥστε ληπτέον πόσα εἶδη ἀλλοιώσεως καὶ πόσα φορᾶς.
 εἰ μὲν οὖν τὰ κινούμενα εἶδει διαφέρει, ὧν εἰσὶν αἱ κινήσεις
 καθ' αὐτὰ καὶ μὴ κατὰ συμβεβηκός, καὶ αἱ κινήσεις εἶδει
 διοίσουσιν· εἰ δὲ γένει, γένει, εἰ δ' ἀριθμῷ, ἀριθμῷ. ἀλλὰ
 15 δὴ πότερον εἰς τὸ πάθος δεῖ βλέψαι, εἰ δὲ τὸ αὐτὸ ἢ ὅμοιον,
 εἰ ἰσοταχεῖς αἱ ἀλλοιώσεις, ἢ εἰς τὸ ἀλλοιούμενον, οἷον εἰ
 τοῦ μὲν τοσονδὶ λελεύκονται τοῦ δὲ τοσονδί; ἢ εἰς ἄμφω, καὶ ἢ
 αὐτῆ μὲν ἢ ἄλλη τῷ πάθει, εἰ τὸ αὐτὸ (ἢ μὴ τὸ) αὐτό, ἴση δ' ἢ
 ἄνισος, εἰ ἐκεῖνο (ἴσον ἢ) ἄνισον; καὶ ἐπὶ γενέσεως δὲ καὶ φθορᾶς
 20 τὸ αὐτὸ σκεπτέον. πῶς ἰσοταχῆς ἢ γένεσις; εἰ ἐν ἴσῳ χρόνῳ

^a 27 ταυτὸν καὶ γλυκὺ καὶ λευκὸν H καὶ] ἢ S 28 ἐν ἄλλῳ om. H
 φέρεται J 29 δὴ om. K ἔστιν FK 30 ἐτέρα ἐτέρα J: ἐτέρας
 ἐτέρας E²: E¹ incertum τὸν] δὲ τὸν FHI: τὸ J 31 ταχέως S τὸ J
 καὶ] ἔστι δὲ καὶ I τινός E ^b I ἔσται HΣS: ἔστιν ΕΦΙJK 2 οὐκέτι
 H ἔστιν EIJS: ἔσται FHK 3 ποσῷ ἢ ἰσότης H 4 ἰσο-
 ταχῆς hic EIS: ante ^b 5 πότερον FHJK ἐν... μεταβάλλον]
 αὐτὸ (τὸ αὐτὸ H, om. K) μεταβάλλον ἐν (τὸ ἐν H) ἴσῳ χρόνῳ FHJK
 5 οὖν om. H συμβιβαλεῖν S 6 ὅτι] ἢ FJ ὅτι] ἢ ὅτι F
 8 ἢ οἷον KAS: ποῖον E 9 εἶδη I¹J: om. F² 10 ὥσπερ
 om. K οὐδὲ φορᾶ F: οὐδὲ φοραὶ J 11 πόσα E²AS: om.
 E¹K φθορᾶς E¹ 13 αὐτὸ FS εἶδει καὶ αἱ κινήσεις S
 15 ἢ om. E 16 εἰ HJ¹S: ἢ E²K: ἢ F: om. I ἀλλοιώσεις
 ... τὸ om. E¹ ἢ... ἀλλοιούμενον om. K¹ 17 τοιονδί HK
 18 τὸ πάθος K εἰ FHI et fecit J²: εἴη E¹: ἢ εἰ E²: εἰ εἴη K
 ἢ μὴ τὸ addidi αὐτό om. ΚΑ 19 εἰ fecit J²: ἢ S ἴσον
 ἢ addidit Pacius δὲ AS: om. EK

τὸ αὐτὸ καὶ ἄτομον, οἷον ἄνθρωπος ἀλλὰ μὴ ζῶον· θάττων δ', εἰ ἐν ἴσῳ ἕτερον (οὐ γὰρ ἔχομέν τινα δύο ἐν οἷς ἡ ἕτερότης ὡς ἡ ἀνομοιότης), ἢ, εἰ ἔστιν ἀριθμὸς ἡ οὐσία, πλείων καὶ ἐλάττων ἀριθμὸς ὁμοειδής· ἀλλ' ἀνώνυμον τὸ κοινόν, καὶ τὸ ἐκάτερον [ποιόν· τὸ μὲν ποιόν,] ὥσπερ τὸ 25 πλείον πάθος ἢ τὸ ὑπερέχον μᾶλλον, τὸ δὲ ποσὸν μείζον.

5 Ἐπεὶ δὲ τὸ κινεῖν κινεῖ τι αἰεὶ καὶ ἐν τιμῇ καὶ μέχρι του (λέγω δὲ τὸ μὲν ἐν τιμῇ, ὅτι ἐν χρόνῳ, τὸ δὲ μέχρι του, ὅτι ποσόν τι μήκος· αἰεὶ γὰρ ἅμα κινεῖ καὶ κεκίνηκεν, ὥστε ποσόν τι ἔσται ὃ ἐκινήθη, καὶ ἐν ποσῷ), εἰ δὴ τὸ μὲν 30 A τὸ κινεῖν, τὸ δὲ B τὸ κινούμενον, ὅσον δὲ κεκίνηται μήκος τὸ Γ, ἐν ὅσῳ δέ, ὁ χρόνος, ἐφ' οὗ τὸ Δ, ἐν δὴ τῷ ἴσῳ χρόνῳ 250^a ἡ ἴση δύναμις ἢ ἐφ' οὗ τὸ A τὸ ἥμισυ τοῦ B διπλασίαν τῆς Γ κινήσει, τὴν δὲ τὸ Γ ἐν τῷ ἥμισυ τοῦ Δ· οὕτω γὰρ ἀνάλογον ἔσται. καὶ εἰ ἡ αὐτὴ δύναμις τὸ αὐτὸ ἐν τῷδι τῷ χρόνῳ τοσήνδε κινεῖ καὶ τὴν ἡμίσειαν ἐν τῷ ἥμισυ, 5 καὶ ἡ ἡμίσεια ἰσχυρὸς τὸ ἥμισυ κινήσει ἐν τῷ ἴσῳ χρόνῳ τὸ ἴσον. οἷον τῆς A δυνάμειως ἔστω ἡμίσεια ἢ τὸ E καὶ τοῦ B τὸ Z ἥμισυ· ὁμοίως δὲ ἔχουσι καὶ ἀνάλογον ἢ ἰσχυρὸς πρὸς τὸ βάρος, ὥστε ἴσον ἐν ἴσῳ χρόνῳ κινήσουσιν. καὶ εἰ τὸ E τὸ Z κινεῖ ἐν τῷ Δ τὴν Γ, οὐκ ἀνάγκη ἐν τῷ ἴσῳ 10 χρόνῳ τὸ ἐφ' οὗ E τὸ διπλάσιον τοῦ Z κινεῖν τὴν ἡμίσειαν τῆς Γ· εἰ δὴ τὸ A τὴν τὸ B κινεῖ ἐν τῷ Δ ὅσην ἢ τὸ Γ, τὸ ἥμισυ τοῦ A τὸ ἐφ' ᾧ E τὴν τὸ B οὐ κινήσει ἐν τῷ

^b 21 οἷον] οἷον εἰ I θάττων ΔS: θάττων EK 22 δ' ΔS: δὴ EK ἴσῳ ἕτερον E²APS: ἀνίσῳ E¹K τινα IJ²SΣ: τι EFHJ¹K ἐν οἷς FJΣ: om. EHIKS 23 ἢ alt.] εἰ F ἢ om. E: καὶ FJ 24 ὁμοειδής EHIJS: ὁμοειδής FK 25 ποιόν . . . ποιόν Moreliana: om. Π 27 κινεῖ τι αἰεὶ HIKS: κινεῖται αἰεὶ E: κινεῖ τε αἰεὶ τι FJ 29 εἰ γὰρ EK καὶ om. E²K: E¹ incertum κεκίνηται H 250^a I δὲ χρόνος E: δὲ χρόνῳ K ᾧ K τὸ EΣ: om. KA 2 ἴση om. HI ἢ om. EJK ᾧ FH τὸ om. J τὸ] τὸ μὲν I διπλασίαν EJ τῆς τοῦ γ I 3 κινήσει τὴν ζ τὴν HI 4 εἰ om. E² et fort. S τῷδι τῷ] τῷ διττῷ E 5 ἐν] τῆς γ ἐν ΣS post ἡμίσει add. χρόνῳ κινήσει I, τοῦ δ χρόνου (χρόνῳ j) Σ, τοῦ Δ χρόνου κινήσει S 6 τὸ pr.] τῆς α τὸ ΣΣ 7 ἥμισυ K: ἡ ἡμίσεια H: ἡμίσει δ' E ἢ om. K τοῦ E 8 ἀναλόγως H ἢ om. EK 9 καὶ] διὸ κἂν E² 10 Δ] δ χρόνῳ bcj γρ. S οὐκ ἀνάγκη E²HIJΣP γρ. S: οὐκ ἀναγκαῖον F: ἀναγκαῖον E¹KS 11 E] τὸ ε F¹ τὸ om. γρ. S Z] ζ βάρους Σ γρ. S 12 γ Π γρ. S: γ, τοῦ μήκους S δὴ ΔS: δὲ EK τὸ] τὴν τὸ F¹ τὸ FHJS: om. EIK κινεῖ E¹H et post A K: κινήσει E²FIJS ὅσην E²FIJΣ: ὅση E¹HK ἢ om. E²I 13 E] τὸ ε HI ἢ om. S

χρόνῳ ἐφ' ᾧ τὸ Δ οὐδ' ἐν τινι τοῦ Δ τι τῆς Γ ἀνάλογον πρὸς
 15 τὴν ὄλην τὴν Γ ὡς τὸ Α πρὸς τὸ Ε· ὅλως γὰρ εἰ ἔτυχεν
 οὐ κινήσει οὐδέν· οὐ γὰρ εἰ ἡ ὄλη ἰσχύς τοσούδε ἐκίνησεν, ἡ
 ἡμίσεια οὐ κινήσει οὔτε ποσὴν οὔτ' ἐν ὀποσφοῦν· εἰς γὰρ ἂν
 κωοίη τὸ πλοῖον, εἴπερ ἦ τε τῶν νεωλκῶν τέμνεται ἰσχύς
 εἰς τὸν ἀριθμὸν καὶ τὸ μήκος ὃ πάντες ἐκίνησαν. διὰ τοῦτο
 20 ὁ Ζήνωνος λόγος οὐκ ἀληθής, ὡς ψοφεῖ τῆς κέγχρου ὀτιοῦν
 μέρος· οὐδὲν γὰρ κωλύει μὴ κινεῖν τὸν ἀέρα ἐν μηδενὶ χρόνῳ
 τοῦτου ὃν ἐκίνησεν πεσῶν ὁ ὅλος μέδιμος. οὐδὲ δὴ το-
 σοῦτον μόριον, ὅσον ἂν κινήσειεν τοῦ ὅλου εἰ εἴη καθ' αὐτὸ
 τοῦτο, οὐ κινεῖ. οὐδὲ γὰρ οὐδὲν ἔστιν ἀλλ' ἡ δυνάμει ἐν τῷ
 25 ὄλῳ. εἰ δὲ τὰ (κωοῦντα) δύο, καὶ ἐκατέρων τῶνδε ἐκάτερον κινεῖ
 τὸ τοσόνδε ἐν τοσῶδε, καὶ συντιθέμεναι αἱ δυνάμεις τὸ σύνθετον
 ἐκ τῶν βαρῶν τὸ ἴσον κινήσουσιν μῆκος καὶ ἐν ἴσῳ χρόνῳ·
 28 ἀνάλογον γάρ.

28 ἄρ' οὖν οὕτω καὶ ἐπ' ἀλλοιώσεως καὶ ἐπ' αὐ-
 ξήσεως; τὶ μὲν γὰρ τὸ αὔξον, τὶ δὲ τὸ αὐξανόμενον, ἐν
 30 ποσῷ δὲ χρόνῳ καὶ ποσὸν τὸ μὲν αὔξει τὸ δὲ αὐξάνεται.
 καὶ τὸ ἀλλοιοῦν καὶ τὸ ἀλλοιούμενον ὡσαύτως—τὶ καὶ ποσὸν
 250^b κατὰ τὸ μάλλον καὶ ἥττον ἡλλοίωται, καὶ ἐν ποσῷ χρόνῳ,
 ἐν διπλασίῳ διπλάσιον, καὶ τὸ διπλάσιον ἐν διπλασίῳ· τὸ
 δ' ἡμισυ ἐν ἡμίσει χρόνῳ (ἡ ἐν ἡμίσει ἡμισυ), ἡ ἐν ἴσῳ δι-
 πλάσιον. εἰ δὲ τὸ ἀλλοιοῦν ἡ αὔξον τὸ τοσόνδε ἐν τῷ τοσῶδε
 5 αὔξει ἡ ἀλλοιοῖ, οὐκ ἀνάγκη καὶ τὸ ἡμισυ ἐν ἡμίσει καὶ
 ἐν ἡμίσει ἡμισυ, ἀλλ' οὐδέν, εἰ ἔτυχεν, ἀλλοιώσει ἡ αὐ-
 ξήσει, ὥσπερ καὶ ἐπὶ τοῦ βάρους.

^a 14 τὸ om. FHJ τι Aldina et ut vid. S: τις K: om. EAS
 γ... 15 γ FJS: γ ἡ... γ HI: γ EK 15 τὴν alt. om.
 FJ ε FHIΣ: ζ EJKS 16 οὐ γὰρ εἰ] οὐ γὰρ J: εἰ γὰρ
 FK ἡ om. E: εἴη K κίνησιν ἡ ἡ K 17 οὐ om. HIK
 ποσὸν HI εἰς] εἰ E 18 ἡ] εἰ J τε om. K 20 ζήνων
 ὡς λόγος I ἀληθές K τῆς FHJKT: τοῦ EI 22 τοῦτου
 om. F πεσῶν HJΣ: ἐνπεσῶν E: ἐμπεσῶν FIK ὅλος ὁ K:
 ὅλος H δὴ] δὴ τὸ HI 24 οὐ... γὰρ om. EK δυνάμει
 om. H 25 κινούντα addidi, fort. legit P καὶ FJΣP: om.
 EHIK τῶνδε] τῶνδε καὶ K: τῶνδε καὶ εἰς E: δὲ τῶνδε I² ἐκίνει
 HIK 26 τὸ om. Λ 28 ἐπ' om. HI ἐπ' om. S 29 αὐξό-
 μενον F 30 δὲ om. EK δὲ αὔξει S ^b I ἡλλοιῶνται
 FJK 2 διπλασίῳ E²AS: διπλάσιον K: om. E¹ διπλάσιον
 om. K καὶ] κατὰ I τὸ δ'] καὶ τὸ ΣS 3 ἡ pr.] καὶ H
 4 τοσῶδὲ HJ 5 ἡ αὔξει ἡ HI ἀναγκαῖον F καὶ ἐν ἡμίσει]
 ἡ καὶ F: καὶ J 6 ἡμισυ FJKS: τὸ ἡμισυ EHI οὐδὲ F

Θ.

Ι Πότερον γέγονέ ποτε κίνησις οὐκ οὔσα πρότερον, καὶ
 φθείρεται πάλιν οὕτως ὥστε κινεῖσθαι μηδέν, ἢ οὐτ' ἐγένετο οὔτε
 φθείρεται, ἀλλ' αἰεὶ ἦν καὶ αἰεὶ ἔσται, καὶ τοῦτ' ἀθάνατον καὶ
 ἀπαυστον ὑπάρχει τοῖς οὔσι, οἷον ζωὴ τις οὔσα τοῖς φύσει
 συνεστώσι πάσιν; εἶναι μὲν οὖν κίνησις πάντες φασὶν οἱ περὶ 15
 φύσεώς τι λέγοντες διὰ τὸ κοσμοποιεῖν καὶ περὶ γενέσεως
 καὶ φθορᾶς εἶναι τὴν θεωρίαν πᾶσαν αὐτοῖς, ἣν ἀδύνατον
 ὑπάρχειν μὴ κινήσεως οὔσης· ἀλλ' ὅσοι μὲν ἀπείρους τε κό-
 σμους εἶναι φασιν, καὶ τοὺς μὲν γίνεσθαι τοὺς δὲ φθείρεσθαι
 τῶν κόσμων, αἰεὶ φασιν εἶναι κίνησις (ἀναγκαῖον γὰρ τὰς 20
 γενέσεις καὶ τὰς φθορὰς εἶναι μετὰ κινήσεως αὐτῶν)· ὅσοι
 δ' ἕνα (ἢ αἰεὶ) ἢ μὴ αἰεὶ, καὶ περὶ τῆς κινήσεως ὑποτίθενται κατὰ
 λόγον. εἰ δὴ ἐνδέχεται ποτε μηδέν κινεῖσθαι, διχῶς ἀνάγκη
 τοῦτο συμβαίνειν· ἢ γὰρ ὡς Ἀναξαγόρας λέγει (φησὶν γὰρ
 ἐκείνος, ὁμοῦ πάντων ὄντων καὶ ἡρεμούντων τὸν ἄπειρον χρό- 25
 νον, κίνησις ἐμποῦησαι τὸν νοῦν καὶ διακρίναι), ἢ ὡς Ἐμπε-
 δοκλῆς ἐν μέρει κινεῖσθαι καὶ πάλιν ἡρεμεῖν, κινεῖσθαι μὲν
 ὅταν ἢ φιλία ἐκ πολλῶν ποιῆ τὸ ἐν ἢ τὸ νεῖκος πολλὰ
 ἐξ ἑνός, ἡρεμεῖν δ' ἐν τοῖς μεταξὺ χρόνοις, λέγων
 οὕτως ἢ μὲν ἐν ἐκ πλεόνων μεμάθηκε φύεσθαι, 30
 ἢ δὲ πάλιν διαφύντος ἑνὸς πλεόν' ἐκτελέθουσιν,
 τῇ μὲν γίνονται τε καὶ οὐ σφισιν ἔμπεδος αἰών· 251^a
 ἢ δὲ τὰδ' ἀλλάσσοντα διαμπερές οὐδαμὰ λήγει,
 ταύτη δ' αἰὲν ἔασιν ἀκίνητοι κατὰ κύκλον.

τὸ γὰρ “ἢ δὲ τὰδ' ἀλλάσσοντα” ἐνθὲνδε ἐκέισε λέγειν αὐτὸν
 ὑποληπτέον. σκεπτέον δὴ περὶ τούτων πῶς ἔχει· πρὸ ἔργου 5

Tit. περὶ κινήσεως τῶν εἰς γ τὸ γ· Θ E: φυσικῆς ἀκροάσεως ἦν H
 b II γέγονε KS: δὲ γέγονε EA ποτε E²KAST: om. E¹ 12 ὥστε
 E²KAT: om. E¹ 13 ἀλλ' εἶην J¹ 15 μὲν KAS: μὴ E 17 καὶ
 περὶ φθορᾶς K πᾶσαν Camotiana: πᾶσιν Π 18 ὅσοι EKST:
 ὅποσοι Δ τε om. FKST 19 εἶναι om. K 20 τὸν κόσμον I
 21 τὰς KAT: om. E φθορὰς J¹ 22 ἕνα ἢ αἰεὶ ἢ scripsi, cum T ut
 vid.: ἢ ἕνα ἢ E¹S: εἰεν αἰεὶ E²: ἕνα ἢ KA 23 δὲ J²K μὴ K
 24 τοῦτο om. H 27 κινεῖσθαι pr. om. E 28 ποιεῖ J: ἢ ποιῆ E²
 30 “οὕτως ἢ μὲν Diels: “οὕτως ἢ μὲν S: οὕτως “ἡμὲν Bekker ἡμὲν
 JH ἐν om. S 31 ἢ δὲ JKS: ἢ δὲ EFHI 251^a 2 τῇ J τὰ
 ἀλλάσσοντα F διαμπερές om. H 3 δ' om. H 4-5 τὸ ...
 ὑποληπτέον] δεῖ γὰρ ὑπολαβεῖν λέγειν αὐτὸν ἢ δὲ τὰδ' ἐνθὲνδε τὰ (τὰ om.
 S) ἀλλάσσοντα EKS 4 γὰρ τῆδε FIJ ἀλλάσσοντα J: ἀλλάσ-
 σοντα I 5 δὴ KAS: δ' ET τούτων EFT: τούτου HIJKS

γὰρ οὐ μόνον πρὸς τὴν περὶ φύσεως θεωρίαν ἰδεῖν τὴν ἀλήθειαν, ἀλλὰ καὶ πρὸς τὴν μέθοδον τὴν περὶ τῆς ἀρχῆς τῆς
8 πρώτης.

8 ἀρξώμεθα δὲ πρῶτον ἐκ τῶν διωρισμένων ἡμῶν ἐν τοῖς φυσικοῖς πρότερον. φαμέν δὴ τὴν κίνησιν εἶναι ἐνέργειαν τοῦ κινήτου ἢ κινήτου. ἀναγκαῖον ἄρα ὑπάρχειν τὰ πράγματα τὰ δυνάμενα κινεῖσθαι καθ' ἐκάστην κίνησιν. καὶ χωρὶς δὲ τοῦ τῆς κινήσεως ὀρισμοῦ, πᾶς ἂν ὁμολογήσειεν ἀναγκαῖον εἶναι κινεῖσθαι τὸ δυνατόν κινεῖσθαι καθ' ἐκάστην κίνησιν, οἷον ἀλλοιοῦσθαι μὲν τὸ ἀλλοιωτόν, φέρεσθαι δὲ τὸ
15 κατὰ τόπον μεταβλητόν, ὥστε δεῖ πρότερον καυστόν εἶναι πρὶν κάεσθαι καὶ καυστικὸν πρὶν κάειν. οὐκοῦν καὶ ταῦτα ἀναγκαῖον ἢ γενέσθαι ποτὲ οὐκ ὄντα ἢ αἰτίδια εἶναι. εἰ μὲν τοίνυν ἐγένετο τῶν κινήτων ἕκαστον, ἀναγκαῖον πρότερον τῆς ληφθείσης ἄλλην γενέσθαι μεταβολὴν καὶ κίνησιν, καθ' ἣν
20 ἐγένετο τὸ δυνατόν κινήθηναι ἢ κινήσαι· εἰ δ' ὄντα προϋπήρχεν αἰεὶ κινήσεως μὴ οὔσης, ἄλογον μὲν φαίνεται καὶ αὐτόθεν ἐπιστήσασιν, οὐ μὴν ἀλλὰ μᾶλλον ἔτι προάγουσι τοῦτο συμβαίνειν ἀναγκαῖον. εἰ γὰρ τῶν μὲν κινήτων ὄντων τῶν δὲ κινήτικῶν ὅτε μὲν ἔσται τι πρῶτον κινουόν, τὸ δὲ κινούμε-
25 νον, ὅτε δ' οὐθέν, ἀλλ' ἡρεμεῖ, ἀναγκαῖον τοῦτο μεταβάλλειν πρότερον· ἦν γάρ τι αἴτιον τῆς ἡρεμίας· ἢ γὰρ ἡρέμησις στέρησις κινήσεως. ὥστε πρὸ τῆς πρώτης μεταβολῆς ἔσται μεταβολὴ προτέρα. τὰ μὲν γὰρ κινεῖ μοναχῶς, τὰ δὲ καὶ τὰς ἐναντίας κινήσεις, οἷον τὸ μὲν πῦρ θερμαίνει,
30 ψύχει δ' οὖν, ἢ δ' ἐπιστήμη δοκεῖ τῶν ἐναντίων εἶναι μία. φαίνεται μὲν οὖν κάκεῖ τι εἶναι ὁμοιότροπον· τὸ γὰρ ψυχρὸν θερμαίνει στραφέν πως καὶ ἀπελθόν, ὥσπερ καὶ ἀμαρτάνει ἐκὼν ὁ ἐπιστήμων, ὅταν ἀνάπαλιν χρήσῃται τῇ ἐπι-
25^b στήμη. ἀλλ' οὖν ὅσα γε δυνατὰ ποιεῖν καὶ πάσχειν ἢ κινεῖν, τὰ δὲ κινεῖσθαι, οὐ πάντως δυνατὰ ἔστιν, ἀλλ' ὧδὲ ἔχοντα

^a 7 τὴν alt. EHIKS: om. FJ 9 ἐνέργειαν EKS: ἐντελέθειαν
ΔΤ 11 τὰ om. K καὶ om. H 14 τὸ alt. post ^a 15 τόπον
H: om. K 15 δὴ EJ 18 κινήτικῶν K ἀναγκαῖον
E²F²I²J²K²S: ἀνάγκη H: om. E¹ 21 φανείται E² 22 προϋῖσι
FH²I²J²K²S ἀναγκαῖον τοῦτο συμβαίνειν F 24 ὅτι E ἔστι F
τι] τὸ F¹ 25 ἡρεμεῖν I ἀναγκαῖον] δεῖ Λ: ἀναγκαῖον δεῖ K
26 ἦν E²KAS: om. E¹ γὰρ ἡρεμία S 27 κινήσεως KAS:
τῆς κινήσεως E πρὸ τῆς] πρώτης E¹ 28 τῷ μὲν K 29 καὶ
om. H 31 τι εἶναι om. E ^b I καὶ] ἢ EK 2 ἀλλ' om. E²

καὶ πλησιάζοντα ἀλλήλοις. ὥσθ' ὅταν πλησιάσῃ, κινεῖ, τὸ δὲ κινεῖται, καὶ ὅταν ὑπάρξῃ ὡς ἦν τὸ μὲν κωητικόν τὸ δὲ κωητόν. εἰ τοίνυν μὴ αἰεὶ ἐκωεῖτο, δηλοῦν ὡς οὐχ οὐ- 5 τως εἶχον ὡς ἦν δυνάμενα τὸ μὲν κινεῖσθαι τὸ δὲ κινεῖν, ἀλλ' ἔδει μεταβάλλειν θάτερον αὐτῶν· ἀνάγκη γὰρ ἐν τοῖς πρὸς τι τοῦτο συμβαίνειν, οἷον εἰ μὴ ὄν διπλάσιον νῦν διπλάσιον, μεταβάλλειν, εἰ μὴ ἀμφότερα, θάτερον. ἔσται ἄρα τις προ- 10 τέρα μεταβολὴ τῆς πρώτης.

πρὸς δὲ τούτοις τὸ πρότερον 10 καὶ ὕστερον πῶς ἔσται χρόνου μὴ ὄντος; ἢ χρόνος μὴ οὐσης κινήσεως; εἰ δὴ ἔστιν ὁ χρόνος κινήσεως ἀριθμὸς ἢ κινήσις τις, εἴπερ αἰεὶ χρόνος ἔστιν, ἀνάγκη καὶ κίνησις αἰδίου εἶναι. ἀλλὰ μὴν περὶ γε χρόνου ἔξω ἐνὸς ὁμοιοητικῶς ἔχοντες φαίνονται πάντες· ἀγένητον γὰρ εἶναι λέγουσιν. καὶ διὰ 15 τούτου Δημόκριτός γε δείκνυσιν ὡς ἀδύνατον ἅπαντα γεγο- νέναι τὸν γὰρ χρόνον ἀγένητον εἶναι. Πλάτων δὲ γεννᾶ μόνος· ἅμα μὲν γὰρ αὐτὸν τῷ οὐρανῷ [γεγονέναι], τὸν δ' οὐρανὸν γεγονέναι φησίν. εἰ οὖν ἀδύνατόν ἐστιν καὶ εἶναι καὶ νοῆσαι χρόνον ἄνευ τοῦ νῦν, τὸ δὲ νῦν ἐστὶ μεσότης τις, 20 καὶ ἀρχὴν καὶ τελευτὴν ἔχον ἅμα, ἀρχὴν μὲν τοῦ ἐσο- μένου χρόνου, τελευτὴν δὲ τοῦ παρελθόντος, ἀνάγκη αἰεὶ εἶναι χρόνον. τὸ γὰρ ἔσχατον τοῦ τελευταίου ληφθέντος χρόνου ἐν τῷ τῶν νῦν ἔσται (οὐδὲν γὰρ ἔστι λαβεῖν ἐν τῷ χρόνῳ παρὰ τὸ νῦν), ὥστ' ἐπεὶ ἔστιν ἀρχὴ τε καὶ τελευτὴ τὸ νῦν, 25 ἀνάγκη αὐτοῦ ἐπ' ἀμφότερα εἶναι αἰεὶ χρόνον. ἀλλὰ μὴν εἴ γε χρόνον, φανερόν ὅτι ἀνάγκη εἶναι καὶ κίνησις, εἴπερ ὁ χρόνος πάθος τι κινήσεως. 28

ὁ δ' αὐτὸς λόγος καὶ περὶ τοῦ 28

^b 3 πλησιάζῃ Λ 4 ἦν] εἶναι FHIJ²K κινήτων τὸ δὲ κωητικόν
 F 5 ἐκείτο E² 6 ἦν EJ¹KS: μὴ F¹I: om. F²HJ² 7 ἔδει
 μεταβάλλειν] μετέβαλλεν KT: μετεβαλεν E 9 μεταβάλλει E²HK
 εἰ] καὶ εἰ I τις ἄρα I 10 τὸ E²KAS: om. E¹ 11 ἦ] ἦ ὁ Λ
 12 ὁ χρόνος ἐστὶν ΚΛ ἀριθμὸς κινήσεως F 15 πάντες om. H
 ἀγένητον FK 16 τοῦτο FIK τε Λ ἅπαν E¹ 17 τὸν ...
 εἶναι om. F¹ ἀγένητον εἶναι T: ἀγένητον εἶναι E: ἀδύνατον γεγονέναι
 F²HIJ: ἀγένητον γεγονέναι K 18 γεννᾶ] αὐτὸν γεννᾶ ΚΛ:
 γεγονέναι S μὲν om. IKS αὐτὸν ΔS: om. EK γεγονέναι
 seclusi: habent ΠS 19 οὖν KAS: δέ E ἐστὶν om. S
 καὶ om. ΔS 21 καὶ pr. EKT: om. Λ ἅμα] ἀλλ' F 22 χρόνου
 om. F παρεληλυθότος Λ 25 τὸν E τε om. FH 26 αἰεὶ
 om. EK

ἄφθαρτον εἶναι τὴν κίνησιν· καθάπερ γὰρ ἐπὶ τοῦ γενέσθαι
 30 κίνησιν συνέβαιεν προτέραν εἶναι τινα μεταβολὴν τῆς πρώ-
 τῆς, οὕτως ἐνταῦθα ὑστέραν τῆς τελευταίας· οὐ γὰρ ἅμα
 παύεται κινούμενον καὶ κινήτων ὄν, οἷον καιόμενον καὶ καυ-
 στὸν ὄν (ἐνδέχεται γὰρ καυστὸν εἶναι μὴ καιόμενον), οὐδὲ
 252^a κινήτικὸν καὶ κινῶν. καὶ τὸ φθαρτικὸν δὴ δεήσει φθαρῆναι ὅταν
 φθείρη· καὶ τὸ τούτου φθαρτικὸν πάλω ὑστερον· καὶ γὰρ
 ἢ φθορὰ μεταβολή τις ἐστίν. εἰ δὴ ταῦτ' ἀδύνατα, δῆλον
 ὡς ἐστὶν ἀίδιος κίνησις, ἀλλ' οὐχ ὅτε μὲν ἦν ὅτε δ' οὐ· καὶ
 5 γὰρ ἔοικε τὸ οὕτω λέγειν πλάσματι μᾶλλον.

5 ὁμοίως δὲ
 καὶ τὸ λέγειν ὅτι πέφυκεν οὕτως καὶ ταύτην δεῖ νομίζειν εἶ-
 ναι ἀρχήν, ὅπερ ἔοικεν Ἐμπεδοκλῆς ἂν εἰπέω, ὡς τὸ κρα-
 τεῖν καὶ κινεῖν ἐν μέρει τὴν φιλίαν καὶ τὸ νεῖκος ὑπάρχει
 τοῖς πράγμασι ἐξ ἀνάγκης, ἡρεμεῖν δὲ τὸν μεταξὺ χρό-
 10 νον. τάχα δὲ καὶ οἱ μίαν ἀρχὴν ποιοῦντες, ὥσπερ Ἀναξα-
 γόρας, οὕτως ἂν εἴποιεν. ἀλλὰ μὴν οὐδέν γε ἄτακτον τῶν
 φύσει καὶ κατὰ φύσιν· ἢ γὰρ φύσις αἰτία πᾶσι τάξεως.
 τὸ δ' ἄπειρον πρὸς τὸ ἄπειρον οὐδένα λόγον ἔχει· τάξις δὲ
 πᾶσα λόγος. τὸ δ' ἄπειρον χρόνον ἡρεμεῖν, εἴτα κινήθηναί
 15 ποτε, τούτου δὲ μηδεμίαν εἶναι διαφορὰν, ὅτι νῦν μᾶλλον
 ἢ πρότερον, μηδ' αὖ τινα τάξιν ἔχειν, οὐκέτι φύσεως ἔργον.
 ἢ γὰρ ἀπλῶς ἔχει τὸ φύσει, καὶ οὐχ ὅτε μὲν οὕτως ὅτε δ'
 ἄλλως, οἷον τὸ πῦρ ἄνω φύσει φέρεται καὶ οὐχ ὅτε μὲν
 ὅτε δ' οὐ· ἢ λόγον ἔχει τὸ μὴ ἀπλοῦν. διόπερ βέλτιον ὡς
 20 Ἐμπεδοκλῆς, κἂν εἴ τις ἕτερος εἴρηκεν οὕτως ἔχειν, ἐν μέ-
 ρει τὸ πᾶν ἡρεμεῖν καὶ κινεῖσθαι πάλιν· τάξιν γὰρ ἤδη
 τι' ἔχει τὸ τοιοῦτον. ἀλλὰ καὶ τοῦτο δεῖ τὸν λέγοντα μὴ
 φάναι μόνον, ἀλλὰ καὶ τὴν αἰτίαν αὐτοῦ λέγειν, καὶ μὴ

^b 29 γὰρ EFHKS: om. IJ 30 κίνησιν KAST: καὶ κίνησιν E
 τινὰ εἶναι KAS: εἶναι τὴν E² 31 ἅμα] ἅμα ἀλλὰ E² 32 παύεται
 EJKS^c: παύσεται FHIS^p καιόμενον EKS: καόμενον Λ 33 ὄν om. K
 γὰρ] γὰρ καὶ F καόμενον Λ 252^a I κινήτων I¹ φθαρτικὸν EKS:
 φθαρτὸν Λ δὴ EIJS^c: δὲ FHKS^p 2 φθείρη KS: φθειρῆ E²:
 φθαρῆ E¹: φθείρηται Λ 3 ταῦτ' EIKS: τοῦτ' FHJ ἀδύνατα
 EKS: ἀδύνατον Λ 6 δεῖ ταύτην E: ταύτην δεῖν F εἶναι νομίζειν E
 8 ἐξ ἀνάγκης ὑπάρχει τοῖς πράγμασι S ὑπάρχειν FK 10 ὥσπερ]
 ὥσπερ καὶ Λ 12 ἢ] εἰ F¹ τάξεως πᾶσι H 14 λόγῳ H
 15 δὴ E 16 οὐκ ἐστὶ K 17 καὶ EJT: om. FHIK
 19 ἔχειν E²S ἄμεινον KS ὡς] ὡς ὁ H 20 ἕτερος] ἕτερος
 οὕτως F 22 δεῖ] δὴ J 23 ἀποφάναι Λ

τίθεσθαι μηδὲν μηδ' ἀξιοῦν ἀξίωμ' ἄλογον, ἀλλ' ἢ ἐπαγωγὴν ἢ ἀπόδειξιν φέρειν· αὐτὰ μὲν γὰρ οὐκ αἷτια τὰ ὑπο- 25
 τεθέντα, οὐδὲ τοῦτ' ἦν τὸ φιλότῃτι ἢ νεῖκει εἶναι, ἀλλὰ τῆς
 μὲν τὸ συνάγειν, τοῦ δὲ τὸ διακρίνειν. εἰ δὲ προσοριεῖται
 τὸ ἐν μέρει, λεκτέον ἐφ' ὧν οὕτως, ὥσπερ ὅτι ἔστιν τι ὃ συ-
 νάγει τοὺς ἀνθρώπους, ἢ φιλία, καὶ φεύγουσιν οἱ ἐχθροὶ
 ἀλλήλους· τοῦτο γὰρ ὑποτίθεται καὶ ἐν τῷ ὄλῳ εἶναι· φαί- 30
 νεται γὰρ ἐπὶ τιῶν οὕτως. τὸ δὲ καὶ δι' ἴσων χρόνων δεῖ-
 ται λόγον τιῶς. ὅλως δὲ τὸ νομίζειν ἀρχὴν εἶναι ταύτην
 ἱκανήν, εἴ τι αἰεὶ ἢ ἔστιν οὕτως ἢ γίνεται, οὐκ ὀρθῶς ἔχει
 ὑπολαβεῖν, ἐφ' ὃ Δημόκριτος ἀνάγει τὰς περὶ φύσεως αι-
 τίας, ὡς οὕτω καὶ τὸ πρότερον ἐγγίνετο· τοῦ δὲ αἰεὶ οὐκ 35
 ἀξιοῖ ἀρχὴν ζητεῖν, λέγων ἐπὶ τιῶν ὀρθῶς, ὅτι δ' ἐπὶ πάν- 252^b
 των, οὐκ ὀρθῶς. καὶ γὰρ τὸ τρίγωνον ἔχει δυσὶν ὀρθαῖς αἰ-
 τὰς γωνίας ἴσας, ἀλλ' ὅμως ἐστὶν τι τῆς αἰδιότητος ταύτης
 ἕτερον αἷτιον· τῶν μέντοι ἀρχῶν οὐκ ἔστιν ἕτερον αἷτιον αἰ-
 δίων οὐσῶν.

5

ὅτι μὲν οὖν οὐδεὶς ἦν χρόνος οὐδ' ἔσται ὅτε κίνη- 5
 σις οὐκ ἦν ἢ οὐκ ἔσται, εἰρήσθω τοσαῦτα.

- 2 Τὰ δὲ ἐναντία τούτοις οὐ χαλεπὸν λύειν. δόξειε δ'
 ἂν ἐκ τῶν τοιῶνδε σκοποῦσιν ἐνδέχεσθαι μάλιστα κίνησιν εἶ-
 ναί ποτε μὴ οὔσαν ὅλως, πρῶτον μὲν ὅτι οὐδεμία αἰδιος
 μεταβολή· μεταβολὴ γὰρ ἅπαντα πέφυκεν ἕκ τιος εἰς τι, 10
 ὥστε ἀνάγκη πάσης μεταβολῆς εἶναι πέρας τὰ ἐναντία ἐν οἷς
 γίνεται, εἰς ἀπειρον δὲ κινεῖσθαι μηδέν. ἔτι ὀρώμεν ὅτι
 δυνατὸν κινηθῆναι μήτε κινούμενον μήτ' ἔχον ἐν ἑαυτῷ μη-
 δεμίαν κίνησιν, οἷον ἐπὶ τῶν ἀψύχων, ὧν οὔτε μέρος οὐδὲν
 οὔτε τὸ ὅλον κινούμενον ἀλλ' ἠρεμοῦν κινεῖται ποτε· προσῆκεν 15
 δὲ ἢ αἰεὶ κινεῖσθαι ἢ μηδέποτε, εἴπερ μὴ γίνεται οὐκ οὔσα.
 πολὺ δὲ μάλιστα τὸ τοιοῦτον ἐπὶ τῶν ἐμψύχων εἶναι φα-

^a 24 ἢ] αἰεὶ I 25 γὰρ om. E¹ οὐκ αἷτια τὰ] οὐκ αἷτια E: οὐκέτι J
 26 ταῦτο ES 27 προσδιοριεῖται K 28 ὅτι] τι E τι τὸ σύναγον
 FH 30 εἶναι om. I 31 δι' om. E¹ δεῖται καὶ λόγου H
 33 εἴ τι EK et ut vid. S: ὅτι A et ut vid. P ἢ pr. AP: om. EKT
 ἔχει KAS: ἔχειν E 34 εἰς K 35 ὅτι E τὰ JKS πρότερα
 K ἐγένετο H ^b 1-2 ὅτι... ὀρθῶς om. E¹ 3 ταῖς γωνίας
 E¹ τι om. K ἰδιότητος E¹ 5 οὖν EIJKS: τοίνυν FH ἦν
 fecit E 6 οὐκ pr. E¹FIJT: ἢ οὐκ E²HK ἔστι E¹ ταῦτα E
 10 πάντα KT 11 ἀπάσης HI 17 τὸ τοιοῦτον μάλιστα I
 μᾶλλον S εἶναι] ἐστὶ FH

νερόν· οὐδεμίᾳς γὰρ ἐν ἡμῖν ἐνούσης κινήσεως ἐνίστε, ἀλλ' ἡσυχάζοντες ὁμῶς κινούμεθά ποτε, καὶ ἐγγίγνεται ἐν ἡμῖν
 20 ἐξ ἡμῶν αὐτῶν ἀρχὴ κινήσεως, κὰν μηθὲν ἔξωθεν κινήση. τοῦτο γὰρ ἐπὶ τῶν ἀψύχων οὐχ ὀρώμεν ὁμοίως, ἀλλ' αἰεὶ κινεῖ τι αὐτὰ τῶν ἔξωθεν ἕτερον· τὸ δὲ ζῶον αὐτὸ φάμεν ἑαυτὸ κινεῖν. ὥστ' εἴπερ ἡρεμεῖ ποτὲ πάμπαν, ἐν ἀκινήτῳ κίνησις ἂν γίνουτο ἐξ αὐτοῦ καὶ οὐκ ἔξωθεν. εἰ δ'
 25 ἐν ζῳῳ τοῦτο δυνατὸν γενέσθαι, τί κωλύει τὸ αὐτὸ συμβῆναι καὶ κατὰ τὸ πᾶν; εἰ γὰρ ἐν μικρῷ κόσμῳ γίγνεται, καὶ ἐν μεγάλῳ· καὶ εἰ ἐν τῷ κόσμῳ, κὰν τῷ ἀπείρῳ, 28 εἴπερ ἐνδέχεται κινεῖσθαι τὸ ἄπειρον καὶ ἡρεμεῖν ὄλον.

28

τού-

των δὴ τὸ μὲν πρῶτον λεχθέν, τὸ μὴ τὴν αὐτὴν αἰεὶ καὶ
 30 μίαν τῷ ἀριθμῷ εἶναι τὴν κίνησιω τὴν εἰς τὰ ἀντικείμενα, ὀρθῶς λέγεται. τοῦτο μὲν γὰρ ἴσως ἀναγκαῖον, εἴπερ μὴ αἰεὶ μίαν καὶ τὴν αὐτὴν εἶναι δυνατὸν τὴν τοῦ αὐτοῦ καὶ ἐνὸς κίνησιω· λέγω δ' οἷον πότερον τῆς μίας χορδῆς εἰς καὶ ὁ αὐτὸς φθόγγος, ἢ αἰεὶ ἕτερος, ὁμοίως ἐχούσης καὶ κινου-
 35 μένης. ἀλλ' ὁμῶς ὀποτέρως ποτ' ἔχει, οὐδὲν κωλύει τὴν αὐ-
 253^a τὴν εἶναι τινα τῷ συνεχῇ εἶναι καὶ ἀίδιον· δηλον δ' ἔσται μάλλον ἐκ τῶν ὕστερον. τὸ δὲ κινεῖσθαι μὴ κινούμενον οὐδὲν ἄτοπον, ἂν ὅτε μὲν ἦ τὸ κινήσον ἔξωθεν, ὅτε δὲ μή· τοῦτο μέντοι πῶς ἂν εἴη, ζητητέον, λέγω δὲ ὥστε τὸ αὐτὸ ὑπὸ
 5 τοῦ αὐτοῦ κινήτικοῦ ὄντος ὅτε μὲν κινεῖσθαι ὅτε δὲ μή· οὐδὲν γὰρ ἄλλ' ἀπορεῖ ὁ τοῦτο λέγων ἢ διὰ τί οὐκ αἰεὶ τὰ μὲν ἡρεμεῖ τῶν ὄντων τὰ δὲ κινεῖται. μάλιστα δ' ἂν δόξειεν τὸ τρίτον ἔχειν ἀπορίαν, ὡς ἐγγιγνομένης οὐκ ἐνούσης πρότερον κινήσεως, τὸ συμβαῖνον ἐπὶ τῶν ἐμψύχων· ἡρε-
 10 μοῦν γὰρ πρότερον μετὰ ταῦτα βαδίζει, κινήσαντος τῶν ἔξωθεν οὐδενός, ὡς δοκεῖ. τοῦτο δ' ἐστὶ ψεῦδος. ὀρώμεν γὰρ αἰεὶ τι κινούμενον ἐν τῷ ζῳῳ τῶν συμφύτων· τούτου δὲ τῆς

^b 18 ἐν ἡμῖν om. FH οὔσης F 19 ὁμοίως E 20 αὐτῶν om. E¹ κινήσεως ἐνίστε κὰν Λ κινήσει J 22 τι αὐτὰ κινεῖ F : τι κινεῖ αὐτὰ H : κινεῖ τι I 23 ἡρεμεῖν J 24 γένοιτο FK
 25 ἐν KAS : om. E τὸ KAS : τοῦτο τὸ E 26 κατὰ τὸ KAS : τὸ κατὰ E γίνεσθαι HIJ 27 καὶ pr.] κὰν E κὰν] καὶ F : καὶ ἐν HIJKS 30 τὰ om. FJ : τ' I 34 αἰεὶ om. I ἡχούσης fecit H
 35 ποτ' EIJKS : πῶς H : om. F 253^a I ἐστὶ J¹ 3 κινήσαν E¹IK τούτο... 5 μή EIJKS : in marg. F : om. H 6 οὐκ αἰεὶ IIS^p : om. S¹ 9 ὑπὸ I 11 γὰρ δὴ αἰεὶ K 12 τι om. J¹ τούτων E

κινήσεως οὐκ αὐτὸ τὸ ζῶον αἴτιον, ἀλλὰ τὸ περιέχον ἴσως. αὐτὸ δὲ φαμεν αὐτὸ κινεῖν οὐ πᾶσαν κίνησιν, ἀλλὰ τὴν κατὰ τόπον. οὐδὲν οὖν κωλύει, μᾶλλον δ' ἴσως ἀναγκαῖον, 15 ἐν μὲν τῷ σώματι πολλὰς ἐγγίγνεσθαι κινήσεις ὑπὸ τοῦ περιέχοντος, τούτων δ' ἐνίας τὴν διάνοιαν ἢ τὴν ὄρεξιν κινεῖν, ἐκείνην δὲ τὸ ὅλον ἤδη ζῶον κινεῖν, οἷον συμβαίνει περὶ τοὺς ὕπνους· αἰσθητικῆς μὲν γὰρ οὐδεμιᾶς ἐνούσης κινήσεως, ἐνούσης μέντοι τινός, ἐγείρεται τὰ ζῶα πάλιν. ἀλλὰ γὰρ 20 φανερόν ἐσται καὶ περὶ τούτων ἐκ τῶν ἐπομένων.

- 3 Ἀρχὴ δὲ τῆς σκέψεως ἥπερ καὶ περὶ τῆς λεχθείσης ἀπορίας, διὰ τί ποτε ἕνια τῶν ὄντων ὄτε μὲν κινεῖται ὄτε δὲ ἡρεμεῖ πάλιν. ἀνάγκη δὴ ἦτοι πάντα ἡρεμεῖν αἰεὶ, ἢ πάντα αἰεὶ κινεῖσθαι, ἢ τὰ μὲν κινεῖσθαι τὰ δ' ἡρεμεῖν, καὶ 25 πάλιν τούτων ἦτοι τὰ μὲν κινούμενα κινεῖσθαι αἰεὶ τὰ δ' ἡρεμοῦντα ἡρεμεῖν, ἢ πάντα πεφυκέναι ὁμοίως κινεῖσθαι καὶ ἡρεμεῖν, ἢ τὸ λοιπὸν ἔτι καὶ τρίτον. ἐνδέχεται γὰρ τὰ μὲν αἰεὶ τῶν ὄντων ἀκίνητα εἶναι, τὰ δ' αἰεὶ κινούμενα, τὰ δ' ἀμφοτέρωθεν μεταλαμβάνειν· ὅπερ ἡμῖν λεκτέον ἐστίν· τοῦτο 30 γὰρ ἔχει λύσιν τε πάντων τῶν ἀπορουμένων, καὶ τέλος ἡμῖν ταύτης τῆς πραγματείας ἐστίν. τὸ μὲν οὖν πάντ' ἡρεμεῖν, καὶ τούτου ζητεῖν λόγον ἀφέντας τὴν αἰσθησιν, ἀρρωστία τίς ἐστὶν διανοίας, καὶ περὶ ὅλου τινός ἀλλ' οὐ περὶ μέρους ἀμφισβήτησις· οὐδὲ μόνον πρὸς τὸν φυσικόν, ἀλλὰ πρὸς πάσας τὰς 35 ἐπιστήμας ὡς εἰπεῖν καὶ πάσας τὰς δόξας διὰ τὸ κινήσει 253^b χρῆσθαι πάσας. ἔτι δ' αἱ περὶ τῶν ἀρχῶν ἐνστάσεις, ὥσπερ ἐν τοῖς περὶ τὰ μαθήματα λόγοις οὐδέν εἰσιν πρὸς τὸν μαθηματικόν, ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων, οὕτως οὐδὲ περὶ τοῦ νῦν ῥηθέντος πρὸς τὸν φυσικόν· ὑπόθεσις γὰρ ὅτι ἡ φυ- 5 σις ἀρχὴ τῆς κινήσεως. 6

σχεδὸν δὲ καὶ τὸ φάναι κινεῖσθαι 6

α 15 ἴσως δ' F	16 ἐν μὲν EKT: om. Λ	τῷ σώματι
post κινήσεις F	17 ἕνια K	ἐκείνη K
20 τὰ] πάντα τὰ E	πάλιν om. E	22 ἥπερ JS: ἔπερ E:
ἔσται ἥπερ FHIK	περὶ om. J	23 ποτε om. F
κινεῖ τε E ¹	24 δὴ ἦτοι FJKT: δ' ἦτοι EI: δὴ τοι H	πάντα
καὶ ἡρεμεῖν F	27 κινεῖσθαι om. F ¹	31 πάντων τε Λ: γε
πάντων F	33 ἀφέντα K	35 τὸ HI
E ¹	3 ἔστιν E ¹ : ἔτι E ²	ἀπάσας EKS
6 τῆς EFKS: τις HIJ	τὸ FI: τὰ K	b 2 χρῆ
4 περὶ F	οὕτως om. K	μαθηματικὰ K: μαθη-
6 τῆς EFKS: τις HIJ	οὐδέν H	5 τὸν] τὸ I
πάντα κινεῖσθαι Λ	δέ τι καὶ IJS	κινεῖσθαι πάντα EKS:

πάντα ψεύδος μὲν, ἦττον δὲ τούτου παρὰ τὴν μέθοδον· ἐτέ-
 θη μὲν γὰρ ἡ φύσις ἐν τοῖς φυσικοῖς ἀρχῇ, καθάπερ κινή-
 σεως, καὶ ἡρεμίας, ὅμως δὲ φυσικὸν ἡ κίνησις· καὶ φασί
 10 τινες κινεῖσθαι τῶν ὄντων οὐ τὰ μὲν τὰ δ' οὐ, ἀλλὰ πάντα
 καὶ αἰεὶ, ἀλλὰ λανθάνειν τοῦτο τὴν ἡμετέραν αἴσθησιν· πρὸς
 οὓς καίπερ οὐ διορίζοντας ποίαν κίνησιν λέγουσιν, ἢ πάσας,
 οὐ χαλεπὸν ἀπαντῆσαι. οὔτε γὰρ αὐξάνεσθαι οὔτε φθίνειν
 οἶόν τε συνεχῶς, ἀλλ' ἔστι καὶ τὸ μέσον. ἔστι δ' ὅμοιος ὁ λό-
 15 γος τῷ περὶ τοῦ τὸν σταλαγμὸν κατατρίβειν καὶ τὰ ἐκφυ-
 ὄμενα τοὺς λίθους διαιρεῖν· οὐ γὰρ εἰ τοσοῦδε ἐξέωσεν ἢ ἀφεῖ-
 λεν ὁ σταλαγμὸς, καὶ τὸ ἡμισυ ἐν ἡμίσει χρόνῳ πρότερον·
 ἀλλ' ὥσπερ ἡ νεωκλία, καὶ οἱ σταλαγμοὶ οἱ τοσοῖδι τοσοῖδι
 κινουῦσιν, τὸ δὲ μέρος αὐτῶν ἐν οὐδενὶ χρόνῳ τοσοῦτον. διαιρεῖ-
 20 ται μὲν οὖν τὸ ἀφαιρεθὲν εἰς πλείω, ἀλλ' οὐδὲν αὐτῶν ἐκινήθη
 χωρὶς, ἀλλ' ἅμα. φανερόν οὖν ὡς οὐκ ἀναγκαῖον αἰεὶ τι
 ἀπιέναι, ὅτι διαιρεῖται ἢ φθίσις εἰς ἄπειρα, ἀλλ' ὅλον ποτὲ
 ἀπιέναι. ὁμοίως δὲ καὶ ἐπ' ἀλλοιώσεως ὅποιασοῦν· οὐ
 γὰρ εἰ μεριστὸν εἰς ἄπειρα τὸ ἀλλοιούμενον, διὰ τοῦτο καὶ
 25 ἡ ἀλλοίωσις, ἀλλ' ἀθρόα γίνεται πολλάκις, ὥσπερ ἡ πῆ-
 ξις. ἔτι ὅταν τι νοσήσῃ, ἀνάγκη χρόνον γενέσθαι ἐν ᾧ ὑγι-
 ασθήσεται, καὶ μὴ ἐν πέρατι χρόνου μεταβάλλειν· ἀνάγκη
 δὲ εἰς ὑγίειαν μεταβάλλειν καὶ μὴ εἰς ἄλλο μηθέν. ὥστε
 τὸ φάναι συνεχῶς ἀλλοιοῦσθαι λίαν ἐστὶ τοῖς φανεροῖς ἀμ-
 30 φισβητεῖν. εἰς τὸνναντίον γὰρ ἡ ἀλλοίωσις· ὁ δὲ λίθος οὔτε
 σκληρότερος γίνεται οὔτε μαλακώτερος. κατὰ τε τὸ φέρε-
 σθαι θαυμαστὸν εἰ λέληθεν ὁ λίθος κάτω φερόμενος ἢ μένων
 ἐπὶ τῆς γῆς. ἔτι δ' ἡ γῆ καὶ τῶν ἄλλων ἕκαστον ἐξ ἀνάγκης
 μένουσι μὲν ἐν τοῖς οἰκείοις τόποις, κινουῦνται δὲ βιαίως

^b 7 τοῦτο Λ 8 μὲν om. E² 9 ὅμως Camotiana:
 ὁμοίως Π: οὐχ ὁμοίως Gaye καὶ om. E 11 λανθάνει
 E² 12 ἢ (εἰ) Thoresby Jones πάσαν I 13 ἀπαντᾶν J¹
 14 ἔστι (ἔστι τι S) καὶ τὸ μέσον KAS: om. E 15 ὁ om. E
 15 τοῦ om. I 16 ἔωσεν KAP 17 πρότερον om. H 18 τοσοῖδῃ
 E²: τοσοῖδε FHST: E¹ incertum 19 τοσοῖδι JT: τοσοῖδε EFHIK
 21 ἅμα] ἅμα ὅλον H 22-3 ὅτι . . . ἀπιέναι om. I 23 ὅποιασ-
 οῦν KAST: ὅποιασποτοῦν E 24 ἄπειρα E J² KSP: ἄπειρον
 FHIJ¹ S^o T 26 νοσήσῃ τι FH: τις νοσήσῃ E²: νοσήσῃ τις
 IJK 27 πέρασι FK² ἀνάγκη . . . 28 μεταβάλλειν om. F¹
 27 ἀνάγκη δὲ εἰς] καὶ E¹: καὶ εἰς E² 28 μὴ om. KA 30 δέ]
 τε FIJ¹ K 34 μὲν om. F κινεῖται FHI

ἐκ τούτων· εἴπερ οὖν ἐνὶ αὐτῶν ἔστιν ἐν τοῖς οἰκείοις τόποις, 35
ἀνάγκη μὴδὲ κατὰ τόπον πάντα κινεῖσθαι. 254^a

ὅτι μὲν οὖν ἀδύ- 1
νατον ἢ αἰεὶ πάντα κινεῖσθαι ἢ αἰεὶ πάντα ἡρεμεῖν, ἐκ τού-
των καὶ ἄλλων τοιούτων πιστεύσειεν ἂν τις. ἀλλὰ μὴν οὐδὲ
τὰ μὲν αἰεὶ ἐνδέχεται ἡρεμεῖν, τὰ δ' αἰεὶ κινεῖσθαι, ποτὲ δ'
ἡρεμεῖν καὶ ποτὲ κινεῖσθαι μὴδέν. λεκτέον δ' ὅτι ἀδύνατον, 5
ὥσπερ ἐπὶ τῶν εἰρημένων πρότερον, καὶ ἐπὶ τούτων (ὀρώμεν
γὰρ ἐπὶ τῶν αὐτῶν γιγνομένας τὰς εἰρημένας μεταβολάς),
καὶ πρὸς τούτοις ὅτι μάχεται τοῖς φανεροῖς ὁ ἀμφισβητῶν
οὔτε γὰρ αὐξήσις οὔθ' ἢ βίαιος ἔσται κίνησις, εἰ μὴ κινή-
σεται παρὰ φύσιν ἡρεμοῦν πρότερον. γένεσιν οὖν ἀναιρεῖ καὶ 10
φθορὰν οὗτος ὁ λόγος. σχεδὸν δὲ καὶ τὸ κινεῖσθαι γίγνεσθαι
τι καὶ φθειρεσθαι δοκεῖ πᾶσιν· εἰς ὃ μὲν γὰρ μεταβάλλει,
γίγνεται τοῦτο ἢ ἐν τούτῳ, ἐξ οὗ δὲ μεταβάλλει, φθείρεται
τοῦτο ἢ ἐντεῦθεν. ὥστε δῆλον ὅτι τὰ μὲν κινεῖται, τὰ δ' ἡρε-
μεῖ ἐνίοτε.

15
τὸ δὲ πάντα ἀξιοῦν ὅτε μὲν ἡρεμεῖν ὅτε δὲ κινεῖσθαι, τοῦτ' ἤδη συναπτέον πρὸς τοὺς πάλαι λόγους. ἀρχὴν
δὲ πάλιν ποιητέον ἀπὸ τῶν νῦν διορισθέντων, τὴν αὐτὴν ἦν περ
ἡρξάμεθα πρότερον. ἢ γάρ τοι πάντα ἡρεμεῖ, ἢ πάντα κινεῖται, ἢ
τὰ μὲν ἡρεμεῖ τὰ δὲ κινεῖται τῶν ὄντων. καὶ εἰ τὰ μὲν ἡρεμεῖ τὰ
δὲ κινεῖται, ἀνάγκη ἦτοι πάντα ὅτε μὲν ἡρεμεῖν ὅτε δὲ κινεῖσθαι, 20
(ἢ τὰ μὲν αἰεὶ ἡρεμεῖν τὰ δὲ αἰεὶ κινεῖσθαι), ἢ τὰ μὲν αἰεὶ ἡρεμεῖν
τὰ δὲ αἰεὶ κινεῖσθαι αὐτῶν, τὰ δ' ὅτε μὲν ἡρεμεῖν ὅτε δὲ κινεῖσθαι.
ὅτι μὲν τοίνυν οὐχ οἴον τε πάντ' ἡρεμεῖν, εἴρηται μὲν καὶ πρότε-
ρον, εἴπωμεν δὲ καὶ νῦν. εἰ γὰρ καὶ κατ' ἀλήθειαν οὕτως ἔχει
καθάπερ φασί τινες, εἶναι τὸ ὄν ἄπειρον καὶ ἀκίνητον, ἀλλ' 25
οὔτι φαίνεται γε κατὰ τὴν αἴσθησιν, ἀλλὰ κινεῖσθαι πολλὰ

^b 35 ἔστιν αὐτῶν K 254^a I οὖν οὐ δυνατόν HI 3 τοιούτων
ἄλλων F οὐδὲ E J² K S : οὔτε F H I J¹ 7 ἐπὶ K A T : καὶ ἐπὶ E
9 γὰρ] γὰρ ἢ E ἔστι F 11 δὲ om. F 13-14 ἐξ . . . τοῦτο
om. K¹ 18 ἦτοι γὰρ K κινεῖται ἢ πάντα ἡρεμεῖ F 19 τὰ
alt.] αἰεὶ τὰ E¹ 20 κινεῖται τῶν ὄντων ἀνάγκη K A 21-2 ἢ pr. . .
δὲ κινεῖσθαι] καὶ πάλιν τούτων ἢ τὰ μὲν κινούμενα κινεῖται αἰεὶ τὰ δ'
ἡρεμοῦντα ἡρεμεῖ, ἢ ὁμοίως πάντα ὅτε μὲν ἡρεμεῖ ὅτε δὲ κινεῖται
margo K 21 αἰεὶ alt. om. J 21 ἢ . . . κινεῖσθαι addidi hic :
post αὐτῶν^a 22 add. Prantl : om. IIS 23 μὲν EFJKS : μὲν
οὖν HI 24 εἶπων E¹ : εἶπομεν J καὶ alt. om. K 25 τινές
φασιν K A 26 οὔτοι I κινεῖται F H I

τῶν ὄντων. εἶπερ οὖν ἔστιν δόξα ψευδῆς ἢ ὅλως δόξα, καὶ
 κίνησις ἔστιν, κὰν εἰ φαντασία, κὰν εἰ ὅτε μὲν οὕτως δοκεῖ
 ὅτε δ' ἑτέρως· ἢ γὰρ φαντασία καὶ ἢ δόξα κινήσει
 30 τινὲς εἶναι δοκοῦσιν. ἀλλὰ τὸ μὲν περὶ τούτου σκοπεῖν, καὶ
 ζητεῖν λόγον ὧν βέλτιον ἔχομεν ἢ λόγου δεῖσθαι, κακῶς
 κρίνειν ἔστιν τὸ βέλτιον καὶ τὸ χεῖρον, καὶ τὸ πιστὸν καὶ τὸ
 μὴ πιστόν, καὶ ἀρχὴν καὶ μὴ ἀρχήν. ὁμοίως δὲ ἀδύνατον
 καὶ τὸ πάντα κινεῖσθαι, ἢ τὰ μὲν αἰεὶ κινεῖσθαι τὰ δ' αἰεὶ
 35 ἡρεμεῖν. πρὸς ἅπαντα γὰρ ταῦτα ἰκανὴ μία πίστις· ὀρῶ-
 254^b μεν γὰρ ἔνια ὅτε μὲν κινούμενα ὅτε δ' ἡρεμοῦντα. ὥστε φα-
 νερόν ὅτι ἀδύνατον ὁμοίως τὸ πάντα ἡρεμεῖν καὶ τὸ πάντα
 κινεῖσθαι συνεχῶς τῷ τὰ μὲν αἰεὶ κινεῖσθαι τὰ δ' ἡρεμεῖν
 αἰεὶ. λοιπὸν οὖν θεωρῆσαι πότερον πάντα τοιαῦτα οἷα κινεῖ-
 5 σθαι καὶ ἡρεμεῖν, ἢ ἔνια μὲν οὕτως, ἔνια δ' αἰεὶ ἡρεμεῖ, ἔνια
 δ' αἰεὶ κινεῖται· τούτο γὰρ δεικτέον ἡμῖν.

Τῶν δὴ κινούντων καὶ κινουμένων τὰ μὲν κατὰ συμβε- 4
 βηκὸς κινεῖ καὶ κινεῖται, τὰ δὲ καθ' αὐτά, κατὰ συμβε-
 βηκὸς μὲν οἷον ὅσα τε τῷ ὑπάρχειν τοῖς κινούσιν ἢ κινου-
 10 μένοις καὶ τὰ κατὰ μόριον, τὰ δὲ καθ' αὐτά, ὅσα μὴ τῷ
 ὑπάρχειν τῷ κινοῦντι ἢ τῷ κινουμένῳ, μηδὲ τῷ μόριόν τι
 αὐτῶν κινεῖν ἢ κινεῖσθαι. τῶν δὲ καθ' αὐτά τὰ μὲν ὑφ'
 ἑαυτοῦ τὰ δ' ὑπ' ἄλλου, καὶ τὰ μὲν φύσει τὰ δὲ βίᾳ
 καὶ παρὰ φύσιν. τό τε γὰρ αὐτὸ ὑφ' αὐτοῦ κινούμενον φύ-
 15 σει κινεῖται, οἷον ἕκαστον τῶν ζῴων (κινεῖται γὰρ τὸ ζῶον
 αὐτὸ ὑφ' αὐτοῦ, ὅσων δ' ἢ ἀρχὴ ἐν αὐτοῖς τῆς κινήσεως,
 ταῦτα φύσει φαμέν κινεῖσθαι· διὸ τὸ μὲν ζῶον ὅλον φύσει
 αὐτὸ ἑαυτὸ κινεῖ, τὸ μέντοι σῶμα ἐνδέχεται καὶ φύσει καὶ
 παρὰ φύσιν κινεῖσθαι· διαφέρει γὰρ ὅποιον τε ἂν κίνησιν
 20 κινούμενον τύχῃ καὶ ἐκ ποίου στοιχείου συνεστηκός), καὶ τῶν
 ὑπ' ἄλλον κινουμένων τὰ μὲν φύσει κινεῖται τὰ δὲ παρὰ

^a 27 καὶ] εἰ H 28 κὰν] καὶ H¹K εἰ] ἢ E²: ἢ J² εἰ
 om. F, erasit J 29 εἶναι ὅτε FHI 30 εἶναι EFJKS:
 om. HI τούτων F: τοῦ I 31 ὧν om. E¹ 32 τὸ alt.
 om. E τὸ tert. E²KAS: om. E¹ 34 αἰεὶ om. H ἡρεμεῖν
 αἰεὶ HIJ 35 μία ἰκανὴ FHIJ² ^b I ὅτε διηρεμοῦντα E¹ 4 θεω-
 ρῆσαι E¹JKS: θεωρητέον FHIJ² 8 αὐτὸ FH 9 οἷον om.
 K¹ 10 τὰ pr. om. E¹K¹ 11 τῷ alt. om. EIJ 12 τὰ
 om. E¹K μὲν . . . 13 τὰ pr. om. E¹ 16 δ'] τε K 17 διότι
 τὸ E² 18 αὐτὸ om. I μέντοι] δέ K 19 διαφέρει H
 ἂν om. FHIJ¹K 20 καὶ alt. om. E¹ 21 κινεῖσθαι K

φύσιν, παρὰ φύσιν μὲν οἶον τὰ γεγραὰ ἄνω καὶ τὸ πῦρ κάτω, ἔτι δὲ τὰ μόρια τῶν ζώων πολλάκις κινεῖται παρὰ φύσιν, παρὰ τὰς θέσεις καὶ τοὺς τρόπους τῆς κινήσεως. καὶ μάλιστα τὸ ὑπό τιος κινεῖσθαι τὸ κινούμενον ἐν τοῖς παρὰ φύ- 25 σιν κινουμένοις ἐστὶ φανερόν διὰ τὸ δῆλον εἶναι ὑπ' ἄλλου κινούμενον. μετὰ δὲ τὰ παρὰ φύσιν τῶν κατὰ φύσιν τὰ αὐτὰ ὑφ' αὐτῶν, οἶον τὰ ζῶα· οὐ γὰρ τοῦτ' ἀδῆλον, εἰ ὑπό τιος κινεῖται, ἀλλὰ πῶς δεῖ διαλαβεῖν αὐτοῦ τὸ κινεῖν καὶ τὸ κινούμενον· ἔοικεν γὰρ ὡσπερ ἐν τοῖς πλοίοις καὶ τοῖς μὴ 30 φύσει συνισταμένοις, οὕτω καὶ ἐν τοῖς ζῷοις εἶναι διηρημένον τὸ κινεῖν καὶ τὸ κινούμενον, καὶ οὕτω τὸ ἅπαν αὐτὸ αὐτὸ κινεῖν.

33

μάλιστα δ' ἀπορεῖται τὸ λοιπὸν τῆς εἰρημένης τελευ- 33 ταίας διαιρέσεως· τῶν γὰρ ὑπ' ἄλλου κινουμένων τὰ μὲν παρὰ φύσιν ἐθήκαμεν κινεῖσθαι, τὰ δὲ λείπεται ἀντιθεῖναι 35 ὅτι φύσει. ταῦτα δ' ἐστὶν ἅ τὴν ἀπορίαν παράσχοι ἂν ὑπὸ 255^a τίνος κινεῖται, οἶον τὰ κοῦφα καὶ τὰ βαρέα. ταῦτα γὰρ εἰς μὲν τοὺς ἀντικειμένους τόπους βία κινεῖται, εἰς δὲ τοὺς οἰκειούς, τὸ μὲν κοῦφον ἄνω τὸ δὲ βαρὺ κάτω, φύσει· τὸ δ' ὑπὸ τίνος οὐκέτι φανερόν, ὡσπερ ὅταν κινῶνται παρὰ φύσιν. τό 5 τε γὰρ αὐτὰ ὑφ' αὐτῶν φάναι ἀδύνατον· ζωτικόν τε γὰρ τοῦτο καὶ τῶν ἐμφύχων ἴδιον, καὶ ἰσάναί ἂν ἐδύνατο αὐτὰ αὐτὰ (λέγω δ' οἶον, εἰ τοῦ βαδίζεω αἴτιον αὐτῷ, καὶ τοῦ μὴ βαδίζεω), ὥστ' εἰ ἐπ' αὐτῷ τὸ ἄνω φέρεσθαι τῷ πυρὶ, δῆ- 10 λον ὅτι ἐπ' αὐτῷ καὶ τὸ κάτω. ἄλογον δὲ καὶ τὸ μίαν κίνησιν κινεῖσθαι μόνην ὑφ' αὐτῶν, εἴγε αὐτὰ ἑαυτὰ κινουσίω. ἔτι πῶς ἐνδέχεται συνεχές τι καὶ συμφυές αὐτὸ ἑαυτὸ κινεῖν; ἢ γὰρ ἐν καὶ συνεχές μὴ ἀφή, ταύτῃ ἀπαθές· ἀλλ' ἢ κεχώρισται, ταύτῃ τὸ μὲν πέφυκε ποιεῖν τὸ δὲ πά-

^b 23 δὲ καὶ τὰ K 27 τῶν κατὰ φύσιν om. E¹ 28 τὰ KAS: om. E 29 κινεῖ E¹ λαβεῖν T 30-32 ἔοικεν . . . κινούμενον om. J 30 γὰρ τάχα ὡσπερ FK² 32 πᾶν S κινεῖν EFJKST: κινεῖ HI 35 ἀντιθεῖναι K: τιθεῖναι E¹: τιθέναι E² 255^a 2 κινῆται E² τὰ alt. om. H γὰρ ἂν εἰς FK² 3 μὲν EFJKS: om. HI βία κινεῖται τόπους I εἰ E² 5 κινεῖνται E¹ 7 δύναίτο F αὐτὰ αὐτὰ scripsi: αὐτο αὐτο E: αὐτὸ ἑαυτὸ K: αὐτὰ F: αὐτὰ HIJ 8 τοῦ alt.] τὸ E² 9 εἰ EKS: ἐπεὶ A αὐτὸ J 10 ἐπ' αὐτῷ om. S καὶ τὸ pr. KAS: καὶ E¹: τὸ καὶ E² 11 μόνην EFHJ¹S: μόνον K: ταῦτα μόνην J²: om. I αὐτὰ om. S 12 συμφυές τι καὶ συνεχές I 13-14 ταύτῃ . . . κεχώρισται om. E¹

- 15 σχει. οὐτ' ἄρα τούτων οὐθεν αὐτὸ ἑαυτὸ κινεῖ (συμφυῆ γάρ), οὐτ' ἄλλο συνεχὲς οὐδέν, ἀλλ' ἀνάγκη διηρηθῆσθαι τὸ κινουὸν ἐν ἐκάστω πρὸς τὸ κινούμενον, οἷον ἐπὶ τῶν ἀψύχων ὄρωμεν, ὅταν κινή τι τῶν ἐμψύχων. ἀλλὰ συμβαίνει καὶ ταῦτα ὑπὸ τινος αἰεὶ κινεῖσθαι· γένοιτο δ' ἂν φανερόν διαι-
- 20 ροῦσι τὰς αἰτίας. ἔστιν δὲ καὶ ἐπὶ τῶν κινούντων λαβεῖν τὰ εἰρημμένα· τὰ μὲν γὰρ παρὰ φύσιν αὐτῶν κινητικὰ ἔστω, οἷον ὁ μοχλὸς οὐ φύσει τοῦ βάρους κινητικός, τὰ δὲ φύσει, οἷον τὸ ἐνεργεῖα θερμὸν κινητικὸν τοῦ δυνάμει θερμοῦ. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. καὶ κινητὸν δ' ὡσαύτως
- 25 φύσει τὸ δυνάμει ποιδὸν ἢ ποσὸν ἢ πού, ὅταν ἔχη τὴν ἀρχὴν τὴν τοιαύτην ἐν αὐτῷ καὶ μὴ κατὰ συμβεβηκός (εἴη γὰρ ἂν τὸ αὐτὸ καὶ ποιδὸν καὶ ποσόν, ἀλλὰ θατέρῳ θάτερον συμβέβηκεν καὶ οὐ καθ' αὐτὸ ὑπάρχει). τὸ δὲ πῦρ καὶ ἡ γῆ κινούνται ὑπὸ τινος βία μὲν ὅταν παρὰ φύσιν, φύσει
- 30 δ' ὅταν εἰς τὰς αὐτῶν ἐνεργείας δυνάμει ὄντα.
- 30 ἐπεὶ δὲ τὸ δυνάμει πλεοναχῶς λέγεται, τοῦτ' αἴτιον τοῦ μὴ φανερόν εἶναι ὑπὸ τίνος τὰ τοιαῦτα κινεῖται, οἷον τὸ πῦρ ἄνω καὶ ἡ γῆ κάτω. ἔστι δὲ δυνάμει ἄλλως ὁ μαυθάνων ἐπιστήμων καὶ ὁ ἔχων ἤδη καὶ μὴ ἐνεργῶν. αἰεὶ δ', ὅταν ἅμα τὸ ποι-
- 35 ητικὸν καὶ τὸ παθητικὸν ὦσι, γίνεταί ἐνεργεῖα τὸ δυ-
- 255^b νατόν, οἷον τὸ μαυθάνων ἐκ δυνάμει ὄντος ἕτερον γίνεταί δυ-
νάμει (ὁ γὰρ ἔχων ἐπιστήμην μὴ θεωρῶν δὲ δυνάμει ἔστιν ἐπιστήμων πως, ἀλλ' οὐχ ὡς καὶ πρὶν μαθεῖν), ὅταν δ' οὕτως ἔχη, ἐάν τι μὴ κωλύη, ἐνεργεῖ καὶ θεωρεῖ, ἢ ἔσται ἐν τῇ
- 5 ἀντιφάσει καὶ ἐν ἀγνοίᾳ. ὁμοίως δὲ ταῦτ' ἔχει καὶ ἐπὶ τῶν φυσικῶν· τὸ γὰρ ψυχρὸν δυνάμει θερμὸν, ὅταν δὲ μεταβάλλῃ, ἤδη πῦρ, καίει δέ, ἂν μὴ τι κωλύη καὶ ἐμποδίζῃ. ὁμοίως δ' ἔχει καὶ περὶ τὸ βαρὺ καὶ κοῦφον· τὸ γὰρ κοῦ-
- ^a 15 συμφυῆς E 16 οὐτ' οὐδὲ S διαιρεῖσθαι H 18 ἐμψύχων αὐτὰ ἀλλὰ E²KA 19 αὐτὰ H αἰεὶ EFHJKS: om. IT ἂν om. F 23 τὸ] τὰ J 27 ἂν om. F καὶ] κατὰ F ποσὸν καὶ ποῖον FIJ 29 κινεῖται F 30 τὴν... ἐνεργεῖαν F 31 λέγεται καὶ τοῦτο S 34 ἐνεργῶν E et ut vid. S: θεωρῶν KA αἰεὶ PS: εἰ Hayduck 35 τὸ om. E¹S γίνεταί FI γρ. A: γίνεταί ἐνίοτε EF²HJKAS ^b 2 ἔστιν om. H 4 μὴ τι KPS τῇ om. S 5 ἐν E²HS γρ. A: οὐκ ἐν J: οὐχ ἀπλῶς ἐν A: om. E¹FIK ἀγνοία: ὁμοίως δὲ Hayduck 6 μεταβάλλῃ H 7 καίη E¹ κωλύση καὶ ἐμποδίσῃ A 8 καὶ τὸ κοῦφον K τὸ γὰρ κοῦφον om. E¹K¹

φον γίγνεται ἐκ βαρέος, οἶον ἐξ ὕδατος ἀήρ (τοῦτο γὰρ δυ-
νάμει πρῶτον), καὶ ἤδη κούφον, καὶ ἐνεργήσει γ' εὐθύς, ἂν 10
μή τι κωλύη. ἐνέργεια δὲ τοῦ κούφου τὸ πού εἶναι καὶ ἄνω,
κωλύεται δ', ὅταν ἐν τῷ ἐναντίῳ τόπῳ ἦ. καὶ τοῦθ' ὁμοίως
ἔχει καὶ ἐπὶ τοῦ ποσοῦ καὶ ἐπὶ τοῦ ποιοῦ. 13

καίτοι τοῦτο ζῆ- 13

τεῖται, διὰ τί ποτε κινεῖται εἰς τὸν αὐτῶν τόπον τὰ κούφα
καὶ τὰ βαρέα. αἴτιον δ' ὅτι πέφυκέν ποι, καὶ τοῦτ' ἔστιν τὸ 15
κούφῳ καὶ βαρεῖ εἶναι, τὸ μὲν τῷ ἄνω τὸ δὲ τῷ κάτω
διωρισμένον. δυνάμει δ' ἔστιν κούφον καὶ βαρὺ πολλαχῶς,
ὥσπερ εἴρηται· ὅταν τε γὰρ ἦ ὕδωρ, δυνάμει γέ πῶς ἐστι
κούφον, καὶ ὅταν ἀήρ, ἔστιν ὡς ἔτι δυνάμει (ἐνδέχεται γὰρ
ἐμποδιζόμενον μὴ ἄνω εἶναι)· ἀλλ' ἔαν ἀφαιρεθῆ τὸ ἐμπο- 20
δίξον, ἐνεργεῖ καὶ ἀεὶ ἀνωτέρω γίγνεται. ὁμοίως δὲ καὶ τὸ
ποιὸν εἰς τὸ ἐνεργεῖα εἶναι μεταβάλλει· εὐθύς γὰρ θεωρεῖ
τὸ ἐπιστήμον, ἔαν μή τι κωλύη· καὶ τὸ ποσὸν ἐκτείνεται,
ἔαν μή τι κωλύη. ὁ δὲ τὸ ὑφιστάμενον καὶ κωλύον κινή- 25
σας ἔστιν ὡς κινεῖ ἔστι δ' ὡς οὐ, οἶον ὁ τὸν κίονα ὑπο- 25
σπάσας ἢ ὁ τὸν λίθον ἀφελὼν ἀπὸ τοῦ ἀσκού ἐν τῷ ὕδατι
κατὰ συμβεβηκὸς γὰρ κινεῖ, ὥσπερ καὶ ἡ ἀνακλασθεῖσα
σφαῖρα οὐχ ὑπὸ τοῦ τοίχου ἐκινήθη ἀλλ' ὑπὸ τοῦ βάλλον-
τος. ὅτι μὲν τοίνυν οὐδὲν τούτων αὐτὸ κινεῖ ἑαυτό, δῆλον·
ἀλλὰ κινήσεως ἀρχὴν ἔχει, οὐ τοῦ κινεῖν οὐδὲ τοῦ ποι- 30
εῖν, ἀλλὰ τοῦ πάσχειν. εἰ δὴ πάντα τὰ κινούμενα ἢ φύ-
σει κινεῖται ἢ παρὰ φύσιν καὶ βία, καὶ τὰ τε βία καὶ
παρὰ φύσιν πάντα ὑπό τινος καὶ ὑπ' ἄλλον, τῶν δὲ φύ-
σει πάλιν τὰ θ' ὑφ' αὐτῶν κινούμενα ὑπό τινος κινεῖται
καὶ τὰ μὴ ὑφ' αὐτῶν, οἶον τὰ κούφα καὶ τὰ βαρέα 35
(ἢ γὰρ ὑπὸ τοῦ γεννήσαντος καὶ ποιήσαντος κούφον ἢ βαρὺ, 256^a
ἢ ὑπὸ τοῦ τὰ ἐμποδιζόντα καὶ κωλύοντα λύσαντος), ἅπαντα
ἂν τὰ κινούμενα ὑπό τινος κινεῖτο.

^b 10 γ' om. F 11 τόπον εἶναι E² 12 δ' om. E¹ ἐν
τῷ om. K¹ 13 ἐπὶ τοῦ alt. om. F καίτοι] καὶ S ζῆτεῖται
E²KAS: ζῆτεῖ E¹ 14 αὐτὸν EF 15 καὶ τὰ] τε καὶ H
που S 16 καὶ] ἢ H κάτω τὸ δὲ τῷ ἄνω FH 17 διωρισ-
μένων J πλεοναχῶς FH 18 τε om. HK¹ γέ om. H:
δέ F 19 ὡς EHS: om. FIJK γὰρ om. E 21 φέρεται
FH 25 ὡς EFIJKS: μὲν ὡς HT κινεῖται F¹ 26 ὁ om.
FKT ἐν δὲ τῷ E 27 ἢ om. F 29 αὐτὸ om. S ἑαυτὸ
κινεῖ F 33 τὰ παρὰ K 34 ὑπ' αὐτῶν E 35 τὰ τε
κούφα Λ 256^a 2 ἢ om. E¹ 3 ἂν . . . τινος] ἄρα . . . τινος ἂν Λ

Τούτο δὲ διχῶς· ἢ γὰρ οὐ δι' αὐτὸ τὸ κινεῖν, ἀλλὰ δι' 5
 5 ἕτερον ὃ κινεῖ τὸ κινεῖν, ἢ δι' αὐτό, καὶ τοῦτο ἢ πρῶτον
 μετὰ τὸ ἔσχατον ἢ διὰ πλειόνων, οἷον ἢ βακτηρία κινεῖ τὸν
 λίθον καὶ κινεῖται ὑπὸ τῆς χειρὸς κινουμένης ὑπὸ τοῦ ἀν-
 θρώπου, οὗτος δ' οὐκέτι τῷ ὑπ' ἄλλου κινεῖσθαι. ἄμφω δὲ
 κινεῖν φαμέν, καὶ τὸ τελευταῖον καὶ τὸ πρῶτον τῶν κινου-
 10 των, ἀλλὰ μᾶλλον τὸ πρῶτον· ἐκείνο γὰρ κινεῖ τὸ τελευ-
 ταῖον, ἀλλ' οὐ τοῦτο τὸ πρῶτον, καὶ ἄνευ μὲν τοῦ πρῶτου τὸ
 τελευταῖον οὐ κινήσει, ἐκείνο δ' ἄνευ τούτου, οἷον ἢ βακτηρία
 οὐ κινήσει μὴ κινουντος τοῦ ἀνθρώπου. εἰ δὲ ἀνάγκη πᾶν τὸ
 κινούμενον ὑπὸ τινός τε κινεῖσθαι, καὶ ἢ ὑπὸ κινουμένου ὑπ'
 15 ἄλλου ἢ μὴ, καὶ εἰ μὲν ὑπ' ἄλλου [κινουμένου], ἀνάγκη τι
 εἶναι κινεῖν ὃ οὐχ ὑπ' ἄλλου πρῶτον, εἰ δὲ τοιοῦτο τὸ πρῶτον,
 οὐκ ἀνάγκη θάτερον (ἀδύνατον γὰρ εἰς ἄπειρον ἵεσθαι τὸ κινεῖν
 καὶ κινούμενον ὑπ' ἄλλου αὐτό· τῶν γὰρ ἀπείρων οὐκ ἔστιν
 οὐδὲν πρῶτον)—εἰ οὖν ἅπαν μὲν τὸ κινούμενον ὑπὸ τινος κινεῖ-
 21 ται, τὸ δὲ πρῶτον κινεῖται μὲν, οὐχ ὑπ' ἄλλου δέ,
 21 ἀνάγκη αὐτὸ ὑφ' αὐτοῦ κινεῖσθαι.
 ἔτι δὲ καὶ ᾧδε τὸν αὐτὸν
 τοῦτον λόγον ἔστιν ἐπελθεῖν. πᾶν γὰρ τὸ κινεῖν τί τε κινεῖ καὶ
 τινί. ἢ γὰρ αὐτῷ κινεῖ τὸ κινεῖν ἢ ἄλλῳ, οἷον ἄνθρωπος ἢ
 αὐτὸς ἢ τῇ βακτηρίᾳ, καὶ ὁ ἄνεμος κατέβαλεν ἢ αὐτὸς ἢ
 25 ὁ λίθος ὃν ἔωσεν. ἀδύνατον δὲ κινεῖν ἄνευ τοῦ αὐτὸ αὐτῷ
 κινουντος τὸ ᾧ κινεῖ· ἀλλ' εἰ μὲν αὐτὸ αὐτῷ κινεῖ, οὐκ
 ἀνάγκη ἄλλο εἶναι ᾧ κινεῖ, ἂν δὲ ἢ ἕτερον τὸ ᾧ κινεῖ, ἔστιν
 τι ὃ κινήσει οὐ τινὶ ἀλλ' αὐτῷ, ἢ εἰς ἄπειρον εἴσω· εἰ οὖν
 κινούμενόν τι κινεῖ, ἀνάγκη στήναι καὶ μὴ εἰς ἄπειρον ἵεσθαι·
 30 εἰ γὰρ ἢ βακτηρία κινεῖ τῷ κινεῖσθαι ὑπὸ τῆς χειρὸς, ἢ

^a 4 αὐτὸ scripsi: αὐτὸ EFK: εἰς τὸ HIJ τὸ om. J ἀλλὰ... 5
 κινεῖν om. F¹ 5 αὐτό scripsi: αὐτό Π 8 δὲ H 13 κινουντος]
 κινουμένη ὑπὸ FIJ 14 τε] αὐτὸ F ὑπὸ] ὑπὸ τοῦ E²F
 κειμένου I 15 κινουμένου omittendum vel μὲν (ὑπὸ τοῦ) scriben-
 dum ci. Spengel 16 δέ] δὲ τὸ J 18 καὶ] καὶ τὸ E²A ἀπείρων
 οὐδὲν ἔστι πρῶτον K 19 εἰ] εἰ μὲν E τινος] κινουντος K 21 δὲ
 om. J 22 γὰρ om. K 23 ἢ αὐτὸς EHK: αὐτὸς IJ:
 αὐτῷ F 25 τοῦ] τούτου E¹ αὐτῷ S, Bekker: αὐτὸ HIJ²: αὐτὸ
 E²F: om. E¹J¹K 26 κινεῖται F¹ ἀλλ'... κινεῖ om. I
 αὐτὸ om. K αὐτῷ fecit J²: αὐτῷ E¹: αὐτὸ E² 27 δ E²
 ἀν] εἰ K ἢ om. K ὁ E² 28 τι καὶ ὁ EK (ἄλλῳ) ἀλλ'
 Spengel αὐτὸ E² ἴησιν K

χειρ κινεῖ τὴν βακτηρίαν· εἰ δὲ καὶ ταύτῃ ἄλλο κινεῖ, καὶ ταύτην ἕτερόν τι τὸ κινεῖν. ὅταν δὴ τινι κινῆ ἅει ἕτερον, ἀνάγκη εἶναι πρότερον τὸ αὐτὸ αὐτῷ κινεῖν. εἰ οὖν κινεῖται μὲν τοῦτο, μὴ ἄλλο δὲ τὸ κινεῖν αὐτό, ἀνάγκη αὐτὸ αὐτὸ κινεῖν· ὥστε καὶ κατὰ τοῦτον τὸν λόγον ἦτοι εὐθὺς τὸ κινεῖν 256^b μὲνον ὑπὸ τοῦ αὐτοῦ κινεῖντος κινεῖται, ἢ ἔρχεται ποτε εἰς τὸ τοιοῦτον.

πρὸς δὲ τοῖς εἰρημένοις καὶ ὧδε σκοποῦσι ταῦτα 3
 συμβήσεται ταῦτα. εἰ γὰρ ὑπὸ κινουμένου κινεῖται τὸ κινούμενον πᾶν, ἦτοι τοῦτο ὑπάρχει τοῖς πράγμασι κατὰ συμ- 5
 βεβηκός, ὥστε κινεῖν μὲν κινούμενον, οὐ μέντοι διὰ τὸ κινεῖσθαι αὐτό, ἢ οὐ, ἀλλὰ καθ' αὐτό. πρῶτον μὲν οὖν εἰ κατὰ συμβεβηκός, οὐκ ἀνάγκη κινεῖσθαι τὸ κινεῖν. εἰ δὲ τοῦτο, δῆλον ὡς ἐνδέχεται ποτε μηδὲν κινεῖσθαι τῶν ὄντων· οὐ γὰρ ἀναγκαῖον τὸ συμβεβηκός, ἀλλ' ἐνδεχόμενον μὴ εἶναι. ἐὰν 10
 οὖν θῶμεν τὸ δυνατὸν εἶναι, οὐδὲν ἀδύνατον συμβήσεται, ψεῦδος δ' ἴσως. ἀλλὰ τὸ κίνησι μὴ εἶναι ἀδύνατον· δέ-
 δεικται γὰρ πρότερον ὅτι ἀνάγκη κίνησι ἅει εἶναι. καὶ εὐ-
 λόγως δὲ τοῦτο συμβέβηκεν. τρία γὰρ ἀνάγκη εἶναι, τό τε κινούμενον καὶ τὸ κινεῖν καὶ τὸ ᾧ κινεῖ. τὸ μὲν οὖν κινούμενον 15
 ἀνάγκη κινεῖσθαι, κινεῖν δ' οὐκ ἀνάγκη· τὸ δ' ᾧ κινεῖ, καὶ κινεῖν καὶ κινεῖσθαι (συμμεταβάλλει γὰρ τοῦτο ἅμα καὶ κατὰ τὸ αὐτὸ τῷ κινουμένῳ ὄν· δῆλον δ' ἐπὶ τῶν κατὰ τόπον κινουμένων· ἄπτεσθαι γὰρ ἀλλήλων ἀνάγκη μέχρι τι-
 νός)· τὸ δὲ κινεῖν οὕτως ὥστ' εἶναι μὴ ᾧ κινεῖ, ἀκίνητον. ἐπεὶ 20
 δ' ὀρώμεν τὸ ἔσχατον, ὃ κινεῖσθαι μὲν δύναται, κινήσεως δ' ἀρχὴν οὐκ ἔχει, καὶ ὃ κινεῖται μὲν, οὐχ ὑπ' ἄλλου δὲ

^a 31 κινεῖται F τῇ βακτηρίᾳ E ταύτῃ Pacius: ταύτην Π
 ἄλλο τι κινεῖ E 32 τι om. K δὴ τι EH 33 αὐτῷ I:
 αὐτῷ F: αὐτὸ J: τὸ E² αὐτὸ FHI: αὐτὸ E 34 αὐτῷ] αὐτῷ
 FK² αὐτὸ αὐτῷ K ^b I καὶ om. I τὸ κινούμενον ἦτοι εὐθὺς Λ
 2 κινῆσεται Λ τι F 3-27 πρὸς . . . ὦν hic ΠS: ante 258^a 4 ἢ
 γ. ΑΤ 3 ταῦτὰ συμβήσεται] συμβήσεται ταῦτὰ Λ: ταυτὰ πάντα ἀπο-
 πα συμβήσεται K² 4 ταῦτα] πάντα F 5 τοῖς πράγμασι ὑπάρχει Λ
 κατὰ] ἢ κατὰ E² 6 κινεῖ FK οὐ] μὴ FI 7 αὐτὸ EF²] KP:
 αὐτὸ αἰεὶ F¹HI 8 κινεῖν FS: κινούμενον EHIJK 10 μὴ] μὲν
 μὴ I 11 εἶναι] μὴ εἶναι E¹F συμβαίνει J¹ 13 γὰρ EKS: γὰρ τοῦ-
 το FIJ: γὰρ ἦδη τοῦτο H 14 δὲ EJS: δὴ K: om. FHI εἶναι
 ἀνάγκη H 16 ἀναγκῆ μὲν κινεῖσθαι Λ 17 τοῦτο KAPS: τοῦτου
 τὸ E 19 ἀνάγκη ἀλλήλων οὕτω μέχρι Λ τινός] γέ τινος F 20 οὕτως
 αἰεὶ ὥστ' FK² ὃ E² 22-3 κινεῖται . . . ἀλλ' κινεῖ μὲν, ὑπ' ἄλλου
 δὲ κινεῖται ἀλλ' οὐχ Prantl, fort. S 22 οὐχ ante 23 ὑφ' Λ

ἀλλ' ὑφ' αὐτοῦ, εὐλογον, ἵνα μὴ ἀναγκαῖον εἴπωμεν, καὶ
 τὸ τρίτον εἶναι ὃ κινεῖ ἀκίνητον ὄν. διὸ καὶ Ἀναξαγόρας ὀρ-
 25 θῶς λέγει, τὸν νοῦν ἀπαθῆ φάσκων καὶ ἀμιγῆ εἶναι, ἐπει-
 δὴ γε κινήσεως ἀρχὴν αὐτὸν εἶναι ποιεῖ. οὕτω γὰρ μόνως ἂν
 27 κινεῖται ἀκίνητος ὢν καὶ κρατοῖται ἀμιγῆς ὢν.

27 ἀλλὰ μὴν
 εἰ μὴ κατὰ συμβεβηκὸς ἀλλ' ἐξ ἀνάγκης κινεῖται τὸ κι-
 νοῦν, εἰ δὲ μὴ κινεῖτο, οὐκ ἂν κινεῖται, ἀνάγκη τὸ κινεῖν, ἢ
 30 κινεῖται, ἥτοι οὕτω κινεῖσθαι ὡς γε κατὰ τὸ αὐτὸ εἶδος
 τῆς κινήσεως, ἢ καθ' ἕτερον. λέγω δ' ἥτοι τὸ θερμαῖνον
 καὶ αὐτὸ θερμαίνεσθαι καὶ τὸ ὑγιάζον ὑγιάζεσθαι καὶ τὸ
 φέρον φέρεσθαι, ἢ τὸ ὑγιάζον φέρεσθαι, τὸ δὲ φέρον
 αὔξανεσθαι. ἀλλὰ φανερόν ὅτι ἀδύνατον· δεῖ γὰρ μέχρι
 257^a τῶν ἀτόμων διαιροῦντα λέγειν, οἷον εἴ τι διδάσκει γεω-
 μετρεῖν, τοῦτο διδάσκεσθαι γεωμετρεῖν τὸ αὐτό, ἢ εἰ ρί-
 πτει, ριπτεῖσθαι τὸν αὐτὸν τρόπον τῆς ρίψεως· ἢ οὕτως μὲν
 μῆ, ἄλλο δ' ἐξ ἄλλου γένους, οἷον τὸ φέρον μὲν αὔξανε-
 5 σθαι, τὸ δὲ τοῦτο αὔξον ἀλλοιοῦσθαι ὑπ' ἄλλου, τὸ δὲ
 τοῦτο ἀλλοιοῦν ἑτέραν τιὰ κινεῖσθαι κίνησιν. ἀλλ' ἀνάγκη
 στήναι· πεπερασμέναι γὰρ αἱ κινήσεις. τὸ δὲ πάλιν ἀνα-
 κάμπτειν καὶ τὸ ἀλλοιοῦν φάναι φέρεσθαι τὸ αὐτὸ ποιεῖν
 ἐστὶ κὰν εἰ εὐθύς ἔφη τὸ φέρον φέρεσθαι καὶ διδάσκε-
 10 σθαι τὸ διδάσκον (δῆλον γὰρ ὅτι κινεῖται καὶ ὑπὸ τοῦ
 ἀνωτέρω κινεῖντος τὸ κινούμενον πᾶν, καὶ μᾶλλον ὑπὸ τοῦ
 προτέρου τῶν κινούντων). ἀλλὰ μὴν τοῦτό γε ἀδύνατον· τὸ
 διδάσκον γὰρ συμβαίνει μαθάνειν, ὦν τὸ μὲν μὴ ἔχειν τὸ
 14 δὲ ἔχειν ἐπιστήμην ἀναγκαῖον.

14 ἔτι δὲ μᾶλλον τούτων ἄλο-
 15 γον, ὅτι συμβαίνει πᾶν τὸ κινητικὸν κινητόν, εἴπερ ἅπαν
 ὑπὸ κινουμένου κινεῖται τὸ κινούμενον· ἔσται γὰρ κινητόν, ὡς-
 περ εἴ τις λέγοι πᾶν τὸ ὑγιαστικὸν [καὶ ὑγιάζον] ὑγιαστον

^b 26 γε EP: περ ΚΑ ποιεῖ εἶναι Λ ἂν μόνως FHIJ²P:
 μόνως J¹ 27 κινεῖ FI κρατοῖται ἂν ἀμιγῆ S 29 ἢ] εἰ EK
 30 ὡς γε scripsi: ὥστε ΚΑ: ὥστε τὸ Ε: ὡς τὸ Gaye 31 δ'] δ' ὅτι
 ΚΑ 34 αὔξανεσθαι EKS: αὔξεσθαι Λ 257^a 1 διδάσκει E¹
 2 ἢ om. E² 3 ἢ] εἰ δὲ E²S 4 φέρον μὲν] φερόμενον E¹
 αὔξεσθαι Λ 6 κίνησιν κινεῖσθαι H 7 γὰρ εἰσιν αἱ Λ 9 τὸ
 διδάσκον διδάσκεσθαι Λ 12 τὸ E²KAP: om. E¹ 13 συμβαί-
 νοι E 16 ὡς ἕαν τις E 17 λέγει FHIJ πᾶν] ὅτι Λ
 καὶ ὑγιάζον secl. Gaye, om. S: καὶ ὑγιάζον καὶ FHI

εἶναι, καὶ τὸ οἰκοδομητικὸν οἰκοδομητόν, ἢ εὐθὺς ἢ διὰ πλειόνων· λέγω δ' οἶον εἰ κινητὸν μὲν ὑπ' ἄλλου πᾶν τὸ κινήτικόν, ἀλλ' οὐ ταύτην τὴν κίνησιν κινήτὸν ἢ κινεῖ τὸ ²⁰ πλησίον, ἀλλ' ἑτέραν, οἶον τὸ ὑγιαστικὸν μαθητικόν, ἀλλὰ τοῦτο ἐπαναβαίνου ἥξει ποτὲ εἰς τὸ αὐτὸ εἶδος, ὥσπερ εἶπομεν πρότερον. τὸ μὲν οὖν τούτων ἀδύνατον, τὸ δὲ πλασματικῶδες· ἄτοπον γὰρ τὸ ἐξ ἀνάγκης τὸ ἀλλοιωτικὸν αὐξήτὸν εἶναι. οὐκ ἄρα ἀνάγκη αἰεὶ κινεῖσθαι τὸ κινούμενον ὑπ' ἄλλου, ²⁵ καὶ τούτου κινουμένου· στήσεται ἄρα. ὥστε ἤτοι ὑπὸ ἡρεμοῦντος κινήσεται τὸ κινούμενον πρῶτον, ἢ αὐτὸ ἑαυτὸ κινήσει. ²⁷

ἀλλὰ ²⁷

μὴν καὶ εἴ γε δέοι σκοπεῖν πότερον αἴτιον κινήσεως καὶ ἀρχῆ τὸ αὐτὸ αὐτὸ κινεῖν ἢ τὸ ὑπ' ἄλλου κινούμενον, ἐκείνο πᾶς ἂν θελή· τὸ γὰρ αὐτὸ καθ' αὐτὸ ὄν αἰεὶ πρότερον αἴτιον ³⁰ τοῦ καθ' ἕτερον καὶ αὐτοῦ ὄντος. ὥστε τοῦτο σκεπτέον λαβοῦσιν ἄλλην ἀρχήν, εἴ τι κινεῖ αὐτὸ αὐτό, πῶς κινεῖ καὶ τίνα τρόπον. ³³

ἀναγκαῖον δὴ τὸ κινούμενον ἅπαν εἶναι διαιρετόν ³³ εἰς αἰεὶ διαιρετά· τοῦτο γὰρ δέδεικται πρότερον ἐν τοῖς καθόλου τοῖς περὶ φύσεως, ὅτι πᾶν τὸ καθ' αὐτὸ κινούμενον συνεχές. ^{257^b} ἀδύνατον δὴ τὸ αὐτὸ αὐτὸ κινεῖν πάντη κινεῖν αὐτὸ αὐτό· φέροιτο γὰρ ἂν ὅλον καὶ φέροι τὴν αὐτὴν φορᾶν, ἐν ὄν καὶ ἄτομον τῷ εἶδει, καὶ ἀλλοιοῖτο καὶ ἀλλοιοῖ, ὥστε διδάσκει ἂν καὶ μανθάνοι ἅμα, καὶ ὑγιάζει καὶ ὑγιάζοιτο τὴν ⁵ αὐτὴν ὑγίειαν. ἔτι διώριστα ὅτι κινεῖται τὸ κινήτὸν· τοῦτο δ' ἔστιν δυνάμει κινούμενον, οὐκ ἐντελεχεία, τὸ δὲ δυνάμει εἰς ἐντελέχειαν βαδίζει, ἔστιν δ' ἡ κίνησις ἐντελέχεια κινήτου ἀτε-

^a 18 εἶναι EKS: ἔσται Λ καὶ E²KAS: om. E¹ τὸ οἰκοδομικὸν E²S: τὸ E¹K 20 κινήτὸν E 21 μαθητὸν HJ: μαθηματικὸν K 24 γὰρ τὸ ἀλλοιωτικὸν ἐξ ἀνάγκης αὐξήτὸν Λ 25 αἰεὶ fecit J²: εἶναι αἰεὶ H τὸ κινεῖν K¹ ὑπ' κινεῖσθαι ὑπ' J¹ 27 κινήσεται E² ἢ ἢ τὸ F αὐτὸ ΠSP: αὐτὸ ἢ S¹ 28 καὶ om. S εἴ ἢ E¹ 29 τὸ av-del. E: αὐτὸ om. S κινούμενον EKS: om. Λ 30 ὄν om. JT αἴτιον αἰεὶ πρότερον Λ: πρότερον αἰεὶ καὶ αἴτιον T 31 αὐτοῦ αἰτίου ὄντος I 33 τὸ KAS: om. E 34 αἰεὶ om. E ^b I τοῖς om. Λ κινούμενον καθ' αὐτὸ KS 2 παντι E αὐτὸ om. S 3 φέροιτο KAS^o: φέροι ESP^T ἂν om. H φέροι KAS^o: φέροιτο ESP^T φορᾶν E¹ 4 καὶ KAS^o: ἢ ESP^T ἀλλοιοῖτο καὶ ΔS: ἀλλοιοῖτο καὶ K: om. E 5 μανθάνοι EKST: διδάσκειτο Λ καὶ ὑγιάζει KAS: om. E 7 δυνάμει alt.] κινούμενον EKP

λής. τὸ δὲ κινεῖν ἤδη ἐνεργεία ἔστιν, οἷον θερμαίνει τὸ θερμὸν
 10 καὶ ὅλως γεννᾷ τὸ ἔχον τὸ εἶδος. ὥσθ' ἅμα τὸ αὐτὸ κατὰ
 τὸ αὐτὸ θερμὸν ἔσται καὶ οὐ θερμόν. ὁμοίως δὲ καὶ τῶν ἄλ-
 λων ἕκαστον, ὅσων τὸ κινεῖν ἀνάγκη ἔχειν τὸ συνῶνυμον. τὸ
 13 μὲν ἄρα κινεῖ τὸ δὲ κινεῖται τοῦ αὐτοῦ αὐτὸ κινεῖντος.

13

ὅτι δ'

οὐκ ἔστιν αὐτὸ αὐτὸ κινεῖν οὕτως ὥσθ' ἐκάτερον ὑφ' ἐκατέρου
 15 κινεῖσθαι, ἐκ τῶνδε φανερόν. οὔτε γὰρ ἔσται πρῶτον κινεῖν οὐ-
 δέν, εἴ γε αὐτὸ ἑαυτὸ κινήσει ἐκάτερον (τὸ γὰρ πρότερον αἰ-
 τιώτερον τοῦ κινεῖσθαι τοῦ ἐχομένου καὶ κινήσει μᾶλλον· δι-
 χῶς γὰρ κινεῖν ἦν, τὸ μὲν τὸ ὑπ' ἄλλου κινούμενον αὐτό,
 τὸ δ' αὐτῷ· ἐγγύτερον δὲ τὸ πορρώτερον τοῦ κινουμένου τῆς
 20 ἀρχῆς ἢ τὸ μεταξύ· ἔτι οὐκ ἀνάγκη τὸ κινεῖν κινεῖσθαι εἰ
 μὴ ὑφ' αὐτοῦ· κατὰ συμβεβηκὸς ἄρα ἀντικινεῖ θάτερον.
 ἔλαβον τοίνυν ἐνδέχασθαι μὴ κινεῖν· ἔστιν ἄρα τὸ μὲν κινου-
 μενον τὸ δὲ κινεῖν ἀκίνητον. ἔτι οὐκ ἀνάγκη τὸ κινεῖν ἀντικι-
 νεῖσθαι, ἀλλ' ἢ ἀκίνητόν γε τι κινεῖν ἀνάγκη ἢ αὐτὸ ὑφ'
 25 αὐτοῦ κινούμενον, εἴπερ ἀνάγκη αἰεὶ κίνησιω εἶναι. ἔτι ἦν κινεῖ
 26 κίνησιω, κινεῖτ' ἂν, ὥστε τὸ θερμαῖνον θερμαίνεται.

26

ἀλλὰ

μὴν οὐδὲ τοῦ πρῶτως αὐτὸ αὐτὸ κινεῖντος οὔτε ἐν μόριον
 οὔτε πλείω κινήσει αὐτὸ αὐτὸ ἕκαστον. τὸ γὰρ ὅλον εἰ κι-
 νεῖται αὐτὸ ὑφ' αὐτοῦ, ἦτοι ὑπὸ τῶν αὐτοῦ τινὸς κινήσεται ἢ
 30 ὅλον ὑφ' ὅλου. εἰ μὲν οὖν τῷ κινεῖσθαι τι μόριον αὐτὸ ὑφ'
 αὐτοῦ, τοῦτ' ἂν εἴη τὸ πρῶτον αὐτὸ αὐτὸ κινεῖν (χωρισθὲν
 γὰρ τοῦτο μὲν κινήσει αὐτὸ αὐτό, τὸ δὲ ὅλον οὐκέτι)· εἰ δὲ
 ὅλον ὑφ' ὅλου κινεῖται, κατὰ συμβεβηκὸς ἂν ταῦτα κινεῖ
 αὐτὰ ἑαυτά. ὥστε εἰ μὴ ἀναγκαῖον, εἰλήφθω μὴ κινούμενα

^b 10 γεννᾷ KAS: γίνεται E τὸ alt. om. HI κατὰ τὸ αὐτὸ
 KAS: om. E 12 ὅσον K¹: ὅσα K² 13 αὐτὸ E³KAS:
 om. E¹ 14 οὐκ om. E¹ ἔστιν EKS: ἐνδέχεται Δ αὐτὸ]
 τὸ αὐτὸ E²FS κινεῖν EKS: κινεῖν Δ ὥσθ'] ὡς καθ' E
 15 οὐδενί γε E 16 αὐτὸ ἑαυτὸ KS: αὐτὸ αὐτὸ E: ἐκάτερον Δ
 ἐκάτερον κινήσει HJ: κινεῖ ἐκάτερον F: κινήσει I αἰτιώτερον
 E²KAS: om. E¹ 18 τὸ alt. om. FK: τῶν E¹: τῶν E²
 20 κινούμενον κινεῖν γρ. A 22 ἔλαβον τοίνυν EFHIJ²S: ἔλαβε
 τοίνυν J¹: τοίνυν ἔλαβον K¹: δεῖ λαβεῖν K² ἔσται FIK: ἔτι J
 et fecit E 23 ἔτι HS: ἐπεὶ Prantl 24 ἢ om. E¹: εἰ E²
 τι om. FK ὑπ' αὐτοῦ FJ 25-6 κινεῖται... κινεῖται E²A 26 κινεῖτ'
 EKS: καὶ κινεῖτ' Δ 32 γὰρ τοῦτο μὲν KAS: μὲν γὰρ τοῦτο E
 33 ἂν om. H κινεῖ ταῦτα FIJ: κινεῖ ταῦτα H 34 ἀναγκαῖα HI

ὕφ' αὐτῶν. τῆς ὅλης ἄρα τὸ μὲν κινήσει ἀκίνητον ὃν τὸ δὲ 258^a
κινήθησεται· μόνως γὰρ οὕτως οἶόν τε τι αὐτοκίνητου εἶναι.
ἔτι εἴπερ ἢ ὅλη αὐτὴ αὐτὴν κινεῖ, τὸ μὲν κινήσει αὐτῆς, τὸ
δὲ κινήσεται. ἢ ἄρα AB ὕφ' αὐτῆς τε κινήθησεται καὶ ὑπὸ
τῆς A.

5

ἐπεὶ δὲ κινεῖ τὸ μὲν κινούμενον ὑπ' ἄλλου τὸ δ' ἀκίνη- 5
τον ὄν, καὶ κινεῖται τὸ μὲν κινοῦν τὸ δὲ οὐδὲν κινοῦν, τὸ αὐτὸ
αὐτὸ κινοῦν ἀνάγκη ἐξ ἀκινήτου εἶναι κινουontos δέ, καὶ ἔτι ἐκ
κινουμένου μὴ κινουontos δ' ἐξ ἀνάγκης, ἀλλ' ὅποτερ' ἔτυχεν.
ἔστω γὰρ τὸ A κινοῦν μὲν ἀκίνητου δέ, τὸ δὲ B κινούμενον τε
ὑπὸ τοῦ A καὶ κινοῦν τὸ ἐφ' ᾧ Γ, τοῦτο δὲ κινούμενον μὲν ὑπὸ 10
τοῦ B, μὴ κινοῦν δὲ μηδέν· εἴπερ γὰρ καὶ διὰ πλειόνων ἦξει
ποτὲ εἰς τὸ Γ, ἔστω δι' ἐνὸς μόνου. τὸ δὴ ἅπαν ABΓ αὐτὸ
ἑαυτὸ κινεῖ. ἀλλ' ἐὰν ἀφέλω τὸ Γ, τὸ μὲν AB κινήσει
αὐτὸ ἑαυτό, τὸ μὲν A κινοῦν τὸ δὲ B κινούμενον, τὸ δὲ Γ οὐ
κινήσει αὐτὸ ἑαυτό, οὐδ' ὅλως κινήσεται. ἀλλὰ μὴν οὐδ' ἢ 15
BΓ κινήσει αὐτὴ ἑαυτὴν ἄνευ τοῦ A· τὸ γὰρ B κινεῖ τῷ
κινεῖσθαι ὑπ' ἄλλου, οὐ τῷ ὕφ' αὐτοῦ τιωὸς μέρους. τὸ ἄρα
AB μόνον αὐτὸ ἑαυτὸ κινεῖ. ἀνάγκη ἄρα τὸ αὐτὸ ἑαυτὸ
κινοῦν ἔχειν τὸ κινοῦν ἀκίνητου δέ, καὶ τὸ κινούμενον μηδὲν
δὲ κινοῦν ἐξ ἀνάγκης, ἀπτόμενα ἦτοι ἄμφω ἀλλήλων ἢ θατέρου 20
θάτερον. εἰ μὲν οὖν συνεχές ἐστι τὸ κινοῦν (τὸ μὲν γὰρ κινούμενον
ἀναγκαῖον εἶναι συνεχές), ἄψεται ἐκάτερον ἐκατέρου. δῆλον δὴ
ὅτι τὸ πᾶν αὐτὸ ἑαυτὸ κινεῖ οὐ τῷ αὐτοῦ τι εἶναι τοιοῦτον οἶον αὐτὸ
αὐτὸ κινεῖν, ἀλλ' ὅλον κινεῖ αὐτὸ ἑαυτό, κινούμενον τε καὶ κινοῦν
τῷ αὐτοῦ τι εἶναι τὸ κινοῦν καὶ τὸ κινούμενον. οὐ γὰρ ὅλον κι- 25
νεῖ οὐδ' ὅλον κινεῖται, ἀλλὰ κινεῖ μὲν ἢ τὸ A, κινεῖται δὲ ἢ τὸ

258^a 1 ὄν om. E¹ 2 μόνως . . . εἶναι E²K²AS: om. E¹K¹
4 κινήσεται E^HJ²KS: κινήθησεται FIJ¹ vide 256^b 3-27 adn. ἄρα]
ἄρα τὸ E² κινήθησεται ΔS: κινήσεται E 5 ἐπεὶ ES: ἐπειδὴ ΚΑ
αὐτοκίνητον J 6 ἑαυτό FI 7 ἔτι om. E 9 δὲ om. E^J 10 οὐ
FH 11 εἴπερ E²KAP: ἐπεὶ E¹ πλειόνων AP^p: πολλῶν EK^P
ἦξει . . . 12 Γ pr. om. E¹ 12 A] τὸ α E 13 αβ αὐτὸ ἑαυτὸ κινήσει
Λ 14 A] γὰρ E¹: γὰρ α E²FHJ 15 ἦ] τὸ K: ἢ τὸ E 16 βγ
KAS: γ E¹: αβγ E² αὐτὸ ἑαυτὸ K γὰρ] μὲν γὰρ F: δὲ H τὸ
K 17 ὑπ' ἄλλου κινεῖσθαι Λ ἄρα KAS: γὰρ E 19 καὶ
KAS: om. E 20 ἀπτόμενα ἐξ ἀνάγκης A ἦτοι EIJA: δὲ ἦτοι
FKS: ἢ H 21 μὲν alt. EKPS: om. Λ 22 συνεχές ἀναγκαῖον
εἶναι Λ ἄψεται ἐκάτερον ἐκατέρου om. EFHJ¹KAPS δὴ
om. E^JK: δὲ J² 23 εἶναι] εἶναι τι E¹ 24 κινεῖν ἑαυτὸ F
κινεῖ] κινεῖν H δὲ EΛ 26 κινεῖται ἀλλὰ om. E ἢ S: ἢ E:
om. ΚΑ κινεῖται δὲ ἢ (ἢ E, om. K) τὸ β EKS: τὸ δὲ β κινεῖται Λ

ναι, ἐνδεχέσθω καὶ τοῦτο. ἀλλ' οὐ τί γε πάσας δυνατὸν
 δῆλον γὰρ ὡς αἴτιον τοῖς αὐτὰ ἑαυτὰ κινουσίην ἐστὶ τι τοῦ ὅτε
 μὲν εἶναι ὅτε δὲ μὴ. τὸ μὲν γὰρ αὐτὸ ἑαυτὸ κινοῦν ἅπαν
 ἔχειν ἀνάγκη μέγεθος, εἰ μὴδὲν κινεῖται ἀμερές, τὸ δὲ κιν- 25
 οῦν οὐδεμία ἀνάγκη ἐκ τῶν εἰρημένων. τοῦ δὴ τὰ μὲν γίνγε-
 σθαι τὰ δὲ φθειρεσθαι, καὶ τοῦτ' εἶναι συνεχῶς, οὐδὲν αἴτιον
 τῶν ἀκινήτων μὲν μὴ αἰεὶ δ' ὄντων, οὐδ' αὖ τῶνδὲ μὲν
 ταδί[κινούντων], τούτων δ' ἕτερα. τοῦ γὰρ αἰεὶ καὶ συνεχοῦς οὔτε
 ἕκαστον αὐτῶν οὔτε πάντα αἴτια· τὸ μὲν γὰρ οὕτως ἔχειν 30
 αἰδίου καὶ ἐξ ἀνάγκης, τὰ δὲ πάντα ἄπειρα, καὶ οὐχ ἅμα
 πάντα ὄντα. δῆλον τοίνυν ὅτι, εἰ καὶ μυριάκις ἔνια [ἀρχαί]
 τῶν ἀκινήτων μὲν κινούντων δέ, καὶ πολλὰ τῶν αὐτὰ ἑαυτὰ 259^a
 κινούντων, φθείρεται, τὰ δ' ἐπιγίγνεται, καὶ τότε μὲν ἀκίνητον
 ὄν τότε κινεῖ, ἕτερον δὲ τοδί, ἀλλ' οὐδὲν ἦττον ἐστὶν τι ὃ πε-
 ριέχει, καὶ τοῦτο παρ' ἕκαστον, ὃ ἐστὶν αἴτιον τοῦ τὰ μὲν εἶ-
 ναι τὰ δὲ μὴ καὶ τῆς συνεχοῦς μεταβολῆς· καὶ τοῦτο μὲν 5
 τούτοις, ταῦτα δὲ τοῖς ἄλλοις αἴτια κινήσεως. 6

εἴπερ οὖν αἰ- 6

διος ἢ κίνησις, αἰδίου καὶ τὸ κινοῦν ἔσται πρῶτον, εἰ ἔν· εἰ
 δὲ πλείω, πλείω τὰ αἰδία. ἐν δὲ μᾶλλον ἢ πολλά, καὶ
 πεπερασμένα ἢ ἄπειρα, δεῖ νομίζεω. τῶν αὐτῶν γὰρ συμ-
 βαυόντων αἰεὶ τὰ πεπερασμένα μᾶλλον ληπτέον· ἐν γὰρ 10
 τοῖς φύσει δεῖ τὸ πεπερασμένον καὶ τὸ βέλτιον, ἂν ἐνδέχ-
 ται, ὑπάρχειν μᾶλλον. ἱκανὸν δὲ καὶ ἔν, ὃ πρῶτον τῶν
 ἀκινήτων αἰδίου ὄν ἔσται ἀρχὴ τοῖς ἄλλοις κινήσεως. 13

φανε- 13

ρὸν δὲ καὶ ἐκ τοῦδε ὅτι ἀνάγκη εἶναι τι ἐν καὶ αἰδίου τὸ
 πρῶτον κινοῦν. δέδεικται γὰρ ὅτι ἀνάγκη αἰεὶ κίνησιν εἶναι. 15

^b 22 γε πάσας EFT: πάσας γε HIJK 23 τι ante τοῖς E²KA
 24 μὴ] μὴ εἶναι AT ἀνάγκη ἅπαν μέγεθος ἔχειν Λ 26 δὲ E¹
 28 τῶνδὲ μὲν scripsi: τῶν αἰεὶ μὲν Π: τῶν μὲν S: τῶν μὲν αἰεὶ Gaye
 29 ταδί E²KAS: αὐτὰ E¹ κινούντων seclusi, om. P τούτων]
 τῶν J²S: διὰ τούτων E καὶ om. F συνεχῶς S 30 ἕκαστα
 E² οὔτε πάντα αἴτια EKS: αἴτιον οὔτε πάντα Λ 31 καὶ pr.
 ΠΑΤ: om. γρ. S 32 ἔνια scripsi: ἐνι E: ἔνια ΚΑ ἀρχαί
 seclusi: habent ΠS 259^a I μὲν om. E κινουσῶν E²KAS
 2 τὰ] τινὰ Η ἀκινήτων F 3 τότε δὲ κινεῖ E¹ δ] ὃ καὶ E¹
 7 ἔν· εἰ] ἐνι E¹ 8 τὰ αἰδία πλείω KS 11 δὴ E τὸ alt.
 om. E¹ 12 ἔν EKS: εἰ ἔν Λ δ] ὃ δὲ E² 13 ὄν KAS: om. E
 14 δὲ] οὖν J ἐκ τούτων J¹ ἐν] αἰεὶ H 15 κίνησιν αἰεὶ εἶναι
 HIJ: εἶναι κίνησιν αἰεὶ F

εἰ δὲ αἰεὶ, ἀνάγκη συνεχῆ εἶναι· καὶ γὰρ τὸ αἰεὶ συνε-
 χές, τὸ δ' ἐφεξῆς οὐ συνεχές. ἀλλὰ μὴν εἴ γε συνεχῆς,
 μία. μία δ' ἢ ὑφ' ἐνός τε τοῦ κινουμένου καὶ ἐνός τοῦ κινου-
 μένου· εἰ γὰρ ἄλλο καὶ ἄλλο κινήσει, οὐ συνεχῆς ἢ
 20 ὅλη κίνησις, ἀλλ' ἐφεξῆς.

20

ἔκ τε δὴ τούτων πιστεύσειεν ἄν

τις εἶναι τι πρῶτον ἀκίνητον, καὶ πάλιν ἐπιβλέψας ἐπὶ τὰς
 ἀρχάς [τῶν κινουμένων]. τὸ μὲν δὴ εἶναι ἅττα τῶν ὄντων ἃ ὅτε
 μὲν κινεῖται ὅτε δὲ ἡρεμεῖ φανερόν. καὶ διὰ τούτου γέγονε
 δῆλον ὅτι οὔτε πάντα κινεῖται οὔτε πάντα ἡρεμεῖ οὔτε τὰ
 25 μὲν αἰεὶ ἡρεμεῖ τὰ δὲ αἰεὶ κινεῖται· τὰ γὰρ ἐπαμφοτερί-
 ζοντα καὶ δυνάμιν ἔχοντα τοῦ κινεῖσθαι καὶ ἡρεμεῖν
 δείκνυσιν περὶ αὐτῶν. ἐπεὶ δὲ τὰ μὲν τοιαῦτα δῆλα πᾶσι,
 βουλόμεθα δὲ δεῖξαι καὶ τοῖν δυοῖν ἐκατέρου τὴν φύσιν,
 ὅτι ἔστιν τὰ μὲν αἰεὶ ἀκίνητα τὰ δὲ αἰεὶ κινούμενα, προϊόντες
 30 δ' ἐπὶ τοῦτο καὶ θέντες ἅπαν τὸ κινούμενον ὑπὸ τιως κινεῖ-
 σθαι, καὶ τοῦτ' εἶναι ἢ ἀκίνητον ἢ κινούμενον, καὶ κινούμενον
 ἢ ὑφ' αὐτοῦ ἢ ὑπ' ἄλλου αἰεὶ, προήλθομεν ἐπὶ τὸ λαβεῖν
 ὅτι τῶν κινουμένων ἐστὶν ἀρχὴ κινουμένων μὲν ὃ αὐτὸ ἑαυτὸ
 259^b κινεῖ, πάντων δὲ τὸ ἀκίνητον, ὀρώμεν δὲ καὶ φανερώς ὄντα
 τοιαῦτα ἃ κινεῖ αὐτὰ ἑαυτά, οἷον τὸ τῶν ἐμψύχων καὶ τὸ
 τῶν ζώων γένος, ταῦτα δὲ καὶ δόξαν παρεῖχε μὴ ποτε ἐν-
 δέχεται κίνησιω ἐγγίγνεσθαι μὴ οὔσαν ὅλως, διὰ τὸ ἐν τούτοις
 5 ὀρᾶν ἡμᾶς τοῦτο συμβαῖνον (ἀκίνητα γὰρ ποτε ὄντα κινεῖ-
 ται πάλιν, ὡς δοκεῖ), τοῦτο δὴ δεῖ λαβεῖν, ὅτι μίαν κίνησιν
 αὐτὰ κινεῖ, καὶ ὅτι ταύτην οὐ κυρίως· οὐ γὰρ ἐξ αὐτοῦ τὸ
 αἴτιον, ἀλλ' ἐνεισιω ἄλλαι κινήσεις φυσικαὶ τοῖς ζώοις, ἃς

^a 16 αἰεὶ EI²J²K¹S: δεῖ FHI¹J¹: δεῖ αἰεὶ κίνησιν εἶναι K² συνεχῆ
 EKS: καὶ συνεχῆ Δ καὶ γὰρ τὸ] τὸ γὰρ S αἰεὶ] αἰεὶ εἶναι FK²
 17 γε om. FIJ 18 ἢ EIJKS: εἰ F: om. H ἐφ' I καὶ KAS:
 καὶ ὑφ' E 19 γὰρ EKT: γὰρ καὶ F: γὰρ τι H] : τι γὰρ I καὶ
 om. J¹ 22 τῶν κινουμένων seclusi: habet ΠPS ὄντων om. K
 23 τούτου γέγονε E²KAPS: τοῦτο γεγονέναι E¹ 25 αἰεὶ pr. EFH
 J²KS: om. IJ¹ 26 τοῦ] ὅτε μὲν Δ καὶ] ὅτε δ' Δ 28 ἐκα-
 τέρου scripsi: ἐκάτερον E: ἐκατέραν KA 31 καὶ κινούμενον om.
 F καὶ] καὶ εἰ S 32 ἢ pr. E²KAS: om. E¹ προσήλθομεν
 E¹: προήλθεν J¹ 33 ἐστὶν om. E¹ κινούμενον K μὲν om.
 E¹ ^b 3 δὲ scripsi cum P: δὴ E²KA: om. E¹ παρέχει E²P:
 παρέχειν J ἐνδέχεται H 4 ἐγγίγνεσθαι FHIKP: ἐγγενέσθαι
 J: γίνεσθαι ES 5 ἡμᾶς ὀρᾶν Δ ὄντα ποτὲ FHJ 6 δὴ] δὲ
 JP: τε E² 7 αὐτὰ scripsi: αὐτὰ Π: ἑαυτὰ S

οὐ κινούνται δι' αὐτῶν, οἷον αὔξησης φθίσις ἀναπνοή, ἃς κινεῖται τῶν ζώων ἕκαστον ἡρεμοῦν καὶ οὐ κινούμενον τὴν ὑφ' 10 αὐτοῦ κίνησιν. τούτου δ' αἴτιον τὸ περιέχον καὶ πολλὰ τῶν εἰσιόντων, οἷον ἐνίων ἢ τροφή· πεπτομένης μὲν γὰρ καθεύδουσιν, διακρινομένης δ' ἐγείρονται καὶ κινούσιν ἑαυτούς, τῆς πρώτης ἀρχῆς ἕξωθεν οὔσης, διὸ οὐκ αἰεὶ κινούνται συνεχῶς ὑφ' αὐτῶν· ἄλλο γὰρ τὸ κινεῖν, αὐτὸ κινούμενον καὶ μεταβάλλον 15 πρὸς ἕκαστον τῶν κινούντων ἑαυτά. ἐν πᾶσι δὲ τούτοις κινεῖται τὸ κινεῖν πρῶτον καὶ τὸ αἴτιον τοῦ αὐτοῦ ἑαυτὸ κινεῖν ὑφ' αὐτοῦ, κατὰ συμβεβηκὸς μέντοι· μεταβάλλει γὰρ τὸν τόπον τὸ σῶμα, ὥστε καὶ τὸ ἐν τῷ σώματι ὄν καὶ τῇ μοχλείᾳ κινεῖν ἑαυτό. 20

ἐξ ὧν ἔστιν πιστεῦσαι ὅτι εἴ τί 20 ἔστι τῶν ἀκινήτων μὲν κινούντων δὲ καὶ αὐτὰ κατὰ συμβεβηκός, ἀδύνατον συνεχῆ κίνησιν κινεῖν. ὥστ' εἴπερ ἀνάγκη συνεχῶς εἶναι κίνησιν, εἶναι τι δεῖ τὸ πρῶτον κινεῖν ἀκινήτου καὶ κατὰ συμβεβηκός, εἰ μέλλει, καθάπερ εἴπομεν, ἔσεσθαι ἐν τοῖς οὔσιν ἄπαστός τις καὶ ἀθάνατος 25 κίνησις, καὶ μενεῖν τὸ ὄν αὐτὸ ἐν αὐτῷ καὶ ἐν τῷ αὐτῷ· τῆς γὰρ ἀρχῆς μενούσης ἀνάγκη καὶ τὸ πᾶν μένειν συνεχῆς ὄν πρὸς τὴν ἀρχήν. οὐκ ἔστιν δὲ τὸ αὐτὸ τὸ κινεῖσθαι κατὰ συμβεβηκός ὑφ' αὐτοῦ καὶ ὑφ' ἑτέρου· τὸ μὲν γὰρ ὑφ' ἑτέρου ὑπάρχει καὶ τῶν ἐν τῷ οὐρανῷ ἐνίοις ἀρχαῖς, ὅσα 30 πλείους φέρεται φοράς, θάτερον δὲ τοῖς φθαρτοῖς μόνον.

ἀλλὰ μὴν εἴ γε ἔστιν τι αἰεὶ τοιοῦτον, κινεῖν μὲν τι ἀκινήτου δὲ αὐτὸ καὶ αἰδίου, ἀνάγκη καὶ τὸ πρῶτον ὑπὸ τούτου κινεῖν

^b 11 τούτων FK 12 ἢ om. Δ πεπτομένης EJPS: πεπτομένης FHI: πεπτομένων K μὲν E¹KS: om. E²Λ 13 ἑαυτά J² 14 οὐκ αἰεὶ] καὶ οὐ E² 16 ἑαυτά E¹FJ²KS: ἑαυτοῦ E²H¹J¹: αυτα P κινεῖν τε τὸ J¹ 17 πρώτως κινεῖν F τὸ E²FHIKP: om. E¹J 19 τὸ alt. om. I καὶ alt. HIJK¹S: καὶ τὸ ἐν E¹F: καὶ τὸ E²: καὶ ὡς K² 21 αὐτὰ scripsi: ἑαυτά KS: αὐτὸ E¹: αὐτῶν κινουμένων E²Λ 22 κινεῖν E²KAS: om. E¹ 23 τι] τι πρῶτον I 24 καὶ HS: καὶ μὴ (μὴ eraserunt EF) E¹F¹IJK εἰ μέλλει E²KAT: om. E¹ 25 εἴπομεν E²KAT: εἴπομεν ἔμπροσθεν E¹ ἔσεσθαι post οὔσιν Δ, post ^b 24 μέλλει KS τις FHJKS et post ἀθάνατος I: om. E 26 μενεῖν scripsi ex T: μένειν Π ἐν αὐτῷ EHK¹S: ἐν ἑαυτῷ F: ἐν αὐτῷ J: ἑαυτῷ I 27 συνεχῆς ὄν μένειν I 28-31 οὐκ . . . μόνον PPS: om. T 28 τὸ alt. E²KAPS^b: om. E¹S¹ 29 γὰρ om. J¹ 30 ὑπάρχειν I τῷ om. E² 31 δὲ om. S 32 γε EJKPST: om. FHI κινεῖν] τὸ κινεῖν S μὲν τι] μέντοι I 33 καὶ αὐτὸ I ὑπὸ τούτου EKP et post κινούμενον HIJ: om. F

- 260^a νοούμενον αἰδίον εἶναι. ἔστιν δὲ τοῦτο δῆλον μὲν καὶ ἐκ τοῦ
 μὴ ἂν ἄλλως εἶναι γένεσιν καὶ φθορὰν καὶ μεταβολὴν τοῖς
 ἄλλοις, εἰ μὴ τι κινήσει κινούμενον· τὸ μὲν γὰρ ἀκίνητον
 [τὴν αὐτὴν] αἰεὶ τὸν αὐτὸν κινήσει τρόπον καὶ μίαν κίνησιν,
 5 ἄτε οὐδὲν αὐτὸ μεταβάλλον πρὸς τὸ κινούμενον. τὸ δὲ κινού-
 μενον ὑπὸ τοῦ κινουμένου μὲν, ὑπὸ τοῦ ἀκινήτου δὲ κινουμένου
 ἤδη, διὰ τὸ ἄλλως καὶ ἄλλως ἔχει πρὸς τὰ πράγματα,
 οὐ τῆς αὐτῆς ἔσται κινήσεως αἰτίον, ἀλλὰ διὰ τὸ ἐν ἐναν-
 τίοις εἶναι τόποις ἢ εἶδεσιν ἐναντίως παρέξεται κινούμενον
 10 ἕκαστον τῶν ἄλλων, καὶ ὅτε μὲν ἡρεμοῦν ὅτε δὲ κινούμενον.
 φανερόν δὴ γέγονεν ἐκ τῶν εἰρημένων καὶ ὁ κατ' ἀρχὰς
 ἠποροῦμεν, τί δὴ ποτε οὐ πάντα ἢ κινεῖται ἢ ἡρεμεῖ, ἢ τὰ
 μὲν κινεῖται αἰεὶ τὰ δ' αἰεὶ ἡρεμεῖ, ἀλλ' ἔνια ὅτε μὲν ὅτε
 δ' οὐ. τούτου γὰρ τὸ αἰτίον δῆλόν ἐστι νῦν, ὅτι τὰ μὲν ὑπὸ
 15 ἀκινήτου κινεῖται αἰδίου, διὸ αἰεὶ κινεῖται, τὰ δ' ὑπὸ
 κινουμένου καὶ μεταβάλλοντος, ὥστε καὶ αὐτὰ ἀναγκαῖον
 μεταβάλλειν. τὸ δ' ἀκίνητον, ὥσπερ εἴρηται, ἄτε ἀπλῶς
 καὶ ὡσαύτως καὶ ἐν τῷ αὐτῷ διαμένον, μίαν καὶ ἀπλήν
 κινήσει κίνησιν.
 20 Οὐ μὴν ἀλλὰ καὶ ἄλλην ποιησαμένοις ἀρχὴν μάλ- 7
 λον ἔσται περὶ τούτων φανερόν. σκεπτέον γὰρ πότερον ἐνδέ-
 χεται τινα κίνησιν εἶναι συνεχῆ ἢ οὐ, καὶ εἰ ἐνδέχεται, τίς
 αὕτη, καὶ τίς πρώτη τῶν κινήσεων· δῆλον γὰρ ὡς εἶπερ
 ἀναγκαῖον μὲν αἰεὶ κίνησιν εἶναι, πρώτη δὲ ἦδε καὶ συνεχῆς,
 25 ὅτι τὸ πρῶτον κινοῦν κινεῖ ταύτην τὴν κίνησιν, ἣν ἀναγκαῖον
 μίαν καὶ τὴν αὐτὴν εἶναι καὶ συνεχῆ καὶ πρώτην. τριῶν δ'
 οὐσῶν κινήσεων, τῆς τε κατὰ μέγεθος καὶ τῆς κατὰ πάθος

260^a 3 γὰρ] αρ E¹ 4 τὴν αὐτὴν om. EKST αἰεὶ τὴν αὐτὴν
 κινήσει E²: αἰεὶ κινήσει τὸν αὐτὸν Λ: τὸν αὐτὸν αἰεὶ κινήσει T: τὸν αὐτὸν
 κινήσει S τρόπον om. E² 5 τὸ δὲ κινούμενον E²KAST: om.
 E¹ 6 ὑπὸ . . . μὲν E²Λ γρ. P: om. E¹KPST δὲ EAP: ἢ
 KST 7 ἤδη E²KAPS: ἢ E¹ τὸ ἄλλω E¹ ἔχει ἠδὲ πρὸς
 E 8 ἐν E²KAS: om. E¹P 10 καὶ om. I 11 δὴ KAS:
 δὲ E 12 ἢ om. H κινεῖται ἢ ἡρεμεῖ EKT: ἡρεμεῖ ἢ κινεῖται Λ
 13 αἰεὶ κινεῖται AS αἰεὶ alt. KAS: om. E 15 κινεῖται alt.
 EKPST: μεταβάλλει Λ 16 ἀναγκαῖον καὶ αὐτὰ I 17 ἄτε
 om. E¹ 21 ἔσται om. I 21-2 ἐνδέχεται . . . εἶναι EKS: εἶναι
 (om. F) τινα κίνησιν ἐνδέχεται Λ 24 κίνησιν μὲν αἰεὶ I εἶναι
 om. K 25 αὐτὴν J ἣν E²FHIJ²KS: om. E¹J¹ 26 καὶ
 alt. APS: om. EK δ'] δὲ ἢ E²: γὰρ S 27 κατὰ EJKST:
 κατὰ τὸ FHI κατὰ EFJKS: κατὰ τὸ HI

καὶ τῆς κατὰ τόπον, ἣν καλοῦμεν φοράν, ταύτην ἀναγκαῖον εἶναι πρώτην. ἀδύνατον γὰρ αὐξήσῃ εἶναι ἀλλοιώσεως μὴ προὔπαρχούσης· τὸ γὰρ αὐξανόμενον ἔστιν μὲν ὡς ὁμοίῳ ἀν- 30 ξάνεται, ἔστιν δ' ὡς ἀνομοίῳ· τροφή γὰρ λέγεται τῷ ἐναντίῳ τὸ ἐναντίον. προσγίγνεται δὲ πᾶν γιγνόμενον ὁμοιον ὁμοίῳ. ἀνάγκη οὖν ἀλλοίωσιν εἶναι τὴν εἰς τὰναντία μεταβολήν. ἀλλὰ μὴν εἴ γε ἀλλοιοῦται, δεῖ τι εἶναι τὸ ἀλλοιοῦν καὶ 260^b ποιοῦν ἐκ τοῦ δυνάμει θερμοῦ ἐνεργείᾳ θερμόν. δῆλον οὖν ὅτι τὸ κωοῦν οὐχ ὁμοίως ἔχει, ἀλλ' ὅτε μὲν ἐγγύτερον ὅτε δὲ πορρώτερον τοῦ ἀλλοιουμένου ἔστιν. ταῦτα δ' ἄνευ φορᾶς οὐκ ἐνδέχεται ὑπάρχειν. εἰ ἄρα ἀνάγκη αἰεὶ κίνησιν εἶναι, 5 ἀνάγκη καὶ φορὰν αἰεὶ εἶναι πρώτην τῶν κινήσεων, καὶ φορᾶς, εἰ ἔστιν ἢ μὲν πρώτη ἢ δ' ὑστέρα, τὴν πρώτην. 7

ἔτι δὲ 7

πάντων τῶν παθημάτων ἀρχὴ πύκνωσις καὶ μάνωσις· καὶ γὰρ βαρὺ καὶ κοῦφον καὶ μαλακὸν καὶ σκληρὸν καὶ θερμὸν καὶ ψυχρὸν πυκνότητες δοκοῦσιν καὶ ἀραιότητες εἶναι τινας. 10 πύκνωσις δὲ καὶ μάνωσις σύγκρισις καὶ διάκρισις, καθ' ἃς γένεσις καὶ φθορὰ λέγεται τῶν οὐσιῶν. συγκριζόμενα δὲ καὶ διακριζόμενα ἀνάγκη κατὰ τόπον μεταβάλλειν. ἀλλὰ μὴν καὶ τοῦ αὐξανόμενου καὶ φθίνοντος μεταβάλλει κατὰ τόπον τὸ μέγεθος. 15

ἔτι καὶ ἐντεῦθεν ἐπισκοποῦσιν ἔσται φανερόν ὅτι 15 ἡ φορὰ πρώτη. τὸ γὰρ πρῶτον, ὡσπερ ἐφ' ἑτέρων, οὕτω καὶ ἐπὶ κινήσεως ἂν λέγοιτο πλεοναχῶς. λέγεται δὲ πρότερον οὐ τε μὴ ὄντος οὐκ ἔσται τᾶλλα, ἐκεῖνο δὲ ἄνευ τῶν ἄλλων, καὶ τὸ τῷ χρόνῳ, καὶ τὸ κατ' οὐσίαν. ὡστ' ἐπεὶ κίνησης μὲν ἀναγκαῖον εἶναι συνεχῶς, εἴη δ' ἂν συνεχῶς ἢ 20 συνεχῆς οὕσα ἢ ἐφεξῆς, μᾶλλον δ' ἢ συνεχῆς, καὶ βέλτιον

^a 30 ὑπαρχούσης E¹ αὐξόμενον F 31 τὸ γὰρ ἐναντίον τροφή λέγεται τῷ ἐναντίῳ Δ 32 προσγίγνεσθαι K 33 εἶναι post μεταβολήν H ^b 1 δεήσει εἶναι Δ 2 θερμοῦ τὸ ἐνεργείᾳ Δ οὖν] οὖν ἔστιν FHI 3 ὅτε . . . ὅτε] ποτέ . . . ποτέ F : ποτέ . . . τοτέ HIJ 5 εἰ E²KAS : om. E¹ κίνησιν αἰεὶ ἀνάγκη H 6 εἶναι αἰεὶ H φορᾶς E²KAS : φορὰν fort. E¹ 11 ἄς] ἄς καὶ E²F 13 κατὰ] καὶ κατὰ E² 14 καὶ alt. om. F 15 ἐναυθα F 16 φθορὰ E¹ ὡσπερ καὶ ἐπὶ τῶν ἄλλων Δ 17 ἐπὶ] ἐπὶ τῆς F ἂν om. E¹HK λέγοιτο] λέγεται K : λέγοιτο πρώτον FIJ 18 τε om. S 19 τὸ om. S τὸ E²KAPS : om. E¹ 20 μὲν om. H εἴη . . . συνεχῶς om. E¹ ἢ] ἢ ἢ Δ 21 οὕσα om. Δ ἢ] ἢ ἢ Δ : ἢ εἰ K

συνεχῆ ἢ ἐφεξῆς εἶναι, τὸ δὲ βέλτιον αἰὲ ὑπολαμβάνομεν
 ἐν τῇ φύσει ὑπάρχειν, ἂν ἢ δυνατόν, δυνατόν δὲ συνεχῆ
 εἶναι (δειχθήσεται δ' ὕστερον· νῦν δὲ τοῦτο ὑποκείσθω), καὶ
 25 ταύτην οὐδεμίαν ἄλλην οἶόν τε εἶναι ἀλλ' ἢ φορᾶν, ἀνάγκη
 τὴν φορᾶν εἶναι πρώτην. οὐδεμία γὰρ ἀνάγκη οὔτε αὐξεσθαι
 οὔτε ἀλλοιοῦσθαι τὸ φερόμενον, οὐδὲ δὴ γίγνεσθαι ἢ φθείρε-
 σθαι· τούτων δὲ οὐδεμίαν ἐνδέχεται τῆς συνεχοῦς μὴ οὔσης,

29 ἣν κινεῖ τὸ πρῶτον κινουῦν.

29 ἔτι χρόνῳ πρώτην· τοῖς γὰρ αἰ-
 30 δίοις μόνον ἐνδέχεται κινεῖσθαι ταύτην. ἀλλ' ἐφ' ἐνὸς μὲν
 ὄτουοῦν τῶν ἐχόντων γένεσιν τὴν φορᾶν ἀναγκαῖον ὑστάτην εἶ-
 ναι τῶν κινήσεων· μετὰ γὰρ τὸ γενέσθαι πρῶτον ἀλλοίω-
 σις καὶ αὐξήσις, φορὰ δ' ἤδη τετελειωμένων κινήσις ἐστίν.

261^a ἀλλ' ἕτερον ἀνάγκη κινούμενον εἶναι κατὰ φορᾶν πρότερον, ὃ
 καὶ τῆς γενέσεως αἴτιον ἔσται τοῖς γιγνομένοις, οὐ γιγνόμενον, οἶον
 τὸ γεννηθῆναι τοῦ γεννηθέντος, ἐπεὶ δόξειέ γ' ἂν ἡ γένεσις εἶναι
 πρώτη τῶν κινήσεων διὰ τοῦτο, ὅτι γενέσθαι δεῖ τὸ πρᾶγμα
 5 πρῶτον. τὸ δ' ἐφ' ἐνὸς μὲν ὄτουοῦν τῶν γιγνομένων οὕτως ἔχει,
 ἀλλ' ἕτερον ἀναγκαῖον πρότερόν τι κινεῖσθαι τῶν γιγνομένων
 ὃν αὐτὸ καὶ μὴ γιγνόμενον, καὶ τούτου ἕτερον πρότερον. ἐπεὶ
 δὲ γένεσιν ἀδύνατον εἶναι πρώτην (πάντα γὰρ ἂν εἴη τὰ κι-
 νούμενα φθαρτά), δηλοῦν ὡς οὐδὲ τῶν ἐφεξῆς κινήσεων οὐδεμία
 10 προτέρα· λέγω δ' ἐφεξῆς αὐξήσιν, εἴτ' ἀλλοίωσιν καὶ φθί-
 σιν καὶ φθοράν· πᾶσαι γὰρ ὕστεραι γενέσεως, ὥστ' εἰ μὴδὲ
 γένεσις προτέρα φορᾶς, οὐδὲ τῶν ἄλλων οὐδεμία μεταβολῶν.

ὅλως τε φαίνεται τὸ γιγνόμενον ἀτελὲς καὶ ἐπ' ἀρχὴν ἰόν,
 ὥστε τὸ τῇ γενέσει ὕστερον τῇ φύσει πρότερον εἶναι. τελευταῖον
 15 δὲ φορὰ πᾶσιν ὑπάρχει τοῖς ἐν γενέσει. διὸ τὰ μὲν ὅλως
 ἀκίνητα τῶν ζώντων δι' ἔνδειαν [τοῦ ὄργανου], οἶον τὰ φυτὰ

b 22 δὲ om. J
 EJKP: om. FHI
 αὐξάνεσθαι FHIK
 ἐνδέχεται EKPST: ἐνδέχεται μόνον FIJ: ἐνδέχεται μόνον H
 31 τῶν ἐχόντων ὄτουοῦν F τῶν κινήσεων εἶναι E
 32 ἀλλοίωσιν καὶ αὐξήσιν FJ²: αὐξήσις καὶ ἀλλοίωσις K
 μένων FI: τελειουμένων H: τελουμένων J 261^a 3 ἐπειδὴ F γ'
 om. FI: δ' H 4 γίνεσθαι H 5 πρότερον K 7 δν]
 δν καὶ H 9 ἀφθάρτα E¹ 10 πρότερον E 13 τε E²J¹P:
 δὲ FHIJ²: τε εἰ KS: om. E¹ 16 ζώντων EFIJKS: ζώων HP
 τοῦ ὄργανου om. E²KP οἶον] ὑπάρχει οἶον F

25 ἄλλην

26 αὐξεσθαι EJPT:

30 μόνον

ἐν I

32 ἀλ-

33 τελευτου-

7 δν]

13 τε E²J¹P:

16 ζώων HP

καὶ πολλὰ γένη τῶν ζώων, τοῖς δὲ τελειομένοις ὑπάρχει.
 ὥστ' εἰ μᾶλλον ὑπάρχει φορὰ τοῖς μᾶλλον ἀπειληφόσιω τὴν
 φύσιν, καὶ ἡ κίνησις αὕτη πρώτη τῶν ἄλλων ἂν εἴη κατ'
 οὐσίαν, διὰ τε ταῦτα καὶ διότι ἤκιστα τῆς οὐσίας ἐξίσταται τὸ 20
 κινούμενον τῶν κινήσεων ἐν τῷ φέρεσθαι· κατὰ μόνην γὰρ
 οὐδὲν μεταβάλλει τοῦ εἶναι, ὥσπερ ἀλλοιούμενον μὲν τὸ ποιόν,
 αὐξανόμενον δὲ καὶ φθίνοντος τὸ ποσόν. μάλιστα δὲ δῆλον
 ὅτι τὸ κινῶν αὐτὸ αὐτὸ μάλιστα ταύτην κινεῖ κυρίως, τὴν κατὰ
 τόπον· καίτοι φαμέν τοῦτο εἶναι τῶν κινουμένων καὶ κινούντων 25
 ἀρχὴν καὶ πρῶτον τοῖς κινουμένοις, τὸ αὐτὸ αὐτὸ κινῶν.

ὅτι μὲν τοῦτων τῶν κινήσεων ἡ φορὰ πρώτη, φανε-
 ρὸν ἐκ τούτων· τίς δὲ φορὰ πρώτη, νῦν δεικτέον. ἅμα δὲ
 καὶ τὸ νῦν καὶ πρότερον ὑποθεθέν, ὅτι ἐνδέχεται τινα
 κίνησιω εἶναι συνεχῆ καὶ αἰδίον, φανερόν ἐσται τῇ αὐτῇ με- 30
 θόδῳ. ὅτι μὲν οὖν τῶν ἄλλων κινήσεων οὐδεμίαν ἐνδέχεται
 συνεχῆ εἶναι, ἐκ τῶνδε φανερόν. ἅπασαι γὰρ ἐξ ἀντικει-
 μένων εἰς ἀντικείμενά εἰσι αἱ κινήσεις καὶ μεταβολαί, οἷον
 γενέσει μὲν καὶ φθορᾷ τὸ ὄν καὶ τὸ μὴ ὄν ὄροι, ἀλλοιώσει
 δὲ τὰ ἐναντία πάθη, αὐξήσει δὲ καὶ φθίσει ἢ μέγεθος καὶ 35
 μικρότης ἢ τελειότης μεγέθους καὶ ἀτέλεια· ἐναντία δ' αἱ
 εἰς τὰ ἐναντία. τὸ δὲ μὴ αἰεὶ κινούμενον τῆνδε τὴν κίνησιω, ὃν 261^b
 δὲ πρότερον, ἀνάγκη πρότερον ἡρεμεῖν. φανερόν οὖν ὅτι ἡρε-
 μήσει ἐν τῷ ἐναντίῳ τὸ μεταβάλλον. ὁμοίως δὲ καὶ ἐπὶ
 τῶν μεταβολῶν· ἀντίκειται γὰρ φθορὰ καὶ γένεσις ἀπλῶς
 καὶ ἡ καθ' ἕκαστον τῇ καθ' ἕκαστον. ὥστ' εἰ ἀδύνατον ἅμα 5
 μεταβάλλειν τὰς ἀντικείμενας, οὐκ ἐσται συνεχῆς ἢ μετα-
 βολή, ἀλλὰ μεταξὺ ἐσται αὐτῶν χρόνος. οὐδὲν γὰρ διαφέ-
 ρει ἐναντίας ἢ μὴ ἐναντίας εἶναι τὰς κατ' ἀντίφασιν μετα-
 βολάς, εἰ μόνον ἀδύνατον ἅμα τῷ αὐτῷ παρεῖναι (τοῦτο
 γὰρ τῷ λόγῳ οὐδὲν χρήσιμον), οὐδ' εἰ μὴ ἀνάγκη ἡρεμῆσαι 10
 ἐν τῇ ἀντιφάσει, μηδ' ἐστὶν μεταβολὴ ἡρεμίας ἐναντίον (οὐ
 γὰρ ἴσως ἡρεμεῖ τὸ μὴ ὄν, ἢ δὲ φθορὰ εἰς τὸ μὴ ὄν), ἀλλ'

^a 17 τῶν om. J ὑπάρχει om. F¹ 19 καὶ E²K αὐτῇ K
 ἂν om. E² 25 τοῦ κινουμένου K² καὶ] καὶ τῶν HI 26 αὐτὸ
 om. H αὐτὸ om. F 28 δεδεικταιον E¹ 29 τὸν K
 καὶ EKS: καὶ τὸ Δ ὅτι] ὅτι δὲ E¹ 33 αἱ] καὶ K 34 τὸ
 alt. EKT: om. ΔS ^b 2 οὖν] δ' E¹ 10 λόγῳ] ὄλφ Bekker
 errore preli οὐδὲν om. FK II μηδ'] εἰ μηδ' J¹ μετα-
 βολὴ ἡρεμίας EFKP¹S: μεταβολῆ ἡρεμίας HI]P^p

εἰ μόνον μεταξὺ γίνεται χρόνος· οὕτω γὰρ οὐκ ἔστιν ἡ μεταβολὴ συνεχῆς· οὐδὲ γὰρ ἐν τοῖς πρότερον ἢ ἐναντίοις
15 *χρήσιμον, ἀλλὰ τὸ μὴ ἐνδέχασθαι ἅμα ὑπάρχειν.*

15 οὐ δεῖ
δὲ ταράττεσθαι ὅτι τὸ αὐτὸ πλείοσι εἶναι ἐναντίον, οἷον ἡ κίνησις καὶ στάσει καὶ κινήσει τῇ εἰς τοῦναντίον, ἀλλὰ μόνον τοῦτο λαμβάνειν, ὅτι ἀντίκειται πως καὶ τῇ κινήσει καὶ τῇ ἡρεμίᾳ ἢ κίνησις ἢ ἐναντία, καθάπερ τὸ ἴσον καὶ τὸ μέτριον
20 τῷ ὑπερέχοντι καὶ τῷ ὑπερεχομένῳ, καὶ ὅτι οὐκ ἐνδέχεται ἅμα τὰς ἀντικειμένας οὔτε κινήσεις οὔτε μεταβολὰς ὑπάρχειν. ἔτι δ' ἐπὶ τε τῆς γενέσεως καὶ τῆς φθορᾶς καὶ παντελῶς ἄτοπον ἂν εἶναι δόξειεν, εἰ γενόμενον εὐθὺς ἀνάγκη φθαρῆναι καὶ μηδένα χρόνον διαμεῖναι. ὥστε ἐκ τούτων ἂν
25 ἢ πίστις γένοιτο ταῖς ἄλλαις· φυσικὸν γὰρ τὸ ὁμοίως ἔχειν ἐν ἀπάσαις.

Ἔστι δ' ἐνδέχεται εἶναι τινα ἄπειρον, μίαν οὖσαν καὶ 8
συνεχῆ, καὶ αὕτη ἐστὶν ἡ κύκλω, λέγωμεν νῦν. πᾶν μὲν γὰρ κινεῖται τὸ φερόμενον ἢ κύκλω ἢ εὐθείᾳ ἢ μικτῆν, ὥστ'
30 εἰ μὴδ' ἐκεῖνων ἢ ἐτέρα συνεχῆς, οὐδὲ τὴν ἐξ ἀμφοῖν οἶον τ' εἶναι συγκεκμημένη· ὅτι δὲ τὸ φερόμενον τὴν εὐθείαν καὶ πεπερασμένην οὐ φέρεται συνεχῶς, δῆλον· ἀνακάμπτει γάρ, τὸ δ' ἀνακάμπτον τὴν εὐθείαν τὰς ἐναντίας κινεῖται κινήσεις· ἐναντία γὰρ κατὰ τόπον ἢ ἄνω τῇ κάτω καὶ ἢ
35 εἰς τὸ πρόσθεν τῇ εἰς τοῦπισθεν καὶ ἢ εἰς ἀριστερὰ τῇ εἰς δεξιὰ· τόπου γὰρ ἐναντιώσεις αὗται. τίς δ' ἐστὶν ἢ μία καὶ
262^a συνεχῆς κίνησις, διώρισται πρότερον, ὅτι ἢ τοῦ ἐνὸς καὶ ἐν ἐνὶ χρόνῳ καὶ ἐν ἀδιαφόρῳ κατ' εἶδος (τρία γὰρ ἦν, τότε κινούμενον, οἷον ἄνθρωπος ἢ θεός, καὶ ὅτε, οἷον χρόνος, καὶ τρίτον τὸ ἐν ᾧ· τοῦτο δ' ἐστὶν τόπος ἢ πάθος ἢ εἶδος ἢ

^b 13 οὐκ om. E² ἔσται HIJK 14 ἢ E²KAS: om. E¹ 15 *χρήσιμος* FHS 16 ἢ εἰ HIJ¹ 18 λαβεῖν K 20 τῷ alt. EFKS: om. HIJ 22 καὶ alt. om. H 23 εὐθὺς ἀνάγκη EKT: ἀνάγκη εὐθὺς Δ 25 γίνονται E²IJ: E¹ incertum 26 ἀπάσαις E²KAS: πάσαις E¹ 27 εἶναι τινα KAPS: τινα εἶναι E 28 ἢ E²KAP: ἢ τέχνη ἢ E¹ λέγωμεν EIJP: λέγωμεν FHK μὲν EJKS: om. FHIT 32 συνεχῆ I 34 τῇ ἄνω ἢ κάτω IJ et ante κατὰ τόπον F ἢ om. J 35 ἔμπροσθεν E² εἰς τὰ (τὰ om. J) δεξιὰ τῇ εἰς τὰ ἀριστερὰ Δ 262^a I ἐν om. I 2 ἦν] ἐστὶ FHIP 4 τρίτον τὸ FHIIPS: τὸ τρίτον E¹J: τρίτον E²K δ' om. I ἐστὶν] ἐστὶν ἢ H τόπος... 5 μέγεθος EKP: τόπος ἢ πάθος ἢ μέγεθος ἢ εἶδος S: πάθος ἢ εἶδος ἢ τόπος ἢ μέγεθος Δ

μέγεθος). τὰ δ' ἐναντία διαφέρει τῷ εἶδει, καὶ οὐχ ἔν· τό- 5
 που δ' αἱ εἰρημέναι διαφοραί. σημείον δ' ὅτι ἐναντία ἡ κίνη-
 σις ἢ ἀπὸ τοῦ Α πρὸς τὸ Β τῇ ἀπὸ τοῦ Β πρὸς τὸ Α, ὅτι
 ἰσῳάσι καὶ παύουσι ἀλλήλας, ἐὰν ἅμα γίνωνται. καὶ
 ἐπὶ κύκλου ὡσαύτως, οἷον ἢ ἀπὸ τοῦ Α ἐπὶ τὸ Β τῇ ἀπὸ
 τοῦ Α ἐπὶ τὸ Γ (ἰσῳάσι γάρ, κἂν συνεχεῖς ὦσι καὶ μὴ γί- 10
 γνηται ἀνακάμψις, διὰ τὸ τἀναντία φθείρει καὶ κωλύει ἀλ-
 ληλα). ἀλλ' οὐχ ἡ εἰς τὸ πλάγιον τῇ ἄνω. 12

μάλιστα δὲ φα- 12

νερὸν ὅτι ἀδύνατον εἶναι συνεχῆ τὴν ἐπὶ τῆς εὐθείας κίνησιν,
 ὅτι ἀνακάμπτου ἀναγκαῖον στῆναι, οὐ μόνον ἐπ' εὐθείας,
 ἀλλὰ κἂν κύκλον φέρηται. οὐ γὰρ ταῦτόν κύκλω φέρε- 15
 σθαι καὶ κύκλον· ἔστω γὰρ ὅτε μὲν συνείρει κινούμενον, ὅτε
 δ' ἐπὶ τὸ αὐτὸ ἐλθὼν ὅθεν ὠρμήθη ἀνακάμψαι πάλιν. ὅτι
 δ' ἀνάγκη ἴστασθαι, ἢ πίστις οὐ μόνον ἐπὶ τῆς αἰσθήσεως
 ἀλλὰ καὶ ἐπὶ τοῦ λόγου. ἀρχὴ δὲ ἦδε. τριῶν γὰρ ὄντων,
 ἀρχῆς μέσου τελευτῆς, τὸ μέσον πρὸς ἑκάτερον ἄμφω ἔστιν, 20
 καὶ τῷ μὲν ἀριθμῷ ἔν, τῷ λόγῳ δὲ δύο. ἔτι δὲ ἄλλο
 ἔστιν τὸ δυνάμει καὶ τὸ ἐνεργείᾳ, ὥστε τῆς εὐθείας τῶν ἐντὸς
 τῶν ἄκρων ὄτιοῦν σημείον δυνάμει μὲν ἔστι μέσον, ἐνεργείᾳ
 δ' οὐκ ἔστιν, ἐὰν μὴ διέλη ταύτη καὶ ἐπιστὰν πάλιν ἄρξῃται
 κινεῖσθαι· οὕτω δὲ τὸ μέσον ἀρχὴ γίνεται καὶ τελευτῆ, 25
 ἀρχὴ μὲν τῆς ὕστερον, τελευτῆ δὲ τῆς πρώτης (λέγω δ'
 οἷον ἐὰν φερόμενον τὸ Α στῆ ἐπὶ τοῦ Β καὶ πάλιν φέρηται
 ἐπὶ τὸ Γ). ὅταν δὲ συνεχῶς φέρηται, οὔτε γεγονέναι οὔτε
 ἀπογεγονέναι οἶόν τε τὸ Α κατὰ τὸ Β σημείον, ἀλλὰ μό-
 νον εἶναι ἐν τῷ νῦν, ἐν χρόνῳ δ' οὐδενὶ πλὴν οὐ τὸ νῦν ἔστιν διαί- 30
 ρεσις, ἐν τῷ ὅλῳ [τῷ ΑΒΓ]. (εἰ δὲ γεγονέναι τις θήσει
 καὶ ἀπογεγονέναι, αἰεὶ στήσεται τὸ Α φερόμενον· ἀδύνατον

^a 6 αἱ εἰρημέναι ΚΑΣ: εἰρημέναι αἱ Ε ἢ ΚΣ: om. ΕΑ 9 ἢ] εἰ Ι
 Β... 10 Γ] γ... β Ε²Κ: τῇ... γ om. Ε¹ 10 γίνεται ΕΚ
 12 οὐχ ΕΗΙΚΡS: οὐχί FJ τὰ πλάγια ST τὸ erasit E, om. P
 14 ἐπ'] ἐπὶ τῆς Λ 15-16 κύκλω... κύκλον (καὶ om. Ε¹) ΕΙJKPS:
 κύκλον... κύκλω FH 17 ἀνακάμπτειν FHIJ¹ 19 ἀπὸ F
 21 λόγῳ δὲ ΕHKST: δὲ λόγῳ FIJ δὲ om. H 23 μὲν om.
 Ε¹ 24 διέληται F ταύτη Ε² et fort. T: ταύτην Ε¹ΚΑ
 25 κείσθαι Ε¹ 27 ἐπὶ τοῦ β στῆ F 28 δὲ om. Ε¹ 29 κατὰ]
 καὶ Ε¹J¹ 30 ἐν alt. om. Ε¹Κ πλὴν εἰ οὐ F ἔστιν διαίρεσις
 ΕKS: διαίρεσις ἔστιν Λ 31 ἐν om. ΕΚ τοῦ ὅλου τινὸς Κ²
 τῷ ΑΒΓ om. ΕΚ φήσει Κ¹: θήσει ἐν τοῖς δυνάμει σημείοις Κ²

262^b γὰρ τὸ Α ἅμα γεγρονέναι τε ἐπὶ τοῦ Β καὶ ἀπογεγονέναι.
 ἐν ἄλλῳ ἄρα καὶ ἄλλῳ σημείῳ χρόνου. χρόνος ἄρα ἔσται
 ὁ ἐν μέσῳ. ὥστε ἠρεμήσει τὸ Α ἐπὶ τοῦ Β. ὁμοίως δὲ καὶ
 ἐπὶ τῶν ἄλλων σημείων· ὁ γὰρ αὐτὸς λόγος ἐπὶ πάντων.
 5 ὅταν δὴ χρήσῃται τὸ φερόμενον Α τῷ Β μέσῳ καὶ τελευτῇ
 καὶ ἀρχῇ, ἀνάγκη στήναι διὰ τὸ δύο ποιεῖν, ὥσπερ ἂν εἶ
 καὶ νοήσειεν.) ἀλλ' ἀπὸ μὲν τοῦ Α σημείου ἀπογέγονε τῆς
 8 ἀρχῆς, ἐπὶ δὲ τοῦ Γ γέγονεν, ὅταν τελευτήσῃ καὶ στή.

8

διὸ

καὶ πρὸς τὴν ἀπορίαν τοῦτο λεκτέον· ἔχει γὰρ ἀπορίαν τήν-
 10 δε. εἰ γὰρ εἶη ἡ τὸ Ε τῇ Ζ ἴση καὶ τὸ Α φέροιτο συνε-
 χῶς ἀπὸ τοῦ ἄκρου πρὸς τὸ Γ, ἅμα δ' εἶη τὸ Α ἐπὶ τῷ
 Β σημείῳ, καὶ τὸ Δ φέροιτο ἀπὸ τῆς Ζ ἄκρας πρὸς τὸ Η
 ὁμαλῶς καὶ τῷ αὐτῷ τάχει τῷ Α, τὸ Δ ἔμπροσθεν ἤξει
 ἐπὶ τὸ Η ἢ τὸ Α ἐπὶ τὸ Γ· τὸ γὰρ πρότερον ὀρμησαν καὶ
 15 ἀπελθὸν πρότερον ἐλθεῖν ἀνάγκη. οὐ γὰρ ἅμα γέγονε τὸ
 Α ἐπὶ τῷ Β καὶ ἀπογέγονεν ἀπ' αὐτοῦ, διὸ ὑστερίζει. εἰ γὰρ
 ἅμα, οὐχ ὑστεριεῖ, ἀλλ' ἀνάγκη ἔσται ἴστασθαι. οὐκ ἄρα θε-
 τέον, ὅτε τὸ Α ἐγένετο κατὰ τὸ Β, τὸ Δ ἅμα κινεῖσθαι
 ἀπὸ τοῦ Ζ ἄκρου (εἰ γὰρ ἔσται γεγονὸς τὸ Α ἐπὶ τοῦ Β,
 20 ἔσται καὶ τὸ ἀπογενέσθαι, καὶ οὐχ ἅμα), ἀλλ' ἦν ἐν τομῇ
 χρόνου καὶ οὐκ ἐν χρόνῳ. ἐνταῦθα μὲν οὖν ἀδύνατον οὕτως
 λέγειν ἐπὶ τῆς συνεχοῦς· ἐπὶ δὲ τοῦ ἀνακάμπτουτος ἀνάγκη
 λέγειν οὕτως. εἰ γὰρ ἡ τὸ Η φέροιτο πρὸς τὸ Δ καὶ πά-
 λιν ἀνακάμψασα κάτω φέροιτο, τῷ ἄκρῳ ἐφ' οὗ Δ τε-
 25 λευτῇ καὶ ἀρχῇ κέχρηται, τῷ ἐνὶ σημείῳ ὡς δύο· διὸ στή-
 ναι ἀνάγκη· καὶ οὐχ ἅμα γέγονεν ἐπὶ τῷ Δ καὶ ἀπελή-
 λυθεν ἀπὸ τοῦ Δ· ἐκεῖ γὰρ ἂν ἅμα εἶη καὶ οὐκ εἶη ἐν
 τῷ αὐτῷ νῦν. ἀλλὰ μὴν τήν γε πάλαι λύσιν οὐ λεκτέον·

^b I τὸ Α om. HI τε] τὸ α HIJ ἐπὶ τὸ β F: κατὰ τὸ β HIJ:
 om. K 2 ἐν] ἀλλ' ἐν I ἄρα] γὰρ K καὶ ἄλλῳ om. E¹S
 5 δὴ scripsi: δὲ ΠS ἀρχῇ καὶ τελευτῇ Δ 7-8 τῆς . . . γέγονεν
 om. K 8 τὸ E² ὅτι τελευτήσῃ J¹ 9 τοῦτο . . . ἀπορίαν om. E¹
 11 τὸ β σημείον I 13 τῷ Α om. E τὸ Δ om. J: τὸ β FHI
 15 οὐ γὰρ ἅμα scripsi, hab. ut vid. S: οὐκ ἄρα ἅμα E¹Δ: οὐχ ἅμα
 ἄρα E²K 16 διὸ] διὸ καὶ F 17 ὑστερεῖ HI ἔσται EHIJS:
 om. FK 18 ἐγένετο KAS: ἐγένετο E κινεῖσθαι ἅμα E
 20 ἐστὶν J¹ τομῇ] τὸ μ I 22 τῆς συνεχοῦς EFJKP: τοῦ συνεχοῦς
 HIS¹: τοῦ συνεχῶς Gaye 23 λύειν F πρὸς . . . 24 φέροιτο
 om. E¹ 24 ἐφ' οὗ] ἐφ' οὗ τὸ K: τῷ Α 25 κέχρηται καὶ ἀρχῇ Δ
 26 τοῦ FHI 27 ἂν EFIJS: om. HK 28 μὴν] δὴ J

οὐ γὰρ ἐνδέχεται λέγειν ὅτι ἐστὶν κατὰ τὸ Δ ἢ τὸ Η ἐν
τομῇ, οὐ γέγονε δὲ οὐδ' ἀπογέγονεν. ἀνάγκη γὰρ ἐπὶ τέ- 30
λος ἐλθεῖν τὸ ἐνεργεῖα ὄν, μὴ δυνάμει. τὰ μὲν οὖν ἐν μέσῳ
δυνάμει ἔστι, τοῦτο δ' ἐνεργεῖα, καὶ τελευταῖα μὲν κάτωθεν,
ἀρχὴ δὲ ἄνωθεν καὶ τῶν κινήσεων ἄρα ὡσαύτως. ἀνάγκη 263^a
ἄρα στήναι τὸ ἀνακάμπτου ἐπὶ τῆς εὐθείας. οὐκ ἄρα ἐνδέ-
χεται συνεχῆ κίνησιν εἶναι ἐπὶ τῆς εὐθείας αἰδίου.

τὸν αὐτὸν δὲ τρόπον ἀπαντητέον καὶ πρὸς τοὺς ἐρωτῶν-
τας τὸν Ζήνωνος λόγον, [καὶ ἀξιούοντας,] εἰ αἰετὸ ἡμῖσι διέναι 5
δεῖ, ταῦτα δ' ἄπειρα, τὰ δ' ἄπειρα ἀδύνατον διεξελεῖν, ἢ
ὡς τὸν αὐτὸν τοῦτον λόγον τιτὲς ἄλλως ἐρωτῶσι, ἀξιούντες
ἅμα τῷ κινεῖσθαι τὴν ἡμίσειαν πρότερον ἀριθμῶν καθ' ἕκα-
στον γινόμενον τὸ ἡμῖσι, ὥστε διελθόντος τὴν ὅλην ἄπειρον
συμβαίνει ἡριθμηκέναι ἀριθμόν· τοῦτο δ' ὁμολογουμένως ἐστὶν 10
ἀδύνατον. 11

ἐν μὲν οὖν τοῖς πρώτοις λόγοις τοῖς περὶ κινή- 11
σεως ἐλόμεν διὰ τοῦ τὸν χρόνον ἄπειρα ἔχειν ἐν αὐτῷ·
οὐδὲν γὰρ ἄτοπον εἰ ἐν ἀπείρῳ χρόνῳ ἄπειρα διέρχεται
τις· ὁμοίως δὲ τὸ ἄπειρον ἐν τε τῷ μήκει ὑπάρχει καὶ
ἐν τῷ χρόνῳ. ἀλλ' αὕτη ἡ λύσις πρὸς μὲν τὸν ἐρωτῶντα 15
ικανῶς ἔχει (ἠρωτᾶτο γὰρ εἰ ἐν πεπερασμένῳ ἄπειρα ἐν-
δέχεται διεξελεῖν ἢ ἀριθμῆσαι), πρὸς δὲ τὸ πρᾶγμα καὶ
τὴν ἀλήθειαν οὐχ ἱκανῶς· ἂν γάρ τις ἀφέμενος τοῦ μήκους
καὶ τοῦ ἐρωτᾶν εἰ ἐν πεπερασμένῳ χρόνῳ ἐνδέχεται ἄπειρα
διεξελεῖν, πυνθάνηται ἐπ' αὐτοῦ τοῦ χρόνου ταῦτα (ἔχει 20
γὰρ ὁ χρόνος ἀπείρους διαιρέσεις), οὐκέτι ἱκανὴ ἔσται αὕτη
ἡ λύσις, ἀλλὰ τὸ ἀληθὲς λεκτέον, ὅπερ εἵπομεν ἐν τοῖς
ἄρτι λόγοις. ἐὰν γὰρ τις τὴν συνεχῆ διαιρῆ εἰς δύο ἡμίση,

^b 29 τὰ δ E 30 τομῇ] τῷ μ I οὐ] οὐδὲ F: οὔτε HI 31 μῆ]
καὶ μῆ F: οὐ K: om. H γρ. A τὰ ES: τὸ ΚΛ 32 τελευταῖα K
263^a I ἄρα AS: om. EK 3 εἶναι . . . αἰδίου Prantl: εἶναι . . . ἴδιον
E¹: εἶναι αἰδίου ἐπὶ τῆς εὐθείας E²K: αἰδίου εἶναι ἐπὶ τῆς εὐθείας Λ: εἶναι
ἐπὶ αἰδίου τῆς εὐθείας Bekker 5 καὶ ἀξιούοντας seclusi, om. fort. S
εἰ om. K δεῖ διέναι H: διέναι K 6 δ' alt. om. J¹ διεξελεῖν
ἀδύνατον FH: ἀδύνατον ἐξελεῖν I 7 τινες λόγον IJ ἐρωτῶσι
ἀλλ' ὡς K 9 γενόμενον H συμβαίνειν ἄπειρον K 10 συμ-
βαίη F 11 ἀδύνατον . . . κινήσεως supra lituram E² τοῖς
om. K 12 διαυτου E: διὰ τὸ FHK ἔχειν ἄπειρα FHJ ἐν
om. E¹ 14 ὑπάρχει post ^a15 χρόνῳ FIJ: ὑπάρχειν K: om. H
16 ἄπειρα] χρόνῳ ἄπειρα KS 17 διεξελεῖν EIJKS: διελεῖν
FH 19 ἄπειρα διεξελεῖν EJKS: διεξελεῖν ἄπειρα FHI

οὗτος τῷ ἐνὶ σημείῳ ὡς δυσι χρῆται· ποιεῖ γὰρ αὐτὸ ἀρ-
 25 χὴν καὶ τελευτήν. οὕτω δὲ ποιεῖ ὅ τε ἀριθμῶν καὶ ὁ εἰς
 τὰ ἡμίση διαιρῶν. οὕτω δὲ διαιροῦντος οὐκ ἔσται συνεχῆς οὐθ'
 ἢ γραμμῇ οὐθ' ἢ κίνησις· ἢ γὰρ συνεχῆς κίνησις συνεχοῦς
 ἔστω, ἐν δὲ τῷ συνεχεῖ ἔνεστι μὲν ἄπειρα ἡμίση, ἀλλ' οὐκ
 ἐντελεχεία ἀλλὰ δυνάμει. ἂν δὲ ποιῇ ἐντελεχεία, οὐ ποιή-
 30 σει συνεχῆ, ἀλλὰ στήσει, ὅπερ ἐπὶ τοῦ ἀριθμοῦντος τὰ ἡμί-
 σεα φανερόν ἐστιν ὅτι συμβαίνει· τὸ γὰρ ἐν σημείῳ ἀνάγκη
 263^b αὐτῷ ἀριθμεῖν δύο· τοῦ μὲν γὰρ ἐτέρου τελευτὴ ἡμίσεος
 τοῦ δ' ἐτέρου ἀρχὴ ἔσται, ἂν μὴ μίαν ἀριθμῇ τὴν συνεχῆ,
 ἀλλὰ δύο ἡμισείας. ὥστε λεκτέον πρὸς τὸν ἔρωτῶντα εἰ ἐν-
 δέχεται ἄπειρα διεξελεθῆν ἢ ἐν χρόνῳ ἢ ἐν μήκει, ὅτι ἔστιν
 5 ὡς, ἔστιν δ' ὡς οὐ. ἐντελεχεία μὲν γὰρ ὄντα οὐκ ἐνδέχεται,
 δυνάμει δὲ ἐνδέχεται· ὁ γὰρ συνεχῶς κινούμενος κατὰ συμ-
 βεβηκὸς ἄπειρα διελήλυθεν, ἀπλῶς δ' οὐ· συμβέβηκε γὰρ
 τῇ γραμμῇ ἄπειρα ἡμίσεα εἶναι, ἢ δ' οὐσία ἐστὶν ἐτέρα καὶ
 9 τὸ εἶναι.
 9 δῆλον δὲ καὶ ὅτι ἐὰν μὴ τις ποιῇ τοῦ χρόνου τὸ
 10 διαιροῦν σημεῖον τὸ πρότερον καὶ ὕστερον αἰε τοῦ ὕστερου τῷ
 πράγματι, ἔσται ἅμα τὸ αὐτὸ ὄν καὶ οὐκ ὄν, καὶ ὅτε γέ-
 γονεν οὐκ ὄν. τὸ σημεῖον μὲν οὖν ἀμφοῖν κοινόν, καὶ τοῦ
 προτέρου καὶ τοῦ ὕστερου, καὶ ταῦτόν καὶ ἐν ἀριθμῷ, λόγῳ
 δ' οὐ ταῦτόν (τοῦ μὲν γὰρ τελευτῆ, τοῦ δ' ἀρχῆς)· τῷ δὲ
 15 πράγματι αἰε τοῦ ὕστερου πάθος ἐστίν. χρόνος ἐφ' ᾧ ΑΓΒ,
 πρᾶγμα ἐφ' ᾧ Δ. τοῦτο ἐν μὲν τῷ Α χρόνῳ λευκόν, ἐν δὲ
 τῷ Β οὐ λευκόν· ἐν τῷ ἄρα Γ λευκόν καὶ οὐ λευκόν. ἐν ὄφου
 γὰρ τοῦ Α λευκόν ἀληθὲς εἰπεῖν, εἰ πάντα τὸν χρόνον τοῦτον
 ἦν λευκόν, καὶ ἐν τῷ Β οὐ λευκόν· τὸ δὲ Γ ἐν ἀμφοῖν.

^a 25 οὕτω] τοῦτο ΗΙ ἀριθμὸν Κ 26 οὐκ ἔστι ΗΙ :
 οὐκέτι F 28 ἔνεστι] ἔστιν Ε : ἔσται Η 30 ἡμίση FK
^b I αὐτὸ Fδ υὸ ἀριθμεῖν Κ ἐτέρου . . . ἡμίσεος] ἐτέρου ἡμίσεος
 ἀρχὴ ΙJ : ἡμίσεος τοῦ ἐτέρου ἀρχὴ FH 2 ἀρχῆ] τελευτῆ Α
 6 ἐνδέχεται οὐ· ὁ Ε² 7 διελήλυθεν ἀνάγκη ἀπλῶς F¹ δ'] γὰρ Ι
 9 δὲ EFJKS : δὴ Η : γὰρ Ι καὶ EFJKS : om. ΗΙ ἂν JS :
 κἂν Κ μὴ et τοῦ χρόνου Ε²KAS : om. Ε¹ 10 τὸ] τὸν
 FHJ : τῶν Ι 11 ἅμα om. Η γέγονεν] γενόμενον F 12 τὸ
 om. Ε¹ καὶ τοῦ προτέρου κοινόν EK 13 ἐν] ἐν καὶ F
 15 πάθος Η οὐ Ι αγβ ΚΑ et fecit Ε² : ABΓ casu Bekker 16 οὐ
 Ι μὲν om. Ε Α] α δλω EK 17 γ ἄρα Ε²FH 18 ἀληθὲς
 εἰπεῖν λευκόν Α 19 ἐν om. EFJK τὸ Ε¹HJK : τῶν Ε²
 μὴ HJK

οὐκ ἄρα δοτέον ἐν παντί, ἀλλὰ πλὴν τοῦ τελευταίου νῦν ἐφ' οὗ 20
 τὸ Γ· τοῦτο δ' ἤδη τοῦ ὑστέρου. καὶ εἰ ἐγίγνετο οὐ λευκὸν καὶ
 ἐφθειρέτο (τὸ) λευκὸν ἐν τῷ Α παντί, γέγονεν ἢ ἐφθαρται ἐν
 τῷ Γ. ὥστε λευκὸν ἢ μὴ λευκὸν ἐν ἐκείνῳ πρώτου ἀληθὲς
 εἰπεῖν, ἢ ὅτε γέγονεν οὐκ ἔσται, καὶ ὅτε ἐφθαρται ἔσται, ἢ
 ἅμα λευκὸν καὶ οὐ λευκὸν καὶ ὅλως ὄν καὶ μὴ ὄν ἀνάγκη 25
 εἶναι. εἰ δ' ὁ ἂν ἦ πρότερον μὴ ὄν, ἀνάγκη γίγνεσθαι ὄν,
 καὶ ὅτε γίγνεται μὴ ἔστω, οὐχ οἷόν τε εἰς ἀτόμους χρόνους
 διαιρεῖσθαι τὸν χρόνον. εἰ γὰρ ἐν τῷ Α τὸ Δ ἐγί-
 γνετο λευκόν, γέγονε δ' ἅμα καὶ ἔστω ἐν ἐτέρῳ ἀτόμῳ
 χρόνῳ ἐχομένῳ δ', ἐν τῷ Β—εἰ ἐν τῷ Α ἐγίγνετο, οὐκ ἦν, 30
 ἐν δὲ τῷ Β ἔστί—, γένεσιν δεῖ τινα εἶναι μεταξύ, ὥστε καὶ
 χρόνον ἐν ᾧ ἐγίγνετο. οὐ γὰρ ὁ αὐτὸς ἔσται λόγος καὶ τοῖς 264^a
 μὴ ἄτομα λέγουσιν, ἀλλ' αὐτοῦ τοῦ χρόνου, ἐν ᾧ ἐγίγνετο,
 γέγονε καὶ ἔστω ἐν τῷ ἐσχάτῳ σημείῳ, οὐ οὐδὲν ἐχόμενον
 ἔστω οὐδ' ἐφεξῆς· οἱ δὲ ἄτομοι χρόνοι ἐφεξῆς. φανερόν δ' ὅτι
 εἰ ἐν τῷ Α ὅλῳ χρόνῳ ἐγίγνετο, οὐκ ἔστω πλείων χρόνος ἐν ᾧ 5
 γέγονεν καὶ ἐγίγνετο ἢ ἐν ᾧ ἐγίγνετο μόνον παντί.

οἷς μὲν οὖν ἂν τις ὡς οἰκείους πιστεύσειε λόγοις, οὔτοι
 καὶ τοιοῦτοί τινές εἰσιν· λογικῶς δ' ἐπισκοποῦσι κὰν ἐκ τῶνδε
 δόξειέ τῳ ταῦτο τοῦτο συμβαίνειν. ἅπαν γὰρ τὸ κινούμενον
 συνεχῶς, ἂν ὑπὸ μηδενὸς ἐκκρούηται, εἰς ὅπερ ἦλθεν κατὰ 10
 τὴν φοράν, εἰς τοῦτο καὶ ἐφέρετο πρότερον, οἷον εἰ ἐπὶ τὸ Β
 ἦλθε, καὶ ἐφέρετο ἐπὶ τὸ Β, καὶ οὐχ ὅτε πλησίον ἦν, ἀλλ'
 εὐθὺς ὡς ἤρξατο κινεῖσθαι· τί γὰρ μᾶλλον νῦν ἢ πρότερον;
 ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. τὸ δὴ ἀπὸ τοῦ Α [ἐπὶ τὸ Γ]

^b 20 ἅπαντι E²K ἀλλὰ] ἅμα E¹ ὑφ' E ὦ H 21 τὸ
 om. A δὲ δὴ E¹ τοῦ ὑστέρου scripsi, habuerunt ut vid. PS :
 τὸ ὑστέρον EA : τοῦ α τὸ ὑστέρον K εἰ E²KAS : om. E¹ οὐ om.
 IJS : καὶ οὐ E¹ καὶ] καὶ εἰ KAS 22 τὸ addidi : om. PS
 23 ὥστε AS : ὥστε εἰ ἦν E πρώτου ἐν ἐκείνῳ Λ
 πρώτῳ E² 24 οὐκ ἔστω F 25 οὐ] μὴ K ὄν om. J¹ μὴ
 EHKS : οὐκ FIJ 26 ὄν pr. E²KAS : om. E¹ 28 α χρόνῳ
 τὸ Λ 29 χρόνῳ ἀτόμῳ H 30 οὐκ] καὶ οὐκ F 31 δεῖ]
 οὖν δεῖ K² εἶναι τινα FHIK 264^a I χρόνος ἦν ἐν Λ ἐγέ-
 νετο IJ ὁ om. F λόγος ἔστω KAP τοῖς E²AP : om. E¹K
 3 οὐ] ὦ K ἐχόμενον ἔστω EKS : ἔστω ἐχόμενον Λ 4 οἱ . . .
 ἐφεξῆς om. H 5 χρόνῳ om. H 6 ἐγίγνετο ἢ E²KAS : om.
 E¹ 7 λόγοις πιστεύσειεν H : πιστεύσειεν S 8 καὶ τοιοῦτοί
 om. E¹ καὶ F 9 συμβαίνειν τοῦτο F 11 εἰ] ἢ E¹
 12 καὶ οὐκ ἐφέρετο I 14 δὲ E¹Λ ἐπὶ τὸ Γ om. EK

15 φερόμενον, ὅταν ἐπὶ τὸ Γ ἔλθῃ, πάλιν ἤξει ἐπὶ τὸ Α συνεχῶς κινούμενον. ὅτε ἄρα ἀπὸ τοῦ Α φέρεται πρὸς τὸ Γ, τότε καὶ εἰς τὸ Α φέρεται τὴν ἀπὸ τοῦ Γ κίνησιν, ὥσθ' ἅμα τὰς ἐναντίας· ἐναντία γὰρ αἱ κατ' εὐθείαν. ἅμα δὲ καὶ ἐκ τούτου μεταβάλλει ἐν ᾧ οὐκ ἔστιν. εἰ οὖν τοῦτ' ἀδύνατον, ἀνάγκη 20 ἵστασθαι ἐπὶ τοῦ Γ. οὐκ ἄρα μία ἡ κίνησις· ἡ γὰρ διαλαμβανομένη στάσει οὐ μία. ἔτι καὶ ἐκ τῶνδε φανερόν καθόλου μάλλον περὶ πάσης κινήσεως. εἰ γὰρ ἅπαν τὸ κινούμενον τῶν εἰρημένων τινὰ κινεῖται κινήσεων καὶ ἡρεμεί τῶν ἀντικειμένων ἡρεμιῶν (οὐ γὰρ ἦν ἄλλη παρὰ ταύτας), τὸ δὲ μὴ 25 αἰεὶ κινούμενον τήνδε τὴν κίνησιν (λέγω δ' ὅσαι ἕτεραι τῷ εἶδει, καὶ μὴ εἴ τι μόριόν ἐστιν τῆς ὅλης) ἀνάγκη πρότερον ἡρεμεῖν τὴν ἀντικειμένην ἡρεμίαν (ἡ γὰρ ἡρεμία στέρησις κινήσεως)· εἰ οὖν ἐναντία μὲν κινήσεις αἱ κατ' εὐθείαν, ἅμα δὲ μὴ ἐνδέχεται κινεῖσθαι τὰς ἐναντίας, τὸ ἀπὸ τοῦ Α πρὸς 30 τὸ Γ φερόμενον οὐκ ἂν φέροιτο ἅμα καὶ ἀπὸ τοῦ Γ πρὸς τὸ Α· ἐπεὶ δ' οὐχ ἅμα φέρεται, κινήσεται δὲ ταύτην τὴν κίνησιν, ἀνάγκη πρότερον ἡρεμῆσαι πρὸς τῷ Γ· αὕτη γὰρ ἦν ἡ ἀντικειμένη ἡρεμία τῇ ἀπὸ τοῦ Γ κινήσει. δηλον τοίνυν 264^b ἐκ τῶν εἰρημένων ὅτι οὐκ ἔσται συνεχῆς ἡ κίνησις. ἔτι δὲ καὶ ὅδε ὁ λόγος μάλλον οἰκείος τῶν εἰρημένων. ἅμα γὰρ ἔφθαρται τὸ οὐ λευκὸν καὶ γέγονε λευκόν. εἰ οὖν συνεχῆς ἡ ἀλλοίωσις εἰς λευκὸν καὶ ἐκ λευκοῦ καὶ μὴ μένει τινὰ χρόνον, 5 ἅμα ἔφθαρται τὸ οὐ λευκὸν καὶ γέγονε λευκὸν καὶ γέγονεν οὐ λευκόν· τριῶν γὰρ ἔσται ὁ αὐτὸς χρόνος. ἔτι οὐκ εἰ συνεχῆς ὁ χρόνος, καὶ ἡ κίνησις, ἀλλ' ἐφεξῆς. πῶς δ' ἂν εἴη τὸ ἔσχατον τὸ αὐτὸ τῶν ἐναντίων, οἷον λευκότητος καὶ μελα-

9 νίας ; ἡ δ' ἐπὶ τῆς περιφεροῦς ἔσται μία καὶ συνεχῆς· οὐθὲν

^a 15 ὅταν . . . ἔλθῃ om. Δ ἐπὶ] πρὸς E 16 εἰς τὸ γ ἐφέρετο Δ
 20 μίαν κίνησιν E² ἡ pr. KAT: om. E 21 οὐ μία EKS: οὐκ
 ἔστιν μία Δ: οὐ μία ἐστίν T ἔτι KAS: ἔτι δὲ E 23 τῶν . . . κινεῖται
 EKS: κινεῖται τινὰ τῶν εἰρημένων Δ ἡρεμῖται I 26 ἔσται S
 27 στέρησις τῆς κινήσεως E²: στέρησις ἐστὶ κινήσεως HIJ: στέρησις τῆς
 κινήσεως ἐστὶν F: ἐστὶν στέρησις τῆς κινήσεως K 30 τοῦ Α Bekker
 31 κινεῖται F 32 ἡρεμῆσαι EFIJKS: ἡρεμῖν HP πρὸς τῷ
 KAS: τὴν πρὸς τὸ E 33 ἦν EJS: om. FHIK ἀπὸ om. E²
^b I ἐκ] ἀπὸ FIJ ὅτι . . . 2 εἰρημένων om. F¹ I ἔσται ES: ἔστι
 F²HIJK 4 εἰς om. E: ἡ εἰς K ἐκ] μὴ ἐκ HI¹: ἐκ μὴ J
 5 τὸ EHIKS: τε FJ καὶ γέγονε λευκὸν EHIKPS: om. FJ
 καὶ . . . 6 λευκὸν E²FHJKP: om. E¹ 7 δ' om. Δ ἀν] ἂν
 οὖν HJ 9 περιφορᾶς H οὐδὲν J: οὐδὲ I

γὰρ ἀδύνατον συμβαίνει· τὸ γὰρ ἐκ τοῦ Α κινούμενον ἅμα ¹⁰
 κινήσεται εἰς τὸ Α κατὰ τὴν αὐτὴν πρόθεσιν (εἰς ὃ γὰρ ἦξει,
 καὶ κινεῖται εἰς τοῦτο), ἀλλ' οὐχ ἅμα κινήσεται τὰς ἐναντίας
 οὐδὲ τὰς ἀντικειμένας· οὐ γὰρ ἅπαντα ἢ εἰς τοῦτο τῆ ἐκ τοῦτου
 ἐναντία οὐδ' ἀντικειμένη, ἀλλ' ἐναντία μὲν ἢ κατ' εὐθείαν
 (ταύτη γὰρ ἔστιν ἐναντία κατὰ τόπον, οἷον τὰ κατὰ διάμε- ¹⁵
 τρον· ἀπέχει γὰρ πλείστον), ἀντικειμένη δὲ ἢ κατὰ τὸ αὐτὸ
 μῆκος. ὥστ' οὐδὲν κωλύει συνεχῶς κινεῖσθαι καὶ μηδένα χρό-
 νον διαλείπειν· ἢ μὲν γὰρ κύκλω κίνησις ἔστιν ἀφ' αὐτοῦ εἰς
 αὐτό, ἢ δὲ κατ' εὐθείαν ἀφ' αὐτοῦ εἰς ἄλλο· καὶ ἢ μὲν
 ἐν τῷ κύκλω οὐδέποτε ἐν τοῖς αὐτοῖς, ἢ δὲ κατ' εὐθείαν πολ- ²⁰
 λάκις ἐν τοῖς αὐτοῖς. τὴν μὲν οὖν ἀεὶ ἐν ἄλλῳ καὶ ἄλλῳ
 γιγνομένην ἐνδέχεται κινεῖσθαι συνεχῶς, τὴν δ' ἐν τοῖς αὐ-
 τοῖς πολλάκις οὐκ ἐνδέχεται· ἀνάγκη γὰρ ἅμα κινεῖσθαι
 τὰς ἀντικειμένας. ὥστ' οὐδ' ἐν τῷ ἡμικυκλίῳ οὐδ' ἐν ἄλλῃ
 περιφερείᾳ οὐδεμίᾳ ἐνδέχεται συνεχῶς κινεῖσθαι· πολλάκις ²⁵
 γὰρ ἀνάγκη ταῦτ' κινεῖσθαι καὶ τὰς ἐναντίας μεταβάλλειν
 μεταβολάς· οὐ γὰρ συνάπτει τῆ ἀρχῇ τὸ πέρασ· ἢ δὲ τοῦ
 κύκλου συνάπτει, καὶ ἔστι μόνη τέλειος. 28

φανερὸν δὲ ἐκ 28

ταύτης τῆς διαιρέσεως ὅτι οὐδὲ τὰς ἄλλας ἐνδέχεται κινή-
 σεις εἶναι συνεχεῖς· ἐν ἀπάσαις γὰρ ταῦτ' συμβαίνει κιν- ³⁰
 νεῖσθαι πολλάκις, οἷον ἐν ἀλλοιώσει τὰ μεταξύ, καὶ ἐν τῇ
 τοῦ ποσοῦ τὰ ἀνὰ μέσον μεγέθη, καὶ ἐν γενέσει καὶ φθορᾷ
 ὡσαύτως· οὐδὲν γὰρ διαφέρει ὀλίγα ἢ πολλὰ ποιῆσαι, ἐν
 οἷς ἔστιν ἢ μεταβολή, οὐδὲ μεταξύ θείναι τι ἢ ἀφελεῖν· ἀμ- ^{265^a}
 φοτέρως γὰρ συμβαίνει ταῦτ' κινεῖσθαι πολλάκις. δῆλον
 οὖν ἐκ τούτων ὅτι οὐδ' οἱ φυσιολόγοι καλῶς λέγουσιν οἱ πάντα

^b II κινήσεται E² 12 καὶ κινήται E¹: κενίηται E² 14 ἢ
 ἐναντία μὲν J κατ' εὐθείαν EKT: ἐπ' εὐθείας AS 15 ταῦτα
 EK τὰ KS: τὸ E: ἢ FHJ: εἰ I 18 διαλιπεῖν K ἀφ'
 (ἢ ἀφ' H) ἑαυτοῦ HIS¹: ἀπ' αὐτοῦ T: ἀπὸ τοῦ αὐτοῦ SP εἰς ...
 19 αὐτοῦ om. K 19 αὐτό scripsi: ἑαυτό F: αὐτό HIJSPT: τὸ
 αὐτό E ἀφ' αὐτοῦ om. S 21 ἀεὶ] αὐτὴν I καὶ ἐν ἄλλῳ FJ
 22 ἐνδέχεται om. E¹ 23 ἅμα γὰρ ἀνάγκη F 26 τὰς αὐτὰς
 EK μεταβολὰς μεταβάλλειν FH 28 συνάπτει E¹ δὲ
 ES: δὲ καὶ KΛ 29 οὐδὲ ... ἐνδέχεται] οὐκ ἐνδέχεται οὐδὲ τὰς
 ἄλλας Λ οὐ E 30 εἶναι] γίνεσθαι K: γίνεσθαι E ταύταις
 συμβαίνει E: συμβαίνει ταῦτα Λ κινεῖσθαι post γὰρ I 31 ἐν]
 ἐν τ' E² τὸ F 32 γένει E¹ 33 οὐδὲ I διαφθεῖρει E¹
 ποιεῖν H 265^a I προσθεῖναι K 2 ταῦτ' συμβαίνει K

τὰ αἰσθητὰ κινεῖσθαι φάσκοντες αἰεὶ· κινεῖσθαι γὰρ ἀνάγκη
 5 τούτων τινὰ τῶν κινήσεων, καὶ μάλιστα κατ' ἐκείνους [ἐστίν] ἀλ-
 λουοῦσθαι· ῥεῖν γὰρ φασιν αἰεὶ καὶ φθίνειν, ἔτι δὲ καὶ τὴν
 γένεσιν καὶ τὴν φθορὰν ἀλλοίωσιν λέγουσιν. ὁ δὲ λόγος νῦν
 εἴρηκε καθόλου περὶ πάσης κινήσεως ὅτι κατ' οὐδεμίαν κίνησιν
 ἐνδέχεται κινεῖσθαι συνεχῶς ἔξω τῆς κύκλω, ὥστε οὔτε κατ'
 10 ἀλλοίωσιν οὔτε κατ' αὔξησιν. ὅτι μὲν οὖν οὗτ' ἄπειρός ἐστι
 μεταβολὴ οὐδεμία οὔτε συνεχῆς ἔξω τῆς κύκλω φορᾶς ἔστω
 τοσαύτ' ἡμῖν εἰρημένα.

“Ὅτι δὲ τῶν φορῶν ἡ κυκλοφορία πρώτη, δῆλον. πᾶσα
 γὰρ φορὰ, ὥσπερ καὶ πρότερον εἵπομεν, ἢ κύκλω ἢ ἐπ'
 15 εὐθείας ἢ μικτῇ. ταύτης δὲ ἀνάγκη προτέρας εἶναι ἐκείνας·
 ἐξ ἐκείνων γὰρ συνέστηκεν. τῆς δ' εὐθείας ἢ κύκλω· ἀπλῆ
 γὰρ καὶ τέλειος μᾶλλον. ἄπειρον μὲν γὰρ οὐκ ἔστιν εὐθείαν
 φέρεσθαι (τὸ γὰρ οὕτως ἄπειρον οὐκ ἔστιν· ἅμα δ' οὐδ' εἰ ἦν,
 20 δὲ τὴν ἄπειρον ἀδύνατον)· ἢ δ' ἐπὶ τῆς πεπερασμένης
 ἀνακάμπτουσα μὲν συνθετὴ καὶ δύο κινήσεις, μὴ ἀνακάμ-
 πτουσα δὲ ἀτελής καὶ φθαρτῆ. πρότερον δὲ καὶ φύσει καὶ
 λόγῳ καὶ χρόνῳ τὸ τέλειον μὲν τοῦ ἀτελοῦς, τοῦ φθαρτοῦ δὲ
 τὸ ἀφθαρτον. ἔτι προτέρα ἦν ἐνδέχεται αἰδιον εἶναι τῆς μὴ
 25 ἐνδεχομένης· τὴν μὲν οὖν κύκλω ἐνδέχεται αἰδιον εἶναι, τῶν
 δὲ ἄλλων οὔτε φορὰν οὔτε ἄλλην οὐδεμίαν· στάσιν γὰρ δεῖ
 27 γενέσθαι, εἰ δὲ στάσις, ἐφθαρταὶ ἢ κινήσις.

εὐλόγως δὲ συμ-
 βέβηκε τὸ τὴν κύκλω μίαν εἶναι καὶ συνεχῆ, καὶ μὴ τὴν
 ἐπ' εὐθείας· τῆς μὲν γὰρ ἐπ' εὐθείας ὠρισταὶ καὶ ἀρχῆ
 30 καὶ τέλος καὶ μέσον, καὶ πάντ' ἔχει ἐν αὐτῇ, ὥστ' ἔστιν ὅθεν
 ἀρξεται τὸ κινουμένον καὶ οὗ τελευτήσει (πρὸς γὰρ τοῖς πέ-
 ρασιν ἡρεμεῖ πᾶν, ἢ ὅθεν ἢ οὗ), τῆς δὲ περιφεροῦς ἀόριστα· τί
 γὰρ μᾶλλον ὁποιοῦν πέρασ τῶν ἐπὶ τῆς γραμμῆς; ὁμοίως

^a 5 τινὰ τούτων FHJ ἐστὶν seclusi 6 αἰεὶ φασιν FHI
 7 ἀλλοίωσιν δὲ λέγουσιν E¹ 14 ἢ alt. om. E¹ ἐπ' εὐθείας] εὐθεία
 EK 16 γὰρ om. H 17 γὰρ alt.] οὖν FH 18 ἅμα δ'] ἀλλ' Λ
 19 οὗ] οὐδὲ E τὸ om. H¹ 20 τὴν] τὸ H πεπερασμένης εὐθείας
 ἀνακάμπτουσα Λ 23 μὲν τέλειον F: τέλειον H 25 ἐνδέχεται
 αἰδιον εἶναι EKS: αἰδιον ἐνδέχεται εἶναι FHJ: αἰδιον εἶναι ἐνδέχεται I
 26-7 στάσιν...κινήσις om. ST 27 γίνεσθαι FIJK εἰ] ἢ E στάσιν I
 ἐφθαρμένη κινήσις E 29 ἐπ' alt. KAS: om. E 32 ἢ...οὗ]
 τὸ πόθεν ποῖ E²K δὲ om. E¹ 33 γραμμῆς] περιφεροῦς FH

γὰρ ἕκαστον καὶ ἀρχὴ καὶ μέσον καὶ τέλος, ὥστ' αἰεὶ τε
 εἶναι ἐν ἀρχῇ καὶ ἐν τέλει καὶ μηδέποτε. διὸ κινεῖται τε καὶ 265^b
 ἡρεμεί πως ἢ σφαίρα· τὸν αὐτὸν γὰρ κατέχει τόπον. αἴτιον
 δ' ὅτι πάντα συμβέβηκε ταῦτα τῷ κέντρῳ· καὶ γὰρ ἀρχὴ
 καὶ μέσον τοῦ μεγέθους καὶ τέλος ἐστίν, ὥστε διὰ τὸ ἕξω εἶναι
 τοῦτο τῆς περιφερείας οὐκ ἔστιν ὅπου τὸ φερόμενον ἡρεμήσει ὡς 5
 διεληλυθός (αἰεὶ γὰρ φέρεται περὶ τὸ μέσον, ἀλλ' οὐ πρὸς τὸ
 ἔσχατον), διὰ δὲ τὸ τοῦτο μένειν αἰεὶ τε ἡρεμεί πως τὸ ὅλον καὶ
 κινεῖται συνεχῶς. συμβαίνει δ' ἀντιστρόφως· καὶ γὰρ ὅτι μέ-
 τρον τῶν κινήσεων ἢ περιφορά, πρώτην ἀναγκαῖον αὐτὴν
 εἶναι (ἅπαντα γὰρ μετρεῖται τῷ πρώτῳ), καὶ διότι πρώτη, 10
 μέτρον ἐστὶν τῶν ἄλλων. ἔτι δὲ καὶ ὁμαλῇ ἐνδέχεται εἶναι
 τὴν κύκλῳ μόνην· τὰ γὰρ ἐπ' εὐθείας ἀνωμαλῶς ἀπὸ τῆς
 ἀρχῆς φέρεται καὶ πρὸς τὸ τέλος· πάντα γὰρ ὄσῳπερ ἂν
 ἀφίστηται [πλείον] τοῦ ἡρεμοῦντος, φέρεται θάττον· τῆς δὲ
 κύκλῳ μόνης οὐτ' ἀρχὴ οὔτε τέλος ἐν αὐτῇ πέφυκεν, ἀλλ' 15
 ἐκτός.

ὅτι δ' ἢ κατὰ τόπον φορὰ πρώτη τῶν κινήσεων, μαρτυ-
 ροῦσι πάντες ὅσοι περὶ κινήσεως πεποιήνται μνεῖαν· τὰς γὰρ
 ἀρχὰς αὐτῆς ἀποδιδοάσιν τοῖς κινουσί τοιαύτην κίνησιν. διάκρι-
 σις γὰρ καὶ σύγκρισις κινήσεις κατὰ τόπον εἰσίν, οὕτω δὲ 20
 κινουῶσα ἢ φιλία καὶ τὸ νεῖκος· τὸ μὲν γὰρ διακρίνει, τὸ δὲ
 συγκρίνει αὐτῶν. καὶ τὸν νοῦν δέ φησιν Ἀναξαγόρας διακρί-
 νειν τὸν κινήσαντα πρώτον. ὁμοίως δὲ καὶ ὅσοι τοιαύτην μὲν
 οὐδεμίαν αἰτίαν λέγουσιν, διὰ δὲ τὸ κενὸν κινεῖσθαι φασιν· καὶ
 γὰρ οὗτοι τὴν κατὰ τόπον κίνησιν κινεῖσθαι τὴν φύσιν λέγου- 25
 σιν (ἢ γὰρ διὰ τὸ κενὸν κίνησις φορὰ ἐστὶν καὶ ὡς ἐν τόπῳ),

^a 34 καὶ τέλος om. EA τε EKST: τέ τινα A ^b 1 ἐν alt.
 om. EJ κινεῖται τε scripsi: κινεῖται EA: κινεῖτε K 3 πάντα
 συμβέβηκε ταῦτα EFKP: πάντα ταῦτα συμβέβηκε J: ταῦτα πάντα
 συμβέβηκε HI τῷ ἐν τῷ K² 4 εἶναι τοῦτο EIKP: τοῦτο
 εἶναι FHJ 5 -φερείας . . . τὸ om. E 7 διὸ E¹: δι' αὐτὸ E²
 τὸ τοῦτο μένειν E² et fort. PST: τοῦτο μένει E¹KA τε] καὶ F
 9 περιφορά] περιφορά ἐστὶ FHI: φορὰ A ταύτην E² 10 πάντα
 HIJ πρώτη E²KAS: πρώτον E¹ 11 μέσον H ὁμαλῇ
 EHJPS: ὁμαλῇ FIK 12 ἐπὶ τῆς εὐθείας ἀπὸ τῆς ἀρχῆς ἀνω-
 μαλῶς FJ ἀπὸ τε τῆς E² 14 ἀφίσταται H πλείον om. S,
 secl. Diels: πλείω FHJK θάττον EJKS: θάσσον FHI 15 οὔτε
 ἢ ἀρχὴ οὔτε τὸ τέλος E²H πέφυκεν ἐν αὐτῇ F 19 διακρίσεις
 γὰρ καὶ συγκρίσεις K 20 εἰσὶ κατὰ τόπον S 23 πρότερον A
 καὶ om. H 24 μηδεμίαν αἰτίαν IJK: αἰτίαν μηδεμίαν FH φασί
 κινεῖσθαι F 25 κίνησιν om. E¹ 26 καὶ ὡς om. S: ὡς EK

τῶν δ' ἄλλων οὐδεμίαν ὑπάρχειν τοῖς πρώτοις ἀλλὰ τοῖς ἐκ
 τούτων οἴονται· αὐξάνεσθαι γὰρ καὶ φθίνειν καὶ ἀλλοιοῦσθαι
 συγκρινομένων καὶ διακρινομένων τῶν ἀτόμων σωμάτων φασίν.
 30 τὸν αὐτὸν δὲ τρόπον καὶ ὅσοι διὰ πυκνότητα ἢ μαυότητα
 κατασκευάζουσι γένεσιν καὶ φθοράν· συγκρίσει γὰρ καὶ δια-
 κρίσει ταῦτα διακοσμοῦσιν. ἔτι δὲ παρὰ τούτους οἱ τὴν ψυχὴν
 αἰτίαν ποιῶντες κινήσεως· τὸ γὰρ αὐτὸ αὐτὸ κινοῦν ἀρχὴν
 εἶναι φασι τῶν κινουμένων, κινεῖ δὲ τὸ ζῶον καὶ πᾶν τὸ ἔμ-
 266^a ψυχὸν τὴν κατὰ τόπον αὐτὸ κίνησιν. καὶ κυρίως δὲ κινεῖ-
 σθαι φάμεν μόνον τὸ κινούμενον [τὴν] κατὰ τόπον [κίνησιν]· ἂν
 δ' ἡρεμῇ μὲν ἐν τῷ αὐτῷ, αὐξάνηται δ' ἢ φθίνη ἢ ἀλλοι-
 οῦμενον τυγχάνη, πῆ κινεῖσθαι, ἀπλῶς δὲ κινεῖσθαι οὐ
 5 φάμεν.

ὅτι μὲν οὖν αἰεὶ τε κινήσεις ἦν καὶ ἔσται τὸν ἅπαντα χρό-
 νον, καὶ τίς ἀρχὴ τῆς αἰδίου κινήσεως, ἔτι δὲ τίς πρώτη κί-
 νησις, καὶ τίνα κίνησιν αἰδίου ἐνδέχεται μόνην εἶναι, καὶ τὸ
 κινοῦν πρῶτον ὅτι ἀκίνητον, εἴρηται.
 10 Ὅτι δὲ τοῦτ' ἀμερὲς ἀναγκαῖον εἶναι καὶ μηδὲν ἔχειν **IO**
 μέγεθος, νῦν λέγωμεν, πρῶτον περὶ τῶν προτέρων αὐτοῦ διο-
 ρίσαντες. τούτων δ' ἐν μὲν ἔστω ὅτι οὐχ οἶον τε οὐδὲν πεπερα-
 σμένον κινεῖν ἄπειρον χρόνον. τρία γὰρ ἔστιν, τὸ κινοῦν, τὸ κι-
 νούμενον, τὸ ἐν ᾧ τρίτον, ὁ χρόνος. ταῦτα δὲ ἢ πάντα ἄπειρα
 15 ἢ πάντα πεπερασμένα ἢ ἔνια, οἶον τὰ δύο ἢ τὸ ἓν. ἔστω δὴ
 τὸ Α τὸ κινοῦν, τὸ δὲ κινούμενον Β, χρόνος ἄπειρος ἐφ' οὗ Γ.
 τὸ δὴ Δ τῆς Β κινεῖται τι μέρος, τὸ ἐφ' οὗ Ε. οὐ δὴ ἐν ἴσῳ
 τῷ Γ· ἐν πλείονι γὰρ τὸ μείζον. ὥστ' οὐκ ἄπειρος ὁ χρόνος
 ὁ τὸ Ζ. οὕτω δὴ τῇ Δ προστιθεὶς καταναλώσω τὸ Α καὶ
 20 τῇ Ε τὸ Β· τὸν δὲ χρόνον οὐ καταναλώσω αἰεὶ ἀφαιρῶν ἴσον
 ἄπειρος γὰρ· ὥστε ἢ πᾶσα Α τὴν ὅλην Β κινήσει ἐν πεπε-

^b 27 τοῖς πρώτοις ἀλλὰ om. E¹ 28 οἴοντε I 29 διακρινομένων]
 ἀλλοιοῦμένων Α φασί. φασί τὸν E¹ 30 δὴ FH ἢ] ἴδια E¹ :
 καὶ E² 31 καὶ pr.] ἢ FHI]² διακρίσει ταῦτα om. E¹ 33 αὐτὸ
 αὐτὸ HI 34 κινήσει Α καὶ] ἦτοι K² 266^a 2 τὴν om. ES
 κίνησιν om. EKS 3 φθίνη ἢ] φθίνει J 6 τε om. K 7 τίς
 alt.] τίς ἢ K κινήσις πρώτη Α 8 ἐνδέχεται αἰδίου Ε μόνην] καὶ
 μόνην K 10 ἀμερὲς ἀναγκαῖον εἶναι EIKS : ἀναγκαῖον ἀμερὲς εἶναι HJ] :
 ἀναγκαῖον εἶναι ἀμερὲς F 11 λέγωμεν FHT 12 ἔστι μὲν ἐν K
 13 κινούμενον, τὸ κινοῦν Α 14 τὸ] καὶ E²H 16 τὸ alt. om. Α
 β κινούμενον F φ' H 17 τῆς Β post μέρος Α : om. K τὸ om.
 Η φ' Α 18 γὰρ om. E¹ 19 ὁ om. Η τὸ scripsi :
 τοῦ Π τῇ] τῷ E¹HJS : τὸ IK 21 β ὅλην Α

ρασμένῳ χρόνῳ τοῦ Γ. οὐκ ἄρα οἶόν τε ὑπὸ πεπερασμένου
κινεῖσθαι οὐδὲν ἄπειρον κίνησιν.

23

ὅτι μὲν οὖν οὐκ ἐνδέχεται τὸ 23

πεπερασμένον ἄπειρον κινεῖν χρόνον, φανερόν· ὅτι δ' ὅλως οὐκ
ἐνδέχεται ἐν πεπερασμένῳ μεγέθει ἄπειρον εἶναι δύναμιν, ἐκ 25

τῶνδε δῆλον. ἔστω γὰρ ἡ πλείων δύναμις αἰεὶ ἢ τὸ ἴσον ἐν
ἐλάττω χρόνῳ ποιούσα, οἶον θερμαίνουσα ἢ γλυκαίνουσα ἢ

ρίπτοῦσα καὶ ὅλως κινούσα. ἀνάγκη ἄρα καὶ ὑπὸ τοῦ πεπε-
ρασμένου μὲν ἄπειρον δ' ἔχοντος δύναμιν πάσχειν τι τὸ πά-

σχον, καὶ πλείον ἢ ὑπ' ἄλλου· πλείων γὰρ ἢ ἄπειρος. 30

ἀλλὰ μὴν χρόνον γε οὐκ ἐνδέχεται εἶναι οὐδένα. εἰ γὰρ
ἔστιν ὁ ἐφ' οὗ Α χρόνος ἐν ᾧ ἢ ἄπειρος ἰσχύς ἐθέρμα-

νευ ἢ ἔωσεν, ἐν τῷ δὲ ΑΒ πεπερασμένη τις, πρὸς ταύτην
μείζω λαμβάνων αἰεὶ πεπερασμένην ἤξω ποτὲ εἰς τὸ ἐν τῷ 266^b

Α χρόνῳ κεκινηκέναι· πρὸς πεπερασμένου γὰρ αἰεὶ προστι-
θεῖς ὑπερβαλῶ παντὸς ὄρισμένου, καὶ ἀφαιρῶν ἐλλείψω

ὡσαύτως. ἐν ἴσῳ ἄρα χρόνῳ κινήσει τῇ ἀπείρῳ ἢ πεπε-
ρασμένη. τοῦτο δὲ ἀδύνατον· οὐδὲν ἄρα πεπερασμένου ἐνδέχε- 5

ται ἄπειρον δύναμιν ἔχειν. 6

οὐ τοίνυν οὐδ' ἐν ἀπείρῳ πεπε-

ρασμένην· καίτοι ἐνδέχεται ἐν ἐλάττω μεγέθει πλείω δύ-
ναμιν εἶναι· ἀλλ' ἔτι μᾶλλον ἐν μείζονι πλείω. ἔστω δὴ τὸ

ἐφ' οὗ ΑΒ ἄπειρον. τὸ δὴ ΒΓ ἔχει δύναμιν τινα, ἢ ἐν τινι
χρόνῳ ἐκίνησεν τὴν Δ, ἐν τῷ χρόνῳ ἐφ' οὗ ΕΖ. ἂν δὴ τῆς 10

ΒΓ διπλασίαν λαμβάνω, ἐν ἡμίσει χρόνῳ τοῦ ΕΖ (ἔστω
γὰρ αὕτη ἡ ἀναλογία), ὥστε ἐν τῷ ΖΘ κινήσει. οὐκοῦν οὕτω

λαμβάνων αἰεὶ τὴν μὲν ΑΒ οὐδέποτε διέξιμι, τοῦ χρόνου δὲ
τοῦ δοθέντος αἰεὶ ἐλάττω λήψομαι. ἄπειρος ἄρα ἢ δύναμις

^a 24 οὐκ ἐνδέχεται hic EKS : post 25 μεγέθει Λ 26 αἰεὶ post γὰρ
E²K : E¹ incertum ἢ alt. om. E ἐν om. EJ 28 ῥίπτοῦσα
scripsi : ῥίπτοῦσα Π 29 τὸ ΕΗJKS : om. FI 30 πλείον E² et
ut vid. P : πλείω E¹KA πλείω K ἄπειρος E¹KS : ἄπειρος δύναμις
F²Λ 32 οὗ] ᾧ E²Λ ἢ om. E ἐθέρμαινε I : ἐθέρμηνεν E²JK :
ἢ ἐθέρμηνεν H 33 ἔωσεν E¹ τῷ ES : ᾧ ΚΑ αβ EKS : ὁ
αβ Λ ^b 1 αἰεὶ λαμβάνων Λ ἤξω] δὲ ἤξω E²H τὸ ἐν om. K¹
2 πρὸς om. J 3 ὑπερβάλλον E¹ ἀφαιρῶν] ἀφαιρῶν αἰεὶ K
ἐλλείψω ὡσαύτως fecit E² 4 χρόνῳ ἄρα I ἢ πεπερασμένη τῇ ἀπείρῳ
Λ 6 ἔχειν δύναμιν F 7 καίτοι καίτοι γε K πλείω EKS :
πλείονα E²Λ 8 ἐνεῖναι S πλείω EFH²KS : πλείων H¹IJ 9 ἢ K
10 ἐφ' ᾧ EJ 11 διπλασίον F χρόνῳ] κινήσει χρόνῳ E²IJK : κινήσεις
χρόνῳ F 12 ζ καὶ θ Λ 13 τοῦ E¹KS : om. E²Λ χρόνον I

- 15 ἔσται πάσης γὰρ πεπερασμένης ὑπερβάλλει δυνάμεως, εἴ γε
 πάσης πεπερασμένης δυνάμεως ἀνάγκη πεπερασμένου εἶναι
 καὶ τὸν χρόνον (εἰ γὰρ ἔν τινι ἢ τοσηδί, ἢ μείζων ἐν ἐλάτ-
 τουι μὲν ὠρισμένῳ δὲ χρόνῳ κινήσει, κατὰ τὴν ἀντιστροφὴν
 τῆς ἀναλογίας)· ἄπειρος δὲ πᾶσα δύναμις, ὥσπερ καὶ πλη-
 20 θος καὶ μέγεθος τὸ ὑπερβάλλον παντὸς ὠρισμένου. ἔστιν δὲ
 καὶ ὧδε δεῖξαι τοῦτο· ληψόμεθα γὰρ τινα δύναμιν τὴν
 αὐτὴν τῷ γένει τῇ ἐν τῷ ἀπείρῳ μεγέθει, ἐν πεπερασμένῳ
 μεγέθει οὔσαν, ἢ καταμετρήσει τὴν ἐν τῷ ἀπείρῳ πεπερασμέ-
 νην δύναμιν.
- 25 ὅτι μὲν οὖν οὐκ ἐνδέχεται ἄπειρον εἶναι δύναμιν ἐν πε-
 περασμένῳ μεγέθει, οὐδ' ἐν ἀπείρῳ πεπερασμένην, ἐκ τού-
 των δῆλον. περὶ δὲ τῶν φερομένων ἔχει καλῶς διαπορησά-
 τινα ἀπορίαν πρῶτον. εἰ γὰρ πᾶν τὸ κινούμενον κινεῖται ὑπὸ
 τινός, ὅσα μὴ αὐτὰ ἑαυτὰ κινεῖ, πῶς κινεῖται ἕνια συνεχῶς
 30 μὴ ἀπτομένου τοῦ κινήσαντος, οἷον τὰ ῥιπτούμενα; εἰ δ' ἅμα
 κινεῖ καὶ ἄλλο τι ὁ κινήσας, οἷον τὸν ἀέρα, ὃς κινούμενος
 κινεῖ, ὁμοίως ἀδύνατον τοῦ πρῶτου μὴ ἀπτομένου μηδὲ κι-
 νοῦντος κινεῖσθαι, ἀλλ' ἅμα πάντα (καὶ) κινεῖσθαι καὶ πε-
 267^a παύσθαι ὅταν τὸ πρῶτον κινῶν παύσῃται, καὶ εἰ ποιεῖ,
 ὥσπερ ἡ λίθος, οἷον τε κινεῖν ὃ ἐκίνησεν. ἀνάγκη δὲ τοῦτο μὲν
 λέγειν, ὅτι τὸ πρῶτον κινήσαν ποιεῖ οἷον τε κινεῖν ἢ τὸν ἀέρα
 [τοιούτου] ἢ τὸ ὕδωρ ἢ τι ἄλλο τοιούτου ὃ πέφυκε κινεῖν καὶ
 5 κινεῖσθαι· ἀλλ' οὐχ' ἅμα παύεται κινῶν καὶ κινούμενον, ἀλλὰ
 κινούμενον μὲν ἅμα ὅταν ὁ κινῶν παύσῃται κινῶν, κινῶν δὲ
 ἔτι ἔστί. διὸ καὶ κινεῖ τι ἄλλο· ἐχόμενον· καὶ ἐπὶ τούτου
 ὁ αὐτὸς λόγος. παύεται δέ, ὅταν αἰεὶ ἐλάττων ἢ δύναμις τοῦ

^b 15-16 ὑπερβάλλει . . . πεπερασμένης E²KAS : om. E¹ 15 εἴ
 γε πάσης] πάσης δὲ ΔS 17 τὸν om. E¹ ἐν om. FJ¹ 18 κινήσει
 χρόνῳ Λ 21 γὰρ E¹HS : γὰρ δὲ E²F¹IJK 22 τῇ EFHKS :
 τὴν IJ 23 τὴν πεπερασμένην δύναμιν ἐν (τὴν ἐν K) τῷ ἀπείρῳ EK :
 τὴν ἐν τῷ ἀπείρῳ μεγέθει πεπερασμένην δύναμιν J : τὴν ἐν τῷ ἀπείρῳ
 πεπερασμένην S 26 οὐδὲ πεπερασμένην ἐν ἀπείρῳ Λ (ἐν om. F)
 τῶνδε HS 27 ἔχει καλῶς EKS : καλῶς ἔχει Λ 28 ὑπὸ τινος κινεῖται
 S 29 συνεχῶς ἕνια E 32 κινεῖ EFJKS : κινεῖ HI 33 πᾶν
 γρ. S : om. K καὶ S Aldina : om. Π γρ. S κενεῖσθαι H γρ. S
 267^a 2 ὁ F τε κινεῖν] τε κινεῖ K : κινεῖ HS : κινεῖ E¹F¹IJ
 δὲ FHIJ¹ 3 τὸ om. F τε E²H¹IKS : καὶ E¹ : τε καὶ J : τι καὶ F¹
 4 τοιούτου seclisi : habet PS τι ἄλλο E¹IJKS : ἄλλο τι FH
 τοιούτου om. EKS ὃ om. E¹ 7 καὶ om. HIJK κινεῖ ἄλλο
 E¹ : κινεῖται ἄλλο H : κινεῖται ἄλλου F¹IJ : κινεῖται τι ἄλλου Moreliana
 8 αἰεὶ ἐλάττων EK et fort. S : ἐλάττων αἰεὶ J : ἐλάττων FHIT

κινεῖν ἐγγίγνηται τῷ ἐχομένῳ. τέλος δὲ παύεται, ὅταν μη-
 κέτι ποιήσῃ τὸ πρότερον κινεῖν, ἀλλὰ κινούμενον μόνον. ταῦτα 10
 δ' ἀνάγκη ἅμα παύεσθαι, τὸ μὲν κινεῖν τὸ δὲ κινούμενον, καὶ
 τὴν ὄλην κίνησιν. αὕτη μὲν οὖν ἐν τοῖς ἐνδεχομένοις ὅτε μὲν
 κινεῖσθαι ὅτε δ' ἡρεμῆν ἐγγίγνεται ἢ κίνησιν, καὶ οὐ συνεχῆς,
 ἀλλὰ φαίνεται· ἢ γὰρ ἐφεξῆς ὄντων ἢ ἀπομένων ἐστίν· οὐ
 γὰρ ἐν τὸ κινεῖν, ἀλλ' ἐχόμενα ἀλλήλων. διὸ ἐν ἀέρι 15
 καὶ ὕδατι γίγνεται ἢ τοιαύτη κίνησις, ἣν λέγουσί τινας ἀντι-
 περίστασις εἶναι. ἀδύνατον δὲ ἄλλως τὰ ἀπορηθέντα λύειν, εἰ
 μὴ τὸν εἰρημένον τρόπον. ἢ δ' ἀντιπερίστασις ἅμα πάντα κι-
 νεῖσθαι ποιεῖ καὶ κινεῖν, ὥστε καὶ παύεσθαι· ἢν δὲ φαίνεται
 τι ἐν κινούμενον συνεχῶς· ὑπὸ τίνος οὖν; οὐ γὰρ ὑπὸ τοῦ αὐτοῦ. 20
 ἐπεὶ δ' ἐν τοῖς οὖσις ἀνάγκη κίνησιν εἶναι συνεχῆ, αὕτη δὲ
 μία ἐστίν, ἀνάγκη δὲ τὴν μίαν μεγέθους τέ τινας εἶναι (οὐ γὰρ
 κινεῖται τὸ ἀμέγεθες) καὶ ἐνὸς καὶ ὑφ' ἐνός (οὐ γὰρ ἔσται
 συνεχῆς, ἀλλ' ἐχομένη ἐτέρα ἐτέρας καὶ διηρημένη), τὸ δὴ
 κινεῖν εἰ ἐν, ἢ κινούμενον κινεῖ ἢ ἀκίνητον ὄν. εἰ μὲν δὴ κινού- 25
 μενον, συνακολουθεῖν δεήσει καὶ μεταβάλλειν αὐτό, ἅμα δὲ
 κινεῖσθαι ὑπὸ τίνος, ὥστε στήσεται καὶ ἤξει εἰς τὸ κινεῖσθαι 267^b
 ὑπὸ ἀκινήτου. τοῦτο γὰρ οὐκ ἀνάγκη συμμεταβάλλειν, ἀλλ'
 αἰετὸν δύνησεται κινεῖν (ἄπουον γὰρ τὸ οὕτω κινεῖν) καὶ ὁμα-
 λῆς αὕτη ἢ κίνησις ἢ μόνη ἢ μάλιστα· οὐ γὰρ ἔχει μετα-
 βολὴν τὸ κινεῖν οὐδεμίαν. δεῖ δὲ οὐδὲ τὸ κινούμενον πρὸς ἐκεῖνο 5
 ἔχειν μεταβολήν, ἵνα ὁμοία ἢ ἢ κίνησις. ἀνάγκη δὴ ἢ ἐν
 μέσῳ ἢ ἐν κύκλῳ εἶναι· αὗται γὰρ αἰ ἀρχαί. ἀλλὰ τά-
 χιστα κινεῖται τὰ ἐγγύτατα τοῦ κινουέντος. τοιαύτη δ' ἢ τοῦ
 κύκλου κίνησις· ἐκεῖ ἄρα τὸ κινεῖν. ἔχει δ' ἀπορίαν εἰ ἐνδέχεται
 τι κινούμενον κινεῖν συνεχῶς, ἀλλὰ μὴ ὥσπερ τὸ ὠθεῖν 10

^a 9 ἐγγίγνηται E²FHST: ἐγγένηται E¹IJK δὲ om. E¹ 11 κινού-
 μενον τὸ δὲ κινεῖν K 12 ὄλην om. S 15 ἐν E¹KS: καὶ ἐν
 E²A 16 καὶ E¹KS: καὶ ἐν E²A 19 καὶ alt. E²KAS: om.
 E¹ παύεσθαι] παύεται E²FHIJ¹ 20 ἐν τι E²A 21 εἶναι
 κίνησιν ES: αἰετὸν κίνησιν εἶναι FI: εἶναι τινα κίνησιν K 22 τε] γέ
 FHK 23 κινεῖ E² τὸ E²FIKS: om. E¹HJ 24 ἐτέρα
 E²KAS: om. E¹ δὲ E² 26 δὲ] δὲ καὶ K ^b 2 γὰρ] δὲ S
 σύμμεταβάλλειν EFHJKS: συμβάλλειν IT 3 τε EIJKT: om.
 FH 5 τὸ κινεῖν οὐδεμίαν EKT: οὐδεμίαν τὸ κινεῖν Λ ἐκεῖνο
 EHKS: ἐκεῖνου FIJ 6 ἢ om. F δὲ E¹FIJ¹ST 7 ἐν FIJKT:
 om. HS: punctis notatum in E αἰ EFHJT: om. I: an καὶ?
 8 τὰ IT: τὸ S 9 κύκλου HKS: ὄλον EFIJT 10 τι E²AS:
 τὸ E¹K

πάλιν καὶ πάλιν, τῷ ἐφεξῆς εἶναι συνεχῶς· ἢ γὰρ αὐτὸ
 δεῖ αἰεὶ ὠθεῖν ἢ ἔλκειν ἢ ἄμφω, ἢ ἕτερόν τι ἐκδεχόμενον ἄλλο
 παρ' ἄλλου, ὡσπερ πάλαι ἐλέχθη ἐπὶ τῶν ριπτουμένων, εἰ
 διαιρετὸς ὢν ὁ ἀήρ [ἢ τὸ ὕδωρ] κινεῖ ἄλλος αἰεὶ κινούμε-
 15 νος. ἀμφοτέρως δ' οὐχ οἶόν τε μίαν εἶναι, ἀλλ' ἐχομένην.
 μόνη ἄρα συνεχῆς ἦν κινεῖ τὸ ἀκίνητον· αἰεὶ γὰρ ὁμοίως ἔχον
 καὶ πρὸς τὸ κινούμενον ὁμοίως ἕξει καὶ συνεχῶς. διωρισμέ-
 νων δὲ τούτων φανερόν ὅτι ἀδύνατον τὸ πρῶτον κινεῖν καὶ ἀκί-
 νητον ἔχειν τι μέγεθος. εἰ γὰρ μέγεθος ἔχει, ἀνάγκη ἦτοι
 20 πεπερασμένον αὐτὸ εἶναι ἢ ἄπειρον. ἄπειρον μὲν οὖν ὅτι οὐκ
 ἐνδέχεται μέγεθος εἶναι, δέδεικται πρότερον ἐν τοῖς φυσι-
 κοῖς· ὅτι δὲ τὸ πεπερασμένον ἀδύνατον ἔχειν δύνάμιν ἄπει-
 ρον, καὶ ὅτι ἀδύνατον ὑπὸ πεπερασμένου κινεῖσθαι τι ἄπει-
 ρον χρόνον, δέδεικται νῦν. τὸ δέ γε πρῶτον κινεῖν αἰεὶ
 25 κίνησιν καὶ ἄπειρον χρόνον. φανερόν τοίνυν ὅτι ἀδιαίρετόν ἐστι
 καὶ ἀμερὲς καὶ οὐδὲν ἔχον μέγεθος.

b 11 τῷ] καὶ τῷ H : καὶ τὸ K συνεχῶς Camotiana : συνεχῆ
 E¹Λ : συνεχῆς E²K γὰρ τὸ αὐτὸ ut vid. PS 12 δεῖ αἰεὶ] δεῖ
 HIJPS : δῆ F ἄλλου F 13 ὡς καὶ πάλαι H εἰ διαιρετὸς
 KS : αἰρετος E¹ : εἰ δὲ διαιρετὸς E²Λ 14 ὢν E²KAS : γὰρ ὢν E¹
 ἢ τὸ ὕδωρ seclusi : habent E²ΚΛ et ut vid. P : καὶ τὸ ὕδωρ E¹S
 ἄλλος FS : ἄλλως E¹P : ἀλλ' ὡς HIJ : ἄλλου E²K κινούμενον P
 16 μόνη EHIJS : μένει FK κινήτον E¹ 17 ἕξει KAS : ἦξει E
 18 τὸ τὸ E¹ 19 ἔχειν] ὃν ἔχειν H τὸ E¹ γὰρ] γὰρ τὸ E¹
 21 πρότερον δέδεικται F 22 ἄπειρον δύνάμιν FHI 23 ὑπὸ]
 ἐστὶν ὑπὸ FK 24 νῦν] τὰ νῦν H δὲ τό E¹ : τό K κίνησιν
 κινεῖ H

H (textus alter)

1 Απαν τὸ κινούμενον ἀνάγκη ὑπό τινος κινεῖσθαι. εἰ μὲν οὖν
 ἐν αὐτῷ μὴ ἔχει τὴν ἀρχὴν τῆς κινήσεως, φανερόν ὅτι ὑφ' 25
 ἑτέρου κινεῖται (ἄλλο γὰρ ἔσται τὸ κινουόν). εἰ δ' ἐν αὐτῷ, εἰλή-
 φθω ἔφ' οὗ τὸ AB, ὃ κινεῖται μὴ τῷ τῶν τούτου τι κινεῖσθαι.
 πρῶτον μὲν οὖν τὸ ὑπολαμβάνειν τὸ AB ὑφ' αὐτοῦ κινεῖσθαι διὰ
 τὸ ὅλον τε κινεῖσθαι καὶ ὑπὸ μηθενὸς τῶν ἕξωθεν ὁμοίον ἔστιν
 ὡσπερ ἂν εἴ τις τοῦ ΔΕ κινουόντος τὸ ΕΖ καὶ αὐτοῦ κινου- 30
 μένου ὑπολαμβάνοι τὸ ΔΕΖ ὑφ' αὐτοῦ κινεῖσθαι, διὰ τὸ
 μὴ συννορᾶν πότερον ὑπὸ ποτέρου κινεῖται, πότερον τὸ ΔΕ
 ὑπὸ τοῦ ΕΖ ἢ τὸ ΕΖ ὑπὸ τοῦ ΔΕ. ἔτι τὸ ὑφ' αὐτοῦ κι-
 νούμενον οὐδέποτε παύσεται κινούμενον τῷ ἑτερόν τι στήναι 242^a
 κινούμενον. ἀνάγκη τοίνυν, εἴ τι παύεται κινούμενον τῷ ἑτε-
 ρόν τι στήναι, αὐτὸ ὑφ' ἑτέρου κινεῖσθαι. τούτου δὲ φα-
 νεροῦ γενομένου ἀνάγκη πᾶν τὸ κινούμενον κινεῖσθαι ὑπό τι-
 νος. ἐπεὶ γὰρ εἴληπται τὸ AB κινούμενον, διαιρετὸν ἔσται 5
 πᾶν γὰρ τὸ κινούμενον διαιρετὸν ἦν. διηρήσθω τοίνυν ἢ τὸ Γ.
 ἀνάγκη δὴ τοῦ ΓΒ ἡρεμοῦντος ἡρεμῆναι καὶ τὸ AB. εἰ γὰρ
 μή, εἰλήφθω κινούμενον. τοῦ τοίνυν ΓΒ ἡρεμοῦντος κινεῖται ἂν
 τὸ ΓΑ. οὐκ ἄρα καθ' αὐτὸ κινεῖται τὸ AB. ἀλλ' ὑπέκειτο
 καθ' αὐτὸ κινεῖσθαι πρῶτον. δῆλον τοίνυν ὅτι τοῦ ΓΒ ἡρε- 10
 μοῦντος ἡρεμήσει καὶ τὸ ΒΑ, καὶ τότε παύσεται κινούμε-
 νον. ἀλλ' εἴ τι τῷ ἄλλο ἡρεμῆναι ἴσεται καὶ παύεται κινού-
 μενον, τοῦθ' ὑφ' ἑτέρου κινεῖται. φανερόν δὴ ὅτι πᾶν τὸ κινού-
 μενον ὑπό τινος κινεῖται· διαιρετὸν τε γὰρ ἔστιν πᾶν τὸ κινού-
 μενον, καὶ τοῦ μέρους ἡρεμοῦντος ἡρεμήσει καὶ τὸ ὅλον. 15

Tit. περὶ κινήσεως τῶν εἰς γ τὸ α α : ζῆ. E : φυσικῆς ἀκρόσεως ζῷ H :
 φυσικῶν ἑβδομον I 241^b 24 οὖν] γὰρ Aldina 26 ἄλλο . . . κινουόν
 om. HIJK 27-8 δ . . . AB om. I : δ om. E 27 κινεῖται]
 κινεῖται καθ' αὐτὸ ἀλλὰ F τῷ μὴ H : μὴ EP 28 ἑαυτοῦ FHK :
 ου το E διὰ . . . 29 κινεῖσθαι om. J 30 ἂν om. E 31 ὑπο-
 λαμβάνει K Δ om. E 32 πότερα τὸ E¹HJ 33 τὸ] ὑπὸ
 τοῦ E¹ EZ] ζε K 242^a 2 κινούμενον an omittendum?
 παύσεται E 3 αὐτὸ Spengel: αὐτοῦ E: τοῦθ' ΚΑ δὲ scripsi: γὰρ Π
 4 γινόμενον FHJK κινούμενον διαιρετὸν κινεῖσθαι E 6 ἦ] εἰς
 E²H 7 βγ FHIK 8 βγ ΚΑ 10 πρῶτον] καὶ πρῶτον Spengel
 βγ FK 12 εἴ τι] ὅτι K 13 δὴ διότι E¹JK 15 καὶ alt. om. ΚΑ

δὲ τὸ κινούμενον ὑπὸ τινος κινεῖται, ἀνάγκη καὶ τὸ κινούμενον πᾶν ἐν τόπῳ κινεῖσθαι ὑπ' ἄλλον· καὶ τὸ κινουὶν τοῖνυν ὑφ' ἑτέρου, ἐπειδὴ καὶ αὐτὸ κινεῖται, καὶ πάλιν τοῦτο ὑφ' ἑτέρου. οὐ δὴ εἰς ἄπειρον πρόεισι, ἀλλὰ στήσε-
 20 ταί που καὶ ἔσται τι ὃ πρῶτως αἴτιον ἔσται τοῦ κινεῖσθαι. εἰ γὰρ μή, ἀλλ' εἰς ἄπειρον πρόεισι, ἔστω τὸ μὲν Α ὑπὸ τοῦ Β κινούμενον, τὸ δὲ Β ὑπὸ τοῦ Γ, τὸ δὲ Γ ὑπὸ τοῦ Δ· καὶ τοῦτον δὴ τὸν τρόπον εἰς ἄπειρον προβαίνετω. ἐπεὶ οὖν ἅμα τὸ κινουὶν καὶ αὐτὸ κινεῖται, δῆλον ὡς ἅμα κινήσεται
 25 τό τε Α καὶ τὸ Β· κινουμένον γὰρ τοῦ Β κινήσεται καὶ τὸ Α· καὶ τὸ Β δὴ κινουμένου τοῦ Γ καὶ τὸ Γ τοῦ Δ. ἔσται τοῖνυν ἅμα ἢ τε τοῦ Α κίνησις (καὶ τοῦ Β) καὶ τοῦ Γ καὶ τῶν λοιπῶν ἐκάστου. καὶ λαβεῖν τοῖνυν αὐτῶν ἐκάστην δυνα-
 30 σόμεθα. καὶ γὰρ εἰ ἕκαστον ὑφ' ἐκάστου κινεῖται, οὐθὲν ἦ-
 30 του μία τῷ ἀριθμῷ ἢ ἐκάστου κίνησις, καὶ οὐκ ἄπειρος τοῖς ἐσχάτοις, ἐπειδὴ περ τὸ κινούμενον πᾶν ἔκ τινος εἰς τι κινεῖται. ἢ γὰρ ἀριθμῷ συμβαίνει τὴν αὐτὴν κίνησιν εἶναι ἢ γέ-
 νει ἢ εἶδει. ἀριθμῷ μὲν οὖν λέγω τὴν αὐτὴν κίνησιν τὴν ἐκ τοῦ αὐτοῦ εἰς τὸ αὐτὸ τῷ ἀριθμῷ ἐν τῷ αὐτῷ χρόνῳ
 242^b τῷ ἀριθμῷ, οἷον ἐκ τοῦδε τοῦ λευκοῦ, ὃ ἔστιν ἐν τῷ ἀριθμῷ, εἰς τὸδε τὸ μέλαν κατὰ τόνδε τὸν χρόνον, ἓνα ὄντα τῷ ἀριθμῷ· εἰ γὰρ κατ' ἄλλον, οὐκέτι μία ἔσται τῷ ἀριθμῷ ἀλλὰ τῷ εἶδει. γένοι δ' ἢ αὐτὴ κίνησις ἢ ἐν τῇ αὐτῇ
 5 κατηγορίᾳ τῆς οὐσίας ἢ τοῦ γένους, εἶδει δὲ ἢ ἐκ τοῦ αὐτοῦ τῷ εἶδει εἰς τὸ αὐτὸ τῷ εἶδει, οἷον ἢ ἐκ τοῦ λευκοῦ εἰς τὸ μέλαν ἢ ἐκ τοῦ ἀγαθοῦ εἰς τὸ κακόν. ταῦτα δ' εἴρηται καὶ
 8 ἐν τοῖς πρότερον.

8

εἰλήφθω τοῖνυν ἢ τοῦ Α κίνησις καὶ ἔστω

^a 16 δὲ πᾶν τὸ κινούμενον F: δὲ τὸ κινούμενον πᾶν HIJK 17 ὑπὸ τινος ἄλλον κινεῖσθαι ἐν τόπῳ I 18-19 ἐπειδὴ . . . ἑτέρου om. E
 19 οὐ δὴ] οὐκ H 20 ὃ om. E 21 ἀλλ' om. F²HK 25 τὸ om. F γὰρ καὶ τοῦ E 26 καὶ τοῦ β ΚΑ τοῦ . . . τοῦ Spengel: τὸ γ καὶ τοῦ γ τὸ Π 27 καὶ τοῦ β Aldina: om. Π
 28 καὶ] καὶ τοῦ E¹ αὐτῶν ἕκαστον IJK: ἕκαστον αὐτῶν FH 29 κινεῖται ὑφ' ἐκάστου H: ὑφ' ἐκάστου αἰεὶ κινεῖται I 30 ἢ om. E
 ἄπειροι EJ: ἄπειρον FK 33 τὴν αὐτὴν] μίαν E²I 34 τῷ pr.] τῷ αὐτῷ E ^b I ἀριθμῷ γινομένην, οἷον ΚΑ τῷ om. E²: τ' E¹
 2 τὸ om. E¹ τόνδε τὸν] δὲ τὸν EHJ: τὸν τόνδε F 3 ἄλλο EHJ 4 ἢ pr. om. I 6 εἰς] κατὰ F τὸ om. H τοῦ] τοῦ αὐτοῦ EI εἰς] ἢ εἰς E 7 δὲ διήρηται E²: διήρηται E¹

ἐφ' οὗ τὸ E, καὶ ἡ τοῦ B ἐφ' οὗ τὸ Z, καὶ ἡ τοῦ ΓΔ ἐφ' οὗ τὸ ΗΘ, καὶ ὁ χρόνος ἐν ᾧ κινεῖται τὸ Α ὁ Κ. ὠρισ-¹⁰ μένης δὴ τῆς κινήσεως τοῦ Α, ὠρισμένος ἔσται καὶ ὁ χρόνος καὶ οὐκ ἄπειρος ὁ Κ. ἀλλ' ἐν τῷ αὐτῷ χρόνῳ ἐκινεῖτο τὸ Α καὶ τὸ Β καὶ τῶν λοιπῶν ἕκαστον. συμβαίνει τοίνυν τὴν κίνησιν τὴν ΕΖΗΘ ἄπειρον οὔσαν ἐν ὠρισμένῳ χρόνῳ κινεῖσθαι τῷ Κ· ἐν ᾧ γὰρ τὸ Α ἐκινεῖτο, καὶ τὰ τῷ Α ἐφε-¹⁵ ξῆς ἅπαντα ἐκινεῖτο ἄπειρα ὄντα. ὥστ' ἐν τῷ αὐτῷ κινεῖται. καὶ γὰρ ἦτοι ἴση ἡ κίνησις ἔσται τῇ τοῦ Α [τῇ τοῦ Β], ἡ μείζων. διαφέρει δὲ οὐθέν· πάντως γὰρ τὴν ἄπειρον κίνησιν ἐν πεπερασμένῳ χρόνῳ συμβαίνει κινεῖσθαι, τοῦτο δ' ἀδύνατον.

οὗτα μὲν οὖν δόξειεν ἂν δείκνυσθαι τὸ ἐξ ἀρχῆς, οὐ μὴν δει-²⁰ κνυταί γε διὰ τὸ μηθὲν ἄτοπον συμβαίνειν· ἐνδέχεται γὰρ ἐν πεπερασμένῳ χρόνῳ κίνησιν ἄπειρον εἶναι, μὴ τὴν αὐτὴν δὲ ἀλλ' ἑτέραν καὶ ἑτέραν πολλῶν κινουμένων καὶ ἀπείρων, ὅπερ συμβαίνει καὶ τοῖς νῦν. ἀλλ' εἰ τὸ κινούμενον πρῶτως [κατὰ τόπον καὶ] σωματικὴν κίνησιν ἀνάγκη ἄπτεσθαι ἢ²⁵ συνεχῆς εἶναι τῷ κινουντι, καθάπερ ὀρώμεν ἐπὶ πάντων τοῦτο συμβαίνον (ἔσται γὰρ ἐξ ἀπάντων ἐν τὸ πᾶν ἢ συνεχές), τὸ δὴ ἐνδεχόμενον εἰλήφθω, καὶ ἔστω τὸ μὲν μέγεθος ἢ τὸ συνεχῆς ἐφ' οὗ τὸ ΑΒΓΔ, ἡ δὲ τοῦτου κίνησις ἡ ΕΖΗΘ. διαφέρει δ' οὐθέν ἢ πεπερασμένον ἢ ἄπειρον· ὁμοίως γὰρ ἐν³⁰ πεπερασμένῳ τῷ Κ κινήθησεται (ἄπειρον) ἢ ἄπειρον ἢ πεπερασμένον. τούτων δ' ἐκάτερον τῶν ἀδυνάτων. φανερόν οὖν ὅτι στήσεται ποτε καὶ οὐκ εἰς ἄπειρον πρόεισιν τὸ ἀεὶ ὑφ' ἑτέρου, ἀλλ' ἔσται τι ὃ πρῶτον κινήθησεται. μηδὲν δὲ διαφερέτω τὸ ὑποτεθέντος τινὸς τοῦτο δείκνυσθαι· τοῦ γὰρ ἐνδεχομένου τεθέντος³⁴ οὐδὲν ἄτοπον ἔδει συμβαίνειν.

2 Τὸ δὲ πρῶτον κινουόν, μὴ ὡς τὸ οὐ ἔνεκεν, ἀλλ' ὅθεν ἡ ἀρχὴ τῆς κινήσεως, ἔστιν ἅμα τῷ κινουμένῳ. ἅμα δὲ λέγω,

^b II δὲ ΚΑ [τοῦ Α] οὔσης F 13 τοίνυν] δὲ τοίνυν I 14 τῇ E¹ 15 καὶ τὰ] κατὰ E τὸ E² ἐκινεῖτο ἐφεξῆς ἅπαντα Η 17 ἡ om. Η τῇ pr. om. J¹: ἢ FHIJ²K τῇ τοῦ B om. E 20 ἂν δόξειεν E μὴν] μὴν οὐ J¹K 23 καὶ alt. om. F²HI 25 κατὰ τόπον καὶ om. E 27 ἢ] ἢ ἀπτόμενον ἢ Spengel τοῦτο E²F 28 τὸ pr. om. E 29 ΓΔ om. E¹: γ E² ἢ alt. om. E 30 τοῦτο δ' οὐθέν διαφέρει εἶτε πεπερασμένον εἶτε I 31 ἄπειρον addidi πεπερασμένον E 32 δὲ καθ' ἕτερον E τῶν ἀδυνάτων] ἀδύνατον FHJK 33 τότε E εἰς om. E¹ 34 μηδὲν διαφέρει E 243^a I δείκνυσθαι τοῦτο Η 3 δέ] τε E² 4 ἅμα τῷ κινουμένῳ ἔστιν F

5 διότι οὐθὲν αὐτῶν μεταξύ ἐστίν· τοῦτο γὰρ κοινὸν ἐπὶ παντὸς
 κινουμένου καὶ κινουντός ἐστιν. ἐπεὶ δὲ τρεῖς εἰσὶν κινήσεις, ἥ
 τε κατὰ τόπον καὶ κατὰ τὸ ποιὸν καὶ κατὰ τὸ ποσόν,
 ἀνάγκη καὶ τὰ κινούμενα τρία· ἡ μὲν οὖν κατὰ τόπον φορά,
 ἡ δὲ κατὰ τὸ ποιὸν ἀλλοίωσις, ἡ δὲ κατὰ τὸ ποσὸν αὔξη-
 10 σις καὶ φθίσις. πρῶτον μὲν οὖν ὑπὲρ τῆς φορᾶς εἴπωμεν·
 αὕτη γὰρ πρώτη τῶν κινήσεών ἐστιν.
 21 Ἄπαν δὴ τὸ φερόμενον ἦτοι αὐτὸ ὑφ' αὐτοῦ κινεῖται ἢ ὑφ'
 ἑτέρου. εἰ μὲν | οὖν ὑφ' αὐτοῦ, φανερόν ὡς ἐν αὐτῷ τοῦ
 22-3 κινουντος ὑπάρχοντος ἅμα τὸ κινουῖν | καὶ τὸ κινούμενον ἔσται,
 καὶ οὐθὲν αὐτῶν μεταξύ· τὸ δ' ὑπ' ἄλλου κινούμενον τετρα-
 24 χῶς κινεῖται· αἱ γὰρ ὑφ' ἑτέρου κινήσεις τέτταρές εἰσιν, ὧσις |
 25 ἔλξις ὄχησις δίνησις. καὶ γὰρ τὰς ἄλλας πάσας εἰς ταύτας
 ἀνάγεσθαι | συμβαίνει. τῆς μὲν οὖν ὥσεως τὸ μὲν ἔπωσις τὸ
 26-7 δὲ ἄπωσις ἐστίν. ἔπωσις | μὲν οὖν ἐστίν ὅταν τὸ κινουῖν τοῦ
 κινουμένου μὴ ἀπολείπηται, ἄπωσις δὲ ὅταν | τὸ ἀπωθῶν ἀπο-
 λείπηται. ἡ δὲ ὄχησις ἐν ταῖς τρισὶν ἔσται κινήσειν. τὸ
 28-9 μὲν | γὰρ ὀχοῦμενον οὐ καθ' αὐτὸ κινεῖται ἀλλὰ κατὰ συμ-
 243^b βεβηκός (τῷ γὰρ | ἐν κινουμένῳ εἶναι ἢ ἐπὶ κινουμένου κινεῖται),
 21-2 τὸ δὲ ὀχοῦν κινεῖται ἢ ὠθούμενον ἢ ἐλκόμενον ἢ διωκόμενον.
 φανερόν οὖν ὅτι ἡ ὄχησις ἐν ταῖς τρισὶν | ἔσται κινήσειν. ἡ
 23-4 δ' ἔλξις ὅταν ἦτοι πρὸς αὐτὸ ἢ πρὸς ἕτερον θάπτων ἢ | ἢ κίνησις
 ἢ τοῦ ἐλκοντος μὴ χωριζομένη τῆς τοῦ ἐλκόμενου. καὶ γὰρ |
 25 πρὸς αὐτό ἐστίν ἢ ἔλξις καὶ πρὸς ἕτερον. καὶ αἱ λοιπαὶ δὲ
 [ἔλξεις] αὐταὶ τῷ εἶδει εἰς ταῦτα ἀναχθήσονται, οἷον ἢ εἰς-
 26-7 πνευσις καὶ ἢ ἐκπνευσις | καὶ ἢ πτύσις καὶ ὅσαι τῶν σωματῶν
 ἢ ἐκκριτικαὶ ἢ ληπτικαὶ εἰσι, καὶ | ἢ σπάθησις δὴ καὶ ἢ κέρκισις·
 28-9 τὸ μὲν γὰρ αὐτῶν σύγκρισις τὸ δὲ διάκρισις. καὶ πάντα δὴ

^a 5 αὐτῶν οὐθὲν FI μεταξύ αὐτῶν F κοινῶς HIK 6 εἰσὶν]
 εἰσὶν αἱ HI ἢ τε] εἶτε E¹ 7 τὸ alt. om. E 8 καὶ om. I
 τρία (εἶναι) Spengel οὖν om. F τόπον . . . 9 τὸ alt. om. E¹
 10 περὶ FHI εἴπομεν K 21 ἦτοι] ἢ τὸ E 22 ἐαυτῷ EFIK
 25 δίνησις ὄχησις F ταῦτα F 27 ἀπολείπηται I ἄπωσις . . .
 28 ἀπολείπηται om. F 28 ἀπῶσαν E ἀπολείπηται E¹ ἐστὶ
 FHI ^b 21 ἢ ἐπὶ κινουμένῳ E 23 ἐστὶ FHI ὅταν ἦτοι
 scripsi cum S: ἦτοι ὅταν EFIJK: ἦτοι ὅτε H αὐτὸ FHK: αὐτὸν
 EIS θάπτων FHJS: θάπτων K: ὅταν θάπτων EI ἢ om. E¹S
 24 ἢ om. E¹ ἢ E²S: om. F μὴ om. E τῆς EFJKS: om. HI
 καὶ γὰρ καὶ J 25 αὐτόν EFIJK ἢ om. FHIK ἔλξεις seclusi
 αὐταὶ scripsi: αὐταὶ E: αἱ αὐταὶ KA 26 ταύτας HIJK 27 ἢ
 pr. om. HI 28 δὲ KA 29 καὶ pr. . . διάκρισις om. K

κίνησις ἢ κατὰ τόπον σύγκρισις καὶ διάκρισις ἐστίν. ἢ | δὲ 244^a
 δῶνσις σύγκριται ἐξ ἔλξεως καὶ ὤσεως. τὸ μὲν γὰρ ὠθεῖ τὸ 16
 κινουόν, τὸ | δ' ἔλκει. φανερόν οὖν ὡς ἐπεὶ ἅμα τὸ ὠθοῦν καὶ
 τὸ ἔλκον τῷ ἐλκομένῳ | καὶ ὠθουμένῳ ἐστίν, οὐθὲν μεταξὺ τοῦ 17-18
 κινουμένου καὶ τοῦ κινουόντος ἐστίν. |

τοῦτο δὲ δῆλον καὶ ἐκ τῶν ὀρισμένων· ἢ μὲν γὰρ ὠσις ἢ
 ἀφ' ἑαυτοῦ ἢ | ἀπ' ἄλλου πρὸς ἄλλο κίνησις, ἢ δ' ἔλξις ἀπ' 19-20
 ἄλλου πρὸς αὐτὸ ἢ πρὸς | ἄλλο. ἔτι ἢ σύνωσις καὶ ἢ δῶσις.
 ἢ δὲ ρῖψις ὅταν θάπτων ἢ κίνησις γέ|νηται τῆς κατὰ φύσιν τοῦ 21-2
 φερομένου σφοδροτέρας γενομένης τῆς ὤσεως, | καὶ μέχρι
 τούτου συμβαίνει φέρεσθαι μέχρι ἂν οὐ σφοδροτέρα ἢ ἢ
 κίνησις | τοῦ φερομένου· φανερόν δὴ ὅτι τὸ κινούμενον καὶ τὸ 23-4
 κινουόν ἅμα, καὶ οὐθὲν | αὐτῶν ἐστίν μεταξὺ.

ἀλλὰ μὴν οὐδὲ τοῦ ἀλλοιουμένου καὶ τοῦ ἀλλοιούντος | 25
 οὐδὲν ἐστίν μεταξὺ. τοῦτο δὲ δῆλον ἐκ τῆς ἐπαγωγῆς. ἐν 26
 ἅπασιν γὰρ συμ|βαίνει ἅμα εἶναι τὸ ἀλλοιοῦν ἔσχατον καὶ τὸ
 πρῶτον ἀλλοιούμενον. τὸ | γὰρ ποιὸν ἀλλοιοῦται τῷ αἰσθητῶν 27-8
 εἶναι, αἰσθητὰ δὲ ἐστίν οἷς διαφέρουσιν | τὰ σώματα ἀλλήλων, 244^b
 οἷον βαρύτης κουφότης, σκληρότης μαλακότης, | ψόφος ἀψοφία, 16-17
 λευκότης μελανία, γλυκύτης πικρότης, ὑγρότης ξηρότης,
 πυκνότης μαυρότης, καὶ τὰ μεταξὺ τούτων, ὁμοίως δὲ καὶ τὰ
 ἄλλα | τὰ ὑπὸ τὰς αἰσθήσεις, ὧν ἐστίν καὶ ἢ θερμότης καὶ ἢ 18-19
 ψυχρότης, καὶ ἢ | λειώτης καὶ ἢ τραχύτης. ταῦτα γὰρ ἐστίν
 πάθη τῆς ὑποκειμένης ποιότητος. | τούτοις γὰρ διαφέρουσι 20-21
 τὰ αἰσθητὰ τῶν σωμάτων ἢ κατὰ τὸ τούτων τι | μᾶλλον καὶ
 ἦττον [καὶ τῷ τούτων τι] πάσχειν. θερμαινόμενα γὰρ ἢ ψυ-| 22
 χόμενα ἢ γλυκαινόμενα ἢ πικραινόμενα ἢ κατὰ τι ἄλλο τῶν

244^a 16 ἐξ] μὲν ἐξ F H J K 17 εἴπερ F H J K ὠθουμένῳ καὶ
 ἐλκομένῳ H 18 κινουόντος καὶ τοῦ κινουμένου K 19 ὀρισμῶν
 F J²: εἰρημένων H I J¹ K ἄπωσις E 20-1 ἀπ' alt. . . δῶσις]
 ἢ δὴ σύνωσις E 21 ἢ alt. om. F J K ῥέψις E θάπτων I K
 22 γενησομένης E 23 τούτου] τούτου γενομένου F K : τούτου γινο-
 μένου J συμφέρεει γίνεσθαι K ἂν om. H I J K ἢ om. E : εἴη F I
 24 φερομένου] κινουμένου H δὴ διότι J K κινουόν καὶ τὸ κινούμενον
 F 25-6 ἀλλὰ . . . μεταξὺ om. F 25 οὐδὲ om. E τοῦ alt. om.
 K 26 ἀγωγῆς E 27 τὸ pr.] τό τε K Λ 28 οἷς om. E¹
^b 17 μελανότης F J K 18 τὸ F ὁμοίως . . . 20 ποιότητος
 margo E² 19 ἢ alt. et 20 ἢ om. I 20 πάθη F et margo E :
 πάθος I J K 21 τοῖς γὰρ E¹ τὸ om. E¹ I¹ τι om. I¹
 22 καὶ alt. . . . τι seclusi 23 ἢ γλυκαινόμενα om. E ἄλλο
 τι F J K

23-4 προειρημέ|νων ὁμοίως τά τε ἔμφυχα τῶν σωμάτων καὶ τὰ
 ἄφυχα καὶ τῶν ἐμφυ|χων ὅσα τῶν μερῶν ἄφυχα. καὶ αὐτὰ
 25-6 δὲ αἰ αἰσθήσεις ἀλλοιοῦνται. πά|σχοσι γάρ· ἢ γὰρ ἐνέργεια
 αὐτῶν κίνησις ἐστὶν διὰ σώματος πασχούσης τι | τῆς αἰσθή-
 27 σεως. καθ' ὅσα μὲν οὖν ἀλλοιοῦνται τὰ ἄφυχα, καὶ τὰ ἐμ-|
 28 ψυχα κατὰ πάντα ταῦτα ἀλλοιοῦνται· καθ' ὅσα δὲ τὰ ἔμφυχα
 245^a ἀλλοι|οῦνται, κατὰ ταῦτα οὐκ ἀλλοιοῦνται τὰ ἄφυχα (κατὰ γὰρ
 17-18 τὰς αἰσθήσεις | οὐκ ἀλλοιοῦνται)· καὶ λανθάνει ἀλλοιούμενα
 τὰ ἄφυχα. οὐθὲν δὲ κωλύει | καὶ τὰ ἔμφυχα λανθάνειν
 19-20 ἀλλοιούμενα, ὅταν μὴ κατὰ τὰς αἰσθήσεις | συμβαίῃ τὸ τῆς
 ἀλλοιώσεως αὐτοῖς. εἴπερ οὖν αἰσθητὰ μὲν τὰ πάθη, | διὰ
 21 δὲ τούτων ἢ ἀλλοιώσεις, τούτοις γε φανερόν ὅτι τὸ πάσχον
 καὶ τὸ | πάθος ἅμα, καὶ τούτων οὐθὲν ἐστὶν μεταξύ. τῷ μὲν
 22-3 γὰρ ὁ ἀῆρ συνεχής, τῷ | δ' ἀέρι συνάπτει τὸ σῶμα· καὶ ἡ μὲν
 ἐπιφάνεια πρὸς τὸ φῶς, τὸ δὲ | φῶς πρὸς τὴν ὄψιν. ὁμοίως
 24-5 δὲ καὶ ἡ ἀκοὴ καὶ ἡ ὄσφρησις πρὸς τὸ κι|νοῦν αὐτὰς πρῶτον.
 τὸν αὐτὸν δὲ τρόπον ἅμα καὶ ἡ γεῦσις καὶ ὁ χυμός | ἐστὶν
 [ὡσαύτως δὲ καὶ ἐπὶ τῶν ἀψύχων καὶ τῶν ἀναισθητῶν].
 26-7 καὶ τὸ αὐ|ξανόμενον δὲ καὶ τὸ αἰξον· πρόσθεσις γάρ τις ἢ
 αἰξησις, ὡσθ' ἅμα τό | τ' αἰξανόμενον καὶ τὸ αἰξον. καὶ ἡ
 28-9 φθίσις δέ· τὸ γὰρ τῆς φθίσεως αἴ|τιον ἀφαίρεσις τις. φανερόν
 245^b δὴ ὡς τοῦ κινουμένου ἐσχάτου καὶ τοῦ κινου|μένου πρῶτου οὐθὲν
 17-18 ἐστὶν μεταξύ [ἀνὰ μέσον τοῦ τε κινουμένου καὶ τοῦ κι|νουμένου]. |
 19 "Ὅτι δὲ τὰ ἀλλοιούμενα ἀλλοιοῦνται πάντα ὑπὸ τῶν αἰσθη- 3
 τῶν, καὶ | μόνων τούτων ἐστὶν ἀλλοιώσεις ὅσα καθ' αὐτὰ
 20-1 πάσχει ὑπὸ τούτων, | ἐκ τῶνδε θεωρήσωμεν. τῶν γὰρ ἄλλων
 μάλιστα [ἂν τις ὑπολάβοι ἔν τε] τοῖς | σχήμασι καὶ ταῖς

23^b προειρημένον ἀλλοιοῦσθαι φαμέν. ὁμοίως margo F 24 καὶ
 alt.] λέγοντες καὶ I 25 ὅσα I πάλιν ὅσα I αἰ om. E² 26 γὰρ
 κατ' ἐνέργειαν αἰσθησις κίνησις I διὰ . . . 27 αἰσθήσεως om. E¹
 27 ἀλλοιοῦται EFJ τὰ pr. om. E¹ 28 ἀλλοιοῦται J ἀλλοιοῦται
 FJ 245^a 17 ἀλλοιοῦται F 18 ἀλλοιοῦται E καὶ| καὶ τὰ μὲν I
 τὰ . . . 19 ἀλλοιούμενα] τὰ δ' οὐ λανθάνει, ἔνια δὲ λανθάνει I 19 λαν-
 θάνει] λανθάνει δὲ E 20 αὐτῆς FI 21 τοῖτοις] τοῖτό FIJK
 γε om. E: γε δὴ FJK 22-5 καὶ . . . ἅμα om. F¹ 22 τῷ] ὁ E
 ὁ om. E 23 ἢ μὲν ἐπιφάνεια] τὸ μὲν χρῶμα K 24 ἢ pr. om. E¹
 πρὸς] τὸ πρὸς I 25 αὐτὰς] αὐτὰ EIJK 26 ὡσαύτως . . .
 ἀναισθητῶν om. E¹ αἰσθητῶν K et margo E αἰξόμενον J 29 δὴ
 Spengel: δὲ FIK: οὖν EJ ^b 17 ἀνὰ . . . κινουμένου om. I 19 τὰ
 om. E¹ ἀλλοιοῦται E 20 ἐν μόνις τοῖτοις I ὅσα] ἢ ὅσα E
 αὐτὸ J πάσχει] λέγεται πάσχειν FIJK 21 ἐκ τῶνδε] δὲ E¹
 ἂν τις ὑπολάβοι om. EI¹ ἐν τε om. E

μορφαῖς καὶ ταῖς ἔξεσι καὶ ταῖς τούτων ἀποβολαῖς | καὶ 22-3
 λήψεω [ἀλλοιώσω ὑπάρχειω.] δοκεῖ [γὰρ] ὑπάρχει τὸ τῆς
 ἀλλοιώσεως, | οὐκ ἔστιν δὲ οὐδ' ἐν τούτοις, ἀλλὰ γίνεταί [τὸ
 σχῆμα] ἀλλοιουμένων τιῶν | ταῦτα (πυκνουμένης γὰρ ἡ 24-5
 μανουμένης ἢ θερμαινομένης ἢ ψυχομένης τῆς | ὕλης), ἀλ-
 λοιώσις δὲ οὐκ ἔστιν. ἐξ οὗ μὲν γὰρ ἡ μορφή τοῦ ἀνδριάντος,
 οὐ λέ|γομεν τὴν μορφήν, οὐδ' ἐξ οὗ τὸ σχῆμα τῆς πυραμίδος 26-7
 ἢ τῆς κλίνης, ἀλλὰ | παρωνυμιάζοντες τὸ μὲν χαλκοῦν τὸ δὲ
 κήριον τὸ δὲ ξύλιον· τὸ δ' ἀλ|λοιοῦμενον λέγομεν· τὸν 28-9
 γὰρ χαλκὸν ὑγρὸν εἶναι λέγομεν ἢ θερμὸν ἢ σκλη|ρόν (καὶ οὐ 246^a
 μόνον οὕτως, ἀλλὰ καὶ τὸ ὑγρὸν καὶ τὸ θερμὸν χαλκόν), | 21
 ὁμωνύμως λέγοντες τῷ πάθει τὴν ὕλην. ἐπεὶ οὖν ἐξ οὗ μὲν
 ἡ μορφή καὶ | τὸ σχῆμα καὶ τὸ γεγονός ὁμωνύμως οὐ λέγεται 22-3
 τοῖς ἐξ ἐκείνου σχήμασι, | τὸ δ' ἀλλοιοῦμενον τοῖς πάθεσι
 ὁμωνύμως λέγεται, φανερόν ὡς ἐν μόνοις | τοῖς αἰσθητοῖς ἢ 24-5
 ἀλλοιώσις. ἔτι καὶ ἄλλως ἄτοπον. τὸ γὰρ λέγειν τὸν |
 ἄνθρωπον ἠλλοιωθῆναι ἢ τὴν οἰκίαν λαβοῦσαν τέλος γελοῖον, 26
 εἰ τὴν τελείω|σι τῆς οἰκίας, τὸν θριγκὸν ἢ τὴν κεραμίδα,
 φήσομεν ἀλλοιώσιω εἶναι, (ἢ) θριγ|κουμένης τῆς οἰκίας ἢ 27-8
 κεραμιδομένης ἀλλοιοῦσθαι τὴν οἰκίαν. δηλοῦν δὴ | ὅτι τὸ
 τῆς ἀλλοιώσεως οὐκ ἔστιν ἐν τοῖς γιγνομένοις.

οὐδὲ γὰρ ἐν ταῖς ἐξε|σιν. αἱ γὰρ ἔξεις ἀρεταὶ καὶ κακίαι, 29-30
 ἀρετὴ δὲ πᾶσα καὶ κακία τῶν | πρὸς τι, καθάπερ ἡ μὲν ὑγίεια 246^b
 θερμῶν καὶ ψυχρῶν συμμετρία τις, ἢ τῶν | ἐντὸς ἢ πρὸς τὸ 21-2
 περιέχον. ὁμοίως δὲ καὶ τὸ κάλλος καὶ ἡ ἰσχύς τῶν | πρὸς
 τι. διαθέσεις γὰρ τινα τοῦ βελτίστου πρὸς τὸ ἄριστον,
 λέγω δὲ τὸ | βέλτιστον τὸ σῶζον καὶ διατιθεὶν περὶ τὴν φύσιν. 23-4
 ἐπεὶ οὖν αἱ μὲν ἀρεταὶ | καὶ αἱ κακίαι τῶν πρὸς τι, ταῦτα δὲ
 οὔτε γενέσεις εἰσὶν οὔτε γένεσις αὐ|τῶν οὐδ' ὅλως ἀλλοιώσις, 25-6
 φανερόν ὡς οὐκ ἔστιν ὅλως τὸ τῆς ἀλλοιώσεως | περὶ τὰς ἔξεις.

^b 22 μεταφοραῖς J¹ τούτων] τούτων δὲ I 23 ἀλλοιώσιν ὑπάρχει
 om. EF¹JK γὰρ om. EI¹ 24 τὸ σχῆμα dett. : om. EF¹JK
 28 χαλκόν EI 29 φαμεν θερμὸν E 246^a 21 θερμὸν καὶ τὸ
 ὑγρὸν K 22 ὁμωνύμως δὲ λέγοντες E μὲν μορφήν E¹
 23 καὶ et 24 δ¹ om. E 27 τὸν] ἢ τὸν F ἢ add. Spengel
 28 ἢ] ἢ τῆς E¹ δὲ J 29 ἐν ταῖς om. E ^b 21 ἢ τινῶν
 E¹ 22 ἢ om. E 23 τὸ βέλτιστον] τοῦ βελτίστου FK
 25 αἱ om. K γενέσεις . . . γένεσις] γένεσις (γενέσεις E²) εἰσὶν E
 26 ἀλλοιώσις . . . ὅλως om. E¹ 27 οὔτε περὶ E²

- 27-8 οὐδὲ δὴ περὶ τὰς τῆς ψυχῆς ἀρετὰς καὶ κακίας. ἡ μὲν | γὰρ
ἀρετὴ τελείωσις τις (ἕκαστον γὰρ τότε μάλιστα τέλειόν ἐστιν,
ὅταν | τύχη τῆς οἰκείας ἀρετῆς, καὶ μάλιστα κατὰ φύσιν, καθάπερ
29-30 ὁ κύκλος | τότε μάλιστα κατὰ φύσιν ἐστίν, ὅταν μάλιστα
247^a κύκλος ᾗ), ἡ δὲ κακία | φθορὰ τούτων καὶ ἕκστασις. γίγνεται
20-21 μὲν οὖν ἀλλοιουμένου τιwὸς καὶ ἡ λήψις | τῆς ἀρετῆς καὶ ἡ
τῆς κακίας ἀποβολή, ἀλλοίωσις μέντοι τούτων οὐδέτερον. |
ὅτι δ' ἀλλοιοῦταί τι, δῆλον. ἡ μὲν γὰρ ἀρετὴ ἦτοι ἀπάθειά
22-3 τις ἢ παθη|τικὸν ὦδι, ἡ δὲ κακία παθητικὸν ἢ ἐναντία πάθησις
τῇ ἀρετῇ. καὶ τὸ | ὅλον τὴν ἠθικὴν ἀρετὴν ἐν ἡδοναῖς καὶ
24-5 λύπαις εἶναι συμβέβηκεν· ἡ γὰρ | κατ' ἐνέργειαν τὸ τῆς
ἡδονῆς ἢ διὰ μνήμην ἢ ἀπὸ τῆς ἐλπίδος. εἰ μὲν οὖν | κατ'
ἐνέργειαν, αἴσθησις τὸ αἴτιον, εἰ δὲ διὰ μνήμην ἢ δι' ἐλπίδα,
26-7 ἀπὸ | ταύτης· ἡ γὰρ οἷα ἐπάθομεν μεμνημένοι τὸ τῆς ἡδονῆς
ἢ οἷα πεισόμεθα | ἐλπίζουσιν.
- 28 ἀλλὰ μὴν οὐδ' (ἐν) τῷ διανοητικῷ μέρει τῆς ψυχῆς ἀλλοίω-
σις. | τὸ γὰρ ἐπιστήμον μάλιστα τῶν πρὸς τι λέγεται. τοῦτο δὲ
29-30 δῆλον· κατ' οὐδε|μίαν γὰρ δύναμιν κινήθεισιν ἐγγίγνεται τὸ
247^b τῆς ἐπιστήμης, ἀλλ' ὑπάρξαντός | τιwὸς· ἐκ γὰρ τῆς κατὰ
20-21 μέρος ἐμπειρίας τὴν καθόλου λαμβάνομεν ἐπιστή|μην. οὐδὲ
δὴ ἡ ἐνέργεια γένεσις, εἰ μὴ τις καὶ τὴν ἀνάβλεψιν καὶ τὴν |
22 ἀφῆν γενέσεις φησίν· τοιοῦτον γὰρ ἡ ἐνέργεια. ἡ δὲ ἐξ
ἀρχῆς λήψις τῆς | ἐπιστήμης οὐκ ἔστι γένεσις οὐδ' ἀλλοίωσις·
23-4 τῷ γὰρ ἠρεμίζεσθαι καὶ καθ|ίστασθαι τὴν ψυχὴν ἐπιστήμων
γίγνεται καὶ φρόνιμος. καθάπερ οὖν οὐδ' ὅταν | καθεύδων
ἐγερθῇ τις ἢ μεθύων παύσῃται ἢ νοσῶν καταστῆ, γέγονεν
25-6 ἐπι|στήμων· καίτοι πρότερον οὐκ ἐδύνατο χρῆσθαι καὶ κατὰ
τὴν ἐπιστήμην ἐνεργεῖν, εἴτα ἀπαλλαγείσης τῆς παραχῆς καὶ
27-8 εἰς ἠρεμίαν καὶ κατάστασιν ἐλθούσης τῆς | διανοίας ὑπῆρξεν
ἡ δύναμις ἢ πρὸς τὴν τῆς ἐπιστήμης χρεῖαν. τοιοῦτο δὴ | τι

^b 27 οὐδὲ δὴ] οὐ E¹: οὐ γὰρ δὴ K
μάλιστα K ὅταν om. E¹ 28 γὰρ τὸ τέλειόν ἐστιν
247^a 21 μὲν τοιούτων E¹ 23 ὦδι] ὡς δεῖ Spengel 30 κακία φθορὰ] παραφορὰ E
24 ἠθικὴν] οἰκείαν J ἐν] ἐν μὲν E¹ 25 μνήμης FJK
εἰ] ἡ E 26 εἰ] ἡ E² μνήμην det.: μνήμης EFJK δέ] δέ]
τὴν E ἐλπίδος F 27 ἦ] εἰ E τὸ add. E ἡδονῆς
ποία E 28 ἐν add. Spengel ψυχῆς ἡ ἀλλοίωσις FJK 29 δέ
om. E ^b 21 ἡ om. E 22 φήσει K 26 καίτοι] καὶ τὸ E
χρησθῆναι E¹ 27 εἴτα] ἀλλ' K ἠρεμίαν καὶ ci. Bekker:
ἐρημίαν καὶ E: om. FJK

γίγνεται καὶ τὸ ἐξ ἀρχῆς ἐν τῇ τῆς ἐπιστήμης ὑπαρχῆ· τῆς
 γὰρ παρα|χῆς ἡρεμία τις καὶ κατάστασις. οὐδὲ δὴ τὰ παιδιά 29-30
 δύναται μαθεῖν οὐδὲ | κρίνειν ταῖς αἰσθήσεσιν ὁμοίως τοῖς 248^a
 πρεσβυτέροις. πολλὴ γὰρ ἡ ταραχὴ | περὶ ταῦτα καὶ ἡ 26-7
 κίνησις. καθίσταται δὲ καὶ παύεται τῆς ταραχῆς τοτὲ | μὲν
 ὑπὸ τῆς φύσεως τοτὲ δ' ὑπ' ἄλλων. ἐν ἀμφοτέροις δὲ τούτοις 28
 ἀλ|λοιούσθαι τι συμβαίνει, καθάπερ ὅταν ἐγερθῆ καὶ γένηται 248^b
 νήφων πρὸς τὴν | ἐνέργειαν. φανερόν οὖν ὅτι τὸ τῆς ἀλλοιώ- 26-7
 σεως ἐν τοῖς αἰσθητοῖς καὶ ἐν τῷ | αἰσθητικῷ μέρει τῆς ψυχῆς,
 ἐν ἄλλῳ δ' οὐθενὶ πλὴν κατὰ συμβεβηκός. 28

^b 29 καὶ] κατὰ E¹ ὑπάρχει E² 30 δύναται τι μαθεῖν F
 248^a 26 κρίνειν] κοινωνεῖν E 27 αὐτὰ F]K 28 ἀλλήλων E
^b 27 ἐν alt. om. F

ANALYSIS

BOOK I

1. *The scope and method of the book.*

184^a 10. Since scientific knowledge of anything involves knowledge of its first principles, the part relating to the first principles is the first part of the science of nature to be studied.

16. The path leads from what is better known to us to what is better known by nature. This path we must now follow; we must reach the first principles by analysis of the confused data we start with.

23. Hence we must proceed from universals to particulars; for wholes are better known to sense, and universals are wholes.

26. Names are in the same relation to definitions; a name denotes a whole indefinitely, and a definition divides it into its particulars.

^b 12. So too children first call all men fathers, and only later speak with more precision.

2. *Our inquiry is about the number and character of the first principles of nature.*

184^b 15. There must be either (1) one principle, or (2) more than one. (1) If there is only one, this must be either (a) unchangeable (Parmenides, Melissus), or (b) changeable (the physicists). (2) If there are more than one, they must be (a) finite or (b) infinite in number. (a) If finite, they must be two or three or four, &c. (b) If infinite, they must be (i) generically one but differing in shape (Democritus) or (ii) different in kind or even contrary.

22. Similarly those who ask whether existing things are many are really asking whether their constituents, i.e. the first principles, are one or many, and if many, whether finite or infinite in number.

25. To ask whether reality is one and unchangeable is not to raise a physical problem; for, as refutation of those who deny the first principles of geometry is the business not of geometry but of another special science or of a universal science, so the student of first principles is not called on to refute those who deny these; indeed if there is only one reality there cannot be a first principle, since a first principle is the first principle of something.

185^a 5. Therefore to consider whether reality is one in this way is like arguing against any other view put forward merely for argument's sake (like that of Heraclitus),

7. or like refuting a contentious argument; the arguments both of Melissus and of Parmenides have this character; they not only make false assumptions but reason wrongly from them; or rather that of Melissus is crude and offers no difficulty; he derives all his results from a single false premiss, which is easy enough.

12. We may assume that natural objects are, all or some of them, in a state of change—as is clear by induction.

14. Further, it is not proper to refute everything, but only what is falsely deduced from the first principles of a science; a geometer must refute the squaring of the circle by means of segments, but not Antiphon's squaring of it.

17. Still, though the Eleatics are not speaking about nature, they incidentally raise certain physical problems which have philosophical interest.

Reality is not one in the way that the Eleatics supposed.

20. (1) 'Being' has different senses. In view of these we must see how all things are supposed to be one. Does 'all things' mean substances, or quantities, or qualities; and are they all one substance, or one quality? All this makes a great difference, and all the alternatives are impossible.

27. For (a) if there are to be both substance and quality and quantity, whether these are separate or not there are many realities;

29. while (b) if all things are to be quality or quantity, this is absurd, or rather impossible; for nothing can exist apart except substance, since it is the subject of which everything else is asserted.

32. Melissus says reality is infinite; therefore it is a quantum, since a substance, quality, &c., can be infinite only incidentally, by being a quantum. Thus if both substance and quantity exist, reality is not one but two; while if only substance exists, it is not infinite, and has no magnitude.

^b 5. (2) 'One' has different senses; in what sense is the universe one? That is one which is (a) continuous, (b) indivisible, or (c) identical in definition.

9. (a) If the universe is continuous, the One is many, since a continuum is divisible.

(11. Incidentally there is a question whether the part and the whole are one or many, and how they can be one or many, and if many, in what sense (this problem occurs equally with regard to non-continuous parts); and the difficulty arises that if each part is one with the whole, the parts are one with each other.)

16. (b) If the universe is indivisible, there will be no quantity or quality, and reality will be neither unlimited nor limited; for the limited is not indivisible, though the limit is.

19. (c) If all things are identical in definition, that leads to Heraclitus' paradox; it will be the same thing to be good and to be bad, to be good and not-good (so that the same thing will be good and not-good, or a man and a horse; reality will be not one thing but nothing), and to have a certain quality and to have a certain quantity will be the same.

25. Even the later of the old philosophers were afraid lest the same thing should turn out to be one and many; hence some refused to say 'A is B', and others insisted on saying 'the man walks', not 'the man is walking'—as if 'one' or 'is' had but one sense.

32. But a thing may be many either in definition (e.g. to be white and to be musical are different, though the same thing may be both; so that the one is many) or by division (as a whole is its many parts). At this point they were in a difficulty; they had to admit that the one is many but were puzzled thereby—as though it were not possible for the same thing to be one and many, provided it is not one and many in the sense in which these are opposed to each other; what is one may be so either potentially or actually.

3. *Refutation of the Eleatic arguments.*

186^a 4. Not only do the above considerations show the falsity of the view that reality is one, but the arguments on which it is based may be refuted. Both Melissus and Parmenides argue like mere debaters.

10. (A) Melissus' argument is invalid. For (1) he thinks he has a right to say that if that which has come into being has a beginning, that which has not has none.

13. (2) It is absurd to think (a) that everything that has come into being has a beginning (of the thing, not of the time), and (b) that there must be a beginning—not of simple coming to be but of qualitative change as well, as though there were no such thing as instantaneous change.

16. (3) Why cannot reality be subject to change if it is *one*? (a) Why cannot the whole have a rotatory movement as a particular piece of water can? And (b) why should it not be subject to qualitative change?

19. (4) Reality cannot be one in kind, but only in matter. But even of the physicists some hold the latter though they deny the former, since man is different from horse in kind, and contrary from contrary.

22. (B) Parmenides is open to the same objections, even if there are others. (I) His view is false, in that he supposes 'being' to have but one meaning; and (II) it is badly reasoned, since (1) (a),

if we take merely the things that are white, (i) the fact that 'white' has but one meaning does not prevent *their* being many; it does not follow that what is white is one either by continuity, or in definition (for to be the colour white and to be that which has the colour are not the same; yet this does not involve there being something apart from the white; for they are different not *qua* separable but in their essence; but this Parmenides had not grasped).

32. To support his view he must assume that 'being', whatever it is asserted of, means not only one thing but what is just being and just one; it will not do to suppose that being is an accident; for (ii) then what it is an accident of will not be; so that there will *be* something that *is not*. Therefore the just-existent will not be an accident of anything, since then that thing would not be an existent—unless 'being' has a variety of meanings so that each of the things answering to them would be an existent; but we are supposing that 'being' has *one* meaning.

^b 4. (b) If, then, that which is just existent is not an accident of anything, but other things are accidents of it, (i) how is 'the just-existent' to mean something that exists and not something that does not exist? For if the just-existent is to be white, but the quality white is not just existent (indeed, 'existent' cannot even be an attribute of it, since *ex hypothesi* nothing is existent except what is just existent), what is white is non-existent (not merely not this or that existent); therefore the just-existent is non-existent; for it was *ex hypothesi* true to say of it that it was white, and this has been shown to mean something non-existent.

11. (ii) To escape this difficulty, we must say that even 'white' indicates something just existent; but then (contrary to Parmenides' original hypothesis) 'existent' stands for more than one kind of thing.

12. (2) The existent will have no magnitude if it is just existent; for if it had magnitude the being of each of the parts would be different.

14. (3) That the just-existent is divisible into other just-existents is evident; if man is a just-existent, so are animal and two-footed. For otherwise they will be attributes, either of man or of some other subject. But that is impossible.

18. For (a) an attribute is (i) that which can either belong or not belong to a subject, or (ii) that in whose definition the subject is present.

23. And (b) elements included in the definition of a complex term do not include the complex term in their own definitions.

26. Hence if the elements involved in man are attributes of man, they must in view of (a) above either (i) be separable (so that a man

need not be two-footed !), or (ii) have 'man' present in their definition, which is forbidden by (b) above;

31. while if they are attributes of something else (and not just existent), man also will be an attribute of that other thing.

33. But let us grant that a just-existent is not an attribute of anything, and that of that of which both of two terms are predicated, the complex of these terms can be predicated; must we to escape the resulting difficulty say that the universe consists of indivisibles?

187^a 1. Some gave in to the argument that all things are one if 'being' has but one meaning, by saying that not-being exists, and to the argument from dichotomy by recognizing indivisible magnitudes.

3. But evidently it is not true that if 'being' means one thing and cannot at the same time mean the opposite, there can be no not-being; there is nothing to prevent what is not, not from being, simply, but from being what is not some particular thing. And surely to say that, if there is nothing besides being itself, all things will be one, is absurd. For who understands being itself to be anything but what is merely a particular existent? And if this is so, there is nothing to prevent the things that are from being many.

10. Clearly then being cannot be one in *this* way.

4. *Statement and examination of the opinions of the physicists about the principles of natural things.*

187^a 12. The views of the physicists are of two kinds. (1) Some make the underlying body one, either one of the usual three or an intermediate between them, and derive the plurality of other things by condensation and rarefaction. These are contraries falling under the head of excess and defect, as do Plato's great and small; but while Plato makes these matter and the One the form, *they* make the underlying one to be matter and the contraries to be form.

20. (2) Others describe the contraries as emerging out of the one; e.g. Anaximander, and those who make existing things one and many, as Empedocles and Anaxagoras do. They both evolve other things out of the 'mixture', but Empedocles makes the evolution cyclical and posits only the 'elements', while Anaxagoras supposes the evolution to happen once for all, and makes both the homoeomeries and the contraries that compose them to be indefinite in number.

26. Anaxagoras made them indefinite because

(a) he accepted the common doctrine that nothing comes out of not-being,

31. and because (b), since contraries come out of each other, they must have already existed in each other; for if everything that comes into being comes either out of what is or out of what is not, and the

latter cannot *ex hypothesi* be true, things must have come out of what already existed but was owing to its smallness imperceptible.

^b1. Therefore, since they saw everything coming out of everything, they said that everything must have been mixed in everything, and that things seemed different owing to the predominance of different elements.

7. Now (a) if the indefinite *qua* indefinite is unknowable, that which is indefinite in number or in size is unknowable in quantity, and that which is indefinite in kind is unknowable in quality. But if the principles are indefinite both in number and in kind, their compounds cannot be known.

13. (b) If that whose constituent parts may be indifferently of *any* greatness or smallness may necessarily itself be so too, then if a living thing cannot be indifferently of *any* greatness or smallness, neither can any of its parts, e.g. flesh, bone, fruit.

22. (c) If all such things are present in each other and do not come into being but emerge, and get their name from their largest constituent, and anything can come out of anything, then since every finite body can be exhausted by subtractions of finite body, each thing cannot be present in each. For if flesh were extracted from water, and more flesh from what is left, then even if what emerges is always smaller, there will be a size than which it will not be smaller. Thus if the emergence comes to an end, there will not be everything in everything; while if it does not, there will be in a finite magnitude an infinite number of equal finite magnitudes; which is impossible.

35. (d) If every body must by the removal of anything become smaller, and the size of flesh is finite in smallness as well as in greatness, no body can emerge from the smallest flesh; for the flesh left will be less than the least possible.

188^a 2. (e) In the indefinite number of original bodies there would already be infinite flesh, blood, and brain, existent though not separate, and each infinite; which is impossible.

5. (f) The statement that they will never be completely separated is made unintelligently but is true, for affections cannot exist separately. If colours and states are mixed, then if they are separated there will be a white or a healthy which is not an attribute of anything. Thus Anaxagoras' Reason is trying an impossible task; it cannot separate things in respect of quantity because there is no least magnitude, nor in quality because qualities cannot exist apart.

13. (g) Anaxagoras does not understand aright even the genesis of homoeomerous things. A clod is divided in one way into clods, in another way into something else; water and air are produced out

of each other, but not as bricks are produced out of a house or a house out of bricks.

17. (*h*) It is better to make the elements fewer, i.e. finite in number, as Empedocles does.

5. *The principles are contraries.*

188^a 19. All thinkers make contraries first principles—both the Eleatics, those who speak of rarity and density, and Democritus with his full and empty; further, he differentiates his atoms by position, shape, and order, each of which is a class including contraries.

27. It is only natural that they should make contraries first principles; for the principles must be composed neither of one another nor of anything else (while all things must be composed of them); the primary contraries fulfil the second condition because they are primary, and the first because they are contraries.

30. But we must show by argument how this happens. We must assume first that things cannot act on, be acted on by, or be generated out of, others at random, unless *per accidens*.

35. For how could white come out of musical, unless musical is an accident of not-white? White is generated from not-white, and not from any and every not-white but from black or an intermediate.

^b3. Nor does a thing pass away into any other indifferently; white does not pass into musical, unless *per accidens*. It passes into not-white, and, more precisely, into black or an intermediate.

8. So too even with composite things (but here the fact escapes us because the opposite conditions are not named).

12. For everything that is tuned must come out of and pass into what is not-tuned, and not-tuned in a precisely corresponding way, and *vice versa*.

15. The same argument applies to order or composition as to tuning. But, further, a house or a statue comes into being in the same way, from a state of disunion or shapelessness, being itself a form of order or composition.

21. Thus everything comes out of and passes into its contrary or an intermediate. And intermediates are composed of contraries; so that all things that come into being by nature are contraries or composed of them.

26. Most thinkers have, without giving a reason for it, adopted contraries as principles, as though compelled by the truth itself.

30. But they differ in that some name contraries better known by definition (odd and even, strife and love), others contraries better known by sensation (wet and dry, hot and cold).

36. Thus they name contraries that are different, and yet are the same by analogy inasmuch as they come from the same set of

opposites, some pairs being wider and others narrower. Some describe them better, others worse; some describe what is better known in respect of definition (the universal), others what is better known to sense (the particular).

189^a 9. Evidently, then, the principles must be contrary.

6. *The principles are either two or three in number.*

189^a 11. Are the principles two, three, or more? (1) There cannot be but one, since contraries go in pairs; (2) they cannot be infinite in number, because (a) being would then not be knowable, (b) there is but one contrariety in one class, and substance is one class, (c) a finite number is sufficient, and preferable, (d) some contraries are generated out of each other, but the first principles must be eternal.

20. The principles, then, are finite in number. (3) It is plausible not to make them two only; for (a) one might ask how density can act on rarity, or *vice versa*. So too with any other pair of contraries; a third thing is needed to be acted on. Some recognize even more principles than three.

27. (b) There is also, if we do not suppose a nature underlying the contraries, the difficulty that contraries do not seem to be the *substance* of anything. But the first principle must not be said to be an *attribute*; for a subject is prior to its attribute, and the first principle would have a first principle prior to it.

32. (c) Substance is not contrary to substance; but how can substance be composed of non-substances?

34. Hence, if we are to reconcile the argument in favour of contraries as principles and the argument against their sufficiency, we must suppose a third thing underlying them, as those do who say the All is a single nature, such as water or fire or their intermediate.

^b3. The intermediate is preferable; for fire, earth, &c., already involve contrarieties. Hence it is best to make the substratum distinct from these, or if one of them, preferably air or water, as having fewest sensible differences.

8. At any rate, it is this One that all the early thinkers give shape to by their contrarieties, which are forms of excess and defect.

11. This view too, that the One and excess and defect are the principles, is ancient; but the old thinkers made the two active and the one passive, while some of the moderns reverse this.

16. The view that there are three elements thus has something to be said for it; (4) the view that there are more has not. For (a) one passive element is enough, but if there are two pairs of contraries there will have to be two intermediates; while if two pairs of contraries can generate from each other, one of the pairs is superfluous.

22. At the same time (*b*) there cannot be more than one pair of primary contraries. For substance is a single kind of reality, and its principles will differ only in priority and not in kind, since in one kind there is only one ultimate contrariety.

27. Thus there is neither one element only, nor more than two or three; whether there are two or three, is a difficult question.

7. *Our view about the number and nature of the principles.*

189^b 30. (1) Let us state the principles involved in all coming-to-be, before we pass to the several kinds.

32. In naming the *terminus a quo* and the *terminus ad quem* of change, we may name either the simple elements ('the man becomes musical' or 'the unmusical becomes musical') or the complex of them ('the unmusical man becomes a musical man').

190^a 5. With one of the simple *termini a quibus* we may use the word 'from'. ('from not-musical he becomes musical'); with the other we cannot ('from a man he becomes musical').

9. The one *terminus a quo* persists through the change, the other does not; the man, but not the unmusical, persists.

13. (2) Thus there is always something that underlies change, and this, if one in number, is not one in definition; for to be a man is not the same as to be unmusical. The former persists, the latter does not.

21. 'From' is used chiefly with the non-persistent element, but is sometimes used with the persistent element ('the statue is made of or from bronze'). Of the non-persistent element we may say either 'from it comes A' or 'it becomes A'.

31. It is only substance that comes to be simply; in other cases a thing comes to be this or that. It is evident that there is something underlying change of quantity, quality, &c., since all the categories other than substance involve an underlying substance.

^b1. But the generation even of substance presupposes a substratum; e.g. living things come from seed. Things that come to be come to be by reshaping, accretion, subtraction, composition, alteration. But all of these presuppose a substratum.

10. Thus what comes into being is always complex, and what comes to be it always includes a supposite and an opposite.

17. (3) Evidently then, if the elements from which natural things are and have come to be—not possessed of some accident, but what they essentially are—are their first principles, every such thing is composed of a substratum and a shape, and into the definitions of these you can analyse them.

23. The substratum is one in number though two in essence (for it is the underlying matter that is counted; for this is more of an

individual thing than the privation, and it is not an accident of that from which what comes into being comes into being; the privation is an accident of *it*).

28. And the form produced is one.

29. Thus the principles are in a sense two, and in a sense three.

30. In a sense contraries, viz. form and privation, are the principles; in a sense they are not (for contraries cannot be acted on by each other). This paradox also is solved by the fact that the substratum is something different from the two contraries.

35. Thus in a sense the principles are no more than two; but in a sense they are three, since the substratum and the privation are different in essence.

191^a 3. We have now seen the number of the principles, and in what sense they are of this number. There must be a substratum and two contraries; yet in a sense three things are not necessary, since one of the contraries can by its absence or presence account for change.

7. The substratum is to be known by analogy. It is to the individual substance as bronze is to a statue, wood to a bed, the shapeless material to the shaped thing.

12. This is one principle (though not one or existent as an individual thing is); the object of definition is another; third comes the privation.

14. We showed first merely that contraries are principles, then that there must also be a substratum; we have now shown the difference between the contraries, how the principles are related, and what the substratum is. It is not yet clear whether the form or the substratum is substance, but we have shown that the principles are three, and in what sense.

8. *The true opinion removes the difficulty felt by the ancient philosophers.*

191^a 23. This is the only way of solving the difficulty into which the early philosophers fell. They took a wrong path owing to inexperience; they thought nothing could come into being because it must come into being either from what is or from what is not, and because *being* could not come into being (since it already was) and nothing could come into being from *not-being* (since there must be a substratum).

31. And, magnifying the consequences as they went on, they said things could not be many but only the One itself could exist.

34. But we maintain (1) that for anything to come into being out of what is or what is not, or for not-being or being to do or suffer or become anything, raises no different problem from a doctor's doing

or suffering something or something's coming into being out of a doctor.

^b2. Therefore, since the latter statements may be made in two ways—viz. (a) a doctor builds, not *qua* doctor but *qua* builder, but (b) he heals *qua* doctor—so may the former.

6. Since we say most properly that something comes into being from a doctor when it comes from him *qua* doctor, we say most properly that a thing comes into being from not-being when it comes from not-being *qua* not-being.

10. The early thinkers went off without drawing this distinction, and were thus led to deny the becoming and the existence of anything but the One Existent.

13. *We* also say that nothing comes into being simply from not-being, but that things come from not-being *per accidens*; they come from their privation, which *per se* is not—this not persisting in them. The early thinkers are surprised at this, and think that nothing can come from not-being.

17. Similarly we say that nothing comes into being from what is, and that what is does not come into being, except *per accidens*; but that this also *does* happen *per accidens*, just as if animal were to come from animal, i.e. a particular animal from a particular animal, e.g. a dog from a dog. For a dog would then come into being not merely from a particular animal, but from an animal, but it would not do so *qua* animal (for that is present already). If a particular animal is to come into being not *per accidens*, it will not be from animal, and if a particular being is to come into being, it will not be from being; nor yet from not-being (i.e. *qua* not-being). At the same time we do not deny that everything either is or is not.

27. (2) Another solution is that the same things may be said with reference either to potentiality or to actuality.

30. Thus we have solved the difficulties which led earlier thinkers off the path which leads to generation and destruction and, in general, change; if they had seen the nature of the substratum they would have been saved from error.

9. *Further reflections on the first principles of nature.*

191^b 35. (1) Certain others have touched on the substratum, but inadequately. (a) They admit that genesis is *per se* from not-being, and that so far Parmenides is right. (b) They think that if the substratum is numerically one it is also one in significance; but there is a great difference between these two things.

192^a 3. For *we* maintain that matter and privation are different, and that matter is not-being *per accidens* while privation is not-being

per se, and that matter is in a sense almost equivalent to substance while privation is not.

6. But *they* identify not-being with the great and the small alike—either with both or with each. Thus their triad is quite different from ours. They got so far as to see that there must be an underlying nature, but they made this single; even if a thinker recognizes a dyad of the great and the small, he is overlooking the other element of the substratum.

13. For while the element that persists is joint cause, with form, of what is produced, the negative one of the pair of contraries might appear, if we look to its destructive character, not to exist at all.

16. For while *we* describe privation as contrary to the good, and matter as desiring the good, *they* have to make one contrary desire its own destruction; but neither can form desire itself (for it lacks nothing) nor can its contrary desire it (for contraries destroy each other). It is matter that desires form, as female does male and as the ugly desires the beautiful—the female or the ugly not *per se* but *per accidens*.

25. (2) The substratum in a sense perishes and comes to be, and in a sense does not. *Qua* that in which the privation is, it perishes when the privation perishes; but with reference to what it can become, it does not perish and does not come to be. For if it comes to be, there must have been already something from which as a constituent it comes into being; but it is just its own nature to be that, so that it would have existed before it came to be; and if it perishes, it will be reduced to its substratum, so that it will have perished before it perishes.

34. (3) The discussion whether there is one formal principle or more, and what it is or they are, must be reserved for First Philosophy, but we shall in what follows discuss natural and perishable forms.

^b 2. (4) We have shown the existence, nature, and number of the first principles; now let us make a fresh start.

BOOK II

A.

1. *Nature and the natural.*

192^b 8. Things may be divided into those that exist by nature and those that do not; the former include animals and their parts, plants, and simple bodies.

13. Each of these has in it a principle of change and rest—in respect of place, of size, or of quality; but a bed or a garment has

as such no such principle (though it has *qua* composed of the simple bodies);

20. which implies that nature is a principle of motion and rest in that in which it is present not *per accidens*.

(23. I say 'not *per accidens*' to exclude such a case as a physician's healing himself; it is an accident that the same man is physician and patient.)

27. Similarly anything else that is *made* has the principle of its making either outside itself or in itself only *per accidens*.

32. This is what nature is; those things 'have a nature' which have such a principle. All such things are substances; nature always involves a subject in which it is. Both these things and their essential attributes are 'in accordance with nature'.

193^a 3. It would be foolish to try to *prove* that nature exists; for obviously many such things exist. To prove the obvious through the not-obvious is to show lack of judgement, and involves one in talk about words, to which no thought corresponds.

9. The nature of natural objects is thought (1) by some to be the unshaped element proximately present in a given thing; e.g. the nature of a bed is thought to be wood.

12. Antiphon cites the fact that if a rotting bed were to put forth a shoot, this would be wood and not a bed, as evidence that the shape imposed on it by art belongs to it *per accidens*, while its nature is that which persists; and says that if there is something related to wood as wood is to a bed, that is the nature of wood.

21. Hence people identify the nature of things with fire, earth, air, water, or with more than one of these, or with them all, and describe everything else as affections or states of these, and say that these are eternal but everything else comes into being and passes away an infinite number of times.

28. This is one sense of 'nature'; (2) another is the shape or form corresponding to the definition.

31. For (a) as a work of art is one which is in accordance with the rules of art, so a natural object is one which is in accordance with nature; and no one would say of what is only potentially a bed that it is in accordance with the rules of art or is a work of art, nor of that which is potentially flesh or bone that it has its own nature or is by nature, till it has acquired the form which corresponds to its definition.

^b 3. Thus in a second sense the nature of things that have an internal principle of change is their form, which is not separable except in respect of definition. (The compound of the two elements, e.g. a man, is not nature, but 'by nature'.) This is more truly nature than the matter; for a thing is itself when it exists actually, rather than when it exists potentially.

8. (*b*) If the fact that a bed would not produce a bed shows that not its shape but its material is its nature, the fact that a man produces a man shows that his form *is* his nature.

12. (*c*) *φύσις* in the sense of generation is a process towards nature. True, healing is a process not towards the healing art but towards health, but *φύσις* in the sense of generation is a process towards nature. That which is growing is as such passing from something towards something, and what is produced in the process of growth is that towards which, not that from which, the growing thing is passing. Therefore shape is nature.

18. Shape or nature is of two kinds ; for even privation is a sort of form. Whether privation (or a contrary) is involved in simple generation is a matter for later inquiry.

B.

2. *Distinction of the natural philosopher from the mathematician and the metaphysician.*

193^b 22. We must next inquire (1) how the mathematician differs from the student of nature (for natural bodies have solid shapes, planes, lines, and points, which are what the mathematician studies), and (2) whether astronomy is or is not a part of physics ; for it is odd if the physicist's task is to study what the sun or moon is, but none of their essential attributes, especially as physicists evidently do study the shape of the moon, the sun, the earth, and the universe.

31. The mathematician also studies solid shapes, but not as the limits of natural bodies ; nor does he study the attributes of shapes as attributes of shapes of natural bodies. This is why he abstracts (for his objects can be thought of in abstraction from change), and incurs no falsity in doing so.

35. The believers in Ideas surreptitiously do the same ; they abstract natural objects, which cannot properly be abstracted like mathematical objects. This becomes plain if we try to define the two kinds of object, and their attributes. The odd and even, the straight and curved, number, line, and figure can exist apart from change, but flesh, bone, man cannot ; these are things like the snub nose, not like 'the curved.'

194^a 7. This is shown also by the more physical branches of mathematics—optics, harmonics, astronomy. Geometry studies a physical line, but not *qua* physical ; optics studies a mathematical line, but *qua* physical.

12. Since nature includes two elements, form and matter, we must study it as if we were studying snubness ; such things are neither

independent of matter nor entirely constituted by matter. There being two natures, which will the physicist study? Or will he study the compound of both? If so, he will study each of the two. Are the two the objects of the same science, or of different sciences?

18. (1) If we look to the ancients, physics would seem to be the study of matter; for only Empedocles and Democritus, and they only to a small extent, touched on form. But if art imitates nature, and the same art studies form and to some extent matter (as the arts in fact do), physics also will study both natures.

27. (2) The end and the means must be studied by the same science; and the nature is the end (for the terminus of a continuous process is also its final cause; hence the poet's absurd remark 'he has the end for which he was born', which is absurd because not every final point but only that which is best is a final cause).

33. Indeed some arts *make* their matter and others make it workable, and we use their matter as existing for our own sake (for we are the end in one of the two senses of 'end').

36. There are two arts that rule and know the matter, the art that uses and that which presides over the making; even the former is in a sense architectonic, but they differ in that the former knows the form, the latter the matter; the steersman knows the form of the rudder, the rudder-maker the wood out of which, and the processes by which, it is to be made. In art *we* make the matter for the sake of the function; in nature it is ready-made.

^b 8. (3) Matter is a relative term; a different form requires a different matter.

9. How far, then, should the physicist know form? To the extent of knowing the final cause of each natural object; he studies things that are separable in respect of form but involve matter; for it takes a man, and the sun as well, to generate a man. That which can exist separately must be left to First Philosophy to study.

C. THE CONDITIONS OF CHANGE.

3. *The essential conditions.*

194^b 16. Since inquiry aims at knowledge, and we know a thing only when we have grasped its proximate cause, we must inquire into the proximate causes of physical change, so that we may refer each particular subject of inquiry to its causes.

23. 'Cause' means (1) constituent material;

26. (2) the form, pattern, or definition, and the generic and other elements in the definition;

29. (3) the proximate originator of change or rest;

32. (4) the end or final cause (of means to an end some are actions, others instruments).

195^a 3. A thing has causes of more than one of these kinds (and this not merely incidentally), and what is the cause of a thing in one sense may be its effect in another; the one may be final and the other efficient cause.

II. That which by its presence causes one thing becomes by its absence the cause of the contrary.

15. All causes fall under these four types. (1) Letters are the cause of syllables, the material is the cause of *artefacta*, the four elements are the cause of bodies, parts the cause of wholes, premisses the cause of the conclusion, in the sense of 'that out of which'.

20. (2) But the essence, whole, synthesis, or form also falls under 'that out of which'.

21. (3) The seed, the doctor, the adviser, and in general the agent fall under the efficient cause.

23. (4) Other things are causes in the sense of final cause; this is the good or the apparent good.

26. Cutting across this classification there are various distinctions: (1) there are particular causes and causes comprehending these (e.g. the cause of health is a doctor, or, more generally stated, a craftsman).

32. (2) There are proper causes and incidental causes, the latter including (a) the subject of that attribute which is the cause proper, (b) classes which include the subject, (c) other attributes of it.

^b 3. (3) Causes whether proper or incidental may be either potential or actual.

6. Of effects also, whether proper or incidental, we may distinguish the particular and the comprehensive.

10. We may state as the cause a complex of the proper with an incidental cause.

12. Thus there are six kinds of cause, (1) the particular cause, (2) the generic, (3) the incidental, (4) the generic incidental, (5) the combination of (1) and (3), (6) the combination of (2) and (4).

16. And any of these may be actual or potential. But while the actual and individual causes exist just so long as the effects do, potential causes are not so limited.

21. We must always seek the most precise cause; e.g. (a) a man builds only because he is a builder, and a builder builds in virtue of the building art, which is therefore the prior cause; (b) generic causes must be stated for generic effects, particular causes for particular effects; and (c) potential causes for potential effects, actual causes for actual effects.

4. *The opinions of others about chance and spontaneity.*

195^b 31. Many things are said to be and to happen owing to chance and spontaneity; we must ask (1) where chance and spontaneity fall among the four causes, (2) whether chance and spontaneity are the same, (3) what they are.

36. (a) Some people doubt if these things exist; they say there is a determinate cause of everything that is ascribed to chance or spontaneity;

196^a 7. and add that if chance existed, it would be odd that the early thinkers in accounting for generation and destruction ascribed nothing to chance.

II. But their procedure was surprising; for there are many things which all men ascribe to chance, though they know they can be ascribed to a definite cause; so that the early thinkers should have said something about chance.

17. Nor can it be said that they identified chance with one of the determinate causes, such as Love, Strife, &c.

19. It is odd, whether they did not think chance existed, or thought it existed but ignored it; especially since they sometimes used it, as Empedocles does in describing the movement of air, or the origin of the parts of animals.

24. (b) There are some who ascribe the origin of this world and of all worlds to spontaneity.

28. This is surprising; they ascribe the origin of living things not to chance but to nature, reason, &c., but that of the heavens and of the heavenly bodies to spontaneity and to no determinate cause.

35. If this is so, it demands explanation; their view is especially odd when they might have seen that in the heavens nothing happens by spontaneity, and that much happens by chance in the region where they deny chance.

^b 5. (c) Some, again, think chance is a cause, but obscure to human reasoning as being divine.

5. *Do chance and spontaneity exist? What is chance and what are its characteristics?*

196^b 10. Chance is not the cause either of invariable (or necessary) or of usual events. But there are also unusual events, and these every one ascribes to chance, so that evidently chance and spontaneity exist; for we know that unusual events are chance events and chance events unusual events.

17. Again, of events some serve a purpose (whether they take place as the result of purpose or not), while others do not; so that among unusual events some may serve a purpose. Events that

serve a purpose are those that might proceed from thought or from nature. When such events take place *per accidens*, we ascribe them to chance.

(24. For as some things exist *per se*, others *per accidens*, so some things are causes *per se*, others *per accidens*. The *per se* cause is determinate, the cause *per accidens* indeterminate; for one thing may have an indefinite number of concomitants.)

29. When accidental causation is found in purpose-serving events, we ascribe this to spontaneity and chance (the difference between them will be discussed later);

33. e.g. M would have gone to recover his debt, if he had known, just when N was recovering his loan; but in fact it was an accident that he went, and did so with the result that he recovered his debt; and that although he did not usually or necessarily go to the place; and the result is one that might have been an object of purpose. This being so, we say he went by chance. Chance, then, is an accidental cause in the purposive subdivision of end-attaining events. Hence it is concerned with the same class of events as thought is.

197^a 8. The causes from which a chance event may happen are indeterminate. Hence it is thought (1) that chance belongs to the indeterminate, (2) that it is inscrutable to man, (3) that nothing can happen by chance. All of these opinions may be justified.

12. (3) No doubt things happen by chance in the sense that chance is an accidental cause; but in the proper sense chance causes nothing; a chance result always has its own proper cause.

18. (2) Chance is rightly said to be incalculable; calculation is of that which is always or usually, while chance is found in the realm of the unusual.

20. (1) Since accidental causes are indeterminate, so is chance. Yet not completely indeterminate; some accidental causes are less remote than others.

25. Chance is called good when something good results, evil when something evil. When a great good results or a great evil is just missed, that is good fortune; evil fortune is the reverse of this.

30. (4) Chance, and therefore good fortune, is rightly called insecure; for no chance event can be invariable or usual.

32. Both chance and spontaneity, then, are accidental causes, in the realm of such unusual events as might take place for the sake of an end.

6. *Distinction between chance and spontaneity, and between both and the essential conditions of change.*

197^a 36. Spontaneity is wider than chance. For chance events can happen only to beings capable of having good fortune, and, in

general, of acting ; as is indicated by the fact that good fortune is thought to be almost if not quite the same as 'doing well', which is a kind of action.

^b 6. Hence no lifeless thing or lower animal or child can *act* by chance, because it has not purpose ; nor can such beings have good or bad fortune except in a merely analogous sense. They can *be acted on* by chance only when the agent who acts on them acts by chance.

13. But the lower animals and many lifeless things can act *spontaneously*. Thus spontaneity is found in the case of end-attaining events in general, when some such event takes place not with a view to the result that actually follows ; chance is found when a purpose-serving result happens spontaneously to a being that has purpose.

22. That this is the nature of spontaneity (*τὸ αὐτόματον*) is shown by the fact that the word *μάτην* is used when an act aimed at an end fails to attain its end.

29. Thus, in accordance with the derivation of the word, spontaneity means the case in which an action in its own proper nature takes place in vain, the result being one that might have been but was not intended.

32. Spontaneity is most clearly distinguished from chance in events that happen by nature but contrary to nature. Yet this is different from spontaneity proper, since in it the cause is internal to the agent, while in spontaneity proper it is external.

198^a 1. Both spontaneity and chance fall under the efficient cause, the cause at work being something that acts by nature or as a result of thought ; but the number of these is indeterminate.

5. Since spontaneity and chance are names for the accidental causation by reason or nature of results which they might cause properly, and nothing accidental is prior to what is *per se*, the accidental cause is not prior to the cause *per se*. Spontaneity and chance are therefore posterior to reason and nature ; so that even if spontaneity is the cause of the heavens, reason and nature are prior causes of the universe and of many things in it.

D. EXPLANATION IN NATURAL PHILOSOPHY.

7. *The physicist should explain by means of all the four conditions of change.*

198^a 14. Clearly there are causes, and the number of their kinds is that which we have stated ; for the question 'why?' is answered by referring (1) to the essence, when we are dealing with unchangeable things (e.g. in mathematics, where explanation rests in the last

resort on definitions), or (2) to the first mover, or (3) to the end, or (4), when we are explaining generation, to the matter.

21. The physicist must explain by reference to all four causes.

24. Form, mover, and end often coincide; for essence and end are one, and the first mover is one in species with these, in the case of all things that move by being moved (and those that do not are no concern of physics, since they move without being susceptible of movement; hence there are three studies, concerned with the unmoved, with the moved but indestructible, and with the destructible).

31. Thus the question 'why?' is answered by reference to the matter, the essence, and the first mover. In considering generation, people are usually interested only in the sequence of events, and in determining the proximate agent and the proximate patient. But there are two kinds of originators of natural movement, one of which is not itself natural, having no tendency to movement in itself; and this includes (1) the completely unchangeable, which is first of all things, and (2) the essence or shape, which is at the same time the end.

^b4. Thus since nature acts for an end, we must know this cause as well, and explain by reference to all four causes. We must point out (1) that from this, that necessarily follows, either always or usually; (2) that if this is to be produced, these materials must be present; (3) that this was the essence of the thing; (4) that it is better so (not absolutely, but with reference to the nature of the particular thing).

8. *Does nature act for an end?*

198^b 10. We must (A) justify our assumption that nature works for an end, and (B) state in what way necessity is involved in natural phenomena; for physicists for the most part explain events as following necessarily from what precedes, making little use of any other cause they may mention, such as love and strife, or reason.

16. (A) Zeus does not send rain to make the corn grow; rain follows by necessity from the pre-existing conditions, and the corn's growing is the necessary result.

23. May not the bodily parts (e.g. the teeth) be similarly produced by necessity, and their fitness for their functions be an undesigned result? Then the creatures in whom everything came about as though for an end survived, and those in which this was not so perished and perish.

32. But this reasoning is not satisfactory. For (1) (a) teeth and all the natural parts come about either always or usually in a certain

way, but chance or spontaneous events never do (rain in winter is not a product of chance, but only rain in the dog-days).

199^a 3. (b) So if these things must be the result either of coincidence or of purpose, and cannot be the former, they must be the latter.

5. (c) But all such things are admittedly natural; so there is purposiveness in what happens and is by nature.

8. (2) Where there is a terminus to a course of action, the earlier stages are for the sake of the terminus. Now the course of nature corresponds to the course of action. Therefore the course of nature also is for an end. If a house were a natural object, it would be constructed as it in fact is by art; and if natural objects were produced by art as well, they would be produced as they are by nature. Nature, therefore, like art, is purposive.

15. Art partly completes and partly imitates the work of nature; therefore if art is purposive, so is nature; for the later stages are related similarly to the earlier in art and in nature.

20. (3) The purposiveness of nature is most manifest in the lower animals, such as spiders and ants, which without art, inquiry, or deliberation do things which look like the work of reason. Tracing this tendency downwards, we find adaptation to ends even in the growth of plants. Evidently, then, a final cause is at work in nature.

30. And of the two elements in nature, matter and form, the latter is the final cause.

33. (4) Art has its failures, where it endeavours after an end but fails to reach it. Similarly monsters (including Empedocles' monsters of the prime) are failures in the purposiveness of nature, due to corruption of some principle in them.

^b7. (5) Empedocles ought to have recognized that there must have been seeds before there were animals; the 'undifferentiated' that came first was seed.

9. (6) There is adaptation even in plants, though less distinct; would he say that there had been monstrous combinations in the plant world as in the animal?

13. (7) On his principles, seeds ought to grow into anything at random; but in fact from a certain kind of seed a certain kind of animal proceeds, unless there is something that hinders it.

18. No doubt end-like results may be produced by chance, but when such results follow always or usually, that is not chance; and in nature they do so follow.

26. (8) It is absurd to deny purposiveness because of the absence of deliberation. Art does not deliberate; and art differs from nature only in that the motive principle is not in the thing moved. When it happens to be so, as when a physician heals himself, we get some-

thing just like nature. So if there is purposiveness in art, there is purposiveness in nature. Nature then is a cause, and one that works towards an end.

9. *The sense in which necessity is present in natural things.*

199^b 34. (B) Is it necessity based on an hypothesis or absolute necessity that is found in nature? People think there is the kind of necessity there would be if a wall had to have the structure it has because the heavy materials sank and the light materials rose. But, in fact, while a wall could not exist without these materials, it exists not because of them but to serve a purpose.

200^a 7. Similarly, wherever there is a final cause, the thing cannot exist without materials, which must be of a certain kind; but it exists for a purpose. Thus the necessity is hypothetical; it is not the necessity of a necessitated result; for it is the matter that is necessitated, while the end belongs to the element of form.

15. The operation of necessity in natural generation is similar to its operation in mathematics. In mathematics the first principles necessitate the conclusions, but not *vice versa*. In the coming of things into being, on the other hand, the end necessitates the beginning.

22. Indeed the end itself is a beginning—not of the action but of the reasoning that leads to it (just as in mathematics the first principle is a beginning of *reasoning*, since there is no *action* there). If there is to be a house, there must be certain materials; but the end does not exist because of these, though it would not exist if they did not, as in mathematics the first principles would not be true if the conclusions were not.

30. Thus what is necessitated in natural things is the matter and the changes in it. The physicist must study both causes, but especially the final cause, which is the cause of the matter and not *vice versa*. In nature, as in art, the necessitation starts from the definition. Since a house is such and such a thing, such and such materials must be used; since a man is such and such a thing, he must be made of such and such materials.

^b4. But presumably even in the definition there is an element that is necessitated. If we define the function of a saw as being to divide in a certain way, it must have teeth of a certain kind, and these must be of iron. Even in the definition there are certain parts which are its quasi-material element.

BOOK III

A. CHANGE.

1. *The nature of change.*

200^b 12. Two reasons why the topics of books iii and iv must be studied by the physicist. (1) He must study change because nature is just a principle of change. He must study the infinite because change is continuous and it is in the continuous that infinity is most evident. He must study place, the void, and time because change is thought to involve these.

22. (2) Because of their universality these things must be studied before we come to more particular subjects of inquiry.

25. We begin with change, and note that (a) the things in any category are divided into those that exist only actually and those that exist both potentially and actually;

28. (b) of relative terms, some are related by way of excess and defect, others as respectively active and passive;

32. (c) there is no such thing as change in the abstract; change is always in respect either of substance or of quantity or of quality or of place;

201^a 3. (d) within each of these categories contraries are found—in substance form and privation, in quality (e.g.) white and black, in quantity complete and incomplete, in place (e.g.) above and below. Any such pair of contraries may form the termini of change.

9. Change may now be defined as the actualization of the potential as such; alteration is the actualization of that which can be altered, growth and diminution of that which can grow or diminish, generation and destruction of that which can be generated or destroyed, locomotion of that which can be moved in space.

15. The accuracy of our definition can be seen by studying typical changes such as being built, learning, healing, &c.

19. Since some self-identical things may be said to be both potentially and actually (only not to be potentially and actually the same thing at the same time), such things can act on, and be acted on by, each other. Thus that which moves in a physical way can be moved, and in fact moves by being moved. But we must not assume as some do that everything that moves moves thus; we shall find that there is an unmoved mover.

27. In our definition the words 'as such' are important. Change is not the actualization of anything in respect of its own specific character—e.g. of bronze as bronze—but of things *qua* changeable.

It is the actualization, not of the capacity of being a statue, but of the capacity of being made into a statue.

34. The presence of different capacities in the same thing may be seen in such a case as that of health and disease. The capacity of being well is different from that of being ill (if it were not, being well and being ill would be the same thing), yet they may be present in the same subject.

^b5. The truth of our definition may be seen, once more, by considering the case of that which is capable of being made into a house. The actualization of this must be either a house or the process of building. But the house cannot be the actualization of the buildable, since when the house exists the buildable has ceased to exist; therefore it must be the process of building that is the actualization of it *qua* buildable. Now building is a change. And generalizing we may say that the actualization of the potential as such is always a change.

2. *The definition of change confirmed.*

201^b 16. The correctness of our definition of change is confirmed (1) by the failure of other attempts and (2) by the impossibility of finding any better definition.

18. (2) Change cannot be placed in any genus other than that in which we have placed it. (1) Change has been defined as otherness, inequality, or not-being. But what is other, unequal, or non-existent neither necessarily suffers change nor is a terminus of change, any more than its opposite does or is.

24. The popularity of such definitions is due to the facts that change is thought to be something indefinite and that otherness, inequality, and not-being have the indefiniteness that all privative terms have.

27. The apparent indefiniteness of change is due to the fact that it cannot be identified either with potentiality or with actuality, since it is not true that either that which can be (e.g.) of a particular size or that which is actually of it necessarily changes to that size, and since change seems to be a sort of incomplete actualization.

32. The 'incompleteness' of change is due to the fact that the potential, of which it is the actualization, is itself necessarily incomplete.

33. This is why change is difficult to define; it cannot be identified simply either with privation or with potentiality or with actuality, but only with the actualization of the potential. /

202^a 3. A mover that is capable of being moved, whose previous lack of movement is not the mere negation of movement but is rest, i.e. the absence of movement in something that can be moved,—

such a mover is always, in causing movement, itself moved. For it moves by contact, and in touching another it is touched, and therefore moved, by it.

9. A mover always has a definite characteristic, e.g. a substantial nature, a quality, or a size, by virtue of which it moves something else. Its moving of what it moves consists in imprinting on it in actuality this characteristic which the moved previously had only in potentiality.

3. *The mover and the moved.*

202^a 13. Our definition of change enables us to answer the question what change is present in, by saying that it is in that which is changeable, since it is the actualization of this by the movent. Change is at the same time the actualization of the movent. For *its* potentiality is a potentiality of actualizing the potentiality of the moved. Thus the one change is the actualization of both movent and moved, as the same interval is the interval between one and two and between two and one. It is a case of there being one thing definable in two ways.

21. Yet, since there are two namable *ἐνέργειαι*, the activity of the agent and the passivity of the patient, we may ask what these are in. Are both in the patient, or is the activity in the agent and the passivity in the patient?

28. (1) If the latter, movement must be in the mover, since the same account applies to mover and moved as to agent and patient. Thus either every mover will be moved or something that has movement in it will yet not be moved.

31. (2) If the former, the following difficulties apparently arise: (a) the actualization of each thing will not be in that thing.

34. (b) It is absurd that the moved, in moving towards a single condition, should be undergoing two movements at once. The actualization of the mover and of the moved must, then, be a single actualization. But how can two specifically different things have the same actualization?

^b2. (c) If the activity and the passivity are the same, the teacher must always be learning and the agent always being acted on.

5. These difficulties are not so serious as might appear. (a) It is not absurd that the actualization of one thing should be in another; teaching is the actualization of that which can teach, but the actualization of it in that which can learn.

8. (b) It is not absurd that the actualization of two things should be the same, provided this is taken to mean 'the same in substratum', not 'the same in essence'.

10. (c) Even if to act and to be acted on are the same, not in

definition but in substratum, it does not follow that the teacher must always be learning. It is not things that are the same in any sense, but things whose essence is the same, that must have all their attributes the same.

16. (*d*) Even if teaching is the same as learning, it does not follow that to teach is the same as to learn, just as, if the distance between two things is a single thing, it does not follow that to stretch from here to there and to stretch from there to here are the same.

19. (*e*) Strictly it is not true that activity is the same as passivity, but only that the movement which is describable as both is one and the same; to be the actualization of this in that and to be the actualization of that by this are things that have different definitions.

23. We have now stated the general nature of change, and it is easy to apply this to the kinds of change; e.g. alteration will be the actualization of the alterable as such, or (more plainly) the actualization of that which is potentially active and of that which is potentially passive, as such.

B. THE INFINITE.

4. *Opinions of the early philosophers.*

202^b 30. Since the study of nature is concerned with magnitudes, change, and time, each of which must be either infinite or finite (even if there are other things that are neither), we must examine whether the infinite exists, and if so, what it is.

36. The appropriateness of this discussion to physics is seen from the fact that all considerable physicists treat the infinite as a first principle.

203^a 4. (1) Some of these do not treat infinity as an attribute of something else but make the infinite itself a substance; but of these the Pythagoreans treat it as present in sensible things, and also describe what is outside the heavens as infinite, while Plato recognizes nothing outside the heavens, but makes the infinite a constituent both of sensible things and of Ideas;

10. and the Pythagoreans identify the infinite with the even (which, being a constituent in things and being limited by the odd, imparts to things their infinity), while Plato recognizes two infinities, the great and the small.

16. (2) The natural philosophers proper assign to the infinite element an underlying nature other than infinity (e.g. water, &c.). None of those who recognize a finite number of elements makes them infinite in extent; those who make them infinite in number,

as Anaxagoras and Democritus do, describe the infinite as continuous by contact.

23. Anaxagoras makes each part a mixture just as the whole is a mixture, because he sees everything coming out of everything. This is why he says all things were together. The separation of the various kinds of thing had a beginning, and this beginning was a single thing, such as what he calls reason, which must have had a beginning of its thinking and consequent action, so that before it began to act all things must have been together.

33. Democritus describes none of his primary entities as coming into being out of another; but, for him, the universal bodily substance, whose parts differ only in size and shape, is the principle of all things.

^b 3. It is reasonable enough in these thinkers to describe the infinite as a principle. For (1) it cannot exist to *no* purpose, and it can have no function except as a principle. For everything is either a principle or derived from one, and the infinite cannot be derived from one, since then it would have a limit.

7. (2) Its being ungenerated and imperishable points to its being a principle; for there is a limit to all generation and destruction. This is why the infinite has no beginning but is itself thought to be the beginning of all other things and to contain and govern them, and to be what is divine.

Main arguments for belief in the infinite.

15. Belief in the infinite is derived from five sources: (1) from the infinity of time, (2) from the divisibility of magnitudes, (3) from the fact that the perpetuity of generation and destruction can be maintained only if there is an infinite source to draw upon, (4) from the fact that the limited is always limited by something else;

22. but above all, the infinity of number, of magnitudes, and of what is outside the heavens is inferred (5) from the fact that there is no limit to our power of thinking of them; while the infinity of what is outside the heavens leads to belief in infinite body and in an infinite number of worlds. For why should there be body in one part of the void rather than in another? Further, if there is infinite void and place, there must be infinite body, since in eternal things there is no difference between being possible and existing.

30. There are, however, difficulties both in denying and in asserting the existence of the infinite. Further, is (1) the infinite a substance, or is (2) infinity an essential attribute of something else, or is (3) something *per accidens* infinite in extent or number? The problem

most pertinent for the physicist is, whether there is an infinite sensible magnitude.

204^a 2. We must first distinguish the senses of 'infinite': (1) that whose nature forbids its being traversed, (2) that which admits of incomplete or (3) difficult traversal, or (4) which, though of such a nature as to be traversable, yet does not admit of it. Again what is infinite is so in respect of addition, of division, or of both.

5. *Criticism of the Pythagorean and Platonic belief in a separately existing infinite.*

204^a 8. (1) The infinite cannot exist apart from sensible things as something that is infinite and nothing else. For if it is neither a magnitude nor a plurality nor an attribute of any kind, but its substantial nature is just to be infinite, it must be indivisible, but if it is indivisible it cannot be infinite except in the sense that it is not finite; which is not the sense we are interested in.

(14. If on the other hand infinity is an attribute of something else, the infinite cannot be, as infinite, an ultimate element of reality.)

17. (2) There cannot be an infinite which is nothing else, unless there are similarly a number and a magnitude that are nothing else. For infinity is an attribute of number and magnitude, and an attribute of an attribute is even less capable of independent existence than an attribute.

20. (3) If the infinite existed as a substance, then if it were divisible every part of it would be infinite (since if it is a substance, not an attribute, it must be infinite through and through). Therefore it is either (i) indivisible or (ii) divisible into infinites.

25. But (ii) the same thing cannot be many infinites. Therefore (i) it must be indivisible. But what is actually infinite cannot be this, since it must be a quantum. Therefore infinity must be an attribute of something else, and then not it, but (if anything) that of which it is an attribute, will be a first principle.

32. Thus the Pythagoreans must be wrong in making it at the same time a substance and divisible.

There is no infinite sensible body.

34. But this inquiry, whether infinity can exist among mathematical objects and among intelligible and non-extended things, is a more general inquiry than that on which we are bent, viz. whether there is among sensible things a body infinite in extension.

^b4. (A) On the face of it such a thing would seem impossible, since body is defined as that which is limited by a surface. On this

showing there cannot be an infinite body either intelligible or sensible; nor, for that matter, can there be an infinite number since number (or that which has number) is that which can be numbered.

10. (B) Passing to more concrete arguments, (1) the supposed infinite body must be either complex or simple. Now (a) it cannot be complex, if the elements are finite in number; for there must be more than one element, and (i) one element cannot be infinite and another finite; for even if the finite element exceeds the other in power, still, if it exceeds it by a limited amount, the infinite element will by its size destroy the other.

19. And (ii) each element cannot be infinite, since what is infinite is infinite in all directions.

22. (b) Nor can the infinite body be simple, either (i) as something other than the elements, out of which they are derived, or (ii) in general. (i) This view was adopted because it was thought that if one of the elements were infinite, it would destroy its contrary.

29. It is refuted by the fact that no such body other than air, fire, earth, and water is ever observed.

35. (ii) Nor can the infinite be fire or any other element; for it is impossible for the universe, even if it be finite, to be or become identical with one of the elements; as it is impossible for it to be or become identical with the One apart from the elements which is posited by the physicists; in fact everything comes out of its *contrary*.

205^a 7. (2) The impossibility of an infinite sensible body may be seen also from the following considerations: Every kind of sensible body has a place where it tends to be, and this is the same for a part as for the whole. Thus (a) if the infinite body is homogeneous, every part will be either immovable or always in movement, yet both are impossible; for in the infinite place proper to the infinite body why should it move or rest in any direction rather than in another?

19. (b) If the whole is not homogeneous, the proper places of its parts will be unlike. Then (i) the body of the whole will be one only by contact. (ii) The parts will be either finite or infinite in variety of kind. (a) Finite they cannot be, for then if the whole is to be infinite some parts must be infinite and others not, and the infinite will be death to the finite.

29. (β) If they are infinite and simple, their places will be infinite in number, and so will the elements be. But the possible places are limited in number, and so must the whole be. For a body and its place must fit each other; the place must not be greater than what will hold the body, nor the body greater than the place; for then there would be either a void, or a body with no proper place.

25. This is why the physicists identify the one infinite body not with fire or earth, but with water or air or their intermediate; that is because the place of the latter is indeterminate in respect of up and down.

^b1. Anaxagoras has an absurd argument about the stationariness of the infinite body. He says it steadies itself because it is in itself (since there is nothing else surrounding it), on the ground that where a thing is, there it is its nature to be.

5. But (1) a thing may be where it is, under compulsion. (2) However much the whole is stationary (since that which is steadied by itself must be stationary), it is still a question why it is not its nature to be moved. It is not enough to leave the matter as Anaxagoras has left it; the infinite might be stationary because it has nowhere to move to, and yet its nature might be to move.

10. The earth does not move, and would not do so if it were infinite, provided it were prevented by the centre of the universe; but it would rest, not because there is nowhere for it to move to but because it is its nature to rest at the centre. Yet it might be said to steady itself.

14. If, then, the earth (if supposed infinite) would rest where it does, not for the alleged reason, but because it has weight and what is heavy rests at the centre, similarly the infinite body will rest in itself not because it is infinite and steadies itself, but for some other reason.

18. (3) On that showing every part should be stationary; for the places of the whole and of its parts are similar.

24. In general, there cannot be an infinite body and at the same time proper places for bodies, if any sensible body has either weight or lightness and therefore tends either to or from the centre; for then the infinite must do so too, but neither can the whole of it do either nor can each half of it do one of the two; for how can you divide the infinite into up and down, or extreme and middle?

31. Again, every sensible body is in a place, and the varieties of place are up and down, before and behind, right and left; and these exist not merely in relation to us, but absolutely. But these varieties cannot exist in what is infinite. In general, if there cannot be an infinite place, and if every body is in place, there cannot be an infinite body.

206^a 2. But what is somewhere is in place, and what is in place is somewhere. Just as what is infinite cannot have size since it would have to have a particular size, that being what having size means, so being in place means being somewhere—up or down or in some other of the six directions, each of which has a limit.

7. Clearly then there is no actually existent infinite body.

6. *That the infinite exists and how it exists.*

206^a 9. On the other hand the complete denial of an infinite involves many difficulties. Time will have a beginning and end, there will be magnitudes not divisible into magnitudes, and number will not be unlimited. Clearly then we need an arbitrator between the opposing views; each view must be in some sense true.

14. 'To be' means (1) to exist potentially, (2) to exist actually; what is infinite is infinite by addition or by division. Spatial extension is not infinite in actuality, but is so (a) by division (the belief in indivisible lines is easily refuted); therefore the spatially infinite must exist potentially.

18. We need not suppose that this involves that it will sometime exist actually. 'To be' has more than one meaning; the being of the infinite is analogous to that of a contest, whose being consists in one thing happening after another. Even in such a case the contrast of 'potentially' and 'actually' is found; there 'are' Olympic games both in the sense that the contest may take place and in the sense that it is taking place.

25. The infinite exhibits itself (i) in one way in time and in the generations of mankind, (ii) in another in the division of spatial magnitudes. In general the infinite exists by one thing being taken after another, each being limited but a new one always being available; but in case (ii) what was previously taken persists, while in case (i) each member of the series perishes, but so that the series does not fail.

^b 3. (b) The infinite in respect of addition is in a sense the same thing as the infinite in respect of division; for where division is going on indefinitely, the part first marked off is being indefinitely added to. For if in a finite magnitude you take a determinate part and add to it in a constant ratio less than 1 : 1, you will never exhaust the finite whole (though if you increase the ratio to 1 : 1 you will exhaust the whole).

12. The infinite exists in no other way, but does exist (1) in the way described, potentially and by way of exhaustion, though it also exists actually, in the sense in which we say a day exists actually; and its potential existence is akin to that of matter; it has no independent existence as the finite has.

16. There is also (2) potentially an additive infinite, in the way which we describe as being in some sense identical with the way of division; you may always take something beyond what you have taken, but not so as to exceed any and every magnitude, as in division you can get something smaller than any assigned magnitude. You cannot even potentially get beyond every assigned magnitude by way of

addition, unless there is a body which is actually infinite, as the physicists suppose there is. If there cannot be such a sensible body, an additive infinite exists only in the way we have stated.

27. Plato said there were two infinities for this reason, viz. that it is possible to proceed without limit both by way of increase and by way of diminution. But though he posits two infinities he does not use them; for in numbers there is for him no infinitesimal (for the unit is a minimum), and no infinite (for he makes ten the maximum).

What the infinite is.

33. The characteristic of the infinite is the opposite of that usually assigned to it. It is not that which there is nothing beyond, but that of which some part is always beyond. This is illustrated by the bezel-less rings which people call endless; but these are not strictly infinite, because though you can always find some part beyond what you have got to, the same part does duty over and over again.

207^a 7. The infinite is that of which some part is always beyond; that of which there is nothing beyond is complete and whole. 'Complete' and 'whole' mean very much the same thing; they involve the presence of a limit.

15. Hence Parmenides spoke more correctly than Melissus; the former says the whole is limited, while the latter calls the infinite 'whole', thus joining incompatibles; for the dignity ascribed to the infinite, its containing everything, is ascribed to it just by virtue of its partial similarity to a whole.

21. The infinite element in the completeness of magnitude is matter, that which is potentially though not actually a whole; divisible indefinitely (which involves an inverse indefinite addition), and a whole and finite not *per se* but *per aliud*; and *qua* infinite it does not contain but is contained.

25. Hence *qua* infinite it is unknowable; for matter is formless. Thus the infinite is of the nature of a part rather than a whole; for matter is only a part of the whole thing; for if it contained in the sensible realm, in the intelligible realm the great and small should contain the intelligibles. It is absurd to make the unknowable and infinite that which contains and limits.

7. *The various kinds of infinite.*

207^a 33. The fact that there is not a spatial extension greater than any that can be assigned, while there is one less than any that can be assigned, follows naturally from the fact that it is the nature of the infinite to be bounded by the formal element.

^b 1. The contrast between number, which has a minimum but no maximum, and extension, which has a maximum but no minimum, is only natural. Number is number of units and finds its minimum in the unit, whose nature is to be indivisible; while the possibility of an indefinite series of subdivisions of extension involves that there is no maximum of number. The infinity of number, being thus secured by the possibility of division without limit, exists itself only in potentiality; it lies in the fact that a number can be found greater than any assigned number. Infinite number has no separate existence; the infinity of number is something that is always coming into being but never persists, any more than time does.

15. With spatial extension it is otherwise; what is continuous can be divided without limit, but there is no infinite in the direction of increase. For there cannot be a potential extension greater than the greatest possible actual extension, so that if there were a potential spatial infinite, there would have to be actually something greater than the sensible universe, which there is not.

21. The infinite in extension, movement, and time is not one single thing; movement is infinite because the extension it covers is infinite; and time is so because the movement that occupies it is so. We use these conceptions of infinity of movement and time meanwhile, but will explain them later, as well as why every extension is divisible into extensions.

27. Our account does not rob mathematicians of their science, by denying an actual inexhaustible infinite; they do not need this nor use it, but only demand that there may be a finite line as large as they wish. Now any magnitude may be divided in the same ratio as the largest magnitude. Thus for the purpose of proof it will make no difference to them whether an infinite exists among existing magnitudes.

Which of the four causes the infinite is to be referred to.

34. In the fourfold scheme of causes, the infinite is evidently a material cause; its being is a privation, and its substratum is what is continuous and sensible. All other thinkers as well use it as matter; hence it is absurd of them to make it what contains, not what is contained.

8. Refutation of the arguments for an actual infinite.

208^a 5. Of the arguments for an actual infinite, some have no demonstrative force; others can be met by valid counter-arguments. (1) An actual infinite sensible body is not needed to provide for the continuance of coming to be; for the destruction of one thing may be the generation of another.

11. (2) Contact and limitation are different. Contact is relative to another object, and is an accident of some of the things that are limited; what is limited is not relative to anything else, nor can any and every limited thing be in contact with any and every other.

14. (3) The reliance placed on our thinking is absurd; the excess and defect in question depend on our thinking, not on the object. For any one might suppose any of us to be many times his own size, exaggerating his size indefinitely; but if some one is bigger than we are, it is not because some one thinks so but because it is so, and that some one thinks so is an accident.

20. (4) Time, movement, and thought are infinite without implying the permanence of the successive phases;

21. and (5) magnitude is not infinite either by virtue of its infinite divisibility or by virtue of our magnification of it in thought.

BOOK IV

A. PLACE.

1. *Does place exist?*

208^a 27. The physicist must discuss whether place exists, and if so, how, and what it is; and this for two reasons, (1) because we all believe existing things to be somewhere, and (2) because the fundamental kind of change is locomotion.

32. The discussion is difficult; for (1) the various facts lend support to different theories; and (2) there has been no previous discussion of the problems.

^b1. Various facts seem to prove that place exists. (1) The fact of displacement. Where there is water, there may come to be air, and perhaps later some other body; place then must be something different from the successive bodies that occupy it.

8. (2) The movements of the four elements show that place not only exists but has some influence on things. For each body when not prevented moves to its own place—up, down, &c.

14. Nor can it be replied that these distinctions of place are merely relative to us. For a thing can change its position relative to us, merely by *our* changing our position; but the distinctions of place exist in nature independently of us, 'up' being where fire and light bodies move to, and 'down' where earthy and heavy bodies move to.

22. Further, the difference between absolute and relative position is shown by mathematical bodies; for while they have no absolute place, they have distinctions of position relative to us.

25. (3) Those who maintain the existence of a void are testifying to the existence of place; for the supposed void is just empty place.

27. We may conclude that place is something distinct from bodies, and that all sensible bodies are in place. Hesiod would seem to be on the right lines in making chaos first of all things; this means that there must first be a space for things to be in.

33. If this be right, an extraordinary importance attaches to place, as that which can exist without anything else while other things cannot exist without it.

Doubts about the nature of place.

209^a 2. But if place exists, it is hard to say what it is—whether it is a sort of volume of body or a distinct entity (for we must first try to establish the genus it belongs to). (1) It has three dimensions, which are just those by which every body is delimited; yet place cannot be a body, for then there would be two bodies coinciding.

7. (2) If bodies have places, surfaces and the other limits of bodies will have places, since where planes of water were, planes of air may come to be. But there is no difference between a point and the place of a point, and therefore none between a line, plane, or body and the place of a line, plane, or body.

13. (3) What could we suppose place to be? It cannot, being what it is, be either an element or a compound of elements, either corporeal or incorporeal. For it has extension but no body, and the elements of sensible things are themselves bodies, while out of intelligible elements no extension can be made up.

18. (4) What effect could place produce in things? It cannot serve as matter (for nothing is composed of it), nor as form or definition, nor as end, nor as moving cause.

23. (5) If place is a reality, it will be somewhere. Zeno's problem demands an answer; if everything that is is in place, place must have a place, and so *ad infinitum*.

26. (6) As every body is in a place, in every place there is a body. What then are we to say of things that increase in size? Their place must grow with them, if each thing's place is neither less nor greater than it.

29. Thus we have still to ask not only what place is but whether it exists.

2. Is place matter or form?

209^a 31. A thing's proper place is that in which it is directly present and which it fills; while the common place is that in which

all bodies are because they are either directly in it or in something which is in it.

^b1. If place proper is the direct container of a body, it will be a limit, so that the place of each thing would seem to be its form, by which its magnitude and matter are delimited.

6. On the other hand, in so far as place seems to be the extension of the magnitude of a thing, i.e. what is contained and limited by the form, it seems to be matter or the unlimited; for when the boundary and the properties of a body are taken away, nothing is left but the matter.

11. Hence Plato in the *Timaeus* identifies space and matter, making space identical with the 'participative' (though he gave a different account of the 'participative' in his unwritten lectures). While every one says place exists, he alone says what it is.

17. Clearly then it is hard to say whether place is form or matter, if it is either of them; the question demands the closest attention, and, in particular, form and matter are hard to detect in abstraction from each other.

21. Still, we can see that place is neither of the two. For (1) form and matter cannot be separated from that whose form and matter they are, whereas place can be separated, since two bodies can take each other's places; thus place is neither a part nor a state of a body.

28. (2) In fact place is akin to a vessel (which is a movable place), and a vessel is no part of what it contains. Thus *qua* separable from what it contains, place is not its form; and *qua* containing it, it is not its matter. Besides, apart from that which is anywhere there seems to be always something else outside it.

33. (Plato, by the way, may well be asked why the Forms and numbers are not in place, if the 'participative' is place,—whether the 'participative' be identified with the great and small or with matter.)

210^a 2. Again (3) how could a thing move to its own place if place were matter or form? That which is in no essential relation to movement and has not an above and below cannot be place; it is among things that *have* these that we must look for it.

5. (4) If a thing's place is in the thing (as it must be if it is form or matter of it), place will be in place (for both form and the indeterminate element move with the thing and are where it is).

9. (5) When air is transformed into water, its place is destroyed, since the new body is not in the same place; what is the nature of this destruction?

11. We have now stated the arguments which show that place is something, and the difficulties involved in saying what it is.

3. *Can a thing be in itself, or a place be in a place?*

210^a 14. We next consider the senses in which one thing can be said to be 'in' another. There is (1) the sense in which a physical part is said to be in the whole to which it belongs, (2) that in which a whole is said to be in its parts, (3) that in which a species is said to be in its genus, (4) that in which a genus is said to be in any of its species, or (more generally) in which any element in a species is said to be in the definition of the species, (5) that in which form is said to be in matter, (6) that in which events are said to centre 'in' their primary motive agent, (7) that in which the existence of a thing is said to centre 'in' its final cause. (8) The strictest sense is that in which a thing is said to be in a vessel or in place.

25. (1) Now, can a thing be in itself? The question is ambiguous; it may mean, can a thing be in itself in respect of itself, or, can a thing be in itself in respect of a part of itself? When a whole has one part in another part, the whole may be said to be in itself; for things may have assertions made of them in respect of their parts (e.g. a man may be said to be white because his surface is white). A jar is not in itself, nor is the wine, but the jar of wine is, since contained and container are parts of the same thing.

33. In this sense, though not in the primary sense, a thing may be in itself. The 'in-ness' is indirect, analogous to the sense in which whiteness is in a body because it is in the surface of the body (or knowledge in the soul because it is the rational part of the soul). (The jar and the wine when apart are not parts, but when together are. Thus when and only when they are parts, the whole may be said to be in itself.) I.e. whiteness is in a man because it is in his body, and in his body because it is in its surface, while it is in the surface directly. And here container and contained (surface and whiteness) are different in species.

^b8. Thus an inductive inquiry shows that a thing is never in itself in any of the senses of 'in'; and this may be confirmed by reasoning. For each of the two, container and contained, would have to be both, if a thing can be strictly in itself. Thus, however much one is in the other, the jar contains the wine not *qua* itself wine but in so far as the wine is wine, and the wine is contained in the jar not *qua* itself a jar but in so far as the jar is a jar.

16. Clearly the two are different in essence (for the definitions of container and contained are different). Nor can a thing be in itself *per accidens*; for then two things would be in the same container; the jar will be in itself, if a vessel can be in itself, and that which it holds will also be in it. Clearly then a thing cannot be in itself in the primary sense.

22. (2) Zeno's difficulty, that if place is anything it will be *in* something, is easy to solve; the primary place may be in something else, but not as in its proper place but in the sense in which health is in warm tissues as a state of them, or warmth in the body as an affection of it. The infinite regress is not involved.

27. (3) This much is clear, that since a vessel is no part of its contents, place is neither matter nor form, but something different. For matter and form are parts of that which is in place.

4. *What place is.*

210^b 32. We may learn what place is by studying the attributes it certainly possesses. (1) It contains that whose place it is. (2) It is no part of what it contains. (3) A thing's primary or proper place is neither smaller nor greater than it. (4) It is capable of being left behind by what it contains. (5) All place admits of the distinction of up and down. (6) Every body naturally moves towards and rests in its proper place, i.e. either up or down.

211^a 6. On these facts we must build our theory. We must try to frame it so that (1) the problems will be solved, (2) the properties believed to belong to place will really belong to it, (3) the cause of the difficulties will be laid bare.

12. There would have been no inquiry about place if there had not been locomotion; the main reason why we think even the heavens must be in place is that they are in constant movement. Besides locomotion, motion includes increase and diminution, which means occupation of more or less room.

17. Some things are moved *per se*, others *per accidens*; of the latter, some are capable of being moved *per se* (e.g. the parts of a moving body), others can be moved only through the movement of that in which they are (e.g. whiteness).

23. We say we are in the universe, because we are in the air and it is in the universe; but we are not in the whole of the air; we say we are in the air because we are within its innermost surface (for it is only this that fulfils the condition that a thing's place must be equal in size to the thing). When the container is continuous with the contained, the latter is in the former not as in a place, but as a part in a whole; when the two are merely in contact, the thing is in the innermost surface of the container, which is no part of the contained and is exactly equal to it.

34. When a thing is continuous with its container it moves *with* it; when it is discontinuous, *in* it; no matter whether the container is in motion or not.

^b 5. It is now clear what place is. It must be one of four things:

(1) form, or (2) matter, or (3) an interval between the extremities of the container, or (4), if there is no such interval apart from the extension of the contained body, the extremities of the container themselves.

9. Three of these can be shown not to be place. (1) Since place contains the body, it looks as if it might be the *form*; for the extremities of container and contained coincide. Both are limits, but form is the limit of the thing itself, place the limit of the container.

14. (3) Because the contained and separate body often changes while the container remains, it is thought that there is an *interval*, as something distinct from the changing body. This, however, is not so; one or other of the changing bodies capable of being in contact with the container replaces the outgoing body.

19. If there were an independent, permanent interval, (a) there would be an infinite number of places coinciding (for when water and air replace each other, all the parts will behave in the whole as the whole water does in the vessel). And (b) place would be something that moves. Thus a place would have a place distinct from itself, and there would be many places coinciding.

25. But in fact the place of the part, in which it moves when the whole vessel moves, remains the same; for air and water replace each other in the place in which they are, not in that in which they come to be, which is a part of the place of the whole universe.

29. (2) *Matter* might seem to be place, if one considered the case of a continuous body at rest. For as, in a case of qualitative change, there is something that is white and was black (which is the reason why we affirm the existence of matter), the belief in the existence of place is due to a similar phenomenon, except that we believe in matter because *what* was air is now water, and in place because *where* there was air there is now water. But matter neither is separable from the thing nor contains it, while place is separable and does contain it.

212^a 2. If then place is none of these three things, it must be (4) *the limit of the containing body* at which it is in contact with the contained, i.e. with that which is locally movable.

7. Place is thought to be something hard to grasp (1) because matter and form present themselves along with it, (2) because the displacement of a moving body takes place in a resting container; for it seems that there may be an interval other than the moving bodies. (3) The apparent incorporeality of air contributes to the difficulty; place is thought to be not merely the boundaries of the vessel, but also the interval, which is supposed to be void.

14. But in fact, as a vessel is a movable place, so place is an

immovable vessel. And so when something is in motion in something that is in *motion* (as a boat in a river), the container acts as a vessel rather than as a place. Place insists on being immovable; and so it is the whole river that is the place of the boat, because the whole river is at rest.

20. Thus place is the innermost motionless boundary of the container. And therefore the centre of the universe and the inner surface of the rotating system are held to be in the strictest sense down and up, because the one is always at rest and the other remains coincident with itself.

24. Thus, since the light is what naturally moves up, and the heavy what naturally moves down, the boundary in the direction of the centre of the universe, and the centre itself, are down, and the boundary towards the outermost part of the universe, and the outermost part itself, are up; and therefore place seems to be a sort of surface, vessel, or container. Further, place is coincident with that whose place it is; for limits are coincident with what they limit.

5. *Corollaries.*

212^a 31. Thus while a body surrounded by another is in place, one not so surrounded is not. Hence even if there were water not so surrounded, while its parts could move (being surrounded by each other), the whole in a sense could but in a sense could not. For as a whole the universe does not change its place, but it can move in a circle, since the whole is the place of the parts. Some of its parts move not up and down but in a circle; others move both up and down, viz. those that admit of densification and rarefaction.

^b3. Some things are in place potentially, others actually. Thus when a homogeneous body is continuous, its parts are potentially in place; but when they are separated but in contact, they are actually in place.

7. Again, some things are in place *per se*; i.e. every body movable by way of locomotion or increase is *per se* somewhere; but the universe is not as a whole anywhere, since nothing surrounds it; yet the circle in which it moves forms a place for the parts, which are contiguous with each other.

11. Other things are *per accidens* in place, e.g. the soul; and also the universe, whose parts are all in place, since on the circle one contains another. Thus the outer sphere moves in a circle, yet the universe is not anywhere. For that which is somewhere must have something surrounding it, but there is nothing outside the universe.

17. Therefore all things are in the heavens; but their place is not the heavens but the inner edge of the heavens, which is in contact

with the movable body. Thus while earth is in water, water in air, air in ether, and ether in the heavens, the heavens are in nothing.

22. Our account solves all the problems about place. For (1) place need not increase with that whose place it is; (2) a point need not have a place; (3) there need not be two bodies in the same place; (4) there need not be a bodily interval (for what is between the boundaries of the place is any body that may be there, not an interval in body). (5) Place is somewhere, but not in place but as a limit is in what it limits. For not everything is in place, but only sensible body.

29. (6) Everything naturally moves to its proper place; for what is successive to and in non-compulsory contact with another is akin to it; and if such things form an organic whole they are not affected by each other, but if they are merely in contact they affect each other. And everything naturally rests in its own place; for so does a part in its whole, and that which is in a place is to its place as a part is to its whole, e.g. when one moves a portion of water or air.

213^a 1. Indeed air is so related to water; for water is as it were the matter of air and air an actualization of water, since water is potentially air while it is only in a secondary sense that air is potentially water.

6. Now if the same thing is matter and actuality (for water is both, but the one potentially and the other actually), water will be to air, in a sense, as part to whole. This is why they are in contact; it is organic union when two things become *actually* one. So much for the existence and nature of place.

B. THE VOID.

6. *The views of others about the void.*

213^a 12. The physicist must investigate the existence and nature of the void as he does that of place. Belief and disbelief arise similarly in both cases from the assumptions that are made. For those who maintain the existence of void think of it as a place or vessel which is full when it contains the mass it can contain, and empty when it is deprived of this; void, plenum, and place being the same thing but differently definable.

19. We must begin by stating (1) the arguments for a void, (2) those against it, (3) the common opinions on the subject. (2) Those who try to prove that it does not exist, e.g. Anaxagoras, are refuting not what people mean by the void but what they mistakenly say about it. They show that air is something, by distending wine-skins and proving the resistance of the air, and by catching it in water-siphons.

27. Now what people mean by void is an interval in which there is no *perceptible* body; but thinking that all that is is body they say that that in which there is nothing is void, and therefore that what is in fact full of air is void.

31. Therefore what ought to be proved is not that air is something, but that there is not an interval different from bodies, either separate or actually existent, which breaks the continuity of body as a whole (as the Atomists maintain), or even as something outside the whole of body, the latter being continuous.

^b2. Thus the arguments used against the void do not attack the problem straightforwardly. (1) Those used on the other side do so better. They say (a) that movement in respect of place (i.e. locomotion and increase) could not exist without a void, since a plenum cannot admit anything into itself. They argue that if there can be two bodies in the same place, there is nothing to prevent there being an indefinite number; and that if this is so the smallest body could admit the largest; for many littles make a mickle, and therefore if there can be many equal bodies in the same place, there can also be many unequal bodies.

12. Melissus indeed proved from these premisses that the whole is *immovable*, since its motion would involve a void.

15. (b) They point out that many things are observably compressed, e.g. that a cask will hold the wine it formerly held, along with the skins into which this has been decanted, and they think this shows that a body which is compressed contracts into the voids which exist in it.

18. (c) Every one thinks that increase is made possible by a void; for food is a body, and two bodies cannot be in the same place.

21. (d) They cite the example of ashes, which absorb as much water as the empty vessel did.

22. (e) The Pythagoreans too said there was a void, which the universe breathed in from the infinite breath, and which divides natures, the void being a sort of separation between successive bodies; and this, they said, was found first in the number series, which is divided up by the void. These then are the arguments for and against.

7. What 'void' means.

213^b 30. (3) A study of the meaning of the word 'void' will help us to decide between the two views. People think that void is 'place in which there is nothing'. This is because they think that what is is body, and that while every body is in place, a place in which there is no body is void; so that if in any particular place there is no body, they think there is nothing there.

34. Again, they think every body is tangible, i.e. heavy or light. It follows by syllogism that that in which there is nothing heavy or light is void.

214^a 4. But this last definition (omitting as it does the word 'place') would lead to the conclusion that a *point* is void; which is absurd, since a void must be a *place* in which there is an intermission of tangible matter.

6. At all events, void (*a*) in one sense means 'not full of tangible matter', i.e. of heavy or light matter. On this we might ask whether if the interval had colour or sound in it, they would call it void. Plainly they must say that if it could hold tangible body it is void, and if not not.

11. (*b*) Void means 'that in which there is no "this"', no bodily substance. Hence some (viz. those who define place in the same way) say the void is the matter of body; but this is not right, since matter is not separable from things, whereas they treat the void as separable.

Refutation of the arguments for belief in a void.

16. Since the void must (if there is such a thing) be place deprived of body, and we have defined the sense in which there is and the sense in which there is not such a thing as place, it is plain that in the sense in which some people maintain its existence void does not exist, either separate or inseparable; for void must be not body but an intermission of body. Hence void is thought to be something just because place is, and for the same reasons.

22. For (*a*) locomotion comes to the aid both of those who assert the existence of place as distinct from the bodies that occupy it, and of those who assert the existence of void. They think void is a condition of change as being that in which it occurs; which would be the sort of thing that some maintain place to be.

26. But the existence of change does not involve that of void. (*i*) Change in general does not involve it, for a reason which escaped Melissus; for a plenum can alter qualitatively.

28. And (*ii*) even locomotion does not involve it; for things can make way for each other, though there is no interval separate from the moving bodies. This is plain in the rotation of continuous bodies, e.g. in that of liquids.

32. (*b*) Things may be compressed not into a void within them but by expelling things that are in them (as the contained air is expelled when water is compressed).

11. And (*c*) they may increase not merely by the entrance of something but by qualitative change, as when water turns into air.

3. In general, argument (1c) from increase and argument (1d) from the water poured on ashes get in their own way. For either (i) not any and every part of the body is increased, or (ii) it is increased by what is not body, or (iii) there may be two bodies in the same place (so that they are asking us to solve a difficulty common to every one, and not proving the existence of void), or (iv) the *whole* body must be void, if it is increased everywhere and increased through the existence of void. Similarly with the ashes. Thus the arguments by which the existence of void is proved are easily refuted.

8. *There is no void separate from bodies.*

214^b 12. We continue the argument against a separately existing void. (1) It could not cause the natural upward or downward movement of the simple bodies. What then can be the locomotion of which it is thought to be the cause?

17. (2) If void is place deprived of body, where will a body placed in a void move to? It cannot move into the whole of the void. The argument used against those who believe in a separately existing place applies here too; how will what is placed in a void either move or rest, either in an upward or in a downward direction?

24. (3) In what sense will things be *in* either place or void? When a whole body is placed in a (by hypothesis) separately and permanently existing place, the expected result does not follow; any part of it will not be in place but in the whole.

28. (4) If place has no separate existence, neither has void.

28. Instead of void being necessary if there is to be movement, it is incompatible with movement; for (1) the void contains no differentiae which should cause a thing to move in one direction rather than another.

215^a 1. (2) Natural movement is prior to compulsory, so that if natural bodies have not natural movement, they will not have compulsory. But the void or infinite contains no differentiae to give rise to natural motions; for as there are no differences in nothing, there are none in the void, which is a form of not-being. But natural motions *are* differentiated, so that their directions must be different in nature.

14. (3) Projectiles in fact continue to move when that which propelled them is no longer in contact with them, either by virtue of mutual replacement, or because the air propelled behind them propels them with a movement quicker than their natural movement to their own place. In a void none of these things can happen; a thing can only move as that does which is carried by something else.

19. (4) In a void there is no reason why a thing should stop here rather than there; so that if it moves at all, it will move for ever.

22. (5) Things are supposed to move into a void because it is yielding; but a void is equally yielding everywhere, so that there should be movement in every direction.

24. (6) A body of given weight moves faster or slower, (a) because the medium is different or (b) because the body is heavier or lighter than the body it is compared with.

29. (a) The medium affects the result because it acts as a check when it is moving in the opposite direction, and even when it is at rest; and the denser it is, the more it does this. A will move through B (say, water) in time Γ , and through Δ (a rarer substance, say, air) in a time E which will be to Γ (if $B = \Delta$ in length) as Δ is to B in density.

^b 12. But there is no ratio in which a void stands to a body in density (as zero is in no ratio to a number); and therefore no ratio between movement through a void and through a body; if a thing moves through the rarest medium a certain distance in a certain time, it will move through the void with a speed that transcends any possible ratio even to this speed.

22. Let Z be a void equal in length to B and Δ . If A is to move through it in a time H, less than E, the void will have to bear that ratio to the plenum. But then in a time = H, A will move through the part Θ of Δ .

27. And it will also in that time traverse the whole of any body Z which exceeds air in rarity as E does H in length. For if Z is as much rarer than Δ as E is longer than H, A will traverse it in a time inverse to the speed, i.e. in a time = H. If Z is empty, then, A will traverse it still faster. But it was assumed to traverse it in H. So it will traverse it in an equal time whether it is full or empty, which is impossible. Thus if there is a time in which a thing moves through any part of a void, we shall have the impossible result that it traverses a certain distance whether full or void in equal times; for there will be a body which is to the other body as the time of transit is to the other time of transit.

216^a 8. To sum up, the cause of the resulting impossibility is that while there is a ratio between any two movements (since they are in time, and there is a ratio between any two finite times), there is no ratio of density between a void and a plenum.

12. (b) When we turn to consider the moving bodies, we see that bodies which have a greater downward or upward impulse move, *ceteris paribus*, quicker over an equal distance, and do so in the ratio of the sizes of the moving bodies. They must do so even through a void. But they cannot; for why should one move faster than the other? (In plena it must be so; for the greater divides the medium faster by reason of its force; for things divide a medium by reason

either of their shape, or of their impulse up or down.) Therefore all things will move with equal speed ; but this is impossible.

21. Evidently then the assumption of a void leads to a result opposite to that to secure which a void is postulated. People think there must be a separately existing void if there is to be locomotion ; but this is the same as saying that there is a separately existing place, which we have shown to be impossible.

There is no void occupied by any body.

26. A consideration of the vacuum in itself will also show its vacuity. (1) As, if a cube be placed in water, water equal in volume to the cube will be displaced, so in air ; only the effect is here insensible. In fact any body in which another is inserted must, if it is not compressed, be displaced, upwards or downwards or in both directions according to its constitution. In a void this cannot happen ; but the void must have penetrated the cube to a distance equal to that which this portion of void formerly occupied in the void—just as if the water had gone right through the cube.

^b2. But the cube has just the size of the void it occupies ; and this is different, even if not separable, from all its attributes. Then if it *were* separated from its attributes such as heaviness or lightness, it would occupy that part of place or of the void which is equal to itself. What then will be the difference between the body of the cube and the equal void or place ? And if there are these two coinciding, why should there not be an indefinite number ?

12. (2) The cube will have this same magnitude even if it is displaced. If this does not differ from its place, why must we credit bodies with a place other than their own volume, if the latter be abstracted from its attributes ? An equal interval connected with this adds nothing to it.

20. Therefore there is no separately existing void.

9. *There is no void in bodies.*

216^b 22. Some try to prove the existence of void from that of rarity and density. They argue that compression is impossible without rarity and density, and that if this be so, either (1) change will be impossible, or (2) the universe will bulge, or (3) every change of volume must be balanced by an equal and opposite change of volume, or (4) there must be a void ; compression and expansion being otherwise impossible.

30. Now (a) if by 'rare' they mean 'having many separate voids', clearly if there cannot be a separate void (any more than there can

be a place having extension of its own), neither can there be a rare as they define it.

33. But (b) if they think the void exists in what is rare, though not separately, this is less impossible indeed, but (i) the void will be the condition only of *upward* movement (for what is rare is light),

217^a I. and (ii) the void will be the condition of movement not as its medium; it will move things up as wine-skins do what is fastened to them. But how can there be a movement of the void, or a place—i.e. a void—for it to move into?

5. (iii) How will the downward movement of heavy things be explained?

6. (iv) If, the rarer a thing is, the more it moves up, then if a thing were completely void it would move fastest of all. But surely it cannot move at all; just as all things are immovable in a void, so a void is immovable; for the velocities of a solid and a void are incomparable.

10. We deny the existence of a void, but the other alternatives are stated correctly, viz. that, if there is no compression and rarefaction, either (1) there will be no change, or (2) the universe will bulge, or (3) every change of volume must be balanced by one equal and opposite to it (for it is clear that a greater volume of air is produced out of a smaller volume of water; so that, if there is no compression, either the extremity of the universe must be made to bulge, or there must be an equal and opposite change elsewhere, or no such original change takes place; for when change takes place this result will always be produced unless the movement is circular, which it is not always).

20. On these grounds others infer the existence of a void; but we maintain, on the basis of the principles we have laid down, that there is a single matter for contrary qualities (heat and cold, &c.), and that what actually is comes to be out of what is potentially, and that matter does not exist as separable though its being is different, and that a single matter may serve for colour, heat, and cold.

26. There is also matter capable of greater or smaller bodily extension. When water has been transformed into air, the matter has not become a different body by the addition of anything from outside, but has become actually what it was potentially; and so too in the opposite change.

31. So too if air contracts or expands, the matter which is potentially smaller or larger becomes either the one or the other. For as the same matter from being cold becomes hot, or *vice versa*, so from being hot it becomes hotter, though nothing in the matter has become hot which was not already hot.

^b 2. The case is like that of an arc of a circle which becomes an

arc of a smaller circle (whether it then retains its identity or not); convexity does not come into being in anything that was straight (for difference of curvature does not involve an intermission of curvature). So is the earlier heat related to the later. Similarly the sensible volume is expanded not by the matter's acquiring anything from without, but because it is potentially the matter for both greatness and smallness; so that the very thing that is dense becomes rare.

11. The dense is heavy, the rare light; both the heavy and the hard are dense, both the light and the soft rare, but heaviness and hardness do not go together in lead and iron.

20. It follows from what we have said that there is neither a separately existent void, either absolutely self-existent or present in the rare, nor a potentially existent void—unless one is willing to apply the name generally to the pre-condition of locomotion. At that rate the matter of the heavy and light would be the void; for it is in virtue of this opposition that the dense and the rare condition movement, while in virtue of their hardness and softness they condition change of quality.

27. This then is our account of the senses in which there is and in which there is not a void.

C. TIME.

10. *Doubts about the existence of time.*

217^b 29. Our next subject is time. It is well to inquire first, quite untechnically, whether it exists, and if it does, what its nature is. The following considerations would lead one to suspect that it does not exist, or that its existence is faint and obscure.

33. (1) Part of it has come into being and is no longer, part is about to be and is not yet; and it is of these parts that both infinite time and any particular time are composed. But that which consists of parts that are not cannot have a share in being.

218^a 3. (2) In the case of any divisible thing, either all or some of its parts must exist when it does; now none of the parts of time exist, though it is divisible. The now is not a part; for (a) a part is a measure of the whole, and (b) a whole must consist of its parts.

8. And (3) it is not clear whether the now which divides the past and the future is always the same or always changing. (a) If it is always different, and no two *parts* of time exist together (unless one includes the other), and that which now is not and previously was must have ceased to be, the nows also cannot exist together, but the earlier now must have ceased to be. Now (i) it cannot have ceased-to-be in itself (for then it was), nor (ii) can it have ceased-to-be in

another now. For let us lay it down that nows cannot be next to each other, any more than points. If then it has ceased-to-be not in the next now but in some other, it would exist in the intermediate nows (infinite in number), simultaneous with them, which is impossible.

21. Nor (*b*) can it remain always the same; for (i) no divisible finite thing has but one limit, whether it be continuous in one dimension or in more; but the now is a limit, and we can take a finite time.

25. And (ii) if to be simultaneous in time is to be in the same now, then if both what is earlier and what is later are in one particular now, the events of 10,000 years ago will be simultaneous with those of to-day, and no event will be earlier than any other.

Various opinions about the nature of time.

30. So much for the properties of time; its nature is left as obscure by the traditional views about it as it is by our preliminary discussion. For (*a*) some say it is the movement of the universe, and (*b*) others say it is the sphere itself. But (*a*) (i) even a *part* of the rotation of the heavens is time. (ii) If there were more than one world, on this view the movement of any one of them would be equally time, so that there would be several simultaneous times. (*b*) The sphere of the universe was thought to be time because all things are in both; but this view is too naive to need refutation.

^b9. (*c*) Time is thought, above all, to be a sort of change. But (i) the change of anything is in that thing only, but time is everywhere alike. (ii) Change may be faster or slower; time cannot. For the fast or slow is defined by reference to time, but time is not defined by reference to time, either to its quantity or to its quality. Evidently then time is not change.

11. *What time is. The 'now'.*

218^b 21. Yet time involves change; for when we are conscious of no mental change we do not think time has elapsed, any more than the fabled sleepers in Sardinia do when they awake; they connect the later now with the earlier and make them one.

27. As, if the now had remained the same, time would not have existed, so when its difference is not noted, the interval is not recognized as a lapse of time. If, then, the failure to notice time happens when we do not mark any mental change, and when we mark it we say time has elapsed, time involves change.

219^a 1. Clearly then time is not change but involves it; we must begin our inquiry into its nature by asking what element in change

it is. We perceive change and time together ; for even if we have no sensuous experience, but experience a mental change, we think time has elapsed ; and conversely when we recognize a lapse of time we recognize change to have occurred. Time is therefore either change or some element of change, and since it is not the former it must be the latter.

10. Since what changes changes from something into something, and every magnitude is continuous, change corresponds to magnitude ; change is continuous because magnitude is so, and time is so because change is so ; for the length of the time answers to that of the change. Therefore the local before and after is the primary before and after.

15. In this case it depends on position ; but since it exists in magnitude it must exist in change, and therefore also in time. The before and after in change are identical in substratum with change, but different in essence.

22. But time too we notice when we notice the before and after in change. We do this by judging the *nows* to be different, and to have an intermediate between them ; and it is then that we say time has elapsed ; for time is limited by the *now*.

30. So when we perceive the *now* as one, and not either as occurring before and after in the change, or as the same *now* but as related to a before and an after, we do not recognize a lapse of time, because we do not recognize change to have taken place. But when we notice the before and after, we say there is time ; for time is the number of change in respect of before and after.

^b2. Time is not change, therefore, but that in respect of which change is numerable. This is indicated by the fact that we discriminate the more and the less by number, and more and less movement by time ; so that time is a number. But 'number' may mean either that which is numbered, or that by which we number it ; time is number in the former sense.

9. As change is different from moment to moment, so is time (but all simultaneous time is identical ; for the *now* is then the same individual *now*—though it may be differently defined—and it is the *now* that marks out time in respect of before and after). The *now* is in a sense the same and in a sense not ; *qua* element in this and then in that time, it is different ; but in respect of its substratum it is the same.

15. For change corresponds to magnitude, and time to change ; and the moving body, by which we recognize movement and the before and after in it, to the point. And the moving body is the same individual thing, though different in its definition ; as the sophists distinguish between being Coriscus in the Lyceum and Coriscus in the market-place.

22. The moving body, then, is different in respect of being in

different places; but the now corresponds to the moving body, as time does to movement (for it is by reference to the moving body that we recognize the before and after in movement, and the now exists in so far as the before and after are numerable); so that the now too is the same in respect of its substratum (for it is the before and after in change), but its being is different.

28. And the moving body is the best known of the entities involved; for change is known because of that which changes, and movement because of the moving body, which is an individual thing, while the change is not.

31. Thus in a sense the now is always the same, in a sense not; just as this is true of the moving body.

33. Time and the now imply each other, as do moving body and movement. For time is the number of movement, and the now corresponds to the moving body and is a sort of unit.

220^a 4. Time is made continuous by the now, and divided at the now; in this respect also corresponding to movement, which is made one by the oneness of the moving body,—not by its individual unity but by its unity of definition. For it is the moving body that marks off the earlier movement from the later.

9. Both the now and the moving body in this respect correspond to the point, which both holds together and divides the line, serving as beginning of one part and end of another. But when we take one point as two, a pause is necessary, if the one point is to be both beginning and end; while the now, because of the movement of the moving body, is always different. Thus time is a number not as a self-identical point has a number in respect of its being both beginning and end; it answers rather to the extremes of the line,—not to its parts, both because, to get the parts of a line, we have to use the middle point as two, so that a pause would be necessary, and because the now is evidently *not* a part of time, nor the cross-section of the movement a part of the movement, nor the point a part of the line.

21. Now in so far as the now is a limit, it is not a time but incidental to time; it is a time only in so far as it numbers it; for limits belong only to that which they limit, but a number may be the number of a particular set of horses and also occur elsewhere.

24. Time, then, is the number of movement in respect of before and after; and, being the number of what is continuous, it is itself continuous.

12. *Various attributes of time.*

220^a 27. (1) The smallest number absolutely is 2. A smallest number in a particular context in a sense there is and in a sense

there is not ; e.g. the smallest number of a line in respect of plurality is 2, or 1 ; but in respect of magnitude there is none, since every line is divisible. Similarly with time ; the smallest number in respect of plurality is 1 or 2, but in respect of length there is none.

32. (2) Time *qua* number we speak of as much or little, and *qua* continuous as long or short ; but we do not speak of it as fast or slow, any more than we so describe any number.

^b 5. (3) There is the same time everywhere at once, but not the same time before and after, because the past and the future change are always different from the present. Time is not the number we count with but the number counted, and this is always different before and after, because the *nows* are different. The number of 100 sheep and that of 100 men are the same, but the things numbered are different.

12. As the same movement can be repeated, the same time can (e.g. a year).

14. (4) We measure time by motion as well as motion by time, because they are determined by each other. We speak of much or little time, measuring it by the motion that takes place in it, as we do a number by the unit. For we apprehend the plurality of a group of horses by the number they count up to, and we apprehend this number by using the single horse as a unit. So too we number movement and time by each other.

24. This is only natural ; for movement corresponds to path, and time to movement, because all these are quanta, continuous, and divisible ; movement is so because the path is so, and time is so because movement is so. We also number path by movement and movement by path.

The things that are in time.

32. Since time measures movement, and does so by marking off a movement which will measure the whole movement, and movement's being in time consists in the fact that it and its being are measured by time, this is what being in time is for other things also.

221^a 9. For to be in time is either (1) to be when time is, or (2) to be in time as some things are said to be in number, i.e. (a) as a part, accident, or element in number, or (b) as having a number.

13. Since time is a number, (2 a) the *now*, the *before*, &c., are in time as the unit and the odd and even are in number (i.e. as elements in it), but (2 b) *things* are in time in the sense which corresponds to being numerable ; and if so, they are included by time as numerable things are by number and things in place by place.

19. To be in time is not (1) to be when time is, any more than to

be in movement or in place is to be when movement or place is. For at that rate all things will be in anything, and the heavens will be in a grain. But this is an *accidental* conjunction, while it is *necessary* that for that which is in time there should be time when *it* is, and for that which is in motion that there should be motion when *it* is.

26. Since that which is in time is so in the sense in which that which is numerable is in number, a time may be found greater than anything that is in time; hence everything that is in time must be contained by time; and these things are acted on by time, as we say 'time wears things away', and 'all things are aged by time', and 'we forget things through time', while we do not say that we learn things, or that things become new or beautiful, through time. Time in itself is rather a cause of destruction; for it is the number of movement, and movement removes what is there already.

^b3. Therefore eternal things are not in time; for they are not contained by time nor is their being measured by time; that they are not in time is shown by the fact that they are not acted on by time.

7. Since time is the measure of motion, it is also the measure of rest; for all rest is in time. For that which is in time need not be moved, as that which is in movement must; for time is not motion but the number of motion, and even that which is at rest may be numerable by the number of motion. For not everything that is not in motion is at rest, but that which is capable of motion though deprived of it.

14. For a thing to be in number means that it has a number, and that its being is measured by the number; so that if it is in time it must be measured by time. Time will measure that which is in motion and that which is at rest, *qua* in motion or at rest; for it will measure their motion or rest. Therefore it is not the size of that which is in motion, but the size of its motion, that will be measurable by time. Thus things that are neither in motion nor at rest are not in time; for to be in time is to be measurable by time, and it is of motion and rest that time is the measure.

23. Therefore not everything that is not, is in time; i.e. not the things that cannot be otherwise than non-existent (e.g. the commensurability of the diagonal with the side). For if time is the measure of motion *per se*, and of other things *per accidens*, the being of all the things whose being it measures will consist in resting or moving.

28. Thus things that are perishable and generable, that sometimes are and sometimes are not, must be in time; for there is a time which will extend beyond their being and the time that measures

their being. Of things that are not, (a) those that time includes either were or will be, or both, according to the direction or directions in which time includes them, and (b) those that it does not include in any direction neither were, are, nor will be.

222^a 3. The latter are those non-existent things whose opposites always exist; they are not in time because their opposites are not in time; they always are not, because they are contrary to things that always are. On the other hand those whose contraries do not always exist are capable both of being and of not-being, and are subject to generation and destruction.

13. *Definitions of temporal terms.*

222^a 10. The now is the link of time; for it holds together past and future, and is the common boundary between times (the beginning of one and the end of another); but this is not obvious, as with the point, which is fixed. The now also divides time, potentially.

14. As doing this, it is always different; as connecting, it is always the same; as with mathematical lines, in which the point is not always the same for thought, since in dividing the line we treat the point as two; but in so far as it is one, it is the same in all respects. So too the now is on the one hand potentially a dividing-point of time, and on the other the common boundary and unity of both parts; the dividing and the uniting are the same and in respect of the same thing, but their essence is different.

20. This is one sense of the 'now'; in another it means the time which is *near* the now in the first sense. In this sense 'he will come now' or 'he has come now' because he has come or will come to-day; but the Trojan war or the ultimate flood is not now.

24. 'Sometime' is a time definitely related to the first sense of 'now', i.e. separated from it by a certain time; and if there is no time that is not sometime, every period of time must be finite. Time will not run short, however, since motion is eternal.

30. If we ask whether time is always changing, the question must be answered like the corresponding question about motion. Since the now is an end and a beginning of time, but not of the same time, time is like the circle, which has its convexity and its concavity in the same place. So too time is always at a beginning and at an end, but because the now is not the beginning and the end of the same time, time is always changing; and because it is always at a beginning it will never fail.

^b7. 'Presently' or 'just now' stands for the part of the future or past time that is near the atomic now. 'Lately' stands for the part of the past near the now; 'long ago' for the part far from it.

14. 'Suddenly' is used of that which has departed from its former state in an imperceptible time; but in fact all change makes things depart from their former state. In time all things become and perish; whence some called time the wisest of things, while Paron called it the most foolish, because in it we forget.

19. Time is in itself the cause rather of perishing, and only *per accidens* of becoming; as is shown by the fact that nothing comes into being without movement and action, while things perish even without undergoing change. We call this destruction by time, but strictly even this is only incidental to time.

27. So much for the existence and nature of time, the meanings of 'now', and the meaning of 'sometime', &c.

14. *Further reflections about time.*

222^b 30. It is clear that all change and everything that moves is in time. For all change is found to admit of fastness and slowness; to move relatively fast is to arrive earlier at a given state over an equal distance with a uniform movement; and what is earlier is in time (for earlier and later are relative to the now, which is in time).

(223^a 8. 'Earlier' when used of past time means 'farther from the present', when used of future time means 'nearer the present'.)

13. It follows that all change is in time.

16. It is worth asking (1) how time is related to the soul, (2) why time is present everywhere. The answer to (2) is that time is an attribute of movement, and that earth, sun, and heavens are alike subject to movement (being in place), and that time and movement are coextensive both in potentiality and in actuality.

21. With regard to (1), would there be time if there were no soul? If there could not be something to do the counting there would be nothing that was countable, and therefore there would be no number; for number is either that which has been or that which can be counted. Thus if nothing but soul can count, there cannot without soul be number, but only the substratum of number, i.e. motion.

29. Of what kind of motion is time the number? Of any kind; for all four kinds take place in time. Thus time is the number of each movement *qua* movement, and therefore of continuous motion without qualification, not of any one kind of movement.

^b1. But there may be two simultaneous motions; so that it seems there would be two simultaneous times. No: equal and simultaneous time is self-identical; and even non-simultaneous times may be specifically the same, just as seven dogs and seven horses have the same number.

6. Thus two simultaneous motions have the same time, though

one may be quick and the other slow, or one locomotion and the other alteration. Motions are different and apart, but time is everywhere the same, because the number of equal and simultaneous movements is self-identical.

12. Everything is numbered by means of something homogeneous with it, and therefore time by a finite time, and time is measured by movement and movement by time; if then the primary thing in each genus is the measure of all things in that genus, uniform circular motion is the measure *par excellence*, because the number of it is the best known.

20. There is no uniform alteration, generation, or increase, but there is uniform locomotion. This is why time is thought to be the movement of the celestial sphere; viz. because time is measured by this movement. This too is why human affairs and events generally are said to form a circle; it is because they are all judged by a temporal standard, and have their beginning and end as though conforming to a cycle.

28. Time itself is thought to be a circle, because it measures and is measured by a circular motion; so that to say that events form a circle is to say that there is a circle of time, i.e. that time is measured by a circular motion; for what is measured is nothing more than the measure taken several times over.

224^a 2. It is said rightly that the number of a group of 10 sheep and of a group of 10 dogs is the same number (if it is equal), but not the same 10, as the equilateral and the scalene are the same figure but not the same triangle; for a is the same c as b if it does not differ from b by a differentia of c .

15. So much for time and its properties.

BOOK V

1. *Classification of movements and changes.*

224^a 21. What changes may change (1) *per accidens*; the musical walks because that which happens to be musical walks; (2) in the sense that a part of it changes simply; a body is healed because the eye or chest is healed; but (3) there is something that itself changes directly. This is what is *per se* movable, and it is different for each kind of movement.

30. That which produces movement does so in the three corresponding ways.

34. There is a direct mover, a direct *mobile*, a time in which, something from which, and something to which movement takes

place; the movement is in the *mobile*, not in the form it takes on; for there is a mover and a *mobile* apart from the form, place, or quality moved towards.

^b7. I say 'moved towards', for a change gets its name from that to which, rather than from that from which, it is; destruction is change to not-being, though it is also from being, and generation is change to being, though it is also from not-being.

10. We have defined motion previously. The forms, affections, and places to which things are moved are themselves unmoved. It might be objected that affections such as whiteness are motions, so that there will be change to a motion; but it is not whiteness but whitening that is a motion.

16. In respect of the *termini*, as well as of the mover and the moved, the distinction of *per accidens*, *per partem* or *per aliud*, and *per se* exists; that which is whitening changes *per accidens* to that which is known (for the colour it changes to may happen to be known), and it changes *per partem* to colour because whiteness is a part of colour; but it changes *per se* to white colour.

22. The distinction, then, of movement *per se* from movement *per accidens*, and of movement *per aliud* from movement proper to a thing itself, is plain with regard both to mover and to moved; and it is clear that movement is not in the form but in the moved.

26. Movement *per accidens* we may leave aside; for it may be found as between any two *termini*, at any time, and attaching to any subject; movement *per se* is found only between contraries and intermediates, and between contradictories, as may be shown by induction.

30. Change may take place from an intermediate, because the intermediate serves as contrary to either extreme. It is a sort of contrary to them, and they to it; grey is white compared with black, and black compared with white.

Classification of changes 'per se'.

35. Since all change is from something to something, that which changes might conceivably change in four ways:—(1) from A to B, (2) from A to not-A, (3) from not-A to A, (4) from not-A to not-B.

225^a 7. Thus there are three kinds of change, (1), (2), (3). (4) is no kind of change because the terms are not opposite, being neither contrary nor contradictory.

12. Change (3) is generation, simply or in a particular respect (e.g. change from not-white to white is generation of white, change from not-being to substance is generation simply); change (2) is destruction, simply or in a particular respect.

20. 'Not-being' has several senses; if neither that which refers to the mental act of separation can be moved, nor that which refers to potentiality, i.e. that which is opposed to what simply exists in actuality (for though the not-white may be moved *per accidens*, since it may be a man, that which is simply no particular thing cannot be moved at all), that which is not cannot be moved;

26. and therefore generation cannot be movement; for what is not *is* generated; for however true it is that it is in virtue of a concomitant that what is not comes to be, what comes to be, simply, is truly said not to be.

29. And similarly what is not cannot rest. Besides the difficulties named, there is the further difficulty that everything that is moved is in place but what is not is not in place.

32. Nor is destruction movement; for the contrary of a movement is either a movement or a rest, but the contrary of destruction is generation.

34. Since all movement is change, and there are the three kinds of change we have named, and of these generation and destruction are not movement, only kind (1)—change from A to B—is movement. The termini are either contraries or intermediates (for even a privative term may be taken to be a contrary), and are denoted by positive terms, such as 'naked', &c.

^b 5. If the categories are substance, quality, place, relation, quantity, action or passion, there must be three kinds of movement, in respect of quality, quantity, and place.

2. Classification of movements 'per se'.

225^b 10. (A) In respect of *substance* there is no movement, because substance has no contrary.

11. (B) There is no movement of what is *relative*, because, if one of two things changes, a relative term may cease to be true of the other though the other does not change, so that the movement of the two is *per accidens*.

13. (C) There is no change of *agent and patient*, or of mover and moved, because there is no movement of movement, or generation of generation, or in general change of change. For (1) movement of movement would imply (*a*) that movement was the subject of movement; now movement cannot be warmed, change place, increase, &c., as a man can change from white to black.

21. Or else (*b*) something else would have to change from change to some other state. But this can only happen *per accidens*. For change is change from one state to another (as are generation and destruction, except that the latter are to states opposed in one way, while movement is to states opposed in another way).

27. A thing changes simultaneously, then (it is supposed), from health to disease, and from this change to another. It is clear then that when it has become ill, it will have changed to whatever other change is involved (though *in fact* it may have changed to a state of rest), and to a determinate change, and this will be a change from one definite terminus to another, so that it will be the opposite process of getting well; but this will be *per accidens*, e.g. something changes from remembering to forgetting only because the subject of these changes changes first to a state of knowledge and then to one of ignorance.

33. (2) There will be an infinite regress, if there is to be change of change and becoming of becoming. The former becoming must exist if the later is to exist. E.g. if the simple coming to be was at one time itself coming to be, then at some time that which was coming to be it was itself coming to be, so that that which was coming to be simply did not yet exist, but something which was coming to be coming to be already existed; and this again was sometime coming to be, so that it was not yet coming to be coming to be. Now since of an infinite number of terms none is first, there will be no first, and therefore no successor to it, and coming to be, movement, and change will be impossible.

226^a 6. (3) The subject of contrary movements and of rest, and again that of becoming and perishing, is the same, so that that which comes to be coming to be is perishing when it has come to be coming to be, since it cannot do so before or after.

10. (4) What can that be which becomes movement or coming to be? And what is its *terminus ad quem*? There must be a movement of A from B to C. But how can there be this? The coming to be of learning is not learning, and therefore the coming to be of coming to be cannot be coming to be.

16. (5) Further, both the subject and the *terminus ad quem* of the movement would have to be one of the three kinds of movement, e.g. locomotion would have to be altered or locally moved!

19. To sum up, change cannot change *per se* nor *per partem*, but only *per accidens*; e.g. if a person who was being healed took to running or learning. But we have already eliminated *per accidens* change as irrelevant.

23. It follows that there is only change in respect of quality, quantity, and place, each of which admits of contrariety. Change of quality may be called alteration. I mean by quality not the quality that forms the differentia of a substance, but that in respect of which a thing is called passive or impassive.

29. Change of quantity has no common name, but its kinds are increase and diminution. Change of place may be called transpor-

tation, though strictly only those things are said to be transported which have not the power of stopping themselves or of moving themselves.

^b1. Change to more or less in the same kind is alteration; for change from a contrary or to a contrary may be so either simply or in some respect; for when a thing moves towards a lesser degree, that may be called change to the contrary, and when towards a greater degree, that is change from the contrary to the state itself. It makes no difference whether the change be qualified or simple, except that in the former case the contraries will be present in a qualified form. Greater or less degree is the presence (or absence) of less or more of the contrary quality.

8. Thus there are just three kinds of movement.

The motionless.

10. The motionless is (1) what is completely incapable of movement, (2) what moves with difficulty in a long time or is slow in beginning, (3) that which is qualified to move, but does not move when, where, and as it is qualified to do so. This alone is said to be at rest. For rest is contrary to motion, and is therefore the privation of motion *in that which is capable of it*.

16. So much for the nature of motion and rest, the number of kinds of change, and the question which of them are movements.

3. *The meaning of 'together', 'apart', 'touching', 'intermediate', 'successive', 'contiguous', 'continuous'.*

226^b 18. Those things are 'together in place' which are in one proximate place; those are 'apart' that are in different proximate places; those things are 'in contact' whose extremities are together.

227^a 7. Since all change is between opposites, and opposites are either contraries or contradictories, and contradictories have no intermediate, what is between is between contraries.

226^b 26. 'Between' involves at least three terms; for the *terminus ad quem* of change is the contrary of the *terminus a quo*, and what is between is that at which what is changing continuously arrives before it arrives at the *terminus ad quem*.

27. That changes continuously which passes over the distance covered, with little or no intermission (the presence or absence of a *temporal* interval being irrelevant). This is seen both in locomotion and in other changes.

32. That is 'contrary in place' which is the greatest distance

apart in a *straight* line; for the shortest line is something definite, and it is that which is definite that serves as a measure.

34. That is 'in succession' which, being after the *terminus a quo* in respect of position or specific character or in some other way, has nothing of the same kind between it and what it is in succession to (e.g. that two lines may be in succession there must be no *line* between them, though there may be something of another kind). For what is in succession must be in succession to, and after, something; 1 is not in succession to 2 but 2 to 1.

227^a 6. That is 'contiguous' which, being in succession, is also in contact. The 'continuous' is a species of the contiguous; two things are continuous when the limits of each become identical and are held together. This is impossible when the limits are distinct. Continuity, then, exists in things out of which in virtue of their mutual contact a unity is produced. The unity of the whole will be of a kind corresponding to the unity of that which holds the parts together, whether they are held together by being nailed, by being glued, by contact, or by organic union.

17. The successive comes first of these three terms; for that which is in contact must be successive, but not *vice versa* (hence succession can be found in more abstract entities, such as numbers, in which contact is not found), and what is continuous must be in contact, but not *vice versa* (for extremities that are together need not be identical, but those that are identical must be together).

23. Therefore organic union is latest in the order of becoming; for the extremities must touch if the things are to be organically united, but not *vice versa*.

27. Thus if there are separately existent points and units, as some maintain, they are not the same; points have contact, units have succession; points can have an intermediate (for every line is between points), units need not have one, any more than there is one between 1 and 2.

32. So much for the definitions of these characteristics, and the kinds of things to which they belong.

4. *The unity and diversity of movements.*

227^b 3. A movement may be one in several senses. (1) Movements are generally one if they are in respect of the same category, e.g. one locomotion and another. (2) They are specifically one if they are also along a path identical in species. There are differences of colour; hence growing black and growing white are specifically different: there are no differences of whiteness; hence all growing white is specifically one.

II. If there are any things that are both genera and species, there will be a movement that is specifically one, but not without qualification; e.g. learning, if knowledge is a *species* of apprehension and the *genus* of the sciences.

14. It might be asked whether there is a specifically identical movement when the same thing changes from the same to the same, e.g. one point from the same place to the same place again and again. If so, circular movement will be the same as rectilinear, and rolling as walking. Or does a specific difference in the path, as between a straight and a curved line, make a specific difference in the movement?

20. (3) A movement that is single without qualification is one that is one in essence and in number. There are three things with which movement is concerned—that which is moved (e.g. a man), that in which it is moved (e.g. in place or in an affection), the time of the movement.

27. Generic or specific identity of movement depends on 'that in which', consecutiveness of movement on the time. Unqualified unity involves all three; 'that in which' must be one and indivisible, the time must be one and continuous, the moving thing must be one (*a*) in no merely accidental way (Coriscus and what is pale are one, but only *per accidens*, and therefore the growing dark of what is pale and Coriscus' walking are not one movement), and (*b*) not merely with a specific unity (the simultaneous healing of two men of ophthalmia is only specifically identical).

228^a 3. The repeated altering of Socrates with specifically the same alteration would be one only if what has perished could renew its identity.

6. A kindred question is whether the states and affections of bodies are self-identical; for bodies are obviously subject to flux. If this morning's health and that of this moment are the same, will not health also be self-identical after an interruption?

12. There is just this difference, that if the states are different the activities must be different (since only what is numerically one can have an activity that is numerically one), while if the state is self-identical it does not follow that the activity is. For when one stops walking, the walking no longer exists till one resumes one's walking. If the walking *were* self-identical, the same thing would perish and come again into being many times.

19. These inquiries are foreign to our subject. Since every movement is continuous, movement that is without qualification one must be continuous, and *vice versa*. For not every movement can be continuous with every movement, just as no two chance things can be continuous, but only those whose extremities are one.

24. Now some things have no extremities, and others have extremities that are specifically different; how could the end of a line touch or coincide with that of an act of walking? Movements that are not specifically or generically one may be contiguous; one may catch fever immediately after running, and a relay race is a consecutive, but not a continuous, locomotion. Thus movements are consecutive by reason of the time, but continuity depends on the continuity of the movements, i.e. on the identity of their extremities.

^bI. Thus a movement that is without qualification continuous and one must be identical in species, must be the movement of one thing, and must be in one time. It must be in one time, lest rest intervene and break up the continuity of the movement. But unity of time is compatible with a lack of specific identity of movement; and specific unity is needed to make unqualified unity though it does not guarantee it.

II. (4) A complete movement is also called a single movement, whether the completeness be in respect of genus, of species, or of essence; just as in other cases completeness is of the nature of unity. But even an incomplete movement is sometimes called one, if it is continuous.

15. (5) A uniform movement is also called one (e.g. movement in a straight line); a non-uniform movement being divisible into different components. This difference is one of degree. Uniformity and non-uniformity may be found in every kind of movement—alteration, locomotion, increase and diminution.

21. Non-uniformity is a difference (*a*) sometimes in respect of the path traversed, e.g. when this is a crooked line or a spiral, or any path of which any part does not fit on to any other.

25. (*b*) Sometimes it depends not on the subject, the time, or the *terminus ad quem*, but on the manner; for it may depend on a difference of speed. Hence quickness and slowness are not species or differentiae of movement, because they belong to all the specifically different kinds of movement. Therefore neither are weight and lightness specifically different, when they mean tendency to move faster or slower in the same direction.

229^a I. A non-uniform movement is one by reason of its continuity, but less of a unity than a uniform movement; and that which is less of something is a mixture of that with its contrary. If any movement that is one may be either uniform or non-uniform, consecutive specifically different movements do not form one continuous movement; for a movement compounded of alteration and locomotion cannot be uniform, since to be so the parts should be capable of being superimposed on each other.

5. *Contrariety of movement.*

229^a 7. What movements are contrary to one another, and what rests? Is (1) movement from A contrary to movement to A, or (2) movement from A contrary to movement from the contrary of A, or (3) movement to A contrary to movement to the contrary of A, or (4) movement from A contrary to movement to the contrary of A, or (5) movement from A to its contrary contrary to movement from the contrary of A to A?

16. (4) Movement from A is not contrary to movement to the contrary of A; these are the same, though their essence is not the same.

20. (2) Movement from A is not contrary to movement from the contrary of A. Movement to contraries is incidentally movement from contraries, but the changing *to* contraries is more the cause of contrariety (since it is the getting of contrariety, while the other is the losing of it), and a movement gets its name rather from its *terminus ad quem* than from its *terminus a quo*.

27. There remain (3) and (5). Now no doubt movements to contraries are also movements from contraries, but the essence of the two is not the same. Since movement differs from change in general in being change from something positive to something positive, it is (5) motion from A to the contrary of A that is contrary to motion from the contrary of A to A.

^b2. Induction will show what kinds of things the contraries involved in contrary changes are.

10. Change which is only *to* a contrary, e.g. becoming white, when the *terminus a quo* is unspecified, is not movement; and in the case of things that have no contrary, it is (1) change from such a thing that is contrary to change to it; but these changes are not movements.

14. Where there are intermediates, these must be treated as contraries; the movement treats the intermediate as a contrary, in whichever direction the movement takes place; the middle term may be said to be either extreme in comparison with the other.

21. Thus (5) motion from A to its contrary is contrary to motion to A from its contrary.

6. *Contrariety of movement and rest.*

229^b 23. Not only is movement contrary to movement, but so is rest, and this demands discussion. Movement is contrary to movement, but rest is also opposed to movement, being its privation,—to each kind of movement a certain kind of rest.

27. We must ask whether rest at a place is opposed to movement thence or to movement thither. There being two termini involved

in movement, to motion *from* A to its contrary is opposed rest at A, to motion *to* A from its contrary is opposed rest in the contrary. Further, these rests are contrary to each other; there must be contrary rests since there are contrary movements.

230^a 1. Rest in health is contrary to rest in disease, and to movement from health to disease. For it cannot be contrary to movement from disease to health (for movement to that in which a thing comes to rest is rather a coming to rest, or at least coming to rest is concomitant with the movement), and it must be contrary either to this movement or to the other.

7. In respect of the things that have no contraries, change from which is opposed to change to them but is not movement, there is also no rest, but only immobility. If there were a subject, its immobility in being would be contrary to its immobility in not-being, but if there is no not-being, it may be asked what immobility in being is contrary to, and whether it is rest.

14. If it is, either not every rest is contrary to movement, or generation and destruction are movement. Clearly then it should not be called rest, but immobility; and it is contrary either to nothing, or to immobility in not-being, or to destruction, which is from it (while generation is to it).

Contrariety of natural and unnatural movement and rest.

18. One might ask why in locomotion natural and unnatural rests and motions are distinguished, but not in the other kinds of motion.

29. But if what is violent is unnatural, will not violent destruction, as being unnatural, be contrary to natural destruction? Are there not also generations that are unnatural, and violent increases and diminutions, and violent and natural alterations?

^b6. There will be also destructions contrary to each other, not to generations. And why not? Destructions would also be contrary if one were pleasant and the other painful; it is not destruction *simpliciter* that is contrary to destruction, but one kind to another kind.

10. This then is the way in which motions and rests are contrary. Upward movement is contrary to downward, and therefore the natural movement of fire is contrary (1) to that of earth, and (2) to the unnatural movement of fire.

15. Again, rest above is contrary to motion from above downwards; therefore the unnatural rest of earth is contrary to its natural motion, just as the natural motion of a thing is contrary to its unnatural motion.

21. It may be asked whether every rest that is not eternal is generated, and whether its generation is a coming to a stop. If so, there must be a generation of unnatural rest; so that when earth is moving upwards it is coming to a stop. But what is coming to a stop moves ever faster, while that which is moving unnaturally moves ever slower. Therefore such a thing without having come to be at rest will be at rest. Again, to come to a stop is either identical with moving to one's own place, or a concomitant of it.

28. There is a difficulty in the view that rest at a place is contrary to motion thence; for when something is moving from a place or losing a characteristic, it still has what it is losing, so that if the rest is contrary to the movement, contrary characteristics will be present together.

32. Or may we say that it is at rest in a sense if it is still stationary, and in general, that of that which is moving part is here and part there? Hence motion is more contrary to motion than rest is.

231^a 2. So much for the unity of motion and rest, and for their contrariety.

BOOK VI

1. *Every continuum consists of continuous and divisible parts.*

231^a 21. If, as we have seen, those things are continuous whose extremities are one, those contiguous whose extremities are together, those successive which have nothing homogeneous with them between them, a continuum cannot be composed of indivisibles, e.g. a line of points.

26. For (1) points have not extremities that are either one or together, since what has no parts has no extremities.

29. (2) If points are to make up a continuum, they must be either continuous or contiguous. Now (a) they cannot be continuous, for the reason just given; and (b) contact is of whole with whole, of part with part, or of part with whole. Now, since the indivisible has no parts, its contact must be of whole with whole; but such contact would not be continuity, which implies locally separate parts.

^b 6. Nor (3) can points make up a line, nor moments a time, through being *successive*; for only those things are successive that have nothing homogeneous between them, but points have always a line (and therefore points) between them, and moments a time (and therefore moments).

10. Further, if length and time were composed of successive points

and moments, they could be divided into indivisibles ; but we saw that nothing continuous was divisible into partless parts.

12. Nor can there be any *other* kind of thing between the points or the moments. For if there is, it will be either indivisible or divisible, and if divisible, either into indivisibles, or into divisibles *ad infinitum* ; and what is of this latter nature is continuous.

15. Further, *every* continuum is divisible into divisibles *ad infinitum* ; for if it were divisible into indivisibles, one indivisible would be in contact with another, since the extremities of things continuous with each other are one and in contact.

18. Either magnitude, time, and motion are all composed of and divisible into indivisibles, or none of them is. For if a magnitude is composed of indivisibles, the motion along it will be composed of an equal number of indivisible movements. E.g. if the line $AB\Gamma$ is composed of the indivisibles A, B, Γ , the motion ΔEZ with which Ω moves along $AB\Gamma$ has each part indivisible.

25. If, then, when motion is present something must be being moved, and *vice versa*, being moved will be composed of indivisibles. Ω then was moved the distance A when it was being moved with the movement Δ , and so with B and Γ .

28. If, then, that which is moving from somewhere to somewhere cannot at the same time *be moving* and *have moved* whither it was moving when it was moving, and if Ω was moving over the partless section A in virtue of the movement Δ , it follows that if (a) it *was* traversing A before it *had* traversed it, the section must be divisible ; for when Ω was traversing it, it neither was at rest nor had traversed it, but was between the extremes ; while if (b) it at the same time is traversing and has traversed A , that which walks, when it is walking, will have walked to the place it is walking to.

232^a 6. And if a thing is moving over the whole of $AB\Gamma$, and its movement is ΔEZ , and nothing is ever moving over the partless section A but can only *have* moved over it, movement will be composed not of movements but of jerks, and will take place through a thing's having moved over something which it never was moving over, so that it will be possible to have walked a distance one never was walking.

12. If, then, everything must be either in motion or at rest, Ω rests at each of the parts $AB\Gamma$, so that it will be possible for a thing to be at the same time continuously at rest and in motion ; for it was moving over the whole $AB\Gamma$ and resting at each part, and therefore at the whole. And if the indivisible parts of ΔEZ are movements, a thing may be at rest while movement is present to it ; while if they are not movements, movement may be composed of non-movements.

18. And time will be indivisible, or composed of indivisible parts, if and only if the same is true of length and motion; for if all motion is divisible, and in a shorter time a thing moving with uniform speed moves a shorter distance, time also will be divisible; while if the time in which a thing moves the distance A is divisible, the distance A also will be divisible.

2. *Further proof that every continuum is infinitely divisible.*

23^a. Since every magnitude is divisible into magnitudes, the faster of two bodies must move (1) in an equal time a greater distance, (2) in a less time an equal distance, (3) in a less time a greater distance.

27. For let A be faster than B. Since that is faster which undergoes a change before something else does, in the time ZH in which A has changed from Γ to Δ , B will be short of Δ , so that (1) above is true.

31. (3) is also true; for let B be at E when A is at Δ . Then, since A reaches Δ in the whole time ZH, it reaches Θ in a shorter time ZK. Then $\Gamma\Theta$ is greater than ΓE , but the time ZK is less than ZH.

^b5. (2) is also true; for (a) since A has traversed a greater distance than B in a shorter time, but itself traverses a greater distance (e.g. ΛM) in a greater time than it does a less distance (e.g. $\Lambda \Xi$), the time ΠP in which it traverses ΛM is greater than the time $\Pi \Sigma$ in which it traverses $\Lambda \Xi$, so that if ΠP is less than X, in which B traverses $\Lambda \Xi$, $\Pi \Sigma$ also will be less than X.

14. (b) If everything must move either in an equal, in a less, or in a greater time than a given other thing, and that which moves in a greater time is slower, that which moves in an equal time equally fast, while the faster is neither equally fast nor slower, the faster can move neither in an equal nor in a greater time, and therefore must move in a less.

20. Since every motion is in time and in every time motion may take place, and everything that moves may move faster or slower, in every time it is possible for a thing to move faster or slower. From this it follows that *time* also must be continuous, i.e. infinitely divisible.

26. For, since we have shown that the faster body traverses an equal distance in a shorter time, let A be faster, B slower, and let B have moved the distance $\Gamma\Delta$ in time ZH. Then A will move the same distance in a shorter time, say in Z Θ .

31. Again, since A has traversed the whole of $\Gamma\Delta$ in time Z Θ , the slower body will traverse in the same time a shorter distance, say

ΓK . And since B traverses ΓK in time $Z\Theta$, A will traverse it in less time, so that the time $Z\Theta$ again will be divided in the same ratio, and with that the distance ΓK , and with that the time.

233^a 5. This will happen without limit if we substitute the slower for the faster and then the faster for the slower; the faster will divide the time, and the slower the distance. If we can always alternate thus, and this always leads to a division, every time will be continuous. And similarly every magnitude will be continuous; for time and magnitude are divided with an equal number of divisions, in the same ratio.

13. Further, that since time is continuous, magnitude must be so, follows from our customary assumptions, that in half the time a thing moves half the distance, and in a less time a less distance; for time and magnitude will admit of the same divisions. And if one is infinite, the other is, and in the same sense; if time is infinite in respect of its extremities, so is magnitude; if in respect of divisibility, so is magnitude; if in both respects, so also magnitude.

21. Hence Zeno's argument is wrong in assuming that it is not possible to traverse an infinite number of points, or be in contact with them, in a finite time. For both magnitude and time, and in general every continuum, may be said to be infinite either in respect of division or in respect of its extremities. Now a thing cannot in a finite time be in contact with things infinite in respect of quantity, but it can with what is infinite in respect of divisibility; for the time itself is infinite in this sense.

28. Thus it is in an infinite, not a finite, time that it is possible to traverse what is infinite, and the contact is by means of parts of time that are infinite, not finite, in number. Therefore a thing cannot traverse either what is infinite in a finite time, or what is finite in an infinite time, but if either is infinite, so is the other.

34. For let there be a finite magnitude AB , and an infinite time Γ ; and take a finite part of the time, $\Gamma\Delta$. In this the moving body will traverse part of the distance, say BE . This will either measure AB exactly or fall short of it or exceed it—it makes no difference; for if it always traverses a distance equal to BE in an equal time, and this measures the whole, the whole time in which it traverses AB will be finite; for it will be divided into just as many parts as the distance.

^b7. Again, if not every magnitude is traversed in an infinite time, but some magnitude in a finite time, say BE , and this measures the whole, the moving body will traverse a distance equal to BE in an equal time, so that the time of the traversal of AB will be finite.

II. That it is not in an infinite time that it will traverse BE is clear, if we suppose the time of the traversal of AB limited in one

direction ; for if it traverses the part in less time than the whole, the time of the traversal of the part will be finite, since it has a limit in one direction. The same proof will refute the suggestion that the distance may be infinite and the time finite.

15. It is clear then that neither a line nor a plane nor any continuum can be indivisible, both from what has been said and because it would follow that the indivisible would be divided.

19. For, since in any time we may have a faster and a slower movement, and the faster traverses a greater distance in an equal time, and it is possible that the one distance traversed should be half as great again as the other, let the faster have travelled half as far again in the same time, and let the greater distance be divided into three indivisible parts AB, BΓ, ΓΔ, and the less into two, EZ, ZH. Then the whole time also will be divided into three indivisible parts, say KA, AM, MN. But, since the slower body has traversed EZH, the time also will be divided into two. Therefore the indivisible will be divided, and a body will traverse the partless distance not in an indivisible but in a greater time. Clearly then no continuum is without parts.

3. *A moment is indivisible, and nothing is moved, or rests, in a moment.*

233^b 33. The 'now' in the primary sense must be indivisible, and such a now there must be in every period of time. For there is a limit of the past, on this side of which there is nothing of the future, and one of the future, on the far side of which there is nothing of the past ; it is, as we maintain, a limit of both. If we can show that it is of this nature *per se* and that the limits of the past and future are identical, it will be evident that the joint limit is indivisible.

234^a 5. The nows which are the limits of the two times must be identical ; for if the limits were different, (1) the one would not be *successive* upon the other because a continuum cannot be composed of indivisibles ; while (2) if the two are *separate* there will be a time between them, since every continuum must have something homogeneous between its limits.

9. But if the interval is a time, it will be divisible, so that the now will be divisible. But if it is, (a) there will be some of the past in the future and of the future in the past ; for that at which time is divided will mark off past and future time. (b) The supposed now will be so not *per se* but in virtue of something else ; for the division will not be at it *per se*. (c) Part of the now will be past, part future, and not always the same part will be past or future ; therefore the now will not be always the same, since the time can be divided at many points.

19. If these consequences cannot be true, the now which is the limit of the past must be identical with that which is the limit of the future, and therefore the now must be indivisible; otherwise we get once more the absurd consequences that have been pointed out.

22. That nothing is moved in a now, is seen from what follows: If something is so moved, it may be moved faster or slower. Let the now be N , and let the faster of two bodies move in it a distance AB . Then the slower will move in it a shorter distance $A\Gamma$. The faster will then move the distance $A\Gamma$ in a shorter time, so that the now, which we have proved to be indivisible, will be divided.

31. Nor can anything *rest* in the now; for only that can be said to be at rest which, being naturally fitted for movement, does not move when, where, and as it is naturally fitted to move; but nothing is naturally fitted to move in a now.

34. Further, if the now is self-identical in the two times it separates, and a thing may be moving in the one whole time and resting in the other, and that which is moving or resting in a whole time will be moving or resting in any section of the whole time in which it is capable of moving or resting, if a body can move or rest in a now it will rest and move in the same now.

^b5. Further, that is at rest which, and whose parts, are in the same state as they were before; but in the now there is no before, and therefore no rest. Therefore it is in time that what moves moves and what rests rests.

4. *Whatever changes is divisible.*

234^b 10. Everything that changes must be divisible. For since all change is from A to B , and when the changing thing is in B it is no longer changing, while when both it and its parts are in A it is not yet changing, one part of that which is changing must be in A and one in B ; for it cannot be either in both or in neither. (B , that which the thing is changing into, is to be understood to mean the first thing changed into; e.g. when A is white, B is grey, not black; for that which is changing need not be in either of the *extremes*.) Evidently then everything that changes is divisible.

Movement is divisible in two ways.

21. Movement is divisible (1) in respect of the time and (2) in respect of the movements of the parts of the moving thing; e.g. if $A\Gamma$ is moved as a whole, both AB and $B\Gamma$ will be moved. Let the movement of AB be ΔE and that of $B\Gamma$ $E Z$. Then ΔZ is the movement of $A\Gamma$; for (a) $A\Gamma$ will be moved with this movement (since

each of the parts is moved with one of the partial movements), and nothing is moved with the movement of another thing.

29. Further, (*b*) if every movement is the movement of something, and the whole movement ΔZ is the movement neither of one of the parts nor of anything else (for the parts of a whole movement are movements of the parts of that of which the whole movement is the movement; but the parts are movements of AB, B Γ and of nothing else, since a single movement was not the movement of more than one thing), the whole movement will be the movement of AB Γ .

34. Further, (*c*) if there be another movement of the whole, e.g. ΘI , the movement of each of the parts can be subtracted from it; and these will be equal to ΔE , EZ; for one thing has one movement. So if the whole movement ΘI is divided into the movements of the parts, ΘI will be equal to ΔZ ; while if ΔZ falls short of ΘI , the remainder of ΘI will be the movement of nothing, since it cannot be the movement of the whole or of the parts or of anything else (for a continuous movement is the movement of continuous bodies). The same impossible result follows if ΔZ exceeds ΘI . They must, then, be equal and in fact identical.

235^a 9. This division (2) is according to the movements of the parts, and every divisible thing must be subject to it. But there is another ((1) of 234^b 21) according to the time of the movement; for, since every movement is in time and every time is divisible, and the less the time the less the movement, every movement must be divisible in respect of time.

The time, the movement, the being-in-motion, the moving body, and the sphere of movement, are all similarly divided.

13. Since everything that moves moves in some respect and for a certain time and has a motion belonging to it, there must be the same divisions of the time, of the movement, of the being-moved, of the moving thing, and of the respect in which it is moved (only not of all respects alike, but of place *per se* and of quality *per accidens*).

18. (1) Let the time be A, the motion B. If then the thing has suffered the whole movement in the whole time, in half the time it suffers a less movement, and so on indefinitely. (2) Conversely if the movement is divisible, so is the time; for if the thing suffers the whole movement in the whole time, it suffers half the movement in half the time, and so on.

25. (3) Similarly the being-moved will be divided. For (*a*) let Γ be the being-moved. The being-moved answering to the half-movement will be less than the whole being-moved, and so on.

28. (b) We get the same result if we set out the being-moved in respect of each of the two movements, $\Delta\Gamma$ and $\Gamma\Xi$. The whole being-moved will answer to the whole movement (if it were different, there would be more than one being-moved in respect of the same movement), as we showed that the movement was divisible into the movements of the parts. For if we take the being-moved in respect of each of the two movements, the whole being-moved will be continuous.

34. (4) Similarly the distance, or in general the respect in which the movement takes place, will be divisible (except that in some cases this is merely incidental to the divisibility of the moving thing); if one is divided all will be divided.

37. And similarly all alike will be finite, or all alike infinite. The divisibility and infinity of all comes primarily from that of the changing thing. Now its divisibility has been proved before; its infinity will be plainer from what follows.

5. *Whatever has changed is, as soon as it has changed, in that to which it has changed.*

235^b 6. Since everything that changes changes from something into something, that which has changed, as soon as it has changed, must be in that into which it has changed. For that which changes leaves behind that from which it changes, and leaving behind is either the same thing as changing or is implied by it, and therefore having left behind by having changed.

13. So, since one kind of change is that from contradictory to contradictory, when a thing has changed from not-being to being it has left not-being behind. It will therefore be in being; for everything must either be or not be. Clearly then in change from contradictory to contradictory that which has changed is in that into which it has changed. But if in this, then also in the other kinds of change.

19. Further, in each kind of change we can see that it must be so, from the fact that that which has changed must be in something—either in that to which it has changed or in something else. If that which has changed to B is in something else, say Γ , it is at the same time changing once more from Γ to B; for B was supposed not to be in contact with Γ , but change is continuous. Thus that which has changed is changing to that into which it has changed. But this is impossible; therefore that which has changed must be in that into which it has changed.

27. And evidently that which has come to be will be, and that which has perished will not be; for the proposition is a general one

about all change, and is particularly clear in regard to change from contradictory to contradictory.

Change is completed at a moment.

30. That in which first that which has changed has changed must be indivisible; by 'first' I mean that which is of a certain kind not by virtue of something else's being so. For let $\Gamma\Gamma$ be divisible, and divided at B. If then the changing thing has changed in AB or in B Γ , it has not changed first in $\Gamma\Gamma$. But if it was changing in each of the two (for it must either have changed or have been changing in each), it would also be changing in the whole; but we supposed it to *have* changed. Similarly if in one it is changing and in the other it has changed; there will then be something prior to the supposed 'first'. Therefore that in which it has changed cannot be divisible.

236^a 5. Evidently also that which has perished or come into being must have completed its doing so at an indivisible moment.

There is no first moment or part in the time of a change, and no part of the changing thing that changes first.

7. 'That in which first a thing has changed' may mean (1) that in which first the change was completed, or (2) that in which it began. (1) exists, for there is an end of change, which end we have shown to be indivisible. (2) does not exist, since there is no beginning of change.

15. For let that in which the thing began to change be $\Lambda\Delta$. This is not indivisible; for (a) then nows would be contiguous. (b) If the thing is resting in the whole time $\Gamma\Lambda$, it is also resting in Λ , so that if $\Lambda\Delta$ is without parts, it will be at rest and have changed at the same time; for in Λ it is at rest, while in Δ it has changed.

20. Since $\Lambda\Delta$ is not without parts, it must be divisible, and the thing must in each part of it have changed; for when $\Lambda\Delta$ is divided, if the thing has changed in neither part it has not changed in the whole; if it changes in both, and in the whole, or in one of its two parts, it has not changed *first* in the whole. Thus in every part it must have changed; therefore there is no time in which it has first changed, since the divisions are infinite.

27. Nor is there a part of that which has changed that has changed first. For let ΔZ be the part of ΔE that has changed first; for everything that changes has been shown to be divisible. And let the time in which ΔZ has changed be ΘI . Then in the half time something less will have changed, and changed before ΔZ , and so *ad infinitum*.

35. There is no first part, then, either (a) of that which changes or (b) of the time in which it changes; but this is not true (c) of the very thing that changes (or the respect in which the changing thing changes). (For there are three things involved in change—the changing thing, that in which it changes, and that into which it changes, e.g. a man, the time of the change, and the quality pale. The first two are divisible, the third is not—except that incidentally even it is divisible, since that to which it belongs is divisible.) Yet, of the respects in which things change, those that are divisible *per se*, i.e. magnitudes, have no first part any more than the changing thing or the time.

^b 10. For (i) let there be a magnitude AB, and let Γ be the first thing to which it has moved from B. Then if B Γ is indivisible, two things without parts will be contiguous; while if it is divisible, there will be something prior to Γ to which AB has moved, and so *ad infinitum*. So there will be nothing into which it has moved first.

16. Similarly (ii) with change of size; this also is in a continuum. Clearly then it is only (iii) in qualitative change that there can be an indivisible transition.

6. *There is change in any part of the commensurate time of any change.*

236^b 19. Everything that changes changes in time; and if we take the first or commensurate time in which a thing undergoes a certain change, it changes in every part of that time.

23. This is clear even (1) from the definition of the first or commensurate time, but (2) also from the following facts. Let XP be the commensurate time of a movement, and let it be divided at K. Then in the time XK the thing either moves or does not move, and similarly in KP. If it moves in neither, it is at rest in the whole; if in one of the two only, XP is not the commensurate time of the movement. Therefore it must move in any part of XP.

Whatever changes has changed before, and whatever has changed was changing before.

32. Therefore (A) everything that is moving must have already moved. For (1) if in the commensurate time XP it has moved a distance KA, in half the time a body moving with equal speed will have moved half the distance, and therefore the body itself must have done so too.

237^a 3. (2) If by taking the last now of the whole time XP (for it is the now that forms the boundary, and what falls between the bounding nows is a time) we can say that a thing has moved in the

whole time, or indeed in any part of it, it must have moved in the other parts. But the point of division is the limit of the half time. Therefore in the half time, and indeed in any part of the time, the thing will have moved; for every section sets up a time defined by its bounding nows. If then every time is divisible, and any interval between the nows is a time, everything that is changing will have suffered an infinite number of changes.

II. (3) If that which is changing continuously and has not been destroyed or ceased from changing must at any time either be changing or have changed, and if in a now it cannot be changing, it must *have* changed in each of the nows; so that if these are infinite, it must have undergone an infinite number of changes.

17. Not only must that which is changing have changed, but (B) that which has changed must have been changing. For (1) everything that has changed has changed in time. For let it have changed from A to B in a *now*. Then (a) in the *same* now in which it is in A, it has not changed (for then it would be both in A and in B); for we have shown that that which has changed is not in that from which it has changed. And (b) if it is in *another* now that it has changed, there will be a time between the two nows; for nows were seen not to be contiguous.

25. Since then it has changed in a *time*, and every time is divisible, it will have undergone another change in the half time, and so *ad infinitum*; so it must always have already been changing.

28. (2) The same conclusion follows more clearly from the continuity of the distance over which the change takes place. For let something have changed from Γ to Δ . If $\Gamma\Delta$ is indivisible, two things without parts will be contiguous; and since this is impossible, the interval must be a distance and infinitely divisible; so that the changing thing must already have been changing into this infinite series of parts of the distance. So everything that has changed must previously have been changing.

35. When change is between two things not continuous with each other, i.e. contraries or contradictories, we can use the proof from the time of the movement ((1) above).

^b3. Thus that which has changed must have been changing, and that which is changing must have changed. Each will precede the other, and we shall never get a first term. The reason is that two things without parts cannot be contiguous; for division may be carried on *ad infinitum*, as in the case of the lengthening and shortening of lines.

9. It is evident then that that which has come into being must have been coming into being, and *vice versa*, so long as we are dealing with things that are divisible and continuous; but what has come

into being need not be what is coming into being, but may be one of its parts. Similarly with what is perishing and what has perished; if what is coming into being or perishing is continuous, it has an element of infiniteness; coming into being and having come into being presuppose each other, and so do perishing and having perished; for every distance and every time are divisible perpetually. So that there is no first time in which, or path along which, change takes place.

7. *The finitude or infinity of movement, of extension, and of the moved.*

237^b 23. (A) Since everything that moves moves in time, and a greater distance in a greater time, it is impossible for the traversal of a finite distance to occupy an infinite time, assuming that the moving thing does not cover the distance over and over again.

26. (1) If the body is moving with uniform speed, it must move the finite distance in a finite time; for if we take an aliquot part of the whole distance, the body has moved the whole distance in equal times as many as the parts of the distance; so that, since these are limited both in size and in number, the time too is limited; it is equal to the time of the part multiplied by the number of the parts.

34. And (2) if the body is not moving uniformly, that makes no difference. For let AB be a finite distance which a body has moved in an infinite time $\Gamma\Delta$. If, then, it must have traversed one part of the distance before another (as it must have done, whether the motion is uniform or is accelerated or retarded), take an aliquot part AE of AB.

238^a 8. Then this part of the movement must take place in a *part* of the infinite time; for it did not occupy an infinite time, since the *whole* took place in that. And if I take another part equal to AE, that again is traversed in a finite time. And if I take more parts, then since there is no part of that which is infinite that will measure it (for an infinite cannot be made out of finites whether equal or unequal, because things that are finite in plurality and in size can be measured by some unit; it does not matter whether they are equal or unequal, provided they are limited in size), but the finite interval is measured by a certain number of AE's, AB must be traversed in a finite time (and so too in the case of coming to rest); so that a self-identical thing cannot be always in a state of becoming or perishing.

20. (B) Similarly it can be shown that a body cannot undergo an *infinite* movement or coming to rest in a *finite* time, whether it move uniformly or not. For if an aliquot part of the time be taken, in this it will move a definite part of the distance and not the whole (for it

moves this in the *whole* time), and so in each part of the time whether equal or unequal to the first; for it makes no difference so long as each is finite; clearly while the time is exhausted the infinite distance is not, since the subtractions made are finite both in amount and in number. It makes no difference whether the distance be infinite in one direction or in both.

32. (C) This having been proved, it follows that a finite magnitude cannot traverse an infinite magnitude in a finite time; for in each part of the time, and therefore in the whole time, it will traverse a finite magnitude.

36. (D) And therefore an infinite magnitude will not traverse a finite magnitude in a finite time, since if it did, a finite magnitude would also traverse an infinite. For it does not matter which of the two is in movement. For when the infinite magnitude A moves, a part of it $\Gamma\Delta$ will occupy the finite magnitude B, and other parts will do so in succession. Thus simultaneously the infinite will have traversed the finite and the finite the infinite; for the former cannot happen without the latter; and since the latter is impossible, so is the former.

^b13. (E) Nor can the infinite traverse the infinite in a finite time; for (a) to do so it would have to traverse the finite which is contained in the infinite; and (b) the argument from the time can be used once more.

17. (F) Since the finite cannot traverse the infinite, the infinite the finite, or the infinite the infinite, in a finite time, there cannot be infinite movement in a finite time; for it makes no difference whether we make the motion or the distance infinite, since if one is so, the other must be so, all locomotion involving place.

8. *Of coming to rest, and of rest.*

238^b 23. Since everything that is capable of movement is either moving or at rest when, where, and in the way in which it is capable of moving, that which is coming to a stand must be moving; for if not, it will be at rest, but that which is at rest cannot be coming to rest. It follows that coming to rest must be in time, since that which moves moves in time. This also follows from the fact that 'faster' and 'slower' imply time, and a thing may come to rest faster or slower.

31. Whatever be the primary time in which a thing comes to rest, it is coming to rest in any part of this. For if we divide the time, (1) if the thing is coming to rest in neither of the parts, it will not do so in the whole; while (2) if it does so in one only, it will come to rest in the whole not primarily but only in virtue of something else, as we proved in the case of that which moves.

36. As there is no primary time in which that which moves is moving, there is none in which that which comes to rest is coming to rest; for there is no primary element either of moving or of coming to rest. For let the primary time be AB. This cannot (1) be without parts; for movement cannot take place in that which is without parts (because the moving thing would have to have *been moved* in part of the supposed partless time), and that which is coming to rest is moving.

239^a 6. But (2) if the time is *divisible*, the body is coming to rest in every part of it, as has been proved before. Since then that in which the body comes to rest primarily is a time and not a moment, and every time is infinitely divisible, there is nothing in which that which comes to rest comes to rest primarily.

10. Nor is there a time when that which is at rest was first at rest; for (1) it did not rest in an indivisible moment, since (a) there is no movement in a moment, and there can be rest only in that in which there can be movement; and (b) we say a thing is at rest when it is in the same condition now as it was before, discerning rest by the use of two moments at least.

17. (2) But if that at which the thing was first at rest is *divisible*, it is a time, and the thing will be at rest in any of the parts of this time; so that there is no first. The reason is that everything that rests or moves does so in time, and there is no first time or magnitude or continuum of any kind, since each is infinitely divisible.

A thing that moves a certain distance precisely in a certain time is not for that time at any part of its course.

23. Since everything that moves moves in time and changes from something to something, therefore in the time in which it moves *per se* and not by moving in a part of the time, it cannot be over against some particular thing primarily. For to rest is for a thing and each of its parts to be in the same state for some time, and therefore that which is changing cannot be as a whole, at the primary time of its changing, over against any particular thing; for since every time is divisible, it would follow that the thing and its parts were in the same state at different parts of the time.

33. If, instead of this, it is only at one now that the thing is in the same state, it will not be over against any particular thing for any time, but only at the limit of time. But in a now, while a thing is always over against something, it is not at rest, any more than it could be in movement; though it may be said not to be moved. That which is in movement is, in the now, not moving, and is over against something, but in a period of time it cannot be at rest over

against anything ; for that which is in movement would then be at rest.

9. *Refutation of Zeno's arguments against the possibility of movement.*

239^b 5. Zeno's argument is unsound. He says that if everything is at rest when it is over against that which is equal to itself, and that which is moving always fulfils this condition at a moment, the moving arrow must be at rest. This is false ; for time is not composed of indivisible nows, any more than any other magnitude is composed of indivisibles.

9. There are four arguments of Zeno's about movement which are hard to refute, viz. (1) that which says that movement is impossible because the moving body must arrive at the halfway point before it arrives at the end. This we have dealt with before.

14. (2) The so-called 'Achilles', viz. that the slowest thing will never be caught up by the quickest ; for the pursuer has first to arrive at the point from which the pursued has started, so that the slower is always ahead. This is the same argument as that from dichotomy, except that the magnitude which is added at each step is not divided in *half*.

20. The conclusion that the slower is not caught up follows from the argument, but depends on the same point as the dichotomy (for in both, the moving body's not arriving at the goal arises from a particular way of dividing the distance ; but in this argument it is added that not even that which is reputed to be the quickest succeeds in its chase of the slowest), so that the solution also must be the same.

26. The claim that that which is ahead is not caught up is false ; it is not caught up when it is ahead, but it *is* caught up, if one allows that a finite line can be traversed to the end.

29. (3) The argument mentioned above, which shows that the moving arrow rests. This arises from assuming time to consist of moments ; if this be denied the argument fails.

33. (4) The argument about the masses which move in opposite directions along a stadium past masses equal to themselves, some from the end of the stadium, others from its turning-point, with equal speed ; in this argument Zeno thinks it follows that the half time is equal to its double. The fallacy consists in supposing that things which move with the same speed past a moving object and past a resting object of the same size take the same time.

240^a 4. Let the masses at rest be AA ; let BB be masses beginning from the turning-point, equal in number and size to these ; and let ΓΓ start from the end, equal in number and size to the A's and in speed to the B's.

9. Then (a) the first B and the first Γ are simultaneously at the end of the A's. But (b) the Γ will have passed all the B's, while the B has passed only half that number of A's; so that the time occupied is the half of the whole time. But (c) the first B has at the same time passed all the Γ 's; for the first Γ and the first B will be simultaneously at the contrary extremes, because both are for an equal time opposite the A's. This is the argument; it depends on the falsity we have pointed out.

19. Nor will change from contradictory to contradictory present any insuperable difficulty. The suggestion is that if a thing is changing from not-white to white and is in neither, it will be neither white nor not-white. But if a thing is not as a whole in either, it does not follow that it cannot be said to be either white or not-white; for we call a thing white or not-white not because it is as a whole one of these but because most of its parts or its most important parts are.

26. Similarly with being and not-being, and other contradictories; the thing will necessarily be in one of the opposite states, though not in either as a whole.

29. So too with the objection that the circle, the sphere, or anything that returns on itself, will be at rest, since both they and their parts are for a certain time in the same place; so that they will be resting and moving at the same time. We answer that (1) the parts are not for any time in the same place, (2) the whole is always changing its position; for the curves starting from A, from B, and from any other point are not the same except *per accidens*, as the musical and the man are the same. Thus the one curve is always changing into the other, and will never be at rest.

10. *That which has not parts cannot move.*

240^b 8. We next maintain that that which is without parts cannot move except incidentally, by virtue of presence in a moving body, as when the contents of a ship are moved by the movement of the ship, or a part by the movement of the whole. (By 'without parts' I mean indivisible in respect of quantity.)

13. For there is a difference between the movement of parts in virtue of the parts themselves and their movement in virtue of the movement of the whole. One can see this best in the sphere. The speed of the parts near the centre, that of those at the outside, and that of the whole are not the same, which implies that there is not one single movement.

17. That which is without parts, then, can only be moved incidentally. For (1) let it change from AB to B Γ , whether from magnitude to magnitude, from place to place, or from contradictory to contradictory; and let the primary time of the change be Δ .

23. Then at the time of the change it must be (*a*) in AB or (*b*) in BF or (*c*) part in the one, part in the other. (*c*) is impossible; for then it would need to have parts. (*b*) is impossible, because then it would have already changed. (*a*) therefore must be the case; and therefore it will be at rest.

30. Thus that which is without parts cannot move, or in general change; it could do so only if time consisted of nows; then it would always have changed and would never be changing.

24^a 2. But we have shown this to be impossible. Time does not consist of nows, a line of points, or a movement of jerks. He who analyses motion into partless motions is doing what corresponds to analysing time into nows or a line into points.

6. (2) The following argument also shows that neither a point nor anything indivisible can be moved. Nothing that is moved can be moved a distance greater than itself, before it is moved a distance equal to or less than itself. This then will be true of a point. But since it is indivisible, it cannot move a distance less than itself; therefore it must move one equal to itself. Therefore the line will be composed of points; for if a point is moved always an equal distance it will measure out the whole line. If this is impossible, so is the movement of an indivisible.

15. (3) If everything is moved in time, and nothing in a now, and all time is divisible, there must be for any moving body a time less than that in which it is moved a distance equal to itself. For that in which it is moved this distance will be a time, since everything that is moved is moved in time; and we have shown that every time is divisible. If then a point is moved, there will be a time less than that in which it was moved its own length. But this is impossible; for in a less time it must move a less distance. Thus the indivisible will be divisible into smaller parts, as the time will be into shorter times.

23. The indivisible could be moved only if movement were possible in an atomic now; movement in a now and movement of an indivisible go logically together.

Can change be infinite?

26. There is no infinite change; for all change of whatever kind is from something to something. Of change from contradictory to contradictory the positive and the negative are the boundaries (e.g. being and not-being); of change between contraries, the contraries. These are the extremes of change, and therefore both of alteration and of increase and diminution. The limit of increase is the complete magnitude answering to a thing's proper nature; the limit of diminution is the loss of this.

^b2. Locomotion is not thus limited; for not all of it is between extremes; but since that which is incapable of being cut, in the sense that it is impossible for it to be cut, cannot be being cut, neither can that which is incapable of changing be in course of changing.

8. If, then, that which is in local movement were to move towards some place, it must be capable of completing the movement. Therefore its movement is not boundless, nor can it move with a boundless movement, since it could not complete it.

II. Thus there cannot be a movement that is not enclosed by boundaries; but we have to consider whether a movement which is single may not be temporally infinite. There is nothing to prevent eternal movement if a change of movement be allowed (e.g. locomotion being succeeded by alteration and that by increase and that by generation); but there is only one *single* motion that can be eternal, viz. rotation.

BOOK VII

I. *Whatever is in movement is moved by something.*

241^b 34. Whatever is in movement is moved by something; for if (1) it has not its source of movement in itself, it is evidently moved by something else; and if (2) it has its source of movement in itself, take AB, which is moved *per se* and not because one of its parts is in movement.

39. Then (a) to suppose that AB is moved by itself, because it is moved as a whole and not by anything outside, is as if, when KA moves AM and is itself in movement, one were to deny that KM is moved by anything, because one did not see which part moved and which was moved.

44. (b) That which is not moved by something need not stop being in movement because something else is at rest, but if anything is at rest because something else has stopped moving, that thing must be moved by something. It follows that everything that is in movement is moved by something. For AB, which has been assumed to be in movement, must be divisible, since everything that is in movement is divisible. Let it be divided at Γ. Then if ΓB is not in movement AB will not be so; for if it were, AΓ would be in movement while ΓB was at rest; so that AB would not be in movement *per se*, as it was supposed to be. If ΓB is not in movement, then, AB must be at rest. But that which must be at rest when something else is not in movement has been admitted to be moved

by something. Therefore everything that is in movement is moved by something.

There is a first movent which is not moved by anything else.

242^a 49. Everything that is in movement must be moved by something; therefore if something is moved locally by something else that is in movement, and again that which moves it is moved by something else that is in movement, and so on, there must be a first movent which sets a limit to the series; for let us suppose that there is not, and that the series is infinite.

55. Let A be moved by B, B by Γ, Γ by Δ, and so on. Since then it is assumed that that which moves moves by being moved, the movement of moved and mover must be simultaneous (since the mover moves and the moved is moved simultaneously); evidently therefore the movement of all the bodies involved will be simultaneous. Let the movement of A be E; that of B, Z; let those of Γ, Δ be H, Θ. For each is always moved by another, yet each has a numerically single movement; for all movement is from something to something, and is not infinite in respect of its extremes. By a single movement I mean one between the same extremes in a numerically identical time.

69. For movement may be one generically, when it is in respect of the same category; specifically, when it is between specifically identical limits; or numerically, when it is between numerically identical limits in a self-identical time.

^b**42.** Let the time in which A has suffered its motion be K. Since the movement of A is limited, so is the time. But since the mover and the moved are infinite, the movement EZHΘ composed of all the separate movements will be infinite (it matters not whether the movements of the other bodies are equal to or greater than that of A). Since A and each of the others are moved simultaneously, the whole movement will be in the same time as that of A; and that of A is in a limited time; so that there must be infinite movement in finite time; but this is impossible.

53. The point might seem to have been proved thus, but it is not a complete proof, because no impossible result has been deduced; for there may be an infinite movement in a finite time, if there be not one but several subjects. And this is what happens here; each subject is moved with its own motion, but it is not impossible for many to be moved at once.

59. But if that which causes local and bodily movement directly must either touch or be continuous with what it moves (as we see in every case), the moved and the mover must be either continuous

or in contact, and thus must form a unity. Whether this is finite or infinite makes no difference to our present point; in any case if the subjects are infinite in number the movement will be infinite, if the movements *may* be either equal or progressively greater; for we will take as actual what is possible. If then the whole composed of $AB\Gamma\Delta$ is either finite or infinite, and is moved with the movement $EZH\Theta$ in the time K , and this time is limited, either something finite or something infinite completes an infinite movement in a finite time. But neither is possible; so there must be a limit—a first mover and a first moved. The fact that the impossible result has been deduced from a hypothesis makes no difference; for the hypothesis has been assumed to be possible, and if what is possible is assumed to exist, no impossible result should follow.

2. *The mover and the moved must be in contact.*

243^a 32. The proximate mover is always together with the moved, in the sense that there is nothing between them. Since there are three kinds of motion—in respect of place, quality, and quantity—there must be three kinds of mover. Let us speak first (A) of locomotion, the primary kind of motion.

II. Everything that is moved locally is moved either by itself or by something else. (1) In things that are moved by themselves, the mover and the moved are obviously together, i.e. without intermediate.

15. (2) Movement by another thing may take place in four ways—pulling, pushing, carrying, rotating. For all locomotions are reducible to these; pushing on is pushing in which that which is causing motion away from itself follows up what it pushes; pushing away occurs when the mover does not follow up; throwing occurs when the mover causes a motion away from itself more violent than the natural motion of that which it moves, and the object moves so long as the imparted motion controls it.

^b 3. Again, pushing apart is pushing away (for this may be either away from the pusher or away from something else), and pushing together is pulling (for this may be either to the puller or to something else). Similarly with the varieties of these, e.g. (in weaving) battening (a variety of pushing together), shedding (a variety of pushing apart). So too the other forms of combination and separation, except those involved in becoming and perishing, are forms of pushing apart or of pushing together. At the same time it is evident that combination and separation do not form a separate kind of movement; for all forms of these can be allotted to one of the aforesaid kinds.

12. Again, inhaling is pulling, and exhaling is pushing. So with

spitting ; and generally the excretive movements are forms of pushing away, the assimilative movements forms of pulling. All other kinds of locomotion similarly fall under the four named.

16. Of these, again, carrying and rotating are reducible to pulling and pushing. For carrying is always dependent on one of the other three forms ; for that which is carried is moved *per accidens*, because it is in or on a moving object and that which carries it is in doing so being either pulled or pushed or rotated. And rotation is a combination of pulling and pushing ; that which is rotating something else must pull part of it and push another part. So that if that which pushes or pulls is together with that which it pushes or pulls, there is nothing between that which is moved locally and that which moves it.

244^a 7. The same result follows from the definitions. Pushing is moving either from the pusher or from something else to something else ; pulling is moving from something else either to the puller or to something else, when the movement is more rapid than that which tends to separate the two continuous things from each other ; for it is thus that the one thing is pulled on with the other. (It might be thought that there is a different kind of pulling, as when wood draws the fire ; but it makes no difference whether that which pulls is in motion or at rest ; in the latter case it pulls to where it is, in the former to where it was.) Now it is impossible to move something either from the mover to something else, or from something else to the mover, without touching it, so that plainly there is nothing between that which is moved locally and that which moves it.

^b 2. Nor (B) is there anything between that which changes quality and that which causes it to change. This is plain by induction ; for we assume that things that change quality change in respect of the so-called affective qualities. For every body differs from every other either in virtue of more or fewer of the sensible qualities, or by having the same qualities in a different degree ; and that which is altered in quality is altered by these same things.

6. For these are affections of the quality in question ; a thing is altered by being warmed, sweetened, condensed, &c., lifeless and living things alike and the non-sensitive and sensitive parts of living things alike. For in a way even the senses suffer alteration ; for actual sensation is a movement transmitted through the body, in which the senses suffer an alteration.

12. In those respects in which a lifeless thing is altered, a living thing is so too, but not *vice versa* ; a lifeless thing is not altered in respect of sense-organs, and it is not aware of being affected, while a living thing is. Yet even a living thing may fail to notice its being affected if the change is not in respect of its sense-organs.

245^a 2. If, then, it is by sensible objects that things are altered, clearly the proximate cause of alteration and the proximate subject of it must be together. The air is continuous with the cause of alteration, and the percipient body with the air. Again, the colour is continuous with the light, and the light with the eye. So too with hearing and smell—the air is the proximate cause of alteration; and the savour is in contact with the organ of taste. Similarly with lifeless and insensitive things. Therefore there is nothing between the cause and the subject of alteration.

II. (C) Nor is there anything between the cause and the subject of increase; the primary cause effects increase by being added to the subject of it so as to become one. Similarly with diminution. The cause, then, either of increase or of diminution must be continuous with the subject of it, and between things that are continuous there is no intermediate.

16. Thus there is nothing between the proximate subject and the proximate cause of movement.

3. *All alteration pertains to sensible qualities.*

245^b 3. That everything that is altered is altered by sensible qualities, and that alteration is found only in things that can be affected *per se* by such, may be seen from what follows. Of other things, it is most of all in shapes, and in states of being and the acquisition or loss of them, that alteration might be thought to occur; but it does not in either.

9. For (1) (a) when a thing has been shaped we do not call it by the name of the material; we do not say that the statue is bronze, but that it is *of* bronze. But that which has undergone alteration we do call by the name of the material; we say that the bronze is liquid, and that the liquid is bronze, calling the material by the same name as the property it has acquired.

246^a 1. So that if when a shape is acquired the resultant is not called by the name of the material, but when an alteration is undergone the resultant is so called, becomings of the former kind are not alterations.

4. (b) It would be absurd to describe a man who had come into being as having been altered; coming into being involves alteration in something (e.g. the condensation or rarefaction of the material), but it is not the things that come into being that are altered, nor is their coming into being alteration.

10. (2) Nor are the states either of the body or of the soul alterations. For (a) such states are either excellences or defects, and neither of these is an alteration. Excellence is a perfecting (for

when a thing has acquired its own excellence, it is said to be perfect, since it is then most in accordance with its nature); and defect is a destroying of perfection.

17. As, then, we do not call the completion of a house an alteration (for it would be absurd if the coping-stone were an alteration, or if the house were altered rather than completed by the addition of it), so with the excellences and defects; they are perfectings or departures from perfection, and therefore not alterations.

^b 3. (*b*) All the excellences depend on the existence of a certain relation. For (i) the excellences of the body depend on a proportionate mixture of hot and cold materials, either within the body or between the body and its environment. Health, beauty, strength, etc., depend on such a relation, and dispose their possessor well with respect to the affections by which it is brought into being or destroyed.

10. Since then relations are not alterations, and are not the subjects of alteration, generation, or any change, neither are states, nor their acquisition or loss, alterations; though no doubt their generation or destruction involves the alteration of something (as does that of form), e.g. of hot and cold, or dry and wet, or of that in which these are directly present, for each defect and excellence is concerned with the things by which the possessor of the excellence or defect tends to be altered; excellence makes it impassive, or passive in a particular way, to these; defect makes it passive, or impassive in the contrary way, to them.

20. And similarly (ii) the states of the mind depend on a certain relation; the excellences are perfectings, the defects fallings away. Excellence disposes its possessor well, defect badly, to its proper affections. Therefore these too, and the loss or acquisition of them, are not alterations.

247^a 6. But their coming into being involves alteration of the sensitive organ. And it is altered by sensible objects; for all moral excellence is concerned with pleasures and pains, and these depend on action, memory, or hope. Those arising in the course of action depend on sensation and must therefore be stirred by a sensible object, and those depending on memory or hope arise from memory or hope of the pleasures of action. Thus all such pleasure is stirred by sensible objects.

14. Since defect and excellence depend on the arising in us of pleasure and pain, and these are affections of the sensitive part, it must be in consequence of alteration in something that we lose or acquire the excellences and defects; so that their coming into being involves alteration, but they are not alterations.

^b 1. Nor (iii) are the states of the thinking part alterations, nor is

there generation of them. For (α) the knowing faculty depends, much the most, on the existence of a certain relation. (β) That which potentially has knowledge becomes actually in possession of knowledge not by any change in itself, but by something coming to be present to it. For when the particular occurs, one knows the universal by virtue of it. (γ) There is no generation of the exercising of potential knowledge—unless one thinks there is generation of seeing or of touching. (δ) The original acquisition of knowledge is not generation or alteration; for it is by our thought coming to rest that we are said to know, and there is no generation of rest, any more than of any change.

13. (ϵ) As, when a man recovers from drunkenness, sleep, or disease, we do not say he has reacquired knowledge by a process of generation (though he could not use it before), neither do we so speak when he originally acquires the knowledge; for it is by the settling down of the soul from its natural disturbance that knowledge is acquired. The reason why children cannot learn or discriminate by the senses as well as their elders is that the disturbance is great in their case. The settling down with regard to some objects is produced by nature, with regard to others by other causes, but in both cases by some alteration in the body, as when mental activity is recovered after drunkenness or sleep.

248^a 6. Evidently, then, alteration depends on sensible objects and takes place in the sensitive part of the soul, and in nothing else save *per accidens*.

4. *Comparison of movements.*

248^a 10. The question may be asked whether all movements are comparable in respect of speed. If they are, (1) curves will be comparable in length with straight lines, (2) it will be possible for an alteration and a locomotion to be equal if they have been accomplished in equal times, so that a sensible affection will be equal to a length; which is impossible. Perhaps we should say then that movements are equal in speed when the objects have suffered equal movements, but that no affection is equal to a length, and therefore the movements are not comparable.

18. (A) How will this work out in the case of the circle and the straight line? (a) It would be absurd if the motion of one thing in a straight line and that of another in a circle could not be of the same speed.

22. (b) It makes no difference if we say the one must be faster or slower; for then a curve would be greater or less than a straight line, and therefore might be equal to it. For if in time A the faster thing

has travelled along a curve B and the slower along a straight line Γ, B will be greater than Γ. But the faster also travels an equal distance in a less time; so there will be a part of A in which B will travel a part of the curve equal to the straight line that Γ covers in the whole of A. The fact remains that if the motions are comparable, there will be a straight line equal to a circle. But the lines are not comparable; so neither are the motions. Things that are not called by the same name in the same sense are incomparable. We cannot compare a pen, a wine, and the highest note of the scale in respect of sharpness, because they are all called sharp only by an ambiguity; we *can* compare the highest note and that next to it, because they are called sharp in the same sense. May we not say then that 'fast' does not mean the same thing when applied to circular and rectilinear motion, and still less when applied to alteration and locomotion?

12. But it is not strictly true that if things are called by the same name in the same sense they are comparable. 'Much' means the same when applied to water and to air, but they are not comparable. If this be denied, at least 'double' always means the same, but not all things that are double of something else are comparable. Or are we to maintain that these words *are* ambiguous? The very definitions of some things are ambiguous. If 'much' means 'so much and more', 'so much' is different things in different cases; 'equal', 'one', and 'two' are similarly ambiguous. For why should some things be comparable and others not, if a single nature were involved in every case?

21. Or are we to say that things are incomparable when the direct recipients of the attribute in question are different? A horse and a dog are comparable in respect of λευκότης because the direct recipient of λευκότης, surface, is self-identical. So too they are comparable in respect of magnitude. But water and a voice are not comparable in respect of λευκότης because the recipients of the quality are different.

25. This solution must be rejected, (1) because at that rate we could maintain that all attributes, such as 'equal', 'sweet', 'white', are the same, but found in different recipients. Besides, (2) there can only be one *direct* recipient of one attribute.

249^a 3. Are we to say then that, for things to be comparable, not only must they be univocal but also neither the attribute nor its recipient must admit of difference? E.g. colour admits of difference; and therefore we cannot compare things in respect of colouredness, though we may in respect of whiteness.

8. Similarly, in respect of motion, two things are of equal speed by virtue of being moved equal amounts in equal times. If then

one thing has been altered over a certain part of its length, and another has moved an equal distance, are the two motions equal in speed? This is absurd; the reason is that there are different species of motion.

12. If, to avoid this difficulty, we say that things that are *locally moved* an equal distance in an equal time are equally fast, we get the paradoxical result that a straight line and a curve can be equal. Why are these motions incomparable; is it because motion is a genus, or because the line is a genus? Though the time is the same, if the lines differ in species the movements do so too. Sometimes the organs used, e.g. feet or wings, also seem to differentiate the motions, but this is not so; it is by the shape of their paths that motions are differentiated. Thus we reach the result that it is things that move along the same path in an equal time that are equally fast, and a path that is identical in kind is also identical as regards the movement along it; so that this is what we must look to, to determine how movement is differentiated.

21. Our argument shows that the genus movement is not undifferentiated; but many similar cases escape notice; and there are among cases of equivocation some where the meanings are far apart, some where they have a certain likeness, some where they almost form a genus or an analogy and are therefore not recognized as equivocations.

25. What, then, is the condition of a difference of species—the presence of the same attribute in different subjects, or of different attributes in different subjects? By what criterion are we to judge that whiteness or sweetness is a single thing, or that it is not? Are we to say it is different because it appears different in different subjects, or because it is not self-identical at all?

29. (B) With regard to alteration, how can one be of equal speed with another? If getting well is an alteration, one man may get well quickly and another slowly, or two men in the same time, so that there will be alterations of equal speed; for two things were altered in an equal time. But altered what? We cannot say 'equally'; what answers here to equality in quantity is likeness.

^b4. Let us say that that is of equal speed which undergoes the *same* change in an equal time. Are we to compare the subjects of the attributes, or the attributes themselves? In the case taken above, since health is self-identical, we may assume that it is present without difference of degree; but if there be two different attributes, if e.g. one thing is getting white and another is getting well, there is no identity, equality, or likeness, inasmuch as the differences of attribute make different species of alteration, as differences of path make different species of locomotion.

II. Thus we must grasp how many species there are of alteration, and of locomotion. If the proper subjects of two changes differ in species, the changes will do so too; if in genus, in genus; if numerically, numerically. But are the 'proper subjects of change', to whose identity or difference we must look to determine whether two alterations are of equal speed, the attributes or the subjects of the attributes (e.g. the extents of the two objects that have become white)? Or should we look to both, and call the alterations identical or different by virtue of the attribute, and equal or unequal by virtue of the subject?

19. (C) Similarly we must ask under what conditions two comings into being or destructions are of equal speed. The answer is 'if two things specifically alike, e.g. two men (not two animals) come into being in the same time'. One coming into being is quicker than another if specifically different things come into being in equal times (for we have not names for the two things between which the difference exists, as we have for the two things between which unlikeness exists)—or, if the theory which reduces substance to number is true, if a greater number and a lesser though specifically like number come into existence in a given time; but we have no general name for the relation between different substances (answering to 'inequality' for quantities and 'unlikeness' for qualities), nor for the two relata (answering to 'more' and 'less' for qualities and 'greater' and 'smaller' for quantities).

5. *The principle of virtual velocities.*

249^b 27. That which is setting in motion is always setting something in motion, in a certain time, and to a certain distance (for when it is causing motion it always has caused motion, so that there must be a certain distance that has been traversed, and in a certain time). Let A then be the mover, B the moved, Γ the distance traversed, Δ the time. Then (1) an equal force will move half of B twice the distance in an equal time, or (2) the same distance in half the time; and since (3) the same force moves the same thing a certain distance in a certain time and half the distance in half the time, (4) half the force (E) will move half of B (Z) the same distance in the same time.

250^a 9. (5) If E moves Z a distance Γ in time Δ , it does not follow that E moves 2Z half of Γ in time Δ ; therefore (6) if A moves B a distance Γ in time Δ , half of A will not necessarily move B in time Δ or in any part of it a distance half of Γ ; for it may not move it at all; if it did, it would follow that one man could move a ship, since both the force of the hauliers and the distance they move the ship can be divided into as many parts as there are men.

19. Therefore Zeno is not right in saying that any part, however small, of a grain of millet must in falling make a sound; for it may be that it would not in any length of time move that extent of air which the whole medimnus would. Nor does it even move so great a part of the whole as it would move if it were alone; for no part even exists, otherwise than potentially, in the whole.

25. But (7) if each of two forces moves one of two weights a certain distance in a certain time, the forces together will move the weights taken together an equal distance in an equal time; for proportion is then preserved.

28. Does this hold of alteration and of increase? There is something that causes increase, something that is increased, a certain time, and a certain amount by which the one increases the other,— and so with alteration; in twice the time there will be twice the change, and twice the change will occupy twice the time; half the patient will be changed in half the time (or the patient will be changed half as much in half the time), or twice as much in an equal time. But in half the time the agent will not necessarily alter or increase half the patient, or alter or increase the patient half as much, but may do so not at all, as in the case of a force moving a weight.

BOOK VIII

1. *There always has been and always will be movement.*

250^b 11. Has movement come into being and does it cease to be, or is it eternal and incessant, the life, as it were, of all natural things?

15. All natural philosophers maintain the existence of movement, because they are making a theory of the world and of generation and destruction, which involve movement. But those who say there are infinite worlds, some coming into being, some ceasing to be, say motion is eternal (for their comings into being and passings away involve motion), while those who say there is one universe, assume movement to be or not to be eternal, according as they assume the universe to be or not to be eternal.

23. If it is possible for motion ever not to be, that must happen in one of two ways: (1) as Anaxagoras says, viz. that when all things had been together and at rest for an infinite time, reason introduced motion and order into them, or (2) as Empedocles says, viz. that things move when Love is making one out of many or Strife many out of one, and rest in the intervals.

251^a 5. To consider the question will be of service both to the study of nature and to the study of the first cause.

8. (1) Let us start from the result of our previous discussions. We say that movement is the actualization of the movable *qua* movable.

There must therefore be things capable of moving with each kind of movement. And apart from the definition, every one would admit that movement implies things capable of the several kinds of movement; so that there must be something inflammable before there is a being burned, something capable of setting on fire before there is a setting on fire.

16. These things then must either have come into being or be eternal. If each of them came into being, there must have been, previous to the assumed change, a change that brought them into being; while the suggestion that they pre-existed already but there was no movement seems absurd at first sight, and will seem still more so on further reflection.

23. For if, while there are things capable of being moved and things capable of causing movement, there are to be sometimes a first mover and a first moved and at other times rest, there must have been a previous change; for there must have been a cause of this rest; for coming to rest is a negation of movement. So there will be change before the supposed first change.

28. For some things cause motion in one way only, others cause contrary movements—fire burns and does not chill, knowledge is of contraries. Yet even in the former class there seems to be something similar; for what is cold in a way causes heat by retiring, as a man with knowledge errs voluntarily when he uses his knowledge perversely.

^b1. But at any rate things capable of causing and suffering movement are so capable only when in a certain condition and in mutual proximity, and when these conditions are fulfilled they move and are moved.

5. If then they were not always in movement, they were not in the condition in which they were capable of moving and being moved, but one of them had to undergo a change; for if two things not in a certain relation are to get into it, at least one must change. Therefore there will be a change before the first change.

10. (2) Besides, how can there be a before and after when there is not time; or time when there is not motion? If time is the number of motion, or itself a motion, and if there is always time, motion must be eternal. But with one exception all philosophers are agreed in saying that time has not come into being, and Democritus uses this to refute the view that all things have come into being. Plato alone generates time; for he makes it simultaneous with the heavens, and says these have come into being.

19. If then it is impossible for time either to be or to be conceived without the now, and the now is a mean, the beginning of the future and the end of the past, time must be eternal; for the end of any

time that may be supposed to be the last will be in a now (since there is nothing in time but nows) and therefore will have time on both sides of it. But if time is eternal, so is motion, since time is an attribute of motion.

28. The same argument ((1) above) shows motion to be *imperishable*. As in discussing the generation of motion we saw there would be a change before the supposed first change, so now there must be one after the last; for a thing does not at the same time cease to be moved and to be movable, or to be capable of causing motion and to be causing it. And the destructive agent will have to be destroyed when it has done its destroying, and that which destroys it will have later to be destroyed; for destruction itself is a change. If these results are impossible, motion is clearly eternal; indeed, the opposite view is fantastic.

252^a 5. The same may be said of the view that 'such is the nature of things' and that this must be regarded as a principle; as when Empedocles says that it is the nature of things that Love and Strife should rule in turn and that there should be rest in the intervals. Those who believe in a single principle, like Anaxagoras, would probably say the same.

II. But nothing disordered exists by nature; nature is the cause of order. Now there is no ratio between infinite and infinite; but all order is ratio. That there should be rest for an infinite time and then movement, but nothing to account for its beginning now rather than before, *this* is not nature's work. For what is by nature is either invariable, like the upward motion of fire, or its variation has a law.

19. Hence it is better, with Empedocles, to make the universe rest and move in turn; for there *is* some order in *this*. But even one who says this should not merely say it but support it by induction or demonstration; for the assumed principles do not explain the alternation, nor was this their essence; their essence was to bring together and to separate respectively.

27. If he is to give definiteness to his alternation, he should quote instances, as he justifies the rôles assigned to Love and Strife in the universe by pointing to their rôles in human life. He should also justify his assignment of equal times to motion and rest.

32. In general, it is not enough to assign as a cause that 'things always are so', as Democritus says 'it happened so before'. What he says is true enough of some cases, but he is not justified in generalizing. The triangle always has its angles equal to two right angles, but there is a reason for *this* eternalness; whereas first principles are eternal and have *no* ulterior cause.

^b 5. This then is our proof that motion is eternal.

2. *Refutation of objections to the eternity of movement.*

252^b 7. The contrary view is not hard to refute. The following reasons seem to favour the possibility of a beginning of movement. (1) No change is eternal; for all change is from something to something, so that the contrary termini must form a limit to movement.

12. (2) We see, even among lifeless things, movement starting in things of which neither the whole nor any part is in movement.

17. (3) This is clearest in the case of living things; movement starts in ourselves when there is no movement in us and no external mover. *This* we do not see in lifeless things, which need an external mover; but if an animal is ever completely at rest, movement can be originated in an unmoving thing from within. And if this can happen in an animal, why not in the universe, if what is infinite can be said as a whole to move or to rest?

28. (1) The first statement is true, that there cannot be a self-identical eternal movement between the same two opposites. This must be so, if it is possible for the motion of a self-identical thing not to be self-identical; if, e.g., the sound produced by a single string is constantly different, though the string is in the same condition and struck in the same way. However this may be, there is no reason why there should not be a movement which is self-identical by virtue of being continuous and eternal; this will become clearer later.

253^a 2. (2) The fact that a thing which is not moving begins to move presents no difficulty, if at one time there is something that will move it from outside and at another there is not. But the question remains how the same thing can at one time be moved and at another not, by the same mover; this is the same as the question why the universe does not consist of things always at rest and things always in movement.

7. (3) The case of living things offers the greatest difficulty, as seeming to show that movement can begin without an external mover.

II. But this appearance is false. For we see some part of an animal to be always in movement; and the cause of this is not the animal, but presumably the environment. An animal originates in itself not all movement, but locomotion. It is possible, or rather necessary, that many movements should be started by the environment, and that some of these should move thought or desire, and that this should move the whole animal, as happens in the case of sleep; there is no perceptive movement present, but there is some movement, and as a result the animal awakes. But this will be made clear by what follows.

3. *There are things that are sometimes in movement, sometimes at rest.*

253^a 22. Our starting-point is identical with the starting-point of inquiry into the above-named problem; it is the question why some things are sometimes in movement, sometimes at rest. Either

- (1) All things are always at rest, or
- (2) All things are always in movement, or
- (3) Some things are in movement, others at rest, and of these either
 - (a) the former are always in movement, the latter always at rest, or
 - (b) all are sometimes in movement, sometimes at rest, or
 - (c) some things are always at rest, some always in movement, some sometimes at rest, sometimes in movement.

The last of these possibilities removes all the difficulties, and the assertion of its truth will terminate our work.

32. To maintain (1) that all things are at rest and to offer argument for this view, abandoning sense-perception, is a weakness of thought, and casts doubt not on a detail but on a system; it opposes not only physics, but practically all the sciences and all ordinary opinions.

^b 2. Besides, as objections to first principles do not concern the mathematician or any other scientist, this view does not concern the physicist; for it is his assumption that nature is a principle of movement.

6. To say (2) that all things are in movement is false, but less subversive of physics; for though nature was defined as a principle of rest, as of movement, movement is what is typical of nature; and some say that all things are always in movement, but that this escapes our senses. Though they do not specify what kind of movement they mean, or whether they mean all, it is easy to reply to them.

13. For (a) neither increase nor diminution can be continuous; there is also the intermediate state. The argument is like that about the wearing away of stones by the dripping of water; if the dripping has removed so much, it does not follow that it removed half the amount in half the time; as in the case of the hauling of a ship, so many drops produce so much change, but a smaller number would in no length of time produce an equal amount. What is removed is divisible into parts, but none of them was moved separately, but all together. Evidently then there need not be something always passing away because the process of diminution is infinitely divisible; the withdrawal may be at a moment.

23. Similarly (b) with any change of *quality*; (i) the change need

not be infinitely divisible because the thing that is changed is so ; it often takes place all at once, as in the case of freezing. Again, (ii) when anything has fallen ill, a time must elapse in which it becomes well ; the change cannot take place in a moment ; and the new process is a process towards health and not towards anything else. Thus to say that change of quality is continuous is to contradict obvious facts ; for change is to a contrary state, but a stone is not always becoming harder or softer.

31. And (c) with regard to locomotion, (i) it would be strange if it could escape our notice whether a stone was falling, or resting on the earth. Again, (ii) each of the four elements rests in its proper place, and moves from it only under compulsion ; if then some of them are in their proper places, all things cannot be moving locally.

254^a 1. These and similar arguments show that things cannot all be always in motion, or all always at rest. But (3 a) neither are some always at rest, others always in motion, and none sometimes at rest and sometimes in motion. We reply to this, as to the previous views, (i) that we see the change from motion to rest and *vice versa* taking place, in the same subjects.

8. We say (ii) that the theory is fighting obvious facts. There can be neither increase nor compulsory motion, unless a thing that is at rest can begin to move contrary to nature ; thus this view does away with generation and destruction. Now all are practically agreed in thinking that motion is a sort of generation and destruction ; for what a thing is changing into, this or in this it comes to be, and what it is changing from, this passes away or the thing passes away from this. Clearly then there are cases of occasional motion and occasional rest.

15. (3 b) The view that *all* things are sometimes at rest and sometimes in motion must be confronted with our former arguments. Let us start from the old enumeration of possible views.

23. We may continue the refutation of view (1). If all things are really at rest, as those maintain who make being infinite and unchangeable, at least they do not seem so to sense-perception. Now if false opinion, or indeed any opinion or imagination, exists, or if things seem sometimes so and sometimes otherwise, motion exists ; for imagination and opinion are thought to be motions of a kind.

30. But to consider this question, and to seek argument where we are too well off to need argument, is to judge badly of the better and the worse, the credible and the incredible, the ultimate and the non-ultimate.

33. Views (2) and (3 a) are similarly impossible. The answer to all these views is that we see some things sometimes moving and

sometimes resting. We have still to consider whether (3 *b*) or (3 *c*) is the true view.

4. *Whatever is in movement is moved by something else.*

254^b 7. Some things are movers or are moved *per accidens*, others *per se*; *per accidens* (1) those that are so in the sense that they belong to what moves or is moved, and (2) those that are so in virtue of a part of themselves; *per se* those that are so in neither of these ways.

12. Of things moved *per se*, some are moved by themselves, others by something else, and some by nature, others by force; for (*a*) that which is moved by itself is moved by nature (e.g. any animal; the whole animal moves itself by nature, though the body may be moved either by nature or contrary to nature, according to the movement it is making and the element it is composed of);

20. and (*b*) of things that are moved by something else (i) some are moved naturally and (ii) others contrary to nature, as when earthy things move upward or when the parts of animals are moved contrary to nature, in respect of their positions or the manner of their movement.

24. The fact that that which is in movement is moved by something is most clear (*b* ii) in things that are in movement contrary to nature;

27. Of things moved naturally it is clearest in (*a*) those that are moved by themselves, i.e. animals. It is not obscure whether these are moved by something, but only how the analysis into mover and moved is to be made; for it seems that the two are separate here as in a ship or any artificial construction, and that it is only in this sense that animals move themselves.

33. The chief difficulty concerns (*b* i) the things that are moved by something else, but naturally. What are these, e.g. things light and heavy, moved by? They move into uncongenial regions by force, but into their proper regions by nature.

255^a 5. We cannot say they move themselves; for (*a*) this appertains to *life*, and (*β*) if they could, they could also stop themselves, so that if it were in the power of fire to move upward, it would be in its power to move downward. (*γ*) If they move themselves, it is absurd that they should move only with one movement.

12. (*δ*) How can a continuous and naturally united thing move itself? *Qua* one and continuous, a thing is impassive; it is only in so far as there are separate parts that one can act and the other be acted on; agent and patient must be separate, as we see them to be when a lifeless thing is acted on by a living thing. If we could analyse the causes we should see the same thing happening within living beings.

20. The same distinction may be found among movents; some are so, contrary to nature (e.g. the lever); others, by nature (e.g. the actually hot has naturally the power of affecting the potentially hot).

24. So too that is naturally movable which is potentially of a certain quality or size or in a certain place, when it has this principle in itself and not *per accidens*; for the same thing might be of a certain quality and of a certain size but the one might belong to the other *per accidens*. Thus fire and earth are moved by something forcibly when they are moved contrary to nature, but naturally when their potentialities are actualized.

30. The existence of different senses of 'potentially' is the reason why it is not clear by what such things are moved. A learner is potentially a knower in a different way from the man who has the knowledge but is not exercising it. But always, when that which can act and that which can be acted on are together, the potential becomes actual; that which is learning, from being potentially one thing comes to be potentially another (for the man who has knowledge without using it is no doubt knowing potentially, but not in the same way as he was before he learned); but when he is in this state he exercises his knowledge if nothing hinders—or else he would be in the opposite state, that of ignorance.

^b5. Similarly with natural things; the cold is potentially hot, and when it has been changed it is actually hot, and burns things if it is not prevented. So too with the heavy and the light; what is light comes from what is heavy, and is then already light, and will act as such if it is not hindered. The activity of what is light is to be in the upper region, and it is being hindered when it is in the lower. So too with size and with quality.

13. Yet the question is asked, why light and heavy things move to their own regions. The answer is that this is their essence. But there is more than one way of being potentially light or heavy. When a thing is water, it is potentially light; and when it is air it is still potentially light (for it may be prevented from moving up); but if the hindrance is removed it becomes actually light and moves higher and higher. So too with that which is potentially of a certain quality or size.

24. The person who removes the hindrance in a sense produces movement and in a sense does not; he produces it only *per accidens*, as a rebounding ball is moved not by the wall but by the thrower.

29. That no such thing moves itself, then, is clear; but it has a principle of movement, not of producing it but of suffering it. If, then, all things that are moved are moved either naturally or contrary to nature, and the latter are all moved by something else, while of the former both those that are and those that are not moved by

themselves are moved by something (e.g. light and heavy things, which are moved either by that which made them light or heavy, or by that which removed the obstacle to their movement), all things that are in movement are moved by something.

5. *The first movent is not moved by anything outside itself.*

256^a 4. (A) Being moved by another is of two kinds. The mover may cause movement (1) because of something else that moves it, or (2) of itself; and this mover proper may either come next to the thing moved or be separated from it by intermediates; the stick moves the stone and is moved by the hand, which is moved by the man, who is moved by nothing else.

8. We say that both the last and the first are movers, but especially the first; for it moves the last and not *vice versa*, and the last will not cause movement without it, but it can without the last.

13. If then everything that is in movement is moved by something, and *either* by something moved by something else *or* not, and in the former case there must be something that causes motion without being moved, while in the latter case there need not be a mover that is also moved (for there cannot be an infinite series of moved movers, since in an infinite series there is no first term)—if then everything that is in movement is moved by something, and the first mover is moved but not by anything else, it must be moved by itself.

21. (B) We may state the same argument in another way. Every mover moves something and with something—either with itself or with something else. Movement cannot be caused without something which moves by itself that which it moves. But if it causes motion by itself, there need not be anything else with which it does so, while if there is something else with which it causes motion, there will also be something that does so by itself, or there will be an infinite regress.

28. If then something causes motion by being moved, there must be a limit to the series; for if the stick causes motion by being moved by the hand, the hand does so with the stick, and if something else does so with the hand, there is something else that moves the hand. When there is a series of things causing motion by means of an instrument, there must be a prior thing that does so by itself.

33. If this is in movement, but that which moves it is not something else, it must move itself; so that this argument also shows that either that which is in movement is moved directly by a self-mover, or we come to a self-mover in the long run.

^b3. (C) The same result can be reached otherwise. If everything that is in motion is moved by something that is in motion, *either* this belongs to things *per accidens*, so that that which causes motion is moved but does not do so by being moved, *or* it belongs to things

per se. Now (r) if it is *per accidens*, that which causes motion need not be moved. And if this is so, it is possible that sometimes nothing should be in motion. Now if we assume what is possible, nothing impossible will follow, though something that is false may. But that there should ever not be motion has been shown to be impossible.

13. This is what might be expected. For there are three things—the moved, the mover, the instrument. The moved must be moved but need not move anything; the instrument must both move and be moved (for this changes with the moved, as is plain in the case of things causing locomotion; for they must be in contact with what they move, up to a point); a mover which is not in contact must be motionless.

20. Since we see the last term, which can be moved but has no spring of movement, and that which is moved by itself, it is probable (not to say necessary) that an unmoved mover also exists. Hence Anaxagoras is right in making his Reason impassive and unmixed, since he makes it a spring of movement; it can move only by being unmoved, and can prevail only by being unmixed.

27. But if (2) that which causes movement is moved *of necessity*, it must, *qua* moved, be moved *either* (a) with the same kind of movement *or* (b) with another.

34. But this is impossible; for on hypothesis (a) there must be the most minute identity, e.g. if some one is teaching geometry, he must be learning the same proposition that he is teaching! And hypothesis (b) is exposed to the difficulty that the number of kinds of movement is limited.

257^a 7. If the advocate of hypothesis (b) says that when A causes local motion and is increased and B causes increase and is altered, C causes alteration and is locally moved, this comes to the same thing as hypothesis (a). For it is plain that a thing is moved not only by its immediate mover but also and even more by the remote mover. But this is impossible; for it means that the teacher must be learning, which implies that he both has and has not knowledge of the same thing.

14. (D) If everything that is moved is moved by something that is moved, this implies the still more absurd consequence that everything that has the capacity for moving has the capacity for being moved, as though everything that could heal could be healed, &c., either (a) directly, or (b) indirectly, i.e. if that which could heal could be taught, but we ultimately come round to the same kind of process (i.e. being healed). (a) is impossible, and (b) fantastic, since it is absurd that that which is capable of causing increase should necessarily be capable of being altered.

25. It is not necessary, then, that that which is moved should be moved by something else, and that something that is moved; therefore there will be a limit to the series. Thus that which is moved will be moved ultimately either by something that is at rest or by itself.

27. (E) But further, if one had to ask whether that which moves itself or that which is moved by another is the cause of motion, any one would name the former; for that which is *per se* a cause is a prior cause to that which is so *per aliud*. We must therefore make a fresh start and ask how that which moves itself does so.

The first mover is immovable.

33. Everything that is in movement must be infinitely divisible; since we have proved that everything that is in movement is continuous. (A) It is impossible, then, that that which moves itself moves itself at all points; for (1) then that which is specifically one would be as a whole causing and suffering the same locomotion or alteration.

^b6. Again, (2) we have shown that it is the movable that is moved; and the movable is potentially, not actually, in movement, and that which exists potentially is moving to actuality, and movement is an incomplete actualization of the movable. But that which causes movement must already have the attribute it imparts; it is that which is hot that heats. Thus the same thing will be at the same point hot and not hot; and similarly wherever that which causes change must have the quality it imparts. Therefore there must be a part of the self-mover that moves and a part that is moved.

13. (B) That each part is not moved by the other is evident from these considerations: (1) there would then be no first mover, since each part would (indirectly) move itself (for of two movers the prior is more the cause of movement; for there were two ways of causing movement, (a) by being moved by something else and (b) by oneself; and that which is farther from what is moved is nearer the first principle of movement than the intermediate).

20. (2) That which causes movement need not be moved otherwise than by itself; therefore it is only *per accidens* that the other part countermoves. I take then the case in which it does not do so; then there is a part that is moved and a part that moves being unmoved.

23. (3) That which moves need not be countermoved, but movement must be caused either by an unmoved or by a self-moved, if there must always be movement.

25. (4) On the hypothesis we are assuming, a thing would be moved with the movement it is causing.

26. But (C) of that which primarily moves itself neither one nor many parts can move *themselves*. For (1) if the whole is moved by itself, it will either be moved by one of the parts, or as a whole by itself as a whole.

30. If (a) it be by a part's being moved by itself, *this* will be the primary self-mover (for it when separated will move itself, and it will not be the *whole* that moves itself); if (b) the whole is moved by the whole, the parts move themselves only *per accidens*. Let us suppose that they do not move themselves. Then part of the whole will cause movement, being unmoved, and part will be moved; for only thus can a thing be self-moved.

258^a 3. Thus if we speak of a self-mover, we are describing the motion of the whole as due both to itself and to a part.

5. But, since some things cause motion by being moved by something else, and others without being moved, and some things that are moved cause motion and others do not, a self-mover must consist of a part that causes motion without being moved and a part that is moved but does not necessarily cause motion.

9. For let A cause motion without being moved, and B be moved by A and move Γ , and Γ be moved by B and move nothing (for we may suppose that there is but one intermediate). Then the whole AB Γ moves itself. But if I take away Γ , AB will move itself, A moving and B being moved, while Γ will not move itself, or be in motion at all. Nor will B Γ move itself without A, for B causes motion only by being moved. AB alone therefore moves itself. Therefore that which moves itself must have a part that causes motion without being moved, and a part that is moved but does not necessarily cause motion, either both touching one another or one touching the other. If that which moves is a continuum (that which is moved *must* be), mover and moved will touch each other.

22. Therefore the whole moves itself not by some part being such as to move itself; it is only as a whole that it moves itself, both being moved and moving because it has a part that moves and one that is moved. It is not moved as a whole nor does it move as a whole; A moves and B is moved.

27. A question arises if one takes away part from A (if that which causes motion without being moved is a continuum) or from B; will the rest of A cause motion or the rest of B be moved? If they will, AB would not be primarily moved by itself.

32. Is the answer that each of the two, or the moved part, may be potentially divisible, provided it is actually undivided, but that if it is divided, it no longer has the same nature; so that the power of causing motion or being moved may be in divisible things primarily?

^b 4. It is evident then that the prime mover is unmoved; for whether that which is moved by something leads straight to the first unmoved mover, or to something that is in motion but moves and stops itself, in either case the first mover involved by all the things that are in motion is itself not in motion.

6. *The immovable first mover is eternal and one.*

258^b 10. Since motion must be eternal, there must be one or more first movers; and the first mover is unchangeable. That *each* unmoved mover should be eternal matters nothing to our argument; but that there must be something that has no part either *per se* or *per accidens* in motion, and that has the power of moving other things, is clear from the following considerations.

16. Allow it to be possible that some things can be and not be without generation and destruction (as must be the case if anything without parts can at one time be and at another not); and that of unmoved movers some at one time are and at another are not. Still, this cannot be so with all; for things that move themselves have a cause of their being at one time and not at another. For everything that moves itself must have magnitude (since nothing without parts can be moved), though that which causes movement need not. The cause of the continuity of generation and destruction, then, is not any of the things that are unmoved but not eternal, nor a succession of such things.

29. For neither each nor all of them can cause what is eternal and continuous; for this causal relation must be eternal and necessary, while they are indefinite in number and not simultaneous. It is clear, then, that however much some of the unmoved movers and many of the self-movers perish and are succeeded by others, and one thing being motionless moves another and that a third, yet there is something that contains these, and that is apart from each of them, which is the cause of some things being and others not, and of the continuity of change; and this is the cause of movement in them, while they are the cause of it in other things.

259^a 6. If, then, motion is eternal, so is the first mover, if it is single; and if there are more than one, the eternal are more than one. But it is better to think the first mover to be one rather than many, finite rather than infinite in number. For if a finite set of conditions will produce the same result it is better to assume them, since in nature the finite and the better must, when it is possible, exist rather than the opposite. And it is enough if there is one which, being the first of unmoved things and being eternal, is the cause of movement in all other things.

13. The following considerations also show that the first mover must be one and eternal. It has been shown that motion must be eternal, and therefore continuous; for the eternal is continuous, while the successive is not. But if motion is continuous, it must be one; and it is one if and only if it is produced by one mover and in one subject of movement; for if it is to be caused by one mover after another, the whole movement will be not continuous but successive.

The first mover is not moved even incidentally.

20. The necessity of a first, unmoved mover can be seen also by reviewing our original argument. It is evident that there are some things that are sometimes in motion and sometimes at rest. And it has thus become clear that neither are all things in motion, nor all at rest, nor some always at rest and the others always in motion; the things that can move at one time and rest at another prove this.

27. Things of this sort are clear to all, but we wish to demonstrate the nature of the other two types, viz. that some things are always unmoved and others always moved. In our advance to this point we have assumed that everything that is in motion is moved by something, and that the mover is either unmoved or moved, and moved either by itself or by something else, and have reached the conclusion that the origin of movement is, among things in motion, something that moves itself, but is in the long run something unmoved. Now we see that there are evidently things that move themselves (i.e. living things), and these have suggested the opinion that motion may come into being, not having existed at all before, since these things seem to pass from complete rest into motion. In answer to this it must be noted that they move themselves with but one motion, and not strictly even with that; the cause is not in themselves; there are in animals other natural movements which they do not impart to themselves—growth, decay, respiration—and these they experience when they are not experiencing the motion they impart to themselves.

^b II. The cause is the environment and many of the things that pass into them, e.g. food (they sleep when this is being digested, and when it is being distributed they awake and move themselves, the first cause being outside them, which is the reason why they are not moved by themselves continuously); it is something else that moves them, itself being in motion and changing as it comes into relation with each of the things that move themselves.

16. In all these self-moving things the first mover and cause of their self-movement is moved by itself, but *per accidens*; for the body, and therefore also that which is in the body and by its leverage of the body moves itself, changes its place.

20. It follows that if there is something unmoved in itself but *per accidens* moving itself, it cannot cause continuous motion. Therefore, since there must be continuous motion, there must be a first mover that is not moved even *per accidens*, if there is to be unceasing motion and being is to remain unchanged; for if the principle remains the whole must remain, since it is continuous with the principle.

28. But it is not the same thing to be moved *per accidens* by oneself and by something else; the latter property belongs even to some of the principles that move the heavenly bodies, viz. to those that move the bodies which have complex orbits; while the former belongs only to perishable things.

The 'primum mobile' is eternal.

32. If there is something that causes motion while itself unmoved and eternal, that which is directly moved by it must also be eternal. This is clear also from the fact that other things could not be subject to change unless there were something that was in motion to move them. For that which is unmoved will always produce a single movement, since its relation to the moved does not change; but that which is moved by something that is moved indeed, but moved by what is unmoved, owing to its varying relation to things does not cause the same movement, but because it is in contrary places or different configurations will make each of the things it moves move in contrary ways, and sometimes rest and sometimes move.

260^a II. What we have said reveals the answer to our original inquiry, why it is not the case that all things are in motion, or all at rest, or some always in motion and others always at rest, but some are sometimes in motion and sometimes at rest. The cause is that some are moved by an unmoved eternal mover, and therefore are always in motion, while others are moved by something subject to change, and therefore themselves change. The unmoved, since it is always in the same condition, will impart one simple movement.

7. *Locomotion is the primary kind of movement.*

260^a 20. Let us make a fresh start and ask whether any, and if so what, movement can be continuous, and what is the primary kind of movement; for if there must always be movement, and one kind of movement is primary and continuous, the first mover must produce movement of this kind.

26. Of the three kinds of movement, in respect of size, quality, and place, the last must be the primary kind. For (1) there cannot be increase without alteration, since that which is increased is increased

in a sense by its like, and in a sense by its unlike ; for contrary is said to be food to contrary, but in being absorbed it becomes like to like. This change to a contrary state must be alteration.

^b1. But if the food is altered, there must be something that alters it and makes it actually hot from being potentially hot. Therefore that which alters it must be at one time nearer to and at another farther from that which is altered. And this involves locomotion. If, then, there is to be movement always, there must, first among the movements, always be locomotion, and the first kind of locomotion if it has a series of kinds.

7. (2) The origin of all changes of quality is condensation and rarefaction ; heavy and light, soft and hard, hot and cold, are forms of density and rarity. But condensation and rarefaction are combination and separation, in virtue of which substances are generated and destroyed. But in being combined and separated things must change their place. And further, the extension of that which grows or decreases changes with respect to place.

15. (3) In movement as in other things, 'first' has more than one meaning. 'Prior' is applied (*a*) to that without which other things cannot exist, while it can exist without them, (*b*) to the prior in time, (*c*) to the prior in essence. Therefore (*a*) since there must be motion continuously, and either continuous or successive motion may exist continuously, but continuous motion does so more completely, and it is better that motion be continuous rather than successive, and we assume the better to exist in nature if it is possible, and it *is* possible for motion to be continuous, and this can only be locomotion, locomotion must be primary.

26. For there is no need for that which changes place to be increased, or altered, or generated or destroyed ; but none of these changes can take place unless there is the continuous movement which the first mover produces.

29. (*b*) This is first in time ; for this alone can belong to eternal things. In the case of a single generable thing locomotion must come last (for after its generation alteration and increase come first, while locomotion belongs to things that have reached maturity) ; but there must be a prior thing subject to locomotion to be the cause of generation without being itself generated, as parent is to offspring.

261^a 3. Generation might seem to be the first of movements because the thing must first be generated. This is true of any single generated thing, but prior to generated things there must be something in motion, itself existing, and not subject to generation, and another prior to *it*.

7. Since generation cannot be the first (for then all moving things

would be destructible), none of the subsequent motions (increase, alteration, diminution, and destruction) can be prior to locomotion.

13. (c) In general, that which is being generated is imperfect and is moving towards its first principle, so that that which is later in generation is prior in nature. Now locomotion is the motion that is acquired last by generable things. Hence some living things are entirely motionless owing to imperfection (i.e. plants, and many kinds of animal), but locomotion belongs to things as they reach perfection. Thus if locomotion belongs more to things that have more completely reached their true nature, it must be essentially the first motion in respect of essence.

20. There is the further reason that the movement in which the moving thing diverges least from its essence is locomotion; in this alone none of its being is changed, while in alteration its quality, in increase and diminution its size, is changed.

23. (4) It is very clear that that which moves itself has locomotion as its most typical motion; and of all things that move and are moved the self-mover is the primary cause of movement to things that are in movement.

No movement or change is continuous except locomotion.

27. Evidently then locomotion is the first motion; what is the first locomotion? The answer to this will prove also what we have laid down both now and earlier, that there can be continuous and eternal motion.

31. That no other movement can be continuous is clear from the following considerations. All other movements and changes are from opposite to opposite; being and not-being are the termini of generation and destruction; contrary qualities, of alteration; greatness and smallness, of increase and diminution; and contrary changes are the changes to contrary termini.

^b 1. Now that which exists before it moves with a particular motion must be at rest. Clearly then that which changes from one *motion* to its contrary will rest at the terminus. So too with opposed kinds of *change*. Destruction and generation are opposed, and a particular generation to a particular destruction. Therefore if a thing cannot simultaneously undergo opposite changes, such change cannot be continuous.

7. For it makes no difference whether opposite changes are contrary or not, if only they cannot belong to the same thing at the same time; nor does it matter if the thing need not rest at the terminus, nor if the contrary of change is not rest (for presumably that which is not is not at rest, and not-being is the terminus of destruction). All that matters is that there must be an interval of

time; for then the change is not continuous; in the case of motion it was not the contrariety that mattered, but the impossibility of both motions being present together.

15. We must not be disturbed by the fact that the same thing will have more than one contrary (i.e. that motion is contrary both to rest and to motion in the contrary direction). We must merely realize that it *is* in a sense opposed to both, as the equal or moderate is opposed both to what exceeds it and to what it exceeds, and that opposite movements or changes cannot be present at the same time.

22. Further, in the case of generation and destruction, and indeed generally, it would seem odd if a thing were destroyed as soon as it was generated, without any interval. And we may extend this to the other kinds of change; for it is natural that the same should hold good of them all.

8. *Only circular movement can be continuous and infinite.*

261^b 27. Let us now show that there can be an infinite movement, single and continuous, and that this is circular movement. Everything that is moved locally is moved either in a circle or in a straight line or in a compound of the two, so that if one of the simple movements is discontinuous, so is the composite movement. Clearly that which moves in a straight line does not move continuously; for (1) it turns back on itself, and therefore moves with contrary movements: up and down, forward and backward, or left and right.

36. We have laid it down that a single and continuous movement is the movement of a single thing in a single time and in a specifically single respect. For there were three things: that which is moved, the time, and the respect, the last being of place, quality, form, or size.

262^a 5. Now contraries are specifically different; and the differentiae of place are those we have named. That movement from A to B is contrary to movement from B to A is shown by the fact that they arrest one another if they are simultaneous. So too with movement on a circle, e.g. from A to B and from A to Γ (for these arrest each other, even if they are continuous and there is no turning back); but not with movement sideways and movement upwards.

12. That rectilinear movement cannot be continuous is most clearly shown (2) by the fact that when it turns back there must be a pause (which is equally true of movement along a circle; for rotatory movement is not the same as movement along a circle; the latter may either be continuous, or turn back when it has returned to its starting-point).

17. That there must be a pause is clear not merely from observation but by argument. For there are three things, beginning, middle, and end, and the middle is beginning relatively to the end

and end relatively to the beginning; it is one in number but two in definition.

21. Again, there is a difference between being potentially and being actually, and any point between the ends of a straight line is a middle potentially, but not actually unless the moving object divides the line there and starts again after pausing; and then the middle point becomes the beginning of the later movement and the end of the earlier.

28. When the movement is continuous, there has been no process of A's coming to be or ceasing to be at B; it is there only in the now, not in any time except that of which the now is a dividing-point, i.e. the whole time. (If one is to say that it has come to be and ceased to be there, A will be always stopping throughout its movement; for A cannot at the same time have come to be and ceased to be at the same point. Therefore it must be at different moments that it has done so. Therefore there will be an interval of time, and so it will rest at B; and similarly at the other points. Thus when A uses the mid-point B both as end and as beginning, it must pause there because it makes it two just as one might in thought.) But it *has* ceased to be at its starting-point A and come to be at Γ, when it has finished its movement and come to rest.

8. Hence we can deal with the difficulty that arises, viz. that if E were equal to Z and A were to move continuously from the starting-point to Γ, and when A was at B, Δ was moving from Z to H uniformly at the same speed as A, Δ would arrive at H before A arrives at Γ; for that which starts first must arrive first. For A has not reached and left B at the same time, and that is why it falls behind Δ.

17. To solve the difficulty we must refuse to assume that when A had reached B, Δ was moving from Z (for if A is to have reached B by a process, there will also be a process of leaving it, and this will not be simultaneous with the reaching it); A was at B at a section of time, not for a time.

21. But the way of speaking which was inappropriate to continuous movement is appropriate to that which turns back on itself. For if H moves to Δ and back again, it uses Δ both as end and as beginning, and must therefore pause at it; and it has not reached and left Δ simultaneously, since then it could both be and not be there simultaneously.

28. We must not use our former solution; we cannot say that H is at Δ at a moment and has not reached it or left it by a process. For here the end to be reached is an actually, not potentially, existing one. The intermediate points in a continuous movement exist

potentially, but this actually ; it is an end from below, a beginning from above. Therefore that which turns back along a straight line must pause, and therefore there cannot be continuous eternal rectilinear movement.

263^a 4. We may answer similarly those who ask Zeno's question—whether the half must always be traversed before the whole, and the series of halves is infinite, and an infinity of things cannot be traversed ; or those who claim that one should be able to count the mid-points as the moving body reaches them, so that when it had traversed the whole line one would have counted an infinite number, which is impossible.

II. In our first discussion of movement we solved this problem by pointing out that the time is infinitely divisible, so that there is no difficulty in traversing an infinite number of points.

15. This solution is a sufficient answer to the putter of the problem (for the question was whether an infinite number of things can be traversed or counted in a finite time), but is not adequate as an account of the facts ; for if one leaves out the distance and the question whether an infinite number of things can be traversed in a finite time, and asks about the time itself (for it is infinitely divisible), this solution is insufficient ; the true one, which we mentioned recently, must be given.

23. This is, that if one divides a continuous line into halves, one uses one point as two. This is done both by one who counts and by one who bisects a line. When one divides it thus, neither the line nor the movement will be continuous ; for continuous movement is movement over a continuous path, and in a continuous path there is no doubt an infinite number of halves, but only potentially. If one makes them actual, one will get not a continuous but an intermittent movement.

30. This is what happens when one counts the halves ; the one point has been counted as two, as the end of one half and the beginning of another.

^b**3.** To one who asks, then, whether an infinite number of things can be traversed either in time or in distance, the answer is that in a sense it can and in a sense it cannot. If they exist actually it is not possible ; if potentially, it is ; for one who moves continuously has incidentally traversed an infinity of points, but not in an unqualified sense, since, while the line is incidentally an infinite number of halves, its essence is different.

9. If one does not treat the moment that divides before and after as belonging to the later time so far as the object as concerned, the

same thing will be simultaneously existent and not-existent, and it will be non-existent when it has come into being. The moment is common to the earlier and the later time and is numerically one, but it is not one in definition, being the end of the one and the beginning of the other. But so far as the object is concerned it belongs to the later stage of what occurs to the object.

15. Let the time be $\Delta\Gamma B$, the object Δ . In the time A, Δ is white, in the time B not white; in Γ , therefore, it is both. For it is white in any element of A (*if* it was white for the whole of A), and not-white in any element of B; and Γ is in both A and B. To avoid this difficulty, we must say that it was white not in the whole of A, but in the whole of A except its last moment Γ , which belongs to the later stage.

21. If not-white was coming into being and white ceasing to be in the whole of A, not-white *has* come to be or white *has* ceased to be in Γ . Then either (1) it is in Γ that Δ can first be said to be white, or (2) when it has become white it is not white, and when it has ceased to be white it is white, or (3) it is white and not-white (or existent and non-existent) at the same time.

26. But if what is, formerly not having been, must have come to be existent, and does not exist when it is coming to be, time cannot be divided into indivisible times. For if Δ was becoming white in time A, and has come to be, and is, white in an indivisible time consecutive to A, viz. in B, there must have been a becoming between A and B, and therefore a time in which it took place.

264^a 1. The same argument will not apply to those who do not believe in indivisible times; for then the thing has come to be, and is, in the last moment of the time in which it was coming to be, a moment to which there is nothing consecutive. Further, if it was coming to be in the whole of A, the time in which it has come to be and was coming to be is no greater than that in which it was coming to be, only.

7. These and such-like are the really appropriate arguments; but the same result emerges from the following abstract considerations. (1) Everything that is moving continuously, if it is not forced out of its path, must have been moving towards that at which it actually arrives, and that too from the beginning of its movement; for why more at one moment than at another? Now that which is moving from A will when it has reached Γ move continuously back to A. So when it was moving from A to Γ , it was also moving from Γ to A, i.e. with contrary movements.

18. (2) At the same time it is moving from where it is not. If this is impossible, it must pause at Γ . Therefore the movement is not a single one.

21. (3) Again, the following more general considerations prove the point with regard to every kind of movement. If everything that moves moves with one of the aforesaid movements (since there was no other), and that which has not always been moving with a given motion (I refer to specifically different motions, not to parts of one whole) must have been resting with the opposite rest; if then rectilinear motions are contrary, and a thing cannot move with contrary motions at once, that which is moving from A to Γ cannot simultaneously be moving from Γ to A; and since it is not performing both movements simultaneously but is about to perform the latter, it must first rest in Γ , since this is the rest opposed to motion from Γ . Clearly then the motion is not continuous.

^b 1. (4) The following argument is more specially adapted to our particular problem. Not-white has ceased to be and white has come to be simultaneously. If then the change to white and from white is continuous and does not pause, not-white has ceased to be, white has come to be, and not-white has come to be, simultaneously.

6. (5) Again, if the time is continuous, it does not follow that the movement is so; it may be successive; how could contraries meet in the same point?

9. But circular motion *is* single and continuous; for no impossible result follows from this. That which is moving from A will be moving at the same time to A in virtue of the same impulse (for to that at which it will arrive, it is moving), but it will not be moving with contrary or opposite movements at once; for not every movement to a point is contrary or opposite to movement from that point; they are contrary if they are along a straight line (for this has points contrary in place, e.g. those at opposite ends of the diameter; for these are at the greatest possible distance from each other), and opposite if they are along the same line. Thus there is nothing to prevent the movement's being continuous; for circular motion is motion of a thing from its place to its place, while rectilinear motion is from its place to another place.

19. Further, circular motion is never repeatedly between the same termini, while rectilinear motion constantly is. Thus the motion which is always shifting its ground can be continuous, but that which repeats itself between fixed limits cannot; for the object would have to undergo contrary motions at once. Thus there cannot be continuous movement even in a semicircle or in any other arc; for the moving thing must often cover the same ground and suffer contrary motions; for such motion does not link its end with its beginning. But circular motion does, and is alone complete.

28. It is plain from this distinction that the other *kinds* of motion cannot be continuous; for in all of them the same ground must be

covered repeatedly, e.g. in alteration the intermediate states, in quantitative change the intermediate sizes, and similarly in generation and destruction. It makes no difference whether we make the intermediates few or many, or whether we add or subtract one; in any case the same ground has to be covered repeatedly.

265^a 2. Clearly, then, those physicists are wrong who say all sensible things are always in motion; for they must be moved with one of these motions, and above all, according to these thinkers, suffer qualitative change; they say that things are always in flux and decay, and that generation and destruction are alteration.

7. But our argument has shown generally that no movement can be continuous except circular movement, and therefore neither alteration nor increase can be so. We need say no more to prove that there is no change either infinite or continuous except circular motion.

9. *Circular motion is the primary kind of locomotion.*

265^a 13. Clearly circular motion is the primary kind of locomotion. For all locomotion is either circular, rectilinear, or mixed. Now the simple kinds must be prior to the mixed. And the circular kind is prior to the rectilinear; for (1) it is simpler and more perfect. For it is impossible to move along an infinite straight line (since there is no such thing, and if there were it could not be traversed); and motion along a finite one, if it turns back, is really two motions, while if it does not it is imperfect and comes to an end. But the perfect is prior to the imperfect, the imperishable to the perishable, by nature, in definition, and in time.

24. (2) A motion that can be eternal is prior to one that cannot; now circular motion can, and no other locomotion or indeed change can, since it must be interrupted by rest.

Confirmation of the above doctrines.

27. It is only natural that circular motion should, and rectilinear should not, be single and continuous; for (1) the latter has a beginning, middle, and end, all in itself, and therefore places where the moving body *must* start and finish, while in a circle these are indeterminate, so that the moving body is always and never at a beginning and at an end.

^b 1. Hence the sphere is in a sense at rest as well as in motion, since it occupies the same place. The reason is that the centre is at once beginning, middle, and end, so that, since (a) it is not on the circumference, there is no place at which the moving body can rest as having traversed its course (for it is always moving *round* the

middle, not to the *end*), and since (*b*) it stands still, the whole is always in a sense both at rest and in continuous motion.

8. Because rotation is the measure of all movements it is the first, and because it is first it measures all.

11. (2) Circular motion alone can be uniform; for things in rectilinear motion do not move with uniform speed from the beginning and to the end, since all things in proportion as they are distant from the state of rest move faster; but circular motion alone has no beginning, middle, and end in itself, but only outside it.

17. All who have spoken of motion bear witness to the priority of locomotion; for it is to things that impart this kind of motion that they assign the origins of motion. For separation and combination are forms of locomotion, and it is thus that Love and Strife impart motion; Strife divides and Love combines. And Anaxagoras makes Mind, the first cause of motion, divide.

23. So too with those who assign no such cause but make motion depend on the void; it is locomotion that they ascribe to nature, and the other kinds of motion they ascribe only to derivative things, which are said to increase, decay, and alter as the atoms are combined and divided.

30. Similarly those who explain generation and destruction by density or rarity effect these by combination and separation.

32. Similarly with those who make soul the cause of motion; they say that which moves itself is the source of motion, but it is locomotion that living things impart to themselves.

266^a 1. Besides, it is only that which moves locally that in the strict sense is said to move.

6. We have now shown that there always was and will be motion, what is the source of eternal motion, what is the primary motion, what motion alone can be eternal, and that the first mover is unmoved.

10. *The first mover has no parts or magnitude, and is at the circumference of the universe.*

266^a 10. We now proceed to show that the first mover is without parts or magnitude, first establishing certain premisses. (1) One is that nothing finite can cause motion for an infinite time. There are three things—mover, moved, time of movement; and these are either all infinite or all finite or some infinite, some finite.

15. Let A move B for an infinite time Γ . Let Δ move a part of B, E. It will not move it in a time equal to Γ ; for it would take a greater time to move the larger object B. Therefore the time, Z, is not infinite. By adding to Δ I can exhaust A, and by adding

to E, B; but I cannot exhaust the time by subtracting always an equal part, since it is infinite. Therefore A must move B in a finite part of Γ . Therefore nothing can be moved by a finite agent through an infinite time.

24. (2) That there cannot be an infinite force in a finite magnitude is clear from the following considerations. Grant that the greater force is that which produces an equal effect in a less time. Then by a finite agent which has infinite force a patient must be affected, and more than by anything else, since infinite force is greater than any other. But this cannot occupy any time. For if A is the time in which the infinite force does its work, and AB that in which some finite force does its, if I take a greater and greater finite force I shall come to something that does its work in time A; for if I add constantly to a finite magnitude I shall exceed any definite magnitude. Therefore this finite force will move the object in a time equal to that in which the infinite force does so. But this is impossible; therefore nothing finite can have infinite force.

^b6. (3) Therefore nothing infinite can have finite force. A greater force can reside in a less magnitude, but the superiority of any such greater force will be still greater if it is in a greater magnitude. (a) Let AB be infinite. Then B Γ has a force which moves Δ in some time, the time EZ. If then I take the double of B Γ , it will do its work in half the time EZ, i.e. in Z Θ . If I proceed thus I shall never exhaust AB, but I shall get a time less than any given time. Therefore the force will be infinite; for it exceeds any finite force, since any finite force must take an infinite time to do its work (for if a certain force does its work in a certain time, a greater force will do its work in a less but definite time); but any force that exceeds every definite force is infinite.

20. (b) This can also be seen in this way: we shall take some force in a finite magnitude (the same in kind with that in the infinite magnitude), which will exhaust the finite force in the infinite magnitude.

25. Thus there cannot be an infinite force in a finite magnitude, nor a finite force in an infinite magnitude. We had better next discuss a difficulty about moving bodies. If everything that is in motion is moved by something, except the things that move themselves, how can some things move continuously though that which moved them is not in contact with them—e.g. projectiles?

30. If that which moved them also moves something else, e.g. the air, which imparts motion by being moved, it is equally impossible that this should be in movement when the first mover is not touching it; all the things moved would have to be in motion simultaneously and to have ceased simultaneously when the first mover ceased, even

if, like the magnet, it makes what it has moved capable of moving other things.

267^a 2. We must admit that the first mover gives the capacity of imparting movement to air or water, or to something else that is capable of imparting and suffering movement. But this thing does not cease simultaneously to move and to be moved; it ceases to be moved when its mover ceases to move it, but it goes on imparting movement, and moves something consecutive to it, and so on. The motion begins to cease when the motive force becomes less in each successive member of the series, and ceases finally when one member makes the next no longer a mover, but only to be in motion. These last two must simultaneously cease respectively moving and being moved, and therewith the whole motion ceases.

12. This motion arises in things that can be at one time in motion, at another at rest, and is not continuous, though it seems so; for the members of the series are either successive or in contact, there being not one movent but two consecutive movents; this is why such motion occurs in air and water. Some call it mutual replacement; but the facts can be explained only in the way we have stated. Mutual replacement makes all the things involved move and be moved simultaneously, and therefore cease simultaneously; but our present problem concerns the appearance of *continuous* motion in a single thing. Since it cannot be the same thing that goes on moving it, what is it that moves it?

21. Since there must be continuous motion somewhere, and this is single, and a single motion must be motion of a magnitude, and of one thing, and by one thing (since otherwise it would be not continuous but successive), therefore if the movent is one, it moves either (1) by being moved or (2) being itself unmoved. If (1), it will have to be moved by something, and the series must come to an end in movement by something unmoved. For an unmoved mover need not change with that which it changes, but will always be able to impart motion (since such imparting involves no effort), and this motion alone or in the highest degree is uniform. And that the motion may be uniform the moved must not change in its relation to the mover. Therefore the mover must be either in the middle or on the circumference, since these are the first principles from which a sphere is derived. But that which is nearest the mover moves quickest, and such is the movement of the circumference; therefore the mover is there.

^b9. The question arises whether it is possible for something that is in motion to cause motion continuously, not as it is caused by repeated pushing; such a mover must either itself continue to push or pull, or both, or else the impulse must be taken up by one mover

from another ; which is what we described as happening with projectiles, if the air, being divisible, causes motion by one part being moved after another. But in either case the motion is not single but consecutive. Therefore the only continuous motion is that imparted by what is unmoved ; for it is invariable and therefore its relation to the moved is invariable.

17. Clearly, then, the unmoved first mover cannot have any magnitude. For if it has, it must be either finite or infinite. We have shown before that there cannot be an infinite magnitude ; and we have now shown that a finite thing cannot have infinite force, and that movement by a finite thing cannot go on for an infinite time. But the first mover imparts infinite motion and through infinite time. Therefore it is without parts or magnitude.

COMMENTARY

BOOK I. CHAPTER I

184^a 10-12. Ἐπειδὴ . . . γνωρίζειν. This point has been laid down in *An. Post.* 71^b 9-12 ἐπίστασθαι δὲ οἰόμεθ' ἕκαστον ἀπλῶς . . . ὅταν τὴν τ' αἰτίαν οἰώμεθα γινώσκειν δι' ἣν τὸ πρᾶγμα ἐστίν, ὅτι ἐκείνου αἰτία ἐστὶ κτλ.

The antecedent of ὧν is probably not τὰς μεθόδους but ταῦτα—not, of course, the ταῦτα of ^a 12 but another ταῦτα which is to be understood as the object of εἰδέναι and ἐπίστασθαι. So S. 9.2, 27, 21. 3.

13-14. τὰ αἴτια . . . τὰ πρῶτα καὶ τὰς ἀρχὰς τὰς πρῶτας καὶ μέχρι τῶν στοιχείων. Pacius takes πρῶτος here to mean 'proximate', while μέχρι τῶν στοιχείων evidently refers to the *ultimate* elements. But probably all three phrases refer to the ultimate factors.

14-16. τῆς περὶ φύσεως ἐπιστήμης . . . ἀρχάς. τῆς . . . ἐπιστήμης must be taken as depending on τὰ περὶ τὰς ἀρχάς (so S. 10. 1-2). But τῆ . . . ἐπιστήμη is very likely to be the true reading. Cf. 191^a 13 n.

16-^b 14. πέφυκε . . . ἐκάτερον. Pacius describes Aristotle as propounding three methods for the study of the first principles of physics: (1) the *methodus resolutiva a toto integrato ad partes integrantes*; e.g. from a natural body into the matter and form that constitute it. This is the method described in ^a 21-3 and actually pursued in bk. i. (2) The *methodus divisiva ab universalibus et a notioribus secundum sensum ad particularia*. This is the method described in ^a 23-6 and followed in natural philosophy generally as it passes from bodies in general (studied in the *Physics*) to simple bodies (*De Caelo*) and then to complex bodies (*De Gen. et Corr.*, *Meteor.*, and the biological treatises). (3) The *methodus definitiva a nomine ad definitionem*, described in ^a 26-^b 12 and used *passim* in the physical works.

Pacius seizes correctly enough the nature of the methods described in ^a 21-3, 23-6, and 26-^b 12, respectively. But he is clearly wrong in suggesting that Aristotle puts these forward as three distinct methods. In the whole passage Aristotle seems to regard himself as describing a single method, as to whose precise nature however he is not very clear. The first section (^a 16-23) is clear enough. It is true that in *An. Post.* i. 2 it is implied that we should proceed from τὰ γνωριμώτερα τῆ φύσει, not from τὰ γνωριμώτερα ἡμῖν. But that is because Aristotle is there stating the nature of scientific proof. Here, on the other hand, he is describing the method of

attaining knowledge of the ἀρχαί (πειρατέον διορίσασθαι πρῶτον τὰ περὶ τὰς ἀρχάς ^a 15; cf. ^a 22 f.). This is the very reverse of scientific proof. It is the method of reasoning back from what is confusedly given in experience to what that presupposes; cf. *E.N.* 1095^b 3 ἴσως οὖν ἡμῖν γε ἀρκτέον ἀπὸ τῶν ἡμῖν γνωρίμων. The method is τεκμηριώδης (P. 9. 17, S. 15. 24, 18. 28), akin to the process of inferring the presence of fire from that of smoke, except that it passes from whole to elements, not from effect to cause.

But in ^a 23-6 the argument takes a turn that is, superficially at least, opposed to what we find in *An. Post.* 72^a 4 f., and to Aristotle's general doctrine. For in *An. Post.* the καθόλου is described as farthest from sense and therefore as γνώριμον τῇ φύσει, not ἡμῖν, while here the καθόλου is identified with the γνώριμον ἡμῖν from which the study of first principles must proceed. It is clear that καθόλου is not used in its usual Aristotelian meaning. The reference must be not to a universal conceived quite clearly in its true nature, but to that stage in knowledge in which an object is known by perception to possess some general characteristic (e.g. to be an animal) before it is known what its specific characteristic is (e.g. whether it is a horse or a cow). It is this phase of Aristotle's meaning that is illustrated by the example of the child who recognizes the general appearance presented by all men and that presented by all women, without noticing the special appearance of its father and its mother, and therefore calls all men father and all women mother (^b 12-14). But between the main account of this contrast (^a 23-6) and the illustration of it (^b 12-14) comes a sentence in which another illustration is given of the process meant, viz. ^a 26-^b 12, in which it is illustrated by the contrast between the name and the definition, i.e. between the use of a name with a general knowledge of the characteristics it stands for, and the use of the definition which brings out more clearly the meaning of the name.

It is not clear, however, precisely what Aristotle thinks of the definition as doing. His normal account of it is that it analyses a whole into its logical elements, genus and differentia. But here he speaks of it as dividing the whole into its καθ' ἑκαστα; which if taken strictly must mean the analysis of a genus into its species; yet that is the business not of definition but of logical division. To take his instance, that of κύκλος (^b 11): does he mean that the definition analyses this into its genus ('plane figure') and its differentia ('such that all points on its circumference are equidistant from a given point'); or that it distinguishes different kinds of thing that are known by the common name, e.g. wheel, wreath, geometrical circle, epic cycle (the last is referred to in *An. Post.* 77^b 32 as illustrating the ambiguity of the word κύκλος)? It seems impossible

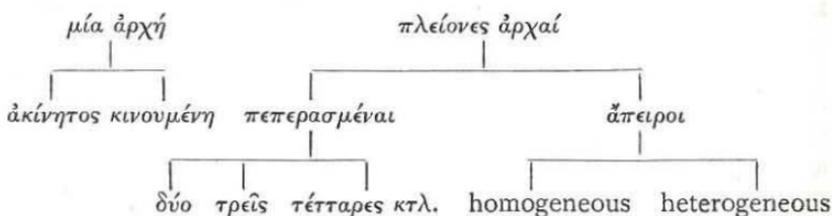
that τὰ καθ' ἕκαστα should be used of the logical elements (genus and differentia). Yet it has not here quite its usual meaning, 'species', for it is certainly no part of the object of the definition of a general name to state the species of the genus (and incidentally the genus circle has no species). τὰ καθ' ἕκαστα seems to have here an unusual meaning: i.e. to mean the various senses of an ambiguous term. Though it is essentially the business of definition to state the logical elements of a complex term, incidentally in doing this it will distinguish the various meanings of the term if this happens to be ambiguous. Only on this interpretation, apparently, will the remark about definition serve to illustrate, even remotely, what it is put forward as illustrating, viz. the transition from the recognition of the generic nature of an object to the recognition of its specific nature (^a 23-6).

Finally, it is to be noted that the transition from name to definition is not put forward as part of the method of physics. It is put forward merely as an illustration, and what Aristotle says of the actual method of physics is that it is one of analysis of the confused data of experience into their elements (^a 21-3), and at the same time one of coming to recognize the specific nature of that whose generic nature alone is at first recognized (^a 23-6); these two features not being clearly distinguished from each other. Both are amply illustrated in Aristotle's actual conduct of his inquiry; the former, e.g., by his analysis in bk. i of the experienced fact of change into the elements matter, form, privation; the latter by the frequent transition from a more general to a more particular determination of some conception. Cf. 189^b 31 ἔστι γὰρ κατὰ φύσιν τὰ κοῖνα πρῶτον εἰπόντας οὕτω τὰ περὶ ἕκαστον ἴδια θεωρεῖν. The passage is discussed by Tannery in *A.G.P.* vi. 468-74.

19. προάγειν. Some such phrase as τὸν λόγον (which occurs in *E.E.* 1224^a 8) is to be understood, as in *Top.* 161^a 4, 8.

CHAPTER 2

184^b 15-22. Ἀνάγκη . . . ἐναντίας. The division is:



The distinction of 'moved' and 'unmoved' is not applied to the

thinkers who believed in *πλείονες ἀρχαί*, because the only thinkers who treated the *ἀρχή* as unmovable were monists (the Eleatics).

16. *μίαν*, 19. *πεπερασμένας*, 20. *ἀπείρους*. The nominatives would be more correct, but the irregularity is not unnatural, and Torstrik's proposal to read the nominatives is unnecessary.

17. *οἱ φυσικοί*. This is not the only passage in which the phrase is used, as Bonitz's *Index* observes, chiefly of the Ionic philosophers and of Empedocles, Anaxagoras, and the Atomists, in distinction from the Eleatics and Pythagoreans, whose views had a more metaphysical character (cf. 186^a 20, 187^a 12, 203^a 13, *Met.* 1078^b 19).

οἱ μὲν ἀέρα φάσκοντες εἶναι, Anaximenes and Diogenes of Apollonia. *οἱ δ' ὕδωρ*, Thales and Hippo.

19. *ἡ δύο*. The reference may be to the Pythagorean cosmology described in Parmenides' Way of Opinion, which recognized the elements fire and night (i.e. mist or air) (fr. 8. 56-9), or to the later Pythagorean cosmology which treated fire and earth as the elements (cf. Pl. *Tim.* 31 b, Theoph. *Met.* 6^b 25, Burnet, *E.G.P.* § 147, and Ross, *Arist. Met.* 984^b 4 n.).

ἡ τρεῖς. Philoponus suggests Timaeus (i.e. Plato's Timaeus), with his principles God, the Idea, and matter. But a thinker who treats God and the Idea as principles is not a *φυσικός* in the sense here meant. More probably Aristotle had no particular thinker in view.

ἡ τέτταρας. The reference is to Empedocles and Hippocrates.

20-22. *ἡ οὕτως . . . ἐναντίας*. The tradition is substantially united here, except that *δέ* is omitted by FJ and may have been omitted by Philoponus (25. 13, 26. 12, but cf. 25. 18), and that *καί* is omitted by I. According to S. 44. 10-27 Alexander had the same reading and took the whole phrase to refer to Democritus, supposing that either *ἡ οὕτως* had been wrongly inserted by a copyist or Aristotle had omitted to add the alternative to which *ἡ οὕτως . . . ἐναντίας* is opposed, viz. the view of Anaxagoras that the principles differ in kind. But the second of these suggestions is absurd, and as regards the first, not only is *ἡ οὕτως* vouched for by the united tradition, and not only does the whole form of the sentence call for alternatives here, but it is extremely unlikely that Aristotle would name Democritus as the only believer in *ἀπειροὶ ἀρχαί*, when elsewhere in similar contexts Anaxagoras is always named with him (203^a 20, *De Caelo* 302^b 14 and 303^a 4, *De Gen. et Corr.* 314^a 17). Themistius (3. 1), Porphyry (S. 44. 1), and Philoponus (26. 8) are therefore justified in taking *ἡ καὶ ἐναντίας* as referring not to Democritus but to Anaxagoras (cf. 187^a 25 *καὶ τὸν μὲν*—i.e. Anaxagoras—*ἀπειρα, τὰ τε ὁμοιομερῆ καὶ τὰναντία*). Simplicius (44. 27-45. 12) thinks *ἡ καὶ ἐναντίας* refers both to Democritus and to Anaxagoras, but this is not satisfactory.

Bonitz argues that ἡ εἶδει διαφερούσας is inappropriate with reference to Democritus and must refer to Anaxagoras (cf. 187^b 10, of Anaxagoras, τῶν δ' ἀρχῶν ἀπείρων οὐσῶν καὶ κατὰ πλῆθος καὶ κατ' εἶδος), and that in accordance with Aristotle's usual practice all the three differentiae of the Democritean atoms must have been mentioned (cf. 188^a 23, *De Gen. et Corr.* 314^a 24, 315^b 35, *Met.* 985^b 15), and therefore proposes to read σχήματι δὲ (καὶ τάξει καὶ θέσει διαφερούσας), ἡ εἶδει διαφερούσας ἢ καὶ ἐναντίας. Torstrik points out that in *De Caelo* 275^b 31 Aristotle says of the atoms διώρισται τοῖς σχήμασιν, simply, and proposes to read σχήματι δὲ (διαφερούσας), ἢ (καὶ) εἶδει διαφερούσας [ἢ] καὶ ἐναντίας ('or differing also in species', &c.); cf. Anax. fr. 4 ἰδέας παντοίας . . . καὶ χροῖας καὶ ἡδονάς.

It is not likely that Aristotle would have mentioned contrariety as the only alternative to unity of kind; he would naturally have mentioned difference of kind as well. The introduction of the first διαφερούσας is therefore justified. If we adopt this reading, γένος and εἶδος are not opposed as genus and species, but used indiscriminately for 'kind'; for other instances cf. *Cat.* 8^b 27 with 9^a 14, *An. Post.* 97^b 24 with 34, *H. A.* 450^b 14 with 17, 31 with 34; 557^a 4 with 24, *Met.* 1058^b 26 with 28, 1071^a 25 with 27, *Pol.* 1250^b 33 with 36. Failure to realize this may have led an early copyist to omit the first διαφερούσας.

The only alteration that is necessary is to read δὲ (διαφερούσας), with Torstrik.

Themistius points out that Anaxagoras held that the ἀρχαί were the moist and the dry, the warm and the cold, the light and the dark; and in *Met.* 1004^b 32 Aristotle speaks of τὸ θερμὸν καὶ ψυχρὸν as ἀρχαὶ ἐναντία.

22-5. ὁμοίως . . . πολλά. Alexander held that Aristotle is here justifying himself for putting in the forefront of his inquiry (^b 15) the question whether there is but one ἀρχή, or a finite number of ἀρχαί, or an infinite number of them, by pointing out that even the physicists who proposed to inquire how many ὄντα there are had first to inquire (Alexander evidently read πρῶτον ζητοῦσι or ζητοῦσι πρῶτον) how many ἀρχαί there are (S. 45. 19-22). Simplicius thinks there is a special reference to the Eleatics, and that Aristotle is putting the most favourable construction on their theory by pointing out that, though they profess to ask whether there are many ὄντα, they cannot really be doubting what is so manifest from experience, and must be asking whether the ὄντως ὄν, i.e. the ἀρχὴ τοῦ ὄντος, is one or many.

Simplicius can hardly be right in supposing that there is a special reference to the Eleatics; for, holding that τὸ ὄν is one, they do not go on to the question εἰ πολλά, πεπερασμένα ἢ ἀπειρα, as the persons here referred to are said to do (^b 24). The reference is, as Alexander

held, to the physicists generally; Aristotle is pointing out that even those whose professed problem is, how many are the *ὄντα*, are really asking, as he has in effect done (^b 15), how many are the *ἀρχαί*. But Alexander is probably wrong in describing this as a *prior* question which they have to ask. Bonitz emends to the favourite Aristotelian form of words *ἐξ ὧν . . . ἐστὶ πρώτων* (cf. 190^b 17 *εἴπερ εἰσὶν αἰτίαι καὶ ἀρχαὶ τῶν φύσει ὄντων, ἐξ ὧν πρώτων εἰσί, De Gen. et Corr.* 325^b 18, *Met.* 998^a 23, 1043^b 30, 1044^a 16, &c.). But S¹ has neither *πρῶτον* nor *πρώτων*, and the variation in the MSS. between *πρῶτον* *ζητοῦσι* and *ζητοῦσι πρῶτον* may possibly point to *πρῶτον* being a later addition.

25-185^a 4. τὸ μὲν . . . τινῶν. As Pacius points out, there are involved here two distinct arguments to show that the inquiry whether reality is one and unchangeable does not belong to natural philosophy. (1) 184^b 25-185^a 3. To say that reality is unchangeable is to deny the existence of nature, since nature is just a principle of change. (This definition of nature is first hinted at in 185^a 12-14, but is present to Aristotle's mind from the very beginning of the work, and is made explicit in ii. 1.) And it is not the business of any science to argue with those who deny its first principles. (2) 185^a 3-5. To say that reality is one and only one is to deny the existence not only of an *ἀρχὴ κινήσεως* but of any *ἀρχή*, since an *ἀρχή* is obviously an *ἀρχή* of something and involves the existence of at least one thing besides itself. For this reason too, then, the student of *ἀρχαί* has not to refute the Eleatic position.

185^a 2-3. ἦτοι . . . κοινής, i.e. (1) the science in question may be a subaltern science (as optics is subaltern to geometry, and harmonics to arithmetic, *An. Post.* 75^b 12-17), and if so, the discussion of its *ἀρχαί* belongs to the superior science. Or (2) it may be a science which has no special science superior to it. In this case its *ἀρχαί* can be reached only by a science which is *πασῶν κοινή*. The Greek commentators say that the science referred to is dialectic, and this might be partially supported by *An. Post.* 77^a 26-9 *ἐπικοινωνοῦσι δὲ πᾶσαι αἱ ἐπιστῆμαι ἀλλήλαις κατὰ τὰ κοινὰ (κοινὰ δὲ λέγω οἷς χρῶνται ὡς ἐκ τούτων ἀποδεικνύντες . . .), καὶ ἡ διαλεκτικὴ πάσαις*. Cf. *Top.* 101^a 36^b 4. But dialectic is not according to Aristotle a science, and the reference is more probably to metaphysics, of which he says that it is *καθόλου* (i.e. *πασῶν κοινή*) *οὕτως ὅτι πρώτη, Met.* 1026^a 30.

4, 5. οὕτως ἔν, i.e. as understood by the Eleatics—a unity that excludes all difference.

5. θέσιν, in the special sense defined in *Top.* 104^b 19—*ὑπόληψις παράδοξος* (cf. *θέσιν διαφυλάττειν De Caelo* 306^a 12, *E.N.* 1096^a 2).

6. τὴν Ἡρακλείτειον, i.e. the thesis which in *Met.* 1005^b 23 Aristotle says some people ascribed to Heraclitus, that the same thing is and

is not (cf. 185^b 20). Aristotle may have in mind such sayings of Heraclitus as 'it is the same thing to be good and to be bad' (^b 21, *Tōp.* 159^b 30), and frs. 58-62, where we find such sayings as *γναφείψ ὁδὸς εὐθεία καὶ σκολίη μία ἐστὶ καὶ ἡ αὐτή: ὁδὸς ἄνω κάτω μία καὶ ὠπή: θάλασσα ὕδωρ καθαρώτατον καὶ μιαρώτατον: ἀθάνατοι θνητοί, θνητοὶ ἀθάνατοι, ζῶντες τὸν ἐκείνων θάνατον, τὸν δὲ ἐκείνων βίον τεθνεώτες.* But Aristotle probably considered the whole doctrine of πάντα ῥεῖ to involve the denial of the law of contradiction.

8-12. ὅπερ . . . χαλεπόν. These words occur with little variation in 186^a 6-10. The MSS. agree in having them in both passages. They are read by Themistius and Simplicius in this passage (T. 4. 12, S. 50. 5, 52. 6) and apparently not in the other (for when Themistius says 8. 17 φορτικός οὖν ὅπερ ἔφην ὁ λόγος, καὶ ἐφ' ἐνὶ σαλεύων ἀτόπω, he is probably referring back to his paraphrase (4. 14) of the present passage, and when Simplicius says 103. 2 μάλλον δὲ αἰτιᾶται τὸν Μελίσσου λόγον, ὡς εἴρηται καὶ πρότερον, ἢ ὅτι πρὸς τοῖς ἄλλοις καὶ ἄπειρον οὗτος τὸ ὄν φησιν, ἢ ὅτι οὗτος μὲν καὶ τὰ λήμματα δοκεῖ λαμβάνειν ψευδῆ καὶ ἀσυλλογίστως συντιθέναι, it does not look as if he had the words in question actually before him at 186^a 6); Philoponus has them in both passages. Bekker thinks the words should be excised here, but in view of the evidence it seems clear that it is in the later passage they should be excised. More strictly, it is the words that are verbally identical in the two passages, viz. καὶ γὰρ . . . χαλεπόν, that should be excised in the second. ἀμφοτέροι γὰρ ἐριστικῶς συλλογίζονται, καὶ Μέλισσος καὶ Παρμενίδης are probably in place there, being a brief summary of what Aristotle says more fully in the present passage. Some copyist, probably between the time of Themistius (c. 315-390) and that of Philoponus (fl. c. 530) added the words καὶ γὰρ . . . χαλεπόν as a gloss, not noticing that ἀσυλλόγιστοὶ εἰσιν, correct enough in 185^a 10, where the subject is ἀμφοτέροι οἱ λόγοι, will not do in 186^a 8, where the subject is ἀμφοτέροι, καὶ Μέλισσος καὶ Παρμενίδης; and finally the ancestor of E, to put this right, added in 186^a 8 αὐτῶν οἱ λόγοι, which is lacking in the other good MSS.

10. μάλλον . . . φορτικός. Cf. *Met.* 986^b 25 ἀφετέοι . . . οἱ μὲν δύο . . . ὡς ὄντες μικρὸν ἀγροικότεροι, Ξενοφάνης καὶ Μέλισσος.

11. ἐνὸς ἀτόπου δοθέντος τὰ ἄλλα συμβαίνει is hardly compatible with ἀσυλλόγιστοὶ εἰσιν, ^a 10. But μάλλον δ' . . . χαλεπόν is meant to correct the statement καὶ γὰρ ψευδῆ λαμβάνουσι καὶ ἀσυλλόγιστοὶ εἰσιν, for μάλλον δ' means 'or rather'. The ἐν ἀτοπον is probably not the illicit conversion mentioned in 186^a 10-13, but, as Simplicius says, that ἐν ἐστὶ καὶ οὕτως ἐν ὡς αὐτὸ μόνον εἶναι. This granted, Melissus' conclusions, such as that there is no motion, that the universe is boundless, &c., follow.

12. τοῦτο . . . χαλεπόν, i.e. there is no difficulty in deducing absurd consequences if you start with absurd premisses.

13. τὰ φύσει . . . εἶναι. Philoponus thinks that in saying ἡ ἔνια Aristotle is allowing for the fact that αἱ δυνάμεις αἱ ἐν ὑποκειμένῳ καὶ αἱ ἄλογοι ψυχαί, though φυσικά, suffer no κίνησις. Simplicius suggests, more probably, that the exceptions implied are the poles, the centre, and the axis of the universe. But more probably still Aristotle has no definite exceptions in mind and is merely speaking cautiously.

16. τὸν τετραγωνισμόν . . . τμημάτων. Themistius, Philoponus, and (with a reservation) Simplicius agree in ascribing this to the great geometer Hippocrates of Chios (fl. c. 450-430). Themistius says Hippocrates tried to square the circle and failed through squaring only the lune (i.e. the figure bounded by two arcs of circles) described on the side of the square inscribed in the circle. Philoponus says he erred in thinking that because he could square a lune he could square the circle (sc. by dividing it completely into lunes similar to the one he had squared—which cannot be done). Simplicius has a much more elaborate account. He first gives, presumably on the authority of Alexander, (1) (56. 1-19) a method of squaring the lune on the side of a square inscribed in a circle, and (2) (56. 19-57. 18) a method of finding a trapezium equal to the lunes inscribed on three consecutive sides of a regular hexagon inscribed in a circle + a semicircle with a radius half that of the original circle. He adds (57. 18-24) that (3), subtracting the rectilinear figure equal to the three lunes (which can be found by the first proposition) from the trapezium we get a rectilinear figure equal to the semicircle mentioned in (2), and thus square the circle.

There is a very obvious fallacy here—that the lune involved in prop. 1 is a lune bounded by a semicircle and a quadrant, while those involved in prop. 2 are bounded by a semicircle and a sextant. This seems too elementary a blunder for Hippocrates to have made.

Simplicius adds (4) (58. 1-24) an argument to the effect that, since by (1) above a lune can be squared, the circle can be squared by being divided into lunes. This fails because the circle cannot be so divided; but this argument again seems too crude for Hippocrates.

After some matter irrelevant to our purpose, Simplicius goes on (60. 22) to state the account of Hippocrates' argument in Eudemus' *History of Geometry*, which, as he says, is more reliable owing to Eudemus' greater nearness to Hippocrates in time (68. 32). Eudemus gives (5) (61. 19-62. 12) a method of squaring a lune whose outer curve is a semicircle, (6) (62. 13-64. 6) a method of squaring a lune whose outer curve is greater than a semicircle, (7) (64. 7-67. 10) a method of squaring a lune whose outer curve is less than a semicircle, (8) (67. 11-68. 32) a method of squaring the sum of a lune and a

circle. Then (9) by subtracting one of the squares reached in (5), (6), or (7) from that reached in (8) we get the square equal to a circle.

All these quadratures of lunes, or of lunes + circles or semicircles, are perfectly sound, and Hippocrates' error, if any, arose in inferring from them that he could square the circle itself. Simplicius thinks that the argument Aristotle is criticizing is (a) the squaring by means of lunes, i.e. argument (4) above; or (b) some non-Hippocratean proof, 'of which Alexander has exhibited one' (Simplicius seems to mean argument (3), which he regards Alexander as having been wrong in ascribing to Hippocrates); or (c) the quadrature of the circle + the lune, i.e. argument (9) (resting on proof (8)). This, he adds, is that which would most naturally be described as Aristotle here describes the proof he has in mind, as τὸν διὰ τῶν τμημάτων τετραγωνισμόν, since it actually uses segments of a circle, which alone are properly τμήματα, lunes not being so. (There is apparently no force in this, because all the proofs use segments proper, as well as lunes.)

Argument (9) contains in principle the same fallacy as argument (3). It assumes that since certain lunes can be squared certain others can. But it is less obviously fallacious. Argument (3) rests on the fact that one type of lune can be squared and assumes that a quite different one can. Argument (9) rests on the fact that a certain lune whose outer curve is a semicircle, one whose outer curve is greater than a semicircle, and one whose outer curve is less than a semicircle, can be squared. It thus has an appearance of generality. But in reality, to be general, it would have to have as premiss that no matter what fraction of a circle the outer curve may be, and no matter what fraction of a circle the inner curve may be, any lune can be squared. Alternatively, of course, the proof would be satisfactory if the lune used in prop. (8) were identical with one of those used in props. (5), (6), or (7); but it is identical with none of these. Still, the argument comes at any rate nearer to generality than argument (3), and is therefore more likely to have been taken by Hippocrates to have achieved the squaring of the circle.

Two other passages of Aristotle bear on the question. One is *Soph. El.* 171^b 12-16 (where the general point is the same as that made in the present passage) τὰ γὰρ ψευδογραφήματα οὐκ ἐριστικά (κατὰ γὰρ τὰ ὑπὸ τὴν τέχνην οἱ παραλογισμοί), οὐδέ γ' εἴ τί ἐστι ψευδογράφημα περὶ ἀληθές, οἷον τὸ Ἰπποκράτους ἢ ὁ τετραγωνισμὸς ὁ διὰ τῶν μηνίσκων. Here ἢ implies that two distinct things are referred to in τὸ Ἰπποκράτους and ὁ τετραγωνισμὸς ὁ διὰ τῶν μηνίσκων. The latter might be supposed to be argument (3) or (4) above, and the former to be the more elaborate (9) above. But since argument (9) is a τετραγωνισμὸς διὰ μηνίσκου, it is very unlikely that the two arguments

should be distinguished by Aristotle as τὸ Ἰπποκράτους and ὁ τετραγωνισμὸς ὁ διὰ τῶν μηνίσκων. Diels is in all probability right in treating ἡ . . . μηνίσκων as a (correct) gloss imported from 172^a 2-3, where the phrase occurs.

The other passage of Aristotle bearing on the question is *An. Pr.* 69^a 30-34 οἷον εἰ τὸ Δ εἶη τετραγωνίζεσθαι, τὸ δ' ἐφ' ᾧ E εὐθύγραμμον, τὸ δ' ἐφ' ᾧ Z κύκλος· εἰ τοῦ EZ ἐν μόνον εἴη μέσον, τὸ μετὰ μηνίσκων ἴσον γίνεσθαι εὐθυγράμμω τὸν κύκλον, ἐγγύς ἂν εἶη τοῦ εἰδέναί. Aristotle is illustrating the process of ἀπαγωγή (reduction of a proposition difficult to prove, to one that is more plausible). Here we are nearer to knowing the proposition 'Z is E', 'the circle is equal to a discoverable rectilinear figure', than we are to knowing the proposition 'Z is Δ', 'the circle can be squared', because there is only one middle term necessary between Z and E, viz. 'equal, along with certain lunes, to a rectilinear figure', whereas between Z and Δ there intervenes E as well as this further middle term.

Here Aristotle is referring to a quadrature of the circle depending on the equality of a rectilinear figure to a circle+lunes (in the plural). I.e., he is referring to argument (3) above. And since we have no evidence that he knew of any other quadrature by means of lunes or segments, it is probable that it is this that he ascribes to Hippocrates in the *Topics* and refers to in the present passage. His testimony is therefore in conflict with that of Eudemus, who ascribes to Hippocrates not argument (3) but arguments (5), (6), (7), and (8), which, if Hippocrates used them for the purpose of squaring the circle, could be used only as the basis of argument (9).

What, now, are the probabilities as to what Hippocrates proved or tried to prove? We may take it from Eudemus that he proved props. (5)-(8), that he squared three different lunes, and a lune+a circle. Did he think he had thereby squared the circle? (a) Heiberg thinks¹ that in the then state of logic he might have done so. But this seems hardly possible; and, as Heath adds, if Hippocrates thought he had squared the circle, he would surely have said so expressly at the end of his fourth quadrature. (b) Björnbo holds² that Hippocrates knew he had not squared the circle, but used language which without being actually untrue was calculated to create the impression that he had. But, as Heath remarks, this would hardly have been worth his while, since the first expert to read his treatise would have noticed the imposture. (c) Heath suggests that Hippocrates 'was merely trying to put what he had discovered in the most favourable light', but this suggestion is open to the same objection as Björnbo's. (d) Montucla suggests that Hippocrates offered (9) as a specimen

¹ *Philol.* xliii, 336-44.

² In Pauly-Wissowa, *Real-Encyc.* xvi, 1787-99.

of fallacious reasoning, and only meant to assert that we should solve the problem of squaring the circle as soon as we could square all the lunes (or rather the lune involved in prop. 8) as satisfactorily as he had squared certain definite lunes. This suggestion seems much more probable than those that precede. But (e) we have seen that it looks as if Aristotle was not very well informed on what Hippocrates had done. He credits him with props. 1-3 instead of 5-8. It seems not at all improbable that Hippocrates simply proved props. 5-8 (no doubt in the hope of ultimately squaring the circle) and made no claim to have squared the circle. The choice seems to lie between this and the previous suggestion.

τμημάτων properly means 'segments', and is not properly applicable to lunes. There are two possibilities about its meaning here. (1) All the propositions in question use segments of the circle as well as lunes, and the word may be used in its proper sense. But (2) in one passage, *De Caelo* 290^a 4, Aristotle uses τμήμα of a sector of a circle. It is possible that in the fluid condition in which geometrical terminology still was, he may have used τμήμα of any part of the area of a circle, and therefore of a lune. This, however, seems less probable, since in *An. Post.* and *Soph. El.* he uses the correct word μνήσκος.

On the whole topic of Hippocrates' proofs cf. Heath, *Hist. of Gk. Math.* i. 183-200, who gives the references to earlier modern discussions. See also references to modern literature in Diels, *Vors.*³ i. 299. 21 n.

17. τὸν δὲ Ἀντιφῶντος. The reference is to Antiphon the Sophist, a contemporary of Socrates. Themistius says that he inscribed an equilateral triangle in a circle, then (by erecting an isosceles triangle on each side of the original triangle) a regular hexagon, then a dodecagon, and so on, and thought that the side of the last triangle would coincide with an arc of the circle; thus violating the geometrical principle of the infinite divisibility of space. Philoponus makes him start by inscribing a square in a circle, then an octagon, and so on (the principle is the same), and makes his error to consist in violating the principle that a straight line cannot coincide with an arc of a circle. Simplicius describes his method more generally. 'Inscribe in a circle any of the regular polygons that can be inscribed, e.g. a square. Then inscribe an octagon, and so on, until you have exhausted the area of the circle.' Simplicius criticizes Alexander for saying that the geometrical principle violated is that a circle touches a straight line at a point; this, he says, is not an ἀρχή but is proved by Euclid in bk. iii (prop. 16). The principle involved, Simplicius maintains, is that a straight line cannot coincide with an arc, and that since magnitude is infinitely divisible you

cannot exhaust the area of the circle by drawing lines between chords and their arcs.

Antiphon's attempt at squaring the circle is mentioned also in *Soph. El.* 172^a 7, without any further information being given. Heath discusses it in *Hist. of Gk. Math.* i. 221-3. He accepts Themistius' account as probably correct, and argues that the objection to Antiphon's method is really only verbal. Euclid, he remarks, uses the same construction in xii. 2; only he expresses the conclusion by saying that if the process be continued far enough, the small segments left over will be less than any assigned area. I.e., Antiphon invented the idea on which 'Eudemos founded his epoch-making method of exhaustion. The practical value of Antiphon's construction is illustrated by Archimedes' treatise on the *Measurement of a Circle*, where, by constructing inscribed and circumscribed regular polygons with 96 sides, Archimedes proves that $3\frac{1}{7} > \pi > 3\frac{1}{7}\frac{0}{1}$, the lower limit, $\pi > 3\frac{1}{7}\frac{0}{1}$, being obtained by calculating the perimeter of the inscribed polygon of 96 sides, which is constructed in Antiphon's manner from an inscribed equilateral triangle.'

Antiphon was a polymath and not a geometrical expert, and we cannot be sure that he did not make the mistake of supposing that he could by this method obtain a precise equivalent to the area of the circle. And if he did, he was certainly deserving of Aristotle's censure. But with the correction supplied by Euclid the method became one of great importance both theoretical and practical.

It may be noted that Aristotle elsewhere (*An. Post.* 75^b 40, *Soph. El.* 171^b 16, 172^a 4) mentions a third attempt at squaring the circle, that of Bryson, which he classes with that of Antiphon as eristical and ungeometrical.

18. *περὶ φύσεως μὲν οὐ*, since in denying the existence of movement they deny the existence of *φύσις*, which is an *ἀρχὴ κινήσεως*.

φυσικὰς δὲ ἀπορίας, e.g. about the void, the infinite, and movement itself.

20. *ἔχει . . . φιλοσοφίαν*, 'is of philosophical interest'.

22. *πῶς*. E's *ιδεῖν* before *πῶς* is pretty clearly a later addition intended to make the construction easier. For the construction without *ιδεῖν* cf. 253^a 22, *De Gen. et Corr.* 315^b 24.

22-6. *πότερον . . . τοιούτων*. Aristotle asks two questions—(1) whether, when the Eleatics say that *τὰ πάντα ἓν ἐστὶ*, they mean by *τὰ πάντα* all substance, all quantity, or all quality, and (2) whether they mean by *ἓν* one substance, one quantity, or one quality.

23-4. *οὐσίαν . . . πάντα*. E's reading *οὐσίαν μίαν δὲ πάντα* is superficially attractive, since it corresponds to *ποῖον ἓν δὲ τοῦτο* 25. But on examination it is seen that *δέ*, while appropriate in the second phrase, is inappropriate in the first. E or its archetype seems (as in

^a 22 and often elsewhere) to have aimed at improving on the traditional text.

29-30. εἰ . . . ἄπορον, 'if it be maintained that all things are quality or quantity, then, whether substance in fact exists or not, the view is absurd'. For if substance does not exist, quality or quantity does not exist, since they both presuppose substance (^a 31 f.); and if substance exists, all things obviously are not quality or quantity.

^b 7-9. λέγεται . . . οἶνος. Pacius points out that in enumerating the senses of 'one' Aristotle omits the second main type of ἐν καθ' ἑαυτό recognized in *Met.* Δ. 6, viz. that which is one εἶδει (1016^a 17-32, ^b 9, 31-1017^a 3). This is because unity in form, i.e. analogical, generic, or specific identity, so obviously implies numerical difference that it could not have been what the Eleatics meant when they described τὰ ὄντα as being one and only one. What they were asserting was the *numerical* unity of that which is.

τὸ συνεχές is the first type of 'one' recognized in Δ (1015^b 36-1016^a 17), ὧν ὁ λόγος ὁ αὐτός the third type (1016^a 32-^b 6). τὸ ἀδιαίρετον corresponds pretty much to what is in Δ. 6 said to be the essential *connotation* of ἐν (1016^b 17-31) as opposed to the continuous, the identical in form, and the identical in definition, which are the three main divisions of the *denotation* of ἐν.

9. μέθυ, a poetical word for wine, from Homer onwards.

10. τὸ ἐν, 'their One'.

12-13. πότερον . . . ὅλον, 'whether the part and the whole together make one thing or two things'.

13-14. καὶ πῶς . . . πῶς πλείω, The apparently superfluous repetition of πῶς πλείω has led Brandis and Natorp to suspect corruption. Brandis proposes πῶς ἐν εἰ πλείω, καὶ εἰ πλείω, πῶς πλείω, and Natorp πῶς ἐν εἰ πλείω, καὶ εἰ ἐν, πῶς πλείω. But really there is no difficulty. The text means 'how can they be one or many, and if they are many, in what sense of "many" are they many?'

14. καὶ . . . μὴ συνεχῶν. Aristotle means that, though the difficulty he is putting has arisen out of a consideration of the first possible meaning of 'one', viz. continuous, it applies equally to parts which are not continuous (e.g. to the sheep of a flock).

15. καὶ εἰ . . . αὐτοῖς, 'and the difficulty arises that if each of two parts is one with the whole in the sense that it is indivisible from it, they will be also one with each other'. The argument in brief is: 'your hand is you; your foot is you; therefore your foot is your hand'.

ἐκότερον. A whole of *two* parts is taken, as being the simplest case; cf. 186^b 13.

16. εἰ ὡς ἀδιαίρετον, 'if reality is one in the sense of being indivisible'.

οὐδὲ ποιόν, presumably because quality is divisible in respect of intensity, or because a bare point or arithmetical unit has no quality.

20. λώπιον. No literary use of the word is quoted in the lexicons as occurring before Aristotle, but cf. *I. G.* 4² (1). 122. 127 (Epidaurus). λώπη is a poetical word (e.g. in Homer) for 'robe' (hence *λωποδότης*). τὸν Ἡρακλείτου λόγον. Cf. ^a 6 n.

21-3. ταῦτον . . . ἵππος, 'it will be the same thing to be good and bad, to be good and not-good, and therefore the same thing will be good and not-good, or a man and a horse'. If all characteristics are the same, that which possesses one will possess all.

23-5. καὶ οὐ . . . μηδέν, i.e. the doctrine that all things are one turns out to deny to things any determinate character at all.

26. καὶ οἱ ὕστεροι, i.e. not merely were the Eleatics anxious to admit no plurality within the one universe, lest that should break up its unity, but later thinkers similarly wished to admit no plurality in any individual thing.

28. Λυκόφρων. In *Pol.* 1280^b 10 Aristotle calls him Lycophron the sophist. As Zeller remarks, the expressions attributed to him in *Rhet.* 1405^b 35, 1406^a 7, Alex. in *Top.* 426. 8, 456. 6 indicate him to have been an imitator of Gorgias (who is cited in the same context in *Rhet.* 1405^b 37). For further information about him cf. Zeller i⁶. 1323 n. 3.

T. 6. 28 explains the present passage by saying that Lycophron allowed 'is' only as predicating existence of a substance, as in *Σωκράτης ἔστιν*, and disallowed it in its copulative use, saying *Σωκράτης λευκός* instead of *Σωκράτης λευκός ἔστιν*. This explanation is probably right.

28-32. οἱ δὲ . . . ὄντος. Themistius refers this view, absurdly enough, to Plato, who in *Soph.* 251 b ridicules the whole line of argument. Philoponus refers it, less improbably, to the Socratic Menedemus of Eretria. S. 91. 28, 93. 32 ascribes to the Eretrians yet a third view, which attempted to do away with all predication except that of identical propositions such as 'the man is a man'. Zeller ii. 1³. 278 n. 2 thinks that the ascription to Menedemus hardly agrees with better attested information we have about him, and that the Cynics and the Megarian Stilpo are meant (on Stilpo cf. Zeller ib. 272). Apelt, however (*Beiträge z. Gesch. d. Gr. Phil.*, 202-4), makes it probable that Antisthenes, the Megarians, and the Eretrians united in attempting to dispense with the copulative *ἔστι*.

30-32. ἵνα . . . ὄντος. S. 91. 23 says rightly ἵνα . . . ἢ δῆλον ὅτι ὑφειμένῃν ἔχει φύσιν τὰ συμβεβηκότα, ὥσπερ καὶ τὸ ῥῆμα ἐνέργειαν ἢ πάθος δηλοῖ ὑφειμένα τῆς οὐσίας ὄντα.

32-4. πολλὰ . . . μέρη, i.e. in fact ὄντα (i.e. any ὄν) may be many

either by including characteristics whose definitions are different, or by being quantitatively divisible into many parts.

34. ἐνταῦθα, i.e. in connexion with that which is both one whole and many parts.

186^a 1-2. ἦδη . . . εἶναι. Superficially this is difficult. 'They were already in trouble, and admitted that the one is many, as though it were not possible for the one to be many.' The explanation is that there is a pause in the thought after εἶναι ^a 1, and ὥσπερ . . . εἶναι goes with ἠπόρουσιν rather than with ὁμολόγουσιν τὸ ἐν πολλὰ εἶναι. 'But at this point they began to be in difficulties, and to admit (in view of the facts) that the same thing is one and many (though they thought this absurd in view of their assumptions)—as if there were any real difficulty in the same thing's being one and many, provided it is not the one and many that are opposed to one another; a thing may be actually one and potentially many' (i.e. divisible into many parts).

CHAPTER 3

186^a 7-10. καὶ . . . χαλεπόν. For the reasons for excising these words here, cf. 185^a 8-12 n.

11-13. οἶεται . . . ἔχει. 'He thinks he has acquired (sc. by a legitimate immediate inference) from the premiss "everything that has come into being has a beginning" the further premiss "that which has not come into being has not a beginning".' The step by which he has passed from one proposition to the other is not in fact a legitimate one.

λαμβάνειν is commonly used of assuming premisses, not of drawing conclusions. But it may be used of acquiring by inference propositions which become premisses for further inferences; cf. 216^a 6 n., *An. Pr.* 24^b 10, *An. Post.* 79^b 27, *Top.* 100^a 29, 155^b 36, and Laas, *Aristotelische Textes-Studien*, 5-10.

Melissus may have committed the fallacy in question (ascribed to him also in *Soph. El.* 167^b 13-17, 168^b 35-40, 181^a 27-9); for Simplicius quotes from him (110. 2.) the phrase ἀρχὴν τε καὶ τέλος ἔχον οὐδὲν οὔτε αἰδιον οὔτε ἀπειρόν ἐστιν (fr. 4), from which it seems likely that he inferred (as Simplicius makes him infer) that τὸ μὴ ἔχον ἀπειρόν ἐστιν. This would be another instance of the fallacy of illicit conversion: 'nothing that has a beginning is ἀπειρον: therefore that which has not a beginning is ἀπειρον'. But in fr. 2 he does not infer τὸ μὴ γενόμενον οὐκ ἔχει ἀρχὴν from τὸ γενόμενον ἔχει ἀρχὴν ἅπαν, but makes the two statements side by side: εἰ μὲν γὰρ ἐγένετο, ἀρχὴν ἂν εἶχεν . . . καὶ τελευτήν. . . ὅτε δὲ μήτε ἤρξατο μήτε ἐτελεύτησεν . . .

οὐκ ἔχει ἀρχὴν οὐδὲ τελευτήν. In any case, as Burnet observes (*E.G.P.*, § 166), even if he perpetrated the illicit conversion, it was not the basis of his belief in the eternity of reality, which is rather to be found in fr. 1, εἰ γὰρ ἐγένετο, ἀναγκαῖόν ἐστι πρὶν γενέσθαι εἶναι μηδέν· εἰ τοῖνυν μηδὲν ἦν, οὐδαμὰ ἂν γένοιτο οὐδὲν ἐκ μηδενός.

13-16. εἶτα . . . μεταβολῆς, 'then this too is odd, that in the case of everything (sc. παντὸς τοῦ γενομένου^a 12) there is a beginning of the thing—not of the time—and that there is a beginning of coming to be—not of simple coming to be, merely, but also of qualitative change—as though change may not come into being all at once'. Aristotle believes that water, for instance, does not begin to freeze at a particular point, but freezes all over at once. You cannot say where freezing begins; the water passes as a whole from one state to another. Cf. 236^a 27 οὐδὲ δὴ τοῦ μεταβεβληκότος ἔστιν τι πρῶτον ὃ μεταβέβληκεν, 253^b 23 ὁμοίως δὲ καὶ ἐπ' ἀλλοιώσεως ὅποιασούν' οὐ γὰρ εἰ μεριστὸν εἰς ἄπειρα τὸ ἀλλοιούμενον, διὰ τοῦτο καὶ ἡ ἀλλοίωσις, ἀλλ' ἄθροια γίγνεται πολλάκις, ὥσπερ ἡ πῆξις. He would admit that in simple generation, e.g. of an animal, there is a part which first comes into being (the heart), but denies the corresponding necessity in the case of qualitative change. Similarly illumination is treated as instantaneous (*De An.* 418^b 20-26).

Melissus evidently held a view opposed to this. He must therefore have argued that if a change takes place, it must begin at a particular point and then spread.

καὶ μὴ τοῦ χρόνου is an aside of Aristotle's, pointing out what is *not* meant, and so is μὴ τῆς ἀπλῆς ἀλλὰ καὶ ἀλλοιώσεως. Cf. *Met.* 994^a 22 διχῶς γὰρ γίγνεται τόδε ἐκ τοῦδε—μὴ ὡς τόδε λέγεται μετὰ τόδε . . . ἀλλ' ἢ κτλ. Cf. also 190^a 21.

The passage probably has a reference to the charge Aristotle brings against Melissus (*Soph. El.* 167^b 13-17, 168^b 35-40, 181^a 27-9) that he reasons from the eternity of the real to its spatial infinity. He represents him here as saying that everything that comes into being has a spatial ἀρχή at which its coming into being begins; and this, taken with the illicit conversion with which he also charges him (^a 11-13), would yield the result that that which does not come into being has no spatial ἀρχή, i.e. is infinite. Burnet argues (*E.G.P.* § 166) that Aristotle has misunderstood fr. 2 of Melissus, and that he takes Melissus to be inferring the spatial infinity of the real when by calling it ἄπειρον Melissus merely means 'without beginning or end in time'. But the fragment seems to justify Aristotle's argument. It stands in Diels as follows: ὅτε τοῖνυν οὐκ ἐγένετο, ἔστι τε καὶ αἰεὶ ἦν καὶ αἰεὶ ἔσται, καὶ ἀρχὴν οὐκ ἔχει οὐδὲ τελευτήν, ἀλλ' ἄπειρόν ἐστιν. εἰ μὲν γὰρ ἐγένετο, ἀρχὴν ἂν εἶχεν (ἦρξατο γὰρ ἂν ποτε γενομένου) καὶ τελευτήν (ἐτελεύτησε γὰρ ἂν ποτε γενομένου). ὅτε δὲ μήτε ἦρξατο

μήτε ἐτελεύτησεν αἰεὶ τε ἦν καὶ αἰεὶ ἔσται, οὐκ ἔχει ἀρχὴν οὐδὲ τελευτὴν. οὐ γὰρ αἰεὶ εἶναι ἀνυστόν, ὅ τι μὴ πᾶν ἔστι, and Diels translates 'denn es müsste ja, wenn entstanden, einmal angefangen haben . . . denn es müsste ja, wenn entstanden, einmal geendet haben'. But in Simplicius (our sole authority for the fragment) we read not γενόμενον but γινόμενον in 29. 24, 109. 22, 23, 26 (*bis*), 27, and γενόμενον only in 109. 29; and in ps.-Arist. *Xen.* 974^a 9-11 we read αἰδιον δὲ ὄν ἄπειρον εἶναι ὅτι οὐκ ἔχει ἀρχὴν ὅθεν ἐγένετο, οὐδὲ τελευτὴν εἰς ἃ γιγνόμενον ἐτελεύτησέ ποτε. It seems clear that this is the right reading in Simplicius, and that the translation is 'for it must have at some time begun coming to be' and 'for it must have at some time finished coming to be'. Thus the spaced τελευτὴν, if it referred to a temporal end, could only refer to the end of reality's coming to be, whereas in the first sentence τελευτὴν would have to refer to the temporal end of its being; and the argument would fall to pieces. It is clear, therefore, that the argument must be: 'For if it had come into being, it must have had a (spatial) beginning (i.e. a part which came first into being) and a (spatial) end (i.e. a part which came last into being); but when it neither began nor finished and always is and always will be, it has no (spatial) beginning or end.'

This is confirmed by the fact that in fr. 4 Melissus says ἀρχὴν τε καὶ τέλος ἔχον οὐδὲν οὔτε αἰδιον οὔτε ἄπειρόν ἐστιν, where unless the οὔτε ἄπειρον is quite otiose it must refer to something different from eternalness, i.e. to spatial infinity. That Melissus asserted this of the real is clear from fr. 3 ἀλλ' ὡσπερ ἔστιν αἰεὶ, οὕτω καὶ τὸ μέγεθος ἄπειρον αἰεὶ χρὴ εἶναι. And Aristotle seems to be right in his view as to *one* of the grounds on which Melissus rested this assertion; though no doubt Melissus had, as Burnet points out, a better ground—that if reality were limited it would be limited by empty space (*De Gen. et Corr.* 325^a 14), i.e. by something which as he holds cannot exist.

M. Offner tries in *A.G.P.* iv. 12-33 to show that Melissus was not guilty of the inference from lack of temporal beginning to lack of spatial limit; but not successfully.

16-18. ἔπειτα . . . εἴη; Melissus had evidently argued: If there is only one thing, τὸ ὄν, it cannot move, for in order to move it must have a space other than itself to move into. Aristotle replies: (1) 'why should it not move in the way of ἀντιπερίστασις, by its parts' taking each other's places (as in vortex motion, 214^a 31)'. (To this Melissus might have replied that he has already excluded the very notion that the One has parts.) (2) 'In any case, Melissus' argument does not show the impossibility of *qualitative* change, which is itself a kind of κίνησις.' But in fact Melissus has a stronger ground for denying the reality of qualitative change. εἰ γὰρ ἑτεροιοῦται, ἀνάγκη τὸ ἐόν μὴ ὁμοιον εἶναι, ἀλλὰ ἀπόλλυσθαι τὸ πρόσθεν ἐόν, τὸ δὲ

οὐκ ἐὼν γίνεσθαι (fr. 7 (2)). I.e., he rests his denial on the fact that in being changed the ὄν would lose its identity.

19. πλὴν τῷ ἐξ οὗ, 'but only, if at all, in respect of the unity of the material of which it consists'.

20. τῶν φυσικῶν. Cf. 184^b 17 n.

22-^b 12. καὶ . . . τὸ ὄν. Aristotle begins his criticism of Parmenides by pointing out (1) that his argument rests on the false assumption that 'being' is used only in one sense (^a 24-5), (2) that even if we grant this premiss his conclusion does not follow. This second point is proved by showing that conclusions adverse to Parmenides' view follow whether we suppose being (*a*) to be an attribute belonging to something that has a distinct substantial nature of its own, or (*b*) to be the substantial nature of that which is. If (*a*) we conceive of τὸ ὄν on the analogy of τὸ λευκόν, then (i) just as there must be two λευκά, viz. white colour and that which possesses it, there must be πολλὰ ὄντα, viz. the substance which possesses being, as well as being itself (^a 26-32). Hence being must be conceived in manner (*b*) (^a 32-4). (*a*) is open to the further objection (ii) that if being be so conceived there will have to be an οὐκ ὄν, viz. that of which being is an attribute (^a 34-^b 1). For this reason, too, being must be conceived not in manner (*a*) but in manner (*b*) (^b 1-3). But (*b*) is (i) open to the second objection raised to (*a*). For if being is the substantial nature of its possessor, then any attributes its possessor possesses will be οὐκ ὄντα, and since it is characterized by them it will be an οὐκ ὄν (^b 3-11). Finally, (ii) if to avoid this we suppose its attributes as well as it to be ὄν, the first objection raised to (*a*) reappears, for ὄν will then signify a variety of things, in other words there will be πολλὰ ὄντα (^b 11-12).

25. λεγομένου πολλαχῶς, i.e. Parmenides is ignorant of the distinctness of the categories of being, and of the difference between potential and actual being.

25-32. ἀσυμπεράντος . . . συνεώρα. Parmenides' two assumptions were: (1) 'being' has but one meaning, and (2) there is nothing besides being. From this he argued that reality is one and indivisible. Aristotle refutes the argument by making parallel suppositions about 'white', viz. that (1) 'white' has but one meaning, and (2) there is nothing but what is white (^a 26, cf. 29-30), and by showing that these are compatible with there being many white things. All that is white will not be one either (*a*) by being continuous, or (*b*) by being identical in definition (since the colour white and that which is white must be differently defined).

The third of the modes of unity named in 185^b 7-9—indivisibility—is omitted, presumably because it is sufficiently obvious that what is white cannot be a geometrical point (cf. 185^b 16-19).

29. τὸ εἶναι λευκῶ . . . δεδεγμένῳ, 'to be the colour white and to be that which has taken on the colour white'.

29-30. καὶ . . . οὐθὲν χωριστόν, 'yet this does not involve that there will be something apart from the white', i.e. we have pointed out the existence of a plurality without deserting the hypothesis εἰ μόνα τὰ λευκὰ ληφθεῖη (^a 26). καὶ . . . χωριστόν should be separated from what precedes by a full stop rather than by a comma.

32. συνεώρα. This reading seems preferable, because the idiomatic word is more likely to have been corrupted into the familiar ἑώρα than vice versa. Cf. *Met.* 984^b 2 οὐθενὶ συνέβη τὴν τοιαύτην συνιδεῖν αἰτίαν, *De Gen. An.* 755^b 27 τοῦτο οὐχὶ συνεωράκεσαν.

32-^b 12. ἀνάγκη . . . τὸ ὄν. This difficult passage may be paraphrased as follows: 'It is necessary, then, for Parmenides' argument that he should assume that "existent", whatever it may be predicated of, means not only one thing, but what is just-existent and just-one, i.e. that the whole nature of any such thing is to be existent and one. It will not do to regard "existent" as an attribute; for an attribute is predicated of a subject, so that if "existent" were an attribute, that whose attribute it was would not be existent (since it is different from "existent"), so that there would exist something non-existent. The "just-existent", then, will not be an attribute of anything else. For if it were, that other could not be an existent—unless "existent" had more than one meaning, so that each of the things answering to these meanings would be a particular existent; but we are assuming (with Parmenides) that "existent" has but one meaning.

'If, then, that which is just existent is not an attribute of anything, but other things are attributes of it, how will "the just-existent" mean something that exists and not rather something that does not exist? For if the just-existent is to be also white, but the quality white is not just-existent (indeed "existent" cannot even be an attribute of it, since *ex hypothesi* nothing is existent that is not just-existent), then what is white is not existent (not merely not red or yellow, but not existent at all): therefore the just-existent is not existent; for it was *ex hypothesi* true to say of it that it is white, and this has been seen to mean something non-existent. To escape this difficulty we must say that even "white" indicates something just existent; but then we are forced to conclude that, contrary to Parmenides' fundamental hypothesis, "existent" stands for more than one kind of thing, viz. for attributes as well as their subject.'

Aristotle has pointed out in ^a 25-31 that the mere assumption that 'white' has only one meaning, i.e. stands for one single quality, would not imply that there could not be many white things. Similarly, he implies, the mere assumption (which Parmenides makes) that 'existent' has only one meaning would not justify Parmenides'

conclusion that there is only one existent. To justify this he must assume that anything of which 'existent' is predicable must be $\delta\pi\epsilon\rho$ $\delta\upsilon\nu$ and $\delta\pi\epsilon\rho$ $\epsilon\iota\nu$, precisely identical with 'existent' and 'one', have its whole nature comprised in being existent and one. Existence must in fact be its substantial nature. Incidentally, Aristotle shows in ^a 34—^b 4 that the opposite assumption, that 'existent' is essentially an attribute of something that has a separate nature of its own, is, when combined with Parmenides' logic of the proposition, fatal to Parmenides' view. For that other thing, just because it is other than 'existent', will be non-existent, so that Parmenides will have (contrary to his main thesis $\text{o}\dot{\upsilon}$ γὰρ μήποτε τοῦτο δαμῆ, εἶναι μὴ ἕόντα, fr. 7. 1) to admit the existence of a non-existent.

The logic of his theory, then, requires Parmenides to make existence the substantial nature of the existent. But if he does this, he gets into an equal difficulty (^b 4—11). For unless he is to make the existent have no qualities whatever but its essential quality of existence, he must predicate some quality of it, say, white. But then just as, in considering the possible view that existence is an attribute, we saw that it led to the absurd conclusion that the subject of this attribute must be an existing non-existent, so we now see that if the existent is a *subject*, any attribute it has must (according to Parmenidean logic), since it is other than it, be non-existent; and then since we have judged the subject to be it (qualified by it), we shall have to say that our subject, the existent itself, is non-existent.

Finally (^b 11—12), to escape this difficulty, we must say that even 'white' denotes a just-existent; but then we shall have given up the essential hypothesis of Parmenides, that 'existent' is applicable only to one kind of thing.

^b 2. $\text{o}\dot{\upsilon}$. . . εἶναι. $\delta\upsilon\nu$ $\tau\iota$ seems preferable to $\delta\upsilon\nu\tau\iota$, and if we read $\delta\upsilon\nu$ $\tau\iota$ it is preferable to read $\alpha\dot{\upsilon}\tau\acute{o}$, as P. 69.6 seems to do. Aristotle prefers the accusative and infinitive to the dative and infinitive with $\epsilon\iota\sigma\tau\iota$ (= 'it is possible') (cf. *Pol.* 1297^b 3, 1308^b 33), as with $\epsilon\nu\delta\acute{\epsilon}\chi\epsilon\tau\alpha\iota$ (*Bz. Index*, 249^a 60—^b 3).

3. εἶναί $\tau\iota$ = $\delta\upsilon\nu$ $\tau\iota$ εἶναι.

5. ἀλλὰ (τὰ ἄλλα) ἐκείνω. The vulgate ἀλλ' ἐκείνω can hardly bear this meaning, which is plainly required. Philoponus had ἀλλ' ἐκείνω before him, and saw its difficulty; for he proposes, as one alternative, to read ἀλλ' ἐκείνω $\tau\iota$ μᾶλλον (69. 14—17). T. 10.10 μᾶλλον δὲ ϕ τὰ ἄλλα συμβέβηκεν may point to our reading. S. 125.18 ἀλλ' ἐκείνω ἄλλο $\tau\iota$ συμβέβηκεν is probably paraphrasing the vulgate reading.

6. ταῦτό. There is no trace of this word in S. 125.22, P. 69.26 (though the quotation in P. 69.23 has it), and the sense is improved by its removal.

11—12. ὥστε . . . τὸ $\delta\upsilon\nu$. To avoid the difficulty stated in ^b 4—11 we

must say that λευκόν as well as the subject that owns it is an ὄν, and therefore a ὅπερ ὄν, since in hypothesis (β) ὄν is equated with ὅπερ ὄν (cf. ^a 32-4). But then ὄν signifies more than one thing—λευκόν as well as that which owns it—and plurality is once more introduced into the universe. ὥστε gives a better sense than ὥστ' εἶ, and ἄρα is not likely to occur in the apodosis of a conditional sentence except after a parenthesis (as in ^b 8); and Simplicius seems to have read ὥστε (125. 33-126. 1).

12-14. οὐ . . . μορίων, a further argument against Parmenides. If the existent is just-existent and nothing else, it cannot have magnitude; for if it had magnitude it would have to have parts, and these, to be different, would have to be, each of them, something more than just-existent. Thus Parmenides in saying that reality is finite, and Melissus in saying that it is infinite, both contradict their fundamental principle. The logical conclusion is that of Zeno, that being has no magnitude, but this in turn is contradicted by plain facts.

13. ἑκατέρῳ (not ἐκάστῳ) is explained by the fact that Aristotle has in mind Zeno's proof that if reality is extended, it is susceptible of διχοτομία *ad infinitum* (cf. 187^a 2). Each of the two parts reached by each successive dichotomy will have to have a different being from the other part.

14-33. ὅτι . . . ἑτέρῳ. In ^b 12-14 Aristotle has shown that the Eleatics' conception of reality as a single indivisible thing which just is is inconsistent with its being extended, and thus comes into conflict both with their assertions that it is 'finite' or 'infinite' in extent, and with the plain facts of experience. He now turns to show that if we pass from the analysis of an extended whole into parts to the analysis of a logical complex into elements, here also we find that there must be not only one substance but many, the logical elements of a substance being themselves substances. Being universals, they are of course only δεύτεραι οὐσίαι (in the language of the *Categories*), but they *are* οὐσίαι. Aristotle's argument is, that if they are not substances, they must be attributes. If they are attributes, they must be attributes either (1) of the original substance (e.g. man), or (2) of something else. (1) His proof that they cannot be the former rests on two assumptions, connected irregularly by τε ^b 19 and ἔτι ^b 23. (a) Attributes are either separable or inseparable from their subjects; the latter kind being attributes whose subjects are necessarily involved in their definition. (b) Elements involved in the definition of a complex term—e.g. in the definition of man—do not involve the complex in their own definition (this is obvious, because otherwise the definitions would be circular, *a* being defined by reference to *b*, and *b* by reference to *a*). Now the elements involved in man—e.g. biped—if they are attributes of man, must either be separable attri-

butes (in which case a man need not be a biped!), or inseparable attributes, which is forbidden by (*δ*) above. (2) If, on the other hand, biped and animal are attributes of something other than man, then man, which is identical with biped animal, must be an attribute of that something.

14. ὅπερ ὄν, 'just-existent' or 'essentially a kind of existent', is used here as equivalent to 'substance', since non-substances are not kinds of existent but attributes of existents.

18-23. συμβεβηκός . . . σιμόν. Only two kinds of συμβεβηκός are illustrated in ^b 21-3; only two should therefore be named in ^b 18-21. The difference of meaning between οὐ ἐν τῷ λόγῳ ὑπάρχει τὸ ψ συμβέβηκεν and ἐν ψ ὁ λόγος ὑπάρχει ψ συμβέβηκεν is but slight, and there is no trace of the latter phrase in T. 11.13, P. 76.3-10, S. 128.13-16. It must be regarded as a gloss on the earlier phrase.

20. οὐ ἐν τῷ λόγῳ ὑπάρχει τὸ ψ συμβέβηκεν is the second kind of καθ' αὐτό mentioned in *An. Post.* (73^a 37-^b 3), viz. ὅσοις τῶν ἐνυπαρχόντων αὐτοῖς αὐτὰ ἐν τῷ λόγῳ ἐνυπάρχουσι τῷ τί ἐστι δηλοῦντι, οἷον τὸ εὐθύ ὑπάρχει γραμμῇ καὶ τὸ περιφερές.

21-2. οἷον . . . χωριζόμενον. This is apparently the origin of the phrase 'separable accident'. χωριζόμενον = ἐνδεχόμενον ὑπάρχειν καὶ μὴ ὑπάρχειν ^b 19.

34-5. καὶ καθ' οὐ . . . λεγέσθω. P. 78.17-19 (cf. 74.25-6) seems to have read καθ' οὐ ἄμφω, καὶ τὸ ἐκ τούτων λεγέσθω. He also recognizes (*ibid.* 20-23) the reading καὶ καθ' οὐ ἄμφω καὶ ἐκάτερον, καὶ τὸ ἐκ τούτων λεγέσθω (recognized also by S. 129.24-7), and (*ibid.* 23-5) the reading καὶ καθόλου ἄμφω, καὶ ἐκάτερον καὶ τὸ ἐκ τούτων λεγέσθω. S. 129.19-21 seems to have himself read καὶ καθόλου ὁ ἄμφω, καὶ τὸ ἐκ τούτων λεγέσθω. Philoponus' reading seems to be the right one. If καὶ ἐκάτερον be retained, the comma must be placed after, not before, it; but the balance of the evidence is against these words, and they add nothing of value to the meaning.

35. ἐξ ἀδιαρέτων ἄρα τὸ πᾶν; The Greek commentators take these words as a statement, not a question. Themistius' interpretation (11.36-12.1) is too wide of the mark to be worth mentioning. Philoponus gives two interpretations (79.2-23): (1) That which is strictly one is one either by being continuous or by being indivisible or by having a single definition (185^b 7-9). Aristotle has shown that reality is not one in the third sense (186^a 24-32), nor in the first (186^a 32-v. Philoponus ad loc.—^b 12). He now infers that it must be one in the second sense—it must be σημείον καὶ ἐκ σημείων: σημείον because it is neither continuous nor identical in definition, ἐκ σημείων because (as we have seen in ^b 14-35) its definition includes words which indicate parts of it. (2) ἐξ ἀδιαρέτων = ἐξ οὐσιῶν, the clause thus summing up the result of ^b 14-35.

It is evident that neither of these interpretations is acceptable. Simplicius also gives more than one interpretation. (1) His first interpretation (128.32-129.7) is so obscure as to demand light rather than supply it, but its general intention is to treat the phrase as a *reductio ad absurdum* of Parmenides' position (v. 129.13-15). (2) His second interpretation (129.8-15), resting like the first on the authority of Alexander, takes ἀδιαίρετων = inseparable from τὸ πᾶν, i.e. of the same nature with it, i.e. οὐσιῶν; thus agreeing with Philoponus' second interpretation.

Pacius takes the words to state the view which Parmenides must adopt if he is to avoid the conclusion that there are many *entia*. (Obviously, a view which recognizes ἀδιαίρετα in the plural does *not* avoid this conclusion.) He makes the interesting suggestion that perhaps we should read ἄρα and interpret the sentence thus: 'What therefore will Parmenides say, to avoid the multitude of entities which we have found to exist by analysing man into its elements? Will he be so absurd as to deny that what is can be divided?'

There is another peculiarity of the passage, by taking account of which we can perhaps arrive at the meaning of the clause. Any one who reads carefully the words εἰ . . . λεγέσθω ^b 31-5 will notice that the order seems peculiar. The argument looks as if it were complete when Aristotle has stated the conclusion of the hypothesis that the elements, animal and biped, are attributes of something other than man (viz. that man would then itself be an attribute), and has confronted this with the principle that a substance (like man) is an attribute of nothing (^b 33-4). The words καὶ καθ' οὐ ἄμφω, καὶ τὸ ἐκ τούτων λεγέσθω seem superfluous where they are. If they are wanted at all, they seem to be wanted as an additional premiss before the conclusion καὶ ὁ ἄνθρωπος ἂν εἴη τῶν συμβεβηκότων ἐτέρω. Simplicius points this out, though without proposing a change of reading. Laas proposed to transfer the words to that position. But this will not do; it separates the imperatives ἔστω, λεγέσθω, which manifestly belong together, and makes the second depend on εἰ, which is impossible.

Both our problems can be solved if we suppose the main argument to end with ἐτέρω ^b 33, ἀλλὰ . . . πᾶν to add a reflection of Aristotle's own, and ἐξ ἀδιαίρετων ἄρα τὸ πᾶν to be interrogative. 'But let us grant that a substance (like man) is not an attribute of anything, and that of that of which both of two terms are predicated, the complex of the two terms can be predicated (which would seem to make man an attribute of that of which animal and biped are attributes); does it follow that the only way out of the difficulty is to make the universe consist of unanalysable entities—throwing overboard the analysis of man into animal and biped, which has led to

the difficulty?' His own solution is a different one; viz. that man is analysable into elements, but that these are themselves not accidents, ἐν ὑποκειμένῳ, but substantial entities predicable καθ' ὑποκειμένου and being its essential nature—οὐσίαι, though only δευτεραι οὐσίαι; i.e. that διαιρεῖται τὸ ὅπερ ὄν εἰς ὅπερ ὄν τι ἄλλο (^b 14).

For ἄρα used thus in a question = 'does it follow that . . .?' cf. Xen. *Mem.* iv. 4. 23 Πότερα οὖν (sc. σπέρματα), ἔφη, βελτίω; Δῆλον ὅτι, ἔφη, τὰ τῶν ἀκμαζόντων. Τὰ τῶν μὴ ἀκμαζόντων ἄρα οὐ σπονδαῖα; and Pl. *Apol.* 26d, *Phaed.* 58a.

187^a 1. ἐνιοὶ δ' ἐνέδοσαν τοῖς λόγοις ἀμφοτέροις, to both the famous Eleatic arguments. The first is the argument ascribed to Parmenides in 186^a 24-5, and considered by Aristotle, *ibid.* ^a 25-^b 12. The second argument, ὁ ἐκ τῆς διχοτομίας, has not been mentioned. The commentators are no doubt right in identifying it with the argument of Zeno against plurality, which has been skilfully reconstructed by Zeller (i.⁶ 749-53) from the accounts that have come down from antiquity. The main arguments against the existence of plurality are two. (1) If being were many, it would have to be both infinitely little and infinitely great. *Infinitely little*, because since every plurality is a number of units, and only the indivisible is a true unity, each of the many must be either an indivisible unit or composed of such. But what is indivisible has no magnitude, since everything that has magnitude is infinitely divisible. The single parts of which the many consists must therefore have no magnitude. Nothing becomes greater by their being added to it, or less by their being taken away. But what does not increase things by its presence or decrease them by its absence is nothing. The many is therefore infinitely small, since each of its parts is so small as to be nothing. But on the other hand these parts must be *infinitely great*. For since that which has no magnitude is not, the many, in order to be, must have magnitude; its parts must therefore be distant from one another, i.e. there must be other parts between them. But the same is true of these; they also must have magnitude and be separated by yet other parts from the others, and so *ad infinitum*, so that we get infinitely many quantities or an infinite quantity. (2) Similarly the many must be both limited and unlimited in *number*. Limited, because it is as many as it is, no more nor less. Unlimited, because two things are two only when they are separated; in order that they may be separated, there must be something between them; and so too between this intermediate and each of the two, and so *ad infinitum*. As in the first proof the conclusion that the many must be infinite in magnitude, so here the conclusion that it must be infinite in number, is got from the fact that it is conceived as a plurality of separated magnitudes, and between any two

of these a third, separating them, is intercalated. This part of both proofs would be aptly called 'the argument from dichotomy', and is no doubt what Aristotle meant by this phrase. It is evident, too, that the acceptance of this argument (*ἐνέδοσαν*), i.e. the acceptance of the view that, if bodies are infinitely divisible, they must consist of an infinite number of infinitely great parts, would, by the paradoxical nature of the result, lead people to do what Aristotle says they did, viz. deny that bodies are infinitely divisible, and accept a belief in indivisible magnitudes.

The other Eleatic argument referred to is the argument that 'if "being" has a single meaning, being is one thing, exclusive of any plurality'; and the thinkers referred to are said to have given in to this argument in that they accepted its conclusiveness and therefore thought that the existence of plurality can be explained only by supposing that being has *not* one single meaning but that not-being is a kind of being distinct from being proper. The reasoning is expressed more clearly in *Met.* 1089^a 2-6, *ἔδοξε γὰρ αὐτοῖς πάντ' ἔσσεσθαι ἐν τὰ ὄντα, αὐτὸ τὸ ὄν, εἰ μὴ τις λύσει καὶ ὁμοσε βαδιεῖται τῷ Παρμενίδου λόγῳ "οὐ γὰρ μήποτε τοῦτο δαμῆ, εἶναι μὴ ἔόντα", ἀλλ' ἀνάγκη εἶναι τὸ μὴ ὄν δεῖξαι ὅτι ἔστιν· οὕτω γάρ, ἐκ τοῦ ὄντος καὶ ἄλλου τινός, τὰ ὄντα ἔσσεσθαι, εἰ πολλὰ ἔστιν.* It might be thought, therefore, that the *ἔνιοι* referred to are the thinkers referred to in the *Metaphysics*, viz. the Platonists. But the *ἔνιοι* are said to have also given in to the argument from dichotomy, and to have accepted the belief in indivisible magnitudes. This might no doubt be a reference to Plato's and Xenocrates' doctrine of indivisible lines. Alexander (*S.* 134.19, 135.15, 138.11), Porphyry (*ib.* 135.1, 140.6), and Themistius think it is Plato that is described as giving way to the first Eleatic argument, and Xenocrates to the second. Simplicius agrees with regard to Xenocrates (*ib.* 142.16), but not with regard to Plato, on the ground that Plato did not believe in a *ἀπλῶς μὴ ὄν* but in *μὴ ὄν τι* (137.7-20).

This is a sound point, and we are therefore justified in looking for (what Simplicius does not supply) another interpretation of *ἔνιοι* than that which refers it to Plato and Xenocrates. Now the most important theory of *ἄτομα μεγέθη* was Atomism, and there is a passage which makes it fairly clear that Atomism is the theory here referred to. In *De Gen. et Corr.* 324^b 35-325^a 32 Aristotle explains Atomism as due to reflection on Eleatic arguments. *ὁδῶ δὲ μάλιστα καὶ περὶ πάντων ἐνὶ λόγῳ διωρίκασι Δεύκιππος καὶ Δημόκριτος, ἀρχὴν ποιησάμενοι κατὰ φύσιν ἥπερ ἔστιν. ἐνίοις γὰρ τῶν ἀρχαίων (to the Eleatics) ἔδοξε τὸ ὄν ἐξ ἀνάγκης εἶναι καὶ ἀκίνητον· τὸ μὲν γὰρ κενὸν οὐκ ὄν, κινήθηναί δ' οὐκ ἂν δύνασθαι μὴ ὄντος κενοῦ κεχωρισμένου, οὐδ' αὖ πολλὰ εἶναι μὴ ὄντος τοῦ διείργοντος . . . Δεύκιππος δ' ἔχειν ψήθη*

λόγους οἷτινες πρὸς τὴν αἰσθησιν ὁμολογούμενα λέγοντες οὐκ ἀναρῆσουσιν οὔτε γένεσιν οὔτε φθορὰν οὔτε κίνησιν καὶ τὸ πλῆθος τῶν ὄντων. ὁμολογήσας (cf. *Phys.* 187^a 1 ἐνέδοσαν) δὲ ταῦτα μὲν τοῖς φαινομένοις, τοῖς δὲ τὸ ἐν κατασκευάζουσι ὡς οὐκ ἂν κίνησιν οὔσαν ἄνευ κενοῦ, τό τε κενὸν μὴ ὄν καὶ τοῦ ὄντος οὐθὲν μὴ ὄν φησιν εἶναι· τὸ γὰρ κυρίως ὄν παμπλήρες ὄν. ἀλλ' εἶναι τὸ τοιοῦτον οὐχ ἔν, ἀλλ' ἄπειρα τὸ πλῆθος καὶ ἀόρατα διὰ σμικρότητα τῶν ὄγκων. ταῦτα δ' ἐν τῷ κενῷ φέρεσθαι (κενὸν γὰρ εἶναι), καὶ συνιστάμενα μὲν γένεσιν ποιεῖν, διαλυόμενα δὲ φθορὰν. Burnet seems to be right (*E. G. P.* § 173) in interpreting the present passage in the light of this other, and in holding that Aristotle is tracing both the main elements in the Atomic doctrine—the belief in the void (τὸ μὴ ὄν) and the belief in the atoms—to reflection on the implications of Eleatic arguments.

3-6. φανερόν . . . τὸ μὴ ὄν, 'but it is also evident that it is not true that if being means one thing and cannot at the same time mean the opposite of that thing, no non-being will be; for there is nothing to prevent that which is not—not from being, simply, but from being what is not some particular thing'. Cf. *Met.* 1089^a 16-18 πολλαχῶς γὰρ καὶ τὸ μὴ ὄν . . . καὶ τὸ μὲν μὴ ἄνθρωπον (εἶναι) σημαίνει τὸ μὴ εἶναι τοδί, τὸ δὲ μὴ εὐθύ τὸ μὴ εἶναι τοιονδί, τὸ δὲ μὴ τρίπηχυν τὸ μὴ εἶναι τοσονδί.

6-8. τὸ δὲ δὴ φάναι . . . ἄτοπον. The sense requires the placing of the comma after φάναι instead of after ὄν^a 7.

7. εἰ . . . ἔσσεσθαι. The vulgate has ὡς εἰ κτλ. Kühner, *Gr. Gr.* ii. § 550. 1 n. 3 (b) quotes several examples of the irregular combination of ὡς or ὅτι with accusative and infinitive (rendered more natural by the presence of an intervening clause, as in 193^a 12-14). But J¹ has not ὡς, and the word seems due to the ὡς εἰ in ^a 4 having caught a copyist's eye.

8-9. τίς . . . εἶναι; 'for who understands being itself to be anything but what is just a particular existent (i.e. a substance)?'

10. ὥσπερ εἴρηται, 186^b 14-33.

οὔτως ἔν, i.e. an undifferentiated unity.

CHAPTER 4

187^a 12. οἱ φυσικοί, in opposition to the Eleatics, cf. 184^b 17 n.

οἱ μὲν γὰρ ἐν ποιήσαντες τὸ [ὄν] σῶμα τὸ ὑποκείμενον. This does not in itself differentiate this school from the other to which Aristotle opposes it, since that also believed in ἐν ὑποκείμενον σῶμα (^a 20 οἱ δ' ἐκ τοῦ ἐνός κτλ.). The distinguishing features of the first school are (1) that it identifies the underlying matter with one of the three elements or with an intermediate between them, and (2) that

it derives sensible things from this by densification and rarefaction. Those of the second school are (1) that it describes the underlying matter as something indefinite in which all definite kinds of matter are potentially present, and (2) that it derives sensible things by segregation from this undifferentiated mixture.

τὸ ὄν σῶμα is not a natural phrase, and if ὄν be kept, the text is best translated 'some, making being a single body, viz. the underlying body'. Neuhäuser takes the Greek as = οἱ μὲν γὰρ ἐν σῶμα ποιήσαντες τὸ ὄν τὸ ὑποκείμενον, but this is more difficult in view of the order of the words. It seems best to treat ὄν as a gloss; it is quite a natural one in view of the general trend of chapters 2 and 3. Alternatively σῶμα might be regarded as a gloss; but it is vouched for by S. 149. 21.

13. τῶν τριῶν τι, i.e. fire, air, or water. Aristotle remarks elsewhere that none of the early philosophers regarded earth as the ὑποκείμενον (*Met.* 989^a 6-9).

14. ἡ . . . λεπτότερον. Such a substance is referred to again in *De Gen. et Corr.* 328^b 35, 332^a 21, *Met.* 988^a 30. A substance intermediate between *water* and *air* is referred to in 203^a 18, 205^a 27, *De Caelo* 303^b 12, *De Gen. et Corr.* 332^a 21, *Met.* 989^a 14; a substance intermediate between *fire* and *water* in 189^b 3. The ancient commentators for the most part (e.g. T. 13. 18, P. 87. 1, Al. in *Met.* 60. 8) explain these passages as referring to Anaximander; but such vagueness in referring to so well-known a thinker would be surprising, and in spite of the occurrence in some of these passages, especially *De Caelo* 303^b 12, *De Gen. et Corr.* 332^a 25, of language which reminds us of Anaximander, the present passage shows clearly that he is not meant. He is mentioned by name in ^a 21, and his view, ἐκ τοῦ ἐνὸς ἐνούσας τὰς ἐναντιότητας ἐκκρίνεσθαι, is expressly distinguished from the belief in an intermediate substance out of which all other things are produced by *densification* and *rarefaction*. Anaximander believed in a primary substance which had no such definite character as would be implied in being intermediate between two of the four commonly recognized elements, but which contained the potency of them all. Cf. Zeller, i⁶. 283-91.

The view in question probably belongs to a somewhat later period of speculation, since it mediates between the views of Heraclitus and Anaximenes, between those of Thales and Anaximenes, or between those of Heraclitus and Thales. It takes its origin from the thought of Anaximenes, since he was the first thinker who treated density and rarity as the characteristic marks of the different kinds of matter. S. 149. 13, 151. 21 says that Nicolaus and Porphyry referred the belief to Diogenes of Apollonia, but claims (25. 7) to have seen Diogenes' treatise *De Natura*, and says it treats *air* as the principle.

This is also Aristotle's account of Diogenes' view (*De An.* 405^a 22, *Met.* 984^a 5). Zeller and Diels conjecture that it was Idaeus of Himera that believed in the intermediate substance, but of this there is no evidence, and the only author who mentions Idaeus (*Sext.* ix. 360) says definitely that he believed in *air* as the primitive substance. We must be content to refer the belief in an intermediate substance to some member or members of the school of Anaximenes, which evidently lasted for a considerable time and had much influence (cf. Burnet, *E.G.P.*, §§ 31, 122). Aristotle's vagueness would be accounted for if he is referring to a view not explicitly stated by any one but implied merely.

16. ταῦτα δ' ἐστὶν ἐναντία. This is important as an anticipation of the doctrine to be proved in ch. 5.

17. ὡσπερ τὸ μέγα φησὶ Πλάτων καὶ τὸ μικρόν. Cf. my notes on *Met.* 987^b 20, *Theoph. Met.* 6^a 25.

18-20. πλὴν . . . εἶδη. For the contrast cf. 189^b 13-16.

21-22. καὶ ὅσοι . . . εἶναι, i.e. 'and those too who make the underlying material an indeterminate mixture which is both one and many', or, as Aristotle would say, actually one and potentially many, since everything emerges from it (^a 23). This is a true account of Empedocles' universe when it is in the state called Σφαῖρος, in which opposites are united by love, and from which they emerge under the influence of strife. It is true also of the primitive condition imagined by Anaxagoras, in which all the homoiomeries or σπέρματα are indistinguishably mingled, before they are separated out and arranged by Reason.

23. καὶ οὗτοι, i.e. as well as Anaximander.

24. τὸν μὲν, Empedocles, who believed in a cyclical change with the four phases Σφαῖρος (love in the ascendant), strife gaining on love, strife in the ascendant, love gaining on strife.

25. τὸν μὲν, Anaxagoras. In the fragments dealing with the condition of things when all were together, we find references on the one hand to σπέρματα of kinds of substance like earth, hair, &c. (fr. 4, 10), on the other hand to qualities grouped in opposites such as wet and dry, hot and cold, &c. (fr. 4, 8, 10, 12, 15). These are what Aristotle refers to as the ὁμοιομερῆ and the ἐναντία respectively. It seems likely that Anaxagoras thought of the homoiomeries as formed by union (in different proportions) of substances characterized by these contrary qualities, so that the latter are the fundamental elements in his picture of the world. Tannery (*Science Hell.* 286 f.) argued that these contrary qualities, and not, as had usually been supposed, such things as hair, earth, &c., were the things of which Anaxagoras declared that there is something of everything in everything. He appears to be right in calling attention to Anaxagoras'

repeated reference to pairs of contraries, but his view is open to criticism in two points: (1) it must not be supposed that when Anaxagoras says τὸ θερμὸν, τὸ ψυχρὸν, &c., he means the qualities of heat and cold in distinction from substances having these qualities. If earth, say, is to be regarded as less ultimate than the hot and the cold, it is not that Anaxagoras supposed a substance could be produced by any mere union of qualities, but rather that earth is thought to be composed of simple substances characterized by heat and cold respectively. (2) Anaxagoras seems to say both of the contraries and of the resultant complex bodies that there is something of everything in every thing. In fr. 4 they are both described as ὅμων εἶδη. In fr. 8 it is the contraries that are said not to be 'cut apart with a hatchet', but in fr. 10 it is equally clearly implied that there is some hair in not-hair and some flesh in not-flesh.

26. τὰ καλούμενα στοιχεῖα, because Aristotle believes Empedocles' 'elements' to be really complex, composed of prime matter + the contraries hot or cold, and wet or dry.

29-30. διὰ τοῦτο . . . ἀλλοιοῦσθαι. Heidel as reported by Diels, *Vors.* i. 388. 25 n. regarded these words as an *emblema* from *De Gen. et Corr.* 314^a 13-15, meant to be inserted after τὰλλα^a 23. But there seems to be no sufficient ground for this. And what does he make of οἱ δὲ σύγκρισιν καὶ διάκρισιν^a 31?

Zeller seems to be right in saying (i⁶. 1209 n. 1) that the mode of reference here implies that τὸ γίνεσθαι τοιόνδε καθέστηκεν ἀλλοιοῦσθαι is an actual fragment from Anaxagoras. This is confirmed by *De Gen. et Corr.* 314^a 13-15 λέγει γοῦν ('Αναξαγόρας) ὡς τὸ γίνεσθαι καὶ ἀπόλλυσθαι ταῦτόν καθέστηκε τῷ ἀλλοιοῦσθαι. Diels explains both passages as references to fr. 17 τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι οὐκ ὀρθῶς νομίζουσιν οἱ Ἕλληνες· οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται, ἀλλ' ἀπὸ εἶδητων χρημάτων συμμίσγεται τε καὶ διακρίνεται. καὶ οὕτως ἂν ὀρθῶς καλοῖεν τό τε γίνεσθαι συμμίσγεσθαι καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι. But this cannot be the passage Aristotle has in mind, for here and in *De Gen. et Corr.* 314^a 13 he clearly implies that Anaxagoras identified γένεσις with ἀλλοίωσις, though this view was proper only for those who believed in a single underlying matter.

The Greek may mean either 'the coming into being of such and such a thing is just a changing of quality', or 'this is the kind of thing that coming into being is—a changing of quality'.

31. οἱ δὲ σύγκρισιν καὶ διάκρισιν, sc. τὴν γένεσίν φασιν εἶναι. We have just seen that in fr. 17 Anaxagoras identifies γένεσις with σύγκρισις, and φθορά with διάκρισις. But οἱ δὲ distinguishes those who made this identification from Anaxagoras, who has been referred to in the earlier part of the sentence. οἱ δὲ refers primarily to Empedocles, whose doctrine Aristotle often refers to as identifying

γένεσις with σύγκρισις καὶ διάκρισις, though this is equally true of, and is ascribed by Aristotle elsewhere to, Anaxagoras.

37-^b I. διὰ μικρότητα . . . ἡμῖν. Cf. Anaxagoras fr. 1 πάντων ὁμοῦ ἔόντων οὐδὲν ἔνδηλον ἦν ὑπὸ σμικρότητος.

^b I. διό . . . μεμίχθαι. Cf. fr. 6 καὶ οὕτως ἂν εἶη ἐν παντὶ πάντα, fr. 11 ἐν παντὶ παντὸς μοῖρα ἔνεστι πλήρη νοῦ.

2-7. φαίνεσθαι . . . πράγματος. Cf. fr. 12 ὄτων πλεῖστα ἐνι, ταῦτα ἐνδηλότατα ἐν ἕκαστόν ἐστι καὶ ἦν.

7. ἢ ἄπειρον. The addition is necessary, since what is indefinite in one respect may be definite and knowable in another; cf. a surface that is indefinitely long but of a definite breadth.

13-18. ἔτι . . . ὁμοίως. If we read ἔτι δ' εἰ ἀνάγκη in ^b 13, we must, to get a properly constructed sentence, accept Bonitz's δῆ for δέ in ^b 16. A way of escape is provided if we accept the reading of E and P. in ^b 13 ἔτι δὲ ἀνάγκη. But we should then lose a very typical Aristotelian sentence (to which Bonitz cites many parallels); and Bonitz's emendation derives some support from Alexander's paraphrase at ^b 16 εἰ οὖν τὰ ζῶα καὶ τὰ φυτὰ μῆτε πηλικά ἐστὶ μῆτε ποσά (S. 168.3, 10); and it looks as if E's reading were due to an attempt to put the sentence right after δῆ had already been corrupted into δέ.

13-14. οὐ . . . μικρότητα. This is a reference to Anaxagoras' doctrine in fr. 3, οὔτε γὰρ τοῦ σμικροῦ ἔστι τό γε ἐλάχιστον, ἀλλ' ἔλασσον αἰεὶ. τὸ γὰρ ἐὸν οὐκ ἔστι τὸ μὴ οὐκ εἶναι. ἀλλὰ καὶ τοῦ μεγάλου αἰεὶ ἔστι μεῖζον.

21. ἢ ἐπὶ τὸ ἔλαττον. The words which S. 167.33-168.1, 168.3-4, 5-6 describes Alexander as having read are evidently a duplicate version of ^b 16-21. Simplicius says they occurred in none of the MSS. known to himself (168. 2).

22-34. ἔτι . . . ἀδύνατον. This is an ingenious argument to disprove Anaxagoras' view that even the smallest portion of one σπέρμα contains something of every other σπέρμα. Aristotle takes for simplicity's sake the supposition that there are merely two kinds of σπέρμα involved. Anaxagoras maintains that in even the smallest portion of water there is some flesh. Now, says Aristotle, it may be assumed that any finite body will be exhausted by a sufficient number of subtractions of finite parts from it (^b 25). If the flesh in the water is exhausted before the water is exhausted, there will be some water left in which there is no flesh (^b 30-32). Anaxagoras, then, must maintain that the subtraction of flesh can go on as long as there is any water left. Now if the portions of flesh subtracted got steadily smaller and smaller, the process might be supposed to go on for ever, just as in 1 you can get an infinite series of the form $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} . . .$ (cf. *De Sensu* 445^b 27 τὸ μὲν οὖν συνεχές εἰς ἄπειρα τέμνεται ἄνισα, εἰς δ' ἴσα πεπερασμένα). But Aristotle has already established (^b 13-21)

that there are minimal parts of flesh (as of everything else). Therefore even if up to a certain point the parts subtracted get steadily less, there is some part that cannot be exceeded in smallness, and any parts subtracted thereafter must be not less than this. The series will take, say, the form $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{8} \dots$ and Anaxagoras will have to maintain that this series continued indefinitely can be got out of the single portion of flesh, which is evidently absurd. Either the *ἔκκρισις* will stop when we have got $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{8}$ of flesh out of the water (in which case it will be clear that what we started with was not water at all, but flesh), or it will stop short of this point (in which case there will be some water left in which there is no flesh).

188^a 1. *ἔσται γὰρ ἐλάττων τῆς ἐλαχίστης*, 'for then there will be a portion of flesh left which will be less than the least'. So S. 171.19, 20, 26. The MSS. of Philoponus vary between *ἐλάττων* and *ἐλαττον*. The MS. reading is a natural corruption due to the assumption that the subject of *ἔσται* is *σῶμα*. But this does not suit the argument, for what Aristotle has proved (187^b 13-21) is not that there is a portion of flesh than which no body can be smaller (this would contradict his doctrine of the infinite divisibility of matter), but that there is a portion of flesh than which no portion of *flesh* can be smaller.

3-4. *κεχωρισμένα . . . ὄντα*. With the MS. reading, *μέντοι* is unmeaning, and there is no opposition between the clauses such as *δ'* implies. For the position of *οὐ* cf. *E.N.* 1147^b 29 τὰ δ' ἀναγκαῖα μὲν οὐ, αἰρετὰ δὲ καθ' αὐτά and Bz. *Index* 539^a 10-14.

5. *τοῦτο δ' ἄλογον*, sc. because bodies existing side by side necessarily bound each other and are therefore not infinite.

7. *εἰ . . . ἕξεις*. Anaxagoras says (fr. 8) *οὐ . . . ἀποκέκοπται πελέκει οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ*, and Aristotle takes him to refer to the qualities. But it is almost certain that Anaxagoras meant 'that which is hot' and 'that which is cold'; cf. 187^a 25 n.

9. *ὁ νοῦς*, the *νοῦς* of which Anaxagoras says (fr. 13) *ἐπεὶ ἤρξατο ὁ νοῦς κινεῖν, ἀπὸ τοῦ κινουμένου παντὸς ἀπεκρίνετο, καὶ ὅσον ἐκίνησεν ὁ νοῦς, πᾶν τοῦτο διεκρίθη*.

13-15. *οὐκ . . . οὐ*, i.e. Anaxagoras is not right in supposing that the homoiomerics are produced always by concretion of smaller portions of themselves which were present in substances predominantly of another kind (fr. 10). It is true that mud can be divided into smaller bits of mud, and built up out of smaller bits of mud. But it can also be analysed into earth and water, and built up out of earth and water.

15-17. *καὶ οὐχ . . . γίνονται*, i.e. water and air are produced out of each other not as bricks can be produced from a house and a

house from bricks (or *πηλοί* from *πηλός* and *πηλός* from *πηλοί*), by mere segregation or aggregation of similar parts, but by a genuine *γένεσις* involving change of quality and indeed of substance. The sense of the passage (as well as linguistic considerations) shows that *δέ* in ^a16 should be excised. It has probably been introduced owing to some copyist's taking *καὶ οὐχ ὁ αὐτὸς τρόπος ὡς πλίνθι ἐξ οἰκίας καὶ οἰκία ἐκ πλίνθων* to go with the previous clause, and supposing that therefore a connective particle is wanted with *οὕτω* *κτλ.*

17-18. *βελτιόν . . . Ἐμπεδοκλῆς*. Apart from being true to the facts, the theory that *ὁμοειδῆ* can be produced out of simpler elements distinct from themselves has the scientific advantage that it enables us to do with a smaller number of ultimate elements, as Empedocles in fact does. The principle enunciated is the ancestor of Occam's razor. Cf. 189^a 14-16, 259^a 9.

CHAPTER 5

188^a 19. Aristotle begins here his positive account of the first principles.

20-22. *καὶ γὰρ . . . γῆν*. The reference to contrary principles occurs (fr. 8. 53) in the second part of Parmenides' poem, that in which he professes to leave the truth of things and state the opinions of mortals (ib. 50-52). In *Met.* 986^b 28 Aristotle describes the transition from the 'way of truth' to the 'way of opinion' by saying that though Parmenides thinks that of necessity only Being exists, he is forced to follow the observed facts, and therefore to admit two causes, Being and Not-being. I.e., Parmenides is supposed to allow a lower order of reality to the sensible world and to set about the explanation of it, even though this explanation is not in accordance with his account of true reality. S. 39.10 describes his procedure in the same way. But this is inconsistent with what Parmenides says in fr. 8. 50-52, which implies that the second part of the poem merely states the false opinions of mortals—not of the average Greeks of his time, who would not have recognized the 'way of opinion' as their own, but of the popular philosophy of the day, i.e., as Burnet points out (*E. G. P.* §§ 90, 91), of the Pythagorean philosophy. Aristotle either is simply mistaken, or knows that he is merely stating what occurs in Parmenides' poem but does not belong to Parmenides' own views. *πῶς* in *Met.* 984^b 4 perhaps gives some colour to the latter alternative.

Aristotle repeats in *Met.* 986^b 34 that the two causes recognized by Parmenides were the hot and the cold. The *μορφαί* that Parmenides

names are *φλογὸς αἰθέριον πῦρ* and *νύξ ἀδαής* (fr. 8. 56, 59). Fire no doubt is hot and night is cold, but we have no evidence that these were the attributes which Parmenides treated as characteristic of them. Rather they are opposed as light and dark (cf. light and darkness in the Pythagorean list of contraries, *Met.* 986^a 25), and the mention of heat and cold is an accommodation to Aristotle's own views, in which these played so important a part.

Again, Aristotle repeats in *De Gen. et Corr.* 318^b 6, 330^b 14, *Met.* 986^b 34 (cf. Theophr. *Phys. Op.* fr. 6) that the two causes assigned by Parmenides were fire and earth. The identification of the second *μορφή* with earth must be regarded as a mistake. The second principle is night (cf. S. 25.16), and by this Parmenides means the Pythagorean 'mist', 'air', or 'void' (cf. what Plato makes the Pythagorean Timaeus say, *Tim.* 58d). Later in the history of Pythagoreanism, fire and earth probably came to be treated as the primary elements (cf. *Tim.* 31b, and Burnet, § 147), and this may explain Aristotle's words.

22. καὶ οἱ . . . πυκνόν. Cf. 187^a 15.

τὸ πλήρες. For this as the name of Democritus' *στερεόν* cf. *Met.* 985^b 5, 1009^a 28.

23. ἔτι θέσει, σχήματι, τάξει, sc. διαφέρειν φησὶ τὸ ὄν. Cf. *Met.* 985^b 15 διαφέρειν γὰρ φασι τὸ ὄν ἄνισμῶ καὶ διαθιγῇ καὶ τροπῇ μόνον· τούτων δὲ ὁ μὲν ἄνισμος σχημά ἐστιν ἢ δὲ διαθιγὴ τάξις ἢ δὲ τροπὴ θέσις· διαφέρει γὰρ τὸ μὲν Α τοῦ Ν σχήματι τὸ δὲ ΑΝ τοῦ ΝΑ τάξει τὸ δὲ Ι τοῦ Η θέσει. *σχῆμα* is a characteristic intrinsic to a particular atom; *θέσις* is the position of one atom relatively to the atoms next it (e.g. ΑΙ differs from ΑΗ in respect of the *θέσις* of the second letter relatively to the first); *τάξις* is the order in which two atoms occur (e.g. ΑΝΗ differs from ΝΑΗ in *τάξις*).

One might expect Aristotle to illustrate all three differentiae, and Susemihl has therefore proposed to read in ^a 25 (τάξεως) πρόσθεν ὀπισθεν, which would agree well with the example of *τάξις* in the *Metaphysics* passage above. But in the sentence ταῦτα . . . περιφερές Aristotle need not be sticking closely to the Atomistic doctrine; he may be expressing his own view, and in that, 'before' and 'behind' is a difference of *θέσις* (cf. *Hist. An.* 494^a 20 ἢ θέσις τῶν μερῶν πρὸς τὸ ἄνω καὶ κάτω καὶ πρόσθιον καὶ ὀπίσθιον). Nor is it very surprising, in view of his habits of composition, if Aristotle neglects to give an instance of difference of *τάξις*.

25. γεγωνιωμένον ἀγωνίον. Bekker's reading *γωνία εὐθὺ περιφερές* cannot stand, as contraries must necessarily come in couples. The reading we have accepted is sufficiently vouched for by the interpretations of Philoponus and Simplicius.

31. ἐπὶ τοῦ λόγου, 'in the case of', i.e. by reference to, the argu-

ment (cf. 262^a 19, and contrast 188^b 29). The appeal to argument is contrasted with the appeal to authority (^a 26).

^b 1. οὐκ ἐκ μουσικοῦ idiomatically = ἐξ οὐ μουσικοῦ.

5. καὶ οὐκ εἰς τὸ τυχόν, i.e. οὐκ εἰς τὸ μὴ λευκὸν τὸ τυχόν.

16-17. ἀλλὰ . . . ὁμοίως. Aristotle passes here to the case in which the thing produced and that from which it is produced are contraries, though their names do not (as in the former case) openly betray this. Thus οἰκία, ἀνδριάς, &c. stand for something ἡρμωσμένον, and πλίνθοι, χαλκός, &c., for something ἀνάρμωστον, though their names are not on the face of it contraries.

26. μέχρι . . . τοσοῦτον. For the idiom cf. Bz. *Index*, 464^b 17-22.

27. καθάπερ εἶπομεν πρότερον, ^a 19-30.

31. πρότερα . . . ὕστερα = 32 γνωριμώτερα κατὰ τὸν λόγον . . . κατὰ τὴν αἴσθησιν.

33. οἱ μὲν . . . θερμὸν καὶ ψυχρόν, Parmenides; cf. ^a 20.

οἱ δ' ὑγρὸν καὶ ξηρόν. Porphyry referred this, probably rightly, to Xenophanes (P. 125. 27). Cf. fr. 29 γῆ καὶ ὕδωρ πάντι' ἐσθ' ὅσα γίνονται ἢ δὲ φύονται.

34. ἔτεροι δὲ περιττὸν καὶ ἄρτιον, the Pythagoreans; cf. *Met.* 986^a 23.

ἢ νεῖκος καὶ φιλία, Empedocles.

36. κατὰ τὸν εἰρημένον τρόπον, i.e. ἀς πρότερα, γνωριμώτερα κατὰ τὸν λόγον, ὡς ὕστερα, γνωριμώτερα κατὰ τὴν αἴσθησιν.

189^a 1. λαμβάνουσι . . . συστοιχίας, i.e. one of the two contraries named by the various thinkers belongs in every case to one and the same column of positive terms, and the other to one and the same column of negative terms.

2. τὰ μὲν . . . ἐναντίων. Bonitz points out that in several passages positive terms are said to be of the nature of excess, and negative terms of defect (187^a 16, 189^b 10, *Met.* 992^b 6, 1042^b 24), and therefore conjectures ὑπερέχει . . . ὑπερέχεται. He ignores the fact that not only are the two συστοιχίαι lists of terms contrary each to each, but each συστοιχία also forms a list ranging from wider to narrower (cf. *An. Pr.* 66^b 27, *An. Post.* 79^b 7-10, 80^b 27, 87^b 6). This is the main point in the context; cf. 188^b 30-33, and especially the contrast between the universal and the particular in 189^a 5-8.

3. καὶ χεῖρον (sc. οἱ τὰ γνωριμώτερα κατὰ τὴν αἴσθησιν) καὶ βέλτιον (sc. οἱ τὰ γνωριμώτερα κατὰ τὸν λόγον).

CHAPTER 6

189^a 13. οὐκ ἐπιστητὸν τὸ ὄν ἔσται. This follows from the principle laid down in 184^a 12-14.

μία τε ἐναντίωσις ἐν παντὶ γένει ἐνί, i.e. one supreme contrariety, of

which more specific forms will naturally also occur within the genus.

14. ἡ δ' οὐσία ἐν τι γένος. γένος is used here = category. The categories are the only γένη proper, the only γένη that are not εἶδη. Cf. 227^b 4, *Met.* 1016^b 33, 1024^b 12, 1054^b 29, 35, 1058^a 13.

The supreme contrariety in the category of substance is that of form and privation. Aristotle assumes that it is the ἀρχαί of φυσικαὶ οὐσῖαι that physics is looking for, and that there must be a contrariety applicable to φυσικαὶ οὐσῖαι which will be a specification of the contrariety applicable to substance in general.

καὶ ὅτι ἐνδέχεται ἐκ πεπερασμένων, cf. 188^a 17.

17-20. ἔτι . . . μένειν. Aristotle does not mean that one of two contraries is generated from the other, but that certain pairs of contraries are generated from others. In referring to sweet and bitter, white and black, he is taking a leaf out of Democritus' book (fr. 125, νόμῳ χροῖή, νόμῳ γλυκύ, νόμῳ πικρόν, ἐτέη δ' ἄτομα καὶ κενόν), and pointing out that contrarieties of colour and taste are derivative contrarieties arising in special circumstances from the operation of more universal and permanent contrarieties. The most universal contrariety, which he is hinting at as the fundamental one, is that of form and privation, which he comes to later in the book.

26-7. ἔνιοι . . . φύσιν, as e.g. Empedocles supposes the existence of four elements for his contrary principles of love and strife to operate on.

29. οὐθενὸς γὰρ ὀρώμεν τῶν ὄντων οὐσίαν τἀναντία, we do not see contraries constituting the substance of anything. Contraries are always qualities which presuppose a ὑποκείμενον, and therefore cannot be *the* ἀρχή^a (30), though they may be included among the ἀρχαί.

32-3. ἔτι . . . οὐσίᾳ. Cf. *Cat.* 3^b 24-7. The argument here is: substances are not contraries. If, therefore, we suppose the ἀρχαί constituting substances to be contraries, we are supposing non-substances to be constitutive of substances, and prior to them, which is manifestly impossible.

34-5. τόν τε πρότερον . . . λόγον, i.e. that the ἀρχαί of substance must include contraries (ch. 5).

35. καὶ τοῦτον, i.e. that substances cannot be entirely analysed into contraries (^a 21-34).

^b 2. οἶον ὕδωρ, Thales.

3. πῦρ, Heraclitus and Hippasus.

τὸ μεταξύ τούτων, cf. 187^a 14 n.

6. οἱ ἀέρα, Anaximenes, and Diogenes of Apollonia.

II. ὥσπερ εἴρηται πρότερον, 187^a 16.

12. καὶ αὕτη ἡ δόξα, as well as the view which treats contraries alone as being the ἀρχαί (188^a 19).

13-14. ἀλλ' . . . πάσχειν. Aristotle has in mind the school of Anaximenes, which subjects a single material principle to the opposite forces of densification and rarefaction (187^a 12-16).

14-16. τῶν δ' ὑστέρων . . . μάλλον. This refers to Plato's doctrine that the One is the formal principle, and the indefinite dyad of the great and small the material. Cf. *Met.* 987^b 18-27. For the contrast between the school of Anaximenes and Plato cf. 187^a 16-20.

18. ὡσπερ εἴπομεν, ^a 21.

18-22. πρὸς μὲν γὰρ τὸ πάσχειν . . . εἶη. One subject-matter is sufficient to play the passive part. If there are two pairs of contraries, they will either have two different subject-matters, one of which will be superfluous (^b 19-21), or they will have the same subject-matter, in which case one of the pairs of contraries is superfluous (^b 21-2).

20. χωρὶς ἑκατέρᾳ. J and Philoponus give the reading which the sense requires. The point is not that a matter separate from each pair of contraries, but that a separate matter for each pair of contraries, will be needed.

21-2. εἰ . . . εἶη. There is a slight looseness in describing contraries as generating from each other. Contrary cannot act on contrary (^a 22-6). What Aristotle means is rather that one contrary generates a new product by acting on a matter characterized by the other contrary.

He is now considering the hypothesis that there are two pairs of contraries, which we may call A and A', B and B'. Now if the pairs of contraries, being two, generate from each other, i.e. if (1) B' can serve as a contrary for A to act on, and (2) B can serve as a contrary for A' to act on, then from (1) it follows that B' is the same as A', and from (2) that B is the same as A (since one thing has only one contrary); so that one of our two pairs of contraries will have turned out to be superfluous.

28. καθάπερ εἴπομεν. Aristotle has not anywhere said expressly that the question whether there are two or three elements is a very hard one. This seems to be a reference to the tentative arguments (ἔχει τινα λόγον ^a 21, ^b 17) in ^a 21-^b 16 in favour of a third principle.

CHAPTER 7

189^b 32. ἐξ ἄλλου ἄλλο καὶ ἐξ ἑτέρου ἕτερον. For the distinction cf. *Met.* 1087^b 29, τὸ ἕτερον (sc. ἐναντίον ἐστί) τῷ ταύτῳ καὶ τὸ ἄλλο αὐτῷ. ἄλλο points to numerical difference, ἕτερον to difference of quality.

190^a 3. ὃ γίγνεται, 'what it becomes'.

5-8. τούτων . . . ἄνθρωπος ἐγένετο μουσικός. When, of the two

ἀπλᾶ γιγνόμενα, we are speaking of something of the type represented by τὸ μὴ μουσικόν, we can say not only 'this becomes so-and-so' but also 'from this, so-and-so comes into being'. When we are speaking of something of the type represented by 'a man', we cannot always use the latter form. We do not use the ἐκ form where (as in 'the man becomes musical') a subject merely takes on a new quality. But we do use it where a ὑποκείμενον undergoes a thorough re-shaping, so that its original nature may be said to be left behind and the word ἐκ thus becomes appropriate. Thus (cf. ^a 25) we say ἐκ χαλκοῦ ἀνδριάς ἐγένετο rather than ὁ χαλκὸς ἀνδριάς ἐγένετο.

14. εἰάν τις ἐπιβλέψῃ ὥσπερ λέγομεν, 'if one examines them in the way we are describing'. Bekker's comma after ἐπιβλέψῃ should disappear.

19. τὸ μὴ μουσικόν. It would be possible to keep the vulgate reading τὸ μουσικόν and suppose this to refer to the case (of the same general type as τὸ ἄμουσον μουσικὸν γίγνεται) in which τὸ μουσικὸν ἄμουσον γίγνεται. But the whole of the context refers consistently to the other case and there is no trace of τὸ μουσικόν in the Greek commentators. For τὸ μὴ μουσικὸν καὶ (= 'i.e.') τὸ ἄμουσον cf. ^a 11.

21. καὶ μὴ τότε γίγνεσθαι τι does not mean that the form τότε γίγνεται τότε cannot be used in the case of τὰ μὴ ὑπομένοντα, but that it is not the one Aristotle is considering at the moment. Thus Laas's conjectures are unnecessary; and they are not really supported by *Met.* 994^a 22 and *S.* 210. 13.

24-6. οὐ . . . ἀνδρίαντα. Cf. *Met.* 1033^a 5-12, 1049^a 18.

32. οὐ γίγνεσθαι, sc. λεγομένων.

35. καὶ ποτέ. These words, if genuine, must be due to inadvertence, for a thing cannot change in respect of date, as it can in respect of quantity, quality, relations to other things, or place. There is no trace of καὶ ποτέ in *T.* 27. 20 (which, however, also omits καὶ ποτέ), nor in *P.* 155. 26-156. 4.

^b 2. καὶ ὅσα ἄλλα ἀπλῶς ὄντα can hardly be right, for αἱ οὐσίαι = ὅσα ἀπλῶς ὄντα (ἐστίν). Simplicius seems to interpret ἄλλα as παρὰ τὰ πρότερον εἰρημένα, 'apart from the other categories' (213. 8), but ἄλλα could not mean anything other than παρὰ τὰς οὐσίας. It is just possible that ὅσα ἄλλα ἀπλῶς ὄντα might mean things that are not strictly substances but substance-like, i.e. the elements in and parts of substances. Or Pacius might be right in taking the reference to be to artificial things; cf. the instances of τὰ γιγνόμενα ἀπλῶς in ^b 6-8. But there is no trace of ἄλλα in Themistius (ἐπὶ δὲ τῶν οὐσιῶν τῶν γίγνεσθαι ἀπλῶς λεγομένων, 27. 20), and it seems preferable to regard ἄλλα as an emblema from the previous line. καί will then = 'i.e.'

6. ἀνδρίας, a bronze statue as distinct from one of stone (^b 7).

8. οἶον τὰ τρεπόμενα κατὰ τὴν ὕλην, i.e. the things that undergo change, not only by virtue of some local movement of their materials (which all the other kinds of change mentioned in ^b 5–8 amount to), but in respect of their matter, i.e. of its παθητικαὶ ποιότητες. τρέπεσθαι is used of such change as that of wine when it turns sour (Sext. Emp. *P.* i. 41, cf. τροπίαις οἴνου Aristoph. fr. 213), and also of the transformation of secretions into body tissue (e.g. *De Part. An.* 670^b 15). Since Aristotle is carefully working up to the conception of ὕλη, the words κατὰ τὴν ὕλην are (as Mr. Hardie observes) an unfortunate anticipation, or possibly a gloss (cf. 191^a 10). But Simplicius has them in 213. 4, 214. 15.

II. ἔστι μὲν τι γιγνόμενον, ἔστι δέ τι ὃ τοῦτο γίγνεται. The sequel shows that Aristotle uses these phrases (ambiguous in Greek) in the reverse sense to that in which they are used in ^a 2–3.

17–19. ὡς . . . ὅτι. For other instances of this repetition v. 233^a 13, 260^a 23, and cf. *Pol.* 1283^b 16, 1337^b 5.

22–3. διαλύσεις . . . ἐκείνων. The plural object τοὺς λόγους (or τοὺς ὄρους) is not very likely to be right where the reference is to ὁ μουσικὸς ἄνθρωπος, and when Philoponus says (160. 7) τὸν γὰρ λόγον τοῦ μουσικοῦ ἀνθρώπου ἀναλύσεις εἰς τοὺς λόγους, and Simplicius says (216. 29) εἰς τοὺς λόγους καὶ εἰς τοὺς ὀρισμοὺς ἢ διάλυσις, it looks as if they had no expressed object to the verb before them. Diels is therefore probably right in supposing that the variants arose from
^{τοὺς ὄρους}

an original διαλύσεις γὰρ εἰς τοὺς λόγους τοὺς ἐκείνων.

24–6. ὁ μὲν . . . μᾶλλον. Bonitz argues that ὕλη, which is presently declared to be only κατ' ἀναλογίαν ἐπιστητή (191^a 8), could not be described as ἀριθμητή, and that ἀριθμητή gives no proper opposition to συμβεβηκός. He therefore proposes ἡ ὕλη ἢ ἀρρῦθμιστος τόδε τι μᾶλλον. But the traditional reading gives a perfectly good sense if taken as a defence of the expression ἀριθμῶ ἔν (^b 24). 'We say that the subject-matter is one in number. For what is to be counted (when we ask how many things there are involved in γένεσις) is—not the duality of aspects (ὕλη-element proper and στέρησις-element) included in that from which change starts, but the one man or one piece of gold or in general one material which undergoes change; for this is more of an individual thing than the privation, and what comes into being comes from it in no merely incidental way, while the privation (or contrariety to the form which comes into being) is incidental to it'.

28. ἔν δέ τὸ εἶδος, i.e. the form which the matter comes to have as a result of the change.

33. ὅπ' ἀλλήλων . . . ἀδύνατον, cf. 189^a 22–6.

36. διὰ τὸ ἕτερον ὑπάρχειν τὸ εἶναι αὐτοῖς, 'because the essence of the matter and the essence of the privation are different'.

191^a 3. τῶν περὶ γένεσιν φυσικῶν, 'of the natural things which are involved in generation', τὰ οὐράνια being excluded. The words are vouched for by T. 29. 7, P. 166. 7-12, S. 219. 20-4, but are clearly unidiomatic: περὶ γένεσιν should perhaps be excluded.

10. ἡ ὕλη καὶ. Diels seems right in omitting these words, with S. 226. 7: ἡ ὕλη καὶ is a gloss which spoils the proportion ἄμορφον : τεχνητόν = ὕλη : οὐσία.

13. μία . . . λόγος. Bekker's and Torstrik's emendations of ἡ into ἦ or ἧ do not mend matters, and Bonitz's (τὸ εἶδος ἦ) ὁ λόγος has no great degree of probability. Simplicius tells us that in Alexander's time there were MSS. which did not read the ἡ; and there is no trace of it in J. But it is very hard to see how ἡ could have been introduced if the original reading had been μία δ' ὁ λόγος. Much the best course is to read μία δ' ἧς ὁ λόγος, 'one which is the object of definition'; cf. ὁ λόγος τῆς οὐσίας *Met.* 1018^a 10, 1028^a 35, &c., τὸ τί ἦν εἶναι οὐ ὁ λόγος ὀρισμός *Met.* 1017^b 21. From HC to the H1 read by E is a very small change. Cf. the constant confusion between πρώτως and πρώτῳ in the MSS. (192^b 22 *et passim*); cf. also 184^a 14-16 n.

15. πρώτον μὲν οὖν ἐλέχθη, ch. 5.

16. ὕστερον δ', ch. 6.

17. τῶν νῦν, ch. 7.

20. οὐπω δῆλον. The subject is to some extent discussed in ii. 1, where form rather than matter is said to be nature, and more fully in *Met.* Z. 3.

CHAPTER 8

191^a 28. ἢ ἐξ ὄντος ἢ ἐκ μὴ ὄντος. It is not at first sight clear whether this means 'either from what is or from what is not' or 'either from what is it or from what is not it'. But the latter seems to be the meaning, for the first of the other pair of alternatives ('from what is') presents no obvious impossibility such as is referred to in ^a 29.

36-^b 27. εἶνα . . . ἀναιρούμεν. The second τρόπος of solution comes in ^b 27. The first τρόπος is led up to by pointing out that the question whether *x* in general can be generated from *x* or from non-*x* is made simpler if we take the single case in which *x* is a doctor. The general effect of the first solution is this: What is¹ comes into being *per accidens* from what is, i.e. from matter, which is not-being not *per se* but by virtue of a privation which belongs to it. At the same time what is comes to be *per accidens* from what is not, i.e. from a privation, which is *per se* not-being; but it does not come to

be *per se* from this privation, but inasmuch as the privation belongs to a matter.

^b3. τὸ ἐξ ὄντος, sc. γίγνεσθαι.

5. λευκὸς γίγνεται. The reference is either to the hair's growing white (cf. λευκῶ γήρα Soph. *Aj.* 625, λευκὰ γήρα σώματ' Eur. *H.F.* 909), or to the complexion's turning pale from lack of exposure to the sun (cf. Ar. *Thesm.* 191, *Eccl.* 428, Xen. *Hell.* 3.4.19, and for the corresponding use of μέλας Pl. *Rep.* 474 e, Dem. 21. 71).

7. ἢ γίγνεσθαι, sc. τι.

9. τὸ ἢ μὴ ὄν = τὸ ἐκ μὴ ὄντος ἢ μὴ ὄν.

10. ὅπερ . . . ἀπέστησαν, 'which distinction the early thinkers went off without drawing'. For ἀπέστησαν cf. *Top.* 107^b 9, *Met.* 1056^b 28, *E.N.* 1165^a 35.

14. πὼς μέντοι . . . ὄντος. Bekker's ὅμως μέντοι is not impossible; cf. Pl. *Crito* 54 d 7, and ὅμως γε μέντοι Aristoph. *Ran.* 61. But it does not seem to be an Aristotelian phrase, and there can be no serious doubt that Cornford is right in restoring πὼς μέντοι. E's ὅπως and the vulgate ὅμως represent successive stages of corruption.

16. οὐκ ἐνυπάρχοντος, 'the privation not surviving in the product'. For the irregular neuter cf. 185^a 31 πάντα γὰρ καθ' ὑποκειμένον λέγεται τῆς οὐσίας, *Cat.* 4^a 17 ἡ οὐσία ἐν καὶ ταυτὸν ἀριθμῶ ὄν δεκτικὸν τῶν ἐναντίων ἐστίν, and Waitz on *Cat.* 4^b 4.

17. ἀδύνατον . . . ὄντος. The comma should come after, not as in Bekker before, γίγνεσθαι τι.

17-18. ὡσαύτως . . . γίγνεσθαι, 'and similarly we deny that anything comes into being out of the existent or that the existent comes to be anything'. This clause still depends on φάμεν ^b 13, ἐκ . . . ὄντος ^b 15-17 being parenthetical.

19. οὕτω, i.e. κατὰ συμβεβηκός.

20-21. οἶον . . . γίγνοιτο. The MSS. and the Greek commentators have οἶον εἰ κύων ἐξ ἵππου γίγνοιτο. But there is no reason why Aristotle should illustrate his point by so fantastic a supposition, when the ordinary case of generation of dog by dog or of horse by horse would serve his purpose. Simplicius finds κύων ἐξ ἵππου difficult, and thinks (239.18) that Aristotle would have done better to say σφκῆες ἐξ ἵππου, a well-known example of the 'spontaneous generation' in which Aristotle believed; but that will not serve as a defence of κύων ἐξ ἵππου. The MS. reading and the variant recorded by Simplicius, οἶον εἰ κύων ἢ ἵππος γίγνοιτο, probably both arose, by omission, from the reading which I have adopted, though Laas is mistaken in claiming that there is any ancient authority for this reading itself.

Aristotle's claim is that the generation of ὄν from ὄν presents no more difficulty than the ordinary generation of animals. In such

generation not only is an animal born of a *particular* animal; it is born of an *animal*, but that does not imply that what is born is exactly the same as what it is born of (which would be absurd); 'animal' is simply a common predicate of two things which have individual differences. And so too with *ὄν*.

22-3. ἀλλ' . . . τοῦτο is difficult. One expects οὐχ ἢ ζῶον to go with ἐκ ζῴου in ^b22, as ἢ μὴ ὄν goes with ἐκ μὴ ὄντος in ^b9-10 and 25-6. But it does not give a good sense to say 'a dog would come into being from an animal, but not from an animal *qua* animal; for that is already present'; we should expect 'for that continues to be present'. One has to suppose therefore that οὐχ ἢ ζῶον goes with ὁ κυών, in which case we get the good sense 'a dog would come into being from an animal, but not a dog *qua* animal; for that is already present', so that the supposed coming to be would not be a coming to be at all. This same line of thought is carried on in εἰ δέ τι μέλλει γίγνεσθαι ζῶον μὴ κατὰ συμβεβηκός κτλ., 'if animal is to be the essential *terminus ad quem* of a coming to be, it cannot also be the essential *terminus a quo*'.

25. οὐδ' ἐκ μὴ ὄντος. Aristotle here recurs to the point made above in ^b6-17.

εἴρηται, ^b9.

26-7. ἔτι . . . ἀναιροῦμεν. Aristotle points out that he has avoided denying the law of excluded middle. If he said roundly that change proceeds neither from what is nor from what is not, he would be denying the law; but in saying that it is neither from what is, simply as such, nor from what is not, simply as such, he does not deny the law.

27-8. ἄλλος . . . ἐνέργειαν. The second solution consists in pointing out that coming to be proceeds from that which actually is not, but potentially is, what it becomes.

29. τοῦτο . . . μᾶλλον. One would naturally suppose this reference to be to the full discussion in *Met.* Θ, especially in ch. 6. But not only does *Met.* Η, which is closely connected with Θ, refer back to the *Physics* (1042^b 7), but even *Met.* Α, which is probably earlier than any other part of the *Metaphysics* except Δ, does so several times. There seem to be three possibilities: (1) The reference may be to *Met.* Δ, which is on several grounds deemed to be an early work. But the passage on potentiality and actuality in Δ. 1017^a 35-^b9 is not so full a discussion as the present reference suggests, and Δ. 12 on δύναμις hardly supplies anything to Aristotle's present purpose. (2) The reference may be to *Met.* Θ, and be a later addition. (3) The reference may be to a lost work. The second suggestion is the most probable of the three.

31. τῶν εἰρημένων ἔνια, i.e. γένεσις, φθορά, and μεταβολή in general (cf. ^b32, 33).

33. αὐτή . . . ἡ φύσις, i.e. ἡ ὑποκειμένη φύσις (^a 7), with (1) its two elements matter and privation, which afford Aristotle's first solution (cf. ^a 36-^b 27 n.), and (2) its two attributes, potential being and actual not-being, which afford the second solution (cf. ^b 27-8 n.).

CHAPTER 9

191^b 35-192^a 25. Ἡμμένοι . . . συμβεβηκός. Aristotle has said in ^b 33 that it was ignorance of the ὑποκειμένη φύσις that led astray the early thinkers. He now proceeds to show that though the Platonists to some extent recognized the ὑποκειμένη φύσις, they were ignorant of its true nature; in particular, of the inclusion of both matter and privation in it.

35. καὶ ἕτεροί τινες. From 192^a 6-8 it is clear that the reference is to Plato and the Platonists. In *Met.* 1088^b 35-1089^a 6 they are similarly described as having accepted the existence of not-being; and they may be referred to in 187^a 1, where rather similar language is used. But see n. *ad loc.*

192^a 1. ἢ Παρμενίδην ὀρθῶς λέγειν, i.e. they admitted the correctness of Parmenides' dilemma, τὸ γινόμενον ἢ ἐξ ὄντος ἢ ἐκ μὴ ὄντος γίγνεται, but instead of regarding γένεσις as therefore impossible they embraced the second horn of his dilemma.

2. δυνάμει μία, 'one in significance'. δυνάμει = the εἶδει of 190^a 16, ^b 24.

6. ἐγγὺς καὶ οὐσίαν πως, 'almost even substance, in a sense'. For the construction cf. *Pl. Men.* 91 e ἐγγὺς καὶ ἐβδομήκοντα ἔτη γεγονότα.

6-8. οἱ δὲ . . . ἐκάτερον, i.e. 'but the Platonists, though like us they recognize a twofold material element, identify not-being with the two aspects of their material principle alike—either with both together, or with either separately'.

8. ὁ τρόπος οὗτος τῆς τριάδος, the Platonic One, great, and small; cf. 187^a 16-20.

9. κάκεινος, Aristotle's form, matter, and privation.

11. τις, Plato, as is clear from *Met.* 987^b 20, 33.

12. τὴν . . . ἑτέραν, the other aspect of the ὑποκειμένη φύσις, viz. privation.

14. ὡσπερ μήτηρ. Aristotle has in mind Plato's description of χώρα as akin to a mother, *Tim.* 50 d, 51 a.

15. πρὸς τὸ κακοποιὸν αὐτῆς, i.e. to its association with φθορά (which depends on its introduction in place of form) rather than with γένεσις.

16-20. ὄντος . . . φθορᾶς, i.e. while we distinguish between privation, which is contrary to form, and matter, which strives after form, the Platonists, failing to distinguish matter and privation, are bound

to make their material principle strive after its contrary, i.e. after its own destruction.

18-19. τὸ δὲ . . . φύσιν. The whole section τὸ μὲν . . . φύσιν^a 17-19 should be stated as a definite expression of Aristotle's own view as against that of the Platonists (τοῖς δέ^a 19). This clause should therefore be governed by φαμέν, and I's reading τὸ δὲ (sc. φαμεν εἶναι) ὁπέφυκεν κτλ. is preferable to the apparently simpler reading of the other MSS.

22. τοῦτ' = τὸ ἐφιέμενον.

22-3. ὥσπερ . . . καλοῦ. Pacius holds that this refers not to the natural desire of woman for man or of the ugly for the beautiful, but for the desire of woman to *be* man and of the ugly to *be* beautiful; and in view of Aristotle's doctrine that θηλύτης is ὥσπερ ἀναπηρία φυσική (*De Gen. An.* 775^a 15) this may be so; but we cannot be sure.

23-5. πλὴν . . . συμβεβηκός. Aristotle realizes that in describing θῆλυ and αἰσχρόν as desiring ἄρρεν and καλόν he has momentarily fallen into the Platonic error of making things desire their own contraries; he points out therefore that αἰσχρόν and θῆλυ are simply concomitants of the matter which is what, strictly speaking, strives after εἶδος.

26-9. ὡς . . . εἶναι, i.e. considered as 'that in which the privation is', the matter perishes; for when the privation passes away, there is no longer anything 'in which the privation is'; but considered with reference to what it is capable of becoming, the matter does not perish *per se*, since when it has the form it is capable of having the privation, and when it has the privation it is capable of having the form.

31. πρῶτον, 'ultimate'.

32. ἐνυπάρχοντος distinguishes matter from the privation, which is an element pre-supposed by the coming into being of a thing but not present in the thing (191^b 16).

μὴ κατὰ συμβεβηκός serves to mark off the matter both from the privation, from which a γιγνόμενον γίγνεται κατὰ συμβεβηκός (191^b 13-16), and from accidental qualities of the material which persist in the product.

33-4. ὥστε . . . φθαρῆναι. The argument would have been clearer if Aristotle had said what symmetry with the argument intended to show that matter οὐ γίγνεται requires, viz. 'so that it will exist after it has perished' (cf. ἔσται πρὶν γενέσθαι^a 30). But it is only another way of saying this to say 'it will have perished before it perishes'.

35-6. τῆς πρώτης φιλοσοφίας . . . διορίσαι. The promise is best fulfilled in *Met.* Z and Λ. 7-9.

^b 2. ἐν τοῖς ὕστερον δεικνυμένοις ἐροῦμεν. This seems to be a general reference to such works as the remaining books of the

Physics (especially bk. ii), the *De Caelo*, the *De Gen. et Corr.* (especially bk. ii), the *Meteorologica*, and the *De Anima*.

2-4. ὅτι . . . λέγωμεν. On these words, and those added in E see Introduction, 5, and Diels, *Textgesch.* 41 f.). Diels thinks that E's reading is the original one, and that it shows that bk. ii was originally connected (by γάρ) with bk. i. But P. 194. 3, 202. 17, S. 261. 5 have no γάρ. Cf. ^b 8 n.

BOOK II. CHAPTER I

192^b 8-23. Τῶν ὄντων . . . συμβεβηκός. The method by which Aristotle establishes the definition of φύσις is this: he considers what it is that distinguishes the things that are said to be φύσει, to be natural objects, from those that are not. What distinguishes them is an internal principle by which things are moved or brought to rest. This then is φύσις.

8. Τῶν ὄντων . . . αἰτίας. In book i Aristotle began the study of φυσική with the conception of ἀρχαί, and the main result of the book was the establishment of three distinct ἀρχαί—ἕλη, στέρησις, εἶδος. In book ii he makes a fresh start by studying the conception of φύσις itself. There is no organic connexion between the two books; they are independent approaches to the whole subject. Their independence is indicated not only by the absence of close connexion in the thought, but by the absence of a connecting particle, which is evidence, so far as it goes, that book ii was originally a separate essay (cf. Introduction, 5). Diels takes the words τῶν γὰρ ὄντων . . . αἰτίας, which occur at the end of book i in E, as showing an original connexion which was later suppressed. But it is now clear that the long Aristotelian works have been put together out of shorter essays, and it is much more likely that the γάρ in E represents a later effort to make a verbal connexion between books i and ii.

Some things, says Aristotle, are by nature, others as a result of other causes (i.e. of τέχνη, τύχη, and προαίρεσις, as T. 35. 6 says). We expect him therefore to point to a class of things that owe their being to nature, in distinction from others which owe their being to other causes. But he does not in fact do this. What he points to is a class of things which owe, not their being but their movement and rest, to an internal principle (^b 13-14), while others do not owe their movement and rest to such a principle but, it is implied, to a principle external to the moving or resting thing (^b 16-19). To this extent the first words of the chapter are misleading; but Aristotle does establish a distinction between two classes of things, one consisting of things which as such have an internal principle of movement (i.e. animals and their parts, plants, and the four simple bodies

earth, water, air, fire), the other of things such as beds and clothes which as such have no internal principle of movement, though in virtue of the simple bodies of which they are made they have such a principle (^b 17-20).

9-II. φύσει . . . ὄδωρ. In this passage and what follows, φύσις is represented as belonging to four grades of thing, each more complex than that which precedes :

- (1) simple bodies (^b 10),
- (2) inanimate compounds (^b 20),
- (3) parts of animals (and presumably also of plants) (^b 9), i.e. (a) tissues and (b) organs composed of these,
- (4) whole animals and plants (^b 9-10).

Anything in either of the last two grades has the ἀρχή or ἀρχαὶ κινήσεως which it has in virtue of its constituents, and in addition a fresh ἀρχή which derives from its own manner of composition. The simple bodies and the inanimate compounds are natural objects in so far as they have an internal principle of movement up or down (^b 14); plants and their parts, in addition to having this in virtue of being compounded out of the simple bodies, have an internal principle of growth and decay (^b 15); animals and their parts, in addition to these principles, have an internal principle of a special kind of qualitative change which is the physical basis of perception (^b 15), and an internal principle of a special kind of locomotion of their own. The special φύσις common to plants and animals is identical with the power of nutrition, and that of animals with the powers of nutrition, perception, and conation, included in their ψυχή. Cf. *De Part. An.* 641^b 9 οὐδὲ γὰρ πᾶσα ψυχή φύσις, ἀλλά τι μόνον αὐτῆς ἐν ἧ καὶ πλείω.

EP have the fuller form φύσει δὲ φαμεν εἶναι τὰ τε ζῶα κτλ., but this, taken with ταῦτα γὰρ εἶναι καὶ τὰ τοιαῦτα φύσει φαμέν (which is read by all the MSS. in ^b 11 and by S. 261. 6), is tautologous, and the shorter form is to be preferred. The absence of a clause δι' ἄλλας δ' αἰτίας κτλ. answering to φύσει μὲν κτλ. is no real difficulty (since the clause πάντα . . . συννεστώτα ^b 12-13 serves the purpose), but may account for the introduction of the alternative reading. As in ^b 4, the writer of E seems to have been trying to improve on the original.

II. τὰ τοιαῦτα probably refers to inanimate compounds (cf. ^b 20), which are certainly included in τὰ φύσει ὄντα.

17. τῆς κατηγορίας ἐκάστης, 'each such predicate', i.e. 'bed', 'garment', &c.

20. ἢ . . . ἔχει. Cornford places the comma before, not after, ἐκ τούτων. It seems better, with T. 35. 22, P. 204. 1-2, to take ἐκ τούτων with μικτοῖς.

22-3. ἐν ᾧ . . . συμβεβηκός. ἐν ᾧ probably = ἐν τούτῳ (rather than τοῦτο) ἐν ᾧ.

An attribute may be present in a subject, says S. 267. 22-268. 6, καθ' αὐτό and not πρώτως, as 'having angles equal to two right angles' belongs to the isosceles καθ' αὐτό and yet mediately, because it is a triangle. Or it can be present in a subject πρώτως and not καθ' αὐτό, as whiteness is present in a surface and virtue in a soul. Sometimes both characteristics are combined, as in the connexion between rationality and man, or between triangularity and the isosceles.

28. τῶν ποιουμένων, sc. by art.

32. τὸ ῥηθέν, cf. ^b 21-3.

34. ὑποκείμενον . . . ἀεί. Bekker and Prantl have no comma after τι. With this punctuation, Aristotle must be supposed to say that φύσις is a ὑποκείμενον. This is clearly wrong, and Laas was right in punctuating after τι. ὑποκείμενον γάρ τι then = ταῦτα γὰρ ὑποκείμενόν τι ἐστίν.

36-193^a 1. τοῦτο . . . ἐστίν. Natural phenomena are not φύσις, since they are what proceeds from φύσις; nor are they φύσιν ἔχοντα, since they are not substances. But like natural substances they are φύσει or κατὰ φύσιν. S. 271. 10-12 distinguishes between φύσει and κατὰ φύσιν, on the ground that everything produced by nature (e.g. mutilation and disease) is φύσει, but only what happens according to nature's plan is κατὰ φύσιν. But here, as elsewhere, Aristotle seems to intend no distinction.

193^a 1-6. τί . . . γνώριμον. According to the doctrine of *An. Post.* 89^b 34-90^a 9 we must know the answer to the question εἰ ἔστι before we inquire τί ἐστίν. But in *this* case no proof of the εἰ ἔστι is necessary, since it is obvious that there is such a thing as nature in distinction from art. If we were to try to prove it, we could only produce grounds that would be less evident than the fact to be proved, and this is the mark of ἀπαιδευσία (*Met.* 1006^a 6), i.e. of ἀπαιδευσία τῶν ἀναλυτικῶν, of ignorance of logic (ib. 1005^b 3).

4-9. τὸ δὲ . . . μηδέν. It seems best to take ὅτι . . . χρωμάτων as parenthetical, and τοῖς τοιούτοις = τοῖς τὰ φανερά διὰ τῶν ἀφανῶν δεικνύναι πειρωμένοις.

The possibility of being unable to distinguish the self-evident from the non-self-evident is illustrated by the case of a blind man who should try to prove what other people can see without proof, for instance that two particular colours match.

9-12. δοκεῖ . . . χαλκός. Burnet contends (*E.G.P.*³ 10-12, 363 f.) that the meaning here indicated—'primitive substance'—was the original meaning of φύσις, and quotes such passages as Plato, *Phaedo* 96 a 7 ταύτης τῆς σοφίας ἣν δὴ καλοῦσι περὶ φύσεως ἱστορίαν; Eur. fr. inc. 910 ἀλλ' ἀθανάτων καθορῶν φύσεως | κόσμον ἀγήρων; Plato, *Laws*

891C κινδυνεύει γὰρ ὁ λέγων ταῦτα πῦρ καὶ ὕδωρ καὶ γῆν καὶ ἀέρα πρῶτα ἡγεῖσθαι τῶν πάντων εἶναι, καὶ τὴν φύσιν ὀνομάζειν ταῦτα αὐτά; Arist. *Protrept.* fr. 52 εἶτε γὰρ πῦρ εἶτ' ἀήρ εἶτ' ἀριθμὸς εἶτ' ἄλλαι τινὲς φύσεις. The original meaning of φύσις is also discussed by Prof. W. A. Heidel in *Proc. of the American Acad. of Arts and Sciences*, xlv, no. 4, Prof. A. O. Lovejoy in *Philos. Rev.* xviii, 369 ff., Mr. Beardslee in a dissertation (Univ. of Chicago Press, 1918), and by W. B. Veazie in *A.G.P.* xxxiii (1920), 1-22. Burnet's case hardly appears to be made out.

IO-II. τὸ πρῶτον . . . ἐαυτό. S. 273. 20-34 takes this to mean 'the ultimate constituent material of each, which is essentially or by its own nature unshaped', i.e. prime matter, in contrast with the proximate constituents of living beings (the organs) and those intermediate between the proximate constituents and the ultimate constituent (the tissues and elements), each of which is unshaped not essentially and completely but only in comparison with that which is formed out of it (the organs relatively to the living being, the tissues relatively to the organs, the elements relatively to the tissues). But this interpretation is put out of court by the instances that immediately follow—ξύλον, χαλκός—and by the whole passage ^a 9-28, in which this first meaning of φύσις is illustrated by the proximate materials of various things, and prime matter is not even mentioned. πρῶτον then must mean 'proximate', and prime matter would be the φύσις only of things that stand next to it, i.e. (in Aristotle's system) of the four elements. In *Met.* 1015^a 7 Aristotle says φύσις δὲ ἢ τε πρώτη ὕλη (καὶ αὕτη διχῶς, ἢ ἢ πρὸς αὐτὸ πρώτη ἢ ἢ ὅλως πρώτη, οἷον τῶν χαλκῶν ἔργων πρὸς αὐτὰ μὲν πρῶτος ὁ χαλκός, ὅλως δ' ἴσως ὕδωρ, εἰ παντὰ τὰ τηκτὰ ὕδωρ). But this reference to prime matter appears to be an afterthought; it occurs in a passage of the *Metaphysics* not answering to anything in the *Physics*. In the parallel passage 1014^b 27 we have simply ἐξ οὐ πρώτου. In *Met.* 1069^a 28 Aristotle says that οἱ πάλαι, the early physicists to whom the present passage refers, treated τὰ καθ' ἕκαστα, e.g. fire and earth, not σῶμα in general, as οὐσία.—ἐκάστῳ confirms the interpretation of πρῶτον as 'proximate'.

Both the grammar of the sentence and a comparison with *Met.* 1014^b 27 ἀρρυθμίστου ὄντος indicate that ὄν should be inserted after ἀρρυθμίστου.

II-12. οἷον . . . χαλκός. These words are puzzling, because *prima facie* a bed and a statue are not instances of τὰ φύσει ὄντα (^a 10). It is probably because of this difficulty that in the parallel passage of the *Metaphysics*, 1014^b 27, A^b reads τῶν μὴ φύσει ὄντων. But there is no help in this reading, for we cannot suppose Aristotle to define φύσις by reference to things that are not φύσει. Nor is it likely that οἷον has the function which Bonitz assigns to it in his note on *Met.*

1014^b 27, of introducing not an example but a comparison. Rather the bed and the statue are introduced as examples of φύσει ὄντα because *qua* wood or bronze they *do* exist by nature (cf. 192^b 19–20).

12–14. σημεῖον . . . ξύλον. Harpocration s.v. ἔμβιος quotes Antiphon as using (in book i of his Ἀλήθεια) the phrase καὶ ἡ σηπεδὼν τοῦ ξύλου ἔμβιος γένοιτο, and Sauppe thinks that his actual words were εἴ τις κατορύξει κλίνην καὶ ἡ σηπεδὼν τοῦ ξύλου ἔμβιος γένοιτο, οὐκ ἂν γένοιτο κλίνη, ἀλλὰ ξύλον (fr. 15 Diels). On Antiphon cf. Zeller i.⁶ 1324–9. The first book of his Ἀλήθεια seems to have dealt with metaphysics and theory of knowledge, but it is impossible to discover the context in which his discussion of φύσις occurred.

For σηπεδῶν as a condition of generation cf. Hipp. Περὶ σαρκῶν 3, Pl. *Phaedo* 96 b.

ὄτι . . . οὐκ ἂν γενέσθαι κλίνην. For the confusion between the ὄτι construction and the accusative and infinitive cf. 187^a 7 n.

18–19. οἶον . . . γῆν. Three of the examples are taken from Pl. *Timaeus*, where gold (59 b 1–4) and bronze (b 6–c 3) are derived from water, bones (64 c 4, 73 e 1) from earth. Aristotle's own theory is that things capable of being solidified and melted are composed either of water, or of water and earth (*Meteor.* 382^b 31).

20. ἐκείνο . . . αὐτῶν. We must either take the accusative and infinitive to depend on φησιν ^a 12, or treat σημεῖον . . . συνεχῶς ^a 12–17 as parenthetical, and take the present clause to continue the thought of δοκεῖ δ' ἡ φύσις κτλ. ^a 9 and to be put in the accusative as if φασί τινες and not δοκεῖ had gone before.

21. οἱ μὲν πῦρ, Heraclitus and Hippasus (*Met.* 984^a 7).

οἱ δὲ γῆν. Elsewhere (*De An.* 405^b 8, *Met.* 989^a 5) Aristotle says that none of the philosophers had made earth their first principle. But he adds (*Met.* 989^a 9) that most ordinary men regard it in that way, and cites Hesiod as evidence.

οἱ δ' ἀέρα, Anaximenes and Diogenes of Apollonia (*Met.* 984^a 5).

οἱ δὲ ὕδωρ, Thales and Hippo (*Met.* 984^a 2).

22. οἱ δ' ἔνια τούτων. Aristotle may have in mind Parmenides' *Way of Opinion*, in which, as Aristotle interprets it, fire and earth are depicted as the ultimate elements (188^a 20, *Met.* 984^b 4, 986^b 33).

οἱ δὲ πάντα ταῦτα, i.e. Empedocles (*Met.* 984^a 8).

25. καὶ ἕξεις καὶ διαθέσεις. ἕξεις differ from διαθέσεις as the more from the less lasting, *Cat.* 8^b 27.

29. πρώτη. For the meaning cf. ^a 10–11 n.

31–^b 3. ὥσπερ . . . ἐστίν. This argument is in essence an argument by analogy from art to nature; as the element of art in a thing is identified not with its bare matter but with the form imposed on this, so nature is to be identified not with matter but with form. But the argument is complicated by a reference to a concrete sense

of τέχνη, in which it means a work of art (cf. Soph. *O.C.* 472 κρατήρῆς εἶσιν, ἀνδρὸς εὐχειρος τέχνη, and fr. 168 (Pearson), ὄπλοις . . . Ἡφαίστου τέχνη, and Pausanias *passim*), and to a corresponding concrete use of φύσις, in which it means a natural object of a certain kind (for which cf. Pl. *Rep.* 359 c ὁ πᾶσα φύσις διώκειν πέφυκεν, *Polit.* 272 c πυνθανόμενοι παρὰ πάσης φύσεως. 'As that is called a τέχνη which is in accordance with the rules of an art or is artificial, and nothing is in accordance with the rules of an art or is a work of art until it has received the appropriate form, so that is called a φύσις which is κατὰ φύσιν καὶ φυσικόν, and nothing is said to have its φύσις or to exist by φύσις until it has received its appropriate form. Hence φύσις is εἶδος'.

While it suits Aristotle's turn in ^a 31-3 to refer to the concrete sense of φύσις, he does not regard it as a proper one, and in ^b 2-3 he says οὔτε φύσει ἐστίν, using φύσις in its ordinary abstract sense, instead of οὔτε φύσις ἐστίν, which parallelism with ^a 35 οὐδ' εἶναι τέχνην would require. And in ^b 5-6 he definitely sets aside the concrete use of φύσις.

This very unnecessary complication would be avoided if we read in ^a 31-2 ὡσπερ γὰρ τέχνη λέγεται (καὶ) τὸ κατὰ τέχνην καὶ τὸ τεχνικόν, οὕτω καὶ φύσις (καὶ) τὸ κατὰ φύσιν καὶ τὸ φυσικόν, and in ^a 35 οὐδ' εἶναι τέχνη, answering to ^b 2 οὔτε φύσει ἐστίν. But there is no authority for this, and it is difficult to suppose that it could have been corrupted into the more difficult form.

^b 2. φ̄ . . . ὁστοῦν. T. 39. 3 καθ' ὃ and P. 215. 8 καθ' ὃν are probably a paraphrase of φ̄. Simplicius seems to have read ὃ (276. 26). With the latter reading, ὃ should probably be taken as the object of λέγομεν, and τί ἐστι σὰρξ ἢ ὁστοῦν of ὀριζόμενοι (so Simplicius).

4-5. οὐ . . . λόγον is added to distinguish Aristotle's from the Platonic εἶδος.

5-6. τὸ δ' ἐκ τούτων . . . ἄνθρωπος. This seems to be a parenthetical note on usage; cf. 192^b 32-193^a 1.

5. τούτων = ὕλη and εἶδος, the two senses of φύσις described in ^a 9-30, 30-^b 5.

7. ἐντελεχεία. On the origin of this word cf. my note on *Met.* 1047^a 30. Hirzel's view (in *Rh. Mus.* 1884. 169-208) is also refuted by Susemihl in Bursian, *Jahresb.* 42 (1885). 7-11. ἐντελεχής, ἐντελεχῶς, wherever they occur, are f. ll. for ἐνδελεχής, ἐνδελεχῶς.

10-11. ὅτι . . . ξύλον, cf. ^a 12-17. Prantl brackets these words, presumably because he thinks them a gloss based on ^a 12-14. But they are supported by Simplicius' paraphrase, and are quite appropriate here. Their omission in E is doubtless due to homoioteleuton.

11-12. εἰ . . . ἄνθρωπος. With the MS. reading the argument must be supposed to be: 'but even if the fact that a bed, if it had enough

vitality to put forth a shoot, would produce not another bed but merely a shoot, shows that its bedness is due to art and only its woodenness is its nature, on the same principle by the consideration of man we can see that form also is nature; since a man produces not merely organs or tissues or elements but another man, of the same form as himself.' The force of *εἰ δ' ἄρα* is concessive, as usual in Aristotle; cf. *Tōp.* 102^a 24, 127^a 9, 180^a 10, 181^b 33, *De Sensu* 437^b 19, 442^b 14, *Pol.* 1315^a 10.

The MS. reading in ^b11, *εἰ δ' ἄρα τοῦτο τέχνη, καὶ ἡ μορφή φύσις* does not run at all naturally. Hamelin points out that *τέχνη* is lacking in S. 278. 31 (cf. ib. 16), and therefore reads *εἰ δ' ἄρα τοῦτο* and explains it by reference to *γίνεται ἄνθρωπος ἐξ ἀνθρώπου* ^b8, treating ^b9-11 *ἀλλ' . . . ξύλον* as parenthetical. But the elliptical *εἰ δ' ἄρα τοῦτο* is not very likely in Aristotle; Bonitz, *Index*, quotes only *Rhet.* 1370^a 30 *εἰ δὲ τοῦτο*. Various passages in the commentators (T. 39. 18, P. 210. 1, 4, 7, 23, S. 278. 26, 27) point to the reading *εἰ δ' ἄρα τοῦτο φύσις*, and this gives far the best sense. *τέχνη* will have been introduced by someone who thought that the opposition between *φύσις* and *τέχνη* must be in Aristotle's mind, and that *τοῦτο* refers to *κλίη*, not to *ξύλον*.

12-18. *ἔτι . . . φύσις*. This is a third argument to support the view that *μορφή* is *φύσις*. The etymological meaning which Aristotle ascribes to *φύσις*, viz. growth, must, he assumes, be identical with progress towards *φύσις*. But what a given thing progresses towards is not its matter, but its final form. Therefore form is *φύσις*.

P. 211. 8 ingeniously uses *φύσανσις*, 'naturation', as equivalent to *φύσις* in the sense of 'growth'.

12-13. *ἡ φύσις . . . γένεσις*. In *Met.* 1014^b 17 n. I have given reasons for doubting whether *φύσις* ever bore this meaning. The few references to it in Greek literature (e.g. Plato, *Laws* 892 c) seem to be learned references to a *supposed* etymological meaning. As Burnet points out, though *φύομαι* means 'I grow', the simple root *φν* is the equivalent of the Latin *fu* and of the English *be*, and need not necessarily have the derivative meaning 'grow'. See Burnet, *E. G. P.*³ 10-12, 363-4.

17. *ἡ φύεται*. This reading seems to be supported by T. 40. 1. Philoponus recognizes both readings (217. 9-12). In Simplicius the MSS. differ (279. 32), but his paraphrase seems to imply *ἡ* (ib. 33). *ἡ* gives, however, rather the better sense.

τί οὖν φύεται; 'what then is produced in this process of growing?' seems to give rather a better sense than *εἰς τί οὖν φύεται*; and is the reading of Simplicius (279. 34).

19-20. *καὶ γὰρ . . . ἐστίν*. S. 280. 12-22 gives various reasons why *στέρησις* is in a sense *εἶδος*: (1) because it is present in a *ὑποκείμενον*

and characterizes it, as εἶδος also does ; (2) because it is not a mere absence of form, but absence of form in something that might have the form, and fitness to receive the privation is a sort of corrupted form ; (3) because certain privations may be considered as the inferior of two contrary forms, and indeed either of two contrary forms is the privation of the other.

20-21. εἰ . . . ἐπισκεπτέον. The problem here stated is whether in the case of simple γένεσις, as of the other kinds of change, there is a privation or contrary of what is generated, from which the generation proceeds. *Prima facie* this is difficult, for it seems to contradict the dictum of the *Categories* that there is no contrary to substance. The solution is that the complete substance, which is a unity of matter and form, has as such no contrary, but that in respect of its form it has a contrary. Simple γένεσις is not of a bare x from a bare contrary y , but of matter characterized by form x from matter characterized by a contrary form y .

21. ὕστερον ἐπισκεπτέον, *Phys.* v. 1, *De Gen. et Corr.* i. 3.

CHAPTER 2

The previous chapter has revealed that φύσις has two main senses, 'matter' and 'form'. In the present chapter Aristotle discusses the attitude of φυσική to these elements, and distinguishes it from μαθηματική, the attitude of which to them is different. Physics studies forms as involving matter for their embodiment ; mathematics studies them in abstraction from such embodiment.

193^b 22-35. Ἐπεὶ . . . χωριζόντων. In ^b 22-6 Aristotle raises two questions : (1) in view of the fact that physical bodies have solid shapes and are bounded by planes, lines, and points, all of which are studied by mathematics, how is mathematics to be distinguished from physics ; and (2) in particular, is astronomy, which is one of the more physical branches of mathematics (194^a 7), different from or a part of physics ? In what follows, both questions are treated together, i.e. the general question is treated with special reference to astronomy. It would be odd, says Aristotle, if physics were limited to the study of the essence of the sun or moon and precluded from studying their geometrical attributes ; and in fact physicists study both. The difference between physics and mathematics, however, is that when physics studies these geometrical attributes it studies them as the attributes of physical bodies, while mathematics studies them in abstraction from this aspect ; a procedure which is quite justifiable.

What Aristotle charges the Platonists with in this passage is with doing improperly with regard to τὰ φυσικά what mathematicians do

rightly with regard to τὰ μαθηματικά. Now mathematicians do not necessarily, nor perhaps usually, 'separate' (χωρίζειν) the objects of mathematics in the sense of supposing that they exist apart from sensible things. They 'separate' them in the sense of considering them in abstraction from sensible things. It is this that the Platonists are charged with doing in the case of τὰ φυσικά. I.e., this is not Aristotle's usual charge against the Platonists, that they assign separate existence to the Forms. But if the Forms should not even be thought of in abstraction from sensible things, still less can it be right to think that they exist apart from sensible things.

25-6. εἶτι . . . φυσικῆς. This is a further question. Hamelin thinks it enough to print it with a question-mark, but it seems better to insert εἶ.

27. τῶν δὲ συμβεβηκότων καθ' αὐτά, i.e. planes, lines, and points.

35-194^a 7. λανθάνουσι . . . λέγεται. While the abstraction of the mathematicians is justified (Aristotle says), that of the Platonists is not. The entities studied by mathematics are inseparable in fact, but can profitably be studied as if they were separable, from physical bodies. But among the Ideas are included Ideas of things like flesh, bone, and man, in the very definition of which a reference to physical bodies capable of movement is implied. Take for instance the definition of man. He is ζῷον λογικὸν θνητόν (S. 294. 16), and ζῷον is οὐσία ἐμψυχος αἰσθητικὴ καὶ κατὰ τόπον κινητικὴ (ib. 18); and here θνητόν, αἰσθητικὴ, and κατὰ τόπον κινητικὴ all include a reference to change.

194^a 2-3. καὶ . . . συμβεβηκότων, i.e. on the one hand of geometrical objects and their attributes, on the other hand of physical objects like flesh, bone, man, and their attributes.

6. ὥσπερ ρῖς σιμῆ, a favourite example with Aristotle of that in which matter is necessarily involved; cf. *Met.* 1025^b 30-1026^a 1, Z. 5, 1035^a 5, 26, 1037^a 31.

7-12. δηλοῖ . . . φυσικῆ. This, while it is brought forward as a confirmation of Aristotle's view about the main question, what is the difference between physics and mathematics (193^b 22-3), serves also as the answer to the question whether astronomy is a part of physics. It amounts to saying that astronomy (like optics and harmonics), while usually reckoned as a specially physical branch of mathematics, is really a branch of physics. Geometry treats of a line which is in fact the boundary of a physical object, but ignores this aspect of it; optics treats of a line that has mathematical properties, but treats it as having a physical character as well.

18. τῆς αὐτῆς ἢ ἄλλης. Philoponus interprets as if the word to be supplied were φυσικῆς (234. 17), but probably ἐπιστήμης is rather to be understood.

18-19. εἰς μὲν γὰρ τοὺς ἀρχαίους . . . ὕλης. This agrees with the account in *Met.* A. 3, where the material cause is described as having been discovered before any of the others.

20-21. ἐπὶ μικρὸν . . . ἤψαντο. On Empedocles cf. *De Part. An.* 642^a 17 ἀρχὴ γὰρ ἡ φύσις μᾶλλον τῆς ὕλης. ἐνιαχοῦ δέ που αὐτῇ καὶ Ἐμπεδοκλῆς περιπίπτει . . . καὶ τὴν οὐσίαν καὶ τὴν φύσιν ἀναγκάζεται φάσαι τὸν λόγον εἶναι, οἷον ὄστω ἄποδιδοὺς τί ἐστιν· οὔτε γὰρ ἐν τι τῶν στοιχείων λέγει αὐτὸ οὔτε δύο ἢ τρία οὔτε πάντα, ἀλλὰ λόγον τῆς μίξεως αὐτῶν (cf. *De An.* 410^a 1, *Met.* 993^b 17).

On Democritus cf. *Met.* 1078^b 19 (about the formal cause) τῶν μὲν γὰρ φυσικῶν ἐπὶ μικρὸν Δημόκριτος ἤψατο μόνον καὶ ὠρίσατό πως τὸ θερμὸν καὶ τὸ ψυχρὸν (cf. *De Part. An.* 642^a 26).

21-7. εἰ . . . φύσεις. Since art imitates nature (while it also completes it, 199^a 15), the study of art must conform to that of nature. But the study of an art involves the study to a certain extent both of form and of matter; so therefore does the study of nature.

23. μέχρι του is probably meant to qualify only the knowledge of the matter, since any science should know completely the form or essence of the things studied by it. It should know the matter to the extent of knowing the proximate matter in which the form is to be embodied (as health is in bile and phlegm), without needing to analyse the matter into its material constituents.

χολὴν καὶ φλέγμα, typical respectively of hot and cold substances (*Probl.* 862^b 27), on a proportion between which health depends (246^b 4).

27-8. ἔτι . . . οὐ ἔνεκα. The same science will study end and means; but φύσις, in its primary sense, i.e. form, is end; therefore the science which studies this will study also φύσις in its other sense, i.e. matter, since this is the means to form.

29-30. ὦν . . . ἔνεκα. Superficially, the sense seems to demand Alexander's transposition of τέλος and ἔσχατον; for in ^a 27 and 28 it is τέλος, not ἔσχατον, that is coupled with οὐ ἔνεκα; and the transposition receives some support from T. 42. 24-6. But the MS. order is confirmed by 199^a 8, ἔτι ἐν ὅσοις τέλος ἔστι τι, τούτου ἔνεκα πράττεται τὸ πρότερον καὶ τὸ ἐφεξῆς, and the transposition is not one that is likely to have occurred. In view of this, I have ventured, instead, to insert τό. This gives the sense 'for where there is a continuous process up to a fixed point, this last point is also the final cause of the process.' Simplicius interprets the passage so (302. 24)—τοῦτο τὸ ἔσχατον τέλος ἐστὶν ὡς τὸ οὐ ἔνεκα καὶ οὐχ ἀπλῶς ἔσχατον, i.e. the τέλος in the sense of πέρασ is also τέλος in the sense of οὐ ἔνεκα.

29. συνεχούς τῆς κινήσεως οὔσης, i.e. when a single thing in an uninterrupted time undergoes change in a single respect (262^a 1). Then the state reached at the end of the change is the εἶδος, whose

στέρησις was the state from which the change started; and the εἶδος is the final cause of the change.

30-31. διδ . . . ἐγένετο, *Com. Adesp.* 447 Kock. Philoponus attributes the line to Euripides, but Bonitz remarks that the resolved fifth arsis suggests a comic poet.

33-5. ἐπεὶ . . . ὑπαρχόντων. To confirm the fact that the study of matter goes with the study of form (^a 27-8), Aristotle points out that the arts not merely study the matter in which the form which is their end is to be embodied, but even make it—either by substantial change from something different, or by rendering it more workable, as when wax is melted or iron smelted; and that the arts then treat the matter as means to human ends.

ἐπεὶ must be separated from what precedes by more than Bekker's comma.

35-6. διχῶς . . . φιλοσοφίας. The distinction is given in *De An.* 415^b 2, τὸ δ' οὐ ἔνεκα διττόν, τὸ μὲν οὐ τὸ δὲ ᾧ (cf. *ib.* 20, *Met.* 1072^b 2). E.g. in one sense health is the οὐ ἔνεκα of the medical art—it is the εἶδος or φύσις to bring which into being the art is practised; in another sense the patient is the οὐ ἔνεκα—he is that in whose interests it is practised. Aristotle does not in the passages named above say where he had previously drawn the distinction. The reference is doubtless, as Bernays points out (*Die Dialoge des Arist.* 107-110) to the dialogue Περὶ φιλοσοφίας.

36-^b 7. δύο . . . ἔσται. Taking up the antithesis ποιῶσιν . . . χρώμεθα (^a 33-4), Aristotle says that both the art that uses a certain matter and the art which presides over its manufacture may be said to rule over it and to know it. Indeed, even that which uses the matter may, since it rules over it, itself be called a presiding art.

36-^b 2. δύο . . . ἀρχιτεκτονική. The form of the sentence shows that Aristotle is not contrasting the arts that rule the matter with those that give knowledge, but saying that there are two different arts which do both of these things. The sense is improved by omitting with FP the vulgate αἰ before γνωρίζουσαι.

^b 2-3. διδ . . . πως. The art which uses the matter may be called ἀρχιτεκτονική πως because it ἀρχεται τῆς ὕλης, but is not strictly ἀρχιτεκτονική because it οὐ τεκταίνεται.

3-5. διαφέρει . . . ὕλης. ἡ μὲν is here ἡ χρωμένη, and this, which is only ἀρχιτεκτονική πως, cannot be opposed as ἡ ἀρχιτεκτονική το τῆς ποιητικῆς ἢ ἀρχιτεκτονική, which is ἀρχιτεκτονική in the strict sense. ἡ ἀρχιτεκτονική ^b 4 is best treated as a gloss, which was probably originally a gloss on the ἡ δέ clause. (It is impossible to be certain what readings the Greek commentators had before them.) When the sentence has been thus corrected, the δέ clause may be taken in either of two ways: (1) = ἡ δὲ ὡς ποιητικὴ ἀρχιτεκτονικὴ οὕσα τῆς

ὕλης γνωριστικὴ ἐστίν, ἢ (2) = ἡ δὲ γνωριστικὴ (ἢ ἀρχιτεκτονικὴ) ἐστίν ὡς ποιητικὴ τῆς ὕλης. The first interpretation gives for the better antithesis—τοῦ εἶδους γνωριστικὴ, τῆς ὕλης γνωριστικὴ—and is in itself the more natural interpretation of the Greek; further, the antithesis it gives is borne out by what follows—ὁ μὲν κυβερνήτης ποῖόν τι τὸ εἶδος τοῦ πηδαλίου γνωρίζει . . . ὁ δ' ἐκ ποίου ξύλου (= ὕλης) . . . ἐστίν.

For the conception of the ἀρχιτεκτών as having knowledge and thereby giving orders to the χειροτέχνη cf. Pl. *Polit.* 259 e, and for the example of the steersman cf. *Crat.* 390 d Τέκτωνος μὲν ἄρα ἔργον ἐστὶν ποιῆσαι πηδάλιον ἐπιστατούντος κυβερνήτου, εἰ μέλλει καλὸν εἶναι τὸ πηδάλιον.

7-8. ἐν μὲν οὖν τοῖς κατὰ τέχνην . . . οὔσα. The point of this sentence seems to be that, since we have not to make the matter in which natural form is to be embodied, there are not two φυσικαὶ ἐπιστήμαι answering to the productive and the using art, but one φυσικὴ which studies matter and form alike.

8-9. ἔτι . . . ἄλλη ὄλη. A further argument to show that physics studies matter as well as form; matter and form are relative to one another, and must therefore be objects of a single science.

10-15. ἡ . . . πρώτη. Aristotle's answer to the problem is stated doubly: (1) The physicist does not study form in general, but studies form to the extent of inquiring into the final (which is identical with the formal) cause of every φυσικὸν σῶμα, and (2) (which comes to the same thing) it studies forms that are separable in thought but embodied in matter, leaving to metaphysics the study of forms that exist in separation from matter (i.e. God and the 'intelligences' that move the planets). The promise in ^b 14-15 is best fulfilled in *Met.* Δ. 6-10.

10-13. ἡ . . . ἐν ὄλη δέ; 'Should we not say that the physicist's knowledge should be like that which the doctor should have of sinew and the bronze-smith of bronze—that he should know form to the extent of knowing the end subserved by each physical object, and that his knowledge is concerned with things which are separable in respect of form but are immersed in matter?'

In ὥσπερ . . . χαλκόν, Aristotle illustrates the nature of physical science by a comparison with the arts, as in ^a 21-7. He sets a limit to the physicist's knowledge of form by saying that he has nothing to do with pure forms that are not embodied in matter, and is concerned only with the forms which are the final cause of the physical things in which they are embodied.

The vulgate μέχρι του. τίνος γὰρ ἕνεκα ἕκαστον gives no good sense. Jaeger's μέχρι του. τίνος γὰρ ἕνεκα ἕκαστον, 'up to a certain point, viz., he must know to what end each thing is', gives a better

sense, but μέχρι του is feeble as an answer to the question μέχρι πόσου. Simplicius evidently read μέχρι τίνος, τίνος γὰρ ἔνεκα ἕκαστον (306. 24), and Alexander knew the variant μέχρι τίνος ἔνεκα, τίνος γὰρ ἔνεκα ἕκαστον (ib. 27, 307. 35). Neither of these readings gives a good sense, and I have little doubt that all the variants have arisen from μέχρι τοῦ τίνος ἔνεκα ἕκαστον, which would be the neatest and most forcible expression of what must be Aristotle's meaning. γὰρ would then be an intruder due to an early copyist's failing to see the construction, by separating τίνος from τοῦ and reading both words as enclitic. For a similar insertion of γὰρ owing to a misaccentuation of τίνος cf. *Met.* 1090^b 37 ἐξ ἄλλου δέ τίνος μικροῦ καὶ μεγάλου τὰ [γὰρ] μεγέθη ποιεῖ. μέχρι τοῦ τίνος ἔνεκα (τίνος γὰρ ἔνεκα ἕκαστον) is also a possible reading.

13. ἄνθρωπος . . . ἥλιος. It is not disembodied forms that are the efficient causes in nature. For the production of a man there is needed the form of man embodied in his father, and as a *causa assistens* the heat embodied in the sun, which is the *causa assistens* of all generation. Cf. *Met.* 1071^a 20 ἀρχὴ γὰρ τὸ καθ' ἕκαστον τῶν καθ' ἕκαστον ἄνθρωπος μὲν γὰρ ἀνθρώπου καθόλου, ἀλλ' οὐκ ἔστιν οὐδεὶς, ἀλλὰ Πηλεὺς Ἀχιλλέως σοῦ δὲ ὁ πατήρ, and ib. 13 ἀνθρώπου αἴτιον τὰ τε στοιχεῖα, πῦρ καὶ γῆ ὡς ὕλη καὶ τὸ ἴδιον εἶδος, καὶ ἔτι τι ἄλλο ἔξω οἷον ὁ πατήρ, καὶ παρὰ ταῦτα ὁ ἥλιος καὶ ὁ λοξὸς κύκλος, the sun and its annual movement in the ecliptic. Cf. also *De Gen. et Corr.* 336^a 31, ^b 6, 17.

CHAPTER 3

This chapter is a doublet which corresponds in all except small details with *Met.* Δ. 2. From the fact that in Δ. 1. 1013^a 16 Aristotle says ἰσαχῶς δὲ καὶ τὰ αἴτια λέγεται πάντα γὰρ τὰ αἴτια ἀρχαί, Bonitz infers that a discussion of the senses of αἴτιον was rendered superfluous in Δ by the discussion of the senses of ἀρχή in Δ. 1, and that Δ. 2 must have been borrowed from *Phys.* ii. 3 and inserted in Δ by a later hand. This reasoning is unconvincing. It is more significant that the senses of αἴτιον given here and in Δ. 2 do not answer to the senses of ἀρχή given in Δ. 1; this may show that the chapter belongs originally to the *Physics* and not to the *Metaphysics*. Asclepius in *Met.* 305. 19 tells us that some parts of Δ had been lost, and that the editors supplied the deficiency out of Aristotle's own writings. This may be the history of Δ. 2, or alternatively Aristotle himself may have used in Δ what he had already written as part of *Physics* ii. Cf. 195^b 16-21 n.

The main other passage on the four causes (apart from *Met.* 983^a 26-32, which describes them much as they are here described,

is *An. Post.* ii. 11. There, instead of the material cause as described here, we have one which is called τὸ τίνων ὄντων ἀνάγκη τοῦτ' εἶναι, and is in fact the *causa cognoscendi*, the premisses of a syllogism. This appears in the present chapter as an *instance* of the material cause (195^a 18).

194^b 18-20. εἰδέναι . . . αἰτίαν, cf. 184^a 12-14. On the analogy of that passage, τὴν πρώτην αἰτίαν should mean the ultimate cause. But the instances given (^b 24-6, &c.) show that Aristotle here means the proximate cause. Cf. 193^a 10-11 n.

26. καὶ τὸ παράδειγμα. These words, which occur also in Δ. 2, point to an early date. It was only in his Platonic period that Aristotle was likely to use so definitely Platonic a term, and it never occurs in his later references to εἶδος.

26-9. τοῦτο . . . λόγῳ. οἶον . . . ἀριθμός is best treated as parenthetical, and καὶ τὰ μέρη τὰ ἐν τῷ λόγῳ as belonging to the general statement, bringing in the differentia in addition to the genus, which is mentioned in ^b 27 and illustrated by ὁ ἀριθμός.

35-6. καὶ . . . τέλους. The principal verb must be supplied from the context. 'We assign in the same way (by mentioning a final cause) a cause to all the things that come in on the way to the end.'

195^a 15. τρόπους. τόπους in Bekker and Prantl is a misprint, or an error due to misreading of E. All the MSS. here and in *Met.* 1013^b 17 and the Greek commentators have τρόπους.

16-21. τὰ μὲν γὰρ στοιχεῖα . . . εἶδος. In 194^b 24, 26 Aristotle distinguished τὸ ἐξ οὗ γίγνεται τι ἐνυπάρχοντος and the εἶδος or παράδειγμα. He now includes both under the ἐξ οὗ. Matter and form are similarly called the ἐνυπάρχοντα αἴτια in *Met.* 1070^b 22.

20. τό τε ὅλον. τὸ ὅλον here means not the complex of form and matter but the δλότης or τελειότης which supervenes on the parts. It is the σύνθεσις or form of combination of the elements.

23. τῆς μεταβολῆς ἢ στάσεως. The sense is improved by the omission of ἢ κινήσεως with E¹MVS. These words are probably a gloss on μεταβολῆς.

27-8. τρόποι . . . ἐλάττους. τρόποι 195^a 15 refers to the four causes (cf. 194^b 23). Here it refers to subdivisions occurring within each of the four causes.

32. καὶ . . . ἕκαστον. This antithesis includes both the antithesis genus—species (^a 29-32) and the antithesis species—individual (^a 33-5).

^b 1-3. ἔστι . . . ἀνδριάντος. Philoponus takes ὁ λευκός and ὁ μουσικός as instances of τὰ πορρώτερον and τὰ ἐγγύτερον respectively, since μουσική is a καθ' αὐτὸ συμβεβηκός of man, while λευκότης is a καθ' αὐτὸ συμβεβηκός of body, which is a genus including man. But

the fuller form found in *Met. Δ.* 1014^a 5 οἷον εἰ ὁ λευκὸς καὶ ὁ μουσικὸς αἴτιος λέγεται τοῦ ἀνδριάντος, ἀλλὰ μὴ μόνον Πολύκλειτος ἢ ἄνθρωπος shows that Simplicius is right in taking both ὁ λευκός and ὁ μουσικός as examples of τὰ πορρώτερον. They are so because they are accidents of Polyclitus or of man, which are in turn accidents of ὁ ἀνδριαντοποιός.

6-7. ὁμοίως . . . εἰρημένους, 'similar distinctions to those already drawn can be made in the case of the things of which the causes are causes'.

9. ἢ ὅλως ὄλης. This does not mean that anything is the cause of prime matter, but that, e.g., the bronze-smelter may be said to produce not only this bronze, or bronze, but also (more generally) matter for the sculptor. Cf. 194^a 33 ποιούσιν αἱ τέχναι τὴν ὕλην αἱ μὲν ἀπλῶς αἱ δ' εὐεργόν.

10. ἔτι . . . λεχθήσεται. It is not clear whether this means (1), as S. 325.9 takes it, 'both with regard to effects and with regard to causes, we may in one statement combine two effects, or two causes', or (2) as seems more likely, 'we may combine in one statement accidental and proper causes (or effects)'.

12-16. ἀλλ' . . . δύναμιν. We may state as the cause of a statue (1) the individual proper cause, 'a sculptor', (2) the genus of the individual proper cause, 'an artist', (3) an individual incidental cause, e.g. 'Polyclitus', (4) the genus of an individual incidental cause, 'a man'. And not only may these be stated simply, but we may couple (1) and (3) and get (5) 'a sculptor, Polyclitus' (cf. ^b 11), or couple (2) and (4) and get (6) 'an artistic man'. Finally, each of these may be taken in two ways, either as actual or as potential (cf. ^b 3-6).

16-21. διαφέρει . . . οἰκοδόμος. Aristotle has treated the antithesis of καθ' ἕκαστον and περιέχον (^a 30-32) and that of ἐνεργούν and κατὰ δύναμιν (^b 3-6) as distinct. But here he treats the καθ' ἕκαστον as identical with the ἐνεργούν (καί in ^b 17 being explicative, and that to which τὰ ἐνεργούντα καὶ τὰ καθ' ἕκαστον are opposed being designated in ^b 20 simply as τὰ κατὰ δύναμιν). This is partly justifiable. For the universal is never operative save as realized in individuals; it is not 'the artist' but a particular artist that actually produces a house (cf. *Met.* 1071^a 17-24). But within the individual artist there is a further distinction between potentiality and actuality; ὅδε ὁ οἰκοδόμος is different from ὅδε ὁ οἰκοδομῶν. The latter phrase, found in ^b 19, is more exact in the context than the former, which occurs in the corresponding passage of *Met. Δ.* (1014^a 23), and this suggests that either (1) Aristotle wrote Δ. 2 first and introduced the correction when he inserted this chapter in the *Physics*, or (2) he wrote *Phys.* ii. 3 and a disciple borrowed it for *Met. Δ.*, making this mistake in

the process. Aristotle himself is hardly likely to have written first the correct ὅδε ὁ οἰκοδομῶν and then the incorrect ὅδε ὁ οἰκοδόμος.

21-5. δεῖ . . . πάντων. τὸ ἀκρότατον αἴτιον here is not the highest, ultimate cause, like the ἀκρόταται αἰτίαι of *Met.* 1003^a 26 or the ἀκρότατον τῶν πρακτῶν ἀγαθῶν of *E.N.* 1095^a 16. It is rather, as T. 47. 2 expresses it (cf. P. 258. 16), τὸ αἴτιον ἐκάστου τὸ κυριώτατον καὶ προσεχέστατον, that which corresponds precisely to, is commensurate with, the effect. Cf. *Met.* 1044^b 1 δεῖ δὲ τὰ ἐγγύτατα αἰτία λέγειν. τίς ἢ ὕλη; μὴ πῖρ ἢ γῆν ἀλλὰ τὴν ἴδιον (and ib. 15-20). This sense of ἀκρότατον is unusual, but may be paralleled by Pl. *Polit.* 268 e ἐπ' ἄκρον ἀφικνεῖσθαι τὸ ζητούμενον, *Phys.* 209^b 20 τῆν ἀκροτάτην ἔχει θέαν, 'it demands the most precise consideration'.

28. πρὸς τὰ ἐνεργούμενα. The passive of ἐνεργεῖν, 'to be actualized', is rare in Aristotle. But cf. *De An.* 427^a 6 δυνάμει τὸ αὐτὸ καὶ ἀδιαίρετον τὰναντία, τῷ δ' εἶναι οὐ, ἀλλὰ τῷ ἐνεργεῖσθαι διαιρετόν.

CHAPTER 4

195^b 33-6. τίνα . . . ἐπισκεπτέον. The first of the three questions is answered in 6. 198^a 2-5, the second in 6. 197^a 36-b 37, the third in ch. 5.

33. ἐν τούτοις . . . αἰτίοις, i.e. among the four enumerated in ch. 3.

36-196^a 3. ἔνοι . . . ἢ τύχης. The reference is to Democritus, who, while he used chance in his κοσμοποιία, did not allow chance to be operative in details such as the finding of treasure (S. 330. 14, relying on Eudemus; cf. 196^a 24-35 and Leucippus fr. 2, οὐδὲν χρήμα μάτην γίνεται, ἀλλὰ πάντα ἐκ λόγου τε καὶ ὑπ' ἀνάγκης).

196^a 11-15. πολλὰ γὰρ καὶ γίγνεται καὶ ἔστιν ἀπὸ τύχης καὶ ἀπὸ ταυτομάτου . . . ὅμως τούτων τὰ μὲν εἶναι φασι πάντες ἀπὸ τύχης τὰ δ' οὐκ ἀπὸ τύχης. Torstrik took τούτων to refer to πολλά, and supposed the end of the sentence to be inconsistent with the beginning. He therefore wished to excise ἀπὸ τύχης καὶ ἀπὸ ταυτομάτου. He also thought τῶν γιγνομένων in ^a 13-14 to be pointless, and proposed ὄρισμένον instead. But τῶν γιγνομένων, taken as depending on ἕκαστον, is quite sound, and τούτων refers to τῶν γιγνομένων; and so interpreted the sentence, while grammatically irregular, contains no contradiction. ἀπὸ τύχης καὶ ἀπὸ ταυτομάτου seems to be vouched for by T. 48. 1 ἐφ' ἐκάστῳ δὲ τῶν ἀπὸ τύχης λεγομένων ἔστιν αἴτιον ὄρισμένον λαβεῖν.

14. ὁ παλαιὸς λόγος is the argument given in ^a 1-7. The words may mean (1) 'the ancient argument', i.e. that put forward by the Atomists (so S. 330. 14), or (2) 'the before-mentioned argument'; cf. 254^a 16 οἱ πάλοι λόγοι, *Pol.* 1282^a 15 ὁ πάλοι λόγος.

17-19. ἀλλὰ . . . τοιούτων, i.e. 'it cannot even be said, in excuse of

their omission, that these thinkers identified chance with any of the causes they name'. ἐκείνων = the αἷτια ὄρισμένα referred to in ^a 2.

22-3. λέγει . . . ἄλλως, fr. 53 Diels. Cf. *De Gen. et Corr.* 334^a 1-8.

23-4. καὶ . . . φησιν. Cf. frs. 57-61 (referring to the period when Love is gaining the ascendant) and 198^b 29-31.

Torstrik's τοτέ is supported by *De Gen. et Corr.* 334^a 2 ἀλλ' ὅτε μὲν φησιν ὡσπερ ἀπὸ τύχης . . . ὅτε δὲ φησι πεφυκέναι τὸ πῦρ ἄνω φέρεσθαι.

24-35. εἰσὶ . . . φυτῶν. S. 331. 16 refers this, no doubt rightly, to Democritus. Aristotle makes the same point, about the inconsistency of the Atomists, in *De Part. An.* 641^b 15-23. *Prima facie*, the statement that Democritus ascribed the origin of the 'whirl' to ταῦτόματον is itself inconsistent with the statement of D.L. ix. 45, πάντα τε κατ' ἀνάγκην γίνεσθαι, τῆς δίνης αἰτίας οὐσης τῆς γενέσεως πάντων, ἣν ἀνάγκην λέγει. The question is discussed by Bailey (*Greek Atomists and Epicurus*, 139-43), who shows that there is no inconsistency; the whirl for Democritus 'is produced as the inevitable outcome of natural processes', but it is ἀπὸ ταῦτομάτου in the sense that it is (1) undesigned and (2) unpredictable.

25. τοῦρανοῦ τοῦδε, this heaven as opposed to others of the infinite number recognized by Democritus (*Plac.* 2. 1, 3, *Simp.* in *De Caelo* 202. 16, D.L. ix. 44, &c.).

26-8. ἀπὸ ταῦτομάτου . . . πᾶν. For the δίνη or δίνος in Democritus cf. frs. 164, 167.

Torstrik seems to be right in maintaining that the reading γενέσθαι is required by διακρίνασαν καὶ καταστήσασαν. The MSS. are very unreliable as between γίγνεσθαι (γίνεσθαι) and γενέσθαι; cf. ^a 34.

28-35. λέγοντες . . . φυτῶν. The sentence is an anacoluthon (owing to the parenthesis); it should have continued (in ^a 33) with ὁμῶς λέγουσι τὸν οὐρανόν.

31-3. οὐ . . . ἄνθρωπος. This became one of Epicurus' arguments to show that nothing comes from nothing (D. L. x. 38, *Lucr.* 1. 159-207), and was probably borrowed from Democritus.

^b 5-7. εἰσὶ . . . δαιμονιώτερον. The reference may be to Anaxagoras (cf. *Plac.* i. 29. 7). Or it may be, as T. 50. 2, S. 333. 5 suggest, to the popular cult of Τύχη. Simplicius also refers to Pl. *Laws* 709 b 'Ὡς θεὸς μὲν πάντα, καὶ μετὰ θεοῦ τύχη καὶ καιρὸς, τὰνθρώπινα διακβερωῶσι σύμπαντα; to the beginning of the appeal to the Delphic oracle (ὦ Τύχη καὶ Λοξία, τῷδέ τι θεμιστεύεις;), and to *Orph. Hymn.* 72.

CHAPTER 5

The account of τύχη and ταῦτόματον in this chapter and the next should be compared with that in *Met.* 1032^b 21-30, 1034^a 9-^b 7. I have summarized Aristotle's doctrine of spontaneous γένεσις, as it

appears in the *Metaphysics*, in my Introduction to that work, p. cxxi. The point of view taken in the *Physics* is rather different, not being concerned with *γένεσις*, but with events involving non-substantial change.

196^b 10-17. Πρώτον . . . ἴσμεν. There are events (A) which *always* happen, given certain conditions (B). There are also events (C) which *usually* happen, given certain conditions (D). No one calls events A or C results of chance. But since there are also events (E) which happen *occasionally* when certain conditions (F) are present, and such events are precisely what are called chance events, it follows that there is such a thing as chance.

Aristotle is not claiming that there is any breach of necessity involved in such cases. Events C and events E, as well as events A, are necessitated by the totality of their conditions. But events C are not necessitated by conditions D, but only by D + other conditions by which D are usually accompanied. And events E are not necessitated by conditions F, but only by F + other conditions by which F are occasionally accompanied.

Nor is he claiming that *τύχη* is an operative force, but only that there are instances of the type of connexion which exists between events E and conditions F.

He speaks in this section as if *τύχη* were coextensive with such loose connexions. But from the next section it appears that its sphere is narrower. Events E are *accidental* results of conditions F, but not *chance* results unless two further conditions are fulfilled, (1) that conditions F have not been brought about in order to produce events E, (2) that they are such as might naturally have been brought about for that purpose.

II. ὡς ἐπὶ τὸ πολὺ. Here, in ^b 13, and in ^b 20 E has ὡς ἐπὶ πολὺ, and this is not impossible; the phrase is found in Thuc. 1. 12. But there seems to be no other example in Aristotle, while ὡς ἐπὶ τὸ πολὺ is extremely common. Philoponus' lemma has ὡς ἐπὶ τὸ πολὺ in ^b 11 (though not in ^b 20), and Simplicius has it in ^b 20 (335. 29), and throughout in his comment on the passage; and it appears in all the MSS. in ^b 36, 197^a 4, 19, 31, 35. The omission of τὸ in E is probably therefore accidental.

II-13. φανερόν . . . πολὺ. Hamelin argues that, since τὸ ἀπὸ τύχης means 'the result of chance', Aristotle cannot be denying that τὸ ἀπὸ τύχης is the cause of what is necessary or usual. He therefore places a comma after λέγεται instead of after τύχης, and takes οὐδὲ . . . πολὺ to mean 'nor does the result of chance belong either to the necessary or to the usual'. This way of taking the sentence is unnatural, however, and the traditional punctuation can be justified if we reflect that an action which is itself the result of purpose but leads

to a chance result can be described as ἀπὸ τύχης (^a 3 τοῦ ἐλθεῖν ἀπὸ τύχης εἰς τὴν ἀγοράν, καὶ καταλαβεῖν ὃν ἐβούλετο μὲν οὐκ ᾤετο δέ), as we can say 'I happened to go into the market, and there I met my debtor'. Where two events are thus connected, either can be said to be ἀπὸ τύχης.

17-22. τῶν δὲ γιγνομένων . . . φύσεως. Aristotle has laid it down that connexions of events with certain conditions or previous events may be (1) necessary or usual, or (2) unusual. He now lays it down that connexions of events may be (a) teleological or (b) non-teleological. And *prima facie* he seems to infer that some events of type (2) are also of type (a); and this is plainly unjustified. The Greek commentators get the passage into syllogistic form thus:

Chance connexions are unusual (^b 10-17).

Chance connexions are teleological (ἄμφω ἐν τοῖς ἐνεκά του, ^b 19).

Therefore some unusual events are teleological (^b 19-21).

This involves taking ἄμφω in ^b 19 = ἢ τε τύχη καὶ τὸ αὐτόματον, and that involves ending the parenthesis with προαίρεσιν ^b 19. But it is obvious (1) that ἄμφω refers far more naturally to τὰ τε κατὰ προαίρεσιν καὶ τὰ μὴ κατὰ προαίρεσιν, and (2) that the syllogism obtained is a *hysteron proteron*. What Aristotle wants to establish is that chance events are both unusual and teleological, and he needs as a *preliminary* to this to show that unusual events may be teleological.

The reasoning is rather this: Since the division of connexions of events into (1) necessary or usual and (2) unusual, and the division into (a) teleological and (b) non-teleological, are divisions based on independent principles, there is a possibility that some events of class (2) are also of class (a). This is what Aristotle says, though not very precisely, in the words καὶ ἐν τοῖς παρὰ τὸ ἀναγκαῖον καὶ τὸ ὡς ἐπὶ τὸ πολλὸν ἔστιν ἕνια περὶ ἃ ἐνδέχεται ὑπάρχειν τὸ ἐνεκά του (^b 19-21). That such events actually exist, he leaves it to readers to supply from their own experience.

One would naturally expect ἐνεκά του to mean 'designed to attain an end'. But there are various considerations which show that the meaning must be 'actually attaining something which either was, or might naturally have been, taken as an end'. (1) This is implied in the words (^b 21) ἔστι δ' ἐνεκά του ὅσα τε ἀπὸ διανοίας ἢ πραχθεῖη καὶ ὅσα ἀπὸ φύσεως, 'things which *might be* done as a result of thought or of nature'. Torstrik, being persuaded that ἐνεκά του must have the other meaning, emends πραχθεῖη to πραχθῆ. But this is arbitrary. The notion that a chance connexion is one in which a result happens which might have been, though it was not, taken as an end, pervades the whole passage (^b 33-6, 197^a 15-16, 35, ^b 15-16, 18-20, 30-32, 198^a 5-7); and such connexions are described as being ἐν τοῖς ἐνεκά

του (^b 33, 197^a 6). Torstrik has to suppose that at some stage an editor or copyist systematically altered the readings to bring the text into agreement with what Torstrik calls the misconception of the meaning of *ἔνεκά του*, by emendations in ^b 22, 197^a 35, 198^a 6. This is most improbable. (2) This meaning of *ἔνεκά του* and the corresponding meaning of *οὐ ἔνεκα* occur elsewhere in Aristotle. In *E. N.* 1111^a 5 it is said that a man may be ignorant *ἔνεκα τίνος* he acts (cf. *ib.* 18), and this is illustrated by the example *ἐπὶ σωτηρίᾳ πίσας ἀποκτείνειν ἄν* (*ib.* 13), 'giving a dose to cure a sick man, one might kill him'. Here it is not the object of his desire but the result his action will produce (this being a result that might have been aimed at) that is called the *οὐ ἔνεκα*. Cf. the parallel passage in *E. E.* 1225^b 2, and *E. N.* 1135^b 12 *τὰ μὲν μετ' ἀγνοίας ἀμαρτήματα ἔστιν, ὅταν μήτε ὄν μήτε ὄ μήτε ὄ μήτε οὐ ἔνεκα ὑπέλαβε πράξει· ἢ γὰρ οὐ βάλλειν ἢ οὐ τούτω ἢ οὐ τούτου ἢ οὐ τούτου ἔνεκα ᾤθη, ἀλλὰ συνέβη οὐχ οὐ ἔνεκα ᾤθη*. (3) Aristotle's whole conception of the general course of nature as being *ἔνεκά του*, though not *κατὰ προαίρεσιν* or *διάνοιαν* (see the contrast in 196^b 18–22), is the conception of a merely 'de facto teleology', that in which results that were not aimed at yet present the appearance of having been aimed at.

προαίρεσιν in ^b 18 and *διάνοια* in ^b 22 are evidently used as synonymous, and *τὰ δ' οὐ κατὰ προαίρεσιν* is therefore to be explained as = *τὰ δ' ἀπὸ φύσεως*. The distinction between conscious teleology and the unconscious teleology of nature is parenthetical here, but prepares the way for the distinction between *τύχη* and *ταῦτόματον*. *τύχη* is what simulates conscious teleology, and *ταῦτόματον* in its narrower sense is what simulates the unconscious teleology of nature.

The reading *πραχθείη* is found in all the MSS., and supported by Pl. 272. 14. T. 51. 1 may imply *πραχθῆ*, or Themistius may have failed to see the significance of *πραχθείη*. In S. 335. 21 the reading is doubtful, but the interpretation (*ib.* 21–336. 1) clearly implies *πραχθείη*. S. 336. 27–9 hardly supports Torstrik's view that Porphyry read *πραχθῆ*.

23–7. *τὰ δὴ τοιαῦτα . . . μουσικόν*. As there are *ὄντα* that exist independently, viz. substances, and others that exist only as incidental to or concomitant with substances, viz. qualities, relations, &c. (cf. *E. N.* 1096^a 21 *παραφνάδι τούτ' (sc. τὸ πρὸς τι) ἔοικε καὶ συμβεβηκότι τοῦ ὄντος*), so there are cases in which A may be said to be *κατὰ συμβεβηκός* the cause of B. This may arise in either of two ways: (1) where A is incidental to C, which is the proper cause of B (cf. 195^a 32–^b 3). It is this type that is (as it happens) illustrated in 196^b 26–7, and a case of this kind is cited in 197^a 12–15 as an instance of *τύχη*. But (2) there is another type of accidental

causation, in which A is the cause of B because B is a concomitant of D, which is the proper effect of A. This is the type pointed to by the words *καὶ ἐπὶ τῶν συμβεβηκότων ὡσαύτως* in 195^b 9. Aristotle's main illustration of chance—the creditor's finding his debtor recovering a loan (196^a 3-5, ^b 33-197^a 5, 197^a 15-18)—approximates more to this type, but not entirely. For in both the above types A has no real share in the causation of B, and it is only by a *façon de parler* that it can be said to cause it at all. In Aristotle's typical illustration A has a genuine share in the causation, not of B but of an end-like result which follows from the conjunction of D and B. M's wish to see someone (197^a 17) causes him to be in the market-place at a certain time. N's wish to recover a loan from O leads him to be in the market-place at the same time. The concomitance of N's presence with M's leads to M's recovery of his debt from N. M's wish has been a part of the cause of the recovery, not a mere concomitant of it.

Chance is defined here without reference to the unusualness of the relation between the causal event and the end-like result. τὸ κατὰ συμβεβηκός has taken the place of τὸ μήτ' ἀεὶ μήθ' ὡς ἐπὶ τὸ πολὺ. And well it may. For, while an αἴτιον καθ' αὐτό (A) will be always followed by its result B, or only prevented by exceptional circumstances from being so followed, in the first type of 'concomitant causation' A will be followed by B only when C happens to be present as a concomitant of A, and in the second type only when B happens to be present as a concomitant of D. And in the illustration M will recover his debt only when N happens to be in the market-place at the same time as himself. If this illustration be taken as best expressing what Aristotle is trying to express, chance is for him a name for that type of sequence of events in which a purposive action, through the concomitance of some other action or event with the first action's proper result, leads to a further result which might have been, but was not in fact, an object of purposive action.

Torstrik argues that ^b 24-5 imply that αἴτια should be read after γένηται in ^b 23, and T. 51. 18, S. 336. 26, 337. 2 lend some colour to his view. But S. 335. 32 tells against it, αἴτια is lacking in Philoponus' lemma, and the logic does not require it. αἴτια where it occurs in Themistius and in Simplicius is probably put in by way of interpretation.

27-9. τὸ μὲν . . . συμβαίη. A result B has one definite cause A ; but A may have an indefinite number of concomitants, and any one of these may be called a concomitant αἴτιον of B.

30. τοῦτο, i.e. τὸ κατὰ συμβεβηκός (^b 23). ^b 24-9 are parenthetical.

32. ὕστερον διοριστέον, in ch. 6.

33-197^a 5. οἶον . . . τύχης. The nature of the case referred to depends on the reading in ^b 34. E¹ apparently read *κομιζόμενος*. FI read *κομισόμενος*, and P. 274. 22 mentions this as a variant. J and T. 52. 13, P. 274. 12, 22, S. 338. 29 read or imply the reading *κομιζόμενου*. *κομισόμενος τὸν ἔρανον* would be a very insipid repetition of *ἔνεκα τοῦ ἀπολαβεῖν τὸ ἀργύριον*, and the best way to deal with the text, if *κομισόμενος* were read, would be to place εἰ ἥδει before instead of after *κομισόμενος τὸν ἔρανον*. But *κομιζόμενου* gives a good sense. M, N's creditor (cf. ^b 23-7 n.), goes to the market-place just when N is himself getting a subscription from O, and seizes his opportunity. The reference is to the same story which was used to *discredit* the belief in chance (196^a 1-5), and we may suppose that the story was a well-known one, perhaps (as Cornford suggests) from a comedy.

Though Aristotle uses *κομιζόμενου* here of N, in ^b 35, 197^a 1, 15 *κομίσασθαι* and *κομιδὴ* refer to M; and this may account for the corruption to *κομισόμενος*.

35. τοῦ κομίσασθαι ἔνεκα is read by the MSS. and by P. 274. 9, 24 and S. 336. 5. It was rejected by Bonitz on the assumption that *ἔνεκα* must mean 'for the sake of'. The phrase might well have come in as a gloss on *τούτου ἔνεκα*. But we have found that in ^b 21 *ἔνεκά του* means 'producing an end-like result' (cf. ^b 17-22 n.), and *ἔνεκα* can have the same meaning here. If we retain these words *ποιῆσαι τοῦτο* means *ἐλθεῖν*; if not, it means *τὸ ἀργύριον ἀπολαβεῖν*. *ποιῆσαι τοῦτο* may seem rather unidiomatic, but cf. 188^b 10, 211^a 5, Hdt. 5. 97 εἰ Κλεομένηα μὲν τὸν Λακεδαιμόνιον μόνον οὐκ οἶός τε ἐγένετο διαβάλλειν, τρεῖς δὲ μυριάδας Ἀθηναίων ἐποίησε τοῦτο, Dem. 18. 52 ἐρώτησον αὐτούς, μᾶλλον δ' ἔγω τοῦθ' ὑπὲρ σοῦ ποιήσω.

36-197^a 1. τοῦτο . . . ἀνάγκης. This merely increases the remarkableness of the coincidence. Even if M went every day to the market-place (for other reasons), his finding N there would be a chance; but not a remarkable chance. But we are perhaps meant to supply *τούτου ἔνεκα*, which is expressed in 197^a 4. If M went to the market-place every day *to find N*, his finding N would not be an instance of chance at all.

197^a 1-2. ἔστι . . . διανοίας. This is irrelevant to the present discussion, but anticipates the distinction drawn in ch. 6 between *τύχη* and *ταυτόματον* in the narrower sense.

ἡ *κομιδὴ*, like any other object of choice, *προαιρετόν*, is something outside the agent, attracting it towards itself, while nature is a force in the agent stimulating it to act in a certain way. Now *τύχη* simulates the operation of *προαίρεσις* or *διάνοια*, and *ταυτόματον* (in the narrower sense) that of *φύσις*. Hence, when the *κομιδὴ* is produced accidentally, this is a case of *τύχη*, not of *ταυτόματον*.

3-4. καὶ . . . κομιζόμενος. With Bekker's punctuation (with a comma after *ἐνεκα* and none after *πολύ*), *κομιζόμενος* spoils the correspondence with 196^b 36-197^a 1, besides making a clause which it is difficult to interpret. On the other hand, with a comma after *πολύ* and none after *ἐνεκα*, *κομιζόμενος* reveals itself pretty clearly as a gloss. There is no trace of it in T. 52. 17 nor in P. 274. 27.

8-25. ἀόριστα . . . αἰτίων. This section is meant to confirm the definition of *τύχη* already given and at the same time to justify the *ἐνδοξα* about *τύχη*, by showing that definition and *ἐνδοξα* agree with each other. Of the *ἐνδοξα* in ^a 9-11, the first, that *τύχη* is *τοῦ ἀορίστου*, is confirmed in ^a 20-21; the second, that it is *ἄδηλος ἀνθρώπῳ* (cf. 196^b 6), in ^a 18-20; the third, that *οὐδεν ἀπὸ τύχης γίγνεται* (cf. 195^b 36-196^a 11), in ^a 12-18. A fourth *ἐνδοξον* is stated and justified in ^a 30-32.

8-9. ἀόριστα . . . τύχης. The causes of a chance event are indefinite, not in the sense that any one of them is indefinite, but in the sense that they are indefinite in number, and that it is impossible to specify what can and what cannot in virtue of a concomitant lead to a particular result.

11-12. πάντα . . . εὐλόγως. *ὅτι*, though read by Philoponus (277. 9, 10) and Simplicius (341. 25), should be omitted. The meaning is 'for all these common opinions have, as might be expected (*εὐλόγως*), some justification'. *εὐλόγως* added thus at the end of a clause is common in Aristotle; cf. ^a 31, *De Part. An.* 673^b 10, 688^a 14, 690^a 28, *De Gen. An.* 738^a 18, 753^a 22, *E.N.* 1153^b 15, 1162^b 6, *E.E.* 1245^a 38.

12-18. ἔστιν . . . θεασόμενος. This is designed to confirm the thesis *οὐδεν ἀπὸ τύχης γίγνεται*. ^a 12-14 *ἔστιν . . . τύχη* is therefore concessive, and the main point of the sentence is stated in *ὡς δ' ἀπλῶς οὐδενός*.

15-18. καὶ . . . θεασόμενος. Cf. 196^b 23-7 n.

18. καὶ θεασόμενος. It seems probable that Simplicius' paraphrase *καὶ θέαν τινὰ ὀψόμενος* (340. 26) points to the true reading, which appears in corrupt forms in FIJT. S¹. has *καὶ φεύγων καὶ θεασόμενος* or *καὶ θεασόμενος καὶ φεύγων*. *καὶ θεασόμενος* may have been cut out of E or its ancestor because it was thought to be a repetition of *ἰδεῖν τινὰ βουλόμενος*, but it is not this, since it means 'to see some public spectacle'.

ὀρθῶς, sc. ἔχει.

21. τὰ οὕτως αἰτία, i.e. τὰ κατὰ συμβεβηκός.

21-5. ὁμως . . . αἰτίων. A colon is better than Bekker's comma after *τύχης* ^a 23. *οἷον . . . ἀποκεκάρθαι* gives in effect Aristotle's answer. 'Is it not the case that, when a man gets his hair cut, the wind that then blows on him or the sun's rays that then heat him

are more truly the cause of the health that results by chance, than his getting his hair cut?' The latter is too remote to count seriously as a cause. For the distinction between remote and proximate accidental *αἷτια* cf. 195^b 1-3.

22. τῆς τύχης is here loosely put for τῶν ἀπὸ τύχης.

23. εἴλησις, Simplicius' reading (343. 2) must be substituted for Bekker's εἴλησις, which would mean 'an eddy'.

25. The extra sentence found in E and paraphrased in T. 53. 24-5 cannot be, as Torstrik thought, an earlier version of ^a 25-7 τύχη . . . ταῦτα, for the identification of εὐτυχία with the success of an endeavour is not Aristotelian. Diels is nearer the mark when he suggests (*Textgesch.* 36-8) that these words are an addition by a Peripatetic inspired by Eudemus' definition (fr. 25) ἂν μὲν τὸ κατὰ τὴν τέχνην ἐπιτελέσῃ, εὐτυχία λέγεται, ἂν δὲ τὸ παρὰ ταύτην, ἀτυχία.

27-30. διὸ . . . δοκεῖ. To come within an ace of a great evil or a great good is counted good or ill fortune respectively, because we think of the great evil or good as having happened to us and then been lost. For the precise usage of παρὰ μικρὸν κακὸν λαβεῖν μέγα cf. Isoc. 8. 95 ταύτην (sc. τὴν πολιτείαν) ἐν ὀλίγῳ χρόνῳ σαλεύσαι καὶ λυθῆναι παρὰ μικρὸν ἐποίησεν, Thuc. 7. 71 αἰεὶ παρ' ὀλίγον ἢ διέφευγον ἢ ἀπώλλυντο.

CHAPTER 6

197^b 5. ἡ δ' εὐδαιμονία πράξις τις. Cf. the doctrine of the *Ethics* that εὐδαιμονία is ἐνέργεια κατ' ἀρετήν.

9-II. ὥσπερ . . . καταπατοῦνται. This is probably (as is argued by Hirzel in *Hermes* x. 254 f.) a quotation from an epideictic speech by Protarchus, the pupil of Gorgias (Pl. *Phil.* 58 a), who plays the second part in the *Philebus*; cf. Wilamowitz, *Platon*, i. 629.

15-16. οἶον . . . ἦλθε. The reference is perhaps to a riderless horse which returns to its own lines in battle.

16-18. καὶ . . . κατέπεσεν. The reference is rather obscure, but the meaning probably is that if a standing tripod is thrown up and falls in such a position as to be capable of being sat on, this is a case of ταυτόματον, since its position was not intended; while, when it was standing, its position was intended.

18-19. ἐν τοῖς . . . γιγνομένοις, 'in those things, *in general*, which happen so as to bring about an end-like result'. I.e. τὸ αὐτόματον in its wider sense includes both what simulates τὸ κατὰ φύσιν and what simulates τὸ κατὰ προαίρεσιν.

19-20. ὅταν . . . αἴτιον, 'when events of which the cause is outside happen not for the sake of the result which actually follows'. The Greek commentators explain this by pointing out that if a cubical block falls so as to be capable of being sat on, the cause is not out-

side, but involved in the nature of the block (since such a block *must* come to rest on one of its sides); while if a tripod so falls, the cause is outside.

With Simplicius' reading οὐδ, we might either construe as above, substituting singular for plural, or we might place a comma after γένηται and take the subject of γένηται to be τὰ ἕνεκά του, and the antecedent of οὐδ to be τοῦ συμβάντος, as Simplicius takes it. But ὄν is better supported, since (on Torstrik's testimony) it appears to be the reading of all the MSS., as well as of Philoponus.

20-22. ἀπό τύχης . . . προαίρειν, 'out of the whole class (viz. τὰ ἀπὸ ταυτομάτου) those of the natural objects of purpose which happen ἀπὸ ταυτομάτου for beings which have purpose, happen by chance'.

22-32. σημείον . . . ἕνεκα. In this parenthetical passage, Aristotle endeavours to support his definition of ταυτόματον as the type of case in which an unintended (though end-like) result is produced, by deriving αὐτόματον from μάτην, which refers to cases in which an intended result is *not* produced.

αὐτόματος is probably not in fact derived from μάτην, but both may be derived from μάομαι, 'I seek' (so Prellwitz, *Etym. Wörterbuch*; Boisacq, *Dict. Étym.*, derives them from different roots). μάτην is the accusative of μάτη, 'folly' or 'fault' (Stesich. 47, Aesch. *Ch.* 918, *Supp.* 820, Soph. Fr. 798), while αὐτόματος in its earliest sense (e.g. *Il.* 2. 408, 5. 749, 18. 376, Hes. *Op.* 103) means simply 'acting of one's own will'. For the form cf. ἡλέματος.

22-3. ὅτι λέγεται . . . ἐκείνου ἕνεκα appears to be the statement of the σημείον, not of that of which it is a σημείον. The subject of λέγεται therefore is τὸ μάτην, and ὅτι means 'because'.

23. ὅταν . . . ἐκείνου ἕνεκα. P. 289. 29 (τὸ παρακολουθοῦν τοῖς ἕνεκά του ὅταν μὴ αὐτοῦ ἐκείνου ἕνεκα γίνονται) seems to imply the MS. reading; his words in 290. 3 (οἷς οὐκ ἀπαντᾷ τὸ τέλος οὐδ ἕνεκα γίνεται), quoted by Bonitz in support of Prantl's reading, may be a free paraphrase. T. 55. 14 οἷς οὐκ ἀπήντησε τὰ τέλη ὄν χάριν ἐπράχθη, and S. 348. 17 ὅταν τῷ ἕνεκά του γινομένῳ μὴ τὸ οὐδ ἕνεκα ἐγένετο ἀκολουθήσῃ, give some support to Prantl's reading, but may be a paraphrase of the MS. reading. S. 349. 5 cites another reading which Diels, following one MS. of Simplicius, prints as γένηται τὸ οὐδ ἕνεκα, ἀλλ' ὁ ἐκείνου ἕνεκα (which is Torstrik's conjecture), but Simplicius' interpretation, ib. 7 ὅταν μὴ γένηται τὸ οὐδ ἕνεκα ἄλλο ἂν τι προεγένετο δι' ἐκεῖνο τὸ προγενόμενον shows that his alternative reading was τὸ οὐδ ἕνεκα ἄλλο ἐκείνου ἕνεκα, to which he tries in vain to give a tolerable meaning.

The MS. reading offers no great difficulty if we remember that ἕνεκά του may mean 'producing an end-like result' (cf. 196^b 17-22 n.). The phrase then means 'when that which is intended to produce a result other than itself does not produce it'.

29-30. οὕτω . . . γένηται, 'Thus the αὐτόματον is, even etymologically, the case in which the event itself has happened in vain', i.e. when in its own causal character (καθ' αὐτό) it has been ineffective, though it has by virtue of a concomitant led to an end-like result.

32-7. μάλιστα . . . ἐντός. Aristotle says here that the nature of τὸ ἀπὸ ταῦτομάτου (in the specific sense), as distinct from τὸ ἀπὸ τύχης, is best seen ἐν τοῖς φύσει γιγνομένοις. T. 56. 16 takes the reference to be to the production of monstrous births. But this can hardly be right, since in τὸ ἀπὸ ταῦτομάτου an end-like result is always produced, whereas monsters are instances of failure in the purposive activity of nature (199^b 4) and are the reverse of end-like results. *Met.* 1032^a 28-32 shows that the reference is to spontaneous generation: τούτων (sc. τῶν ποιήσεων) δέ τινες γίνονται καὶ ἀπὸ ταῦτομάτου καὶ ἀπὸ τύχης παραπλησίως ὡσπερ ἐν τοῖς ἀπὸ φύσεως γιγνομένοις· ἐνια γὰρ κἀκεῖ ταῦτά καὶ ἐκ σπέρματος γίγνεται καὶ ἄνευ σπέρματος. In spontaneous generation an end-like result is produced; the normal teleological action of nature in producing offspring from parents of the same kind is simulated by nature's producing offspring in an exceptional way, without seed. Thus the production is both φύσει and παρὰ φύσιν. And it is easily distinguishable from the operation of τύχη, which simulates the action not of nature but of human choice.

At the same time (197^b 35-7), such generation is distinct from the form of τὸ ἀπὸ ταῦτομάτου described above. For there the production of the end-like result was due to an external concomitant (ὧν ἔξω τὸ αἴτιον^b 20), while here it is due to something internal, i.e. due to the fact that matter—not prime matter but partly formed matter such as rotting earth, dew, mud, excrements, wood (cf. Bonitz, *Index* 124^b 3-22)—has a certain power of initiating change, and the particular change that will transform it into a living body (ὅσα δὲ ἀπὸ ταῦτομάτου . . . γίγνεται, βίων ἢ ὕλη δύναται καὶ ἐφ' αὐτῆς κινεῖσθαι ταύτην τὴν κίνησιν ἣν τὸ σπέρμα κινεῖ, *Met.* 1034^b 4-6).

The case in which an illness cures itself (*H.A.* 604^b 9) would be another instance of the kind of case Aristotle here means, in which the αἴτιον is ἐντός.

198^a 3-4. ἢ . . . ἐστιν, 'for what is at work in spontaneous and chance events is always one of the causes that operate by nature or as a result of thought'; sc. and nature and thought are *efficient* causes.

6-7. ὅταν . . . αὐτῶν. This may mean (1) 'when one of these very causes (reason and nature) has become a cause incidentally' (T. 57. 2, P. 295. 1), or (2) 'when something has become incidentally the cause of these very effects' (S. 354. 4-5). (1) is perhaps preferable, since it fits in better with the remark in ^a 3-4 that it is always nature or

thought that is at work in spontaneous or chance events. The present sentence then will mean that spontaneity and chance are names for the production by nature or thought *per accidens* of results which they *might* produce directly.

9-13. ὕστερον . . . παντός. Since spontaneity and chance are names for the production by nature or thought of results which are incidental to their proper results, the proper operation of nature and thought must be prior to spontaneity and chance.

A distinction must, it seems, be intended between ὁ οὐρανός and τὸδε τὸ πᾶν. Even if, merely for the sake of argument, we grant to Democritus (cf. 196^a 24-35) that ταυτόματον is the cause of the heavens, reason and nature must be prior causes of the universe as a whole and of many details in it, since ταυτόματον is only definable as that which simulates the action of nature or of reason.

CHAPTER 7

198^a 14. ὅσα φαμέν, i.e. the four causes; cf. 194^b 23-195^a 3.

16-21. ἢ . . . ὕλη. The four causes are represented, it seems, as of unequally wide application. (1) With regard to all facts and events, one way of answering the question 'why are they as they are?' is to refer to an essence or definition as one's final explanation (ἔσχατον in ^a 16 goes with τὸ τί ἐστίν, as ἔσχατον in ^a 18 goes with ὀρισμόν). Aristotle says ἐν τοῖς ἀκινήτοις, as if the formal cause were used only in dealing with eternal facts. But this cannot be the meaning, since he later (^a 22-33) uses it as a principle of explanation of events as well. His meaning must be not that the formal cause is operative only ἐν τοῖς ἀκινήτοις, but that it is the only cause that is operative there, efficient, final, and material causes being by the nature of the case excluded. (2) With regard to events, another way of answering the question 'why do they happen?' is to point to an efficient cause. (3) With regard to events, a third way of answering the question is to point to a final cause. (4) With regard to events that have the special character of being γενέσεις (ἐν τοῖς γιγνομένοις ^a 20), a fourth way of answering the question is to point to the matter out of which the new-formed substance is made.

17-18. οἶον . . . ἔσχατον. So too in *An. Post.* 72^a 14-24 ὀρισμοί, i.e. nominal definitions of the terms used in a science, are counted among the ultimate, ἀμεσοὶ ἀρχαί of scientific proof.

19. οἶον . . . ἐσύλησαν. The example is stated more fully in *An. Post.* 94^a 36-^b 7. The reference is to Darius' expedition against Athens in revenge for the occupation and burning of Sardis.

24-5. ἔρχεται . . . πολλάκις. Bonitz is no doubt right in reading

εἰς ἓν; he has the support of T. 57. 21, P. 301. 7, S. 363. 32. Cf. *De Caelo* 288^a 16 πλείους ἤδη αἱ φοραὶ συνεληλύθασιν εἰς ἓν.

25. **πολλάκις.** The qualification is necessary, because the formal cause ἐν τοῖς ἀκινήτοις is *not* an efficient or a final cause. But ἐν τοῖς κινήτοις the essence of a thing is identical with the end that is fulfilled in it; and the efficient cause of a thing is the essence of the thing present in another member of the same species (^a 26-7). It is a human being that begets a human being; and in everything that moves by being moved, it is the presence of a certain form in it that makes it the efficient cause of the presence of that form in that which it moves; e.g. it is the form of health in the doctor's mind that makes him the efficient cause of health in others (*Met.* 1070^b 30-34).

27. **καὶ ὅλως ὅσα κινούμενα κινεῖ** is loosely tacked on to ἄνθρωπος γὰρ ἄνθρωπον γεννᾷ; we must understand something like *ὁμοιοειδῆ ἐστι τοῖς ὑπ' αὐτῶν γινομένοις* (T. 57. 26).

28-31. **ὅσα . . . φθαρτά.** In this parenthesis Aristotle points out that ὅσα κινεῖ μὴ κινούμενα are no part of the subject of physics, since they have no κίνησις or ἀρχὴ κινήσεως (here = ἀρχὴ τοῦ κινεῖσθαι) in them and are therefore not φυσικά. Thus there are three separate studies—metaphysics, the study of unmoved movers, i.e. God and the intelligences that move the planets; astronomy, the study of things subject to movement but eternal; and terrestrial physics, the study of destructible things.

Bonitz is justified in preferring ἀκινήτων, κινουμένων, ἀφθάρτων to ἀκίνητον, κινούμενον, ἀφθαρτον. The use of περὶ with the genitive followed by περὶ with the accusative has parallels in *Met.* 1026^a 12-16, *Rhet.* 1355^b 28-35, 1359^a 30-34, but is awkward enough to have given rise to corruption.

31-3. **ὥστε . . . κινήσαν.** The final cause has been completely identified with the formal (^a 25), and is therefore omitted here. The efficient cause is mentioned separately, because it has been less completely identified with the formal cause. The efficient cause of a thing is the form of the thing, but present in another thing of the same species (^a 26-7).

33-^b 9. **περὶ γενέσεως . . . οὐσίαν.** Philoponus and Simplicius take ^a 33-5 as repeating in different words what was said in the last sentence, and therefore take τί μετὰ τί γίγνεται (^a 34) to refer to the formal cause, since τί πρῶτον ἐποίησεν ἢ τί ἔπαθεν refers to the efficient and the material. But this is impossible as an interpretation of τί μετὰ τί γίγνεται.

Rather the whole passage ^a 33-^b 9 must be taken to be a criticism of the usual method of physicists. They are usually concerned only in tracing the sequence of events (τί μετὰ τί γίγνεται). They start with some event in nature and ask what was the direct efficient

cause (τί πρῶτον ἐποίησεν) or what was the direct material cause (ἢ τί ἔπαθεν,) and then ask what was the efficient cause of the efficient cause, and the material cause of the material cause (καὶ οὕτως αἰεὶ τὸ ἐφεξῆς). Cf. the remark in *Met.* 985^a 10 that physicists like Empedocles and Anaxagoras recognized only the material and the efficient cause. But there are in fact two kinds of ἀρχή that produce natural change, and one of these is not itself natural, having no principle of movement (i.e. ἀρχή τοῦ κινεῖσθαι) in itself. Besides the efficient cause which is a link in a sequence, moving by being moved, there is a kind of cause which moves without being moved; and under this we must recognize both (1) the completely immobile first cause of all things (God) and (2) the formal cause, which is at the same time the final cause. Since nature in fact works for an end, the student of nature must study the formal-final cause, as well as the others (καὶ ταύτην ^b 4). In fact, since there is a difference of aspect between the formal and the final cause, the complete answer to the question 'why?' must contain four different elements—efficient, material, formal, and final cause.

To understand the sequence of events in nature we must not be satisfied with tracing back the sequence itself (τί μετὰ τί γίνεται). We must recognize eternal causes which stand outside the sequence. Otherwise we are led back in a never-ending search for beginnings. εἴ τε μὴ ἔσται παρὰ τὰ αἰσθητὰ ἄλλα, οὐκ ἔσται ἀρχὴ καὶ τάξις καὶ γένεσις καὶ τὰ οὐράνια, ἀλλ' αἰεὶ τῆς ἀρχῆς ἀρχή, ὥσπερ τοῖς θεολόγοις καὶ τοῖς φυσικοῖς πᾶσιν, *Met.* 1075^b 24.

33-5. περὶ γινέσεως . . . ἐφεξῆς. Carteron states that Alexander and Themistius placed these words after ἔνεκα ^a 24. But what Alexander says (S. 366. 15) is simply that the intervening words may be treated as parenthetical, and T. 58. 1-9 arranges his paraphrase accordingly.

35-^b4. διτταὶ . . . ἔνεκα. There are two types of ἀρχή that produce natural movement—natural, as distinct from the changes imposed on things by τέχνη or προαίρεσις (S. 366. 35). One such type of ἀρχή is found in ὅσα κινούμενα κινεῖ (^a 27). The other is found in (1) the unmoved first mover, and in (2) the formal cause of each natural thing. Both (1) and (2) are final causes of natural process, the one its transcendent, the other its immanent end.

^b2-3. ὥσπερ . . . μορφή. The παντελῶς ἀκίνητον is identical with the πάντων πρῶτον, i.e. with the prime mover, God, just as the τί ἐστὶ is the same as the μορφή. I have bracketed τό as due to a copyist who thought four things were being mentioned. Simplicius probably read τό (367. 18-23), but points out that the παντελῶς ἀκίνητον is identical with the πάντων πρῶτον.

5-9. καὶ . . . οὐσίαν. πάντως, 'in all four ways'. ὅτι ἐκ τοῦδε

ἀνάγκη τόδε, 'that from this that must follow', refers to the efficient cause. εἰ μέλλει τοδὶ ἔσσεσθαι, 'that, if this is to be, that must first be present', refers to the material cause. This is illustrated here, as in 195^a 18, by the necessity of premisses as the material cause or precondition of the conclusion. ὅτι τοῦτ' ἦν τὸ τί ἦν εἶναι refers to the formal cause. διότι βέλτιον οὕτως, 'that the thing is so because it is better thus', refers to the final cause, and Aristotle points out that in explaining natural process the physicist must not be content, as a Platonist might, to say 'this is so, because it subserves the end of the whole universe', but must be able to show that the attributes each thing has are better with a view to the nature of that particular thing; that, e.g., it is better for a man to have hands because they serve as organs of reason (P. 306. 2). This is Aristotle's way of accounting for structure, in his biological writings, especially in the *De Partibus Animalium*.

CHAPTER 8

198^b 14-16. καὶ γὰρ . . . νοῦν. Aristotle expresses more fully his criticism of Empedocles and Anaxagoras for insufficient use of the efficient and the final cause, in *Met.* 985^a 10-23, 988^b 6-16. Cf. Socrates' disappointment with Anaxagoras, Pl. *Phaedo* 98 b.

24-7. οἶον . . . συμπεσεῖν. W. Theiler, *Zur Gesch. der teleologischen Naturbetrachtung*, 25, argues that both Socrates (Xen. *Mem.* i. 4. 6) and Aristotle (*De Part. An.* 661^a 34-662^a 15) borrowed their teleological account of the teeth from Diogenes of Apollonia. Diels's *Vorsokratiker* contains no evidence on the subject.

27. ἐπεὶ . . . συμπεσεῖν. The construction is due to the fact that Aristotle is in effect quoting a view held by certain other thinkers.

32. τὰ βουγενῆ ἀνδρόπρωρα. The phrase occurs in Empedocles fr. 61, but with reference simply to the production of such creatures. A reference to their perishing in the struggle for existence may have followed; or, as Hamelin suggests, καθάπερ . . . ἀνδρόπρωρα may refer to ὅσα δὲ μὴ οὕτως, rather than to ἀπόλετο καὶ ἀπόλλυται.

199^a 8-12. ἔτι . . . ἐνεκά του. 'The course of nature corresponds to the course of intelligent action. Now the course of such action is directed towards an end. Therefore the course of nature is directed towards an end.' The premiss that the course of nature corresponds to that of intelligent action is then illustrated by the fact (or assumed fact) that if a house were a natural product, it would be built by the same stages by which it is actually built by the art of building; while if natural products were produced by art, they would be built up by the same stages by which they are produced by nature.

S. 375. 1 points out that if τέλος is taken = 'final cause', the sentence ἐτι . . . ἐφεξῆς (^a 8-9) is tautologous, and infers ib. 14 that τέλος is used in a temporal, not in a teleological sense. 'When there is a certain course of intelligent action terminating in a certain state of affairs, the earlier stages have that for their final cause.' The tautology is perhaps not so complete that the other interpretation is impossible. But Simplicius derives support from 194^a 29-30. The argument would have been easier to follow if the substance of ^a 8-9 ἐτι . . . ἐφεξῆς had not been repeated, after the other premiss (^a 9-11 οὐκοῦν . . . ἐμποδίζῃ), in ^a 11 πράττεται ἕνεκά του.

11-12. πράττεται . . . ἕνεκά του. The conclusion given in Bekker's reading καὶ πέφυκεν ἄρα τούτου ἕνεκα is not warranted. ἕνεκά του, the reading of P. 316. 13 and of S. 376. 7, must be adopted. E combines both readings.

15-20. ὅλως . . . πρότερα. On the analogy between the operations of nature and art cf. *Meteor.* 381^a 9-12, ^b 3-9, *De Part. An.* 639^b 15-21.

22. διαπορούσιντες. The reference may be to Democritus, who was impressed by the instinct of spiders and swallows (fr. 154, cf. ἀράχλαι 199^a 22, 27, χελιδῶν ib. 26). The spider, the ant, the bee, and the swallow came to be stock instances of animal sagacity, repeated by one author after another. For the history cf. S. O. Dickerman, *Some Stock Illustrations of Animal Intelligence in Gk. Psychology*, in *Trans. of the Amer. Philol. Assn.* 42 (1911). 123-30.

30-31. καὶ ἐπεὶ . . . μορφῇ, cf. 193^a 28-31.

33-4. ἔγραψε . . . γραμματικός. The reference is to writing to dictation (*Top.* 142^b 31).

^b4. καὶ . . . ἕνεκά του. For Aristotle's theory of monsters cf. *G.A.* iv. 3, 4 (especially 767^a 36-^b 15, 770^b 9-17).

5. ἐν ταῖς . . . συστάσεσι, in the monstrous combinations which according to Empedocles preceded the present animal forms:—

πολλὰ μὲν ἀμφιπρόσωπα καὶ ἀμφίστερνα φύεσθαι,
βουγενῆ ἀνδρόπρωρα, τὰ δ' ἔμπαλι ἐξαντέλλειν
ἀνδρσφυῆ βούκρανα, μεμειγμένα τῇ μὲν ἀπ' ἀνδρῶν
τῇ δὲ γυναικοφυῆ, σκιεροῖς ἡσκημένα γυίοις (fr. 61, cf. 198^b 32).

7. ὥσπερ . . . σπέρματος, 'as monsters are in fact produced when something untoward happens to the semen from which they are produced.'

7-9. ἐτι . . . ἦν. This is a further criticism of Empedocles' theory. Empedocles speaks as if animals were produced direct from animals, but there must always have been the intervening stage consisting of the semen, and if it is true that the now existing

animals were formed from something undifferentiated (οὐλοφνές), that must have been a seed and not an animal.

The Greek commentators take the argument to be 'the mere fact that a full-grown animal must always be preceded by a seed shows a regular sequence which must be purposive.' But it is hard to read this into the Greek, and it seems better to take the sentence to be an incidental criticism of Empedocles' theory, not relevant to Aristotle's main argument. Matters do not seem to be mended by reading with Hamelin σπέρματος· εἴ γ' ἀνάγκη, κτλ. P. 322. 8 reads and S. 381. 21 implies ἔτι.

9. οὐλοφνές μὲν πρῶτα:—οὐλοφνεῖς μὲν πρῶτα τύποι χθονὸς ἐξάνε-
τελλον (Emp. fr. 62. 4).

οὐλοφνεῖς = 'undifferentiated'; as is shown by the subsequent lines of the fragment. These primitive forms are according to Empedocles compounds of water and fire. Aristotle uses ὀλοφύης in the same sense in *De Part. An.* 693^a 25.

13-18. ἔτι . . . ἐμποδίση. ὅλως in ^b 14 seems not, as P. 320. 11, S. 383. 13 think, to start a new argument, but to be closely connected with ἔτι . . . ἔτυχεν. On Empedocles' principles, it ought to be a matter of chance what development takes place in semina. But to talk thus is to overthrow the whole course of nature. For in fact from a given seed there develops only one kind of animal, barring accidents.

17-18. ἀφ' ἐκάστης . . . ἐμποδίση. The meaning may be (1) 'the result which proceeds from each ἀρχή (each type of semen) is not the same for the several species, nor yet any chance result, but in each species tends towards the same type'; or (2) 'the result which follows from each ἀρχή is not, indeed, the same for the individuals of each species, nor yet is it a chance result, but it always tends towards the same type.'

20. λυσάμενος ἀπῆλθεν. Prantl is no doubt right in adopting this reading; λουσάμενος is a corruption, and λυτρωσάμενος an interpretation, of λυσάμενος. As Diels observes (*Textgesch.* 23), there is probably a reference to Plato's imprisonment in Aegina and his being ransomed by Anniceris of Cyrene, who had accidentally arrived there. Cf. D.L. iii. 20 λυτροῦνται δὲ αὐτὸν κατὰ τύχην παρὼν Ἀννίκερις ὁ Κυρηναῖος εἴκοσι μνῶν. Cf. also Luc. *Dem. Enc.* 23 and Aelian *Var. Hist.* ii. 27. The story is noticed by Philoponus (324. 21). The allusion cannot be to the *Misoumenoi* of Menander (Oxyr. Pap. No. 1013), to which S. 384. 14 refers.

24. πρότερον, 196^b 23-7.

26-31. ἄτοπον . . . ἔοικεν ἢ φύσις. It is absurd to deny teleology in nature because we do not find deliberation there. No one denies that art is purposive, but art does not deliberate. The carpenter

does not need to deliberate whether to saw off his plank or plane it first, nor the grammarian how to spell 'Cleon' (T. 63. 1-4; cf. *E.N.* 1112^a 34 καὶ περὶ μὲν τὰς ἀκριβεῖς καὶ αὐτάρκεις τῶν ἐπιστημῶν οὐκ ἔστι βουλή, οἷον περὶ γραμμάτων (οὐ γὰρ διστάζομεν πῶς γραπτέον). The difference between art and nature lies not in this, but in the fact that art is a power in one thing to effect change in another (ἀρχὴ ἐν ἄλλῳ, *Met.* 1070^a 7), and nature a power in a thing to effect change in itself (ἀρχὴ ἐν αὐτῷ), so that if the art of shipbuilding were present not in the artist's mind but in the timbers, its operation would be just like that of nature. Nay more, art is sometimes (*per accidens*) present in the very thing that it changes, as when a physician heals himself. If this be all the difference between art and nature, then since art is teleological, so is nature.

CHAPTER 9

199^b 34-5. Τὸ δ' ἐξ ἀνάγκης . . . ἀπλῶς; The question is whether necessity is present in nature only in the sense that certain conditions are necessary if a certain desirable result is to be produced (οὐ οὐκ ἄνευ τὸ εἶ, *Met.* 1072^b 12), or also in the sense that from certain conditions a certain result must follow.

35. οἴονται. The reference is probably to Empedocles and Anaxagoras; cf. 198^b 11-16. 200^a 1-5 is a parody of such passages as Anaxagoras fr. 15 τὸ μὲν πυκνὸν καὶ διερὸν καὶ ψυχρὸν καὶ τὸ ζοφερὸν ἐνθάδε συνεχώρησεν, ἐνθα νῦν (ἢ γῆ), τὸ δὲ ἀραιὸν καὶ τὸ θερμὸν καὶ τὸ ξηρὸν ἐξεχώρησεν εἰς τὸ πρόσω τοῦ αἰθέρος.

200^a 4. ἢ δὲ γῆ, as Cornford remarks, means unbaked brick, of which house-walls were usually made.

8. τῶν ἀναγκαῖαν ἔχόντων τὴν φύσιν, materials which must have a certain nature if they are to be the materials of a certain kind of thing.

13-15. ἐξ ὑποθέσεως . . . λόγῳ, 'the necessity, therefore, is hypothetical (i.e. is the necessity for this to be, if that is to be), not the necessity of a result which must follow from certain conditions; for the necessity affects the matter (i.e. it is the matter that is under necessity to be of a certain sort), while the end for the sake of which the matter has to be of a certain sort lies in the form which is to be realized.'

Aristotle adopts this as one of the leading principles of his biology; cf. *De Part. An.* 639^b 11-640^a 8.

15-24. ἔστι . . . εἰσίν. (1) There is an analogy between the necessity found in mathematics and that found in natural processes, viz. that both are one-sided. In mathematics we have this sort of situation. The equality of the angles of a triangle to two right

angles is based upon the definition of the straight line, but the latter is not based on the former; though it is true that if the proposition did not hold good the definition would not be true. In natural process also there is a one-sided necessity. But (2) the two cases are the converse of each other in this respect:—In mathematics the necessity proceeds from ground to consequence. In natural processes it proceeds from ends to preconditions; if the end is to be achieved, the preconditions must be so and so, and if these are not present the end will not be achieved. Yet (3) there is a closer analogy than has yet been suggested. For where action is concerned the final cause is the starting-point—not of the action but of the reasoning that leads up to it, just as in mathematics, where there is no question of action, the premiss is the starting-point of the reasoning. Thus in both cases we find the necessitation of a *συμπέρασμα* by an *ἀρχή*, unaccompanied by a necessitation of the *ἀρχή* by the *συμπέρασμα*. And (it is implied) the unconscious working of nature is analogous to the conscious working of human purpose; in both cases it is the end that necessitates the means, not vice versa.

In ^a 15–16 the comparison is stated as one between mathematics and natural generation. But in ^a 19 it is widened so as to become one between mathematics and *γένεσις* in general, including the coming into being of things by human endeavour as well as by nature; and for the moment, as οὐ τῆς πράξεως ἀλλὰ τοῦ λογισμοῦ implies, it is the former that is mainly in Aristotle's mind; and it is this that is illustrated in ^a 24–9. But in ^a 30–^b 4 he returns to natural *γένεσις* and shows that there, as in artistic production, the end dictates the material.

16–17. ἐπεὶ . . . τὸ εὐθὺ τοδί ἐστιν refers to the nominal definition of the straight line, which is one of the starting-points of geometry (*An. Post.* 76^b 3 ἐστὶ δ' ἴδια μὲν καὶ ἀλαμβάνεται εἶναι, περὶ ἃ ἐπιστήμη θεωρεῖ τὰ ὑπάρχοντα καθ' αὐτά, ὅσον μονάδας ἢ ἀριθμητικῆς, ἢ δὲ γεωμετρία σημεῖα καὶ γραμμὰς· ταῦτα γὰρ λαμβάνουσι τὸ εἶναι καὶ τοδί εἶναι). The proof of the equality of the angles of a triangle to two right angles with which Aristotle was familiar (*Met.* 1051^a 24–6) was that which we find in *Euc.* i. 32. It depends on *Euc.* i. 13, which proves that the straight line has the property that when one straight line stands on another, it makes the adjacent angles equal to two right angles; and the proof of this depends on the understanding of the nature of the straight line. The relation is irreversible; you cannot deduce the nature of the straight line from the property of the triangle, for in any proof you might attempt you would be assuming from the start the nature of the straight line, which is a precondition of the understanding of the nature of the triangle.

19. οὐδὲ τὸ εὐθὺ ἔστιν. More strictly, this would be οὐδὲ τὸ εὐθὺ

τοδί ἐστιν. But the Greek can stand in the sense of 'neither does the straight line as we have understood it exist'.

24-6. ἀνάγκη . . . ἐνεκά του. Bekker has ἀνάγκη ταῦτα γενέσθαι ἢ ὑπάρχειν ἢ εἶναι, ἢ ὅλως τὴν ὕλην τὴν ἐνεκά του. Here γενέσθαι ἢ ὑπάρχειν refers to two possibilities—that the proximate material of the product either may have to be made by the artist or may be already present; cf. 194^a 33 ποιούσιν αἱ τέχνηαι τὴν ὕλην αἱ μὲν ἀπλῶς αἱ δὲ εὐεργόν. ἢ εἶναι is pointless after ἢ ὑπάρχειν, and it seems better to take εἶναι as going with what follows. The ἢ which follows it was inserted by some copyist who took ἢ εἶναι with what precedes. In Philoponus' lemma two MSS. have ἢ εἶναι ὅλως τὴν and the remaining MS. has the unmeaning ἢ εἶναι ὅλως ἢ τὴν.

30-32. φανερόν . . . ταύτης. What is necessitated in physical objects is not the result, but the matter and the processes in it, which are necessitated by the result to be achieved.

34-^b 3. καὶ τὸ τέλος . . . λόγου, ὡσπερ . . . ὑπάρχειν—οὕτως κτλ., an instance of 'binary construction', for which see Riddell, *Apology of Plato*, 198-9. It is very common in Aristotle. Cf. 202^a 18-21 n., 222^a 14-19 n., 226^a 11-12 n.

^b 4. εἰ δὲ ταδί, ταδί, 'and if these means must come into being, the means to them must come into being'.

4-8. ἴσως . . . λόγου. Aristotle has said in ^a 30-32 that the necessitated element in the being of natural things is their matter and the processes in it; he now adds that in their definition also there is a necessitated element. One element in the complete definition of a physical thing will be a statement of the material of the thing, and the material is necessitated by the work the thing is to do. Thus the complete analysis of a physical thing is:—τὸ σύνολον (τὸ φυσικόν) = (1) matter + (2) form, which = (a) material element of form + (b) functional element of form. Here (a) is to (b) as (1) is to (2); it is ὡς ὕλη τοῦ λόγου, the quasi-material element in the definition.

In ^b 5 the reading ὀρισσαμένῳ is supported by T. 66. 14 ὀρισσαμένοις, P. 337. 25 εἰ . . . ὀρίσαιμι, S. 393. 3 εἰ . . . ὀρίζοιτο τις, and is pretty certainly right. With this reading the δ' of the MSS. in ^b 6 becomes very difficult. There are a few recorded cases of δέ with a principal verb, preceded by a participle; cf. Pl. *Symp.* 220 b πάντων ἢ οὐκ ἐξιόντων ἐνδοθεν, ἢ εἰ τις ἐξίοι, ἡμφισμένων . . ., οὗτος δ' . . . ἐξήγει, and Xen. *Anab.* vi. 6. 16, *Hell.* iii. 3. 7, *Hdt.* v. 50. Other instances are cited in Denniston, *Greek Particles*, 181-2, with the comment that few are textually above suspicion. I know of no such case in Aristotle, and it is much more likely that γ' has been corrupted into δ'.

BOOK III. CHAPTER I

Books iii and iv form a continuous work in which Aristotle treats of the most general notions involved (or, in the case of the void, wrongly thought to be involved) in the notion of nature. These are motion (iii. 1-3), the infinite (iii. 4-8), place (iv. 1-5), the void (iv. 6-9), time (iv. 10-14). The reasons for the discussion of these subjects are given in iii. 1. 200^b 12-25.

200^b 16-17. δοκεῖ . . . συνεχῶν. This *prima facie* view is confirmed by argument in iv. 219^a 10-13.

17-18. τὸ δ' ἄπειρον . . . συνεχεῖ. Simplicius explains this as meaning that, though infinity belongs to both kinds of ποσόν, to the διωρισμένον (discrete quantity, i.e. number) as well as to the συνεχές, it belongs primarily to the latter; it is the infinite divisibility of the continuous that gives rise to the infinity of the number series.

18-20. διδ . . . ὄν. No definition of the continuous by any thinker earlier than Aristotle seems to be recorded. He himself frequently describes the continuous as infinitely divisible (*Phys.* 185^b 10, 231^a 24, 232^a 24, 239^a 22), but it is apparently only in *De Caelo* 268^a 6 that this is put forward as its definition. He has other definitions of it as well—τὸ συνεχές ὧν τὰ ἔσχατα ἐν (*Phys.* 228^a 29, cf. 227^a 11 = *Met.* 1069^a 6, *Cat.* 5^a 1), συνεχές οὗ κίνησις μία καθ' αὐτό (*Met.* 1016^a 5), τὸ συνεχές ἐν τι ἐκ πλείονων ἐνυπαρχόντων μάλιστα μὲν δυνάμει, εἰ δὲ μή, ἐνεργείᾳ (*Met.* 1023^b 32).

20-21. ἄνευ τόπου . . . κίνησιν ἀδύνατον εἶναι. This is obvious in the case of φορά, but according to Aristotle it is also true of the other kinds of change. Generation (*Met.* 1042^b 1-5) and alteration (*Phys.* 260^b 4) presuppose locomotion, and growth presupposes alteration (*Phys.* 260^a 29).

21. καὶ κενοῦ. It is not Aristotle's own opinion that motion implies a void; he does not believe in the existence of a void. The sentence is under the governance of φασί 'understood from' δοκεῖ (^b 16). The implication of a void is one of the ἐνδοξα, since it was insisted on by the atomists.

26. ἔστι . . . καὶ ἐντελεχεία. The text as printed is given in all the MSS. of the *Physics* and the best MS. of the *Metaphysics* (1065^b 5) and was read by Alexander, Themistius, Porphyry (who, however, punctuated it, not to its improvement, with a comma before and not after καὶ ἐντελεχεία), Philoponus, and Simplicius. Palaeographically, it is easy to explain the absence of the first τὸ δὲ δυνάμει as due to haplography, or its presence as due to dittography or to deliberate correction by a copyist. Some support might be found for Spengel's reading by a comparison with *De Int.* 23^a 23-6 καὶ τὰ μὲν ἄνευ

δυνάμειος ἐνέργειαί εἰσιν, οἷον αἱ πρῶται οὐσίαι, τὰ δὲ μετὰ δυνάμειος, ἃ τῇ μὲν φύσει πρότερα τῷ δὲ χρόνῳ ὕστερα, τὰ δὲ οὐδέποτε ἐνέργειαί εἰσιν ἀλλὰ δυνάμειος μόνον. But the doctrine that there are δυνάμειος that from the nature of the case cannot be realized is rather an excrescence on Aristotle's usual doctrine of δυνάμειος—a device which he adopts in order to deal with the difficult problems of the infinite and the void (*Met.* 1048^b 9-17). The normal doctrine is that it is the nature of that which is potentially, to be realized. What is relevant here, where Aristotle is leading up to the definition of motion, is to oppose the changeable to the unchangeable, and this the reading of our text does. / τὸ ἐντελεχεῖα μόνον is that which is always actually what it ever is, in respect of substance, size, quality, and the other categories (^b 27-8); τὸ δυνάμειος καὶ ἐντελεχεῖα is that which passes from a state of potentiality to one of actuality in any of these respects.

27-8. καὶ . . . ὁμοίως. The antithesis of potentiality to actuality, and the possibility of a change from one to the other, exist in every category (e.g. a man who is actually sitting is potentially standing, so that there may be change in the category of κείσθαι). But in v. 1, 2 Aristotle gives reasons for holding that essentially there is μεταβολή only in respect of the four categories substance, quality, quantity, place, and κίνησιος only in respect of the last three.

τῶν ἄλλων is a loose partitive genitive, 'and so too in the case of things in the other categories'.

28-32. τοῦ δὲ πρὸς τι . . . κινήτικου. In the *Categories* τὸ πρὸς τι is not divided into kinds. In *Met.* Δ. 15 it is divided into (1) τὰ ὡς . . . ὑπερέχον πρὸς ὑπερεχόμενον, (2) τὰ ὡς . . . τὸ ποιητικὸν πρὸς τὸ παθητικόν, (3) τὰ ὡς τὸ μετρητὸν πρὸς τὸ μέτρον καὶ ἐπιστητὸν πρὸς ἐπιστήμην καὶ αἰσθητὸν πρὸς αἰσθησιν. In *Met.* I. 1056^b 35 it is divided into τὰ ὡς ἐναντία and τὰ ὡς ἐπιστήμη πρὸς ἐπιστητόν. *Met.* Δ thus contains the fullest classification; *Phys.* iii and *Met.* I both omit one of the three kinds. *Top.* 125^a 33-^b 4 classifies τὰ πρὸς τι from a different point of view into (1) those that must be in or about their correlatives (e.g. διάθεσιος, &c.), (2) those that may be in their correlatives (e.g. knowledge of a soul, which may be in the soul that is known), (3) those that cannot be in their correlatives (e.g. contraries, which cannot be in their contraries, and knowledge of anything but a soul).

The connexion of this section with what precedes is not very close, but seems to be as follows. Aristotle has just pointed out that the distinction of δυνάμειος and ἐντελέχεια, and therefore the possibility of a transition from one to the other, which is κίνησιος, exists in all the categories. The mention of the categories now leads him to point out that (while κίνησιος can occur in various categories) τὸ κινήτικόν and τὸ κινήτόν as such form one main part of the category of relation (or relata).

29-31. τὸ δὲ . . . κινήτων. ποιητικὸν καὶ παθητικὸν is narrower than κινήτικὸν καὶ κινήτων because it refers only to change of quality (ἀλλοίωσις).

32. τὰ πράγματα here means not the things that change but the various respects in which things may change (τὰ ἐν οἷς ἡ κίνησις). Aristotle's object is to state that, since there is no such thing as 'being' in the abstract, there is no such thing as change in the abstract; change is change either of substantial nature or of quantity or of quality or of place. Simplicius thinks that this is maintained in opposition to Plato (though he labours to show that the opposition is more apparent than real). But the passages he refers to—*Parm.* 138 b-139 b, 162 e-163 b, *Soph.* 248 e-249 b—do not show Plato to have differed from Aristotle on this point.

201^a 3-4. ἕκαστον . . . πᾶσιν, 'the character of each category is present in the various things that fall within the category, in either of two modes'. The expression is rather loose, but the meaning is that in respect of substance a thing may either have a certain substantial form (e.g. that of fire) or have the privation of this form; that in respect of quality it may have either whiteness or the absence of whiteness which is blackness; and so with the other categories.

8-9. ὥστε . . . ὄντος. This might, as Alexander suggested, have followed directly after the last sentence but one. But the intervening sentence has supplied something towards the conclusion, since it has pointed out explicitly the existence of the termini between which change may take place in each of the four categories concerned.

The statement is not strictly true, since according to Aristotle there is μεταβολή in respect of only four categories (substance, quality, quantity, place), and κίνησις in respect of only three (quality, quantity, place): cf. 225^b 7.

9^b 15. διηρημένου . . . κινήσεων. An aggregate of bricks, stones, &c., may be regarded (1) as so many bricks, stones, &c., (2) as potentially a house, (3) as potentially being in course of being fashioned into a house. The movement of building is the realization not (1) of the materials as these materials (they are, previously to the movement of building, already actually these materials), nor (2) of their potentiality of being a house (the *house* is the realization of this), but (3) of their potentiality of being fashioned into a house. Similarly every movement is a realization-of-a-potentiality which is a stage on the way to a further realization of potentiality, and only exists while the further potentiality is not yet realized. Hence it is ἀτελής (^b 32), and, though in a sense an ἐνέργεια, is distinct from an ἐνέργεια in the narrower sense in which ἐνέργεια implies that no element of δύναμις is present at all.

10-11. ἡ τοῦ δυνάμει ὄντος ἐντέλεχεια . . . ἐστίν. ἐντέλεχεια must here mean 'actualization', not 'actuality': it is the *passage* from potentiality to actuality that is κίνησις.

16-17. ἡ . . . εἶναι, lit. 'in so far as we say it is such,' more strictly 'in that respect which we refer to when we call it "the buildable".' Building is the actualization of its buildability, not of its being brick or stone, which was actual before it began to be made into a house.

19-21. ἐπεὶ . . . αὐτό, 'since some self-identical things are both potentially so-and-so and actually so-and-so, only not at the same time or else not the same so-and-so'. Some things, not all, because pure forms (God and the intelligences that move the spheres) have no potentiality in them. Things that have both potentiality and actuality act by virtue of the latter and are acted on by virtue of the former; and thus if X which is actually A is potentially B, and Y which is actually B is potentially A, X by virtue of its actuality and Y's potentiality can make YB to be YA, and Y by virtue of its actuality and X's potentiality can make XA to be XB; while things that have only actuality act without being acted on.

24. τὸ κινεῖν φυσικῶς. The πρῶτον κινεῖν ἀκίνητον moves not φυσικῶς, but simply as being the object of desire or love (*Met.* 1072^a 26, ^b 3).

25. δοκεῖ . . . κινεῖν. The reference may be, as Alexander thought, to Plato's view that soul, which is what moves other things, is itself self-moved. But the self-movement he ascribes to soul is not of any of the physical kinds recognized by Aristotle, and Simplicius is probably right in rejecting Alexander's interpretation and holding that the reference is to the early materialists.

26. ἐξ ἄλλων, viii. 5.

28. ἐντέλεχεια. It is necessary to insert either this or ἐνέργεια after ἡ δὲ τοῦ δυνάμει ὄντος, and it is more likely that it is ἐντέλεχεια that has been lost, by haplography. Diels points out that the words ἐπεὶ . . . ἀκίνητον ^a 19-27 are represented in the summary in *Met.* K only by the words συμβαίνει δὲ κινεῖσθαι ὅταν ἡ ἐντέλεχεια ἢ αὐτή, καὶ οὔτε πρότερον οὔθ' ὕστερον (1065^b 20-21), from which ἐντέλεχεια can easily be 'understood' after ὄντος; and he thinks that the passage ^a 19-27 belongs to a later amplified version which took the place of something answering more closely to what we have in *Met.* K. This is quite likely.

οὐχ ἢ αὐτὸ ἄλλ' ἢ κινήτον, the reading of Aspasius (*S.* 422. 20), is the only one of all the variants here that gives a good sense (Simplicius sensibly describes it as 'safer' than that of Alexander, 423. 12): 'not in respect of being the thing that it is but in respect of being changeable'; cf. ^a 10-11.

32. κινήτῳ, which is omitted in the *Metaphysics* (1065^b 26) and by Simplicius, is pretty clearly a gloss on δυνάμει τινί. Themistius' δυνάμει ἀνδριάντι (71. 11) is probably an interpretation of δυνάμει τινί; at any rate Themistius almost certainly did not read κινήτῳ. Philoponus follows Themistius (352. 21).

34^b 3. δῆλον . . . ἐν. The distinction between the substratum (e.g. bronze) and the capacity (e.g. the capacity for being shaped into a statue) is here brought out by pointing to the fact that a single substratum combines opposite capacities in itself. The capacity for health is obviously not the same as the capacity for disease, but the same body has both.

^b 3. εἴθ' ὑγρότης εἴθ' αἶμα. The first view is that of Hippocrates, the founder of the humour-pathology, and of Plato (*Tim.* 81 e-86 a), the second probably that of Empedocles (cf. Diels³ i. 205. 9, 222. 38).

4. ὡσπερ . . . ὁρατόν. Colour is no doubt what is seen, but is defined by Aristotle as κινητικὸν τοῦ κατ' ἐνέργειαν διαφανοῦς (*De An.* 418^a 31-^b 2) or as τὸ τοῦ διαφανοῦς ἐν σώματι ὠρισμένῳ πέρασ (*De Sensu* 439^b 11). It needs a further condition, viz. light, before it becomes visible (*De An.* 418^b 2 διόπερ οὐχ ὁρατόν ἀνευ φωτός, ἀλλὰ πάν τὸ ἐκάστου χρώμα ἐν φωτὶ ὁρατόν). I.e., visibility is a συμβεβηκός which under a certain condition the subject colour acquires.

10-15. ἡ . . . κινήσεων. The fulfilment of the buildable must be either the act of building (or process of being built) or the resulting house. But when the house is there, the buildable is no longer there, so that the house cannot be the fulfilment of the buildable. Therefore the act of building is the fulfilment of the buildable. Now the act of building is a typical κίνησις, and a parallel account holds good of all κίνησις. Therefore κίνησις is the fulfilment of potentiality.

CHAPTER 2

201^b 17. περὶ αὐτῆς, i.e. about movement, referring back to ^b 5.

18-20. οὔτε . . . ἐνιοι. οὔτε . . . 19 τις answers to ἐκ τοῦ μὴ ῥᾶδιον εἶναι διορίσαι ἄλλως αὐτήν, and δῆλόν τε σκοποῦσιν κτλ. το ἐξ ὧν οἱ ἄλλοι περὶ αὐτῆς λέγουσιν.

19. δῆλόν τε. In the ordinary reading δῆλον δέ, δέ has to be taken as answering loosely to οὔτε ^b 18. But E seems to have preserved here the original reading.

19-21. ὡς . . . κίνησιν. According to the Greek commentators, the reference is to the Pythagoreans and to Plato. τῆς ἐτέρας συστοιχίας ^b 25 suggests a reference to the former, and in *Met.* 986^a 25 κινούμενον occurs in the συστοιχία of the indefinite. But the reference to otherness, inequality, and not-being suggests rather Plato's view;

cf. such passages as *Soph.* 256 d-e (τὸ μὴ ὄν d 11, ἡ θατέρου φύσις d 12), *Tim.* 57 e-58 c (ἀνωμαλότης 57 e 7, ἀνισότης 58 a 1).

21-4. ὦν . . . ἀντικειμένων. To identify movement with otherness, inequality, or not-being can only (Aristotle argues) be a loose way of saying either that these are the subjects of movement or that they are the termini of movement. And to each of these statements there is an obvious objection.

25. τῆς . . . ἐτέρας συστοιχίας, the second of two columns of which the first contains positive terms, the second their opposites. The most famous of these pairs of columns is that set up by some Pythagoreans, *Met.* 986^a 22-6; and in this ἡρεμοῦν and κινούμενον are placed under πέρας and ἄπειρον respectively.

28-9. οὔτε . . . ἐνέργειαν, 'neither on the δύναμις-side nor on the ἐνέργεια-side of reality'.

31-2. ἢ τε κίνησις . . . ἀτελής δέ. The relation between κίνησις and ἐνέργεια is stated more fully in *Met.* 1048^b 29-35 πᾶσα γὰρ κίνησις ἀτελής, ἰσχυασία μάθησις βάδισις οἰκοδόμησις· αὐται δὲ κινήσεις, καὶ ἀτελεῖς γε. οὐ γὰρ ἅμα βαδίζει καὶ βεβάδικεν, οὐδ' οἰκοδομῆ καὶ ᾠκοδόμηκεν, οὐδὲ γίγνεται καὶ γέγονεν ἢ κινεῖται καὶ κεκίνηται, ἀλλ' ἕτερον, καὶ κινεῖ καὶ κεκίνηκεν· ἑώρακε δὲ καὶ ὄρα ἅμα τὸ αὐτό, καὶ νοεῖ καὶ νενόηκεν. τὴν μὲν οὖν τοιαύτην ἐνέργειαν λέγω, ἐκείνην δὲ κίνησιν.

202^a 2. οἶαν εἶπαμεν, 201^a 10-11.

3-4. κινεῖται . . . κινήτόν. The sentence runs better with a comma after πᾶν instead of commas before and after ὥσπερ εἴρηται. τὸ κινεῖν ὥσπερ εἴρηται = τὸ κινεῖν φυσικῶς 201^a 24.

4-5. ᾧ . . . ἡρεμία. ἡρεμία, being the privative and not the bare negative of κίνησις, can be ascribed only to that which is susceptible of movement.

5-9. τὸ γὰρ πρὸς τοῦτο ἐνεργεῖν . . . πάσχει, 'for to act on a thing in respect of some characteristic it has, is identical with moving it; and this the agent does by contact, so that it is at the same time also acted on; thus movement is the actualization of the movable in respect of its movability, and this happens by the contact of that which has the capacity of moving it, which therefore is at the same time also acted on.' ^a 7-9 sums up the whole account of motion, with the corollary that for a thing which is capable of being moved to cause movement implies its also suffering movement.

Prantl bracketed ^a 8-9 συμβαίνει . . . πάσχει as a doublet of ^a 6-7 τοῦτο . . . πάσχει. But the summing-up διὸ ἡ κίνησις ἐντελέχεια τοῦ κινήτου, ἢ κινήτόν would be pointless here except as leading up to the corollary that this involves action of the patient on the agent. Simplicius has ^a 8-9 as well as ^a 6-7 (434. 32, 436. 16, 438. 5).

In *De Gen. et Corr.* 323^a 25-33 it is pointed out that, though contact is usually mutual and action usually involves reaction, there

are things (Aristotle means God and the beings that move the planets) which touch and act without being touched and acted on.

10. ἡ τοσόνδε. There is something to be said for omitting these words (with E), since it is in γένεσις and ἀλλοίωσις that the transference of form is most apparent. But Simplicius has ἡ τοσόνδε, and the omission in E is probably due to haplography.

CHAPTER 3

202^a 13. τὸ ἀπορούμενον. This seems to refer not to any previous passage, but simply to a problem familiar to Aristotle's readers.

ἐν τῷ κινητῷ, sc. οὐκ ἐν τῷ κινητικῷ.

18-21. ὁμοίως . . . ὡσπερ . . . ὁμοίως is a good instance of Riddell's 'binary structure' (*Apology of Plato*, 198, § 209). Cf. *Met.* 983^b 11-17 and *Phys.* 200^a 34^b-3 n.

20. ἐν μὲν ἔστιν, i.e. τῷ ὑποκειμένῳ, in respect of their substratum.

21. ἀπορίαν λογικὴν. The meaning of λογικός may be seen from such passages as *Top.* 162^b 27 εἰ μὲν γὰρ ἐκ ψευδῶν ἐνδόξεων δέ, λογικός (sc. ὁ λόγος), *G.A.* 747^b 28 λέγω λογικὴν (sc. ἀπόδειξιν) διὰ τοῦτο, ὅτι ὄσῳ καθόλου μᾶλλον, πορρωτέρω τῶν οἰκείων ἔστιν ἀρχῶν (cf. 748^a 7-11). λογικὸς συλλογισμὸς is opposed to ἀπόδειξις (*An. Post.* 93^a 15), λογικῶς θεωρεῖν, σκοπεῖσθαι (σκοπεῖν) τὸ ἐκ τῶν κειμένων (*An. Post.* 88^a 19, 30), or to φυσικῶς (*Phys.* 204^b 4, 10, *De Gen. et Corr.* 316^a 11). What the present phrase intimates, then, is that the question is a superficial or dialectical one, turning on the verbal difference between ποίησις and πάθησις and failing to see that these are but two ways of describing the same event from two different points of view.

25-7. ἡ . . . πάσχοντι. The fuller form found in the Arabo-Latin translation and apparently in Themistius, and cited as a variant by Simplicius, would seem to be necessary to make the disjunction of possible views complete. But only the two alternatives found in our other authorities are taken up in the discussion, the second in ^a 28-31, the first in ^a 31^b-22. Aristotle evidently omits as patently impossible the view that both activity and passivity are embodied in the agent, and the fuller reading is the result of a later endeavour to make a formally complete disjunction without regard to the actual course of the discussion.

29-30. ὁ γὰρ αὐτὸς λόγος . . . κινουμένου. At first glance, one would suppose this to mean 'for the same account will apply to the mover as to the moved'. But then ἀλλὰ μὴν εἰ τοῦτο would have to mean εἰ ἡ πάθησις ἐν τῷ πάσχοντι, whereas it must refer to the single indivisible view εἰ ἡ μὲν ποίησις ἐν τῷ ποιοῦντι, ἡ δὲ πάθησις ἐν τῷ πάσχοντι. We must therefore suppose ὁ γὰρ αὐτὸς λόγος . . . κινου.

μένου to mean 'for the same account will apply to mover and moved as to agent and patient'.

35-6. τίνες . . . εἶδος; The patient is one thing and suffers change to one single condition (e.g. from ignorance to knowledge); how then can we suppose that it is suffering two alterations, as would be involved if the activity as well as the passivity takes place in it?

^b 9. μὴ . . . αὐτό, 'not as being the same thing in essence'. Grammar requires us to write τῷ εἶναι for τὸ εἶναι; cf. 186^a 31, 216^b 5, &c.

9-10. ἀλλ' . . . ἐνεργοῦν, i.e. the same in substratum though capable of being differently described. In the same way one and the same change may be described as activity from the point of view of the agent and as passivity from that of the patient.

12. μὴ . . . λέγοντα. Grammar requires us to read ὥστε for the ὡς of the MSS.

14. ὥσπερ . . . πρότερον, ^a 18-20.

23-4. τί . . . μέρος. This sums up the substance of chs. 1-3, especially of chs. 1 and 2.

CHAPTER 4

202^b 33. οἷον πάθος ἢ στιγμαή. A πάθος is neither finite nor infinite because it is not in the category of quantity but in that of quality; a point is neither, because it is not a quantity but the limit of a certain quantum, viz. of a line.

203^a 6. πλὴν . . . αἰσθητοῖς. Aristotle points out elsewhere (*Met.* 986^a 23) that πέρας καὶ ἀπειρον was one of the chief ways (περιττὸν καὶ ἄρτιον being another) in which the Pythagoreans formulated the formal and the material principle constitutive of sensible realities. They did not suppose these to have any existence except as constituting sensible realities, while Plato assigned a double role to the formal and the material principle (^a 9-10, cf. *Met.* 988^a 8-14). The Ideas contained as formal principle the One and as material principle the great and small (or ἀπειρον); sensible realities contained as formal principle the Ideas and as material principle a different ἀπειρον (spatial extension).

6-7. οὐ . . . ἀριθμόν. When Aristotle says (*Met.* 987^b 27) that the Pythagoreans identified real things with numbers, it is not to be supposed that they reduced reality to an abstraction, but rather that they did not recognize the abstract nature of numbers. What they were doing was little more than to state that the characteristics of things depended, to a large extent, on the number and the numerical relations of their components.

7. καὶ . . . ἀπειρον. This may be illustrated by 213^b 22-5. The

Pythagoreans described the universe as 'breathing in' from the infinite πνεῦμα or void which surrounded it. Cf. Stob. *Ecl.* i. 18, 6 (*Dox.* 316), where time also is described as breathed in from the infinite that surrounds the οὐρανός; and the problem ascribed to the Pythagorean Archytas by Simplicius (467. 26)—ἐν τῷ ἐσχάτῳ οἶον τῷ ἀπλανεῖ οὐρανῷ γενόμενος, πότερον ἐκτείναιμι ἂν τὴν χεῖρα ἢ τὴν ῥάβδον εἰς τὸ ἕξω, ἢ οὐ;

Thus Aristotle says that the Pythagoreans recognized τὸ ἄπειρον (1) as an element in ordinary sensible things, and (2) as that which is outside the heavens.

IO-II. καὶ οἱ μὲν . . . ἄρτιον. For the reasons which led the Pythagoreans to identify the infinite with even number cf. my note on *Met.* 986^a 18. Prof. Taylor has made a noteworthy further suggestion (*C.R.* xl (1926) 149 f.). He argues that on the Pythagorean assumption that the point is a μονὰς θέσειν ἔχουσα, every line consists of a finite number of finite but indivisible points separated by gaps, and that if this premiss be granted, a line containing an even number of points is capable of bisection *ad infinitum* (since every cut comes in a gap), while a line containing an odd number of points cannot be bisected at all (since the first cut would have to come at an indivisible point). This suggestion seems to me to offer a highly probable interpretation of the following passages. Stob. *Ecl.* i. 10 (*Dox.* 97) καὶ μὴν εἰς δύο διαιρουμένων ἴσα, τοῦ μὲν περισσοῦ μονὰς ἐν μέσῳ περίεστι, τοῦ δὲ ἄρτιου κενὴ λείπεται χώρα καὶ ἀδέσποτος καὶ ἀνάριθμος, ὡς ἂν ἐνδεοῦς καὶ ἀτελοῦς ὄντος. Plut. *De Vita et Poesi Homeri* 145 ὅθεν καὶ τῶν ἐφεξῆς ἀριθμῶν τὸν μὲν ἄρτιον ἐνδεὰ καὶ ἀτελεῖ, τὸν δὲ περισσὸν πλήρη τε καὶ τέλειον ἀπέφηνεν . . . γόνιμος γὰρ ἐστὶ καὶ ἔχει δύναμιν ἀρχῆς καὶ διαίρεσιν οὐκ ἐπιδέχεται, ἀεὶ τῆς μονάδος ἐν αὐτῷ περιούσης. ὁ δ' ἄρτιος οὔτε γεννᾷ ποτε τὸν περισσὸν συντιθέμενος ἑαυτῷ, οὔτε ἐστὶν ἀδιαίρετος. Plut. *Mor.* 388A ταῖς γὰρ εἰς ἴσα τομαῖς τῶν ἀριθμῶν, ὁ μὲν ἄρτιος πάντῃ διστώμενος ὑπολείπει τινὰ δεκτικὴν ἀρχὴν οἶον ἐν ἑαυτῷ καὶ χώραν, ἐν δὲ τῷ περιττῷ ταῦτ' οὐ παθόντι μέσον ἀεὶ περίεστι τῆς νεμήσεως γόνιμον. Ib. 288A καὶ διαιρουμένων εἰς τὰς μονάδας, ὁ μὲν ἄρτιος καθάπερ τὸ θῆλυ χώραν μεταξὺ κενὴν ἐνδίδωσι, τοῦ δὲ περιττοῦ μόριον ἀεὶ τι πλήρες ὑπολείπεται.

It may be noted that *if* Zeno's argument about the ὄγκοι (239^b 33-240^a 18) was directed against Pythagoreans, it must have been against a different form of theory from that implied in Prof. Taylor's explanation; for the ὄγκοι or indivisible units are represented as touching one another. So, too, are the points referred to in 227^a 29.

13-15. περιτιθεμένων . . . ἔν. There is no doubt what περιτιθεμένων τῶν γωμόνων περὶ τὸ ἔν . . . ὅτε δὲ ἔν refers to. It presupposes the Pythagorean method of representing numbers by dots arranged in a geometrical pattern, and expresses the fact that if you start with

one dot and place gnomons successively round it, you get figures of constant shape, viz. squares

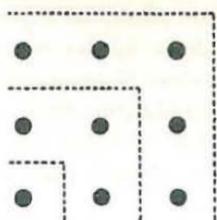


FIG. 1.

i.e. the fact that $1 + 3 + 5 + \dots (2n-1) = n^2$. The question is, 'what is the other case that is opposed to this?'—in other words, 'how is *καὶ χωρὶς* to be interpreted?' Themistius says (80. 22-4) *οἱ δὲ ἄρτιοι προστιθέμενοι τῇ μονάδι κατὰ τοὺς ἐφεξῆς ἀεὶ τι καινὸν εἶδος ποιούσι καὶ ἡ διαφορά πρόεισιν εἰς ἄπειρον, τρίγωνον, εἶτα ἐπτάγωνον, εἶθ' ὃ τι καὶ τύχοι*. In other words, he thinks the series $1, 1+2, 1+2+4 \dots$ is meant. Philoponus presents the same series, but also the series $2, 2+1, 2+3, 2+5 \dots$ and the series $3, 3+2, 3+4, 3+6 \dots$ (394. 11-13, 23-6).

Simplicius first interprets the passage as meaning *περιτιθεμένων περὶ τὸν ἕνα ἀριθμὸν τὸν τετράγωνον ποτὲ μὲν χωρὶς τῶν γνωμόνων . . . ποτὲ δὲ χωρὶς τῶν ἀρτίων* (457. 8-11). Later, however, he mentions with approval Alexander's interpretation, that *χωρὶς* refers to ordinary arithmetical addition without the use of *περίθεσις σχηματικῆ* (ib. 12-25), and adds an interpretation of his own which is a variant upon this (ib. 25-458. 7).

Milhaud (*Philosophes-Géomètres de la Grèce*, 115-17), Burnet (*E.G.P.*³, § 48.), and Heath (*Hist. of Gk. Math.* i. 82-3) offer a different interpretation, viz. that *καὶ χωρὶς* refers to the figure

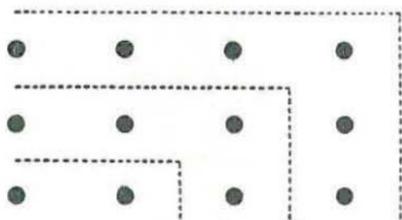


FIG. 2.

i.e. to the fact that $2 + 4 + 6 + \dots 2n = n(n+1)$, i.e. gives rise to a series of rectangular figures differing in the proportions of their adjacent sides, but gradually approaching to squareness. Prof. Taylor,

in *C.R.* xl (1926). 150-1 has reverted to Themistius' interpretation, and supported it by citing Stob. i. 1. 10, p. 20 (*Dox.* 97) ἔτι δὲ τῆ μονάδι τῶν ἐφεξῆς περισσῶν γνωμόνων περιτιθεμένων, ὁ γινόμενος αἰεὶ τετράγωνός ἐστι· τῶν δὲ ἀρτίων ὁμοίως περιτιθεμένων, ἑτερομήκεις καὶ ἀνισοὶ πάντες ἀποβαίνουσιν, ἴσον δὲ ἰσάκεις οὐδέεις.

Simplicius' various interpretations may be dismissed as obviously inadequate, and so may that of Zeller (i^e. 455, n. 3), that καὶ χωρὶς means καὶ περιτιθεμένων τῶν ἀριθμῶν χωρὶς τῶν γνωμόνων (i.e. περιτιθεμένων τῶν ἀρτίων). The question we are left with is whether τῶν γνωμόνων is limited to odd numbers, and χωρὶς means 'in the other case' (i.e. in the case in which *even* numbers are placed round the one), or τῶν γνωμόνων includes even numbers as well as odd, and χωρὶς means 'when gnomons are placed *one round another, without the odd*'. I doubt whether καὶ χωρὶς can have the meaning assigned to it in the first interpretation. The second interpretation involves taking χωρὶς as meaning 'separately' or 'apart from the one', which is a rendering much easier to accept. The matter seems to me to be settled by a long passage in Iamblichus' well-informed *In Nicomachi Arithm. Introd.* (73. 15 ff. Pistelli), which turns entirely on the unity of shape preserved in series (1) and the diversity of shape produced in series (2). That this is a genuine presentation of an early Pythagorean doctrine is confirmed by the fact that the antithesis τετράγωνον, ἑτερομήκες occurs in the list of Pythagorean contraries in *Mel.* 986^a 22-6, for an ἀριθμὸς ἑτερομήκης is precisely a number of the form $n(n+1)$ (*Nicom. Ar.* ii. 17. 1, 18 2; *Theon Sm.* 26. 21 Hiller; *Iamb. In Nic.* 74. 19 Pistelli).

The question remains whether γνώμονες can be used to include even numbers as well as odd. The stricter meaning of the word is 'the figure which remains of a square when a smaller square is cut out of it'; and in this sense each successive gnomon stands for an odd number, since the difference between two consecutive square numbers is always an odd number. But in a wider sense γνώμων can stand for any number which when added to a figurate number gives the next number of the same figure (*Iamb. In Nic.* 58. 19 Pistelli; *Hero Deff.* 58). Now, though the successive rectangles produced in fig. (2) differ in their proportions, they agree in being of the form $n(n+1)$, and it was therefore a natural extension of the meaning of the word to call their complements γνώμονες.

Cornford suggests that 'possibly putting gnomons round without the unit means putting *two* minimum gnomons *round one another*,

thus . Each succeeding gnomon will then contain an even number (6, 8, 10, &c.). and we shall obtain the traditional series of

oblongs'. This does not seem very likely, because the next step, that of putting six dots round the six, is so different in character from the putting of three dots round the first three.

15-6. Πλάτων . . . μικρόν. For the meaning of this cf. my note on *Met.* 987^b 20. Prof. A. E. Taylor has put forward an ingenious and attractive theory of the meaning of the doctrine of the great and small (*Mind*, 1926, 419-40 and 1927, 12-33), but I have in my note on Theophr. *Met.* 6^a 25 given reasons for doubting whether this can be accepted.

The reason given by Aristotle for Plato's describing the material principle in this way is ὅτι καὶ ἐπὶ τὴν αὐξήν δοκεῖ ὑπερβάλλειν καὶ εἰς ἄπειρον ἰέναι καὶ ἐπὶ τὴν καθαίρεσιν (206^b 28), i.e. that plurality appears to be capable of indefinite extension both in the upward and in the downward direction.

16. οἱ δὲ περὶ φύσεως. This, as in some other passages (e.g. *Met.* 1001^a 12), excludes the Pythagoreans and Plato, who are thought of as being *a priori* theorists rather than genuine students of nature; it excludes also the Eleatics, who in denying the existence of movement denied the existence of φύσις, which is an ἀρχὴ κινήσεως; cf. 184^b 17 n.

οἱ περὶ φύσεως πάντες here means not all the physicists in the narrower sense but all of them who recognize the infinite; for some are said not to recognize it at all (^a 18-19). Aristotle in effect divides οἱ περὶ φύσεως (in the narrower sense) into three classes (though the first is not clearly marked off by him from the other two): (1) those who recognize one infinite body (^a 16-18); (2) those who recognize a finite number of elements and do not think they make up an infinite whole (^a 18-19); (3) those who recognize an infinite number of elements and treat them as making up an infinite whole (^a 19-^b 2).

17-18. ἑτέραν . . . στοιχείων, 'some other nature of the so-called elements', i.e. some underlying substance, viz. one of the so-called elements. For τῶν λεγομένων στοιχείων cf. 187^a 26 n.

18. οἶον . . . ἀέρα. The reference is to Thales (ἕδωρ) and to Anaximenes and Diogenes of Apollonia (ἀέρα).

ἢ τὸ μεταξὺ τούτων. The reference (as in 205^a 27, *De Caelo* 303^b 12, *De Gen. et Corr.* 332^a 20, *Met.* 989^a 14) seems to be not to Anaximander (from whose doctrine the doctrine of the μεταξύ is distinguished in 187^a 14, 21) but to a member of the school of Anaximenes never named by Aristotle but identified (without much probability) by Diels with Idaeus; cf. 187^a 14 n.

18-19. πεπερασμένα, finite in number; ἄπειρα, infinite in extent. The reference is to such thinkers as Empedocles.

21. τῶν ὁμοιομερῶν. Anaxagoras called these σπέρματα; Aristotle

called them *ὁμοιομερῆ* to bring out the fact that each portion of them has the same analysis as their whole mass (^a 23-4).

τῆς πανσπερμίας τῶν σχημάτων, the differently shaped atoms which form the seed-bed, as it were, out of which all things grow.

22-3. *τῇ ἀφῆ . . . φασίν*. These thinkers recognize not one single infinite body (like the thinkers referred to in ^a 17), but an infinite number of bodies which make up an infinite whole only by continuity.

25. *ὁμοῦ . . . εἶναι*, fr. 1.

27-8. *καὶ . . . πάντων*. Since things existed *ὁμοῦ*, together in space, they existed *ἅμα*, simultaneously in time. For there was not only an originative source of the separation of each of them, but a single originative source of the separation of them all, and before this began to operate they must have existed simultaneously.

28-33. *ἐπεὶ . . . κινούμενα*. The principal clause begins at *καί τινα ἀρχὴν* ^a 30.

31-2. *ὁ δὲ νοῦς . . . νοήσας*, i.e. there must have been a moment of time at which the thought leading up to the separate activity of *νοῦς* began; or perhaps the reference of *ἀρχῆς τινος* may be to some principle the apprehension of which induced *νοῦς* to begin its activity, or to some principle in its own nature which induced it to begin its work of separation.

33-^b 2. *Δημόκριτος . . . διαφέρον*. While Anaxagoras says that out of every substance portions of all other substances may be separated, Democritus says there are atoms differing in size and shape (^b 1-2) which cannot emerge out of each other. According to him all change is simply the regrouping of these unmodifiable elements. Still, since they differ in nothing but size and shape, they are themselves modifications of something that is common to them all, viz. *σῶμα*.

^b 7-9. *ἔτι . . . φθορᾶς*. The infinite is ingenerable and indestructible as being an *ἀρχή*, i.e. as it might be expected to be if it were an *ἀρχή*, so that its ingenerability and indestructibility confirm the view that it is an *ἀρχή*. Its ingenerability and indestructibility are themselves proved by the fact that if it were generated and destroyed its generation would come to an end when the whole of it had been generated, and its destruction when the whole of it had been destroyed; whereas that which is infinite has no last part to be generated or destroyed.

II. *πάντα κυβερνᾶν*. Diels conjectures that this may be an expression of Anaximander's. The expression occurs also in Heraclitus fr. 41, Parmenides fr. 12. 3, but neither of these can be referred to here. The nearest extant parallel to the whole phrase *περιεῖχεν ἅπαντα καὶ πάντα κυβερνᾶν* is Anaximenes fr. 2 *οἶον ἢ ψυχῇ ἢ ἡμέτερα*

ἀήρ οὐσα συγκρατεῖ ἡμᾶς, καὶ ὄλον τὸν κόσμον πνεῦμα καὶ ἀήρ (Anaximenes' ἄπειρον) περιέχει.

13-14. ἀθάνατον . . . καὶ ἀνώλεθρον. Diels (*Vors.*³ 17. 35) prints these words as a quotation from Anaximander, and so they may well be.

17-18. χρῶνται . . . ἀπείρω, i.e. mathematicians assume that every line, plane, and solid is capable of being divided without limit.

18-20. ἔτι . . . γιγνόμενον. This argument is ascribed to Anaximander (*Plac.* i. 3. 3). τὸ γιγνόμενον, sc. καὶ τὸ φθειρόμενον.

25. τὸ ἔξω τοῦ οὐρανοῦ, the space beyond the heavens; cf. ^a 7.

26. καὶ κόσμοι. The doctrine of an infinity of worlds is ascribed to many of the early thinkers—Anaximander, Anaximenes, Archelaus, Xenophanes, Diogenes, Metrodorus of Chios, Anaxarchus, Zeno. But the reference to the void makes it probable that it is the Atomists that are chiefly referred to.

28-30. ἅμα . . . αἰδίοις. The argument is an abbreviated form of one ascribed by Eudemus (fr. 30 Spengel) to Archytas (S. 467. 26-35). As abbreviated it runs: 'even if we waive the previous argument and suppose that there is (not body but) void and infinite place beyond the universe, still, since (place is that in which there can be body, and since) in the case of eternal things what can be is, if there is infinite place there must be infinite body too'.

34-204^a 1. ἡ οὐδετέρως . . . πλήθει; The suggestion is that, though there is nothing whose nature it is just to be infinite, and nothing to which infinity belongs as an essential attribute, there may be something which by pure accident is infinite or forms an infinite plurality.

204^a 1-2. εἰ . . . ἄπειρον, i.e. whether there is a body that is essentially infinite, the second alternative mentioned above (203^b 33-4).

3-6. ἔνα . . . πέρας. On the various meanings of *a*-privative, cf. *Met.* 1022^b 32.

3-4. ἔνα . . . ἀόρατος. This is the purely negative sense ('not limited') in which even something non-quantitative such as a πάθος or στιγμή might be said to be ἄπειρον (202^b 33), as opposed to the privative sense in which ἄπειρον might be applied to that which, being a ποσόν, so far as its generic nature goes might be traversed, but in virtue of its specific or individual nature cannot be completely traversed, or can be traversed only with difficulty.

5. ἡ ὁ μόγυς. This is the colloquial sense in which, as S. 470. 24 says, a maze or a pit might be called endless.

6-7. ἡ κατὰ πρόσθεσιν . . . διαίρειν, either capable of being added to, or capable of being divided, without limit. According to Aristotle, number is infinite κατὰ πρόσθεσιν, space κατὰ διαίρειν, and time ἀμφοτέρως.

CHAPTER 5

204^a 8-9. αὐτό . . . ἄπειρον = τι ὄν αὐτὸ ἄπειρον (cf. ^a 17-18), 'something that is itself just infinite and nothing more' (cf. ἀλλ' οὐσία αὐτό ἐστι τὸ ἄπειρον ^a 10). The reference is to the Pythagorean and Platonic view: cf. 203^a 4-6.

12-13. εἰ μὴ . . . ἀόρατος, cf. ^a 3-4.

16-17. ὥσπερ . . . ἀόρατος. It is not the unseen as such, but voice, which is *per accidens* unseen, that is the ἀρχή of speech.

19-20. ἔτι . . . μέγεθος. Number and extension exist not as separate entities but as attributes of things. Still less, then, can infinity, which is (if anything) an attribute of number and extension, exist as a separate entity.

21. καὶ ἀρχήν. Only if there is an infinite whose essence is just to be infinite, i.e. only if the infinite as such is a substance, is the infinite as such a first principle or element of reality. If it is an attribute, it will be (at best) the subject of that attribute that will be an ἀρχή. Cf. ^a 14-17.

28. ἀλλ' . . . ἄπειρον, sc. ἀμέριστον καὶ ἀδιαίρετον εἶναι.

30. εἴρηται, ^a 14-17.

31. τὸν ἀέρα, a reference to the view of Anaximenes and Diogenes of Apollonia.

ἢ τὸ ἄρτιον, a reference to the Pythagorean view. Cf. 203^a 10-15.

34. καὶ μερίζουσιν. The Pythagoreans used, as one of their reasons for identifying the infinite with τὸ ἄρτιον, the fact that an even number can be divided by two. Cf. my notes on 203^a 10-11 and on *Met.* 986^a 18.

34-^b 4. ἀλλ' . . . αὔξεισιν. Aristotle presupposes here a division of entities into (1) αἰσθητά, (2) μαθηματικά, (3) νοητά which have no magnitude either sensible or mathematical. The νοητά are pure forms; the μαθηματικά are forms combined with ἕλη νοητή or extension (*Met.* 1036^a 9; cf. 1059^b 15); the αἰσθητά are forms combined with both ἕλη νοητή and ἕλη αἰσθητή. Cf. my note on *Met.* 1036^a 9-10. For the threefold classification cf. ib. 1026^a 13-16. It is derived from Plato's recognition of τὰ μαθηματικά as a class μεταξύ, between Forms and sensible things (*Met.* 987^b 14-18); but Aristotle modified Plato's doctrine by treating forms (apart from a few cases such as God and the beings that move the planetary spheres, which are pure disembodied forms) and mathematical objects as elements in sensible things, separable only by abstraction.

^b 4. ἐπὶ τὴν αὔξεισιν = κατὰ πρόσθεσιν ^a 6, infinitely extended, as opposed to infinitely divisible.

λογικῶς. Cf. 202^a 21 n. The abstract argument (^b 4-10) is one

that applies to mathematical as well as to physical objects (οὔτε νοητὸν (see ^b 6 n.) οὔτε αἰσθητὸν ^b 6); the concrete argument (^b 10 ff.) applies only to physical objects and turns on the division of these into ἀπλᾶ and σύνθετα (^b 11).

6. νοητὸν here corresponds not to ἐν τοῖς νοητοῖς (^b 1) but to ἐν τοῖς μαθηματικοῖς (^a 35). The νοητά of ^b 1 do not include σώματα at all, for σώματα must have μέγεθος. But τὰ μαθηματικά, which are combinations of form with ἕλη νοητή, may in a looser sense be called νοητά. Cf. *Met.* 1036^a 2-5.

7. ὡς κειρωρισμένους, sc. from numbered things.

10. τὸ ἄπειρον, the supposed infinite number.

12-13. εἰ . . . στοιχεῖα. Aristotle does not in this proof (^b 11-205^a 7) consider the other alternative, that there is an infinite number of elements. Alexander complained that he overlooked it (S. 478. 18); but he has already disproved it in *Phys.* i. 6, and he takes account of it in a later argument (205^a 29).

13. ἀνάγκη . . . εἶναι. If the elements are finite in number, it is in the abstract possible that there should be only one. But Aristotle has already refuted this possibility in i. 4, 5.

17-18. μόνον . . . ἔχον, i.e. provided that the δύναμις of a portion of fire exceeds that of an equal portion of air in a finite ratio.

23-4. οὔτε . . . γεννώσιν. This may be a reference either to the ἄπειρον of Anaximander (so Simplicius) or to an element intermediate between the four commonly recognized elements. The two views are distinguished in 187^a 14, 21; the present reasoning would apply to both. But see next note.

24-9. εἰσὶν . . . ταῦτα. This appears to refer to one of Anaximander's arguments for the existence of an ἄπειρον distinct from all the things of our world. He assumed a strife between the opposites that make up the world—warm and cold, dry and wet. If any one of these had been the fundamental reality, nothing else could ever have existed. Cf. Burnet, *E.G.P.*, § 14, and the passages quoted by him.

27-8. οἶον . . . ὑγρόν. Aristotle holds that, strictly speaking, air is characterized primarily by being ὑγρός and water by being ψυχρόν (*De Gen. et Corr.* 331^a 4-5); and he holds that air is not ψυχρός but θερμός, in addition to being ὑγρός (ib. 330^b 4 *et passim*). Simplicius therefore suggests (481. 33) that there may be a scribal error, i.e. that the original reading may have been ὁ μὲν ἀήρ ὑγρός, τὸ δ' ὕδωρ ψυχρόν. But his other suggestion is more probable, that Aristotle in a purely illustrative reference to the four elements may not have aimed at strict accuracy. It may even be that when he wrote this he had not worked out the doctrine expounded in the *De Gen. et Corr.*

205^a 2-7. ἀδύνατον . . . ψυχρόν. The reason why the universe can

never have been, and can never come to be, identical with (a) one of the elements (^a 2-3) or with (b) something more ultimate than the elements (^a 4-5) is that everything comes out of its contrary (^a 6-7). This premiss (which has itself been argued in i. 4, 5) proves the point, for Aristotle takes it as self-evident that (a) none of the four elements can be contrary to the other three, and that (b) something more ultimate than the four elements cannot be contrary to them all. The argument is made clearer by putting ὁ δ' αὐτὸς λόγος . . . φυσικοί^a 4-5 in brackets.

3-4. Ὡσπερ Ἡράκλειτος . . . πῦρ, fr. 30, 31, 63-6, 90. What Aristotle ascribes to Heraclitus is not the belief in a future simultaneous conflagration of all things (so Zeller i^o. 867), but the view that all things at one stage in their cyclical process of change become fire. The evidence for a Heraclitean doctrine of a general conflagration is late and untrustworthy; cf. Burnet, *E.G.P.*, §§ 77-8.

5. τοῦ ἑνὸς . . . φυσικοί, cf. 204^b 23-6.

7. κατὰ παντός, i.e. the following argument is one which is equally applicable whether the infinite body is supposed to be one of the commonly recognized elements (204^b 35-205^a 4) or something apart from these (205^a 4-5).

II. καὶ . . . παντός. Aristotle does not mean that the place (i.e. τὸ τοῦ περιέχοντος πέρασ, the inner limit of that which contains the thing, 212^a 20) of a whole is identically the same as that of any of its parts, but that the region of the universe proper to a whole is also the region proper to each of its parts. A clod of earth tends to fall towards the region proper to the earth, i.e. the part of the universe next the centre.

12-^b1. Ὡστε . . . εἶναι. The argument against an infinite body based on difficulties about its place discusses it under two alternative hypotheses, (a) that it is homogeneous throughout (^a 12-19), (b) that it contains parts of different nature (^a 19-^b1).

12-19. Ὡστε . . . στήσεται. The argument to show that there cannot be a homogeneous infinite body is difficult. Aristotle first states the general position and then (^a 14-19) illustrates it by taking a particular case. The general argument is:

(A) If the infinite body is homogeneous, it will be immovable or else always in motion.

(B) Both are impossible, for

(C) why should it rest, or move, down or up, or anywhere in particular, rather than anywhere else?

(Therefore (D) there cannot be a homogeneous infinite body.)

The justification for (A) is as follows: Since the whole is homogeneous, there is no part of its place which is more appropriate to one part of the whole than to another. The natural conclusion

is that each part, and therefore the whole, should remain where it is. But if the whole should move, then since no part of its place is a more appropriate resting-place for any part of the whole than any other, it will never cease moving.

(B) *καίτοι ἀδύνατον* must be taken to set aside both these alternatives. This it will do if *τί . . . ὀπουοῦν*; be taken to mean 'why should any part of the whole be resting unmoved, or be moving, in the downward or the upward or any particular region?' The question is grounded on the fact that, the whole being homogeneous, every part of its region is equally proper to every part of the whole. *κάτω, ἄνω, ὀπουοῦν* must refer to the places of rest, or motion, of the parts of the infinite whole; as applied to the place of the whole itself they would be unmeaning. Accordingly Aristotle proceeds to illustrate his argument by the case of a clod of earth.

He considers and rejects various alternatives that present themselves. (1) Will the single clod occupy the whole region of earth? Obviously not. (2) How else can it rest, or move? (a) Suppose it to rest somewhere, it will equally well rest everywhere (all parts of the region of earth being alike to it), and so will never move. (b) Suppose it to move in one place, it will equally move everywhere, and so will never rest. That it should never move, and that it should never rest, Aristotle treats as alike absurd, in view of his experience of the fact that earth sometimes moves, viz. when it is not as near the centre of the universe as it can get, and sometimes rests, viz. when it is as near as it can get.

19. τὸ πᾶν, the whole infinite body.

22. ταῦτ', the unlike parts of the infinite body.

23-4. ἔσται . . . ἄπειρον. Since finite amounts of each of a finite number of kinds of body cannot make up an infinite whole, there would have to be infinite amounts of some of these kinds, and finite amounts of others. Aristotle silently rejects the possibility of there being infinite amounts of each of the kinds, because they would be limited by each other and therefore not be infinite.

30. καὶ ἔσται . . . στοιχεῖα. This consequence of the hypothesis is not used in the refutation, which directs itself to the other consequence οἱ τόποι ἄπειροι. But Aristotle has proved elsewhere that there cannot be an infinite number of elements (i. 6).

30-1. εἰ . . . τόποι. Aristotle assumes that space has just three dimensions, each of which extends in two directions (^b 31-3).

31. καὶ τὸ ὅλον, i.e. the universe must contain a finite number of kinds of part, and therefore (in view of the argument in ^a 22-5) be itself finite.

33-4. οὔτε . . . εἶναι. If Aristotle had been speaking of the place actually occupied by a body, he would have said ἢ ὅσον τὸ σωμά ἐστι.

Since he is speaking of the proper place, to which a body tends, he says ἢ ὅσον ἐνδέχεται τὸ σῶμα εἶναι, 'than what the body is capable of filling'.

25-8. καὶ . . . κάτω. This section is quite out of place where it occurs in the MSS. and Greek commentators, viz. before εἰ δ' ἄπειρα in ^a 29; for it does not turn on the destruction of one element by an infinite contrary element (^a 24-5), and in fact contemplates not a plurality of elements at all but a single infinite element (^a 26). The words fit in better where I have, on Pacius' suggestion, placed them. They do not occur at all in *Met.* K, where 1067^a 18-23 answers exactly to 205^a 22-32 without this section. Their absence from K is less surprising if we suppose them to have occurred in the *Physics* where I have placed them; for the whole of *Phys.* 205^a 32-b 24 is omitted in K.

The section fits in well after ^a 29-b 1, for it turns on the point raised there, of the necessity for each element and its proper region fitting one another. Fire has a determinate τόπος, viz. the circumference of the universe, and earth has a determinate τόπος, viz. the centre of the universe; therefore neither fire nor earth can be supposed to be itself infinite, but (if anything) only air or water (since these tend to occupy the interspace between circumference and centre, and thus 'share the properties of upness and downness', have both an upward and a downward tendency), or a supposed intermediate between them.

Alternatively we might suppose with Hayduck that there is a lacuna after πρότερον in ^a 25, where there stood something answering to Themistius' words (88. 27-9) προσέτι δὲ οὐδὲ οἶόν τε ἐν τῶν στοιχείων ἄπειρον εἶναι ἐν τῇ συνθέσει ὅν πῦρ ἢ γῆ. ὄρισται γὰρ ἐκάστου τούτων ὁ τόπος, καὶ οὐ πᾶς οἰκεῖος ἅπαντι, ἀλλὰ τῷ μὲν ἄνω τῷ δὲ κάτω.

25-6. καὶ . . . φυσιολόγων. Aristotle says in *Met.* 989^a 5-8 that each of the four elements except earth has found an advocate among the physicists. But it is true that fire does not play the same part in Heraclitus' system that air or water does in some others. Fire is in his system only one of the phases through which everything passes (cf. 205^a 3-4 n.), and is, apart from this, simply a symbol of the change and destruction which is the law of the universe. The reason given in the *Metaphysics* for earth not having been treated as the element is different from that here mentioned. In 189^b 5-8 yet another reason is given for the preferability of air and water as elements. Aristotle is in each case simply guessing.

27. ἢ ὕδωρ probably refers to Thales, though he does not seem to have characterized water as infinite.

ἢ ἄερα refers to Anaximenes.

ἢ τὸ μέσον αὐτῶν. Cf. 203^a 18 n.

^b 3-4. τοῦτο . . . εἶναι. Anaxagoras' argument as stated by Aristotle (we have no other evidence for it) is: the infinite is in itself (since there is nothing bigger than it for it to be in); now where a thing is, there it is its nature to be; therefore it is the nature of the infinite to be in itself; therefore it supports itself in its existing position. Aristotle criticizes by saying that the fact that a thing is where it is does *not* prove that it is not its nature to move elsewhere; it might be kept where it is by βία. Thus even if we admit for the sake of argument that the infinite is at rest, being self-supported, it has still to be shown *why* it must be at rest.

9-10. εἴη . . . κινούμενον. It is clear that Themistius (89. 25), Philoponus (449. 13-14, 451. 16), and Simplicius (486. 1-2) had before them E's reading εἴη γὰρ ἂν καὶ ὅτι οὐκ ἔχει ἀλλαχῆ κινεῖσθαι οὐ κινούμενον, 'for it might be at rest because it has nowhere else to move to', and yet it might be its nature to move.

10-18. ἐπεὶ . . . ἑαυτό. The earth also might be described as supporting itself (^b 13-14). But that explains nothing. In the case of the earth we can reject the explanation of immobility suggested above, that it has nowhere else to move to. Its immobility is produced by the attraction exercised on it by the centre of the universe (^b 11), or in other words by the nature of earth (^b 13), which is to move to the centre and rest there, or in other words by its having weight (^b 15). So, too, a definite reason should be given for the immobility of the infinite body.

18-24. ἄμα . . . ἑαυτῷ. Aristotle now confirms his refutation of Anaxagoras' explanation of the immobility of his infinite body (^a 1-18), by showing that on that basis every part of the infinite body, i.e. every sensible body, ought to be always at rest.

24-31. ὅλως . . . μέσον; Aristotle now passes to a further attack on the belief in an infinite body, by showing that it is incompatible with the assigning of a proper place to bodies. The argument is that if you assign a proper place to bodies, and say that every sensible body tends to move either to or from the centre of the universe, you ought to say the same of the infinite body; but neither can it as a whole have one of the two movements nor can each half of it have one of the two; for how can you divide an infinite into halves, or how can part of it be up and part down, or part circumference and part centre?

33-4. καὶ ταῦτα . . . διώρισται. Cf. 208^b 8-22. Aristotle discusses in *De Caelo* iv. 1 the view that there is no absolute up or down in the universe (308^a 17), and declares that there is an absolute up, the circumference of the universe, and an absolute down, its centre (ib. 21, 30). (Elsewhere he lays it down that the south pole is absolutely the ἄνω πόλος and the north pole the κάτω (*De Caelo*

285^b 14), but that is not his usual way of defining the *ἄνω* and *κάτω*.) Again, the right side of the universe is stated to be that in which the stars arise, and the left that in which they set (*De Caelo* 285^b 16). In *De Caelo* ii. 5 Aristotle says that the movement of the heavens must be supposed to proceed forwards and not backwards; but that does not give us a definite *ἔμπροσθεν* and *ὀπίσθεν* in the universe, since the movement is circular.

206^a 3-5. εἰ . . . πού. The construction of this sentence is difficult, and Bonitz thought it necessary to read in ^a 5 οὕτω οὐδὲ ἐν τόπῳ, ὅτι πού (sc. ἔσται), where οὐδὲ ἐν τόπῳ is parallel to μηδὲ ποσόν in ^a 3, ποσὸν γὰρ . . . ποσόν ^a 3-5 being parenthetical. Bonitz thinks that the Greek commentators all support his reading. It is impossible to be certain what Themistius (91. 4-5) and Philoponus (464. 1-5) read. Simplicius read καὶ τὸ ἐν τόπῳ (490. 27) (τῷ before τόπῳ in the MSS. of S. is plainly corrupt), and his οὐδὲ ἐν τόπῳ (ib. 22) is merely paraphrase.

The reading of the MSS. and Simplicius may be justified if we treat ποσὸν γὰρ . . . ποσόν ^a 3-5 as parenthetical, and suppose that the apodosis takes a form conforming not to the protasis but to the end of the parenthesis. 'If, then, the infinite cannot be a quantum—for it would have to be a particular quantum, e.g. two or three cubits long; for that is the sort of thing that "a quantum" means—so, too, "in place" means' (understand σημαίνει) 'that a thing is in a particular place' (sc. and therefore the infinite cannot be in place any more than it can be a quantum). Cf. *Met.* 1067^a 31 (the parallel passage) τὸ γὰρ ἐν τόπῳ πού, τοῦτο δὲ σημαίνει ἢ ἄνω κτλ.

CHAPTER 6

206^a 11. καὶ . . . εἰς μεγέθη, 'and magnitudes will not be invariably divisible into magnitudes.' If infinite divisibility be denied, there are indivisible magnitudes; which are proved in vi. 1 to be impossible.

13. διατητοῦ δεῖ. Cf. *De Caelo* 279^b 11.

15. καὶ . . . διαίρεσει. Aristotle takes up at once (^a 16-^b 3) the ἄπειρον διαίρεσει, and explains in ^b 3-12 the ἄπειρον προσθέσει.

διαίρεσει. This is the reading of T. 91. 22, P. 464. 21, 24, and S. 491. 28, and διαίρεσις occurs elsewhere in the context (^a 17, ^b 4, 17, 19, 27, cf. 203^b 17, 204^a 7). καθαίρεσις also occurs, ^b 13, 29, 31, 207^a 23, 208^a 21. The reading ἀφαίρεσει may owe its origin to the fact that ἀφαίρεσις is the obvious opposite of πρόσθεσις. But the process Aristotle has in mind is essentially one of division.

17. εἴρηται, ch. 5.

τὰς ἀτόμους γραμμάς. This doctrine is ascribed to Plato in *Met.* 992^a 20-22, and to Xenocrates by later writers (Proclus,

in *Tim.* 36^b, ii. 246 Diehl, in *Eucl.* 279. 5 Friedlein; Al. in *Met.* 120. 6, 766. 33; T. in *Phys.* 12. 6; P. in *Phys.* 83. 20, 84. 20; S. in *Phys.* 138. 14, 140. 12, 142. 16, in *De Caelo* 563. 22, 665. 7; Syr. in *Met.* 124. 2). The pseudo-Aristotelian treatise *De Lineis Insecabilibus* is apparently directed against Xenocrates' view. In my note on *Met.* 992^a 20 I have discussed the reasons which may have led Plato and Xenocrates to this strange belief. Aristotle discusses this view in *Phys.* vi. 1.

18. *δυνάμει*, i.e. by virtue of the potentiality which spatial extension has of being divided without limit.

18-25. οὐ . . . τῷ γίγνεσθαι. Aristotle here in effect divides τὰ δυνάμει ὄντα into two kinds—one whose potentiality can be completely realized once for all (as the bronze which is potentially a statue becomes actually a statue), and one whose potentiality admits of progressive realization but is never completely realized at any one time. Thus when it is night, or before the Olympic games have begun, we may say 'there is (sc. potentially) such a thing as day' or 'there are Olympic games', and later we may say 'it is (actually) day' or 'it is (actually) the Olympic games to-day' (^a 24-5), but the actualization is not such that the whole day or the whole of the games exists at any one time. Their actualization is essentially a process, a *feri*. The infinite admits only of such an actualization as this; we can say of it 'it is being actualized', but never 'it has been actualized.'

25-^b 3. ἄλλως . . . ἐπιλείπειν. Having compared the progressive but never complete realization of the infinite to that of a day or a contest, Aristotle now points out that nevertheless the actualization of infinity admits of two kinds. The realization of both alike consists in the emergence of a series of parts each of which is itself limited but has successors which follow upon it without limit; but in the realization of infinity in a spatial magnitude by successive divisions of it each part persists after it has been called into being by an act of division; while in the progressive realization of time or of a natural kind such as mankind each member perishes, yet so that the succession never fails.

It will be seen that ^a 27-9 ὅλως . . . καὶ ἕτερον, ^a 33-^b 3 ἄλλ' . . . ἐπιλείπειν form a single sentence such as is required to justify the general statement in ^a 25-7 ἄλλως . . . μεγεθῶν; a sentence which would be seriously interrupted by the section ^a 29 a-33 ἔτι . . . καὶ ἕτερον. It is plain too that ἔτι . . . καὶ ἕτερον is an alternative version of ^a 18-29. Themistius seems, as his editor Schenkl observes (note on 92. 22) to have had a conflation of both versions before him (cf. 92. 20 with ^a 19, 92. 25 with ^a 31). Philoponus says (468. 9) that the second version was omitted in the more accurate MSS. Simplicius

says (495. 8) that it was omitted in many of the MSS. and that Alexander was aware of this. It was probably an alternative version which occurred in the margin of the original and was at an early date incorporated into the text in most of the MSS.

25-7. ἄλλως . . . μεγεθῶν. Aristotle means to distinguish not three but two modes of realization of the infinite; χρόνος and ἄνθρωποι are contrasted with ἡ διαίρεσις τῶν μεγεθῶν, as is evident from ^a 33-^b 3.

^b 3-12. τὸ δὲ κατὰ πρόσθεσιν . . . ὀρισμένῳ. Aristotle now explains the sense in which there is an ἄπειρον προσθέσει. If you divide a whole μέγεθος AA' into AB and BA' , BA' into BC and CA' , CA' into CD and DA' , &c., and add BC , CD , &c. to AB , then just as AA' can be divided without limit, AB can be added to without limit. But, as he points out, the process of addition is limitless only if the fractions added to the ὀρισμένον (AB) diminish in a constant ratio. If the fractions added are equal, the whole will be exhausted in a finite number of additions.

This last statement is equivalent to the famous Axiom of Archimedes, which had already been used by Eudoxus, and possibly by Hippocrates of Chios (Heath, *Greek Math.* i. 326-8).

5. ἀντεστραμμένως, since, as the parts taken diminish, the μέγεθος produced by adding them to one of the original parts increases.

8. τοῦ ὅλου μέγεθος. The MS. variants arose, as Diels points out, ^{τοῦ λόγου μέγεθος} from an original written thus: τοῦ ὅλου μέγεθος.

12-15. ἄλλως . . . πεπερασμένον. The punctuation I have adopted seems on the whole most likely to represent the course of Aristotle's thought. He first makes a statement which reproduces what he has said in ^a 16-18, that the infinite exists potentially, and by way of division (i.e. as the infinitely divisible, not as the infinitely extended). He then remarks parenthetically that (while it does not exist at any time as a given entity), it does exist actually in the special sense that, when division of a line is going on, a process which in principle endless is being progressively actualized, as a day or a contest is progressively actualized (cf. ^a 21-5). Finally, he elucidates its potential existence by a comparison of it with matter.

It would also be possible to omit δὲ ἔστιν, with E, and take δυνάμει . . . ἐντέλειᾳ as meaning (1) 'both potentially-and-by-way-of-exhaustion and actually', or (2) 'both potentially and, by way of exhaustion, also actually'; and some readers may prefer one of these interpretations.

13. ἐπὶ καθαιρέσει, 'along the way of diminution', refers to the same process that has hitherto been called διαίρεσις, but refers to it in a slightly different aspect. In the one the whole is regarded as divided into parts; in the other as diminished by the removal of parts.

14-15. καὶ δυνάμει . . . πεπερασμένον. The explanation of ἐντελεχεία by the words ὡς . . . ἀγῶνα leads Aristotle to revert to the existence of the ἄπειρον δυνάμει and offer a corresponding explanation of that. Just as ἕλη exists δυνάμει in the sense that it is capable of taking on successively a number of different forms, in each of which it is partially, and in none completely, realized, so too the ἄπειρον exists δυνάμει in the sense that it is capable of being partially realized by successive divisions of a whole. It never exists as a self-subsistent entity as the finite does.

The reading of E, Philoponus, and Simplicius καὶ οὐ καθ' αὐτὸ πεπερασμένον derives some support from 207^a 24, but gives a less suitable meaning here than the fuller reading.

16-17. δ . . . διαίρειν, cf. ^b 3-12. But Aristotle adds now that the κατὰ πρόσθεσιν ἄπειρον is only τρόπον τινα parallel to the κατὰ διαίρειν ἄπειρον. You can always find, within a μέγεθος A, something beyond what you have taken before. If you have taken $\frac{A}{2}$, you can get $\frac{A}{2} + \frac{A}{4}$, $\frac{A}{2} + \frac{A}{4} + \frac{A}{8}$, &c., just as, if you have taken $\frac{A}{2}$, you can get $\frac{A}{4}$, $\frac{A}{8}$, &c. But while by the latter method you can get something smaller than any assigned magnitude, you cannot by the former get something greater than any assigned magnitude, but only something greater than what you have already got by the application of the method; for A is the limit of what you can get by adding $\frac{A}{4}$, $\frac{A}{8}$, &c. to $\frac{A}{2}$. And in fact the universe is of a finite size which frustrates any attempt to find an infinite magnitude (^b 20-7); for the proof of the finitude of the universe cf. *De Caelo* i. 5.

23-4. ὡσπερ . . . εἶναι, cf. 203^a 7, ^b 25-6.

24-5. εἰ . . . οὕτω. Aristotle considers himself to have proved this in ch. 5.

28. δύο τὰ ἄπειρα, sc. τὸ μέγα καὶ τὸ μικρόν. Cf. 203^a 15-16 n.

32. μέχρι . . . ἀριθμόν. This doctrine was held by the Pythagoreans (Theon Smyrn. pp. 99. 17 Hiller; *Theolog. Arithm.* pp. 59 Ast; Photius, *Bibl.* p. 439^a 5 Bekker). Aristotle ascribes the view to some of the Platonists in *Met.* 1073^a 20, 1084^a 12, 31. Plato may have thought that the numbers higher than 10 could be treated as mere combinations of the numbers up to 10; though this involves treating the higher numbers, contrary to his own principle, as συμβλητοί. But it is quite possible that Aristotle is taking seriously some mere *obiter dictum* of his master. It may have been simply that he pointed out that both the Greek names for the numbers and the Greek symbols

for them (jumping from $\iota' = 10$ to $\kappa' = 20$) were based on a decimal system. This is the line of explanation suggested by S. 499. 16-20, 32-500. 2.

207^a 1-2. οὐ . . . ἐστίν. It seems that there is a slight play upon words in this aphorism. The οὐ in οὐ μὴδὲν ἔξω seems to depend on ἔξω. The ἀπειρον ἔξω τοῦ οὐρανοῦ was that which unlike the οὐρανόσ has nothing beyond it. The οὐ in οὐ αἰετι ἔξω ἐστί seems to be a partitive genitive depending on τι, for the infinite as conceived by Aristotle is that of which there is always some part beyond the point you have reached in dividing it or in building it up by addition. When, on the other hand, Aristotle identifies that οὐ μὴδὲν ἔξω with the complete (^a 8-9), here too οὐ is a partitive genitive, and ἔξω is used in a different sense, viz. = 'lacking' (ἀπεστιν ^a 10). This strange use of ἔξω, adopted for the sake of epigram, leads to the still stranger and really indefensible phrase οὐ ἔστιν ἀπουσία ἔξω (^a 12).

10-12. ὥσπερ . . . ἐστίν ἔξω, 'as we say of individual things "that is whole of which no part is outside or lacking", so we say of that which is strictly the whole (i.e. the universe) that it is that which nothing is outside, or from which nothing is lacking.'

16. ὁ μὲν γὰρ . . . φησίν. Bonitz emended this to ὁ μὲν γὰρ ἀπειρον τὸ ὄλον φησίν, thus getting a more precise antithesis to ὁ δὲ τὸ ὄλον πεπεράνθαι. But Aristotle is simply saying that Melissus applied the word ὄλον to his ἀπειρον, while Parmenides applied the word πεπερασμένον to his ὄλον or universe, and he thus gets at any rate a verbal antithesis which suits his purpose. Bonitz gets some support from T. 95. 10 and P. 475. 2, but Simplicius clearly had the MS. reading (502. 5, 20). Bonitz points out rightly that Aristotle's usual way of referring to Melissus' doctrine is to say that he describes τὸ ὄν or ὁ οὐρανόσ as infinite (185^a 32, ^b 17, 254^a 25, *Met.* 986^b 20, *Soph. El.* 167^b 13, 181^a 29). But Simplicius affords a perfectly simple explanation of the form of words used here when he says (502. 5) Μέλισσος μὲν γάρ, ἀπειρον εἰπὼν τὸ ὄν, καὶ ὄλον αὐτό φησιν εἶναι. It may be added that the repetition of τὸ ὄλον produced by Bonitz's reading is unnecessary and uncharacteristic of Aristotle.

17. μεσσοῦθεν ἰσοπαλές. Fr. 8. 44 μεσσοῦθεν ἰσοπαλές πάντη, 'equal in all directions from the middle.'

λίον λίνῳ συνάπτειν, a proverb for putting like things together. Cf. Pl. *Euthyd.* 298 c, Strattis *Potam.* fr. 38.

19-20. περιέχειν . . . ἔχειν. Bonitz's emendation of Bekker's περιέχον . . . ἔχον is sufficiently supported by T. 95, 15; E also has περιέχειν, and its omission of the words following περιέχειν is easier to explain if its original had ἔχειν, not ἔχον. For the view in question cf. 203^b 11.

21-2. ἔστι . . . οὐ, 'the infinite element in the complete constitu-

tion of a magnitude is matter'; i.e. in any actual extended thing that which is infinite in the sense in which Aristotle has admitted the infinite, viz. that which is infinitely divisible, or in other words spatial extension, is the material element, which needs to be supplemented by the formal element, i.e. definite shape. It is only when thus supplemented that it becomes actually a *ὄλον*; apart from such supplementation it is only potentially a *ὄλον*.

The order of the words is in favour of taking *τῆς . . . τελειότητος* as depending on *τὸ ἄπειρον*, not on *ὑλη*.

22-3. *διαιρετὸν . . . πρόσθεσιν*. The wording is very loose, and the phrase is excised by Stölzle; but it is sufficiently supported by P. 479. 15-18, S. 502. 31-2, T. 95. 22-4. For the meaning of *τὴν ἀντεστραμμένην πρόσθεσιν* cf. 206^b 3-12.

24. *κατ' ἄλλο*, in virtue of the element of form or definite shape.

27. *ἐν μορίου λόγῳ*, a fairly common idiom in Aristotle (cf. *H.A.* 559^b 20, *E.N.* 1131^b 20), as well as elsewhere (e.g. *Hdt.* 3. 120 *ἐν ἀνδρῶν λόγῳ*, 'to be reckoned as a man').

29-30. *ἐπεὶ . . . νοητά*. Bonitz's punctuation restores sense to a passage which as printed by Bekker, with a comma after *μικρόν* and none after *αἰσθητοῖς*, was unintelligible. If the *ἄπειρον* is what contains or bounds in the case of sensible things, then the *μέγα καὶ μικρόν*, which is Plato's *ἄπειρον* (203^a 15), should be what contains in the case of intelligible things. But Plato actually makes it the material or bounded element in the Ideas (as well as in sensible things), *Met.* 987^b 20.

CHAPTER 7

207^b 8-10. *τὸ γὰρ τρία . . . ἕκαστος*, i.e. the nouns representing the numbers (as when we say 'two is an even number') are related *παρωνύμως* to the corresponding adjectives; 'two' means 'the number containing two units', and the nominal use arises from the adjectival use. Aristotle's doctrine of *παρόνυμα* is not very satisfactory, since in it metaphysical and linguistic considerations are blended. In general, he holds that adjectives expressing the presence of some quality are *παρόνυμα* as compared with the corresponding abstract nouns (*Cat.* 1^a 14, 10^a 30, ^b 9, *E.E.* 1228^a 35), as also adjectives of material as compared with the nouns of material (*Phys.* 245^b 11). He can hardly mean by this that they are etymologically derived from them; for he can hardly have thought that *λευκός* was derived from *λευκότης* (*Cat.* 10^a 30) or *ἐστάναι* from *στάσις* (ib. 6^b 13). A word is called a *παρόνυμον* of another when (1) there is a linguistic connexion between the words (*Cat.* 10^a 32-^b 9) and (2) the latter stands for something metaphysically simpler and more fundamental

than what the former stands for. λευκός is παρώνυμον from λευκότης because it means 'characterized by λευκότης'. Similarly the noun 'two' is derived from the adjective 'two' because it means 'the number composed of two units'.

For the order τὸ τρία καὶ δύο cf. *Phys.* 227^a 32 οὐδὲ γὰρ μεταξύ δυνάδος καὶ μονάδος.

14. τῆς διχοτομίας is probably a (correct) gloss on χωριστός. 'This number has no existence apart from the bisection which gives rise to it'. Simplicius interprets χωριστός rather differently; he thinks the meaning is that the number thus produced is not an abstract number, ἐν ἐπινοίᾳ κείμενος, but a σωματικὸς ἀριθμὸς (so too Philoponus).

14-15. οὐδὲ . . . χρόνου, cf. 206^a 21-^b 3.

19. ἐπεὶ . . . αἰσθητόν. This Aristotle considers himself to have established in ch. 5.

21-5. τὸ δ' ἄπειρον . . . κίνησιν. The infinity which Aristotle believes to exist in μέγεθος is not infinite extent but infinite divisibility (with what follows from it, the possibility of indefinite addition of diminishing fractions to an original fraction of the whole) (206^a 16-18, ^b 3-12). It is therefore a corresponding infinity that he here ascribes to movement and to time. Since there is no μέγεθος infinite in extent, there can be no movement over an infinite μέγεθος. But there may be infinite movement in another sense. Time is infinite in extent (251^b 13, 26), and circular movement lasting throughout infinite time will itself be infinite (241^b 19, 261^b 27-265^a 12).

25-7. νῦν . . . διαιρετόν, i.e. we use for the present the phrases 'infinite magnitude', 'infinite movement', 'infinite time', but we shall show later what each of them stands for, and why every magnitude is divisible into magnitudes. The reference is to vi. 1, 2, 4.

28. ἀναιρῶν . . . ἄπειρον. I can find no other instance of this use of ἀναιρῶν with an accusative and infinitive. ἀναιρῶν τὸ διαλέγεσθαι (*Met.* 1062^b 11, 1063^b 11) and ἀναιρῶν τὸ ἐπίστασθαι (ib. 994^b 20) are found, and possibly we should insert τό here.

31-2. τῷ δὲ μεγίστῳ μεγέθει . . . ἕτερον. Any straight line, however short, can be divided in the same ratio as any other however long (*Eucl. El.* vi. 10), and therefore any property that could be proved by the use of a great magnitude can equally be proved by the use of a small one. Thus mathematics does not need very great magnitudes, let alone infinite ones.

33-4. ὥστε . . . μεγέθεισιν. Reading τὸ δὲ εἶναι ἐν τοῖς οὖσιν ἔσται μεγέθεισιν, S. 511. 26 interprets κἂν τὴν ἀπόδειξιν δυνατόν ὁμοίως καὶ ἐπὶ τῶν μὴ ὄντων ἀλλ' ἐπινοουμένων μεγεθῶν ποιείσθαι, ἀλλὰ τὰ γε ὑφεστῶτα σχήματα οὐκ ἐν πᾶσι μεγέθεισιν' οὐ γὰρ δὴ καὶ ἐν τοῖς ἐπινοου-

14. οὐδ' . . . ἔστιν, a second argument against this argument. Everything that exists is limited, but not any and every thing can be in contact with any and every other. Simplicius illustrates by saying that an utterance and a line cannot be in contact though both are limited. Contact can only exist either between two material things or between two mathematical objects, and is thus clearly distinct from limitation.

15-16. οὐ . . . νοήσεως, the infinitely great and infinitely small quantities that we get exist not in reality but in our thought. ἐπί = 'on the side of'.

18. ἔξω . . . μεγέθους. Alexander took ἔξω τοῦ ἄστεος to mean 'outside the city' (so too Themistius and Philoponus); but Simplicius objects that this would not be directly relevant to the discussion of the infinite, and prefers (after Eudemos) to take the words as meaning 'bigger than the city'. This has the advantage of avoiding the zeugma in the use of ἔξω implied in Alexander's interpretation. But it gives a most unnatural meaning to ἔξω τοῦ ἄστεος. Diels seems to be right in following the 'more accurate manuscripts' reported by P. 495. 6 as having omitted τοῦ ἄστεος and ἦ. Diels is very likely right in thinking the interpolation arises from some words in Eudemos' commentary such as οὐ διὰ τοῦτο Διάρης χιλίων σταδίων ἐστὶν ἢ τοῦ ἄστεος μείζων (cf. S. 517. 13-17).

20-1. ὁ δὲ χρόνος . . . λαμβανόμενου. Here Aristotle allows some importance to the first of the arguments for an infinite put forward in ch. 4. Time, movement, and thought must be admitted to be limitless, but their being is a constant coming into being and passing away; they never exist as given infinite wholes. Cf. 206^a 25^{-b} 3.

21-2. μέγεθος . . . ἄπειρον. Aristotle here denies the force of the second argument put forward in ch. 4. An actual infinite is not proved to exist either by our power of actually whittling away a given magnitude without limit, or by our power of imaginatively supposing it increased without limit. νοητικῇ is advisedly added to ἀυξήσει and not to καθαιρέσει; for Aristotle thinks there is a maximum, though no minimum, of really existing magnitude; cf. 207^b 3-5.

BOOK IV. CHAPTER I

208^a 28. πῶς ἔστι, i.e. whether it exists as a separate entity (as on the διάστημα view), or as an element in that whose place it is (as on the views which identify it with matter or with form), or as an element in what surrounds the thing whose place it is (as on Aristotle's own view).

30. τραγέλαφος, 'a fantastic animal, represented on Eastern carpets and the like' (L. and S.); cf. *De Int.* 16^a 16, *An. Pr.* 49^a 24, *An.*

Post. 92^b 7, *Aristoph. Ran.* 937, *Menand. Hal.* 24, *Pl. Rep.* 488a.

31-2. καὶ τῆς κινήσεως . . . φοράν. *φορά* is the most κοινή of the four species of κίνησις (or rather μεταβολή), since it is involved in the existence of all the others; cf. 260^a 26-261^a 26, *Met.* 1072^b 8, 1073^a 12. It is also κυριωτάτη κίνησις since it is that to which the word κίνησις is most strictly applicable.

34-^b1. ἔτι . . . αὐτοῦ. Earlier thinkers have not stated the difficulties about place; still less have they surmounted the difficulties.

13-5. ὅτε δὲ . . . δοκεῖ. Bekker and Prantl read ὅτε δὲ κτλ., with a comma after κατέχει. But a much better sense is got by reading ὅτε indefinite and placing a colon after κατέχει. Cornford takes the passage so, but prints ὅτε.

10. τινὰ δύναμιν. δύναμις means more than 'significance'. The proper place of a body, according to Aristotle, has an actual influence on it; an attractive influence which draws the body to it, as the form which matter is destined to assume has an attractive influence on matter. Cf. *De Caelo* 310^a 33 τὸ δ' εἰς τὸν αὐτοῦ τόπον φέρεσθαι ἕκαστον τὸ εἰς τὸ αὐτοῦ εἶδος ἐστι φέρεσθαι.

13-14. καὶ αἱ λοιπαὶ . . . διαστάσεων. The behaviour of light and heavy bodies αἱ proves the physical influence only of the directions 'up' and 'down'. But Aristotle evidently assumes that if they have an independent existence, the other four must have such as well. Elsewhere he tries to establish an objective or absolute definition for them also. The right side of the universe is that on which the stars rise, the left that on which they set (*De Caelo* 285^b 17-19). The front of the universe is that region through which the stars move in going from right to left; the back is that which is opposite to the front (ib. 287^b 22-288^a 12).

It is clear that, with Aristotle's conception of the universe as forming a sphere, if up and down, right and left, front and back are to be treated as the six divisions or directions, each pair must be interpreted as being the hemispheres into which the sphere is divided by a plane, and the three planes must be at right angles to each other. This gives quite a different interpretation to 'up' and 'down' from that offered in the present chapter, where 'up' refers to the circumference of the universe and 'down' to its centre. The other interpretation is given to 'up' and 'down' in *De Caelo* ii. 2, where it is argued that the south is the true upper pole of the universe.

Really, of course, the present interpretation of ἄνω and κάτω would exclude there being any other directions at all, or alternatively would require six others and not four. In the latter case up and down would express distance from and nearness to the centre, and the

other six would express position in one or other of the six hemispheres produced, two at a time, by three planes through the centre intersecting at right angles.

24-5. ὡς . . . ἕκαστον is the reading of S. 524. 34, 526. 4, 16. E has ὡστε μόνον αὐτῶν νοεῖσθαι τὴν θέσιν, ἀλλὰ μὴ ἔχειν φύσιν τούτων ἕκαστον. The other MSS. and apparently Themistius (103. 22) have ὡστε μόνον νοεῖσθαι αὐτῶν τὴν θέσιν, οὐκ ἔχοντα φύσει τούτων ἕκαστον. Philoponus very likely had the same (500. 18-25, 503. 12-20). Simplicius tells us that Alexander emended to ὡστε μόνον νοεῖσθαι αὐτῶν τὴν θέσιν; it is not clear what Alexander read after this. What is clear is that Alexander's emendation has found its way into the MSS., and that Laas and Diels are right in going back to Simplicius' reading. Diels takes ὡς τὰ μόνον λεγόμενα . . . οὐκ ἔχοντα as an accusative absolute, and in view of *Met.* 981^a 25 σοφωτέρους τοὺς τεχνίτας τῶν ἐμπείρων ὑπολαμβάνομεν, ὡς κατὰ τὸ εἰδέναι μᾶλλον ἀκολουθοῦσαν τὴν σοφίαν πᾶσι, and the other instances cited in Bonitz's *Index* 872^a 18-23, this is quite likely to be the construction. But another is equally likely; omitting the comma after ἀριστερά and placing one after θέσιν, we get the sense: 'for, though they are not in place, yet in respect of their position relatively to us they have a right and a left in the sense of "right" and "left" in which these are merely names assigned in respect of relative position, while they have not these distinctions by their own nature.'

In any case the object of the reference to τὰ μαθηματικά is to reinforce the distinction between a right and left relative to the observer and one rooted in the nature of the observed, by pointing out that mathematical objects have the former and not the latter.

30-1. λέγει . . . εὐρύστερνος, *Theog.* 116-17.

209^a 2-30. οὐ . . . ἀναγκαῖον. Aristotle claims in 212^b 22-9 that these problems are solved by his account of place. The first problem is referred to in 212^b 25, the second *ib.* 24-5, the fifth *ib.* 27-9, the sixth *ib.* 23-4. The third and fourth are not taken up in the later passage.

4-6. διαστήματα . . . πᾶν. The suggested argument is: 'Place has the three dimensions; body has the three dimensions; therefore place is body': an obvious fallacy, but plausible enough to give rise to an ἀπορία.

14-18. οὐτε . . . μέγεθος. Aristotle sets himself to prove four things: that place is not (1) a corporeal element, nor (2) composed of such, nor (3) an incorporeal element, nor (4) composed of such. (1) and (2) are not kept clearly apart in the proof, nor are (3) and (4); but the whole implied proof may be put as follows. Place cannot be (1) or (2) because both corporeal elements and what is composed of them are bodies, and space is not a body. It cannot

be (3) or (4) because neither incorporeal elements nor the things composed of them have size, and place has size.

16. οὔτε τῶν ἀσωμάτων. By the incorporeal or intelligible (^a 18) elements Aristotle means such elements as the Pythagorean *πέρας* and *ἄπειρον*, or the Platonic *ἐν* and *ἀόριστος δυάς*.

23-5. ἔτι . . . ἄπειρον. The nature of the argument here, as well as of the repetition of it in 210^b 23, and of the answer to it in 212^b 27-9, shows that we should read *που ἔσται* not (as in the editions) as a question, but as a statement, 'place will be somewhere'. This is confirmed by T. 105. 13, P. 513. 5-6, S. 534. 7-8.

28. ἐκ τούτων, from the facts named in ^a 26-7, that every body is in place and there is body in every place, i.e. that body and place are co-extensive (*εἰ μήτ' ἐλάττων μήτε μείζων ὁ τόπος ἐκάστου*). Aristotle has still to prove that there is body in every place, i.e. that there is no void (chs. 7-9). But here he is merely stating *ἀπορίαι*, and he can assume this as an *ἔνδοξον* though he has not proved it.

CHAPTER 2

209^a 32-3. καὶ . . . πρώτῳ. Aristotle here defines *κοινὸς τόπος* as the all-inclusive place, and the *ἴδιος τόπος* of a body as the place completely occupied by it. Really there may be a series of intermediate places, for A may be in B, B in C, C in D, &c. Each of these intermediate places is a *κοινὸς τόπος* of A; but only the all-inclusive place is a completely *κοινὸς τόπος*. This all-inclusive place is coextensive with the *οὐρανός*.

^b 3-4. ὧ . . . μεγέθους. We may say either that a definite magnitude is limited by its form, or that the indefinite extension which is the matter or potentiality of a definite magnitude is limited by a form and the definite magnitude is thus produced.

6. τὸ διάστημα τοῦ μεγέθους here means very much the same as ἡ ὕλη ἢ τοῦ μεγέθους in ^b 4. It is the indefinite extension which becomes a definite extension when limited by a form.

10. τὰ πάθη, i.e. the mathematical properties of the sphere, and the attributes consequent on the material it is made of.

11-13. διὸ . . . ταυτόν. It is correct to say that the *Timaeus* identifies *χώρα* and τὸ μεταληπτικόν. The latter phrase does not occur there, but τὴν τοῦ γεγονότος ὅρατοῦ καὶ πάντως αἰσθητοῦ μητέρα καὶ ὑποδοχὴν . . . ἀνόρατον εἶδος τι καὶ ἄμορφον, πανδεχές, μεταλαμβάνον δὲ ἀπορώτατά πη τοῦ νοητοῦ καὶ δυσαλωτότατον of 51 a 4-b 1 is identified with *χώρα* in 52 a 8, b 4 (where *τόπος* also is used, apparently without distinction of meaning, ἐν τινι τόπῳ καὶ κατέχον χώραν τινά), and d 3. This, with *παράδειγματα* or Forms, is what Plato needs for the construction of the sensible world.

Aristotle's phrase τὸ μεταληπτικόν may be due to a misinterpretation of the phrase μεταλαμβάνον δὲ . . . τοῦ νοητοῦ. That phrase does not mean 'receptive of intelligible form', but 'sharing in intelligibility' (as the context shows). But τὸ μεταληπτικόν is not a bad paraphrase of such words as ὑποδοχή and πανδεχές (cf. ἔδραν παρέχον ὅσα ἔχει γένεσιν πᾶσιν 52 b 1). It is much more risky to say, as Aristotle does, that Plato identified χώρα with ὕλη. The truth about this is excellently put by Prof. Taylor (on *Tim.* 52 b 4). 'It is . . . not true that Timaeus teaches that matter is space. . . Matter really plays no part in his cosmology at all. The "permanent implied in change" is not thought of by him as a "stuff" or a "substrate". In being the permanent implied in change, it discharges the same function which ὕλη or "matter" does in the *Physics* of Aristotle, but there the resemblance of the two notions stops. There is no "substrate of change" in the scheme of Timaeus. Aristotle is himself so imbued with the view that the permanent implied in change can only be thought of as "stuff" or "substrate" that he was probably unconscious that he was falsifying the theory of the *Timaeus* by forcing his own technical terminology into it.' Cf. also Prof. Taylor on *Tim.* 58c 2-4.

13-16. ἄλλον δὲ τρόπον . . . ἀπεφήνατο. Comparing this passage with ^b 33-210^a 2 we see that the discrepancy between the *Timaeus* and the 'unwritten doctrines' was that in the latter the μεθεκτικόν or μεταληπτικόν was identified not with ὕλη (or rather, as we have seen in the previous note, not with χώρα) but with the great and small. The substitution of this for χώρα as the non-formal element may be explained by the fact that, while in the *Timaeus* Plato was discussing only the constitution of sensible things, he later carried his analysis further and performed an analysis of the Forms corresponding to that which he had already performed on sensible things. 'The great and small' was a more suitable name than 'space' to use of that which unites with the One to make the Forms, as well as with the Forms to make sensible things (*Met.* 987^b 18-22, 988^a 11-14).

The ἀγραφα δόγματα of Plato are not elsewhere alluded to by Aristotle under this name. They are probably to be identified (as by S. 545. 23) with Plato's lectures on the Good, which, if we may trust the summary of them by Alexander in S. 454. 22-455. 11, expounded *inter alia* the doctrine of the great and small. These lectures, we are told (S. 453. 28), were attended and taken down by Aristotle, Heraclides, Hestiaeus, and others.

25. ὥσπερ ἔφαμεν, 208^b 2-6.

28-30. καὶ . . . ἐστίν. This sentence confirms the point just made, that the place of a thing is no part of the thing and therefore cannot be either its matter or its form; this is confirmed by the

facts that the place of a thing is akin to a vessel containing it (only that the vessel is movable while the place is not), and that a vessel is no part of its contents. The distinction between place and vessel is brought out more fully in 212^a 14-21.

30-32. ἡ μὲν . . . εἶδος sums up ^b 21-30; ἡ δὲ . . . ὕλης sums up ^a 31-b 5.

32-3. δοκεῖ . . . αὐτοῦ. This is a note putting in a slightly different way the distinctness of a thing's place from it, which has been the theme of ^b 22-32. Common thought, says Aristotle, holds that if a thing is somewhere, there is something outside it, distinct from it; this, he implies, is its place.

33-210^a 2. Πλάτωνι . . . γέγραφε. Aristotle evidently assumes that τὸ μεθεκτικόν (= τὸ μεταληπτικόν of ^b 14) is in Plato's system receptive of the Forms and numbers; this is perhaps due to the misunderstanding of Plato's phrase μεταλαμβάνον ἀπορώτατά πη τοῦ νοητοῦ mentioned in my note on ^b 11-13. In fact the ὑποδοχή is never represented by Plato as receiving the Forms but only as receiving τὰ πάντα σώματα (50b 6), and Aristotle's misunderstanding is due to his thinking of the function of the ὑποδοχή too much in terms of his own conception of matter (cf. ^b 11-13 n.), according to which matter does receive or participate in form.

Plato implies in *Tim.* 52 a 8-b 5 that there are things (and he must mean the Forms) which are not in place; and this is undoubtedly his view about the Forms. Aristotle's argument against him on this ground rests on the misunderstanding mentioned above.

210^a 2-5. ἔτι . . . τόπος. Aristotle reverts here to the point made in 208^b 8-14, the tendency of bodies to move to a place of their own, and uses it effectively to refute the view that place can be either the matter or the form of that whose place it is.

3-4. οὐ μὴ κίνησις . . . ἐστὶ does not mean 'that of which there is no motion', for there is no motion of place. The genitive must be taken more generally, 'that to which motion and the distinction of up and down are in no necessary relation', i.e. that to or from which there can be no motion, and which does not contain the distinction of up and down; sc. matter or form.

5. εἰ . . . τόπος. αὐτῷ is the reading in the first hand of all Bekker's MSS. and occurs in Philoponus and in Simplicius' lemma (547. 33) and paraphrase (548. 2). Simplicius is no doubt right in interpreting αὐτῷ as αὐτῷ τῷ πράγματι. Bekker's αὐτῷ gives no good sense.

9-II. ἔτι . . . φθορά; Alexander (S. 549. 25-550. 4) and S. 550. 5-24 take this to be an attack on the view that place is either form or matter. Alexander supposes the argument to be: 'if form is place, then since when air becomes water the form of air perishes, its place perishes; but place cannot perish. If on the other hand

matter is place, the difficulty arises that when water becomes air the matter remains the same but the place changes.' Simplicius agrees as regards the first horn of the dilemma, but thinks the second horn must be: 'if on the other hand matter is place, the place becomes smaller, so that the old place perishes—which is absurd.' These explanations seem to me over-elaborate. There is no reference to the identification of place with form or with matter. As Aspasius saw (S. 549. 12), the sentence only means 'when matter shrinks (as from the gaseous to the liquid condition), its former place is no longer there; for the matter now occupies a smaller place. But how can place perish?' The argument, like all those in chapters 1 and 2, is dialectical; it presents the difficulty about shrinking bodies corresponding to that which 209^a 27-9 presents about expanding bodies.

CHAPTER 3

Since the notion of place is inseparably bound up with that of being in a place, Aristotle endeavours to clear up ambiguities in the notion of 'in', before proceeding to the further discussion of place. Incidentally this discussion provides him with three valuable results: (1) It enables him to dispose of the question whether, and if so in what sense, a thing can be in itself (^a 25-^b 22). (2) It enables him to answer Zeno's objection, that if place is anything it must be in another place (^b 22-7). (3) It furnishes yet another argument against the identification of place with either form or matter (^b 27-31).

In *Met.* 1023^a 23-5 the senses of *ἐν* are said to correspond to those of *ἔχειν*, which means (1) to treat according to one's own nature or impulse (answering to sense (6) here), (2) to have, as a receptive material has the form that is imposed on it (answering to sense (5) here), (3) to contain (answering to senses (1), (3) and (8) here), (4) to prevent a thing from moving according to its own impulse (answering to nothing in the present classification).

210^a 19. *καὶ ὅλως τὸ μέρος τοῦ εἴδους* is added to show that the differentia, no less than the genus, may be said to be in the species.

20. *ὡς . . . ψυχροῖς*, i.e. health resides in the hot and cold materials in the body, and depends upon a proper balance of them for its existence.

21-3. *ἔτι . . . ἐνεκα*. These two are idiomatic senses of *ἐν*, in which the English 'in' cannot be used, except with certain special verbs, as we might say 'the fortunes of a company centre in the managing director' (sense (6)), or 'this is the object in which my desires are centred' (sense (7)).

25^b-22. ἀπορήσειε . . . δῆλον. The question naturally presents itself, why Aristotle discusses at such length whether a thing can be in itself. Simplicius provides a probable answer by saying that the problem was suggested to Aristotle by Anaxagoras' statement (205^b2) that the infinite maintains itself at rest because it is in itself. Aristotle refuted the view there on other grounds, but may have thought it well to add by implication a further argument against it.

Another source of Aristotle's interest in the problem may be found in Plato's dialectical proofs in the *Parmenides* that the One cannot be in itself (138a 7-b 5) and that it must be in itself (145 b 6-c 7) (quoted in S. 560, 561).

26-7. διχῶς . . . ἔτερον, i.e. we may be asking (1) whether a thing can be, strictly *qua* itself, in itself *qua* itself, or (2) whether a thing can be in itself, in virtue of something else (i.e. in virtue of some part of itself being in another part of itself). Aristotle's conclusion is that it is only in the second, very loose, sense that a thing may be said to be in itself.

29-30. λέγεται . . . λογιστικόν. The examples of whiteness and scientificness are introduced not, at this stage, as examples of a thing's being said to be in another *κατά τι μέρος*, but of the more general fact that an assertion which can be made strictly about a part may for that reason be made indirectly about the whole. A man is called white because his surface is white, or scientific because his rational faculty has been trained so as to have become scientific.

31-3. ὁ δὲ τοῦ οἴνου ἀμφορεὺς . . . μόρια, i.e. if we are willing to combine the loose way of speaking of *a* as being in *b* when a part of *a* is in *b*, and the loose way of speaking of *a* as being in *b* when *a* is in a part of *b*, we may say that the whole bottle-of-wine is in itself because the wine is in the bottle.

34^b-6. οἶον . . . ἄλλο. The instances of whiteness and scientificness are now brought into closer relation with the question whether a thing can be in itself. They are not instances of that (οἶον therefore means 'just as', not 'e.g.'), but they are, equally with it, instances of the fact that A may be said to be in B *κατ' ἄλλο* (C). A jar of wine may be said to be in itself in virtue of a part of it (the wine) being in another part (the jar). Not quite dissimilarly, whiteness may be said to be in a body because it is in its surface, and science to be in a soul because it is in its rational element (ὅτι τὸ λογιστικόν^a 30); and, once more, it is in virtue of their presence in these (body and soul), which are parts when they are considered as present in a man (ὡς γὰρ ἐν ἀνθρώπῳ^b 2), that whiteness and scientificness may be said to be in a man, or in other words that a man may be described by the appellations (*προσηγορίαι*^b 2) white' and 'scientific'.

^b 2-4. ὁ δὲ ἀμφορεὺς . . . αὐτῷ. This appears to be a parenthesis.

The statement that soul and body are parts, when considered as elements in human nature (^b 2), leads Aristotle to revert to the instance of the jar of wine (mentioned in ^a 30-33) and to point out that similarly the jar and the wine are parts only when they are together. Then in ^b 4 he returns to the case of whiteness and states more explicitly what he has stated more obscurely in ^a 34-^b 2. The sense is made clearer by the punctuation I have adopted in ^a 34-^b 4.

6-8. καὶ . . . λευκόν. Aristotle here points out that when we examine the case of whiteness and find what whiteness directly inheres in (viz. surface), we get no confirmation whatever for the view that a thing can be καθ' αὐτό, or directly, in itself; surface and whiteness are quite different things, and definable in quite different terms.

9. κατ' οὐδένα τῶν διορισμῶν, i.e. of the senses of ἐν enumerated in ^a 15-24.

16-21. κατὰ μὲν οὖν τὸ εἶναι . . . οἶνος. Aristotle proves two different things about container and contained. (1) They cannot be one in essence; to be a container and to be contained are clearly quite differently definable. But when to be an A and to be a B are quite different; it sometimes happens that a particular A can serve as a B to itself, as when a physician becomes his own patient. Then A and B are the same κατὰ συμβεβηκός though not κατὰ τὸ εἶναι. But (2) container and contained cannot be even thus related. For the relation of container and contained involves not only a notional but a factual difference between the two, so that if that which contains were in itself, there would be two bodies occupying the same place.

Since the clause beginning ἀλλὰ μὴν οὐδέ is in opposition to κατὰ μὲν τὸ εἶναι ὅτι ἕτερον, it ought to run ἀλλὰ μὴν οὐδὲ κατὰ συμβεβηκὸς ἐνδέχεται τὸ αὐτὸ εἶναι. Its actual form is dictated by a reminiscence of εἴπερ ἐνδέχεται αὐτό τι ἐν αὐτῷ εἶναι ^b 12, so that it would read in full ἀλλὰ μὴν οὐδὲ κατὰ συμβεβηκὸς ἐνδέχεται αὐτό τι ἐν αὐτῷ εἶναι. The sense is substantially the same.

19-21. αὐτός . . . οἶνος, 'for (a) the jar will be in itself (if we make the absurd assumption that that whose nature is to contain can be in itself), and (b) that which it is its nature to contain, e.g. wine if it is its nature to contain wine, will also be in it (the jar).'

22-7. δ . . . ἰέναι. Aristotle reverts to Zeno's problem mentioned in 209^a 23-5. The reading εἰ τι (^b 23) is (with ὅτι) better grammar, and gives a better argument, than Bekker's ἐν τίνι. It is also read by the Greek commentators. Zeno, in accordance with the thoroughgoing materialism of his school, said 'that which exists must be in something, i.e. in some place. Therefore if a place exists, it must be in another place, and so *ad infinitum*. But this

infinite series does not exist. Therefore there is no such thing as place.' Aristotle answers: 'Grant that that which is must be in something. Yet it need not be in a place; there are, as we have seen (^a 15-24) other senses of "in". It may be in something as health is in warm living tissues as a state embodied in them, or as warmth itself may be in a body as a concomitant attribute. No infinite series is involved. If the place of a body were in another place just as the body is in the first place, an infinite series would result. But if the first place is in something else in a different sense of "in", an infinite series is not involved.'

30. τοῦ ἔνοντος, 'of the thing which is in a place'.

CHAPTER 4

211^a 3-4. πρὸς δὲ τοῦτοις . . . κάτω. Simplicius asks why the other directions, right and left, before and behind, are not mentioned as well as up and down, and answers correctly that the latter alone are differentiae of place considered as receptive of natural bodies. Aristotle tries, no doubt, (cf. 208^b 13-14 n.) to find a cosmic significance for the other four directions, but essentially they relate to the parts of animal bodies and the directions of the movement of animals. Hence 'up' and 'down' alone find a definition in Aristotle's final account of place (212^a 21-9).

7-11. δεῖ . . . φανερόν. The construction is confused. The last two clauses are (as τε ^a 8 shows) dependent on ὥστε, but instead of using the infinitive, as in the first ὥστε clause, Aristotle reverts to the indicative, which he has used with ὅπως ^b 7. The ὅπως clause is itself interrogative, but merging into finality as often with verbs like σκέπτεσθαι, and the 'final' element in the ὅπως clause leads to the confusion in the two last ὥστε clauses.

13-14. διὰ γὰρ τοῦτο . . . κινήσει, 'indeed, the chief reason why we think of even the heavens as being in place is that they are always in movement'. But our reasoning is inaccurate, because their movement, being rotation, does not involve their being in place, and in fact they are not so (212^a 31-^b 11).

18. ἐνεργεία. The point of this is seen when we come to ἐνδεχόμενον ^a 19. Of the things that are *actually* moving *per accidens* some are *capable* of moving *per se*.

26. τὸ ἔσχατον αὐτοῦ, the inner surface of the air.

27-9. εἰ . . . ἔστιν. Here Aristotle uses, to aid him in discussing τόπος, the third of the ἔνδοξα of 210^b 32-211^a 6, viz. τὸν πρῶτον τόπον μήτ' ἐλάττω μήτε μείζω εἶναι.

32-3. ὁ . . . ἴσον. This is added to show that the account just given of the place of a thing agrees with the ἔνδοξα stated in ^a 1-2.

^b1-5. ἔτι . . . κἀδῶ. These words were read by Philoponus (546. 20), Simplicius (570. 28), and Themistius (112. 22). According to Simplicius, Alexander condemned them as a dittograph of ^a29-36, and Aspasius said nothing about them in his commentary. Philoponus and Simplicius are inclined to defend them, as adding something new by giving *examples* of the distinction. They may well be by Aristotle himself, but if so they must belong to an alternative version; they are too much of a repetition of ^a29-36 to have been meant to follow them. E furnishes some evidence of the intrusiveness of ^b1-5, for it has the words ἐν γὰρ τῷ αὐτῷ . . . ἦτρον ^a33-^b1 both before and after ἔτι . . . κἀδῶ, as if the scribe were not sure where the latter could best be fitted in.

In ^b3 the sense requires the insertion of ὡς ἐν τόπῳ before οἶον. Bekker's κατά in ^b4 is apparently a mere slip.

2. ἡ ὄψις here means that part of the eye which is the precise organ of sight, i.e. according to Aristotle's view the κόρη or pupil.

10. τὰ τρία, i.e. any of the three first named. The first two views have been already discussed and rejected in 209^a 31-210^a 9, but Aristotle adds a brief refutation here; he argues against the identification with form in ^b12-14, against the identification with matter in ^b36-212^a 2. He shows that the former view comes very near to the truth; it errs merely by identifying place with the outer boundary of the contained, when it should have identified it with the inner boundary of the container, which is spatially coincident with but in definition distinct from the outer boundary of the contained.

19. ἀπτεσθαι, to touch, i.e. to fit, the container.

19-21. εἰ . . . τόποι. The MSS., Philoponus, and Simplicius' lemma, have εἰ δ' ἦν τι τὸ (τὸ om. PS) διάστημα τὸ (τὸ om. E) πεφυκὸς καὶ (καὶ om. J) μένον ἐν τῷ αὐτῷ (αὐτῷ τόπῳ GIJ) ἀπειροὶ ἂν ἦσαν τόποι. T. 116. 12 has εἰ ἦν τι διάστημα καθ' αὐτὸ πεφυκὸς εἶναι καὶ μένειν ἐν ἑαυτῷ, ἀπειροὶ ἂν ἦσαν οἱ τόποι. Diels supports the MS. reading, interpreting τὸ πεφυκὸς as τὸ φύσει ὄν. This, however, is not in accordance with Aristotle's usage. We are not bound to assume that Themistius had before him the words which he himself uses. His ἐν ἑαυτῷ is a mistaken paraphrase which he was led into by punctuating (as the editors have done) after instead of before ἐν τῷ αὐτῷ. The comma must come before these words, for the absurd consequence to which Aristotle drives this view is not that there is an infinity of places, but that there is an infinity of coincident places (cf. ^b24 πολλοὶ τόποι ἅμα ἔσονται). But Themistius' καθ' αὐτὸ πεφυκὸς εἶναι (as Laas pointed out) gives the right sense (cf. 216^a 24), and I can think of nothing that is more likely to have been what Aristotle wrote. Simplicius' paraphrase διαστήματός τις φύσις ὑπο-

μένοντος καθ' αὐτὸ καὶ μὴ ἐν σώματι ὄντος (574. 23) may point to the same reading.

With the phrase καθ' αὐτὸ πεφυκὸς εἶναι καὶ μένον may be compared 214^b 26 κεχωρισμένῳ τόπῳ καὶ ὑπομένοντι.

21-3. μεθισταμένου . . . ἀγγείῳ. When water and air are replacing each other in a process of ἀντιμετάστασις or ἀντιπερίστασις (cf. 208^b 2), each of their parts will do, within the whole made up of the water and the air, what the water does in the vessel, in the case considered above (^b14-16); i.e., on the view which Aristotle is combating, each part will leave an empty self-subsistent interval behind it when it changes its place. Thus within the whole self-subsistent interval which is supposed to extend from wall to wall of the containing vessel, there will be (since water or air is divisible into parts *ad infinitum*) an infinite number of self-subsistent intervals, one inside another like the boxes in a nest of boxes. And each of them will partly coincide with all those that are inside itself, so that there will be (this is the first paradoxical conclusion to which Aristotle drives the opposing view) an infinite number of self-subsistent entities ἐν τῷ αὐτῷ.

23. ἅμα . . . μεταβάλλον. This is the second paradoxical consequence, that when a container moves, the self-subsistent interval which, on the view in question, it has inside it, will be undergoing a change, i.e. will be moving to occupy another interval. Not only will things change their place, but places will change their place.

It is necessary, I think, to suppose that the situation here contemplated is not that in which certain contents move out of a certain container (for then, on the view in question, the διάστημα remains behind—μένον ^b 20—and does not move to a new place), but that in which the container itself moves, carrying with it the διάστημα inside it. Movement of the container (as well as the independent movement of the contents) is referred to plainly in the next sentence.

24-5. ὅστ' . . . ἔσονται. Here Aristotle restates the two absurd consequences, in the reverse order.

25-9. οὐκ . . . οὐρανοῦ. Aristotle now points out that the facts of the case, when properly interpreted, do not involve the second of these consequences. 'The place of a part, i.e. the place in which it moves, when the vessel is removed as a whole, is not different but the same'. The meaning one is at first inclined to expect is 'the place of the part, into which it is moved, is not different'. The MSS. and the lemmata of P. 554. 15 and S. 577. 9 read κινεῖται in ^b 26, but all three commentators interpret as if they read γίνεται (T. 117. 8, P. 554. 24, S. 576. 8). If this be the general sense, we must suppose either that ἐν is used to express motion to and subsequent rest in

a place (L. and S. s.v., A.I. 8), or that γίνεται has been corrupted into κινείται. But the former hypothesis does not seem consistent with Aristotle's carefulness of expression in such matters, and the corruption is not very probable. The words can be interpreted in a different way, in which ἐν ᾧ κινείται is seen to be strictly correct. The meaning may be expanded as follows: 'The view that the place of a thing is a self-subsistent interval leads to the conclusion that one place moves into and acquires another place. But in fact, when we consider an ἀντιπερίστας going on in a vessel which is also moved as a whole, while the remote or indirect place *from* which the contents are moved (i.e. the earlier proper place of the vessel) is different from that *to* which they are moved (ἐν ᾧ γίνονται τόπων, ^b 28, i.e. the later proper place of the vessel), the proper place of the contents, *in* which they are moved, is self-identical (being the inner surface of the vessel itself).'

It would also be possible to take ἐν ᾧ κινείται (as Prof. Taylor does, in his *Commentary on Plato's Timaeus*, 673) to mean 'while it moves', but this is made rather improbable by the following words ἐν ᾧ γὰρ ἔστιν, ἀντιμεθίσταται ὁ ἀήρ κτλ.

27. ἢ τὰ μέρη τοῦ ὕδατος, i.e. 'or the parts of the water (when it is not a case of water and air replacing one another but merely a case of ἀντιπερίστας (i.e. of rotation) of the water in a vessel)'.
 28-9. ὅς . . . οὐρανοῦ. It is not easy to see the precise point of this addition. It seems, however, to be meant to distinguish that ἐν ᾧ the mutual replacement of the water and air takes place, which is really (in the case supposed) a moving vessel, from that ἐν ᾧ they come to be, which is a genuine place or region, one division of the whole extension of the universe. The difference between the two kinds of ἐν ᾧ is brought out more clearly in 212^a 14-16.

29-36. καὶ ἡ ἄλλη . . . ὕδωρ. Aristotle has already said that it is the fact of κίνησις κατὰ τόπον that brings to light the necessity of recognizing the existence of place (208^b 1-8, 211^a 12-14). In accordance with this he now says that it is possible to fail to recognize place as something distinct from matter, if we consider the case of a body that is at rest and has not been detached from its surroundings but remains in continuous contact with them, i.e. an instance not of locomotion but of change of substantial character, as when air becomes water (cf. 210^a 9). It is the presence of a quality like whiteness in that which was black that leads us to recognize the existence of matter; and it is a similar phenomenon that leads us to recognize the existence of place; and it might be thought that it is the same thing that is being recognized in both cases. But it is not precisely the *same* fact that leads to the recognition of matter and of place. What leads to the one is the fact that *what* was air

is now water; what leads to the other is the fact that *where* there was air there is now water.

συνεχεῖ must, I think, be interpreted as meaning not strictly 'continuous' (which for Aristotle implies substantial unity), but 'in unbroken contact'.

212^a 1. ὥσπερ . . . πρότερον, 209^b 23, 31.

6-6 a. καθ' ὃ . . . περιεχομένῳ. These words, omitted by all Bekker's MSS., are preserved in the Arabo-Latin translation, in T. 118. 8, and in S. 580. 3, 582. 30, 584. 20, and paraphrased in P. 567. 5. They are clearly presupposed by the next words λέγω δὲ τὸ περιεχόμενον κτλ. They are found in the second and third Basel editions of Aristotle's works (1539, 1550), but not in the first.

8. παρεμφαίνεσθαι means 'to appear alongside of something else' so as to interfere with it and produce confusion, as in *De An.* 429^a 20 παρεμφαινόμενον κωλύει τὸ ἀλλότριον καὶ ἀντιφράττει.

13-14. φαίνεται . . . (ὄν), 'for not only do the inner boundaries of the vessel seem to be the place of the contents, but also (when the vessel is not full) what intervenes between the contents and the vessel, what intervenes being taken to be a void, instead of air, which it is'.

14-15. ἔστι . . . ἀμετακίνητον. This appears to have no close logical connexion with what precedes. The whole section ^a 7-14 is an interlude in the exposition of the nature of place, in which Aristotle pauses to comment on the reasons that have led to erroneous views. The mention, in this interlude (^a 13), of the vessel brings him back to business and leads him to enunciate the difference between place and vessel, which had been rather overlooked in the preceding exposition.

18. τῷ περιέχοντι, the part of the river that immediately surrounds the boat, as distinct from ὁ πᾶς ποταμός (^a 19).

βούλεται. For the idiom cf. many passages cited in Bonitz, *Index*, 140^b 37-55.

19. ὁ πᾶς μᾶλλον ποταμὸς τόπος, 'the whole river-bed is more truly a place than the constantly changing particles of water that fill it from time to time'.

20-1. ὥστε . . . τόπος, the place of a thing is the nearest unmoved boundary of a container, the first you would come to in working outwards from the thing. The requirement, the significance of which has dawned on Aristotle in the course of the discussion, that the place of a thing must be distinguished from its containing vessel, as unmoved from moved, comes into conflict with the requirement that the place of a body must be the limit of the containing body at which it is in contact with the contained body (^a 6). This latter requirement is also implied in the assumption that a thing has an

ἴδιος or πρῶτος τόπος which contains nothing beyond it (209^a 31^{-b} 2); cf. also 212^a 29-30. The two requirements are in conflict, because you may have a body A in a moving body B. There is then no body which both is unmoved and immediately surrounds A.

From Aristotle's silence on the point, it seems as if he had not noticed the difficulty.

21-8. καὶ διὰ τοῦτο . . . ἔσχατον. Aristotle's object in this section is to show that his account of place agrees with one of the ἔνδοξα with which he started (210^b 32-211^a 6), viz. that place essentially bifurcates into up and down (211^a 3-6). This, he now remarks, arises from the fact that the inner surface of the rotating celestial system and the centre of the universe are the first (and indeed only) permanently unmoved limits between which any given body is placed.

21. τοῦ οὐρανοῦ, here, means 'of the universe'.

24. τοῦ δὲ κύκλω, sc. φερομένου σώματος, seems to be the reading implied by Simplicius' paraphrase τοῦ κυκλοφορητικοῦ σώματος (585.14), and gives a rather better sense than τοῦ δὲ κύκλου, which would be a natural 'emendation' for a copyist to make. Simplicius' *corollarium de loco* has κύκλω in 603. 27, κύκλου in 607. 13.

ἡσάυτως ἔχον μένει, i.e. does not as a whole change its place.

28-30. καὶ διὰ τοῦτο . . . πέρατα. Here Aristotle notes the agreement of his account with two others of the ἔνδοξα (210^b 34-211^a 1, 211^a 1-2); cf. 212^a 21-8 n. The place of a thing contains it; and the outer surface of a body coincides with its place, i.e. with the inner surface of its container, so that body and place have the same size. This is unfortunately incompatible with the definition of place in ^a 20-1; cf. n. *ad loc.*

^a 21-30 is thus entirely occupied with pointing out the agreement of Aristotle's account with ἔνδοξα, and there is no need to treat ^a 29-30 (ἔτι . . . πέρατα) as a 'stray', as Prof. Cornford does.

28. ἐπίπεδον here means not 'plane' but 'surface'. Aristotle usually expresses by this ἐπιφάνεια. But the distinction is not always clearly drawn. Cf., for example, *Met.* 1076^b 5-36, where ἐπίπεδον corresponds not to εἰθεία γραμμὴ but to γραμμὴ, and includes curved section-faces of a solid as γραμμὴ includes curved section-edges of a plane.

CHAPTER 5

212^a 32^{-b} 3. διὸ . . . μάνωσιν. The stress in the previous sentence is, as usual, on the δέ-clause. τοιοῦτο therefore can naturally mean 'such as to have no container'. The supposition that a volume of water could hold together without a container no doubt seems to Aristotle an extravagant one, and the point of καὶ is to suggest its extravagance.

διὸ . . . οὐ ^a 32-4 in itself merely states what would follow if this

extravagant hypothesis were made. But in *ὡς . . . μάνωσιν* ^a 35-^b 3 Aristotle is stating his own view about the actual universe. The transition is made possible by the fact that the supposition that water may be contained by nothing amounts to supposing that water may be the whole physical universe. Though *τοιούτου* is grammatically the predicate of the clause it occurs in, that which it stands for, viz. the uncontained, i.e. the whole universe, becomes the subject of Aristotle's thought, and he can thus proceed to make statements about the actual universe. The transition is aided by *τὸ πᾶν*, which can mean either 'the whole of the water' or 'the universe'.

35-^b 1. *ὡς . . . τόπος*. The reasoning is not very easy to follow, but is probably as follows: the universe does not change its place as a whole, since, having no container, it has no place; but it can and does move in a circle, because such movement is really the movement of its parts, and the circle, i.e. the outer surface of the celestial system, does serve as a container, i.e. as a place, for all the parts of the system.

^b 2. *κύκλω . . . κάτω*. The MSS. have *κύκλω δ' ἔνια τὰ δὲ καὶ ἄνω καὶ κάτω* (οἱ κάτω καὶ ἄνω). Themistius' paraphrase has *τὰ μὲν γὰρ αὐτῶν* (sc. *τῶν μορίων*) *κύκλω κινεῖται, τὰ δὲ ἄνω καὶ κάτω* (119. 24). Philoponus has *κύκλω δὲ ἔνια' ἔνια δὲ ἄνω καὶ κάτω* (601. 11). Simplicius' paraphrase has *κύκλω δὲ μόνον. τῶν δὲ μορίων αὐτοῦ τὰ μὲν κύκλω . . . τὰ δὲ καὶ ἄνω καὶ κάτω* (οἱ κάτω καὶ ἄνω) (588. 38, cf. 590. 34). Later he has *κύκλω δέ' ἔνια δὲ καὶ κάτω καὶ ἄνω* (589. 29), and later still says *τινὲς δ' οὐ γράφουσιν ἔνια, ἀλλὰ τὰ δὲ ἄνω καὶ κάτω*. On the whole it seems as if he read *κύκλω δέ' ἔνια δὲ καὶ κάτω καὶ ἄνω*. With this reading, *κύκλω δέ'* refers to the whole, and this produces a repetition of *κύκλω δὲ κινεῖται* ^a 35. The reading of the MSS. or that of Philoponus (which is identical in sense) is therefore preferable. The doctrine stated then is that the universe as a whole has no movement of translation, but only rotation, and that some parts of it (i.e. the *πρῶτος οὐρανός* and the spheres that carry round the planets—for which cf. *Met.* A. 8) are in circular motion, while others (i.e. the four elements, which suffer condensation and rarefaction) also move up or down, towards or away from the circumference of the universe, as they are rarefied or condensed.

3. *ὥσπερ δ' ἐλέχθη*, 211^a 17-^b 1. The parts of a continuous whole are in place only potentially; detached bodies are in place actually.

7-II. *καὶ τὰ μὲν καθ' αὐτά* (sc. *ἐν τόπῳ ἐστίν*) . . . *τὰ δὲ κατὰ συμβεβηκός*. For the distinction cf. 211^a 17-23. It is for different reasons that *ἡ ψυχή* and *ὁ οὐρανός* are said to be *per accidens* in place; the soul because the body, in which it resides, is in place, the universe because its parts are in place. The case of the soul is analogous to that of whiteness or knowledge (211^a 22).

The two corresponding kinds of *κατὰ συμβεβηκὸς κινῶντα καὶ κινούμενα* are distinguished in 254^b 8-10, *κατὰ συμβεβηκὸς οἶον ὅσα τε τῷ ὑπάρχειν τοῖς κινουσιν ἢ κινουμένοις καὶ τὰ κατὰ μόριον.*

8. ὡσπερ εἴρηται, ^a 32.

10-11. ἐφ' ᾧ . . . ἐστίν. The evidence of the MSS. and commentators is rather in favour of ἐφ' ᾧ κινεῖται. But the case must be the same as the case with ἐπί in ^b 13, and there the dative is clearly right. The direction in which the οὐρανός moves, i.e. the circle (^a 35-^b 1) or rather the spherical surface of the rotating οὐρανός, contains all the parts of the universe and is thus their place.

14. τὸ ἄνω, sc. σῶμα, the heavenly sphere.

18. ὁ τόπος, the place of τὰ ἐν οὐρανῷ.

19. τὸ ἔσχατον, the inner surface.

πέρας ἡρεμοῦν. There is no trace of these words in T. 121. 18, nor in S. 594. 12, 602. 3, 607. 4. They occur in P. 604. 10, 15, but on the whole seem likely to be a later addition.

21. οὗτος . . . οὐρανῷ. αἰθήρ is here used as synonymous with πῦρ. Anaxagoras used the word in this sense (*De Caelo* 302^b 4, *Meteor.* 339^b 21, 369^b 14), and Aristotle blames him for doing so (*De Caelo* 270^b 24). He never uses it himself as the name of the fifth element, of which the heavenly bodies are composed, though it later came to be used in this sense (e.g. *De Mundo* 392^a 5).

22-213^a 4. φανερόν . . . τρόπον. Aristotle claims that the account he has given of place solves all the problems raised in 209^a 2-30.

23-4. οὔτε . . . τόπον refers to problem 6 (209^a 26-9).

24. οὔτε . . . τόπον refers to problem 2 (209^a 7-13).

25. οὔτε . . . τόπῳ refers to problem 1 (209^a 4-7).

27-9. καὶ ἔστιν . . . σῶμα refers to problem 5 (209^a 23-5).

The third and fourth ἀπορίαι are omitted.

The sixth ἀπορία was that since a body and its place are coextensive, the place must grow when the body grows. Aristotle's answer presumably is that since (on his view) the place of a body is not the extent of it, but the inner boundary of what contains it, when a body grows its container must yield before it, so that its place is changed but does not grow.

The second ἀπορία was that since a body has a place, the surfaces, lines, and points in it must have places; but since a point is indistinguishable from its place, on the same principle the lines, surfaces, and body are indistinguishable from their places. Aristotle's answer presumably is that since the place of a thing is the surface of what contains it, and since there is no surface that contains a point, a point has no place, though a body has.

The first ἀπορία was that place has just the same three dimensions that body has, so that *prima facie* it is a body; but it cannot be

this, since then there would be two bodies coinciding (viz. an ordinary body and its place). Aristotle's answer is that since place is not a body but the boundary of the containing body, the existence of place does not involve the existence of two bodies coinciding. To this he adds (^b 25-7) that in repudiating the view that place is a body we are not driven to suppose that it is an interval in body. What intervenes between the boundaries that constitute the place of a thing is not an interval in body but whatever body happens to be there. ^b 25-7 answers not one of the problems of 209^a 2-30, but a suggestion made in 211^b 7.

The fifth ἀπορία was that of Zeno, that if place is a reality it must be somewhere, so that a place will have a place, and that place will have another, and so *ad infinitum*. Aristotle's answer is that in a sense place is somewhere, but not as in a place but as a limit may be said to be in (an element in) that which it limits; Zeno was wrong in assuming that everything that is must be in place; this is true only of movable body. This answer may be compared with that in 210^b 22-7, that a place may be in something not as in a place, but as health is in warm tissues or as warmth is in a body, i.e. as an element in the constitution of that which it is 'in'.

29-34. καὶ . . . ἀλόγως. To understand this passage we must remember (1) that in Aristotle's cosmology earth is normally concentrated round the centre of the universe, water forms a layer outside earth, air a layer outside water, and fire a layer outside air; (2) that in his system each of these is characterized by two of the πρῶται ἐναντιότητες. Earth is cold and dry, water wet and cold, air hot and wet, fire dry and hot. Thus, working from τὸ ἄνω to the centre of the universe, we have

Fire	{	Dry Hot
Air	{	Hot Wet
Water	{	Wet Cold
Earth	{	Cold Dry

A stone may no doubt be propelled into the region of air, with which it has no common quality; or water into that of fire; or *vice versa*. But the elements that are naturally (μὴ βίαι) successive and in contact are συγγενῆ, have a quality in common. Thus air, in moving to the region between fire and water, is moving towards two things each of which is in one respect συγγενές with it (εὐλόγως, i.e. as it might be expected to do); and similarly water, in moving to the region between air and earth. But while air, for instance, shares

one quality with fire and one with water, it differs from each in one quality, so that it never thoroughly coalesces with it (*συμπεφυκότα*)—in which case it would cease to be capable of acting on, or being acted on by, it—but retains both these capacities.

This section is designed not to answer any of the problems of 209^a 2–30, but to show that Aristotle's account of place agrees with the *ἐνδοξον* stated in 211^a 4–6, which was one of the *ὑποκείμενα* (ib. 6) with which any theory must agree if it is to be true.

34–5. καὶ . . . ἐστίν. The reading of Bekker is καὶ γὰρ τὸ μέρος τόδε ἐν ὄλῳ τῷ τόπῳ κτλ. Here it is to be noted that the words μέρος and ὄλῳ are both inappropriate. The object plainly is to compare the relation between a thing and its place to that between a part and its whole; 'part' and 'whole' should therefore not be present in the description of the thing compared, but only in the description of that to which it is compared. The passage is made right by adopting the reading of P. 600. 8, 605. 13. 'Everything naturally remains in its proper place; for so does a part in its whole, and that which is in a place is to its place as a detached part is to its whole.' It is impossible to be sure what Themistius and Simplicius read.

A comparison, and a distinction, between the relations of thing to place and of part to whole has already occurred in 211^a 29–^b 1. The word *διαμετόν* in 212^b 35 calls attention to the fact that what the relation of thing to place is most like is that of a detached part to its whole, not that of a part of a continuous whole to its whole.

35–213^a 1. οἶον . . . ἀέρος. The tendency of bodies to move towards and remain in their proper places is compared here to the tendency of detached portions of water or air to rejoin and remain together. The reference is to what happens when, for instance, one dips one's hand into water and thus detaches part of the water; the separated parts rejoin and stay together (P. 600. 10).

213^a 1–4. οὕτω . . . τρόπον. A new point is now added. Not only is there a general resemblance between the relation of thing to place and that of part to whole, but a thing in its proper place, e.g. water below air, is in a sense a part of that whose inner boundary forms its place, since it is relatively unqualified matter, which by the addition of a certain form is transformed into air. Earth, water, air, fire form a series in which each member is more like the celestial element in respect of tenuity, as well as nearer to it in position, than that which comes before, and is therefore regarded as the *τελείωσις* or *ἐνέργεια* of what comes before.

In the phrase οἶον ὕλη γάρ, τὸ δὲ εἶδος it is to be remarked that τὸ δὲ εἶδος is not strictly correct, since air is rather the *σύνθετον* formed by the addition of a certain form to water, than strictly its form.

3–4. ὁ δ' ἀήρ . . . τρόπον, 'though in another way air is potentially

water'. Water can be formed out of air no less than air out of water, but since the process here is one towards something less perfect, the process, which is both one of *γένεσις* and one of *φθορά*, is more properly regarded as one of *φθορά* or loss of form, than as one of *γένεσις* or acquisition of form.

4-5. διοριστέον . . . ὕστερον, in *De Gen. et Corr.* i. 3.

6-7. εἰ . . . ἄμφω, 'if the same thing is matter and actuality (for water is both).' The sense is improved by omitting ἦ before ἕλη and before ἐντελέχεια, as Philoponus (606. 17) seems to have done.

7-8. ἀλλὰ . . . ἐντελεχεία, 'but is the one—form or rather the formed thing (air)—potentially, and the other—matter (water)—actually.'

9-10. διὸ . . . γίνονται. The relation just stated accounts for water being naturally in contact with air; if they had not the affinity that has been pointed out they would not be even in contact, and if they had more than affinity—if they became actually the same—they would completely coalesce.

CHAPTER 6

213^a 13. καὶ τί ἐστίν. This reading is confirmed by 208^a 28.—In the main, Aristotle denies the existence of the void, and καὶ πῶς ἔστι, καὶ τί ἐστίν may therefore excite suspicion. We may suppose (1) that Aristotle means 'and if it exists, how and what it is.' But (2) remembering that he sums up his results by saying καὶ περὶ μὲν κενοῦ, πῶς ἔστι καὶ πῶς οὐκ ἔστι, διωρίσθω (217^b 27), it is better to suppose that he means 'in what sense there exists something which is what the supporters of a void mistakenly describe as a void, and what is its nature'.

21-2. καὶ . . . δόξας. These common opinions furnish, on Aristotle's usual principle, the test to which the opposing theories are to be brought. It is not quite clear where Aristotle introduces the statement of the κοινὰ δόξαι, but we may conjecture that ^b 30-214^a 16 is the passage referred to.

24. ὄ. The introduction of this word is plainly required by the sense, and is confirmed by T. 123. 3, P. 607. 15, S. 648. 6.

ὥσπερ Ἀναξαγόρας. Aristotle describes Anaxagoras in *De Caelo* 309^a 19 as one of those who deny the existence of a void. Cf. *De Resp.* 470^b 33, ps.-Arist. *Xen.* 976^b 22.

26-7. στρεβλοῦντες . . . ἀήρ, i.e. they strained wine-skins tight by blowing air into them, and then showed the resistance of the air from the fact that the skins could not be squashed flat.

27. καὶ . . . κλεψύδραις. The nature of κλεψύδραι is well discussed by H. Diels in *Antike Technik*,² 192 f., J. U. Powell in *Class. Quart.*

xvii. 172-4, and H. Last, *ib.* xviii. 169-173. It is clear that the κλειψύδρα referred to here, as in the famous fragment of Empedocles, 100. 8-21, in *De Resp.* 473^b 8, and in *Probl.* xvi. 8 (where Anaxagoras is again mentioned) is not the water-clock but the earlier instrument which was actually, as its name implies, a 'water-thief' or 'water-lifter' acting on the siphon principle. In emptying this instrument the air was received in it (ἐναπολαμβάνοντες) by removing the finger from the upper orifice, when the inrush of the air drove the water out at the lower orifices.

27-31. οἱ δὲ ἄνθρωποι . . . εἶναι. The argument here is rather elliptical. It may be expanded as follows: 'But they mean by void an interval in which there is no perceptible body; and thinking that all there is is (perceptible) body, they say that that in which there is absolutely no (perceptible corporeal) thing is void; whence they say that that which is (in fact) full of air is void.' I.e. their citation of vessels with nothing but air in them, as evidence of the existence of a void, is due to mere inadvertence; their theory is to be refuted not by showing that such examples are not in fact examples of void, but by attacking the whole conception of a complete void.

32. οὔτε . . . οὔτε here, after οὐκ, might mean either 'either . . . either' or 'neither . . . neither'; but sense requires the former.

Porphry's reading is an interesting one, but there is no reason to adopt it against all the other evidence.

33. τὸ πᾶν σῶμα here means not 'any particular whole body', but 'the whole bodily universe', for this is what τοῦ παντὸς σώματος means in ^b 1.

34-^b 1. καὶ ἕτεροι . . . φυσιολόγων. Simplicius mentions Metrodorus of Chios, and this is confirmed by *Plac.* i. 3. 17, Theophr. *Phys. Opin.* fr. 8, Clem. *Protr.* 5. 66 (i. 50. 18 St.), Eus. *P.E.* xiv. 19. 8. We know of no *pre-Socratic* who believed in a void, except the Pythagoreans mentioned in 213^b 23.

^b 1-2. ἢ . . . συνεχούς. This is a reference to the Pythagorean notion of a void outside the universe (cf. ^b 22), while the intervening arguments (^b 4-22) were used to support the belief in voids *within* the universe (^a 32-4).

2-3. οὐ . . . ἀπαντῶσιν, a proverbial phrase meaning 'they (the deniers of a void) do not attack the problem by the right method of approach'.

4-22. λέγουσιν . . . κενόν. In *De Gen. et Corr.* Aristotle ascribes the argument from movement (^b 4-14) as well as that from increase (^b 18-20), definitely to Leucippus (325^a 23-32, ^b 4). The argument from compression (^b 15-18) may well have been used by Leucippus, though we have no evidence of this. Gomperz (*Greek Thinkers*, i. 352) thinks we may ascribe the fourth argument (^b 21-2) 'to

Democritus with his marked bias to empiricism', but it is difficult to see that it is more empirical than the others—all alike appeal to experience, and the second to a very special supposed experience—and we have no evidence on the point.

The argument of ^b 4-14 is refuted in 214^a 22-32, that of ^b 15-18 in 214^a 32-^b 1, that of ^b 18-20 in 214^b 1-9, that of ^b 21-2 in 214^b 9-10.

7-12. εἰ . . . ἄνισα. If the same space will hold two bodies, it will on the same principle hold any number, and if you will only divide up a body however large and introduce the parts one by one, you will get them into a space however small; so that if a pint pot could hold three pints, it would follow that it could hold both a pint and a quart. And on the same principle it will hold *any* amounts.

12-14. Μέλισσος . . . ὄντων. Cf. Melissus fr. 7 (7-10), *De Gen. et Corr.* 325^a 2-16.

16-17. οἶον . . . πίθους. This phenomenon is discussed in *Probl.* 938^b 14-24.

17-18. ὡς . . . σώματος, i.e. the Atomists thought that it was by the compression of the wine into its own interstices that the cask was enabled to hold the wine-skins as well as the wine that had previously filled it.

21-2. μαρτύριον . . . κενόν. Gomperz (i. 352) remarks that the Atomists can only have meant that the fact that a vessel with ashes in it will hold *nearly* as much water as when there were no ashes in it, proves the existence of a large amount of vacuum in the ashes. They must surely have noticed that it does not hold *quite* as much water. The problem is discussed in *Probl.* 938^b 24-939^a 9.

22-7. εἶναι . . . αὐτῶν. Stobaeus, *Ecl.* i. 18. 1, after quoting part of this passage, adds ἐν δὲ τῷ περὶ τῆς Πυθαγόρου φιλοσοφίας πρώτῃ γράφει (sc. Aristotle) τὸν μὲν οὐρανὸν εἶναι ἓνα, ἐπεισάγεσθαι δ' ἐκ τοῦ ἀπείρου χρόνον τε καὶ πνοήν ([χρόνον] τήν τ' ἀναπνοήν Diels) καὶ τὸ κενόν, ὃ διορίζει ἐκάστων τὰς χώρας αἰεί.

22-3. εἶναι . . . κενόν. Xuthus (cf. 216^b 26) and Ecphantus (*Plac.* i. 3. 19) seem to have been among the Pythagoreans in question.

23-4. καὶ . . . κενόν. The readings here are somewhat doubtful. G, Pl. (615. 19), Sp. (651. 27), Stobaeus have αὐτῷ; EFIJ and T. (124. 18) have αὐτό. But on this point the requirements of sense and of Aristotle's idiom count for more than the evidence. Again, for πνεύματος W. G. Tennemann suggested πνεῦμα, and Diels πνεύμά τε, which he thinks derives some support from P. 615. 22, S. 651. 27, and the passage of Stobaeus quoted above (note on 213^b 22-7). In E πνεύματος is written over something which may or may not have been πνεύμά τε. But Stobaeus reads πνεύματος in *this* passage, and the passage in the *Physics* need not correspond verbally with that in the *De Pythagoreis* (^b22-7 n.). The sentence seems to me to run

most naturally if we read *αὐτό* and *πνεύματος* and take the meaning to be 'and that it enters into the universe from the infinite breath, the universe being supposed to inbreathe the void as well' sc. as the portions of *πνεῦμα* found in the universe, e.g. in living things. Philoponus' and Simplicius' paraphrases seem to me at least equally compatible with this reading and interpretation.

24-7. δ... αὐτῶν. Simplicius remarks, no doubt rightly, that *διορίζει τὰς φύσεις* cannot refer to the mere separation of physical bodies by void, since in that case *σώματα* would have been the natural word to use. This being so, it is most natural to suppose that the reference is to the Pythagorean localization of different types of thing in different parts of the universe (cf. *Met.* 990^a 22-7), and the suggestion will be that the different kinds of thing are kept apart by void; cf. Stob. (quoted in ^b22-7 n.) *τὸ κενόν, ὃ διορίζει ἐκάστων τὰς χώρας ἀεί*. And since all things were according to the Pythagoreans modelled on numbers, this separation was supposed to be due to the discontinuity of the number series (^b26), to the fact that successive numbers differ by a finite interval. T. 124. 20, P. 610. 17-19 may be right in supposing that *τὸ γὰρ κενὸν διορίζει τὴν φύσιν αὐτῶν* refers also to the discontinuity which the Pythagoreans thought of as existing between the units of each single number (cf. 203^a 10-11 n.).

CHAPTER 7

213^b 31-4. *τούτου... ἐνταῦθα*. The explanation is made confusing (1) by the order of the clauses and (2) by the introduction of the purely concessive clause *πάν δὲ σῶμα ἐν τόπῳ*. Restated, it takes this form: 'People think that while every body is in place, there are places in which there is no body, and call these voids; and then, since they think that all that is is body, they think that where there is no body there is nothing, and hence define the void as a place in which there is nothing'.

214^a 4-6. *ἄτοπον... ἀπτοῦ*. Aristotle here points out the objection to the last named definition of void as 'that in which there is nothing heavy or light' (^a 2-3). Those who omit the word 'place' from the definition let themselves in for the consequence that a *point* is a void, since it is something in which there is nothing heavy or light. But plainly a void must be a *place*, and a place in which there is an intermission of tangible matter.

T. 125. 2-6 and S. 653. 33-654. 7 take the passage so. Cornford points out that two other interpretations are possible: (1) 'for that in which (as in the void) there is extension of tangible body (i.e. room, whether empty or full, for an extended body) must be a place

(and a point is not a place)'; (2) 'for it (the point, if it is a void) must be a place in which there is extension of tangible body (but a point is not that)'. I.e. the subject of εἶναι may be (a) τὸ κενόν, (b) (τοῦτο) ἐν ᾧ σώματος ἔστι διάστημα ἀποῦ, or (c) τὴν στιγμὴν. The first of the three interpretations seems on the whole the best.

9-11. διὸ . . . οὐ. Aristotle objects to the definition of void just given (^a 7): 'what would you say of an expanse, empty of tangible matter, that had in it colour or sound? If you say it is a void, you will have to explain how a void can have a sensible quality. If you say it is not a void, you will be admitting that something which is not full of tangible matter is yet not a void, and thus contradicting your definition. You must therefore amend your definition by recognizing that 'void' is a privation, not a bare negation, i.e. by saying that void is that which is empty of tangible body though it could be occupied by it'.

11-12. ἄλλον . . . σωματικῆ. This second definition differs from the first by omitting the qualification 'tangible' or 'heavy or light'. This is a more scientific definition, since if there is matter in a certain expanse, the fact that the matter is not tangible is not a good reason for calling the expanse a void.

13-14. οὔπερ . . . καλῶς. The sense is obviously improved by making οὔπερ . . . τοῦτο parenthetical and removing the comma placed by the editors after τόπον. The reference in οὔπερ . . . τοῦτο is to 211^b 7, 29-212^a 2. Plato is included (209^b 11-16).

Aristotle's statement that certain thinkers think of the void as the matter of body is unhistorical, since no previous thinker had the conception of matter as Aristotle conceives of it. A reference to 211^b 29-212^a 2 will show the reasons that led him to find in the notion of void or place affinities with his own notion of matter, and at the same time notable discrepancies from it. The *former* are summed up in the comparison 'just as matter is something which (e.g.) is white and was black, so place is that where water is and air was' (211^b 31-6). I.e., place, void, and matter have this in common, that each of them has in it a number of diverse potentialities. The *latter* are summed up in the dictum (211^b 36-212^a 2): 'matter is inseparable from, and does not contain, the thing whose matter it is; place is separable from, and does contain, that whose place it is.'

16. περὶ τόπου διώρισται, iv. 1-5.

17. εἰ ἔστιν. The sense is much improved by placing commas before and after these words. They then mean 'if there is such a thing'.

18. πῶς ἔστι, as the inner limit of what contains a thing. πῶς οὐκ ἔστιν, as a self-subsistent interval; in other words, as a τόπος ἐστερημένος σώματος. οὕτω, as a place deprived of body (^a 17).

19. οὔτε . . . ἀχώριστον. Simplicius gives alternative explanations. (1) κενὸν κεχωρισμένον = a self-subsistent void, some of which, viz. that beyond the material universe, never has body in it, while some—that which is enclosed in tenuous bodies and that which breaks the continuity of bodies—sometimes has no body in it: κενὸν ἀχώριστον = a self-subsistent interval always in fact filled with body. (2) κενὸν κεχωρισμένον = void outside the material universe: κενὸν ἀχώριστον = void contained in bodies. Now in 213^a 32 χωριστόν is applied to a supposed interval breaking the continuity of bodies, i.e. to what on Simplicius' second interpretation is a κενὸν ἀχώριστον. His first interpretation is therefore probably the true one.

22^b-10. ἦκει . . . τέφρας. Aristotle here takes up and briefly refutes the arguments for void mentioned in 213^b 4-22. 214^a 22-32 answers to 213^b 4-14, ^a 32^b 1 to 213^b 15-18, ^b 1-9 to 213^b 18-20, ^b 9-10 to 213^b 21-2.

22. ἦκει. For the idiomatic use = 'is there to aid them', cf. *De Caelo* 279^a 4 πάλιν ὁ αὐτὸς ἤξει λόγος, and ib. 304^a 23.

27. πάσης κινήσεως, sc. αἴτιον (a necessary condition) εἶναι τὸ κενόν (^a 24).

δι' ὃ καὶ Μέλισσον ἔλαθεν. The traditional reading διὸ καὶ Μέλισσον ἔλαθεν gives no good sense; the alteration of διὸ to δι' ὃ gives the good sense 'for a reason which escaped Melissus', with the implication that if he had noticed it he could not have argued that since there is no void there cannot be change (213^b 12-14). καὶ is best rendered 'incidentally', 'by the way'.

28-9. ἀλλὰ . . . κίνησιν, a *constructio ad sensum*. Sc. ἄνευ κενοῦ ἀδύνατον εἶναι.

29-30. ἅμα . . . ἀλλήλοις. This is what Aristotle calls ἀντιπερίστασις or ἀντιμετάστασις. Cf. 208^b 2, 215^a 15, 267^a 16.

^b 1-9. καὶ . . . κενοῦ. Aristotle points out that (1) in claiming that a void affords the only possible explanation of increase of size, the Atomists are overlooking the fact that increase may take place not only by assimilation, which is the only kind to which their explanation addresses itself, but by expansion (^b 1-3); and that (2) their explanation of assimilation gets in its own way by making the fact more inexplicable than ever (^b 3-9).

In *De Gen. et Corr.* 321^a 9-29 Aristotle distinguishes between αὔξησης and such a change as the production of air out of water. While similar in various respects, such expansion differs from αὔξησης in that (1) there is no accession of fresh material, (2) there is no perceptible substance persisting through the change. It is thus a case not of αὔξησης but of φθορά and γένεσις. Cf. Prof. Joachim *ad loc.* The passage in *De Gen. et Corr.* presents a more mature view than the present passing reference to expansion.

5-9. ἡ γὰρ . . . κενού. The Atomists claimed that the void enabled them to explain growth without introducing the paradox of there being two things in the same place—the growing body and the food that nourishes it (213^b 18-20). Aristotle refutes them by stating four alternatives, one or other of which they must accept, and none of which they *can* accept. (1) Not every part of the growing body grows. This will not do, for it is matter (Aristotle assumes) of common knowledge that a growing body grows proportionally in all its parts (*De Gen. et Corr.* 321^a 2-3). Or (2) every part of the growing body grows, but what nourishes it is not body. This will not do, since both experience and the Atomistic theory imply that what nourishes is something bodily. Or (3) every part of the growing thing grows, and it is nourished by something bodily, and *some* parts of the growing thing are body. But then the bodily parts of it and the body they are nourished by are in the same place, and the Atomists fall into the same difficulty that they accuse us of falling into (213^b 18-20). I.e. they are calling on us to solve a difficulty which beats both us and them, and are certainly not proving the existence of void. Or (4) every part of the growing thing grows, and is nourished by something bodily, and all of its own parts are voids. This no doubt escapes the difficulty of 'two bodies in one place', but at what a price!

A similar argument occurs in *De Gen. et Corr.* 321^a 5-9, in the chapter in which Aristotle's own account, by which he claims to avoid all these difficulties, is found.

6-7. ἀπορίαν . . . λύειν. The Greek commentators take this to mean 'they are trying to solve an ἀπορία which is common'. But ἀξιοῦσιν means not 'try' but 'demand', i.e. demand of us (cf. ὑμᾶς ἀξιοῦμεν ἐμμένειν *et sim.*, *Rhet.* 1377^b 9, ^a 25, 29, 1384^b 33).

9. διὰ κενού, 'through the presence of void in itself'.

9-10. ὁ δ' αὐτὸς λόγος . . . τέφρας. The alleged fact here was (213^b 21-2) that if you put ashes into a vessel, the vessel will hold as much water as it did when there were no ashes there. The Atomists' explanation is that the water occupies voids in the ashes; and Aristotle claims that this lands them in the same fourfold dilemma as their account of growth.

CHAPTER 8

214^b 16-17. δοκεῖ . . . τόπον. Aristotle's argument here is not convincing. The supporters of the void put it forward as an αἴτιον (necessary condition) of locomotion (213^b 4). He replies that it cannot be an αἴτιον (determining cause) of locomotion in any particular

direction. The ambiguity in the meaning of αἴτιον makes the argument worthless.

18. ὅταν ἢ κενόν may be taken either with what precedes or with what follows. (1) 'If when there is a void there is something like a place deprived of body'; (2) 'If void is something like a place deprived of body, then, when there is a void', &c.

ποῦ = ποῖ. L. and S. describe this use as characteristic only of late writers, but it is not uncommon in Aristotle. Cf. οὐ^b 33, οὐδαμοῦ 215^a 13.

19. οὐ . . . ἅπαν. It is easy to see that Aristotle silently adds 'nor can it move into any part of the void, since any part of the void is exactly like any other'.

25-7. οὐ . . . ὅλφ. S. 665. 33 seems to be right in interpreting οὐ γὰρ συμβαίνει as οὐ κατὰ λόγον ἀπαντᾶ, 'things do not turn out right for those who believe in a separate void'. If a whole body be supposed to be in a separately existing place or void, then on the same principle they must say that each part of the body is in a corresponding part of the place or void. But in fact we say that an undetached part of a body is not in a place but in the whole body (cf. 211^a 29-^b 1).

26. σῶμά τι. The sense requires us to read this instead of Bekker's σώματι.

28. τόπος, sc. κευχωρισμένος, having an independent existence.

31-2. ὡσπερ . . . γῆν ἠρεμεῖν is an allusion to such passages about the earth as Pl. *Phaedo* 109 a ἰσορροπον γὰρ πρᾶγμα, ὁμοίου τινός ἐν μέσῳ τεθέν, οὐχ ἔξει μᾶλλον οὐδ' ἦττον οὐδαμόσε κλιθῆναι, ὁμοίως δ' ἔχον ἀκλινές μενεῖ, *Tim.* 62 d εἰ γάρ τι καὶ στερεόν εἶη κατὰ μέσον τοῦ παντός ἰσοπαλές, εἰς οὐδὲν ἂν ποτε τῶν ἐσχάτων ἐνεχθείη διὰ τὴν πάντῃ ὁμοιότητα αὐτῶν. Anaximander seems to have said very much the same about the earth (*De Caelo* 295^b 11, Hippol. *Ref.* i. 6. 3). In view of the language of these passages, διὰ τὸ ὁμοιον seems to mean not 'for a like reason' but 'because of the uniformity of the medium'.

33. οὐ = οἶ. Cf. ^b 18 n.

215^a 1. ἔπειθ'. The first reason why a void makes movement impossible was given in 214^b 31-215^a 1; the second begins here. Simplicius not only reads ἔπειτα in his lemma (667. 6), but expressly describes the argument as δεύτερος λόγος (ib. 8). The variant reading πρῶτον μὲν οὖν may have arisen from the fact that Simplicius, in describing this argument, divides it into parts, and says καὶ πρῶτον μὲν τίθησιν ὅτι πᾶσα κίνησις ἢ κατὰ φύσιν ἐστὶν ἢ βίαιος (ib. 11). Or it may be due to the fact that (according to Alexander *apud* S. 667. 3-5) in some MSS. συμβαίνει . . . διαφορὰν 214^b 28-215^a 1 was omitted. The variant readings are unintelligently combined in E.

10-11. τοῦ κενοῦ (τὸ γὰρ κενόν . . . εἶναι), which is as well attested as Bekker's τοῦ μὴ ὄντος (τὸ δὲ κενόν . . . εἶναι), gives a better sense

since it does not involve a distinction between τὸ μηδέν and τὸ μὴ ὄν, a distinction which Aristotle is not likely to have meant to draw.

12. ὥστε . . . διάφορα. Bekker's reading ὥστ' ἔσται τὰ φύσει (sc. κινούμενα) διάφορα does not give the right sense; it is not a distinction between the things that move by nature, but a distinction between the directions they move to, that is proved, and that tends to refute belief in the void. This sense is given by ὥστ' ἔσται φύσει διάφορα (sc. τὸ ἄνω καὶ τὸ κάτω, ^a 9).

13. οὐδαμοῦ, cf. 214^b 18 n.

15. δι' ἀντιπερίστασις, cf. ἀντιμετάστασις 208^b 2. ὥσπερ ἐνιοί φασι is probably a reference to Pl. *Tim.* 59 a πάλιν δ' ἐκπίπτοντος αὐτόθεν τοῦ πυρός, ἅτε οὐκ εἰς κενὸν ἐξιώντος, ὠθούμενος ὁ πλησίον ἀήρ εὐκίνητον ὄντα ἔτι τὸν ὑγρὸν ὄγκον εἰς τὰς τοῦ πυρὸς ἕδρας συνωθῶν αὐτὸν αὐτῷ συμμείγνυσιν. The air pushed in front of the projectile gathers in behind it and so pushes it on.

15-17. ἢ . . . τόπον. If this alternative is really to be distinguished from ἀντιπερίστασις, the suggestion must be that there was from the start air between the propellant and the projectile, and that this pushes on the projectile so long as its impressed movement is more vigorous than the impulse of the projectile to move to its own proper region of space (i.e. downwards). This explanation is stated more fully in 266^b 27-267^a 12.

18-19. οὐδ' . . . ὀχοῦμενον. The argument is: in the absence of a medium a body could continue moving only so long as it was carried on by something else as a ship is by the river which bears it; but projectiles in fact move without being thus carried on.

22-3. ἔτι . . . δοκεῖ. Aristotle is evidently, as Philoponus and Simplicius suppose, referring to the argument for the void resting on the supposed fact that it is the existence of more void patches in, say, fire or air, than in water or earth, that makes motion through the former faster than motion through the latter. Aristotle's objection is unconvincing. The suggestion of the Atomists was that if a body had a natural or impressed motion in a certain direction, it would move faster or further in that direction if it encountered more voids than if it encountered fewer. The absence of διαφοραὶ in the void would thus not prevent the body from maintaining the direction of its natural or impressed motion.

25-9. ὀρῶμεν . . . κουφότητος. On the face of it this seems to say that a body of fixed weight moves faster at one time than at another either owing to a difference in the medium or to a difference in the weight; the end of the sentence seems incompatible with its beginning. Hence Laas's emendations. But the text is probably right. Aristotle has packed into one sentence, with insufficient

attention to the expression of his meaning, two comparisons: (1) a comparison of a body moving in one medium with the same body moving through a different medium (in 215^a 29-216^a 12, which works out this comparison, a single moving body A is contemplated throughout); (2) a comparison of a body with a heavier or lighter body moving through the same medium (in 216^a 12-21, which works out this comparison, two moving bodies are clearly contemplated). In both cases he is considering τὸ αὐτὸ βάρος καὶ σῶμα, a body of fixed weight; but he first compares it with itself, moving through a different medium, and then with a body of different weight.

26-7. δι' ὕδατος . . . ἀέρος. The fuller reading in E is strongly supported by T. 130. 23-4, P. 651. 5-8. S. 671. 28-9 seems to have read διὰ γῆς ἢ δι' ὕδατος ἢ δι' ἀέρος.

29-216^a 12. τὸ μὲν οὖν δι' οὐ φέρεται . . . συμβαίνει. Treating movement as being essentially not the moving a certain distance in a certain time, but the overcoming of a certain resistance, Aristotle commits the mistake of making the speed of a body through different media inversely proportional to the resistance of the media. For him velocity through water : velocity through air = resistance of air : resistance of water (215^b 3), whereas it really = initial velocity minus resistance of water : initial velocity minus resistance of air. He is thus led to the wrong conclusion that, since a vacuum would offer no resistance, the velocity of movement through a vacuum should be infinite, and, since there are no observed movements which take no time, concludes that there is no vacuum in nature.

^b13-18. εἰ . . . οὐδέν. The apodosis answering to the εἰ clause may begin (1) in ^b15 with τοῦ δέ. δέ can stand thus *in apodosis* when the principal clause is as here antithetic to the protasis¹ (cf. *Pol.* 1287^b 13, and the commoner use of ἀλλά *in apodosis*); or perhaps γε should be read. Or we may treat ἀνάγκη . . . στιγμῶν ^b16-19 as parenthetical and (2) read ὁμοίως δῆ (with Cornford) in ^b19, and treat this as beginning the apodosis, or (3) suppose the apodosis to be introduced irregularly by ὥστε ^b20 (for this construction cf. Bonitz, *Arist. Studien* iii. 106-22, and *Index*, 873^a 31-44). The latter two interpretations are open to the objection that they involve the presence of οὐκέτι in an εἰ clause in ^b15, but that is not unparalleled; cf. *Cat.* 8^b 2. Or (4) we might omit δέ in ^b14, with E; but this gives a less natural sentence.

22. διὰ τοῦ κενού. The sense requires the comma to be placed before these words, not after them as in most editions.

28. ταύτην τὴν ἀναλογίαν is a cognate accusative after διαφέρων. Cf. *De Long. Vit.* 465^a 11 διαφέρουσι ταύτην τὴν διαφορὰν.

¹ Several examples are cited in Denniston, *Greek Particles*, 181.

31-216^a 1. ἀντεστραμμένως . . . A, 'A will traverse Z in a time inverse to the speed of the movement, viz. in a time = H'.

216^a 2-3. ἀλλ' . . . H, 'but the movement of A through Z when Z was empty was supposed to occupy time H', cf. 215^b 24.

6. ληφθήσεται. Bonitz conjectures *συμβήσεται* or *λεχθήσεται*. But *ληφθήσεται* in the sense of 'the result will be got' seems quite possible; cf. 186^a 11-13.

14. εἰάν . . . σχήμασι. Either εἰάν τὰλλα ὁμοίως ἔχη or εἰάν ὁμοίως ἔχη τοῖς σχήμασι would give good sense, but the combination seems impossible. τὰλλα is on the whole the better supported reading (cf. also 215^a 28), and τοῖς σχήμασι is probably a gloss, anticipating ^a 19.

20. τὸ φερόμενον . . . ἀφεθέν. τὸ φερόμενον presumably refers to a naturally moving body, τὸ ἀφεθέν to a projectile.

20-21. ἰσοταχῆ . . . ἀδύνατον. What Aristotle treats as an absurd consequence of the belief in a void, that everything will fall with equal velocity in the void, is of course now known to be a fact. Cornford points out that Empedocles divined it without experiment (*Er.* i. 61, cf. *Lucr.* ii. 238).

25-6. τοῦτο . . . πρότερον, 211^b 18-29.

27-9. ὥσπερ . . . κύβος. This should not be taken as an anticipation of Archimedes' principle that a solid lighter than a fluid will be immersed, 'just so far that the *weight* of the solid is equal to the *weight* of the fluid displaced'. Aristotle is referring to the more obvious fact that a *volume* of water equal to the *volume* of the submerged part of the solid must have been displaced.

30. ἔχοντι μετάστασιν. This is put in, Philoponus says, to exclude τὰ μαθηματικὰ μεγέθη. It seems to be more likely to be meant to exclude celestial matter, which has no tendency to move up or down.

33. ἢ ἐπ' ἄμφω, sc. if it is water or air. Water will move above earth and below fire and air; air will move above earth and water and below fire.

35. διεληλυθέναι. δόξειεν cannot stand without ἄν (as in Δ). It is missing in E¹, and it seems best to omit it and to suppose that διεληλυθέναι depends on ἀνάγκη supplied κατὰ σύνεσιν out of ἀδύνατον ^a 34; which is made easier by the presence of ἀνάγκη in ^a 31.

35-6. ὅπερ . . . κενῶ, 'which the portion of space now filled by the cube formerly extended to in the void'.

^b 3. ὅσον κατέχει κενόν (E), 'as the amount of void it occupies', seems more likely to be right than ὅσον κατέχει τὸ κενόν (read by the other MSS.), 'as the void occupies'.

4-9. ὁ . . . ἐαυτῶ. Aristotle's object is to point out that though the volume of the cube is characterized by certain sensible qualities,

it can be distinguished from them (cf. *De Gen. et Corr.* 320^b 16-25), and when distinguished from them is an entity that is indistinguishable from the equal volume of void which the believers in a void seek to distinguish from it.

12. τοῦτο, i.e. μέγεθος οἱ ὄγκων.

14. τοῦ τόπου. According to Torstrik's account of Bekker's MS. notes, τοῦτό που is a mere misprint for τοῦ τόπου. The latter seems to be implied by τοῦ κενοῦ in T. 135. 3, P. 666. 30, S. 682. 14.

15. εἰ . . . ὄγκος, if the volume be treated in abstraction from the sensible qualities; cf. ^b 4-6.

16. περὶ αὐτόν seems to be implied by Philoponus' ἐξῶθεν (662. 20, 667. 1), and occurs in Simplicius' lemma (682. 11). But ἐξῶθεν hardly gives the right sense, since the void is not thought by its supporters to extend beyond the cube, but to coincide with it. περὶ αὐτόν would have to be interpreted as 'connected with it'. But περὶ and παρά are constantly confused in the MSS., and παρά should perhaps be read.

16. τοιοῦτον, i.e. κευωρισμένον.

17-20. ἔτι . . . ἀπτοῦ. These words are omitted by the Greek commentators; they are found in all Bekker's MSS. and in the *Vetus Versio* and the Arabo-Latin translation, and in Averroes' commentary. ἄλλως ἔτι in GH (^a 17) perhaps indicates that they stood in the margin in the archetype of GH. οἶον κενόν (^a 17) is difficult. 'Something like a void' does not give the sense required; and οἶον κενόν for 'what sort of thing the void is' is not Aristotelian. On the whole the passage is likely to be a later addition, not by Aristotle. The first Basel edition has the note: *Ex Averroee sumpta.*

20. κευωρισμένον κενόν. For the meaning of this cf. 214^a 19 n.

CHAPTER 9

The argument from the fact of compression was mentioned already in 213^b 15-18 as one of the arguments for the void.

216^b 23-29. εἰ . . . ἄλλως. The argument here quoted for the void is as follows: (1) Compression involves the existence of rarity and density in bodies (^b 23-4).

(2) This being granted, there are only the following possibilities: (a) movement never takes place (which is absurd), or (b) movement does take place; and this it can do only on one or other of three conditions, (i) that when it takes place the universe bulges (which is absurd), (ii) that when quantity *a* of a dense substance is transformed into quantity *b* of a rare substance, somewhere else a quantity = *b*

of a rare substance is being transformed into a quantity = a of a dense substance (which would be a strange coincidence), or (iii) that compression and expansion take place, which involve (as we have seen in (1)) rarity and density, which in turn (it is asserted) involve a void.

The statement of the alternatives is loosely expressed. Grammatically *εἰ τοῦτο μὴ εἶη*, 'if compression did not exist', is the antecedent to all four consequents; but in fact it is the antecedent only to the first three. The argument is that if the denial of compression involves one or other of three absurd consequences, compression, and therefore a void, must be admitted to exist.

25. ἢ . . . ἔσται. One alternative is to deny the existence of change of any kind—in place, size, or quality. This would be regarded by most people (and certainly by the Atomists) as too paradoxical to need refutation. But if we admit the existence of movement, we are (so the Atomists said) driven either into one of two equally paradoxical conclusions, or into admitting the existence of the void.

25-6. ἢ κυμανεῖ . . . Ξοῦθος. If we admit the existence of locomotion or of growth (or of alteration, which involves locomotion), the first alternative is to suppose that the thing that is moving through space or growing pushes other things before it so as to produce a wave or bulge at the extremity of the universe. This is again treated as absurd; and the Atomists might have added that a bulge at the surface of the universe would involve a void for the universe to bulge into, and thus introduce a void outside the universe in the attempt to escape admitting a void inside it.

Very little is known of Xuthus. S. 683. 24 calls him a Pythagorean. Iamb. *V.P.* 267 mentions a Pythagorean of Croton whom he calls Βοῦθος, perhaps in error for Ξοῦθος. Zeller i. 1^b. 544 n. 1 suggests, with some probability, that Xuthus was a half-Pythagorean, half-Atomist.

26-8. ἢ . . . γεγενῆσθαι. This alternative is treated as equally absurd.—The MSS. read ἢ εἰς ἴσον ἀεὶ μεταβάλλειν κτλ., but we need an indicative as in ^b 25. Bonitz was no doubt right in suggesting ἀεὶ δεῖ. Confusion between δεῖ and ἀεὶ is common in MSS.

30-33. εἰ μὲν . . . ἔχον . . . εἰ δὲ . . . κενόν. The alternative ways of explaining *μανότης* by means of the void are to suppose (1) that there are little pockets of void, capable of receiving body, in the rare body; (2) that there is void diffused throughout it.

32. τόπον . . . αὐτοῦ, 'having an extension of its own', i.e. an extension which is not that of a body. This refers to the view of place (refuted in 211^b 18-29) as *διάστημα καθ' αὐτὸ πεφυκὸς εἶναι*.

217^a 3. τὸ συνεχές, e.g. nets to which inflated skins act as floats.

4-5. κενού γὰρ . . . φέρεται, 'for then we get something void of void into which void moves'.

5-6. ἔτι . . . κάτω; This is not really a fresh objection, but the continuation of that made in 216^b 34-217^a 1.

8. ἴσως . . . κινηθῆναι. In view of λόγος . . . τάχη^a 8-10, the meaning evidently is 'it is as impossible for a void to be moved as for things to be moved in a void'.

8-10. λόγος . . . τάχη. The argument to show that there can be no movement through a void because the speed of such movement would be in no ratio to the speed of movement through occupied space will be found stated at length in 215^a 29-216^a 11.

10-26. ἐπεὶ . . . ψυχροῦ. Bekker finishes the sentence with γίγνεται^a 14, which leaves it without a principal clause. Bonitz puts^a 14 δῆλον . . . γίγνεται in brackets, followed by a colon, and finishes the sentence at κινεῖσθαι^a 18. It seems to me clear, however, that (as Hayduck has urged)^a 15-20 ἀνάγκη . . . εὐθύ belongs to the parenthesis which begins in^a 14, and that the principal clause does not come till^a 20.

II. τὰ ἄλλα . . . ἀληθῶς, in 216^b 24-30.

19. ἂν . . . περιίστηται, an allusion to ἀντιπερίστασις, for which cf. 208^b 2, 215^a 15.

21. ἐκ τῶν ὑποκειμένων, i.e. on the basis of the conception of ὕλη established in i. 9.

^b 4. (ἦ) . . . ἄλλη. Aristotle sets aside as irrelevant to his present purpose the question whether an arc in suffering deformation could be said to retain its identity.

8. (πρὸς) τὴν ὕστερον. There seems to be no satisfactory explanation of the vulgate τῇ ὕστερον. To supply in thought ἔνεστι would not give the right sense. πρὸς τὴν ὕστερον derives some support from S. 690. 6 οὕτω δὲ καὶ ἡ θερμότης ἢ πρότερον πρὸς τὴν ὕστερον.

II-12, 16-26. ἔστι . . . κοῦφον. δύο . . . μᾶλλον. The object of this section is to set aside the Atomists' explanation that it is by virtue of the void in it that what is μανόν rises (216^b 34-217^a 1), by saying that it is simply because it is necessarily light that τὸ μανόν rises.

12-16. ἔτι . . . ὕλης. This sentence interrupts the discussion of the connexion between density and weight (which begins in ^b 11 and is continued in ^b 16). There is no trace of it in Themistius, and Simplicius says that some MSS. omitted it. It is clearly a doublet of ^b 2-7, and has crept into the text from the margin.

19. μολίβδου. *E.M.* 590. 8, Eust. 1340. 30, Zonar. *Lex.* 1366 say that μόλιβος and μόλυβδος are the only correct forms. But μόλιβδος is better supported both here and in Aristotle generally, and it seems better to keep this on record by reading it here.

20-21. οὐτ' . . . δυνάμει. Bekker prints this without punctuation,

as if the οὐτέ's introduced four alternatives. But really δυνάμει is opposed to ἀποκεκριμένον, and within ἀποκεκριμένον Aristotle opposes ἀπλῶς to ἐν τῷ μανῶ. A κενὸν ἀποκεκριμένον ἀπλῶς would be one existing apart from bodies, e.g. outside the universe (cf 213^b 1-2). A κενὸν ἀποκεκριμένον ἐν τῷ μανῶ would be one of which pockets existed within rare bodies breaking up their continuity (cf. 213^a 33-4). A κενὸν existing δυνάμει would be one which was always in fact occupied by body but was distinguishable from it in thought, as being capable of existing without body in it. Aristotle's own conception is thus stated by Joachim (on *De Gen. et Corr.* 321^a 5-9): 'We must not think of a "dense" body as one in which there are few or small "pores", and of a "rare" body as one with large or many gaps interspacing its corporeal particles. We must rather conceive of ὕλη as a material capable of filling space with all possible degrees of intensity, or capable of expanding and contracting without a break in its continuity. In this respect Aristotle's ὕλη resembles "das Reale", as Kant conceives it: cf. *Kritik d. r. Vernunft*, "Anticipationen d. Wahrnehmung".'

24. κατὰ ταύτην τὴν ἐναντίωσιν, i.e. that of heavy and light.

25-6. κατὰ δὲ τὸ σκληρὸν . . . ἀπαθείας, i.e. of ἀπάθεια in virtue of being hard, of πάθος in virtue of being soft.

26. καὶ οὐ . . . μᾶλλον. Simplicius holds that ἐτεροίωσις does not mean ἀλλοίωσις merely but includes also the remaining two kinds of change—change of substance and of size. The word does not occur elsewhere in Aristotle's genuine works, but all these three kinds of change might well be grouped as ἐτεροίωσις in opposition to φορά, which does not alter the moving thing but only its space-relations to other things.

27. πῶς ἔστι, sc. only if 'void' be used as a name for the condition on which movement depends (^b 21-4).

CHAPTER 10

217^b 30-31. καὶ . . . λόγων. The ἐξωτερικοὶ λόγοι are explained by Philoponus as οἱ μὴ ἀποδεικτικοὶ μηδὲ πρὸς τοὺς γνησίους τῶν ἀκροατῶν εἰρημένοι, ἀλλὰ πρὸς τοὺς πολλοὺς καὶ ἐκ πιθανῶν ὤρημένοι (705. 22), and very similarly by Simplicius as τὰ κοινὰ καὶ δι' ἐνδόξων περαινόμενα, ἀλλὰ μὴ ἀποδεικτικὰ μηδὲ ἀκροαματικά (695. 34). I have collected and discussed Aristotle's references to the ἐξωτερικοὶ λόγοι in a note on *Met.* 1076^a 28. The preposition διά here, like the preposition ὑπό in *Met.* 1076^a 28, seems to show that discussions rather than any special books are meant—discussions not peculiar to the Peripatetic school; but in many cases Aristotle had in point of fact

developed these in his dialogues. The λόγοι here referred to are those that are put forward in ^b 33-218^a 30.

218^a 14-16. τὸ δὲ νῦν μὴ ὄν . . . πρότερον. With the well-supported reading τό τε νῦν κτλ., τό τε νῦν κτλ. and καὶ τὰ νῦν κτλ. are two apodoses following on the protasis εἰ . . . πλείονος (^a 11-13). But a better sense is got by reading τὸ δὲ νῦν κτλ., which then is part of the protasis. καὶ τὰ νῦν then means 'the nows also'; i.e., the nows, though they are not parts of time, share with the parts of time the attribute of non-simultaneity. A misunderstanding of καὶ as 'and' probably led to the reading τε.

19. στιγμήν. The vulgate reading στιγμή would involve the interpretation 'as a point is next to another point'. But there are no next points (as Aristotle proves in vi. 1).

20. ἐν τοῖς μεταξὺ τοῖς νῦν can hardly be right. I read ἐν τοῖς μεταξὺ νῦν, 'in the intermediate nows' with S^c. 796. 18; cf. P. 704. 28, 29, T. 141. 24-5.

26. καὶ ἐν [τῷ] νῦν. The vulgate reading καὶ ἐν τῷ νῦν does not give the right sense. The reading νῦν simpliciter derives some support from P. 705. 9, 708. 16, S. 699. 27, 30, 33. But T. 141. 32 εἰ ταῦτ' ὄν καὶ ἐν διαμέλει τὸ νῦν (cf. ib. 29) supports our reading, which accounts better for the corruptions in the MSS.; cf. ^a 10, ^b 27. Simplicius' citation in 796. 23 has the vulgate reading.

28. τὰ ἔτος γεγόμενα μυριστόν. S^c. 796. 25 has γενησόμενα, and Diels on the strength of this reads γενησόμενα ἢ γεγόμενα, and thinks that the γινόμενα which S^c. 796. 24 has before ἐν in ^a 27 arises from dislocation of the original reading. But T. 142. 1-3, P. 705. 10, S^p. 699. 29, 31, 32 plainly imply γεγόμενα simply, and *Rhet.* 1386^a 29 τὰ δὲ μυριστόν ἔτος γεγόμενα ἢ ἐσόμενα, which Diels cites, does nothing to support his reading, since the context is quite different. It confirms, however, the omission of εἰς by E¹.

31-3. τί . . . πρότερον, i.e. the nature of time is left just as obscure by the traditional views about it as it is by the difficulties we have already (in 217^b 30-218^a 30) discussed (περὶ ὧν = ἐκ τούτων περὶ ὧν).

33-^b 1. οἱ μὲν γὰρ . . . φασιν. This is an allusion to such passages of Plato as *Tim.* 39c 5-d 2. Eudemus, Theophrastus, and Alexander agreed in thinking Plato is meant (S. 700. 18).

^b 1. οἱ δὲ . . . αὐτήν. Simplicius interprets this as referring to the Pythagoreans, and suggests that the reference is due to a misinterpretation of the saying ascribed to Archytas by Iamblichus that time is the διάστημα τῆς τοῦ παντὸς φύσεως (S. 700. 20, 786. 13). (The other definition of time ascribed to Archytas—κίνασιός τις ἀριθμός (S. 786. 12) is almost certainly a plagiarism from Aristotle's own definition. It probably occurred in Ps.-Archytas περὶ τοῦ Παντός.) Cf. *Plac.* i. 21. 1 Πυθαγόρας τὸν χρόνον τὴν σφαῖραν τοῦ περιέχοντος εἶναι.

19-20. μηδὲν . . . μεταβολήν. These words are important as indicating that even when, as in *Phys.* i-iv, Aristotle uses κίνησις and μεταβολή interchangeably, he is aware of the distinction which he unfolds in v. 225^a 34^{-b} 9. They furnish a strong argument against Tannery's view that bks. v-vi are earlier than bks. iii-iv; cf. Intro. 7-8.

CHAPTER 11

218^b 22. μεταβάλλωμεν. μεταβάλωμεν would be more accurate, but μεταβάλλωμεν may be defended by reference to πάσχωμεν 219^a 5.

23-6. καθάπερ . . . μεταξύ. Philoponus says the myth was that certain sick people went to the heroes in Sardinia and were treated, and slept for five days, of which they had no recollection when they awoke. Simplicius says the story was that nine children borne to Heracles by the daughters of Thespius the son of Thespius died in Sardinia (for the settlement of Sardinia by Heraclidae headed by Iolaus cf. Diod. iv. 29 f., v. 15, Strabo v. 225, Paus. vii. 2. 2, x. 17. 5, [Arist.] *Mir. Ausc.* 838^b 16, Solin. 14. 10, 46. 12 Mommsen), and that their bodies, down to the time of Aristotle and even of Alexander of Aphrodisias (from whom he evidently takes his information), resisted decay and looked like the bodies of men asleep. He adds that it was the custom for people *ὄνειρων ἔνεκεν ἢ ἄλλης τινὸς χρείας* to sleep *τινας μακροτέρους ὕπνους* in the presence of these heroes; and that Eudemus confirmed the possibility of the phenomenon related by Aristotle by a similar incident at Athens during the festival of the Apaturia. The Sardinian story is discussed by Rohde (*Rhein. Mus.* 35. (1880) 157-63), who points out its obvious affinities to the legends which represent Alexander the Great, Nero, Charlemagne, Arthur, or Friedrich Barbarossa as sleeping in the earth till they come to revisit their people. The whole story combines some such legend with the common practice of *incubatio* in a holy place in order to get predictive dreams or other illumination. Cf. also E. Pais, *La Sardegna prima del dominio romano* (Accad. d. Linc. 7. 1881, 294). Rohde and Pais suspect a Phoenician origin for the story of the sleeping heroes.

The story evidently grew. Aristotle speaks of the whole story as a myth, but Alexander (unless Simplicius misrepresents him) seems to have claimed that the uncorrupted bodies of the heroes were still to be seen in his time.

30. ὀρίσωμεν. This reading seems to be established by a comparison with ^b 32, 219^a 22.

219^a 11. καὶ . . . συνεχές, sc. and therefore, in particular, the μέγεθος which stretches from the *terminus a quo* to the *terminus ad quem*.

19-21. ἔστι . . . [ἔστιν]. The meaning of ὁ ποτε ὄν is best seen in such an example as *De Part. An.* 649^b 21 τὸ αἷμα ὡδὶ μὲν ἔστι θερμόν, οἷον τί ἦν αὐτῷ τὸ αἵματι εἶναι . . . τὸ δ' ὑποκείμενον καὶ ὁ ποτε ὄν αἱμά ἐστιν, οὐ θερμόν. In the present passage ὁ ποτε ὄν is an abbreviated form of τοῦθ' ὁ ποτε ὄν πρότερον καὶ ὕστερον ἐν τῇ κινήσει ἐστίν, i.e. that, being which the before and after in movement are before and after, i.e. the ὑποκείμενον or subject which is before and after. The general sense of the sentence must be 'the before and after in movement is, as regards its subject, movement; but its essence is not movement'. Thus the ἔστι in ^a 19 and the ἔστιν in ^a 21 repeat each other, and ἐστίν should probably be omitted, as it is in S. 712. 25, P. 720. 26-8. The construction is just like that in ^b 18; ὁ μὲν ποτε ὄν is expegetic of τὸ πρότερον καὶ ὕστερον ἐν τῇ κινήσει, as it there is of τοῦτο. ἐστίν is due to misunderstanding of the difficult phrase ὁ ποτε ὄν. Bekker's αὐτῶν in ^a 20 is pretty clearly an emblemata from ^a 19.

29. τὸ . . . ὀριζόμενον τῷ νῦν, 'that which is bounded by a now at each end'.

32. προτέρου . . . τινός, 'but as an element (viz. the end) of an earlier section and an element (viz. the beginning) of a later'.

^b 2-3. οὐκ . . . κινήσις, 'time is therefore not movement, but the aspect of movement in respect of which it is numerable'. For the construction cf. ^b 25. Torstrik's insertion of ἦ, though not unlikely to be right, is not strictly necessary.

6. τὸ ἀριθμητόν is to be understood as almost a synonym of τὸ ἀριθμούμενον. A numbered or numerable plurality of particular things is being contrasted with abstract number (μοναδικὸς ἀριθμὸς) ᾧ ἀριθμούμεν.

8-9. ἔστι . . . ἀριθμούμενον. Torstrik is very likely right in placing this after ἀριθμούμεν ^b 7; the words may have been first omitted (cf. J¹) and then inserted in the wrong place.

10-12. ὁ δ' ἅμα πᾶς χρόνος . . . ὕστερον. The punctuation I have adopted seems to give the best connexion of thought here. We might paraphrase as follows: 'but the time of one event is identical with the time of another simultaneous event; for the now involved, whatever now it may have been, is identical (though it is one thing for it to be the now involved in the time of one event, and another thing to be the now involved in the time of another simultaneous event), and it is the now that marks the time as before and after, and therefore also determines the times of two events as simultaneous and identical when neither is before or after the other'.

11-12. τὸ δὲ νῦν . . . ὕστερον. Bekker's reading is τὸ δὲ νῦν τὸν χρόνον μετρεῖ, ἢ πρότερον καὶ ὕστερον. This is the reading of all the MSS. but E, and is supported by P. 725. 1, S. 722. 1, 15. But in

218^a 6-7 Aristotle implies quite clearly that the moment does not measure time, and it is obvious that not a moment (which has no duration) but only a finite stretch of time could measure time. Further, *μετρῆί* is inappropriate to ἡ πρότερον καὶ ὕστερον. Aristotle has said that we mark the passage of time by discriminating different moments within it (^a 25-6), but this is not to *measure* time. Nor is the *measuring* of time relevant to the present context. These difficulties, or some of them, were felt by Torstrik, Prantl, and Gottschlich; and Torstrik is probably right in supposing *ὀρίζει* to have been the original verb, which was displaced early by the gloss *μετρῆί* and preserved in the wrong place by E and the Arabo-Latin translation. Alternatively, one might suppose both *μετρῆί* and *ὀρίζει* to be corruptions of *μερίζει*. Cf. 239^a 9 ἅπας χρόνος εἰς ἄπειρα μεριστός. Gottschlich's *διαίρει* might be held to derive support from 222^a 14, 18, 262^a 30, but it would be rash to adopt it.

12-15. τὸ δὲ νῦν . . . αὐτό. Aristotle now passes to the question already discussed dialectically in 218^a 8-30, whether the now remains one and the same or constantly changes. He answers the question in his usual manner, by saying that in a sense it is the same and in a sense not. *Qua* occurring at different points in the time series it is constantly changing, but as regards that, being which it is the now, viz. τὸ πρότερον καὶ ὕστερον τὸ ἐν κινήσει ^b27, it is the same.

14. τοῦτο . . . (εἶναι). Bonitz's addition of *εἶναι* derives some support from P. 726. 21, 24, though Philoponus may have been expanding; it seems impossible to see for certain what lies behind Simplicius' paraphrase τοῦτο δὲ ἦν αὐτῷ πρώτῳ (leg. προτέρῳ) καὶ ὑστέρῳ λέγειν (? λέγεσθαι). Bonitz's reading gives the good sense 'and this (i.e. occurrence at this or that point of time) was what nowness was for it'.

15-220^a 21. ἀκολουθεῖ . . . μόρια. The main object of this section is to develop the thought of ^a 10-19, that μέγεθος (path), κίνησις, and χρόνος correspond to one another, by adding that στιγμή: μέγεθος = φερόμενον: κίνησις = νῦν: χρόνος. The difficulties of this view are too obvious to require comment.

15-16. ἀκολουθεῖ . . . φαμεν. These words, with the exception of ὡς ἐλέχθη and ὡς φαμεν, are repeated in 220^b 24-6, and seem to be appropriate in both places. They are vouched for *here* by P. 726. 28-30, and with the exception of ὡς φαμεν by T. 150. 12-13, S. 722. 23-4; and *there* by T. 153. 24-5, P. 745. 3-8, S. 733. 30-31. ὡς ἐλέχθη and ὡς φαμεν seem at first sight to form a weak repetition, but in fact ὡς ἐλέχθη simply refers back to ^a 10-19, while ὡς φαμεν means 'as we maintain', against actual or possible opponents.

16-17. καὶ . . . φερόμενον. The analogy between movement and

the μέγεθος (path) it covers, in respect of continuity, was brought out in ^a10-19. Aristotle now points out that there is a similar analogy between the point which traces out the path, and the moving object which traces out the movement. He is evidently working with the conception of the line as produced by the fluxion (ρύσις) of a point (*De An.* 409^a 4, P. 727. 25, S. 722. 28, 724. 34, *Iamb.* in *Nicom. Arithm.* (ed. Pistelli) 57. 8).

19. ἢ στιγμῇ γάρ. In ^b15-18 the στιγμῇ (i.e. the geometrical point) has been treated as the generator of the path (μέγεθος), as the φερόμενον is the generator of the movement. Here στιγμῇ is, by an unfortunate lapse, treated as a φερόμενον; and here therefore στιγμῇ must be used in the sense of a particle. P. 728. 28, S. 723. 5 have στιγμῇ, and it is difficult to think of any likely emendation. Torstrick tries to remove the difficulty by treating τῇ στιγμῇ in ^b17 as corrupt, but it is in ^b19, not in ^b17, that the difficulty exists. The MS. reading may be defended by reference to 227^b 16, where στιγμῇ is used of a moving material particle.

τῷ λόγῳ δὲ ἄλλο, 'but is different in respect of the account that may be given of it', viz. because it is at one time body A at place B, and at another body A at place C.

20-21. ὥσπερ . . . ἀγορᾶ. The premiss 'being Coriscus in the Lyceum is different from being Coriscus in the market-place' was used by the sophists to support the conclusion that Coriscus is different from himself. The argument, according to S. 723. 11-20, was 'Coriscus, being the same, is now in the market-place and now in the Lyceum; he who comes to be now in the market-place and now in the Lyceum comes to be different from himself'.

21-8. καὶ τοῦτο . . . ἐστίν. The moving body becomes different from itself in respect of being now here, now there. But the now corresponds to the moving body. Therefore the now becomes different in respect of its εἶναι; a different aspect of its being is revealed.

25. ἢ . . . ἐστίν. These words reappear almost identically in ^b28. They are vouched for here by T. 150. 23, P. 728. 31-729 6, S. 723. 29-30, and there by T. 150. 25-6, P. 729 9, 20-24, S. 723. 33-5.

The parallelism between the now and the moving body would have been made clearer if Aristotle had said τῷ δὲ νῦν τὸ πρότερον καὶ ὕστερον ἐν χρόνῳ. What he says comes to the same thing. If the now is that by virtue of which the before and after can be counted, i.e. distinguished as being two, not one, then it is by the passage of the now (revealed to us by the newness or presentness of different events in succession) that we recognize the before and after in time, and the parallelism between the now and the moving object is established. Time is the ρύσις τοῦ νῦν, as movement is the ρύσις τοῦ φερομένου, and the μέγεθος (γραμμῆ) the ρύσις τῆς στιγμῆς.

26-8. ὥστε . . . ἐστίν, 'thus (as the point remains the same, but by entering into different relations traces out the line, and as the moving body remains the same, but by entering into different relations traces out the movement) in the case of nows too the now remains the same in respect of that, being which it is a now (viz. that which comes before and after in movement), yet its being is different; for it is in so far as the before and after is numerable that we get the now'. The sentence is improved by reading *νῦν ἐστι, τό* instead of *νῦν, ἔστι τό*. Cf. ^b 14-15.

28-31. καὶ γινώριμον . . . οὐ. Aristotle here points out that, as change is not directly cognizable, but is cognized by observing a *φερόμενον* to be now here and later there, or (more generally) a *κινούμενον* to be now in one condition and later in another, so time is not directly cognizable, but is cognized by noticing that nowness belongs first to one and then to another state of affairs. The further implication is that, as the moving body is a *τόδε τι* while its movement is not, the now is a *τόδε τι* while time is not. But this view would be hard to maintain. Simplicius discusses what Aristotle can have meant by maintaining the unity of all nows *τῷ ὑποκειμένῳ*, and is driven to the rather lame suggestion that Aristotle treats the nows as one *τῷ ὑποκειμένῳ* simply because they do not differ either in genus, in species, or in accidents (724. 27-725. 4, 725. 9-24). This does not really imply that they form one *τόδε τι*.

29. τοῦτ', sc. τὸ νῦν.

220^a 2-3. οὕτως . . . φορᾶς. Time has already been called the number of movement (219^b 2); the now is here called the number of the moved object. The suggestion is that, as the moving body by its successive appearances at successive places makes up a movement, so the now by its passage from the future to the past makes up time.

4. τὸ νῦν . . . ἀριθμοῦ, i.e. the now corresponds to the moving body, being a sort of unit involved in time (which is the number of movement) as the moving body, or rather its successive positions, are involved in the movement. The addition *οἶον μόνως ἀριθμοῦ* is unfortunate, for a time is not made up of a finite number of nows, nor a movement of a finite number of positions, as a number is made up of a finite number of units. In fact the notion of the now as the unit of time is incompatible with the notion of it as the generator of time, which is that with which Aristotle has chiefly been working. The error is implicit in the original error of defining time as the number of movement.

6. τοῦτο, the dependence of time on the now for its continuity and its divisibility.

7-8. καὶ οὐχ . . . λόγῳ. It is not the individual unity of a moving body that makes the movement continuous (for a single body may have an interval between its movements), but the unity of the moving body in respect of the account that can be given of it, i.e. in respect of the fact that it can be described as 'a single body moving from a single place to a single place in a single time' (cf. 242 a 66-8). Carteron's ἀλλὰ (ἄλλα) does not improve matters.

7. καὶ οὐχ ὅ ποτε ὄν = καὶ οὐχ ἐν ὅ ποτε ὄν φέρεται, 'and not one thing, being which it is moved', i.e. the self-identity of the moving body is not enough to secure the continuity of the movement.

8-9. καὶ ὀρίζει . . . τοῦτο. The moving body forms the boundary between the earlier and the later movement, in the sense that its presence at a particular place divides its total movement into an earlier and a later phase.

To get a formal correspondence with ^a 5 and with ^a 10-11, Torstrik wishes to insert καὶ συνέχει after τοῦτο in ^a 9. But the uniting function of τὸ φερόμενον has been mentioned in ^a 7, and only its dividing function remains to be stated in ^a 9. The logic is correct if we read in ^a 9 καὶ ὀρίζει δέ, as Simplicius seems to have done (726. 27): οὐ μόνον δὲ συνεχῆ τὸν χρόνον ποιεῖ τὸ νῦν κατὰ τὴν πρὸς τὸ φερόμενον ἀκολουθίαν, ἀλλὰ καὶ διαιρεῖ αὐτὸν διορίζον τὸ πρότερον καὶ ὕστερον τῆς κινήσεως.

12-14. ἀλλ' . . . ἕτερον. When we treat one point in a line as two, i.e. as the end of one part and the beginning of another, we must in thought pause over against the point, as it were; but we cannot (Aristotle maintains—wrongly, as it seems) thus pause over against a now, since the moving body is always moving to new positions, and needs a succession of ever-new nows to enable it to do so.

14-16. ὡσθ' . . . τελευτή. Time is a plurality, not in the sense in which a plurality can be distinguished within a single point inasmuch as it is the end of one part of a line and the beginning of another.

16. τῆς γραμμῆς. The vulgate reading τῆς αὐτῆς could only mean τῆς αὐτῆς στιγμῆς, which in the context makes no sense. We cannot be sure what Simplicius read (cf. 727. 12, 32). Philoponus seems to have read τῆς γραμμῆς (736. 1), and there is little doubt that we should either read this or omit τῆς αὐτῆς. In either case there is an emblemata from the previous line.

17-21. διὰ τε τὸ εἰρημένον . . . μόρια. Simplicius thinks that the first reason alleged is a reason for holding that the plurality of nows which makes up time is *not* that which is got by considering one now as both an end and a beginning, but *is* the plurality consisting of an earlier and a later now; and that the second (καὶ ἔτι (sc. διότι) φανερόν κτλ.) is a reason for maintaining that the plurality of nows is not a plurality of *parts* of time. Philoponus thinks that both are

reasons for the second statement, and that must, I think, be Aristotle's intention, in view of the phrasing. On Simplicius' interpretation the words $\tau\eta\ \gamma\alpha\rho\ \mu\acute{\epsilon}\sigma\eta\ \sigma\tau\iota\gamma\mu\eta\ \dots\ \sigma\upsilon\mu\beta\acute{\eta}\sigma\epsilon\tau\alpha\iota$ mean 'for to get plurality in a mid-point we have to treat it as two, which involves a pause at the point, and if a moment of time were to function as two, time would have to stand still at that moment'. On Philoponus' interpretation the words in question are a very brief way of saying 'for in order to get two parts of a line you must treat the mid-point as two, and to get two consecutive parts of time you must treat time as standing still at the moment that divides them; but time does not stand still'.

21-4. $\eta\ \dots\ \alpha\lambda\lambda\omicron\theta\iota$. Each clause of the vulgate reading (which has $\eta\ \delta'\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota},\ \alpha\rho\iota\theta\mu\acute{o}\varsigma$) can in itself be interpreted intelligibly, but (1) the first part of the sentence (down to $\alpha\rho\iota\theta\mu\acute{o}\varsigma$) has little or no connexion with the second, and (2) $\eta\ \delta'\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota},\ \alpha\rho\iota\theta\mu\acute{o}\varsigma$ furnishes no proper antithesis to $\eta\ \mu\acute{\epsilon}\nu\ \pi\acute{\epsilon}\rho\alpha\varsigma\ \tau\acute{o}\ \nu\hat{\upsilon}\nu,\ \omicron\upsilon\ \chi\rho\acute{o}\nu\omicron\varsigma$. The reading which Philoponus (737. 16, 25-7) had before him omitted $\alpha\rho\iota\theta\mu\acute{o}\varsigma$ and 'understood' $\chi\rho\acute{o}\nu\omicron\varsigma\ \epsilon\sigma\tau\acute{\iota}$ instead; and this gives a fair antithesis, and a better connexion with the second part of the sentence. With this reading, we might perhaps paraphrase the whole as follows: 'In so far, then, as the now is a limit, it is not time but is merely something involved in the nature of time, but in so far as it counts time (i.e. in so far as nowness is a characteristic the repetition of which pluralizes time), it *is* time (i.e. by its repetition constitutes the whole of time); for limits are individual entities relative only to that of which they are limits, while the number of these horses, the number ten, is a universal that is repeated in other contexts'.

The words $\eta\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota}$ were already in the text which Alexander had before him (P. 738. 24-8, S. 729. 7-13), and are probably genuine. Alexander proposed $\eta\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota}\tau\alpha\iota$, but $\eta\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota}$ can stand, in the sense 'inasmuch as it is the unit which serves for the counting of time'. But the absence of a principal clause after $\eta\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota}$ is unsatisfactory. Further, Themistius seems to have had a different text before him. His interpretation (152. 1-4) presupposes something like $\kappa\alpha\theta'\ \alpha\hat{\upsilon}\tau\acute{o}\ \mu\acute{\epsilon}\nu\ \omicron\upsilon\hat{\nu}\ \pi\acute{\epsilon}\rho\alpha\varsigma\ \tau\acute{o}\ \nu\hat{\upsilon}\nu\ \tau\omicron\upsilon\ \chi\rho\acute{o}\nu\omicron\upsilon,\ \alpha\lambda\lambda\grave{\alpha}\ \sigma\upsilon\mu\beta\acute{\epsilon}\beta\eta\kappa\epsilon\nu,\ \eta\ \alpha\rho\iota\theta\mu\epsilon\hat{\iota},\ \tau\eta\varsigma\ \kappa\iota\eta\eta\sigma\epsilon\omega\varsigma\ \epsilon\hat{\iota}\nu\alpha\iota$. Though Simplicius (721. 14) quotes the text in the same form as Philoponus does, his commentary (728. 27-729. 4) cannot be reconciled with this; it starts by reproducing part of Themistius' comment, and continues with a paraphrase of this.

Various conjectures might be suggested, but none of them has any great probability, and it seems doubtful if what Aristotle wrote can ever be recovered.

CHAPTER 12

The first part of this chapter, 220^a 27-^b 32, is occupied in stating four attributes of time. (1) ^a 27-32. Time in one sense has and in another has not a minimum. (2) ^a 32-^b 5. Time may be much or little, long or short, but cannot be fast or slow. (3) ^b 5-14. Simultaneous times are identical; successive times are numerically different, though they may be the same in species. (4) ^b 14-32. Movement and time determine and measure each other. The second part of the chapter, ^b 32-222^a 9, is occupied with the discussion of the phrase 'in time', and of the things that may be said to be in time.

220^a 27-32. Ἐλάχιστος . . . ἔστιν. The contrast between ἀριθμὸς ἀπλῶς and τις ἀριθμὸς is that between number ϕ ἀριθμοῦμεν and τὸ ἀριθμούμενον (219^b 6), i.e. between number in the abstract and number as embodied in particular groups of things.

According to the normal view of Greek mathematicians, 2 was the first number. Cf. *Met.* 1088^a 6 διὸ καὶ εὐλόγως οὐκ ἔστι τὸ ἐν ἀριθμῷ οὐδὲ γὰρ τὸ μέτρον μέτρα, ἀλλ' ἀρχὴ καὶ τὸ μέτρον καὶ τὸ ἐν. Heath (*Gk. Math.* i. 69) thinks that this doctrine may be of Pythagorean origin, but it is already implied in the definition of number as μονάδων σύστημα ascribed to Thales (*Iamb. in Nicom. Ar. Introd.* ed. Pistelli, 10. 8-10). It appears in *Nicom. Introd. Arithm.* ii. 6. 3, and is implied by Euclid (*El.* vii, Defs. 1, 2). Some of the Pythagoreans called the unit ἀριθμοῦ καὶ μορίων μεθόριον, the boundary between number and fractions (*Iamb. in Nicom. Ar. Introd.* 11. 10). Perhaps the first to treat 1 definitely as a number were the followers of Chrysippus, who called it πλῆθος ἓν, magnitude one (ib. 11. 8). When he turns to particular or concrete number (^a 29, 32), Aristotle wavers as to whether 1 or 2 is the first number. He naturally allows himself greater laxity of language when speaking about concrete than when speaking about abstract number.

^b 4. ἀριθμὸς ϕ ἀριθμοῦμεν would be ἀριθμὸς μοναδικός, abstract number, as opposed to ἀριθμὸς ὡς τὸ ἀριθμούμενον, concrete number, of which time is an example; cf. 219^b 5-8. Torstrik contends that it would be a bad argument to say 'time' (which is concrete number, ^b 8, 219^b 7) 'cannot be quick or slow because abstract number cannot be so.' There is no trace of ϕ ἀριθμοῦμεν in T. 153. 1, and Torstrik regards it as an interpolation due to the same line of thought which led to the variant recorded by Aspasius in 219^b 8. But his reasoning is not convincing.

8-10. ὁ δὲ χρόνος . . . ἕτερα. An abstract number is self-identical in each instance of its occurrence (^a 23-4), being in fact a universal; but time, being an ἀριθμὸς ἀριθμούμενος, is an individual, which is never repeated, since the nows comprised in it cannot recur.

12-14. ἔτι . . . μετόπωρον. When Aristotle says that the same movement, or time, may recur, he must be understood to be speaking of specific, not numerical identity.

19-22. καθάπερ . . . αὐτόν, 'as we ascertain the number by using as a unit the thing that is to be counted, e.g. the number of a group of horses by using the single horse. For while we ascertain the size of the group of horses by using the abstract number, we ascertain the abstract number applicable to the horses by using the single horse as a unit.'

24-6. ἀκολουθεῖ . . . εἶναι, cf. 219^a 10-19.

32-221^a 9. ἐπεὶ . . . χρόνου. Bekker prints a colon after αὐτῆς in 221^a 5 and a full stop after εἶναι in ^a 7, followed by δῆλον δ' ὅτι. But this leaves the first of his two sentences without a principal verb. Bonitz saw that there is but one sentence, and proposed to read δῆλον δῆ, making this the beginning of the apodosis. But δῆλον without a particle is well supported, and δέ may easily have been added by a copyist who did not see the construction. The argument is made easier to follow by printing ὥσπερ . . . ὄλον ^a 2-4 and ἄμα . . . εἶναι ^a 5-7 as parentheses.

221^a 1. κινήσεως καὶ τοῦ κινεῖσθαι. The distinction is the same which is in 221^a 5 conveyed by καὶ αὐτὴν καὶ τὸ εἶναι αὐτῆς. As Simplicius points out, and as Aristotle himself remarks in ^b 16-20, a substance is not measured by the same thing which measures its being; the former is measured by a lineal measure (such as a πῆχυς, ^a 3), the latter by a temporal measure (such as a year). But if you take something, like κίνησις, whose very being is ἐν τῷ γίγνεσθαι, to measure it is the same thing as to measure the duration of its being, and it is a temporal unit that does both.

6. τῆς κινήσεως. Torstrik is right in reading this; cf. ^a 5, 7, 9, ^b 5, 15, 27. Alexander (S. 735. 31), Themistius (154. 9), and Simplicius (735. 36) may have read τῆς κινήσεως. Simplicius well remarks that τὸ εἶναι has not its usual Aristotelian meaning = εἶδος, but means τὴν παράτασιν τῆς ὑπάρξεως καὶ οἷον τὴν ἐνέργειαν τοῦ ὄντος (735. 33).

II. ἐν ἀριθμῷ. We cannot use the phrase 'in number' in this sense, but perhaps 'included in the numerical system' will serve for both the senses of ἐν ἀριθμῷ mentioned in ^a 11-13.

14-15. τὸ μὲν νῦν . . . ἄρτιον. The correspondence is exact. The now is in time and the unit in number, as elements involved in the fundamental nature of time and number (ὡς μέρος ^a 12). The attribute 'before-after' is in time, and the attribute 'odd-even' in number, as attributes alternatively predicable of time and number respectively (ὡς πάθος ^a 12). One is tempted to say that the now and the unit are καθ' αὐτό to time and number in the *first* sense of

καθ' αὐτό mentioned in *An. Post.* i. 4, viz. ὅσα ὑπάρχει τε ἐν τῷ τι ἐστίν, οἷον τριγώνω γραμμῇ καὶ γραμμῇ στιγμῇ (ἢ γὰρ οὐσία αὐτῶν ἐκ τούτων ἐστί), καὶ ἐν τῷ λόγῳ τῷ λέγοντι τί ἐστίν ἐνυπάρχει (73^a 34-7), and that 'before-after' and 'odd-even' are καθ' αὐτό to time and number in the *second* sense mentioned in that passage: ὅσοις τῶν ἐνυπαρχόντων αὐτοῖς αὐτὰ ἐν τῷ λόγῳ ἐνυπάρχουσι τῷ τί ἐστί δηλοῦντι, οἷον τὸ εὐθὺς ὑπάρχει γραμμῇ καὶ τὸ περιφερές, καὶ τὸ περιττὸν καὶ ἄρτιον ἀριθμῷ (ib. 37-40). Aristotle may have had that distinction in mind here, but it does not fit quite exactly; for (1) he does not define time by reference to the now (though he sometimes defines number by reference to the unit, as πλῆθος μονάδων); and (2) he does define time by reference to before and after (219^b 1), and not *vice versa*.

16-17. τὰ δὲ πράγματα . . . ἐστίν. Torstrik argues that the MS. reading τὰ δὲ πράγματα ὡς ἐν ἀριθμῷ τῷ χρόνῳ ἐστίν contains no proper antithesis to τὸ μὲν νῦν . . . ἄρτιον, and that ἐν would be necessary before τῷ χρόνῳ. Torstrik's conjecture gives an excellent sense, but finds no support in the Greek commentators. One is much tempted, instead of τῷ χρόνῳ ἐστίν, to read boldly οἱ δέκα ἵπποι, which is strongly suggested by T. 154. 20 and finds support in P. 750. 23, S. 738. 16, 21. We should then have to suppose that the archetype was mutilated (as in ^a 17-18), and that τοῦ χρόνου τί ἐστίν was inserted from the previous line, and then altered into τῷ χρόνῳ τί ἐστίν (which I has), and finally into τῷ χρόνῳ ἐστίν.

But the traditional reading is defensible. Aristotle has said in ^a 14-16 that τὸ νῦν, τὸ πρότερον, &c., are in time as μονάς, τὸ περιττόν, &c., are in number. There is an analogy between the relation of the one set of entities to time and that of the other to number. In contrast with this, *events* are 'in time as their number'; time and number do not figure here as having elements analogically related to them (the now to time, the unit to number). Time now figures as itself a variety of number, the number of movement, and for events to be in time is to be numerable, i.e. susceptible to the recognition of a before and an after in them.

17-18. εἰ . . . τόπου. Torstrik argues that this is not in place, (1) because it is a mere anticipation of ^a 26-30, (2) because it interrupts the discussion of the senses of ἐν χρόνῳ. He thinks, however, that it is not an interpolation but a piece of bad editing. Aristotle may have meant to go straight in ^a 17 to the question of τὸ περιέχασθαι ὑπὸ χρόνου and then have added by an afterthought in ^a 19-26 the rejection of the sense of τὸ ἐν χρόνῳ εἶναι as τὸ εἶναι ὅτε ὁ χρόνος ἐστίν.

17-18. περιέχεται . . . τόπου. The words added in brackets are required by the sense, and were read by Themistius (154. 24) and Simplicius (738. 25).

22. καὶ . . . κέγχρω. This is perhaps the far-off origin of Blake's 'To see a world in a grain of sand' (*Auguries of Innocence*).

^b 4. ἡ αἰεὶ ὄντα, in respect of their eternal being, not in respect of changes they may undergo in the course of it.

8. κατὰ συμβεβηκός is omitted in T. 155. 31, and Philoponus says that most MSS. omitted it and that Alexander's commentary said nothing about it (756. 9). κατὰ συμβεβηκός in T. 156. 8 seems to be expansion, and in 156. 29 it seems to refer to 221^b 26. It is just the sort of phrase that might have been added by a copyist under the influence of κατὰ συμβεβηκός ^b 26, or of Alexander's comment (S. 742. 34) ὅτι συμβέβηκε τῇ κινήσει ἢ στέρησις τῆς κινήσεως.

9-14. οὐ . . . πρότερον. Time being not movement but the number of movement, or (as we might perhaps better say) the dimension in which movement is extended, there is no reason why rest should not be extended in the same dimension; given that rest is not the negation of movement but the privation of it, i.e. the alternative state to movement in a thing that is capable of movement.

13-14. καθάπερ . . . πρότερον, iii. 202^a 4.

23-5. φανερόν . . . σύμμετρον. Aristotle says that not all the things that are not are in time; the non-existent things that are of necessity non-existent (ἄλλως ^b 24 = ἄλλως ἢ μὴ εἶναι), such as that the diagonal of a square is commensurate with its side, are not in time. On the other hand, things that, though not existent now, were or will be existent, such as Homer or any future event (^b 32), are in time. Similarly in *Met.* 1024^b 19-21 τὸ τὴν διάμετρον εἶναι σύμμετρον and τὸ σὲ καθῆσθαι are quoted as instances of the two types of οὐκ ὄντα.

26. τῶν δ' ἄλλων κατὰ συμβεβηκός. This refers to moving (or resting) objects, which, as Aristotle has said in ^b 19, time measures not in respect of their own nature but in respect of the movement (or rest) which belongs to them.

29. καὶ ὅλως . . . μή. This is added to bring in the things that pass from not-being to being and *vice versa* without a process of generation or destruction, viz. accidental events (*Met.* 1026^b 23) and their causes (ib. 1027^a 29), sensations (*De Sensu* 446^b 4), geometrical points, lines, and surfaces (*Met.* 1002^a 32), moments (ib. ^b 6), forms superinduced on matter (ib. 1033^b 5, 1043^b 15, 1044^b 22), contacts (*De Caelo* 280^b 27).

222^a 2. καὶ ἦν καὶ ἔσται, which is lacking in V and P^v, seems likely to be a gloss.

6-7. οὐ . . . ὄντι. Torstrik argues that the fact that the commensurability of the diagonal of the square with the side is not in time should be inferred from its never existing, and not *vice versa*. He therefore holds that the text must have read διότι ἐναντίον κτλ., that

αἰεὶ οὐκ ἔστιν is a gloss which got inserted after διό, and that τι then was altered into ὅτι. The readings of Philoponus and Simplicius are doubtful; T. 157. 7 has διότι ἐναντίον ἔστιν τῷ αἰεὶ ὄντι. But Themistius may be simplifying, as he often does. The text may stand, as a slightly loose way of saying 'and the reason why it always does not exist is just the already (^a4) mentioned fact that it is contrary to that which exists always'.

CHAPTER 13

Of the two kinds of thing described in 221^a 13-17 as being in time, Aristotle has in 221^a 26-222^a 9 discussed πράγματα (events), which are in time in the sense of being measurable by time. He discusses in this chapter the other class (τὸ νῦν καὶ τὸ πρότερον καὶ ὅσα τοιαῦτα, 221^a 14), which are in time in the sense of being μέρος or πάθη of time, or generally τοῦ χρόνου τι (ib. 12-13, 16) as unit, odd, even are of number (ib. 15).

222^a 10-20. Τὸ δὲ νῦν . . . ταῦτό. The object of this section is to show that the now both actually holds time together, and potentially divides it. Simplicius takes the reference to its divisive function to begin with καὶ πέρας χρόνου ἔστιν ^a 11-12, and on the face of it this seems the natural interpretation. But it is negated by the fact that in ^a 17-19 πέρας καὶ ἐνότης are coupled together in opposition to διαίρεσις. The whole of ^a 10-13 must therefore be treated as expressing the uniting activity of the now, and the dividing activity held to be first introduced by διαίρει δὲ δυνάμει ^a 14.

10. ὡςπερ ἐλέχθη, 220^a 5.

12. πέρας χρόνου means here not a boundary of the whole of time, but a boundary between one time and the next.

ὅλως, which Bekker has before πέρας, gives a wrong sense (since πέρας is not a generalization of συνέχεια), and is probably a corruption of ὄρος, which is an old variant for (or gloss upon) πέρας. The reading πέρας is preferable to ὄρος because it is the word which Aristotle uses in ^a 18.

13. ἀλλὰ . . . φανερόν. The activity of the now as uniting time is analogous to that of the point as uniting the line, but owing to its transitoriness the fact is less obvious.

14. διαίρει δὲ δυνάμει. Both the line, and time, are essentially continuous; the point and the now divide them only in the sense that they make them potentially divisible by an act of thought which regards the line as made up of two lines, or the time of two times.

14-19. καὶ . . . ἐνότης, an example of 'binary construction'; cf. note on 200^a 34-b 3. The point (or the now) is always one individual entity,

ἐν τῷ ὑποκειμένῳ. But when it is treated as dividing, it is treated as δύο τῷ λόγῳ, as if it were two, one being the end of one part and another the beginning of another; while when it is treated as uniting, it is treated as ἐν τῷ λόγῳ, a single principle holding together a single whole. πάντη ^a 17 = τῷ τε ὑποκειμένῳ καὶ τῷ λόγῳ.

18. τὸ μὲν . . . τὸ δέ, 'on the one hand . . . on the other hand'.

19-20. ἔστι . . . ταυτό, 'the dividing and the uniting are the same and are in respect of the same thing (i.e. the point in the case of the line, the now in the case of time), but their essence is not the same'. This is Aristotle's way of saying that they are inseparable but diverse aspects of one single situation.

23. οὐδ' . . . νῦν. In ^a 26 the κατακλυσμός is described as future; and we want here a reference to a future event, to balance the reference to the Trojan war, as we have a past and a future event named in ^a 22 and in ^a 25-6. Therefore γέγονε is probably corrupt. Themistius seems to have had nothing in its place (158. 2); it is not clear whether Philoponus' text simply omitted it or had ἔσται in its place (761. 23, 764. 26). Simplicius' paraphrase omits γέγονε νῦν (750. 6), but we cannot be sure what he read. Probably γέγονε and ἔσται are rival glosses on the bare νῦν.

Plato (*Tim.* 22 c) speaks of future as well as past floods, and Aristotle has a similar belief in cyclically returning destructions of civilization (*Met.* 1074^b 10).

24. ὁ χρόνος is a slight improvement on Bekker's χρόνος, and better attested.

25. τὸ πρότερον νῦν, i.e. the momentary now of ^a 10-20 as opposed to the extended now of ^a 21-4.

29. πᾶς . . . χρόνος, not, of course, time as a whole, but every particular period of time.

30. εἴπερ . . . κίνησις. This, which is assumed here, is proved in viii. 1.

31-3. δῆλον . . . ἔσται. Aristotle merely says that the same time recurs if and only if the same movement recurs; but he evidently wishes his readers to draw the conclusion that, since what recurs is not a numerically but only a specifically identical movement, the same is true of time. He has already stated this in 220^b 6-14.

^b 2-4. ἔχοι . . . τελευτή. Strict grammar would require the second clause to run οὕτως καὶ ὁ χρόνος ἐν τῷ αὐτῷ πως ἀρχὴν καὶ τελευτήν, but the variation of form is natural enough.

4-7. καὶ διὰ τοῦτο . . . ἀρχῆ. ^b 4-6 καὶ διὰ τοῦτο . . . εἴη, ^b 6-7 καὶ οὐχ . . . ἀρχῆ give Aristotle's answers to the two questions raised in ^a 29-31.

5-6. ἅμα . . . εἴη. For the repetition of ἅ cf. Bonitz, *Index*, 41^a 59^b 3.

16-17. ἐν δὲ τῷ χρόνῳ . . . φθείρεται. Torstrik objects that not all things come into being and disappear in time, and emends accordingly. But the Greek commentators understand the text rightly as meaning that all things that come into being and disappear do so in time.

17. οἱ μὲν σοφώτατον ἔλεγον, Simonides fr. 19, p. 1123 Bergk. Simonides' actual words are not known. σοφώτατον χρόνος· ἀνευρίσκει γὰρ πάντα is also quoted as an apophthegm of Thales (Diog. Laert. i. 35.)

ὁ δὲ Πυθαγόρειος Πάρων. Themistius and Philoponus treat Πάρων as a proper name. Simplicius conjectures παρών, and connects the reference with the unnamed sage whom Eudemus described as remarking (when he heard Simonides at Olympia praise time as σοφώτατον) τί δέ, ὦ Σιμωνίδη, οὐκ ἐπιλανθανόμεθα μέντοι ἐν τῷ χρόνῳ; If Simonides had been mentioned by Aristotle, and if Aristotle had said Πυθαγόρειός τις, Simplicius' view would be plausible; as things are, it is not. Nothing, however, is known about Paron, beyond what Aristotle says here.

20-1. καθάπερ . . . πρότερον, 221^b 1.

21-2. γενέσεως . . . συμβεβηκός. This is because the destruction of one substance is necessarily the generation of another.

23. γίγνεται . . . πράττειν. κινεῖσθαι refers to such cases as the γένεσις of a house by changes produced in the materials, πράττειν to such cases as the production of an artist by practice in the art (*E.N.* 1103^a 33 οἰκοδομοῦντες οἰκοδόμοι γίνονται καὶ καθαρίζοντες καθαρισταί).

24. ταύτην, i.e. destruction by which a thing is destroyed without suffering any κίνησις, e.g. death from old age as opposed to death by violence, accident, or disease.

CHAPTER 14

223^a 1. τὸ ὑποκείμενον, the assumed terminus of change. Cf. 229^b 29 ἐν δυσὶν ἢ κίνησις ὑποκειμένοις.

ὁμαλήν κίνησιν κινούμενον. To judge from the instance given, ὁμαλήν seems to refer here not to the uniform velocity of each of the moving bodies, but to the fact that the two moving bodies move along paths of similar shape, and not merely κατὰ τὸ αὐτὸ διάστημα, between extremes that are the same linear distance apart. Cf. 228^b 18-25.

3. τὴν περιφερῆ, sc. γραμμὴν.

20-21. ὁ δὲ χρόνος . . . ἐνέργειαν, i.e. the things that are actually in movement are identical with those that are actually in time, and those that are potentially in movement with those that are potentially in time. Alexander thought that by the latter class of things are meant τὰ ἡρεμοῦντα. But Simplicius points out that, since time is the measure of rest as well as of movement (221^b 8), things at rest are *actually* in time. He may therefore be right in suggesting that

the reference is to things that are capable of coming into being but have not yet done so.

24-5. ἀριθμός . . . ἀριθμητόν, i.e. ἀριθμός in the sense in which Aristotle holds time to be ἀριθμὸς κινήσεως, as distinct from ἀριθμὸς ᾧ ἀριθμοῦμεν (abstract number) (219^b 5-8).

26. ἀλλ' ἢ idiomatically = 'but only'; cf. *H.A.* 563^b 22, 580^a 20, *Met.* 1005^a 12, 1036^b 31, 1038^a 14, *Pol.* 1257^b 21. The idiom is discussed by Cook Wilson in *Class. Quart.* iii. 121-4, and by Denniston in *Gk. Particles*, 24-7.

27. τοῦτο . . . χρόνος. We may either (1) omit ὄν with S. 760. 4 and translate 'that which time is', i.e. is as regards its ὑποκείμενον, i.e. the substratum of time. Or (2) we may read ὄν and translate 'that, being which time exists', which again means 'the substratum of time'. In the latter case we should expect ὄν, and ὄν must be explained by supposing that the phrase ὁ ποτε ὄν had become so habitual with Aristotle (cf. 219^a 20, ^b 14, 18, 26, 220^a 8) that he uses it even where the subject of the ἔστιν is a masculine noun. This reading is preferable, because it is doubtful if ὁ ποτέ ἔστιν ὁ χρόνος would indicate clearly enough that the substratum of time is meant.

^b 1-2. ἀλλ' . . . ἀριθμός, 'but in addition to a particular thing that has changed something else may have changed; and there will be a number of each of the two respective changes of these subjects'. ἄλλο is better than ἄλλα, in view of ἑκατέρας, and is supported by P. 776. 18, 781. 6, S. 763. 30.

Torstrik holds that ὦν ἑκατέρας τῆς κινήσεως is bad Greek, and should be ὦν ἑκατέρου τῆς κινήσεως or else ὦν ἑκατέρας κινήσεων. The text is not impossible, however, if translated as above. If any change is made, ὥσθ' ἑκατέρας τῆς κινήσεως (cf. P. 781. 8) would be better than Torstrik's ὥστε καὶ ἑτέρας κινήσεως.

2-3. ἕτερος . . . εἶεν. This is a dialectical statement of a conclusion that might be drawn from what precedes; Aristotle immediately sets it aside.

3-4. ὁ αὐτὸς γὰρ χρόνος . . . ἅμα. I have adopted a reading which gives the right sense, and perhaps will account as well as any other for the extraordinary variety of recorded readings. E's reading would have arisen from it by omission of εἰς ὁ by haplography before ἴσος, and that of FGIJ by corruption of ὁ ἴσος into ὁμοίως. For ὁ αὐτὸς καὶ εἰς cf. 185^b 8, *Cat.* 4^a 10, *Pol.* 1280^b 35, &c., and εἰς καὶ ὁ αὐτὸς ^b 11 infra; and for ὁ ἴσος καὶ ἅμα cf. ^b 9, 12.

4. εἶδει . . . ἅμα. Cf. 220^b 12-14.

8-10. ὁ μέντοι χρόνος . . . φορᾶς. The vulgate text can hardly be right, either with or without a comma after ἴσος. It is most simply put right by treating ὁ ἀριθμός as a gloss.

12-13. ἐπεὶ . . . κύκλω. Prantl inserts πρῶτη before ἔστί, to provide

a minor premiss to fit the major premiss τὸ πρῶτον (sc. ἐστὶ) μέτρον πάντων τῶν συγγενῶν ^b 18, and to give the conclusion drawn in ^b 19. The argument would have been clearer if the Greek had run so, and πρῶτη if written ἀ' might easily have been omitted. But there is no trace of πρῶτη in any of the MSS. or of the Greek commentators; and in point of fact the reason for regarding uniform circular movement as πρῶτον (the primary kind of movement) and therefore as μέτρον (the measure of all movement) is given in the last words of the sentence, ὅτι ὁ ἀριθμὸς ὁ ταύτης γνωριμώτατος. It is the knowability of the number of regular circular movement that makes such movement the best measure of other movements and of time. It owes its knowability (1) to the fact that a single revolution forms a natural unit of circular motion, whereas there is no natural unit of rectilinear motion or of non-local κίνησις, any unit of such that is taken being taken arbitrarily; and (2) to the fact that the heavenly bodies, which exhibit it, are visible to all men.

If it be thought necessary to insert πρῶτη, the clause should run ἐπεὶ δὲ πρῶτη (? τῶν κινήσεων) ἐστὶν ἡ φορά.

15. ὡσπερ εἴπομεν, 220^b 23.

20-21. ἀλλοίωσις . . . ἐστίν. Aristotle does not mean to deny that there may be ἀλλοίωσις, αὔξησις, or γένεσις which for a time proceeds at a uniform rate. What he is asserting is that none of them can be counted on to proceed always at this rate. The reason for this is expounded in 261^a 28-^b 26, viz. that all kinds of κίνησις other than circular motion move between opposite termini and involve a pause at each terminus before movement begins in the opposite direction.

Again, he is not asserting that all φορά proceeds uniformly. Rectilinear motion does not do so, since (according to him) when it is κατὰ φύσιν it becomes faster as bodies near their proper place, and when it is παρὰ φύσιν it becomes slower as the impressed force becomes exhausted. The circular motion of the heavenly bodies is the only change which by its nature proceeds uniformly.

21-224^a 2. διὸ . . . ὅλον. Aristotle here points out that the sayings which describe time as the motion of the heavenly sphere, or as a circle, are natural exaggerations due to the close relation between time and its primary measure, which is the circular motion of the heavens.

21-2. διὸ . . . κίνησις, the ἐνδοξον recorded in 218^a 33.

25-6. καὶ . . . φθοράν, sc. κύκλον εἶναι.

27. κρίνεται = μετρεῖται ^b 15.

33-224^a 2. παρὰ γὰρ τὸ μέτρον . . . ὅλον. The MS. reading is indefensible and Torstrik's τῷ μετρομένῳ seems necessary; παρεμφαίνεται then has its proper meaning, 'nothing appears apart from the

measure *in* the measured'. In view of examples such as Xen. *Oec.* 2. 13 οὔτε ἄλλος πώποτε μοι παρέσχε τὰ ἑαυτοῦ διοικεῖν ἀλλ' ἢ σὺ νυνὶ ἐθέλεις παρέχειν (cf. Denniston, *Gk. Particles*, 24-7), it is unnecessary to insert ὅτι after ἀλλ' ἢ.

224^a 2-15. λέγεται . . . ἴπποι. In this section Aristotle returns to the point dealt with in 223^b 1-12, that the time of different events is the same time provided that it is equal and simultaneous, as the number of different groups is the same number if the groups are equal. He establishes the latter point by a more careful treatment, and evolves the general formula that if two things *a* and *b* do not differ from one another by a differentia of their genus *c*, they are the same *c* (i.e. the same sort of *c*), though they may not be the same *d* (the same sort of *d*) where *d* is a species of *c*. Thus the ten which is the number of a group of ten sheep is the same number, but not the same ten, as the ten which is the number of a group of ten dogs.

There is this difference, not pointed out by Aristotle, between the case of the two tens and that of the equilateral and the scalene triangle, that while the former differ only numerically, the latter form different sub-species.

At the same time, this section probably has a connexion with what has immediately preceded in 223^b 23-224^a 2. Aristotle has there admitted that there is some truth in the saying that the history of the world is cyclical. Here he by implication points out that though days, months, years, and even the events that fill them, succeed one another cyclically, yet each day, month, year, and cycle of events is different individually from that which it succeeds, as a group of ten sheep is individually different from a group of ten dogs though they are both instances of the same number 10.

Themistius does not comment on this section, but his allusion to δέκα πρόβατα in 162. 23 (cf. 224^a 3) seems to show that he had it before him; neither the number ten nor sheep are mentioned in 223^b 5. Philoponus and Simplicius comment on the passage, and take it as an elucidation of 223^b 4-6.

6-7. ταῦτο . . . διαφέρει, 'for they are called the same *c* if they do not differ by a differentia of *c*, but not the same *d* if they differ by a differentia of *d*'.

7-8. οἶον . . . διαφέρει. Torstrik's insertion of *τριγώνου* receives some support from S. 772. 9, and is called for by the sense.

11-12. σχῆμα . . . τρίγωνον. Bekker has *σχῆμα μὲν οὖν τὸ αὐτὸ καὶ τοῦτο (τρίγωνον γάρ)*. But here the *καὶ* is unmeaning; for no other pair of things has been described as *τὸ αὐτὸ σχῆμα*. Now E has instead of *καὶ τοῦτο (τρίγωνον γάρ)* simply *καὶ τὸ τρίγωνον*, and it looks as if *καὶ τοῦτο τρίγωνον* were the true reading, to which *γάρ* was added

through misunderstanding of the construction. Philoponus' and Simplicius' commentaries do not indicate clearly what they read, but P. 786. 6-8, S. 770. 30 might be held to support our reading.

12. καὶ ἀριθμός. The editors have καὶ ὁ ἀριθμός, but καὶ ἀριθμός is required for the sake of parallelism with σχῆμα τὸ αὐτό^a 11, δεκάς οὐχ ἢ αὐτή^a 14.

16. τῶν . . . οἰκείων τῆ σκέψει = τῶν τῆ περὶ αὐτὸν σκέψει οἰκείων.

BOOK V. CHAPTER I

224^b 7-10. μᾶλλον . . . ὄντος. Aristotle explains here why he has not in ^b 6 named the ἐξ οὐ as well as the κινεῖν, the κινούμενον, and the εἰς ὄ. Movement must have an ἐξ οὐ, but is sufficiently, and more commonly, described by naming the εἰς ὄ in addition to the κινεῖν and the κινούμενον; sufficiently, because in a κίνησις proper the ἐξ οὐ must be the contrary of the εἰς ὄ (or an intermediate) (225^b 1-3), and in a γένεσις or φθορά the contradictory of the εἰς ὄ (225^a 35-^b 1); and more commonly, because it is natural to take for granted the given or pre-existing terminus and name that which is (during the change) still in the future.

II. εἴρηται πρότερον, iii. 201^a 10.

τὰ δὲ εἶδη . . . πάθη. εἶδη is here used of substantial natures, πάθη of the inessential qualities and the sizes which are the *termini ad quos* of alteration, and of increase or diminution, respectively. In ^b 5 εἶδος included both substantial natures and inessential qualities.

13-14. εἰ . . . κινήσεις. This is an assumption which is natural enough, since πάθος is often used of processes of undergoing change. Aristotle's answer (^b 15-16) consists in pointing out, in effect, that the word πάθος is ambiguous, standing sometimes for a process (such as λεύκανσις) and sometimes for a condition that is a result of a process (such as λευκότης), and that it is only a πάθος in the second sense that can properly be described as the *terminus ad quem* of a change.

16-22. ἔστιν . . . αὐτό. Aristotle has already pointed out that the distinction of κατὰ συμβεβηκός, κατὰ μέρος, καθ' αὐτό πρῶτον exists in the case of the κινούμενον (^a 21-8) and of the κινεῖν (^a 30-34). He now points out that it exists also ἐν ἐκείνοις, in the case of the termini which are involved in all change (^b 12; cf. ^a 35-^b 1). He illustrates this by reference to the εἰς ὄ, which he has already described as more important for the characterization of change than the ἐξ οὐ (^b 7-10). That which is growing white (1) may be moving *per accidens* to the state of being an object of thought, if it when it has become white is going to be an object of thought, and (2) it may

be said *per partem* to be moving towards being coloured, since whiteness is a part (or rather species) of colour; but (3, it is moving *per se* towards white colour.

17-18. καὶ [τὸ] κατ' ἄλλο . . . ἄλλο. Bekker reads τὸ κατ' ἄλλο and τὸ μὴ κατ' ἄλλο. But ^b 16-18 must be referring to the same three things that have been distinguished in ^a 21-8 and in ^a 30-34. Further, τῷ ἄλλο τι τῶν αὐτοῦ has occurred in ^a 27 in the same sense as κατὰ μέρος in ^a 32. Bonitz seems justified therefore in arguing that here κατὰ μέρος and κατ' ἄλλο are synonymous and that the τό before κατ' ἄλλο is intrusive. Similarly τὸ πρώτως καὶ μὴ (not τὸ μὴ) κατ' ἄλλο is a good equivalent for τὸ καθ' αὐτὸ πρῶτον (^a 32-3). Thus we get (1) τὸ κατὰ συμβεβηκός, (2) τὸ κατὰ μέρος καὶ κατ' ἄλλο, (3) τὸ πρώτως καὶ μὴ κατ' ἄλλο.

21. καὶ . . . Εὐρώπης. In ^b 18-22 as a whole Aristotle works out the distinction between the three possibilities (cf. last note) in a case of ἀλλοίωσις, in which the εἰς ὃ proper is a πάθος. But in the middle of the illustration it occurs to him that the distinction applies equally well to φορά, in which the εἰς ὃ is a place, and in the present words he briefly indicates its application in such cases.

22-6. πῶς . . . ἐνέργειαν. πῶς . . . 25 δῆλον sums up ^a 21-34; 25-6 καὶ . . . ἐνέργειαν sums up ^a 34-^b 10.

24. καὶ . . . πρῶτον. Prantl's emendation is necessitated by the sense and supported by τῷ αὐτὸ κινεῖσθαι πρῶτον ^a 28. But Bonitz holds that, the three possibilities to be distinguished having been already named in πῶς . . . τι ^b 22-4, πῶς τῷ αὐτὸ πρῶτον is either an interpolation or in its wrong place (by the latter suggestion he no doubt means that in ^b 22-3 we should read πῶς μὲν οὖν καθ' αὐτὸ κινεῖται καὶ τῷ αὐτὸ πρῶτον). The text, however, is perfectly defensible if we take Aristotle to be first opposing καθ' αὐτό to κατὰ συμβεβηκός, and then τῷ αὐτὸ πρῶτον to κατ' ἄλλο τι. The two oppositions taken together then serve to oppose τὸ καθ' αὐτὸ πρῶτον (^a 32-3) both to τὸ κατὰ συμβεβηκός and to τὸ κατ' ἄλλο τι.

26. ἢ μὲν οὖν κατὰ συμβεβηκός μεταβολὴ ἀφείσθω. S. 810. 7-8 may be right in saying that Aristotle excludes τὸ κατὰ μέρος from consideration as well as τὸ κατὰ συμβεβηκός proper; at least he does not discuss it in what follows. Change which is not *per se*, being completely indeterminate as regards its termini (ἐν ἅπασιν), its time (αἰεὶ), and its subjects (πάντων), is no matter for scientific analysis.

27-8. ἐν ἅπασιν τε . . . πάντων. Change *per accidens* can take place ἐν ἅπασιν, since its termini are not necessarily either contraries (or their intermediates) or contradictories (cf. ^b 28-9); it may be, e.g., from being black to being an object of thought (^b 18). It can take place αἰεὶ, since a thing may be changing *per accidens* even when it is not changing *per se*, e.g. a man at rest in a ship is moving *per*

accidens if the ship is moving (S. 810. 23-5). It can be πάντων, since even subjects that are not susceptible of movement *per se* may suffer movement *per accidens*; e.g. the soul through its association with the body (S. 810. 14-17).

30. τούτου . . . ἐπαγωγῆς. Aristotle means that if you reviewed all the cases of *per se* change you could think of, you would satisfy yourself of the truth of what he says.

35-225^b 9. ἐπεὶ . . . τόπον. The classification of change given in this chapter may be summarized as follows: In the abstract, change might be supposed to be (1) from A to B, (2) from A to not-A, (3) from not-A to A, (4) from not-A to not-B. But in fact no change can be merely from not-A to not-B, since there is no antithesis between the supposed termini. Thus we get (1) change from A to B, where either A and B are contraries (each denoted by a positive term), or one is a contrary and the other is intermediate between it and its contrary. (2) change from A to not-A, i.e. φθορά, which may be (a) φθορὰ ἀπλῶς, the ceasing to be of a substance, or (b) φθορὰ τις, a substance's losing of a quality (or, we may add, of a size, or location). (3) change from not-A to A, i.e. γένεσις, which may be (a) γένεσις ἀπλῶς, the coming to be of a substance, or (b) γένεσις τις, a substance's acquisition of a quality (or size, or location). Since that which is not cannot be said to move, (3) is described as not being κίνησις though it is μεταβολή; and since (3) is not κίνησις, (2) (which is its contrary) is not κίνησις either (225^a 20-34). Thus we have a division of μεταβολή into (I) κίνησις, between contraries, and (II) γένεσις and φθορά, between contradictories. But it will be noticed that under the heading of γένεσις τις and φθορά τις Aristotle introduces the very same changes which are also κινήσεις. The fact is that the same process may be described in either of two ways. Describe it as a thing's acquisition (or loss) of whiteness; then it is γένεσις (or φθορά) τις. Describe it as a thing's passage from contrary to contrary, e.g. from blackness to whiteness (or from whiteness to blackness), and it is κίνησις.

A fresh principle of classification is introduced by the mention of the categories in 225^b 5-9. The kinds of μεταβολή then regroup themselves as

- (a) κατ' οὐσίαν—γένεσις καὶ φθορά—which is not κίνησις,
- (b) κατὰ τὸ ποιόν—ἀλλοίωσις,
- (c) κατὰ τὸ ποσόν—αὐξήσις καὶ φθίσις,
- (d) κατὰ τὸ πού—φορά.

225^a 3-7. ἢ . . . δηλούμενον. The use of ὑποκείμενον here can hardly be brought, as Bonitz brings it (*Index*, 798^b 13), under its common meaning of *id quod positum est tamquam fundamentum cui alia inhaerent*, for it refers not to the substratum of change (τὸ

κινούμενον) but to its termini, which are not viewed as having anything inherent in them. Rather Aristotle means a positive entity (^a 6-7)—a substantial nature, a quality, a size, or a place—which has to be laid down or presupposed as implied in change, viz. as its *terminus a quo* or *ad quem*. Then μὴ ὑποκείμενον is used loosely for the absence of such an entity, such absence being implied as a terminus in two of the kinds of change (γένεσις and φθορά).

5. οὐκ ἐξ ὑποκειμένου. Since this is clearly meant to state the *terminus a quo*, it must be supposed to stand idiomatically for ἐκ μὴ ὑποκειμένου, which is substituted for it in ^a 9-10. Cf. Bonitz, *Index*, 539^a 14.

7. ἐκ τῶν εἰρημένων more probably means 'as a result of what has been said' (in 224^b 28-9) than 'of the possibilities named'.

13. κατ' ἀντίφασιν, i.e. the relation of the *terminus a quo* to the *terminus ad quem* is in this case (as opposed to that of change ἐξ ὑποκειμένου εἰς ὑποκείμενον) one of contradiction, not of contrariety.

14. ἡ μὲν ἀπλῶς . . . τινός. There is a chiasmus here, τινός answering to ἀπλῶς, and τίς to ἀπλή (cf. τούτου ^a 15)(ἀπλῶς ^a 16). In *Met.* 1067^b 23 A^bEJ have τίς τινός, some later MSS. τινός τίς. Ib. 24-5 (on φθορά) A^b has τίς τινός, EJ τινός τίς. S. 813. 26 omits ἀπλή and τινός. The reading is therefore somewhat uncertain, but since Aristotle in ^a 18-19 opposes ἀπλῶς to τίς, it would seem that he is not very careful in his statement of the opposition, and we may therefore accept what is the reading of all the MSS. here, τίς τινός.

15. ἡ δ' ἐκ τοῦ μὴ ὄντος ἀπλῶς εἰς οὐσίαν. This does not mean genesis out of nothing; for Aristotle believes that *ex nihilo nihil fit*; a man is produced from a seed, earth is produced from water. The fundamental difference for him between γένεσις τις and γένεσις ἀπλή is that in the former there is a substance that persists through the change, while in the latter there is not, but only matter, which is only an element in a substance, incapable of existing without the element of form. This difference he somewhat exaggerates by describing γένεσις ἀπλή as ἐκ τοῦ μὴ ὄντος ἀπλῶς, which receives only a partial justification from the fact that in γένεσις ἀπλή a substance comes into being out of a state in which the substance simply was not, while in γένεσις τις a substance which already existed receives a new qualification.

19. ἡ εἰς τὴν ἀντικειμένην ἀπόφασιν, e.g. from whiteness to not-whiteness (cf. ^a 14-15).

20-26. εἰ . . . κινεῖσθαι. Bekker and Prantl read in ^a 22-5 τὸ τῷ ἀπλῶς κατ' ἐνέργειαν ὄντι ἀντικείμενον· τὸ μὲν γὰρ μὴ λευκὸν ἢ μὴ ἀγαθὸν ὅμως ἐνδέχεται κινεῖσθαι κατὰ συμβεβηκός (εἴη γὰρ ἂν ἄνθρωπος τὸ μὴ λευκόν), τὸ δ' ἀπλῶς μὴ τότε οὐδαμῶς· ἀδύνατον γάρ κτλ. The sentence is thus left without a principal verb, and ἀδύνατον τὸ μὴ ὄν κινεῖσθαι

is made the reason for what has gone before, instead of the conclusion from it. The sentence is completely cured by placing ^a 23-5 τὸ μὲν γὰρ μὴ λευκὸν . . . οὐδαμῶς in brackets and excising γάρ in ^a 25, which is omitted by the MSS. J and T in *Met.* 1067^b 30, and by Themistius in the *Physics*, since his paraphrase (169. 18) reads ἀδύνατον τοίνυν τὰ οὕτω μὴ ὄντα κινεῖσθαι.

20. εἰ . . . πλεοναχῶς. The senses of μὴ ὄν that Aristotle has in mind are (1) τὸ κατὰ σύνθεσιν ἢ διαίρεσιν (^a 21), (2) τὸ τῷ ἀπλῶς κατ' ἐνέργειαν ὄντι ἀντικείμενον (^a 22) = τὸ ἀπλῶς μὴ τόδε (^a 25), i.e. that of which not-man is an instance, (3) τὸ μὴ λευκὸν ἢ μὴ ἀγαθόν (^a 23). He points out that (1) and (2) cannot be moved at all, and that (3) can be moved only *per accidens*, and concludes (^a 25-6) that τὸ μὴ ὄν cannot, in any of its senses, be strictly said to be moved.

21. τὸ κατὰ σύνθεσιν ἢ διαίρεσιν. This is that which is not, in the sense that it is a false proposition, false because it puts together what does not in fact coexist (κατὰ σύνθεσιν), or divides what in fact coexists (ἢ διαίρεσιν). It is what is in *Met.* 1089^a 28 called τὸ ὡς ψεῦδος μὴ ὄν (cf. ib. 1017^a 31, 1026^a 35, 1051^b 1). In *Cat.* 4^a 21-^b 13 Aristotle points out that though a true λόγος or δόξα may become false or a false one true, it undergoes no change but is made false or true only by a change in the facts.

22-3. τὸ κατὰ δύναμιν . . . ἀντικείμενον. This is the μὴ ὄν ἀπλῶς of ^a 15, the ἀπλῶς μὴ τόδε of ^a 25, in contrast to τὸ μὴ λευκὸν ἢ μὴ ἀγαθόν (^a 23). The not-white cannot be said to undergo change *strictly*, when what is not white becomes white, since what undergoes change persists through the change; but it can be said to undergo change *per accidens* since that of which it is an accident (and which is also an accident of it), viz. the not-white *thing*, the man or stick or whatever it is, persists through the change. But when a τόδε, an individual substance, is produced out of what is not it, there is no substance that persists, and therefore no *thing* that can be said to undergo change, but only the matter, which is not a thing but only one element in a thing.

25. οὐδαμῶς, i.e. neither *per se* nor *per accidens*.

27-9. εἰ . . . ἀπλῶς, i.e. even if it is *per accidens* that the μὴ ὄν comes to be something, i.e. even if it is not what is just not a man that becomes a man, but a whole (viz. a seed) made up out of not-manness inhering in matter, still not-manness may anyhow be predicated of that which comes to be a man, and in general, of that which comes to be any τόδε it may be said that it *is not* that τόδε. Cf. 191^b 13-17.

29. ὁμοίως . . . ἡρεμεῖν. ^a 26-9 εἰ . . . ἀπλῶς being parenthetical, the present words follow, in sense, upon ^a 25-6 ἀδύνατον . . . κινεῖσθαι. But the intervening words have driven the original construction out

of the author's mind, and he writes τὸ ἡρεμεῖν, instead of ἡρεμεῖν, as if he had said ἀδύνατον τὸ τὸ μὴ ὄν κινεῖσθαι.

Rest, being not the negation but the privation of movement, i.e. being predicable only of that which of which movement *might* be predicable, cannot be predicated of τὸ μὴ ὄν any more than movement can.

30-31. ταῦτά τε . . . ὄν. Jaeger (*Emend. Arist. Specimen*, 58-60) objects to Bekker's reading (1) that the proper construction with συμβαίνει should be not τῷ κινεῖσθαι but ἐκ τοῦ κινεῖσθαι, (2) that the words cannot be translated 'et hae eveniunt difficultates et aliae, quandoquidem' (εἰ), &c., and that there is nothing in the Greek to justify *aliae*. He reads therefore ταῦτά δὲ (ταῦτα δὲ E) δὴ συμβαίνει δυσχερῆ τῷ κινεῖσθαι τὸ μὴ ὄν καὶ κτλ. and translates 'die gleichen ungereimten Konsequenzen wie bei der Bewegung des Nicht-seienden ergeben sich auch aus der Ueberlegung, dass alles was sich bewegt im Raume ist'.

His objection to τῷ κινεῖσθαι when taken with συμβαίνει is perhaps justified; but the words τῷ κινεῖσθαι τὸ μὴ ὄν are absent in EHJ and in *Met.* 1067^b 35 and are almost certainly a gloss. His interpretation of ταῦτά as *die gleichen* and of τῷ κινεῖσθαι τὸ μὴ ὄν as 'as arise from the movement of the non-existent' hardly commends itself; and there is no real difficulty in the introducing of the further *δυσχερῆ* by εἰ. ταῦτά τε . . . δυσχερῆ καὶ εἰ πᾶν κτλ., 'these consequences turn out difficult, and another difficulty arises if', &c. is good Aristotelian Greek. For the predicative use of *δυσχερῆ* with συμβαίνει cf. *συμβαίνει ἄτοπον De An.* 411^a 13, and for εἰ in a similar construction to the present cf. *Meteor.* 342^b 4 οὐδὲν ἄτοπον εἰ. εἰ is here practically = ὅτι, so that οὐκ (^a 31) is not irregular. Cf. Kühner, ii. § 511. 4^b γ.

35. αἱ εἰρημέναι, in ^a 8-10.

^b 3-4. καὶ . . . ἐναντίον. Privative terms, though not strictly contraries (since only the extreme degree of privation is contrariety, *Met.* 1046^b 14, 1055^a 35), may be classed with contraries rather than with contradictories, since they stand not for the mere absence of a quality but for its absence from a subject which is in some degree qualified to have it. The termini of movement are, unlike the *terminus a quo* of generation and the *terminus ad quem* of destruction, expressed by a positive word (*δηλοῦται καταφάσει*); cf. ^a 6-7.

'Naked' and 'toothless' are typical privative terms, but 'black' is for Aristotle a typical contrary. καὶ δηλοῦται καταφάσει, τὸ γυμνὸν καὶ νωδὸν καὶ μέλαν therefore follows in sense not on καὶ γὰρ ἢ στέρησις κείσθω ἐναντίον (which is parenthetical) but on τὰ ὑποκείμενα ἢ ἐναντία (which, as Aristotle says, may be taken to include privative terms) ἢ μεταξύ.

4-5. τὸ γυμνὸν . . . μέλαν. Bonitz objects that γυμνόν does not

occur elsewhere in Aristotle as an instance of *στέρησις*, and suggests *ψυχρόν* (cf. *Cat.* 12^b 34, *De Caelo* 286^a 26, *De Gen. et Corr.* 318^b 17) or *τυφλόν* (cf. *Cat.* 12^a 32 and *Cat.* ch. 10 passim, *Met.* 1022^b 26–1023^a 5), which is supported by *caecum* in Bessarion's translation of *Met.* 1068^a 7). But *γυμνόν* has all the remaining evidence in its favour and is a perfectly good example of privation.

Bonitz objects also to *λευκόν*, and here there can be little doubt that the reading of the *Metaphysics*, *νωδόν* (cf. *Cat.* 12^a 31, 34, 13^a 36) is right. It is easy to see how *μέλαν* may have led to the introduction of *λευκόν*.

5-7. εἰ . . . πάσχειν. The omission of *ἔχειν* and *κείσθαι* is not uncommon; they occur only in *Cat.* 1^b 27, 2^a 2-3, *Top.* 103^b 23. It seems probable that Aristotle had come to regard them not as categories but as sub-categories, perhaps merging them respectively in *ἕξις* and *διάθεσις*, two of the sub-forms of *ποιόν* (*Cat.* 8^b 26-9^a 13).

6. [καὶ τῷ ποτέ]. S. 829. 29 expressly comments on the absence of these words, and they are absent from *Met.* 1068^a 8-9. Further, it is only *οὐσία* (^b 10-11), *πρός τι* (^b 11-13), and *ποιεῖν* and *πάσχειν* (^b 13-226^a 23) that are eliminated as not being possible spheres of *κίνησις* (cf. 226^a 23-4). It seems then that the category of time must have been silently omitted by Aristotle, because it is self-evident that, time being that in which *all* movement takes place (224^a 35), or the number of movement (219^b 1), there is no *species* of movement which is in respect of time.

7. καὶ . . . πάσχειν. It is noticeable that here, as in 226^a 24, *ποιεῖν* and *πάσχειν* seem to be coupled together as forming a single category. They are similarly coupled in *Met.* 1017^a 26, 1068^a 9. In *Met.* 1029^b 25, 1054^a 6, 1069^a 22, *E.E.* 1217^b 33 this single category is called simply *κίνησις*. This group of passages may be contrasted with those in which *ποιεῖν* and *πάσχειν* appear as separate categories, viz. *Cat.* 1^b 27, *Top.* 103^b 23, *An. Post.* 83^a 22, ^b 17, *Met.* 1016^b 7-8.

CHAPTER 2

225^b 10-11. τὸ μηδὲν εἶναι . . . ἐναντίον. This is laid down in *Cat.* 3^b 24-7. Aristotle there goes on to show (^b 27-32) that definite quantities also have no contrary, but admits that much and little, great and small, are contraries; and it is these that form the termini of quantitative change. There is change (*μεταβολή*) in respect of substance, but it is not *κίνησις* but generation or destruction, being between contradictories, not between contraries (225^a 35).

11. τοῦ πρὸς τι. The genitives in ^b 8, 14, 226^a 23, 24 show that *τοῦ* and not *τῷ* should be read here.

11-13. ἐνδέχεται . . . αὐτῶν. The sense required plainly is 'for,

owing to a change in one of two correlatives, the other correlative term may cease to be applicable though that to which it is applied does not change at all; thus the change of A in respect of relation is incidental to change of B in respect of some other category.' E.g. A is double the size of B; then if B changes its size, 'double' ceases to be applicable to A though A has not changed its size. S. 409. 2, 835. 14, 859. 26 quotes the text as it is given by the MSS., but we must before ἀληθεύεσθαι insert either μή, with Schwegler (in his edition of the *Metaphysics*), or ἀληθεύεσθαι καὶ μή, which would more easily have dropped out and seems to be the reading presupposed by A. *apud* S. 835. 1 and by T. 170. 20-24.

13-33. οὐδὲ . . . ἄγνοιαν. The statement that there is no movement of agent and patient, or of mover and moved, is pretty loose, but Aristotle makes his meaning clear by saying (a) that movement is never itself the subject of movement (^b 17-21), and (b) that movement is never a terminus of movement except *per accidens*; i.e. if A passes from state B to state C and back to B, it will incidentally pass from the passage from B to C to the passage from C to B ^b 21-33. It may be remarked that even if e.g. acceleration or retardation, or change of direction of movement, is incidental to locomotion, that is no sufficient reason why these should not be treated as forming a distinct class of change, i.e. change from one movement to another.

14. ἦ . . . κινουόντος. The παντός read by AS is hard to defend, since κινουόν and κινούμενον are, if anything, narrower than ποιούν and πάσχον, not wider (since an agent may act on a patient by bringing it to rest). I think therefore that παντός is a mistaken gloss.

22. εἰς ἕτερον εἶδος, 'into another mode of being'. Philoponus and Simplicius interpret this as 'into another kind of change'. But this is not a natural interpretation of ἐκ μεταβολῆς εἰς ἕτερον εἶδος. It is true that in ^b 27-8 Aristotle says μεταβάλλει . . . ἐξ αὐτῆς ταύτης τῆς μεταβολῆς εἰς ἄλλην, sc. μεταβολήν. But that comes after he has recalled the fact that change is between opposites (^b 26); of course the opposite of a change must be a change. Here he expresses himself more generally.

οἶον . . . ὑγίειαν. This is not an illustration of change from change to something else, and I no longer think (as I did in commenting on *Met.* 1068^a 22) that it may be treated as such by taking νόσου and ὑγίειαν loosely for νοσάνσεως and ὑγίανσιν. Further, S. 840. 8-9 seems to read the clause as illustrating the fact that all change is ἐξ ἄλλου εἶδους εἰς ἄλλο (^b 23-4); accordingly I have transferred it to ^b 24. And to give it a correct construction I have read ἀνθρώπου, which derives some support from the readings of Simplicius (MS. F) and of the *Metaphysics*.

23. αὐτή. Diels prints αὐτη in S. 839. 29. But the statement

must be a general one about all κίνησις, and Simplicius' interpretation (ib. 30) takes it so. I have therefore written αὐτή, which gives much the same sense as the πᾶσα of the *Metaphysics* (EJ).

26. εἰς ἀντικείμενα ὠδί, i.e. from not-A to A, or from A to not-A (a 35^b 1).

ἡ δὲ . . . κίνησις. I have adopted here the reading of A^b in *Met.* 1068^a 25 and of S. 840. 6-7. ἡ δὲ ὠδί = ἡ δὲ εἰς ἀντικείμενα ὠδί, i.e. from A to its contrary B. Cf. b 1-3. The readings of H (ἡ δὲ κίνησις) and of FI (ἡ δὲ κίνησις οὐχ ὁμοίως) seem to be attempts to get an antithesis to αἱ μὲν εἰς ἀντικείμενα ὠδί after ἡ δὲ ὠδί had been lost by haplography. The reading of *Met.* (EJ) (οὐ κινήσεις) has been introduced from 1068^a 3.

27. ἄμα at first sight seems questionable; it would seem that the change from change A to change B must *succeed* change A. But, as Simplicius points out, of that which is changing into something else some part must still have some of its former character. Change A must partly exist while it is changing into change B.

29. ἐνδέχεται γὰρ ἡρεμεῖν. The point of this is to remind us that *in fact* what follows on a change may be a state of rest, though according to the view under discussion it has to be supposed that what is changing from state A to state B is at the same time changing from that change to another change. Philoponus and Simplicius take the clause so.

30. κάκεινη . . . ἔσται. The point is not that the second change will have changed from something to something, but that it will be a change from something to something. I have therefore introduced E's ἔσται into the text.

30-31. ὥστε . . . ὑγίανσις, 'so that it will actually be the getting well that is the opposite of the falling ill,' sc. since the change to, while a thing changes from, one change must be the opposite change. ὑγίανσις is preferable to Bekker's ἡ ὑγίανσις.

33. ὅτε μὲν . . . ἄγνοιαν. One would expect this clause to refer solely to the case last mentioned, the change from recollecting to forgetting, while the MS. reading ὑγίειαν introduces a reference to the remoter case of change from falling ill to recovering. Further, ὅτε μὲν . . . ὅτε δ' refers naturally not to different cases but to successive stages in the same case. Again, ὑγίεια in the one case does not answer to ἐπιστήμη in the other. The corresponding pairs of terms as given by Aristotle are as follows: there is primarily a change from health to illness, or from ignorance to knowledge, and incidentally a change from falling ill to recovering, from recollecting to forgetting. Thus the term corresponding to ἐπιστήμη is νόσος. Finally, the change from recollecting to forgetting is incidental not to the change from ignorance to knowledge, alone, but to this + a

subsequent change from knowledge to ignorance. On all these grounds, Prof. J. A. Smith's *ἀγνοίαν* seems to be a necessary emendation; it is confirmed by P. 853. 32-854. 4 and S. 842. 18, 24, 26-843. 1.

35. ἀνάγκη . . . προτέραν, sc. γένεσιν γίγνεσθαι. Aristotle takes up the particular case of γενέσεως γένεσις rather than the general case of μεταβολῆς μεταβολή.

226^a 1. ἀπλή γένεσις has not here its technical meaning of generation as opposed to change in size, quality, or place (cf. 225^a 14-17)—a distinction that would be pointless here. It means the original, simple coming to be as opposed to the coming to be of coming to be that is mentioned in 225^b 35.

2-3. ὥστε . . . ἤδη. On the extraordinary variety of readings recorded here it may be remarked that (1) Bonitz's *τι γιγνόμενον γιγνόμενον* in ^a 2 is what the sense requires, and is confirmed by *ὅταν γένηται γιγνόμενον* ^a 8; (2) there is good authority for the omission of *τό* in ^a 2, but *τὸ γιγνόμενον ἀπλῶς*, rather than *γιγνόμενον ἀπλῶς*, seems to be needed as the antithesis to *τι γιγνόμενον γιγνόμενον*; (3) the balance of evidence is strongly in favour of *ἤδη* as against *εἰ δὴ* in ^a 3. The sentence which Bonitz gets by reading *εἰ δὴ*, i.e. *εἰ δὴ καὶ τοῦτ' ἐγίγνετό ποτε, ὥστ' οὐκ ἦν πω τότε γιγνόμενον*, is a more violent instance of *ὥστε in apodosis* than any in Aristotle; 232^a 12-14, with which Bonitz compares it (*Arist. Stud.* ii. iii. 109), is probably not an instance at all (cf. n. *ad loc.*).

3-4. ὥστ' . . . γιγνόμενον γιγνόμενον. I have introduced the second *γιγνόμενον* from E¹. 'So that it was then not yet coming to be coming to be,' sc. but only coming to be coming to be coming to be.

6-7. ἔτι . . . φθορά, 'further, what is subject to one movement is subject to the contrary movement, and to resting, and what is subject to being generated is subject to being destroyed.' Philoponus understands *ἡ ἐναντία* with *ἡρέμησις* as well as with *κίνησις*, and takes Aristotle to mean that what is capable of one sort of rest is capable also of the contrary rest, i.e. of rest in the contrary region of the universe. More probably Simplicius is right in taking *ἡρέμησις* to mean the rest which is contrary to the original movement. According to this view Aristotle means that what can move from A to B can also move from B to A or rest at A. In any case *καὶ ἔτι ἡρέμησις* is parenthetical, since the possibility of the contrary movement is alone what concerns the argument.

ἡρέμησις here, as in 231^a 2, probably means 'resting', not as in 230^a 4, 238^a 18, 'coming to rest'. In 251^a 26 either meaning would do.

8-10. ὥστε . . . φθειρόμενον. In accordance with the principle

just laid down, that which comes to be must also cease to be; the question is, when? Not as soon as it is coming to be coming to be (we must understand εὐθὺς γιγνόμενον as being opposed to ὅταν γένηται, so that another γιγνόμενον is to be understood, or read, after it), nor after it has come to be (ὑστερον must apparently mean ὅταν γένηται, as opposed to ὅταν γένηται γιγνόμενον). For what is perishing must exist; and the γιγνόμενον does not exist at either of these times; at one of the times there is only a γιγνόμενον γιγνόμενον, at the other only a γεγονός. It follows that it perishes when it has become, and is, γιγνόμενον; i.e. it ceases to be while it is coming to be, which is absurd.

In ^a 8 I have adopted E's original reading τὸ γιγνόμενον γιγνόμενον. The second γιγνόμενον is more likely to have been wrongly omitted than wrongly inserted.

11-12. τίς οὖν ἔσται—ὡσπερ . . . οὕτω τί is an instance of Riddell's 'binary structure' (*Apology of Plato*, 198, § 209); cf. 200^a 34^b-3 n.

13-14. δεῖ . . . γένεσιν. Bekker's καὶ μὴ κίνησιν ἢ γένεσιν is a conflation of two readings which S. 854. 15-16 treats as alternatives, μὴ κίνησιν and ἢ γένεσιν. The first of these will hardly bear Bonitz's rendering 'Denn Bewegung muss Bewegung sein aus diesem bestimmten Etwas in dies bestimmte Etwas, nicht blosse Bewegung'. To get this meaning, one would have to insert something like ἀπλῶς after μὴ κίνησιν. Further, as S. 854. 21 quotes Alexander as remarking, the objection would seem to anticipate that in ^a 15-16. ἢ γένεσιν on the other hand gives a perfectly suitable sense.

16. οὐδὲ . . . τινός is a rather careless elliptical expression of οὐδ' ἢ τῆς γενέσεως γένεσις γένεσις οὐδ' ἢ τινός γενέσεως γένεσις τις γένεσις.

16-17. εἰ . . . ἔστιν, 'if there are just three kinds of movement.' At first sight it would seem that this ought not to be assumed, for the point to be proved in 225^b 13-226^a 23 is just that there is not, in addition to change of quality, quantity, and place (225^b 8-9), change in respect of ποιεῖν and πάσχειν. But this would mean, strictly, change from one action to another, or to being acted on, as change of quality means change from one quality to another; and that change τοῦ ποιούντος καὶ πάσχοντος in this sense does not exist has been proved in 225^b 21-33, and Aristotle is justified in now assuming it. He has now returned to the distinct point, which he had introduced in 225^b 17-21, under cover of the loose phrase 'there is no movement of ποιούν and πάσχον, or of κινούν and κινούμενον' (225^b 13), viz. that movement itself cannot be moved. Since there are only the three kinds of movement, if movement were moved it would have to be movement of one of three kinds, and to be moved in one of these three ways; i.e. we should have such an absurdity as locomotion being altered or being moved locally (^a 18).

18. καὶ εἰς ἃ κινοῦνται must be interpreted rather loosely, 'and the *termini ad quos* of the supposed movements would have to be *termini ad quos* of one of these three kinds of movement,' i.e. qualities, quantities, or places.

19-20. ἢ . . . αὐτό. Clearly the τῶ's read by Bekker before κατὰ συμβεβηκός and before καθ' αὐτό are corrupt. Cf. 224^a 21-34, and S. 856. 27-8.

20-22. κατὰ συμβεβηκός . . . μανθάνοι, i.e. change from one change to another can only occur as incidental to change from one quality, quantity, or place to another; cf. 225^b 23-33.

23. ἀφείμεν παλαιά, 224^b 26-8.

27-9. λέγω . . . εἶναι, cf. *Met.* 1020^a 33 ποιὸν λέγεται ἓνα μὲν τρόπον ἢ διαφορά τῆς οὐσίας, οἷον ποιὸν τι ἄνθρωπος ζῶον ὅτι δίπουν κτλ., ^b 8 ἔτι ὅσα πάθη τῶν κινουμένων οὐσιῶν, οἷον θερμότης καὶ ψυχρότης κτλ. Change with respect to a quality which is ἐν τῇ οὐσίᾳ would be not ἀλλοίωσις but γένεσις or φθορά.

30. τὸ μὲν κοινόν. τὸ κοινόν, as is clear from ^a 32, does not agree with τὸ ποσόν but is an accusative of respect, 'as regards its common nature.'

καθ' ἑκάτερον, in respect of each of the two extremes of size, viz. greatness and smallness.

33-^b 1. καίτοι . . . τόπον. In adopting φορά as the name for locomotion in general, Aristotle remarks that in ordinary usage φέρεσθαι tends to be restricted to things that do not initiate their own movement, i.e. to lifeless things. Of livings things such words as πορεύεσθαι, βαδίζειν, τρέχειν would rather be used.

^b 1-5. ἢ δ' ἐν τῷ αὐτῷ εἶδει μεταβολή . . . αὐτό. Aristotle here points out that change in degree need not be considered a separate kind of change, but falls under ἀλλοίωσις, being change from contrary to contrary πῆ, though not absolutely.

2-3. ἢ γὰρ ἐξ ἐναντίου . . . πῆ. The opposition between εἰς ἐναντίον and ἐξ ἐναντίου in ^b 4-5 justifies us in reading ἐξ ἐναντίου ἢ εἰς ἐναντίον in ^b 3, with E.

We may then (1) read ἢ in ^b 2, with E, and take the subject of the clause to be alteration (not change of degree, for this is ἢ ἐξ ἐναντίου ἢ εἰς ἐναντίον πῆ, as opposed to other alteration, which is ἢ ἐξ ἐναντίου ἢ εἰς ἐναντίον ἀπλῶς), or (2) read ἢ in ^b 2 and interpret 'for change from or to a contrary is so either absolutely or in a certain sense.'

5. εἰς αὐτό, 'to the quality itself'. Bekker's εἰς τὸ αὐτό is, according to Torstrik, not supported by Bekker's MS. collations; but it is as old as Morel's edition.

6-7. πλὴν . . . ὑπάρχειν, 'except that in the former case the contraries will have to be present only in a qualified sense.'

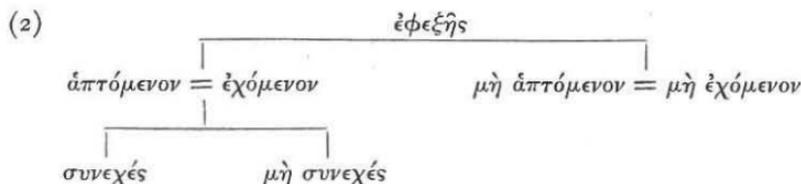
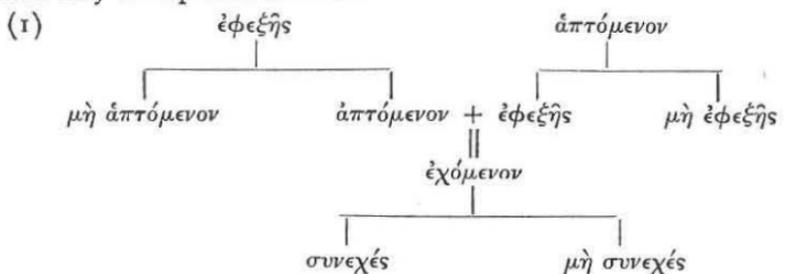
15-16. ὥστε . . . δεκτικοῦ. The stress is on τοῦ δεκτικοῦ. Being the contrary, not the contradictory, of movement, rest is 'privation of movement in that which is capable of movement,' and therefore not in that which is rather non-movable (τὸ ὅλως ἀδύνατον κινηθῆναι^b 10) than immovable.

CHAPTER 3

The terms whose relations Aristotle is mainly interested in working out (cf. 227^a 17-32) are ἐφεξῆς, ἀπτόμενον, ἐχόμενον, συνεχές. ἄμα is introduced because it is implied in the definition of ἀπτόμενον (226^b 23), χωρίς because it is the opposite of ἄμα (ib. 22), μεταξύ because it is implied in the definition of ἐφεξῆς (227^a 1). The relations between the four main terms are not altogether clear. He begins by defining ἀπτόμενον (226^b 23) and ἐφεξῆς (ib. 34) independently of each other, and says that both attributes must be united to make an ἐχόμενον (227^a 6). Thus, to take Simplicius' examples, two successive numbers are not ἐχόμενα because they are not in contact (cf. 227^a 29); and a coat in contact with the body is not ἐχόμενον to it because it is not successive to it, not being of the same kind (cf. ib. 1); but two successive houses that touch are ἐχόμενα. Later, however, Aristotle implies (ib. 18) that ἐφεξῆς is a wider term including ἀπτόμενον. If this be so, if the ἀπτόμενον be necessarily ἐφεξῆς, then ἐχόμενον is a mere synonym of ἀπτόμενον and ib. 6 is misleading.

Finally, the continuous is described indifferently as a species of the ἐχόμενον (ib. 10) and of the ἀπτόμενον (ib. 21). It is the species in which the extremities are not merely together but identical.

Thus there is a confusion between two arrangements of the terms, which may be represented thus:



The latter is the prevalent classification in Aristotle. In no passage other than the present (and the corresponding passage in *Met.* K) is there any attempt to distinguish ἐχόμενον from ἀπτόμενον.

226^b 22. ὄσα . . . πρώτῳ. 'You are ἐν τῷ οὐρανῷ because you are ἐν τῷ ἀέρι, ἐν τῷ ἀέρι because you are ἐν τῇ γῆ, ἐν τῇ γῆ because you are in this place which contains nothing but you' (209^a 33^{-b} 1). The last is your τόπος ἴδιος, ἐν ᾧ πρώτῳ (ib. ^a 33), in which you are directly or proximately.

Prima facie then two things cannot be ἅμα κατὰ τόπον, for the place which contains nothing but A cannot contain nothing but B. Yet Aristotle evidently means that in some sense two things can be ἅμα κατὰ τόπον. Two suggestions might be made as to his meaning. (1) He might mean that one thing, occupying one place, may be two things in the sense that it discharges two functions. E.g. the ends of two lines that meet may be said to be ἅμα, but that only means that one point serves as the end of two lines. But, since ἅμα is used in the definition not of continuity but of the less close relation of contact (226^b 23), and the unity of two ἄκρα is expressly distinguished from their being ἅμα (227^a 22-3), it is evident that Aristotle's meaning is not what has been suggested but (2) that two things are ἅμα if they are in one place which contains nothing but *the two*, i.e. where there is nothing between them.

227^a 7-9. ἐπεὶ . . . μεταξύ. This section is out of place in the MSS. both of the *Physics* and of the *Metaphysics*; I have placed it where Themistius places it, at the beginning of the discussion of τὸ μεταξύ.

226^b 26-7. ἐν ἔλαχιστοις . . . ἐναντίον. If these words were kept where the MSS. places them, μέν would have to be excised, since ἔσχατόν ἐστι τῆς μεταβολῆς τὸ ἐναντίον would be the sole reason given for ἐν ἔλαχιστοις ἐστὶ τὸ μεταξύ τρισίν. The passage is much improved by Cornford's rearrangement.

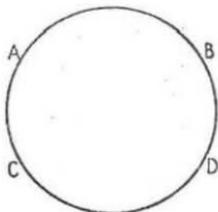
27-31. συνεχῶς . . . κινεῖται. Continuity of movement demands that the whole πρᾶγμα in which the movement takes place, i.e. the whole distance traversed (whether this be literal distance, as in the case of locomotion, or the metaphorical distance between a quality and its contrary, as in alteration, or between small size and great size, as in increase and diminution), be covered, little or nothing of it being omitted. The presence or absence of a temporal interval is irrelevant, since, in the sense required for the definition of 'between', a movement is continuous even when it is temporally interrupted (οὐδὲν γὰρ κωλύει διαλείποντα, sc. τινά (masc. sing. or neut. pl.) τι τοῦ χρόνου ὅμως συνεχῶς κινεῖσθαι); and on the other hand when there is no temporal interruption you have not continuous

movement when contrary states follow one another immediately (καὶ εὐθὺς δὲ μετὰ τὴν ὑπάτην φθέγξασθαι τὴν νεάτην).

For the use of τοῦ πράγματος for the path of movement, or the quasi-path of other change, cf. 227^b 28.

28. ἢ ὅτι ὀλίγιστον. This might seem indefensible, on the ground that a movement *must* cover the *whole* distance between the termini. The words may be defended, however, in the light of Aristotle's words in ^b 29-30 καὶ εὐθὺς δὲ μετὰ τὴν ὑπάτην φθέγξασθαι τὴν νεάτην. Such a transition is not continuous; but if all the notes between the highest and the lowest were sounded the transition would be continuous; and if the notes omitted were relatively very few (ἢ ὅτι ὀλίγιστον) the transition would still (in a slightly looser sense) be called continuous.

32-4. ἐναντίον . . . πεπερασμένον. Contraries being defined as the things that are at the greatest distance from each other, Aristotle adds that this 'greatest distance' is to be measured along a straight line; for the straight line, which is the shortest between two points, is perfectly determinate and can therefore serve as a measure. On the other hand two points which are further from each other than other two along one curve may be nearer each other than the other two along another curve.



A and B are the most distant points on the curve ACDB, while C and D are the most distant on the curve CABD, so that 'the most distant points' has no determinate single application when distance is measured along a curve.

227^a 2. λέγω . . . γραμμαί, 'e.g. a line or lines between the given line and the first line of the series.'

27. οἷας λέγουσι κεχωρισμένας, sc. οἱ τὰ ὑποκείμενα τοῖς μαθήμασι μὴ ἐξ ἀφαιρέσεως λέγοντες (S. 880. 3), i.e. the Pythagoreans and Platonists, whose views about τὰ μαθηματικά are discussed in *Met. M.* 1-3.

28-9. οὐχ . . . αὐτό. Cf. *Met.* 1084^b 25 (in criticism of the Platonists) ὥστε . . . ὡς στιγμήν τὸ ἐν καὶ τὴν ἀρχὴν ἔθηκαν (ἢ γὰρ μονὰς στιγμήν ἄθετός ἐστιν), and the definition of στιγμή as μόνας θέσειν ἔχουσα (*De An.* 409^a 6). Aristotle treats these definitions of μονάς and στιγμή as implying the view that a unit actually becomes a point merely by acquiring position.

29. ταῖς μὲν γὰρ (sc. στιγμαῖς) ὑπάρχει τὸ ἄπτεσθαι. This is not strictly true, since points have no ἄκρα (cf. 226^b 23). Alexander thought (S. 880. 10) that ἄπτεσθαι was used for ἐφαρμόζειν, coincidence, and S. (880. 11) thinks that Aristotle is expressing loosely the fact that lines touch at points. More probably he means that points, if conceived as they were by the Pythagoreans, viz. as very small solids, would be capable of touching.

30-2. καὶ . . . μονάδος. If there is to be any proper opposition between ἐνδέχεται and οὐκ ἀνάγκη, ἐνδέχεται must mean ἀνάγκη ἐνδέχασθαι, and οὐκ ἀνάγκη must mean οὐκ ἀνάγκη ἐνδέχασθαι. Now every line is between points, and therefore there may be a μεταξύ between points; but if points ever touched, as Aristotle has said (^a 29) that (as conceived by the Pythagoreans) they can, there would be no μεταξύ between them. And on the other hand, though successive units have not a μεταξύ, non-successive units have. Thus the opposition is ill thought out.

32. οὐδὲ . . . μονάδος. The MS. reading οὐδὲν κτλ. can hardly be right, since δυνάς is not a μονάς. I therefore read οὐδὲ κτλ. with T. 174. 14. 'There cannot be anything between two units, any more than between a two and a unit.'

CHAPTER 4

227^b 6-11. εἶδει . . . πάσῃ. In ^b 19 Aristotle says ἡ διώρισται, τὸ ἐν ᾧ ἂν ἕτερον ἢ τῷ εἶδει, ὅτι ἕτερα ἢ κίνησις; The only previous passage to which this can refer is ^b 6-7 εἶδει δὲ μία, ὅταν τῷ γένει μία οὐσα καὶ ἐν ἀτόμῳ εἶδει ἢ, the meaning of which must therefore be 'a movement is one in species when, being one in genus, it is also along a path which is self-identical in species'. In the present passage specific identity of path is thought of as secured by specific identity of termini; and specific difference of path by specific difference of termini. But in ^b 14-20 Aristotle points out that two movements between the same extremes may differ by following different routes (e.g. a straight and a curved path) or by being made in different manners (e.g. by rolling and by walking). All these three differences are covered by the general phrase 'difference of path' (τὸ ἐν ᾧ ἂν ἕτερον ἢ τῷ εἶδει).

9-10. πάσα . . . μελάνσει is pretty evidently out of place; in sense it belongs to the second half of the sentence, and is in fact a doublet of διὸ . . . πάσῃ ^b 11. Simplicius makes sense of it where it is only by interpreting οὖν as if it were δέ (882. 21). He notes that λευκότητος . . . πάσῃ was missing in some MSS., and there can be little doubt that the vulgate text has arisen from the conflation of doublets. Cornford's conjectures offer an alternative rectification of the passage.

12-13. δῆλον . . . ἔσται. Bekker has δῆλον ὡς εἶδει κτλ. Torstrick and Bonitz argued that the sense must be 'they will be *in a sense*

specifically identical', and proposed the reading I have adopted. This is found in E² and derives some support from the reading of H, and is probably what lies behind S. 883. 6 πὼς δὲ εἰσιν and T. 174. 23 πὼς μὲν εἶδει μία.

14-20. ἀπορήσειε . . . εἶδει; Cf. ^b 6-11 n.

16-17. οἶον . . . καὶ πάλιν, cf. 219^b 19 n.

20-228^a 3. γένει . . . μία. That a movement may be numerically self-identical, Aristotle maintains, it must have (1) one subject, (2) one ἐν ϕ , and (3) one ὅτε (^b 23-4). The meaning of ἐν ϕ does not seem to be precisely the same here as in ^b 19. There it meant the path of the movement. Here it seems to mean rather the province in which movement occurs, i.e. place (in the case of locomotion) or πάθος (in the case of alteration). The generic or specific identity of a motion is described as depending on the unity of the ἐν ϕ , and its consecutiveness on the unity of the ὅτε (^b 27-8). Bonitz argues that Aristotle must also have stated here what sort of identity of movement depends on the unity of the σ , and that ἅπασι τούτοις (^b 29) implies that all three and not merely two of the implications of movement (^b 23-4) must have been mentioned in ^b 27-8. He therefore inserts after κινεῖται ^b 28 τὸ δὲ τῷ ὑποκειμένῳ μίαν ἐν τῷ πράγματι σ κινεῖται. This would make the treatment more symmetrical, and might easily have dropped out by haplography. But while unity of ἐν ϕ produces a genuine identity of movement in a certain sense, viz. generic or specific identity, and unity of ὅτε produces a genuine unity of movement in another sense, viz. consecutiveness, unity of σ without unity of ἐν ϕ or of ὅτε does not produce unity of movement in any genuine sense at all. No one would say that my coughing to-day was a single movement with my walking from Oxford to Woodstock ten years ago, merely because my body performed both these movements. Unity of substratum is important not as a separate source of unity of movement, but only when it is *added* to unity of ἐν ϕ and of ὅτε, in which case it secures numerical identity of movement; and this point is made in what *follows* (^b 29-228^a 3).

Again, ἅπασι τούτοις in ^b 29 may refer not to ^b 27-8 but to ^b 23-6. For these reasons I reject Bonitz's addition.

27. τῷ πράγματι ἐν ϕ κινεῖται, cf. 226^b 27-31 n.

28. τὸ δ' ἐχομένην ἐν τῷ χρόνῳ. The MS. reading τὸ δ' ἐχόμενον ἦν ἐν τῷ χρόνῳ is objectionable (1) because we want a feminine adjective answering to μίαν ^b 27, (2) because ἦν would presuppose a previous discussion of temporal consecutiveness, and there has been none such (the definition of ἐχόμενον in ^a 6 does not meet the case, because that referred to spatial contiguity; nor does iv. 14, as Prantl suggests, meet the case). Bonitz proposed (for τὸ δ' ἐχόμενον ἦν) τὸ δὲ τῷ ὅτε μίαν εἶναι. But the reading τὸ δ' ἐχομένην gives the right

sense with a minimum of change, and derives some support from P. 793, 32, S. 885.3. For ἐχόμενος used of consecutive movement, cf. 228^a 26, 30.

29-30. ἐν ᾧ . . . οἷον τὸ εἶδος, 'the province in which the movement takes place, i.e. the species of the movement.'

228^a 3-6. τὸ δὲ Σωκράτη τὴν αὐτὴν μὲν ἀλλοίωσιν ἀλλοιοῦσθαι . . . οὐ. Aristotle considers here the case in which the ἐν ᾧ and the κινούμενον of two movements are identical but the times of the two are separated. In these circumstances we could, he says, regard the two movements as identical only if we could suppose an individual thing (viz. the earlier movement) to perish and then to resume its existence as the same individual thing; which is absurd.

6. ἡ αὐτὴ μὲν, sc. τῷ εἶδει καὶ τῷ ὑποκειμένῳ.

6-19. ἔχει . . . πολλάκις. Aristotle here passes from the question whether temporally separate but specifically like κινήσεις of the same subject can be said to be one κίνησις, to the question whether relatively permanent states (ἔξεις) or relatively transient ones (πάθη), when they recur in the same subject after a temporal interval, can be said to be self-identical, in spite of changes suffered by the subject in the interval (^a 9). His answer is that, though a diversity of ἐνέργειαι (here = κινήσεις) does not in itself imply a diversity of ἔξεις (^a 12-17), yet (δ' οὖν ^a 17) temporally separated ἔξεις can be supposed to be identical only if we can (as we cannot) suppose the same thing (i.e. the same individual ἔξις) to perish and then come into being again (^a 17-19).

12. ὁ γὰρ αὐτὸς λόγος. This λόγος comes in ^a 17-19, where Aristotle points out that in spite of the difference in one respect between ἔξεις and ἐνέργειαι or κινήσεις, the same can be said of ἔξεις that was said in ^a 3-6 of κινήσεις.

13-14. εἰ . . . ἀνάγκη. The reading here is very doubtful. It is impossible to tell what Themistius read. Philoponus seems to have read and interpreted as follows (856. 17-24): εἰ μὲν (sc. αἱ ἔξεις) δύο, δι' (but τὸ 794. 10) αὐτὸ τοῦτο (sc. καὶ αἱ κινήσεις δύο), ὡς (sc. εἰ) τῷ ἀριθμῷ μία (sc. ἡ κίνησις), καὶ τὰς ἔξεις ἀνάγκη (sc. μίαν εἶναι). S. 888 16-889. 1 seems to have had the same reading and interpreted it in the same way, which is obviously unsatisfactory. It seems that we must in any case read ἐνεργείας for ἔξεις. Then we may either read with E¹ H εἰ μὲν δύο, δι' αὐτὸ τοῦτο, ὡς τῷ ἀριθμῷ ('numerically different' as opposed to 'specifically different'), or with γρ. Al. εἰ μὲν δύο οὕτως, τῷ ἀριθμῷ, or εἰ μὲν δύο, οὕτως, τῷ ἀριθμῷ, continuing in any case with καὶ τὰς ἐνεργείας ἀνάγκη, and understanding δύο εἶναι. But none of these readings is really satisfactory, and there may be more deep-seated corruption. An alternative would be to read εἰ μὲν δύο τὸ αὐτὸ τοῦτο ὡς τῷ ἀριθμῷ, καὶ τὰς ἔξεις ἀνάγκη (μία γὰρ ἀριθμῷ

[ἐνέργεια] ἐνὸς ἀριθμῶ), interpreting τὸ αὐτὸ τοῦτο as the ὑποκείμενον commonly treated as one, but on the theory of flux (^a 9) really two.

21. εἴπερ πᾶσα διααιρετή. If every κίνησις is divisible, each of the κινήσεις of which a larger κίνησις is composed is divisible, and so *ad infinitum*. Therefore every κίνησις is *infinitely* divisible, i.e. continuous.

22-^b 10. οὐ . . . ἀνάγκη. Aristotle here brings out the implication of the statement just made, that a continuous movement must be one. It follows that if two movements are to be continuous with each other, i.e. are to form a continuous movement, they must have the characteristics which a single movement has already (227^b 29-228^a 1) been said to have; they must be specifically alike, movements of a single subject, and in a single continuous time (228^b 1-3).

24. ἔσχατα . . . ἔστι, e.g. of units, points, moments:

26-9. ἐχόμεναι . . . οὐ. The texts have a colon after γένει, and a comma after εἰθὺς. But only δραμῶν . . . εἰθὺς is an instance of change consecutive but not specifically or generically like. καὶ οἶον . . . οὐ brings out a fresh point, that there are consecutive movements that *are* specifically like but not continuous (because they are not movements of the same subject). I have altered the punctuation to bring this out.

27. αἱ μὴ αἱ αὐταί, 'those which are not the same.' The divergent readings of EJ and of FHIST point to the true reading. Cf. 229^a 4.

28-9. καὶ . . . οὐ, 'and there may be a movement (like the relay torch-race) that is consecutive, but not continuous'. ἡ λαμπὰς ἡ ἐκ διαδοχῆς derives support from T. 176. 12. λαμπάς is often used = λαμπαδρομία (see L. and S.).

^b 7-9. τῆς δὲ τῷ εἶδει μὴ μιᾶς . . . εἷς. Bekker has τῆς δὲ τῷ εἶδει μὴ μιᾶς οὐ, καὶ εἰ μὴ διαλείπεται ὁ χρόνος· ὁ μὲν γὰρ χρόνος εἷς. Here, as Bonitz points out, there is no construction for the genitive. I prefer the shorter reading to that of Bonitz, because διαλείπεται, 'is intermitted', requires as its subject not ὁ χρόνος but ἡ κίνησις.

11-15. τίς μὲν οὖν κινήσις . . . συνεχῆς. The general meaning of this section is that a complete movement is more properly said to be *one* than a movement that is incomplete, since the latter is part of a movement rather than one movement.

12-13. εἴαν τε κατὰ γένος . . . οὐσίαν. It would be grammatically possible to take these words either with μία or with ἡ τέλειος, though perhaps they go more naturally with the latter. Taken with μία they seem to give no satisfactory sense. If we take them with ἡ τέλειος, the intention must be to distinguish (*a*) movements that are complete in respect of their γένος, i.e. because they belong to a genus of movement that is particularly complete or thoroughgoing, (*b*) those

that are complete in respect of their species, because they belong to a species of movement that is particularly complete, (*c*) those that are complete in respect of their individual nature, because they are particularly complete members of their species.

17-18. ἡ γὰρ ἀνώμαλος διαιρετή. An irregular movement, e.g. one that is partly rectilinear and partly curvilinear, can always be analysed into two or more separate movements.

18-19. ἔοικε . . . ἤπτον, i.e. there is a continuous gradation from complete regularity to complete irregularity, everything that intervenes being more or less irregular.

21-2. ἀνωμαλία . . . διαφορά, 'irregularity is a differentiation in the path of the movement' (cf. ^b 27 διώρισται, 'an irregular movement is differentiated') gives a better sense than Bekker's ἀνωμαλίας κτλ.

23-5. οἶον . . . μέρος. According to the Greek way of thinking, there are two types of uniform or regular path, i.e. two paths such that by a shift along the direction of the path any part of it may be superimposed on any other: the straight line and the circle. I.e. they regarded the circle as having a uniform direction, where modern mathematicians would describe it as having a uniform change of direction.

23. τῆς κεκλασμένης, i.e. a path that has angles in it.

24. τῆς ἑλικῆς. The κοχλίας or cylindrical spiral is regular in the sense that any part will fit upon any other; but this was first proved by Apollonius of Perga in the 3rd century B.C. The tapering spiral, is, of course, irregular.

25-6. ἡ δὲ . . . ὤς, 'another form of irregularity depends not on a difference of the thing moved, a separation in time, or a difference in the *terminus ad quem*, but on a difference in the manner of the movement.'

οὔτε . . . εἰς ὄ. Bekker reads οὔτε ἐν τῷ ποῦ οὔτ' ἐν τῷ πότε οὔτε εἰς ὄ. But there is no proper opposition between ποῦ and εἰς ὄ. The three elements in motion named here should correspond to those named in 227^b 23 ὃ καὶ ἐν ᾧ καὶ ὅτε, the thing moved, the path of movement (or quasi-path of qualitative or quantitative change), the time; cf. 228^b 2, where τὸ εἶδος = τὸ ἐν ᾧ (they are equated in 227^b 29). In view of this, ὄ (ο E¹) should be read instead of ποῦ. One is tempted to read ἐν τῷ ἐν ᾧ for εἰς ὄ, but there is no evidence to support this, and the terminus may easily be named instead of the path as the third element in movement (cf. 224^a 35, 236^b 3). I therefore read ἐν τῷ εἰς ὄ.

28-30. διὸ . . . εἶδος. Since the difference in respect of ὤς, i.e. of velocity, is independent of the difference of εἰς ὄ or εἶδος (^b 26) and cuts right across it, it does not itself constitute a difference of εἶδος.

30-229^a 1. ὥστε . . . αὐτό, 'therefore neither do heaviness and lightness, when they are tendencies to move in the same direction (sc. but with different velocity), e.g. when they characterize two kinds (or portions) of earth compared together, or two kinds (or portions) of fire compared together, constitute species of movement.' When heaviness and lightness are used, on the other hand, of the tendency downward and the tendency upward respectively, as when earth is said to be heavy and fire light, they do constitute species of movement.

229^a 2. τῆ κεκλασμένη, cf. 228^b 23 n.

3-6. εἰ . . . ἐφαρμόττειν. Aristotle has pointed out (^a1) that a movement may be non-uniform, and yet one by reason of its continuity. But any single movement, even if it is not carried out with uniform velocity, is capable (ἐνδέχεται ^a 3) of being so carried out; while a combination of specifically different movements is not capable of being so carried out; therefore no such combination can form a single movement.

In ^a 4 I have adopted the reading which the sense requires, and which is supported by P. 795. 22, S. 899. 22-3 (though Simplicius' quotation has simply αἰ μὴ κατ' εἶδος ἐχόμεναι (900. 1)). Cf. 228^a 27.

CHAPTER 5

229^a 7-8. καὶ . . . τρόπον. For this v. ch. 6.

10. οἶον . . . δοκεῖ. κίνησις is different from γένεσις and φθορά (cf. ch. 1). But if it were the motion from A that was strictly contrary to the movement to A (no contrary of A being involved), contrariety between movements would be in this respect like the contrariety between generation and destruction, in which no contrary of A but only its absence is involved, as *terminus a quo* or *ad quem*. Cf. ^a 30-32 n., ^b 10-14.

22. ἀλλὰ . . . ἐροῦμεν, ^a 28.

25. καὶ λέγεται δ' ἐκάστη (sc. παρὰ τοῦτο, ὅτι ἀπὸ τούτου) εἰς ὃ κτλ.

26. νόσανσις. Bekker has νόσωσις here, but νόσανσις in 230^a 22. Neither νοσαίνω nor νοσοῦμαι seems to be found. Aristotle apparently coined the word νοσάζομαι (^b 3) on the analogy of ὑγιάζομαι (^b 4), and then νόσανσις on the analogy of ὑγίανσις, as if ὑγίανσις had been formed from ὑγιάζομαι and not from ὑγιαίνω.

27-8. λείπεται . . . ἐναντίων. The *first* alternative, πότερον ἐναντία κίνησις ἢ ἐκ τοῦ αὐτοῦ τῆ εἰς τὸ αὐτό (^a 8-9) has not yet been considered, but is dismissed in ^b 11-14.

30-32. ἐπεὶ . . . ἐστιν. In ch. 1 movement was defined as being between two contraries, both denoted by positive terms, while generation and destruction were defined as being from not-A to A and from A to not-A respectively (225^a 3-7, 34-^b 3).

^b3. τὰ ἐναντία, not the contrary movements (which would be αἱ ἐναντίαι) but the contraries involved as the *termini a quibus* and *ad quos* of contrary movements.

4-5. τὸ μανθάνειν . . . αὐτοῦ, 'learning from another to being deceived, in the sense in which that means being deceived otherwise than by oneself'.

6-10. καὶ ἢ ἄνω φορὰ . . . ταῦτα. For the assignment of up-down, right-left, before-behind to length, breadth, and depth respectively cf. *De Caelo* 284^b 24-5.

7. ταῦτα, sc. τὸ ἄνω and τὸ κάτω.

10-11. ἢ δ' εἰς ἐναντίον . . . τινος. Passage to one of two contraries, when it is described simply as that and not as passage from one to the other of two contraries, is being viewed not as movement but as change (i.e. as the *γένεσις τινος* of 225^a 14). Cf. 224^b 35-225^b 9 n.

If passage to one contrary merely is not movement, the passage to one contrary and the passage to the other are not contrary movements. This eliminates the *third* of the possibilities stated in ^a8-15.

11-14. καὶ . . . οὔ. In ^b10-11 Aristotle has dealt with the case in which the contrary which is the *terminus a quo* is simply abstracted from. He now passes to the case in which the *terminus ad quem* (in *γένεσις*) or *a quo* (in *φθορά*) is not one of two contraries (e.g. is such a thing as the form of man). This is the *γένεσις ἀπλῆ* and the *φθορὰ ἀπλῆ* of 225^a 14, 18. Here the two changes are contrary, but they are not movements. This eliminates the *first* of the possibilities stated in ^a8-15.

19-20. τὸ γὰρ μέσον . . . ἄκρων. The sense is improved by inserting the second ἐκότερον (EJ) before τῶν ἄκρων.

20-21. καθάπερ . . . πρότερον, 224^b 32-5.

21-2. κίνησις . . . ἐξ ἐναντίου εἰς ἐναντίον. All the other alternatives having been removed, the *fifth* possibility named in ^a8-15 is now left in possession of the field.

CHAPTER 6

229^b 26. ποιᾷ δὲ ποιά, οἶον. A better sense is got thus than by reading with the editors ποία δὲ ποία; οἶον.

29-30. ἐπεὶ . . . ὑποκειμένοις, cf. 225^a 34-^b 5.

31-230^a 7. ἄμα . . . ὑγιείᾳ. Aristotle now passes from the contrariety between rest and motion to the contrariety between rest and rest. αὐται ^b32 = rest in one contrary and rest in the other. But in the middle of this discussion he reverts to the point he had made in 229^b 29-31, that rest in A is opposed to motion from A to its contrary, not to motion to A from its contrary, and establishes this

by a fresh argument. 230^a 3-6 κινήσει . . . εἶναι is thus parenthetical, and in ^a 6-7 οὐ . . . ὑγιαῖα he returns to confirm the point made in ^a 2, that the rest contrary to rest in health is rest in disease. I have tried to make the argument clear by punctuation.

230^a 4-5. ἡ γὰρ εἰς αὐτὸ κίνησις . . . ἐστίν, 'for movement to that very state in which the moving thing stands still is rather a coming to rest than the contrary of the rest'. ἡρέμησις occurs in 226^a 7, 231^a 2 in the sense of ἡρεμία, but here the sense of 'coming to rest' is required, as in 238^a 18, *Rhet.* 1380^a 8.

5. ἡ συμβαίνει γε (sc. ἡρέμησιν) κτλ. seems to give a better sense than ἡ συμβαίνει γε. Cf. ^b 27.

6. ἀνάγκη . . . εἶναι, i.e. it must be either movement from disease to health or movement from health to disease that is the movement contrary to rest in health.

7-18. ὅσοις . . . ἐκείνην. Aristotle has already in 229^b 11-14 considered the changes which are the coming into being, and the ceasing to be, of something that has no contrary, i.e. ἀπλή γένεσις and ἀπλή φθορά. He now considers the ἀμεταβλησία which is contrasted with such changes. If in such change there were a ὑποκείμενον that passed from a state of not-being to one of being (or *vice versa*), its ἀμεταβλησία in the state of being would be contrary to its ἀμεταβλησία in the state of not-being (^a 10-12); but if the non-existent is not a thing at all, it may be asked (1) what is the contrary of ἀμεταβλησία in the state of being, and (2) whether such ἀμεταβλησία is rest (^a 12-13). If it were rest, then either not every rest would have a movement as its contrary (which is absurd), or the γένεσις and φθορά to which the ἀμεταβλησία is opposed would be movement (which they are not, as we have seen in ^a 7-9) (^a 14-15). Clearly then, it is not rest, but is something similar to rest and may be called ἀμεταβλησία; and either it is contrary to nothing (if there is not τι μὴ ὄν, ^a 12), or (if there is, ^a 10-11) it is contrary either to ἀμεταβλησία in the state of not-being, or to destruction—to destruction, not to generation, since destruction is a movement away from the ἀμεταβλησία, while generation is a movement to it (^a 15-18).

19-20. ἐν μὲν τῇ κατὰ τόπον μεταβολῇ . . . κινήσεις, e.g. the movement of fire upward and its rest at the outside of the universe are natural, its movement downward and its rest at the centre of the universe are unnatural.

22-3. οὐδὲν . . . παρὰ φύσιν. This sounds surprising. But it must be remembered that Aristotle is here simply developing an ἀπορία. His answer is that the distinction of natural and unnatural is found in *all* kinds of κινήσις.

29. ἡ εἰ. I have adopted the reading of E. ἡ as usual introduces tentatively Aristotle's answer to the ἀπορία of ^a 18-29.

^b 2. καὶ μὴ πιληθέντες, 'even when not packed close in the earth'. Aristotle may be thinking of plants grown in the warmth of a house; Simplicius refers to the Ἀδώνιδος κῆποι, cuttings planted in pots for the time of mourning for Adonis; cf. Pl. *Phdr.* 276 b, Theophr. *H.P.* 6. 7. 3, Theoc. 15. 113, and Frazer, *Adonis, Attis, Osiris*, i. 236.

4-5. οἱ ἀφιέμενοι . . . ἡμέραις, 'people who recover from fevers not on the critical days'.

6-7. ἔσονται . . . γενέσει. Aristotle is not denying that φθοραὶ are contrary to γενέσεις; he holds that they are (229^b 12-13). What he is saying is that there will also be contrarieties that are between φθορά and φθορά, not between φθορά and γενέσεις. I have emended accordingly.

7. καὶ . . . ὡς; The reading of E¹PS is decidedly better than Bekker's καὶ τί γε κωλύει; ἔστι γὰρ ὡς. ἔστιν ὡς = πῶς (sc. ἐναντίας εἶναι).

8-10. καὶ . . . ἔστιν. φθορά could not be supposed to be simply as such opposed to φθορά, but it is easy to see that one φθορά may be contrary to another in virtue of some characteristics they possess, e.g. that of being respectively pleasant and painful, or natural and unnatural.

10. τὸν εἰρημένον τρόπον. I.e. apart from the contrariety existing ἀπλῶς between κίνησις and ἡρεμία, there are contrarieties between κινήσεις (^b 12-15), between ἡρεμίαι, and between κινήσεις and ἡρεμίαι (^b 15-19), in virtue of some particular characters they possess (ἢ ἢ μὲν τοιαυτὴ ἢ δὲ τοιαυτὴ αὐτῶν ἔστιν ^b 9). And this is so ὅλως, not, as was suggested in ^a 18-29, only in the case of φορά.

12. The added words which E preserves here and H in ^b 21 are fragmentary; they need to be supplemented by τοῖς ἀπλοῖς σώμασι (so S. 913. 4; cf. P. 798. 4). Their meaning is that the distinction between movement (and rest) in the upward and in the downward directions belongs primarily to earth, water, air, and fire. There seems to be no sufficient reason for including the clause in the text.

15. καὶ . . . ὡσαύτως, 'and similarly there will be rests opposed to movements'.

21-8. ἔχει . . . ἄμα. In this section Aristotle states, without answering, the ἀπορία arising from the assumption that every non-eternal state of rest must have a becoming, which is a coming to a standstill (τὸ ἴστασθαι). The ἀπορία arises from a consideration of the coming to rest of a thing in a place unnatural to it—which possesses characteristics the very opposite of those associated with τὸ ἴστασθαι.

24-5. ἀλλὰ . . . θάττον. This is a consequence of the fact to be named presently (^b 26-8), that τὸ ἴστασθαι is very much the same

thing as a thing's moving to its own place. When it is doing this, it comes (according to Aristotle's theory) more and more under the influence of the attraction of its own place, and therefore moves faster and faster. Since that which is moving under compulsion, on the contrary, moves slower and slower as the influence of the propeller becomes weaker, that which is at rest after a compulsory motion cannot be said to have 'come to a standstill'. Therefore it is at rest without ever having been coming to rest (^b 25-6).

26-8. ετι . . . αμα. The words preserved by H and Simplicius here seem to have been originally an alternative version of the sentence as we have it.

28-231^a 2. εχει . . . ηρεμης. Aristotle now states a difficulty arising from his view that rest at a place is contrary to motion thence (229^b 28-31).

30. αυτη η ηρεμια. The argument requires this slight emendation.

32-231^a 1. η . . . μεταβαλλει; If we read πη indefinite, these words give the solution of the απορια. 'Are we to say that if the changing thing still remains where or as it was, it is in a certain definite respect at rest (i.e. and in that respect not in movement, so that no contradiction arises), and that in general part of a changing thing is at the *terminus a quo* and part at the *terminus ad quem* (sc. of a part of the total movement)?'

δλωσ . . . μεταβαλλει. This is proved in 234^b 10-20.

231^a 1-2. διδ . . . ηρεμης. ηρεμης is here evidently used in the sense of ηρεμια (cf. 226^a 6-7 n.).

3. πως εκατερα μια, cf. ch. 4 (though the unity of ηρεμια was not dealt with there).

τινες εναντιαι τισιν, cf. chs. 5 (on contrariety between movements) and 6 (on contrariety between rest and movement, and between rests).

5-17. απορησειε . . . αντικειται. S. 918. 11-15 remarks that this section was lacking in some MSS. and was omitted by Porphyry and Themistius (in whose paraphrase there is in fact no trace of it), but that Alexander, though noting its absence in some MSS., commented on it. Simplicius' own view is that the section, being a repetition of what we have had earlier in the chapter, is a later addition. It is omitted by H and at least five other MSS., but read by EFIJ and at least twenty others.

It contains, in fact, nothing that we have not had already in 230^b 10-28, and this, with the fact that the section comes after what are evidently meant to be the closing words of the chapter (231^a 2-4), justifies us in rejecting it as an alternative version of 230^b 10-28 which has been by mistake included in the text.

BOOK VI. CHAPTER I

231^a 21-2. ὡς . . . πρότερον, v. 227^a 10-13, 226^b 23, 34-227^a 1.

^b 1. τὸν εἰρημένον λόγον, ^a 26-9.

8-10. ἀλλὰ . . . χρόνος. Aristotle has in ^a 29-^b 6 shown that points cannot be either continuous or contiguous, the latter of which at least they would have to be in order to make up a continuous line. He now adds as an afterthought that they cannot even have the successiveness which in view of the definition of continuity in 227^a 10-13 (cf. *ib.* 6) they must have in order to make up a continuous line.

8-10. ἐφεξῆς . . . χρόνος. Two things are successive if they have nothing συγγενές with themselves between them. Now a line is not συγγενές with a point, nor a time with a moment. Therefore the argument is not complete as it stands, and must be supplemented by the reflection that a line must include points and a time moments, so that if there is a line between any two points, there must be points between them, and similarly moments between any two moments.

In ^b 9 the argument requires μεταξύ, not τὸ μεταξύ; and there is no sign of τό in S. 928. 13-14.

10-12. ἔτι . . . διαιρετόν. The next sentence, ^b 12-15 ἄλλο . . . συνεχές, plainly connects with the argument in ^b 6-10 to show that continua cannot be composed of successive (though not continuous or contiguous) indivisibles (cf. ^b 12 with ^b 9-10). Therefore, unless we are to suppose the order of the arguments to have become quite confused, we must suppose the present argument not to be a third main argument to show that continua cannot be composed of indivisibles, but to be a further argument to show that they cannot be composed of *successive* indivisibles. This, says Aristotle, would imply that they were *divisible* into successive indivisibles. But, he adds, we have seen already (^a 26-^b 6) that a continuum cannot be divided into indivisibles at all. The close connexion between ^b 6-10 and ^b 10-12 is also seen from the fact that ἐκάτερον (^b 11) must mean μῆκος and χρόνος (^b 8).

10. ἔτι, sc. εἰ τὸ μῆκος καὶ ὁ χρόνος ἐκ τῶν ἐφεξῆς ἀδιαίρετων εἶεν.

12-15. ἄλλο . . . συνεχές. Aristotle has said (^b 9-10) that there is always a line between points, and a time between moments. He now adds that nothing other than a line can intervene between points, nothing other than a time between moments, since what intervened would have to be either indivisible or divisible. He does not refute the first alternative, but it has been already refuted in ^a 26-^b 6. The second alternative is refuted by the consideration that if the intermediate is divisible it must be divisible either into indivisibles (which

leads to the same difficulty as the first alternative) or into divisibles *ad infinitum*, in which case it is a continuum, i.e. a line or a time as the case may be.

13. ἢ γάρ. I have adopted E's reading, which seems to be supported by S. 930. 1-2. The longer version has all the appearance of being a (correct) gloss.

15-18. φανερόν . . . συνεχῶν. From the cases of μήκος and χρόνος (^b 8) Aristotle generalizes to all continua. They must be divisible into divisibles *ad infinitum*, for if they were divisible into indivisibles, there would be indivisibles touching each other, which has in ^b 2-6 been shown to be impossible.

17-18. ἐν . . . συνεχῶν. Bekker's and Prantl's comma after ἔσχατον is due to misunderstanding of the clause.

18-232^a 22. τοῦ δ' αὐτοῦ λόγου . . . διαιρετή. This is a single argument to show that magnitude, time, and motion must either all be composed of indivisibles, or none of them so composed; that the continuity or infinite divisibility of any of them implies the continuity of all.

22. ἢ τοῦτου. Bywater's ἢ ἐπὶ τοῦτου perhaps derives some support from T. 183. 3, S. 932. 9. But if Aristotle can say κινεῖται τοῦτο (sc. τὸ μήκος), it is not unnatural that he should say ἢ κίνησις ἢ τοῦτου, and Themistius and Simplicius may be simply paraphrasing. The idiom is defended by Cook Wilson in *J. of P.* xxxii. 150-1 as an objective genitive analogous to the English 'a movement of a foot', 'a retreat of two miles'. A parallel in the *Physics* itself is 263^a 27 ἢ γὰρ συνεχῆς κίνησις συνεχοῦς (along a continuous line) ἐστίν.

30. οὐ. It is simplest to take this to stand, as it often does, for οἶ. It is illustrated by Θήβαζε, ^b 30, 31, 232^a 1.

232^a 2. ὥστ' . . . διήει. ὥστ' irregularly introduces the apodosis; cf. Bonitz, *Index*, 873^a 31-44.—Bonitz's conjecture of διεληλύθει for διήλθεν derives some support from T. 183. 30, S. 933. 23, and is called for by the sense.

4-5. εἰ . . . κινεῖται. The sense is somewhat improved by inserting commas before and after τὸ βαδίζον.

5. ἐκεῖ . . . οὐ. Cf. 231^b 30 n.

7. τὰ ΔΕΖ ἐστι, 'is the movement denoted by the letters ΔΕΖ'. οὐθέν must be taken adverbially, 'not at all'; cf. 222^b 24, *De Gen. An.* 745^a 23.

9. τῷ κεκινήσθαι, 'and it will exist by reason of a thing's having completed a motion', &c., gives the right sense, and accounts best for the variants τὸ (EJKP) and τῶν (S. 934. 13, where Diels's τοῦ is an emendation).

12-14. εἰ . . . κινούμενον. Bonitz, reading ἡρεμῆ δέ in ^a 12, treats this (*Arist. Stud.* ii, iii, 109) as an example of ὥστε in apodosis. But

FJK and T. 184. 23 are evidently right in omitting δέ, and the sentence thus becomes normal.

18-19. ὁμοίως . . . ἀδιαιρέτων. The supposed indivisibility, or composition out of indivisibles, of time stands or falls with the corresponding supposed property of length and of motion.

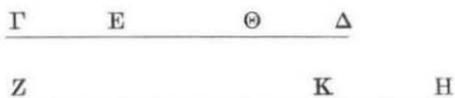
20. ἐν τῷ ἐλάττωι δέ, sc. χρόνῳ.

CHAPTER 2

232^a 23. δέδεικται, in ch. 1.

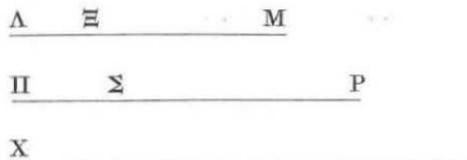
27. καθάπερ . . . θάπτον, i.e. some people actually use these three attributes as forming the definition of the 'faster'.

31-^b 5. ἀλλὰ . . . διείσιν. The diagram implied is



If A travels distance ΓΔ, and B distance ΓE, in time ZH, then if Θ be taken anywhere between E and Δ, A will travel distance ΓΘ in a time ZK which will be less than that in which B travels the shorter distance ΓE.

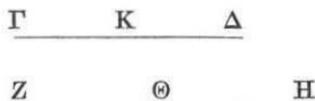
^b 5-14. φανερόν . . . ἴσον. The diagram implied is



If A travels distance ΛM in time ΠP, and Ξ be taken such that the slower body B takes, to travel ΛΞ, a time X greater than ΠP, and if A travels ΛΞ in time ΠΣ, then since ΠΣ must be less than ΠP, it must *a fortiori* be less than X.—In ^b 11, 12 the reading X is better attested than the vulgar ΠX. The MSS. in S. 940. 5, 13, 15 vary between the two readings, but Simplicius' commentary in 940.6 shows that he read X. Instead of producing the line ΠP to represent the time taken by B, Aristotle draws a fresh line and calls it simply X (for χρόνος—cf. XP, 236^b 26).

19. καὶ τὸ ἴσον μέγεθος, as well as the greater μέγεθος which in ^a 31-^b 5 the faster body was proved to traverse in a less time than that in which the slower body traversed a less μέγεθος.

26-233^a 3. ἐπεὶ . . . χρόνος. The diagram implied is



26. δέδεικται, in ^b 5-20.

233^a 3-4. τούτου . . . λόγον, i.e. in the time in which A will traverse ΓΚ, B will traverse a part of ΓΚ which will be to ΓΚ as the time in which A traverses ΓΚ is to the time ΖΘ in which B traverses it.

5-6. μεταλαμβάνουσιν . . . βραδύτερον, 'passing from the faster and taking the slower instead'. I have found no other instance of ἀπό with μεταλαμβάνειν; the ordinary proposition is ἀντί.

9. ἀντιστρέφειν . . . ἀντιστρεφόμενου. ἀντιστρέφειν is evidently used transitively, with a personal subject understood. S. 943. 24-8 suggests two interpretations; (1) that ἀντιστρέφειν is used as equivalent to μεταλαμβάνειν (^a 5), = 'substitute'; (2) that it refers to the fact that if the faster body 'divides' the time, the slower 'divides' the distance, and *vice versa*. Probably Aristotle means 'if it is always correct to introduce the faster body and the slower alternately by saying

B covers distance ΓΔ in time ΖΗ.

Therefore A covers distance ΓΔ in time ΖΘ (say, half of ΖΗ).

Therefore B covers distance ΓΚ (half of ΓΔ) in time ΖΘ.

Therefore A covers distance ΓΚ in half of ΖΘ, &c.'

11-12. τὰς αὐτὰς . . . διαιρέσεις . . . διαίρεται. The time and the distance suffer the same divisions, i.e. divisions in the same ratio, and an equal number of such divisions.

13. ἐκ τῶν εἰωθότων λόγων λέγεσθαι, such as that ἐν τῷ ἡμίσει χρόνῳ ἡμισυ διέρχεται κτλ. (^a 14-16).

13-14. ὡς . . . ὅτι. For the pleonasm cf. 190^b 17, 260^a 23.

18-21. οἶον . . . μέγεθος. The distinction between infinity τοῖς ἐσχάτοις and τῇ διαιρέσει is equivalent to that between κατὰ πρόσθεσιν or προσθέσει (204^a 6, 206^a 15) or ἐπὶ τὴν αὔξησιν (204^b 4, 207^b 29), and κατὰ διαίρεσιν (204^a 7) or ἐπὶ καθαιρέσει (206^b 13).

The statement that if time is infinite τοῖς ἐσχάτοις, μῆκος must be so too, is a dangerous one for Aristotle to make; for he denies the infinity of extension (iii. 5) and asserts that of time (viii. 1, 2). Simplicius is no doubt right when he says that Aristotle would have defended himself by urging that the never-ending rotation of the celestial sphere is movement along an infinite μῆκος. But the defence would not be satisfactory.

21-3. διὸ . . . χρόνῳ. This is the argument against the possibility of movement which in 239^b 11 is called Zeno's πρῶτος λόγος. It is

there described as δ *περὶ τοῦ μὴ κινεῖσθαι διὰ τὸ πρότερον εἰς τὸ ἡμισυ δεῖν ἀφικέσθαι τὸ φερόμενον ἢ πρὸς τὸ τέλος.*

26. *κατὰ τὸ ποσὸν* here = *τοῖς ἐσχάτοις.*

30. *τοῖς ἀπείροις.* S. 947. 30 gives alternative interpretations, *ἐν τοῖς ὁμοίως ἀπείροις τοῦ χρόνου μέρεσιν ἢ ἐν τοῖς ἑαυτοῦ.* T. 187. 16 and P. 803. 11 give the first interpretation, which is probably right, since there is no reference in the context to the infinite divisibility of the moving body.

34-5. *ἔστω . . .* AB. Since Aristotle evidently thinks of BE as the *first* part of the distance, his meaning would have been clearer if he had called the whole line BA.

^b2-3. *τοῦτο . . . ὑπερβαλεῖ.* I.e., either AB will be an exact multiple of BE, or the nearest multiple of BE to AB will be less or else greater than AB. BE 3, AB 16 will be an instance of *ἔλλειψις*, BE 6, AB 16 an instance of *ὑπερβολή.*

4-7. *διαφέρει . . . μέγεθος.* It makes no difference whether BE *καταμετρεῖ* AB, *ἐλλείπει*, or *ὑπερβάλλει.* For in any case it in a looser sense *καταμετρήσει* AB, i.e. a sufficient number of distances = BE will exhaust AB. And if they do, an equal number of times = ΓΔ will exhaust Γ. In ^b7 the vulgate reading *ὡς καὶ τὸ μέγεθος* is mistaken, for the point stressed by Aristotle is not that the time and the distance are each of them divided into equal parts, but that the divisions of the one will be exactly as numerous as those of the other (^a 11-12). Simplicius' lemma has *ὡς καὶ τὸ μέγεθος*, but he later states both readings without choosing between them (949.30-950. 5).

7-11. *ἔτι . . . χρόνος.* This sentence might have been dispensed with, but in view of its presence in all the MSS. and in T. 188. 2-5 and in S. 950. 7 there is no sufficient reason for excising it. Bonitz takes the sentence as an example of *ὥστε in apodosis* (which is not uncommon in Aristotle, cf. Bonitz, *Index* 873^a 31-44), but it is equally probable that the apodosis is *καὶ τὸ ἴσον ἐν ἴσῳ δίεσιν.* *ὥστε in apodosis* occurs for the most part only after a very long protasis.

11-14. *ὄτι . . . ὑπάρχοντος.* Since the whole line is finite (^a 34), Aristotle naturally assumes that the time begins at a definite moment, i.e. is limited at one extremity. This one extremity being given (*θατέρου γε πέρατος ὑπάρχοντος*), it is easy to show that the time of the partial movement must also be limited at the other end, and therefore completely finite.

θατέρου γε πέρατος ὑπάρχοντος might also be taken, but perhaps less naturally, to mean 'the *other* extremity (i.e. the end) being given'. *τοῦτο* ^b 13 means 'the time of the partial movement'.

21. *ἐνδέχεται . . . μήκος.* This may be taken either, with *δέ*, as a third premiss, or, without *δέ* (as in the vulgate), as the conclusion.

S. 953. 27 takes it in the former way and must have read δέ, while Themistius' paraphrase, omitting δέ, may be loose (189. 7).

23-5. τὸ μὲν . . . τὸ δὲ, E's reading, is evidently right as against the vulgate reading τὰ μὲν . . . τὰ δὲ. It is supported by S. 954. 1, 2.

24. εἰς τρία ἄτομα . . . ΓΔ. Parallelism with ^b25, Simplicius' commentary 954. 1, 2, and the readings of FH, suggest that this is the true reading. EIJK similarly abbreviate EZ ZH into EZH in ^b25, and ΚΑ ΛΜ ΜΝ into ΚΑΜΝ in ^b28.

29-30. διαιρεθήσεται . . . ἄτομον. I.e., if one body moves half as fast again as the other, and if we suppose the distance covered by the faster to consist of three indivisible parts, and to be covered in three indivisible times, we must suppose the distance covered by the slower to consist of two indivisible parts, and the time to consist of two indivisible times. Then the same time will consist of three equal parts and also of two equal parts, and if so the middle one of the three parts which have been supposed indivisible will turn out to be divisible.

30-31. καὶ . . . πλείονι. This is a second objectionable consequence. The slower body will traverse each of the two indivisible parts of the distance it covers, in a time which is half as great again as the indivisible time in which the faster body covers one of the indivisible parts of its journey.

CHAPTER 3

233^b 33-4. τὸ νῦν . . . λεγόμενον. This is the strictly momentary now, described in 222^a 10-20, in distinction from the now which is a finite stretch of time including the momentary now (ib. 21-4), and called now by reason of the inclusion (καθ' ἕτερον).

234^a 2-3. ὁ . . . πέρας. H's reading φαμεν, 'and this we maintain to be the limit of both', is supported by S. 956. 2, and gives a decidedly better sense than ἔφαμεν (cf. ^a23, ^b6). The latter would have to be supposed to be a reference to iv. 222^a 12, and the absence of something like πρότερον or ἐν τοῖς πρώτοις λόγοις would be suspicious.

A similar variation of reading occurs at ^a32, where λέγομεν is confirmed by Themistius and Simplicius.

3. τοιοῦτον, i.e. ἀμφοῖν πέρας. καὶ ταῦτόν is then explicative of τοιοῦτον. καθ' αὐτό is somewhat pointless, and there is no trace of it in S. 955. 31.

6-7. εἰ . . . ἀμερῶν. If the *terminus a quo* of the future be different from the *terminus ad quem* of the past, it cannot succeed it immediately, for then there would be a continuous time consisting of two indivisible moments, whereas it has been proved in ch. 1 that no

continuum can consist of indivisibles. Simplicius remarks that the argument might seem to be a *petitio principii*, since Aristotle assumes the indivisibility of the moment in an argument to prove its indivisibility. But Simplicius rightly observes that it is the now regarded as terminus *either* of the past *or* of the future that Aristotle assumes to be indivisible, while he is proving that there is an indivisible now which is the terminus *both* of the past *and* of the future.

9. συνώνυμον, not with the *πέρατα* (for where the *πέρατα* are points the *μεταξύ* is a line, where the *πέρατα* are lines the *μεταξύ* is a plane, &c.), but with that of which the *πέρατα* are *πέρατα*.

10-11. πᾶς γὰρ χρόνος . . . διαιρετός, in ch. 2.

11-14. ὥστε . . . χρόνον. If we once suppose the *terminus ad quem* of the past to be different from the *terminus a quo* of the future (^a6), it has been shown that there must be a time between them. And this time, like any other continuum, must be divisible. Therefore if the now which is the meeting-place of past and future be once supposed to contain two distinct moments, it must be conceived of as a lapse of time itself divisible into an earlier and a later, or a past and a future, time. Let A and B be the two distinct terminal moments of the now, and C and D the periods we get by dividing at any point the lapse of time between A and B. Then in the lapse A to B, which should be entirely future *qua* being all after A, there is yet a part C which is past relatively to D; and in the same lapse, which should be entirely past *qua* being all before B, there is yet the part D which is future relatively to C.

14-16. ἄμα . . . αὐτό. A further objectionable consequence of making the terminus of the past not identical with the terminus of the future is that the extended 'now' constituted by both together will not be a now which is a now *per se*, but one which is a now only in the secondary sense of including a now (cf. 233^b 33-4 n.). For the real division of past from future occurs not precisely at it, but at some point intermediate between the two nows.

The reading of the MSS. in ^a16 οὐ καθ' αὐτὸ appears preferable to the others which Philoponus and Simplicius had before them. Though Simplicius' lemma has οὐ καθ' αὐτό, he plainly read οὐ τοῦ καθ' αὐτό (958. 23).

17-19. καὶ . . . χρόνος. If the *terminus ad quem* of the past and the *terminus a quo* of the future are different, there will, as we have seen (^a6-9), be a period of time between them, and this, being a continuum, will be divisible at an infinite number of points, each of which will be a different now and will mark off a different past and a different future, all within the same *μακρὸν νῦν* (Philoponus' phrase) or 'specious present'.

32. λέγομεν. This reading is confirmed by T. 191. 1, S. 961. 13.

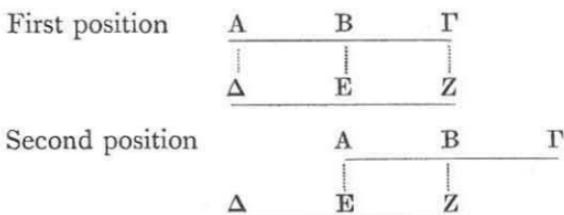
Cf. ^a 2-3 n. If ἐλέγομεν be read, the reference is to v. 226^b 12-16.

35. ἀμφοῖν τοῖν χρόνοι, i.e. the past which it ends and the future which it begins.

CHAPTER 4

234^b 12-13. ὅταν . . . πάντα, 'but when the changing thing is, both itself and all its parts, in that from which it was supposed to be changing'. Bonitz objects to the vulgate ἐξ οὗ μετέβαλε that it is absurd to say 'when the changing thing is in that from which it changed', and wishes to read μεταβάλλει. But both here and in ^b 12 the μεταβάλλει of T. 191. 25, 26 and of S. 963. 7, 8 is probably a free rendering of EJK's μετέβαλλεν, which as interpreted gives the right sense.

22-235^a 8. ἄλλον . . . ἴσην. The object of this section is to show that the movement of a whole is divisible into the movements of its parts. To establish this, Aristotle first shows that the movement of a whole is identical with the sum of the movements of its parts. This is proved first in the section ^b 23-9. At first sight it looks as if he were thinking of the motion of a body of length AΓ moving in the direction of its length.



But then the movement of AB from Δ (i.e. from the position in which its hindmost part is at Δ) to E + the movement of BΓ from E to Z yields a movement of AΓ not from Δ to Z but only from Δ to E. The linear representation must therefore be abandoned (unless Aristotle made a careless mistake, which is possible), and ἡ ΔE and ἡ EZ must be taken not to mean the movement of AB from Δ to E and of BΓ from E to Z, but to be simply designations for the movements of the parts (whatever these movements may be) which together make up the motion of the whole. The movement of the whole has to be thought of as the product of the mass of the whole by the distance it covers, and the movement of each part similarly; then the movement of the whole = the sum of the movements of the parts. The movements of the parts are represented in a purely symbolic way by the collinear lines ΔE, EZ. In this case the sug-

gestion which the phrases ἡ ΔΕ, ἡ ΕΖ convey, that they stand for the *paths* of the parts, is misleading.

29-34. ἔτι . . . μεγέθους, a second argument to show that if ΔΕ, ΕΖ are the movements of the parts ΑΒ, ΒΓ, ΔΕΖ is the movement of the whole ΑΒΓ. The argument may be expanded as follows: 'What else can ΔΕΖ be the motion of? Not of ΑΒ or ΒΓ, since *their* motions are ΔΕ, ΕΖ. Not of anything else; for if ΔΕΖ as a whole were the motion of something other than ΑΒΓ, the parts of ΔΕΖ would be movements of the parts of that thing; but in fact the parts of ΔΕΖ are the movements of the parts of ΑΒΓ and of nothing else (since one movement can only be the movement of one thing). Hence the whole movement ΔΕΖ is the movement of ΑΒΓ.'

31-2. οὐ . . . μερῶν, 'for the parts of the movement are movements of the parts of that of which as a whole the movement as a whole is'.

33. οὐδένων. The plural of οὐδεῖς is rare (except in the sense of 'nobodies'), and there seems to be no other case in Aristotle. But it occurs in Plato (*Tim.* 20 b, *Eph.* 344 a) and especially with ἄλλοι (*Alc. II.* 148 e, *Euthyd.* 305 d), and occasionally in other authors.

πλειόνων . . . κίνησις, 'for one movement cannot have had more than one subject'. ἦν does not seem to point to any previous discussion.

235^a 4-7. εἰ . . . τινῶν. If the movements of the parts fall short of ΘΙ to the extent, say, of ΚΙ, ΚΙ will be the movement of nothing; for (a) it cannot be the movement of the whole or of the parts, because the movements of these are respectively ΘΙ, ΔΕ, ΕΖ and one thing has only one movement; and (b) it cannot be the movement of anything else, since a continuous movement is the movement of things continuous with each other and ΑΓ contains no continuous parts besides ΑΒ, ΒΓ.

14. ἐν τινι κινεῖται, 'is moved in some respect', i.e. in respect of place, quality, or quantity. For this use of ἐν τινι cf. 227^b 25, 29. ἐν τινι also suggests that movement is along a path (when the movement is locomotion) or along a quasi-path (when it is change of quality or of size); and it is the path or quasi-path that in ^a 16 is said to be divisible (ἐν ᾧ ἡ κίνησις).

παντός, sc. τοῦ κινουμένου.

16. καὶ τῆς κινήσεως . . . κινεῖσθαι. It is not very clear what distinction Aristotle means to draw between ἡ κίνησις and τὸ κινεῖσθαι. P. 806. 22, 865. 26 suggests that ἡ κίνησις is regarded as a *ἕξις*, τὸ κινεῖσθαι as an *ἐνέργεια*. It is perhaps more exact to say that by the *κίνησις* Aristotle means a certain movement considered as capable of being undergone by a variety of subjects, by τὸ κινεῖσθαι the historical undergoing of the movement by some individual subject.

18. τοῦ μὲν τόπου . . . συμβεβηκός. Simplicius tells us that Alexander conjectured ποσοῦ for τόπου, and it seems likely that it is from this

source that *ποσοῦ* has found its way into all the MSS. except J¹. If we read *τόπου* we must suppose that the third case, that of change of size, is omitted as obviously ranking with change of place in the respect mentioned (so S. 975. 21). The *ἐν φ* here is identical with the *αὐτὸ δ μεταβάλλει* of 236^b 1-18, and Aristotle says definitely there that, of the three *αὐτὰ ἀ μεταβάλλει*, that which is involved in change of size (^b 16-17), as well as that involved in change of place (^b 8-16), is divisible *per se*, and only that involved in change of quality is divisible *per accidens* (^b 5-8, 17-18).

Alexander supposes that *τοῦ ποσοῦ* can include both change of size and change of place (so T. 193. 4), but this seems very doubtful. It would be strange if locomotion, the primary and most literal kind of *κίνησις*, were not mentioned explicitly. We should perhaps read *τοῦ μὲν τόπου καὶ τοῦ ποσοῦ*.

18-22. *εὐλήφθω . . . οὕτως*. This proves that the movement must have divisions answering to those of the time. Prantl's reason for bracketing this sentence is probably that he fails to notice the difference between it and the sentence ^a 22-4.

22-4. *ὁμοίως . . . ἐλάττονι* proves the converse of what is proved in ^a 18-22. This is made clearer by the introduction of *εἰ* in ^a 22, which is confirmed by S. 976. 2.

28-34. *ἔστι . . . ὅλον*. This seems to be meant to be an alternative way (to that in ^a 25-8) of showing that *τὸ κινεῖσθαι* is divisible correspondingly to the division of the *κίνησις*. In 234^b 22-235^a 8 Aristotle proved that the movement of a whole is the sum of the movements of the parts, in order to show that a movement is divisible correspondingly to the division of the moving thing into parts. Similarly here he proves that where there is a *κίνησις* divisible into parts, the *κινεῖσθαι* answering to the whole *κίνησις* is the sum of the *κινεῖσθαι*'s answering to the parts of the *κίνησις*, in order to show that the whole *κινεῖσθαι* is divisible correspondingly to the division of the *κίνησις*.

28. *ἐκθέμενον*, 'setting out by way of a particular example'.

29-30. *οἶον . . . ΓΕ*. In ^a 26 a line Γ has figured as the symbol of a whole *κινεῖσθαι*. Aristotle now designates it as the line ΔΓΕ and takes it (rather confusingly) as a symbol of a whole *κίνησις* divisible into two parts.

30-31. *εἰ . . . κίνησιν*. If we suppose that there is a *κινεῖσθαι* answering to the whole *κίνησις* ΔΕ other than the sum of the *κινεῖσθαι*'s answering to ΔΓ, ΓΕ, we shall be supposing that there is more than one *κινεῖσθαι* answering to the same *κίνησις*, since the *κινεῖσθαι* which is their sum certainly is a *κινεῖσθαι* answering to the whole *κίνησις*. The argument is of the same type as that in 234^b 34-235^a 8.

31. πλείω ἔσται κινεῖσθαι. The use of the infinitive in the plural must be very rare in Greek, but when the argument requires an unusual phrase Aristotle never hesitates to use it. It would be possible to take the words as meaning 'it will be possible for more than one thing to be moved', but this does not fit the argument so well, and Simplicius takes the words in the other way.

33-4. ληφθέντος . . . ὄλον. The point of the clause seems to be this: The only possible reason for supposing that the sum of the κινεῖσθαι's answering to the κινήσεις ΔΓ, ΓΕ is not the κινεῖσθαι answering to the sum of the κινήσεις lies in the suspicion that the two κινεῖσθαι's do not form a continuous κινεῖσθαι; but in fact they do (since the κινήσεις ΔΓ, ΓΕ are themselves continuous with each other).

36. ἐνός, any one of the five things enumerated in ^a 15-17.

37. ἐπὶ τοῦ πεπερασμένα εἶναι ἢ ἄπειρα. ἐπὶ with the genitive and infinitive in the sense of 'in the matter of' is unusual, but cf. Dem. 21. 180 τὴν ἐπὶ τῆς πομπῆς καὶ τοῦ μεθύειν πρόφασιν λαβών.

^b 4. τὸ μὲν οὖν διαιρετὸν δέδεικται πρότερον, 234^b 10-20.

5. τὸ δ' ἄπειρον . . . δῆλον, in ch. 6.

CHAPTER 5

235^b 8. ἐν ᾧ μεταβέβληκεν = ἐν τούτῳ εἰς ὃ μεταβέβληκεν (^b 27).

13. ἐπεὶ . . . ἀντίφασιν, i.e. γένεσις and φθορά (225^a 12-20).

18. ταῖς ἄλλαις, i.e. change of place, quantity, and quality.

22. τούτῳ, i.e. τούτῳ εἰς ὃ μεταβέβληκεν.

24. τὸ Β (*alt.*). Hayduck's emendation is needed, for (1) ἔχασθαι takes a genitive, not a dative, and (2) of two contiguous things only that which comes after the other is said ἔχασθαι (227^a 4-6), and Β comes after Γ. After τὸ Β we must understand τοῦ Γ.

δε is better attested than the vulgate γάρ, and gives a better sense. If Γ, Β are different points in a continuous whole, there must be an interval between them, which the moving thing has still to cover.

32. ἐν ᾧ is used here not as in ^a 16-17 of the respect in which or interval over which a thing changes, but of the time of the change, as in 224^a 35.

236^a 2-3. ὁ αὐτὸς δὲ λόγος . . . μεταβέβληκεν. Aristotle by oversight adds this as if it were a separate case. It has already been mentioned in the words ἢ πάλιν ἐν τῷ ΒΓ 235^b 36.

10-15. τὸ μὲν οὖν κατὰ τὸ τέλος . . . μετέβαλλον. No part of the process can be called absolutely first, because the part may be divided again, thus revealing a prior first, and so *ad infinitum*. Similarly of course no part of the process can strictly be called the

end; but the limit (*πέρας*) exists not as a part of the process but as an indivisible limit to it. In the corresponding sense there is an *ἀρχή*, but it is not strictly speaking an *ἀρχή μεταβολῆς*, because as yet the process has not begun; so it remains true that there is no such thing as τὸ ἐν ᾧ πρῶτῳ ἤρξατο μεταβάλλειν.

16-17. τοῦτο . . . νῦν. To treat *ΑΔ* as indivisible would be to adopt the view which regards time as made up of very short indivisible units of time contiguous to one another.

17. ἐν τῷ ΓΑ χρόνῳ, i.e. in the period of time immediately preceding *ΑΔ*.

18. καὶ . . . ἤρεμεῖ. It would be more correct to say 'it is not in motion in *A*'; for in a moment nothing can be at rest any more than it can be in motion (234^a 31-4).

23-5. εἰ . . . πρῶτῳ. With the vulgate reading εἰ δ' ἐν ἀμφοῦν μεταβάλλει, καὶ ἐν τῷ παντί· εἰ δ' ἐν θατέρῳ κτλ., the words εἰ . . . παντί are pointless. I have adopted the reading which S. 985. 26-7 seems to presuppose. With this reading εἰ . . . παντί and εἴτ' . . . μεταβέβληκεν are two protases leading to the same apodosis οὐκ ἐν τῷ ὅλῳ πρῶτῳ. For εἰ . . . εἴτε cf. Xen. *Cyr.* ii. 1. 7, Plat. *Laws*, 952 b.

29-30. πᾶν . . . μεταβάλλον, 234^b 10-20.

32. ἔλαττον . . . μεταβεβληκός. The sense is slightly improved by reading *τι* for the vulgate *τό* (cf. 237^a 30). The omission of *τι* after *ἔσται* in *EH* is more natural than that of *τό* would be, and Simplicius' variation of order is unimportant.

^b1. αὐτὸ . . . ὁ μεταβάλλει, 'the very element in the changing thing that changes'. Prantl emends to εἰς ὁ, for the sake of uniformity with ^b3, but this is not necessary.

6. πάντα, sc. τὰ ποιῶ. ποιῶ are divisible not *per se* but only because they are, as it were, spread out over the extended and therefore divisible things that possess them.

8-9. ὅσα . . . συμβεβηκός, those of the αὐτὰ ἃ μεταβάλλει which are *per se* divisible, i.e. the elements that change when the change is locomotion (^b 10-16) or growth-or-diminution (^b 16-17).

9. οὐδ' ἐν τούτοις, sc. any more than in the μεταβάλλον (dealt with in ^a 27-35) or in the time (dealt with in ^a 13-27).

10-11. ἔστω . . . πρῶτον. *AB* is a line used to symbolize a moving body, which moves along a line which is the production of its own length.

12. ἀμερές . . . ἐχόμενον. This is impossible, because it would imply that a continuum could be made up out of contiguous indivisible elements, whereas it can only be composed of divisible parts (chs. 1, 2).

17-18. φανερόν . . . εἶναι. Aristotle's doctrine with regard to

qualitative change is that so far as the *αὐτὸ δ μεταβάλλει* (e.g. the colour) is concerned there are indivisible instalments of change; since on the other hand the quality is spread out over an extended and infinitely divisible thing, the whole thing changes quality through changes of quality of its parts, each of which changes is divisible into changes of quality of smaller parts, *ad infinitum*.

CHAPTER 6

236^b 20–21. λέγεται . . . ἕτερον. Cf. the corresponding distinction with regard to place, 209^a 31–^b 1.

22–3. ἐν ᾧ πρώτῳ χρόνῳ . . . μεταβάλλειν. *μεταβάλλειν* here cannot have the meaning exactly corresponding to that of *μεταβάλλει*. The meaning must be ‘in any part of the primary or commensurate time in which the changing thing completes a certain change, it must be changing’.

24. τὸ γὰρ πρῶτον οὕτως ἐλέγομεν (235^b 33), i.e. as meaning ‘filled by, or not extending beyond, the given change’. It follows from this that in every part of the *πρῶτος χρόνος* the changing thing is changing.

26. ἐφ’ ᾧ ΧΡ. The letters are of course suggested by the word *χρόνος*.

πᾶς γὰρ χρόνος διαιρετός. Cf. 232^b 23–233^b 32.

32. *κινεῖσθαι* appears to be the right reading here; cf. *μεταβάλλειν*

^b 23. *κεκινήσθαι* has got into ΚΛ through the influence of *κεκινήσθαι*

^b 33.

237^a 4. ἡ . . . χρόνῳ. The argument shows that Bekker’s ἡ ὅλως ἡ is wrong; cf. ^a 8. ἐν ὅτῳ οὖν χρόνῳ means ‘in any part of the whole time’.

14. ἐν ὅτῳ οὖν means ‘in any element of the whole time’, including both the shorter periods of time, in each of which the changing thing *μεταβάλλει*, and the moments, at each of which it *μεταβέβληκεν*.

19–25. ἅπαν . . . νῦν. As a preliminary to proving that everything that has changed, previously was changing, Aristotle proves that everything that has changed has changed in time. This then becomes the starting-point of the argument in ^a 25–8.

23. ἐν τούτῳ, in that from which it has changed.

24. δέδεικται πρότερον, 235^b 6–13.

25. οὐ . . . νῦν, cf. 231^b 6–10, where it is shown that nows are not *ἐφεξῆς*. This implies that they are not *ἐχόμενα*, for the *ἐχόμενον* is a subdivision of the *ἐφεξῆς* (227^a 6).

30. ἔστω γὰρ τι μεταβεβληκός. F’s reading *τι* is confirmed by P. 869. 25; cf. 236^a 32.

32. ἐπεὶ . . . ἀδύνατον. This follows from the definition of ἐχόμενον as ὃ ἂν ἐφεξῆς ὄν ἀπτηται (227^a 6), and of ἀπτόμενα as ὧν τὰ ἄκρα ἄμα (226^b 23). That which has no parts has no ἄκρα.

35^b 3. ἢ γὰρ αὐτὴ ἀπόδειξις . . . ἐρούμεν. In 225^a 12 it is said that the termini of change must be either contraries or contradictories; and the doctrine there stated is that γένεσις and φθορά are between contradictories (ib. 12-20), and the other three kinds of change between contraries (ib. 34^b 5, 226^a 25). In particular, locomotion is said to be between ἐναντία κατὰ τόπον (226^b 32, 230^b 11). But in ch. 5 Aristotle has said that change of place and change of size are ἐν συνεχεῖ, over a continuous distance (236^b 8-17), and that change of quality is the only κίνησις that is not so (ib. 17-18). It is this, therefore, that is meant here by change ἐν ἐναντίοις (and indeed qualitative change is at least more obviously between contraries than change of place or of size), while change ἐν ἀντιφάσει is γένεσις and φθορά. Since change of quality and γένεσις-and-φθορά are ἐν τοῖς μὴ συνεχέσιν, the argument from the infinite divisibility of the distance covered (^a 28-34) is inapplicable, and Aristotle falls back (^b 2) on the previous argument from the infinite divisibility of the time occupied by the change (^a 19-28).

^b 8-9. ἄπειρος . . . γραμμῶν. If we bisect a line, bisect half of it, and so on, we get both a series of lines each greater than the one before (AC, AD, AE . . .) and a series of lines each less than the one before (AC, CD, DE . . .)

A C D E B

and this process of division may be carried on *ad infinitum* (cf. 206^b 3-6).

II. ὅσα . . . συνεχῆ. This is meant to exclude the things which Aristotle holds to be γενητὰ καὶ φθαρτὰ ἄνευ τοῦ γίγνεσθαι καὶ φθείρεσθαι, i.e. which come into being instantaneously (*Met.* 1027^a 29), e.g. ἐνέργειαι such as sensations (*De Sensu* 446^b 4), points (*Met.* 1044^b 22, 1060^b 19), moments (ib. 1002^b 6), forms superinduced on matter (ib. 1043^b 15, 1044^b 22).

II-13. οὐ . . . θεμέλιον. S. 997. 7 asks why Aristotle qualifies his statement by ἐνίοτε, since it is *always* the case that the γίγνεσθαι of a thing can have been preceded by the γεγονέναι only of a part, not of the whole. He thinks that the words οὐ . . . θεμέλιον apply not to τὸ γιγνόμενον γεγονέναι πρότερον but to τὸ γεγονὸς γίγνεσθαι πρότερον, and points out that, while the γεγονέναι of a house is always preceded by its γίγνεσθαι, it ἐγίγνετο not only when it was being completed but also when its foundation was being laid. This interpretation obviously does not do justice to what Aristotle says, and is precluded by Aristotle's actual language, οὐ μέντοι αἰεὶ δὲ γίγνεται, which obviously

refers to τὸ γιγνόμενον γεγονέναι, not to τὸ γεγονὸς γίγνεσθαι πρότερον. The meaning must be that while (a) when the whole is a ὁμοιομερές, one may say, e.g., whenever flesh is coming into being, that flesh has already come into being, (b) when the whole is an ἀνομοιομερές like a house, we cannot say, when the house is coming into being, that a house has come into being, but only that a foundation has.

21-2. ὥστ' . . . πρώτῳ. Though the proposition enunciated at the beginning of the chapter is that a thing is changed in any part of the *time* which is taken as that ἐν ᾧ πρώτῳ μεταβάλλει, yet, since Aristotle has now pointed out the infinite divisibility of the path as well as of the time (^b 20-21), ἐν ᾧ probably refers to both, and Aristotle is saying that there is no time in which, or path along which, a changing thing changes ὡς πρώτῳ.

CHAPTER 7

237^b 25. πεπερασμένην, sc. γραμμὴν οἱ κίνησιν.

25-6. μὴ τὴν αὐτὴν . . . κινούμενον, 'not performing the same motion again and again, and at every time one of its parts', as in rotation or the swing of a pendulum.

35. τὸ AB. Bonitz's emendation is justified by S. 1000. 19 and by Aristotle's invariable practice in naming a line; cf. 238^a 7, 8, 18.

238^a 2. ἔτερον here and in ^a 3, 4 is an accusative of extent.

3. ὅτι = 'that', not 'because'.

13-14. ἐκ πεπερασμένων . . . ἀνίσων. πεπερασμένων must here mean 'finite both in size and in number'. It is impossible both that the infinite should be made out of a finite number of finite equals, and that it should be made out of a finite number of finite unequals.

15-16. εἰάν τε ἴσα . . . ἦττον. Bekker's and Prantl's punctuation, εἰάν τε ἴσα ἢ εἰάν τε ἄνισα· ὠρισμένα δὲ τῷ μεγέθει οὐθὲν ἦττον, gives quite a wrong sense. Punctuated properly, the words mean 'this being none the less true whether the parts are equal (as the parts of the time would be if the motion were of uniform velocity) or unequal (as they would be if it were of non-uniform velocity), provided they are limited in size'. Cf. ^a 4-6.

17. ποσοῖς. This reading is confirmed against Bonitz's πεπερασμένοις ποσοῖς by P. 870. 18. ποσοῖς τοῖς ΑΕ, 'by a certain (finite) number of the (*ex hypothesis*) finite parts ΑΕ', gives the sense required without the addition of πεπερασμένοις.

18-19. κινῶτο . . . ἔν. Bekker's punctuation κινῶτο. ὡσαύτως . . . ἡρεμήσεως ὥστε . . . ἔν is wrong in that it suggests that ὥστε . . . ἔν follows from ὡσαύτως . . . ἡρεμήσεως. It follows from the previous argument, ὡσαύτως . . . ἡρεμήσεως being parenthetical.

18. ὡσαύτως . . . ἡρεμήσεως. In a sense all κίνησις is ἡρέμησις,

since what is moving from a *terminus a quo* is necessarily coming to rest at a *terminus ad quem*. But the form of words used shows that Aristotle is thinking of ἡρέμῃσις as a different process from κίνησις. He has been so far thinking of κίνησις as of uniform or increasing velocity, and he now points out that what he has said of this is true of movement of diminishing velocity; viz. that such a movement over a finite path cannot occupy an infinite time.

18-19. ὥστε . . . ἔν. These words, bracketed by Prantl, were read by Simplicius, and are perfectly defensible. γίγνεσθαι and φθείρεσθαι are processes of change, and the γένεσις or φθορά of a single (finite) thing is thought of as if it were movement along a finite path, and therefore said to be incapable of lasting for an infinite time.

24. ὅλον . . . καί. Bekker's and Prantl's punctuation ὅλον ἔν γὰρ τῷ παντὶ τὸ ὅλον, καί spoils the argument, for which cf. ^a 9.

^b 6. τὸ πεπερασμένον. E's reading is required by the sense.

II. ἢ . . . ἀναμετροῦν, i.e. the finite μέγεθος either may actually move through the infinite, or it may measure it by the infinite's moving through it.

16. ἔτι . . . ἀπόδειξις. The reference is to the proof which proceeds by dividing up the time of the movement and not the path (238^a 22-30).

17-19. ἐπεὶ . . . κινεῖται. Since ἐν πεπερασμένῳ χρόνῳ qualifies all three statements, the sentence is much improved by omitting δίδεισιν, with E, and treating it as a gloss.

CHAPTER 8

238^b 29-30. ἔτι . . . βραδύτερον. This is a second proof that ἐν χρόνῳ ἴστασθαι ἀνάγκη. εἰ κτλ. must therefore be taken as depending on φανερόν (sc. ἐστὶ) ^b 26. S. 1007. 11-14 interprets so. Perhaps, however, E is right in omitting εἰ.—In ^b 31 Aristotle passes to a fresh point, and Bekker's colon after βραδύτερον is not a sufficient stop.

31-6. ἐν ᾧ δὲ χρόνῳ . . . πρότερον. Aristotle now proves of τὸ ἰστάμενον what he proved of τὸ κινούμενον in ch. 6.

34. ἐν πρώτῳ τῷ ὅλῳ. This gives a better sense than ἐν πρώτῳ ὅλῳ, and is confirmed by P. 872. 23, S. 1007. 27.

35. καθ' ἕτερον is confirmed by P. 815. 4, 872. 24, and by the passage referred to in καθάπερ ἐλέχθη καὶ ἐπὶ τοῦ κινουμένου πρότερον, viz. 236^b 31. καθ' ἕτερον = τῷ ἐν ἐκείνῳ τινί (239^a 24).

239^a 5. διὰ τὸ κενηθῆσθαι τι ἂν αὐτοῦ, 'because before being moved it would have had to have been moved for a part of the supposed partless time'. The reference is to the doctrine proved in 236^b 32-237^a 17, that everything that is being moved must already have been moved. E's ἂν is confirmed by P. 815. 13. The vulgate reading also gives

a good sense, but $\alpha\tilde{\nu}$ is more likely to have been accidentally omitted than to have been inserted later.

τὸ δ' ἰστάμενον δέδεικται κινούμενον, 238^b 23-6.

7. τοῦτο . . . πρότερον, 238^b 31-6.

II. ἐν ἀμερεῖ μὲν. What answers to this is εἰ δὲ μεριστόν, ^a 17.

13. ἔφαμεν, v. 226^b 12-15.

13-14. ὅτε . . . ᾧ, 'when, i.e. in that in which'. ἐν ᾧ is introduced to make the statement square exactly with that in ^a 12.

18-19. τὸν αὐτὸν γὰρ τρόπον . . . πρότερον. I.e., the same can be proved of τὸ ἡρεμοῦν as was proved of τὸ κινούμενον in ch. 6 and of τὸ ἰστάμενον in 238^b 31-6.

24. τῷ ἐν ἐκείνου τινί. Either this reading or Gaye's τῷ ἐν τῶν ἐκείνου τινί gives the right sense. It is not clear which Simplicius read (1009. 29, 1010. 2, 27). There are parallels to Gaye's reading in 224^a 32, 241^b 27, 38.

25. κατὰ τι εἶναι πρῶτον, 'over against some particular thing primarily', i.e. so as to be precisely opposite it, not in some larger place of which only part is occupied at once.

33-^b 4. εἰ . . . ἡρεμεῖν. From ^a 23 on, Aristotle has been proving that in the time in which a body is moving, in the sense that its movement precisely occupies the whole time, there is nothing which the moving body is precisely over against, no place which it precisely fills. He has proved this by reference to the infinite divisibility of time. He now points out that if it is said that it is in a single now that the body is precisely κατὰ τι, then it is not κατὰ τι for any time but only at a boundary of time, and that in this, though it can be said not to move, it cannot be said to rest. In any case this could not amount to resting at a place for a certain time; for that would imply that what was moving was resting.

^b 3. κατὰ τι ἡρεμοῦν. It is impossible to get a good sense out of the vulgate κατὰ τὸ ἡρεμοῦν. The passage is cured by reading τι (cf. κατὰ τι μὲν ὄν ^a 35); the reading of E² is due to a conflation of the right with the wrong reading. For confusion between τι and τό in the MSS. cf. 236^a 32, 237^a 30.

CHAPTER 9

It is impossible to say with any certainty against whom Zeno's paradoxes about motion were directed. Stallbaum (Plato, *Parm.*, 25-9) thought that Anaxagoras and Leucippus were chiefly intended. Tannery (*Science hellène*, 249-52), Bäumker (*Problem der Materie*, 60-61), and Burnet (*E.G.P.*, 158, 159) hold that it is Pythagoreans that are attacked. Gaye argues (*J. of P.* xxxi (1908). 110-115) that the fourth argument is directed against Empedocles. H. Gomperz

(*Sophistik u. Rhetorik*, 18 ff.) suggests that Gorgias' *Περὶ φύσεως ἢ περὶ τοῦ μὴ ὄντος*, being a satirical exaggeration of Parmenides' views, may have been one of the works aimed at.

Chronological grounds make it improbable that Zeno could as a young man (*Pl. Parm.* 128 d 6) have attacked Anaxagoras, Leucippus, or Gorgias. Again, it cannot well be maintained that all four of Zeno's arguments were directed against a single thinker or school; for the first two are directed against those who believe, and the last two against those who disbelieve, in the infinite divisibility of continua. The only one of the four arguments whose language gives any plausible ground for thinking of any particular school as being attacked is the fourth, where the reference to *ὄγκοι* is taken by Tannery to point to the Pythagoreans. As Gaye points out, the passages of which Tannery was presumably thinking are the following:

Stobaeus, *Ecl.* i. 17. 3 Ἐμπεδοκλῆς καὶ Ξενοκράτης ἐκ μικρότερων ὄγκων τὰ στοιχεῖα συγκρίνει, ἅπερ ἐστὶν ἐλάχιστα καὶ οἰονεὶ στοιχεῖα στοιχείων.

Galen, *Hist. Phil.* 18 Diels (244 Kühn) Ἡρακλείδης δὲ ὁ Ποντικός καὶ Ἀσκληπιάδης ὁ Βιθυνὸς ἀνάγκους ὄγκους τὰς ἀρχὰς ὑποτίθενται τῶν ὄλων.

Eusebius, *Praef. Evap.* xiv. 23 οἱ δὲ τὰς ἀτόμους μετονομάσαντες ἀμερῆ φασιν εἶναι σώματα τοῦ παντὸς μέρη, ἐξ ὧν ἀδιαίρετων ὄντων συντίθεται τὰ πάντα καὶ εἰς ἃ διαλύεται . . . ὄνομα δέ, φασίν, αὐτοῖς ἄλλο Ἡρακλείδης θέμενος ἐκάλεσεν ὄγκους.

It is clear that the use of the word *ὄγκος* by writers so late as Xenocrates, Heraclides Ponticus, and Asclepiades Bithynus can throw no reliable light on early Pythagorean theory, and there is no real evidence that *ὄγκος* was used by Pythagoreans whom Zeno could have had in mind. On the whole it seems pretty clear (in spite of the statement of *Plut. Mor.* 883 D and *Stob. Ecl.* i. 14. 1 that the Pythagoreans said that bodies are *τμητὰ εἰς ἀπειρον*) that the Pythagoreans held that bodies are made up out of indivisible parts (cf. 227ⁿ 29 n.); but there is little to support the view that they and they alone were aimed at by Zeno. Burnet says 'We know from Plato that Zeno's book was the work of his youth. It follows that he must have written it in Italy, and the Pythagoreans are the only people who can have criticized the views of Parmenides there and at that date.' But a criticism by Empedocles of Agrigentum might well have come within Zeno's knowledge, more particularly if, as Alcidamas said (*Diog. Laert.* viii. 56), they were fellow-students under Parmenides (and Zeller and Burnet agree in thinking this probable).¹

¹ Zeller, *I⁶*. 752, n. 1 rejects the view that Zeno's arguments were directed against the Pythagoreans.

The evidence connecting the theory with Empedocles is, in turn, also slight. He uses the word *ὄγκος*, but in no technical way (fr. 20. 1 *τοῦτο μὲν ἂν βροτέων μελέων ἀριδείκετον ὄγκον*, 100. 13 *ἄερος ὄγκος ἔσωθε πεσῶν ἐπὶ τρήματα πυκνά*). And indeed, in discussions of this subject, far too much has been made of the word *ὄγκος*, which Aristotle, for instance, not seldom uses as a natural synonym for *σῶμα* (*Phys.* 203^b 28, 213^a 17, *De Caelo* 305^b 15, *De Sensu* 442^b 6, *Met.* 1085^a 12, 1089^b 14). What is more to the point is that Empedocles criticizes Parmenides (fr. 2. 3-6

παῦρον δὲ ζωῆς ἰδίου μέρος ἀθρήσαντες
 ὠκύμοροι καπνοῖο δίκην ἀρθέντες ἀπέπταν
 αὐτὸ μόνον πεισθέντες, ὅτῳ προσέκυρσεν ἕκαστος
 πάντοσ' ἐλαυνόμενοι, τὸ δ' ὅλον πᾶς εὐχεται εὐρεῖν,

and fr. 4. 1 *ἀλλὰ θεοὶ τῶν μὲν μανίην ἀποτρέψατε γλώσσης*); that he believed in indivisible bodies (cf. Stob. *Ecl.* i. 17. 3 quoted above, and Plutarch *Mor.* 883 E to the same effect); and that Zeno wrote an *Ἐξήγησις τῶν Ἐμπεδοκλέους* (Suidas s.v. *Ζήνων*), which, as Diels has shown (*Sitzb. d. Akademie zu Berlin*, 1884. 359), must have been a criticism rather than a commentary. Empedocles, as the first of the scientific pluralists, may well have been the main object of Zeno's attack. But there is some force in T. Gomperz's view (*Griech. Denker*, i. 155-6) that the description of his book which Plato puts into Zeno's mouth in *Parm.* 128 c (*βοήθειά τις . . . τῷ Παρμενίδου λόγῳ πρὸς τοὺς ἐπιχειροῦντας αὐτὸν κωμωδεῖν . . . ἀντιλέγει δὴ οὖν τοῦτο τὸ γράμμα πρὸς τοὺς τὰ πολλὰ λέγοντας*) suggests not so much a serious criticism by a rival philosopher, as the satirical attacks of those for whom Parmenides' denial of plurality was too much opposed to the evidence of the senses. All that we can say is that, if the fourth argument was aimed at any philosopher, it was more probably aimed at Empedocles than at any other.

239^b 5-240^a 18. *Ζήνων . . . ψεῦδος*. The line of thought of the later part of the last chapter leads naturally up to the mention of Zeno's paradox of the flying arrow (cf. 239^a 35-^b 4 with ^b 5-9), and the mention of this leads on to Zeno's other paradoxes about motion.

5-7. *εἰ . . . οἰστόν*. The MS. reading can hardly be right; nor is it possible to be sure what readings the commentators had before them. T. 199. 4-6 has *εἰ γὰρ ἡρεμεῖ, φησίν, ἅπαντα, ὅταν ἦ κατὰ τὸ ἴσον αὐτοῦ (? αὐτῷ) διάστημα, ἔστι δὲ αἰεὶ τὸ φερόμενον κατὰ τὸ ἴσον ἑαυτοῦ (? ἑαυτῷ) διάστημα, ἀκίνητον κτλ.* P. 816. 30-817. 2 has *ἅπαν, φησίν, ἐν τῷ ἴσῳ ἑαυτοῦ (? ἑαυτῷ) τόπῳ ὑπάρχον ἢ ἡρεμεῖ ἢ κινεῖται, ἀδύνατον δὲ ἐν τῷ ἴσῳ αὐτοῦ (? αὐτῷ) κινεῖσθαι, ἡρεμεῖ ἄρα. τὸ τοίνυν φερόμενον βέλος ἐν ἑκάστῳ τῶν νῦν τοῦ χρόνου καθ' ὃν κινεῖται (ἐν) ἴσῳ*

ἑαυτοῦ (? ἑαυτῶ) τόπω ὑπάρχον ἡρεμήσει κτλ. Simplicius' comment is too long to quote, but it seems from 1011. 27-8 that he had the same reading as our MSS., and that in his comment *ib.* 19-27 he is trying to make the best of a difficult and indeed (one must think) impossible text.

ἡ κινεῖται would be in point only if Zeno had argued disjunctively that because the arrow is not in motion, it is at rest; but since his conclusion is ἀκίνητον (not ἡρεμοῦσαν) τὴν φερομένην εἶναι διστόν, he does not seem to reason thus. I think therefore that Themistius, who has no trace of ἡ κινεῖται, preserves the original reading, and that ἡ κινεῖται has come in through the influence of such passages as 238^b 23. Possibly, however, we should read οὐ κινεῖται; for the construction cf. 263^b 30.

In view of the emphatic position of ἔστιν, it seems to me possible to 'understand' κατὰ τὸ ἴσον with the clause ἔστιν δ' αἰεὶ τὸ φερόμενον ἐν τῷ νῦν. But if necessary it can be inserted after αἰεὶ, or after φερόμενον, or after νῦν, or we might read (κατὰ τὸ ἴσον) δ' ἔστιν.

Accepting ἡ κινεῖται, Diels continues (οὐδὲν δὲ κινεῖται) ὅταν ἡ κατὰ τὸ ἴσον, ἔστι δ' αἰεὶ τὸ φερόμενον ἐν τῷ νῦν, (πᾶν δὲ κατὰ τὸ ἴσον ἐν τῷ νῦν), which gives a possible expression of what we may suppose to have been Zeno's argument, but involves more emendation than seems necessary.

7. τὴν φερομένην . . . διστόν. The gender is very unusual, and is probably reproduced from Zeno.

8-9. οὐ . . . οὐδέν, cf. ch. 2.

II-14. πρῶτος . . . λόγοις. From 233^a 21-3 we see that this first argument was an argument to show that motion involved an infinite regress. It is not quite clear which of two forms it took. Zeno may have reasoned thus: (1) Before a moving body can get to the end of a line it must get to the midway point; before it can get to the midway point it must get to the midway point of the first half; before it can get to that it must get to the midway point of the first quarter; and so on. Or he may have reasoned thus: (2) Before a moving body can get to the end of any line it must get to the midway point; then to the midway point of the second half; then to the midway point of the fourth quarter; and so on. T. 199. 13-16 and S. 1013. 6-10 take the argument in the first way. Aristotle's words in 239^b 18-20 ἔστιν δὲ καὶ οὗτος (the Achilles) ὁ αὐτὸς λόγος τῷ διχοτομεῖν (the present argument), διαφέρει δ' ἐν τῷ διαιρεῖν μὴ δίχα τὸ προσλαμβανόμενον μέγεθος might seem to point to the second interpretation. For (a) the present argument is clearly more like the Achilles on the second interpretation than on the first. And (b) on the first interpretation there is no προσλαμβανόμενον μέγεθος, no further

distance to be covered, involved in the present argument, since the problem is how any distance at all can be covered. But (a) even on the first interpretation there is quite enough resemblance between the first two arguments, since they both turn on the necessity for passing an infinite number of points before a point a finite distance from the start can be reached. And (b) Aristotle's words do not necessarily imply that there is a *προσλαμβανόμενον μέγεθος* involved in the first argument; they may only mean that the *προσλαμβανόμενον μέγεθος* involved in the second argument is not bisected, as the *μέγεθος* involved in the first argument was. The words of 239^b 12-13 'because the moving body must arrive at the mid-point before it arrives at the end' are perhaps more naturally supplemented by adding 'and at the mid-point of the first half before it arrives at the end of the first half' than by adding 'and at the mid-point of the second half before it arrives at the end of the second half'. Zeno's argument certainly is more striking if the first interpretation be adopted; for it then shows, not that a moving body can never reach the end of a certain finite distance, but that it can never get going at all.

Aristotle's previous answer to this argument (referred to in ^b 13-14) was that the time is infinite in exactly the same sense as the distance, viz. infinitely divisible (233^a 21-31).

14-29. *δεύτερος . . . πεπερασμένην*. Diogenes Laertius (ix. 29) says that Favorinus described Parmenides as having used the argument about Achilles and the tortoise; but he himself says that Zeno invented it, and this is no doubt right. Cf. the account given by Zeno of his own role relatively to Parmenides, in *Pl. Parm.* 128 b-e.

15. *τὸ βραδύτατον*. That Zeno took the tortoise as his example we learn from *T.* 199. 25, *S.* 1014. 5. Cf. *Plut. Mor.* 1082 E, where the pursuer is *Ἀδρήστον ταχὺς ἵππος*.

16-18. *ἔμπροσθεν . . . βραδύτερον*. The argument is: before the pursuer can catch the escaper he must reach the point A from which the escaper starts; but meantime the escaper will have got some way on, to B. Again, the pursuer must reach B before he can catch the escaper, but meantime the escaper will have got to C, and so *ad infinitum*.

18. *τῷ διχοτομεῖν*, i.e. as the argument in ^b 11-13.

19-20. *διαφέρει . . . μέγεθος*. The principle of the two arguments is the same, viz. that a moving thing has to reach an infinite number of points before it can reach a given point. But in the first argument Zeno happened to consider the infinite points as reached by successive bisection, while in the second argument he did not use bisection, but divided the *προσλαμβανόμενον μέγεθος*, i.e. the distance

which, in addition to the tortoise's start, Achilles has to cover in order to catch the tortoise, into parts which are to one another in a different ratio, viz. the ratio of the speed of Achilles to that of the tortoise, whatever that may be.

26-9. τὸ δ' ἀξιοῦν . . . πεπερασμένην. This amounts to saying that Zeno is guilty of an *ignoratio elenchi*. He shows successfully that when Achilles has travelled the distance of the tortoise's start, he is $\frac{b}{a}$ behind (when the start is 1, his velocity a , and the tortoise's velocity b), that when he has travelled the distance $1 + \frac{b}{a}$ he is $\frac{b^2}{a^2}$ behind, and so on; but he has not shown, and cannot show, that when Achilles has traversed the distance $\frac{a}{a-b}$ he is still behind; and if it be admitted that this finite distance can be traversed in a finite time (which is possible owing to the fact that time is infinitely divisible no less than space, 233^a 21-31), then he can and does catch the tortoise, and Zeno's argument for the unreality of motion, derived from the absurd result (which seems to follow from its reality) that a faster body can never overtake a slower, falls to the ground.

30. ὁ νῦν ῥηθείς, b 5-7.

33-240^a 18. τέταρτος . . . ψεύδος. Zeno's fourth argument is very difficult to follow, partly owing to the use of ambiguous language by Aristotle, partly owing to doubts as to the readings. The argument assumes three sets of ὄγκοι (masses or bodies) placed along a race-course, one stationary and the other two moving past this one in opposite directions. One of the latter is described as moving from the end of the stadium, the other as moving from the middle (239^b 34-5). And according to the common reading in 240^a 6 (ἀπὸ τοῦ μέσου τῶν A) the latter is described as moving from the middle of the fixed bodies, the former from the last of them. We are naturally led therefore to suppose that the fixed bodies are placed half-way along the length of the stadium, and that the other two sets of bodies are at the start placed unsymmetrically with regard to them, thus:

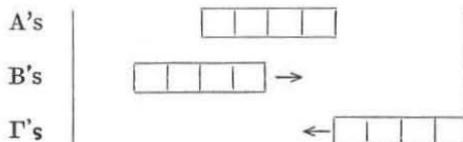


Fig. 1

(The diagrams given by writers on the subject often represent the bodies as divided by gaps (□ □ □ □), but if gaps had been intended Zeno could not have failed to take account of the time spent in passing them. I therefore, with Gaye and Heath, represent the bodies in each set as touching one another.) There is an initial difficulty in this interpretation, since it is only the front B that starts ἀπὸ τοῦ μέσου, and only the rear Γ that starts ἀπὸ τοῦ τέλους, of the stadium. But that is not in itself insuperable; Aristotle's diagram may have made plain what his words state rather obscurely.

This unsymmetrical arrangement seems at first sight to be confirmed by a reading in 240^a 10-12 which has good authority—*συμβαίνει δὲ τὸ Γ παρὰ πάντα τὰ Α διεξεληλυθέναι, τὸ δὲ Β παρὰ τὰ ἡμίση*. Gaye tries to explain the words on the basis of a symmetrical arrangement of the B's and the Γ's relatively to the A's. He supposes the original arrangement to be

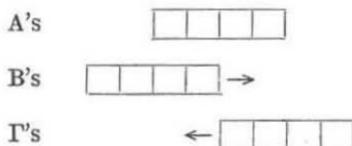


Fig. 2

and the arrangement contemplated in 240^a 10-12 (as the result of movement by the B's and the Γ's) to be

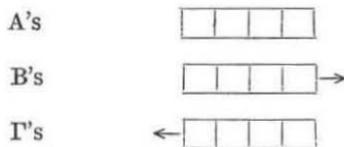


Fig. 3

But on this arrangement it requires an argument to justify the statement made by Aristotle that the first Γ has moved past all the A's while the first B has passed only half of them (viz. the argument 'the first Γ has moved past all the B's, but it takes an equal time to pass any two bodies of equal size (^a 1-4); therefore it must have passed all the A's'), while this is, in fact, represented by Aristotle as the natural result of the situation as described by him. Now the words in question (240^a 10-12) at first sight fit in well with the situation we started by assuming, since they imply that originally the B's and the Γ's were not situated symmetrically with regard to the A's. But difficulties arise when we look more closely into the matter. For the words we are considering are preceded immediately by the words

'it follows then that the first B and the first Γ are simultaneously ἐπὶ τῷ ἐσχατῷ as they move past one another'. This cannot mean (on the basis of our fig. 1) that the B's and the Γ's simultaneously reach the opposite ends of the race-course, or the terminal A's, since they are not symmetrically situated either with regard to the race-course or with regard to the A's. The words can only mean that the first B reaches the rear Γ when the first Γ reaches the rear B (which of course it will). Now on the basis of our fig. 1 this will happen when the three sets of bodies are thus related

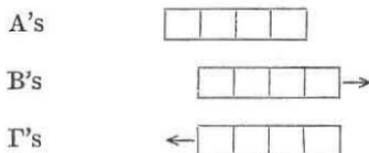


Fig. 4

and when the bodies are in this position it is not true that (as Aristotle says in 240^a 10-12, according to the reading of FJKAPS), the first Γ has passed all the A's, and the first B only half of them. This would happen only if the bodies were in the position of fig. 3, but that is a position they can never reach from the original position assumed in our fig. 1. For by the time the Γ's have got so far to the left, the B's must have got further to the right. Again, the position described in the alternative reading in 240^a 10-12, *συμβαίνει δὲ τὸ Γ παρὰ πάντα τὰ Β διεξελθῆναι, τὸ δὲ Β παρὰ τὰ ἡμίση* (sc. τῶν Α), is the position shown in fig. 3; but the bodies cannot get from the position of fig. 1 to that of fig. 3. Pacius, who alone of the commentators takes the original position to be that of fig. 1, has to suppose that the Γ's move two places to the left before the B's start moving; in fact, that the B's begin to move only when the situation is that of fig. 2. But there is no hint of this in Aristotle, and Pacius' interpretation is a desperate attempt to reconcile the supposition that the B's begin from the middle of the A's, and the Γ's from the end of the A's, with the situation described in 240^a 9-13.

On general grounds a symmetrical arrangement would seem to be preferable to an unsymmetrical one. Since the argument turns simply on the problem raised by bodies moving past fixed bodies and at the same time past one another, nothing whatever would be gained by making the arrangement unsymmetrical.

Our unsymmetrical arrangement will evidently not work. The problem is, how to reconcile a symmetrical arrangement with the language of 239^b 34-5 and 240^a 6-7. Simplicius interprets ἀπὸ μέσου 239^b 35, ἀπὸ τοῦ μέσου 240^a 6, as 'beginning from the beginning

of the stadium and finishing at the middle of the A's'; and he takes the middle of the stadium to coincide with the middle of the A's. But, on the symmetrical arrangement which he presupposes, it could equally be said of the Γ's that they begin from the *end* of the stadium and finish at the middle of the A's, so that the difference between the B's and the Γ's would be quite misleadingly stated in Aristotle's words 'the one set starting from the *end* of the stadium and the other from the *middle*'. Gaye (p. 103) tries to justify Simplicius' interpretation by saying that ἀρχόμενοι 240^a 5 means not 'beginning to move' but 'extending', and that the phrases used by Aristotle in 239^b 33-5 and 240^a 5-7 'must be explained by reference to the point of view of an imaginary person standing at the ἀρχή τοῦ σταδίου: that is to say, in their original position the C's stretch *from* the end of the course, and the B's *from* the middle point of the course, *in the direction of* any one occupying that position; thus there is no reference to the direction of the respective *motions* of the two sets of ὄγκοι'. But he seems to have overlooked the fact that in 239^b 33-5 the bodies are described as *moving*, the one set from the end of the stadium, the other from the middle, with equal speed. I would urge that this is not a possible description of the situation in fig. 2, *if* the μέσον means the mid-point of the length of the stadium, that being also the mid-point of the A's. For then both the B's and the Γ's move ἀπὸ μέσον, and they could not be opposed as moving ἀπὸ μέσον, ἀπὸ τέλους.

The solution lies in the supposition that τὸ μέσον means the middle of the complete course along the stadium and back again; in other words the turning-point. ἀπὸ μέσον, ἀπὸ τοῦ τέλους then refer to direction, not to position, and the particular position of the A's relative to the length of the stadium is immaterial, as in view of the general nature of the argument it ought to be. The only difficulty that remains is the vulgate ἀπὸ τοῦ μέσου τῶν A 240^a 6, but EHIJ¹ and perhaps Simplicius omit τῶν A. These words (τῶν A) are harmless in themselves since we do, in fact, suppose the B's to move from the middle of the A's, but they cannot stand because they would require us to take ἀπὸ τοῦ ἐσχάτου as meaning 'from the end of the A's', and thus imply a contrast between the B's and the Γ's which does not exist. (Since writing this, I find that Lachelier has anticipated my interpretation of ἀπὸ τοῦ μέσου, and my omission of τῶν A in ^a 6.) It must be admitted that τὸ μέσον is apparently not used elsewhere of the turning-point of the δίαυλος, the ordinary name for which is καμπτήρες. It must be admitted also that the δίαυλος was only one out of many races that were run in the stadium, and that when only one length was run, one end of the race-course could not be called the μέσον. But if Aristotle had in mind any race in which

an even number of lengths was run, he might naturally refer to the *καμπτήρες* as the *μέσον*; and a gesture by him as he drew the figure would make plain what he meant by the *μέσον*. The unnaturalness of the alternative interpretation of the passage seems to me to outweigh the lack of other evidence for our interpretation of τὸ μέσον.

I adopt fig. 2, then, but drop the encumbering supposition made by most of those who adopt the figure. How, then, do the three consequences stated in 240^a 9-17 work out?

(1) 240^a 9-10. I take it that at this point Aristotle drew fig. 3. In view of the figure, the meaning of ἐπὶ τῷ ἐσχάτῳ will be clear. The front B is opposite the right-hand A (and the rear Γ) at the same time as the front Γ is opposite the rear B (and the left-hand A).

(2) 240^a 10-13. Bekker's reading (παρὰ πάντα τὰ B^a 11) seems, on the face of it, absurd, since one then naturally supplies τῶν B with παρὰ τὰ ἡμίση, so that Aristotle would seem to be saying 'the Γ has passed all the B's, and the B has passed half the B's'; and Gaye has therefore adopted τὰ A for τὰ B. But it does not follow obviously from the situation as described by Aristotle that in passing from the position in fig. 2 to that of fig. 3 the front Γ has passed all the A's. It has passed only half of them. Simplicius feels the difficulty and tries to remove it. He supposes Zeno to reason that the front Γ *must* have passed all the A's because it has passed all the B's and because (as Zeno supposes, ^a 1-4) it takes the same time to pass a standing body as it does to pass a moving body of the same size. But surely this reasoning would have to be inserted, whereas in fact what is said in ^a 10-12 is presented as the obvious implication of the situation as already described. I think therefore that τὰ B is in principle right; but if we adopt it, it is difficult to interpret παρὰ τὰ ἡμίση as meaning 'past half that number of bodies'. Nor does it seem likely that we should read, in the absence of any MS. support, παρὰ τὰ ἡμίση A. A, which occurs in S. 1018. 2, is probably Simplicius' gloss—a gloss which it would be natural for him to add since he reads τὰ A earlier in the line. The variants τὰ A, τὰ B seem to me most likely to have arisen as rival glosses. The text is quite intelligible without them. Of the three parallel sets of bodies the B's are thought of as intermediate between the A's and the Γ's, and are thought of primarily as moving past the A's and only secondarily as moving past the Γ's, while the Γ's are thought of primarily as moving past the B's and only secondarily past the A's. Thus the text means 'Γ has moved past all the bodies it is moving past, B past only half of those it is moving past'.

From the position described in these words Aristotle represents Zeno as inferring that the time of B's passage must be only half as great as that of Γ's. For it has passed only half the number of

bodies that Γ has, and (argues *Z.*) a moving body takes an equal time to pass each body of equal size that it passes, irrespective of whether what it passes is resting or moving (cf. ^a 1-4).

(3) 240^a 13-17. In ^a 13 the vulgate has τὰ B. But it is not true that in fig. 3 the B's, i.e. all the B's, have passed all the Γ 's; only the first B has done so. I therefore read τὸ πρῶτον B, which is what lies behind E's reading τὸ α β. πρῶτον is correctly represented by α; for a similar confusion in the MSS. cf. *Met.* 1047^b 22 πρῶτον . . . δεύτερον EJA^b: α . . . β recc.

In ^a 15-16 the vulgate will not stand. γιγνόμενον must go (1) with τὸ πρῶτον Γ or (2) with τὸ πρῶτον Γ καὶ τὸ πρῶτον B. But (1) τὸ πρῶτον Γ καὶ τὸ πρῶτον B being the joint subject of the previous clause, it is almost impossible that we should have a participial clause going with τὸ πρῶτον Γ alone. Further, the statement that the first Γ takes the same time to pass each B as it does to pass each A does not support, and is not even compatible with, the statement in the previous clause that the first Γ and the first B will be simultaneously 'at the opposite extremes', i.e. in the position of fig. 3, since if the first Γ took the same time to pass each B as to pass each A it would never get into that position from fig. 2. And (2) if we take the clause to mean 'the first Γ taking the same time to pass each B as the first B does to pass each A', that is similarly incompatible with the previous clause. And neither interpretation goes well with the following clause. It is strange reasoning that says 'the first Γ takes the same time to pass each B as it (or as the first B) does to pass each A, because the first Γ and the first B take the same time to pass the A's'. On the other hand, with ἴσον . . . φησιν away we get a clear argument.

Alexander saw the difficulty, and proposed to transpose ἴσον . . . φησιν after διεξέληλυθέναι in ^a 11. This, with our text and interpretation of ^a 10-12, gives a fairly good sense. But it is hard to see why the words should have got out of their proper place; and after them ἴσον γὰρ ἐκάτερόν ἐστιν παρ' ἑκαστον would be singularly flat. Omitting various other suggestions that might be made, it may be said that the most satisfactory solution is to treat ἴσον . . . φησιν as a gloss on ἴσον γὰρ ἐκάτερόν ἐστιν παρ' ἑκαστον. A gloss added in the margin might easily find its way into the text at the wrong place.

Lachelier's proposals (see critical notes on ^a 14-15, 16) give a good sense, but are very hazardous in the absence of MS. support.

The general meaning of ^a 9-17 is clear. ^a 9-10 states the obvious fact that if the B's and the Γ 's start moving in opposite directions from positions symmetrically disposed towards the A's, the position of fig. 3 will in time be reached. ^a 10-13 points out that the front Γ will then have passed all the B's, while the front B has passed only

half that number of A's, so that the time of B's passage must be half of the time of the front Γ 's passage. ^a 13-17 points out that nevertheless the front B has passed as many Γ 's as the front Γ has passed B's, so that the time of its passage must be *equal* to that of the front Γ . Thus the half of a certain time must be equal to that time (^a 1): an absurd consequence which is held to disprove the reality of motion.

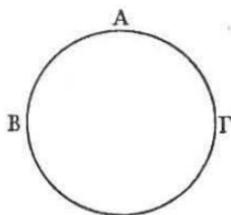
240^a 1. ἴσον . . . ἤμισον. Gaye argues (pp. 101-3) that this means that a time $T/2 =$ the time $2T$, not that it $=$ the time T , and he supposes that this is established by establishing in ^a 10-13 that $T/2 = T$, and in ^a 13-17 that $T = 2T$ (pp. 105-6). But the other interpretation of the words is at least equally natural, and his interpretation of ^a 13-17 is not plausible, and is impossible if we are right in reading τὸ πρῶτον B in ^a 13.

18. τὸ εἰρημένον ψεῦδος, ^a 1-4.

19. κατὰ τὴν . . . μεταβολήν, i.e. generation and destruction. Aristotle first (^a 20-26) takes a case of γένεσις τις (generation of a quality), and then (^a 26) alludes briefly to the case of γένεσις ἀπλή (passage of a substance from not-being to being); cf. 225^a 12-20.

29-30. πάλιν . . . ὅτι follows the construction of ^a 19-21 οὐθὲν ἡμῖν ἔσται ἀδύνατον, οἶον . . . ὡς κτλ., 'we shall not be placed in any insuperable difficulty by the objection (e.g.) that . . . nor again by the objection that. . .'

^b 1-6. εἶτα . . . ἡρεμήσει. Aristotle maintains that not only do the parts of a rotating body change their place, but that, strictly, even the whole is always moving εἰς ἕτερον, sc. τόπον. For, in the case of the circle, for example, the circumference ABΓA is different τῶ



εἶναι from the circumferences ΒΓΑΒ, ΓΑΒΓ, and only τῶ ὑποκειμένῳ the same. And each of these is always moving into the position of one of the others (loosely expressed by αἰεὶ ἢ ἕτερα εἰς τὴν ἕτεραν ^b 5).

CHAPTER 10

240^b 8-14. Ἀποδεδειγμένων . . . κίνησιν. The expression in ^b 12-14 is elliptical. The connexion of thought may be expanded as follows: 'that which is without parts can be moved only incidentally, through

the movement of that in which it is contained, as the contents of a ship or the parts of a whole may be moved. (That which is without parts, however, is that which is quantitatively indivisible, and therefore not a part of a whole.) For the parts of a whole have (like that which is without parts) a motion due to the motion of the whole, though they also have (what that which is without parts cannot have) a motion proper to themselves.'

10. ἡ τοῦ μεγέθους. S. 1025. 2-8 seems to give the right explanation of this. Aristotle adds these words because he reflects that a point (which is the ἀμερές in question) is not contained directly in that which is primarily moved, viz. a body, but in a line, which is contained in a plane, which is contained in a body.

10-12. καθάπερ . . . κινήσει. The case of the contents of a vessel and that of the parts of a whole are different; the former are moved ἐν ἐκείνῳ, the latter μετ' ἐκείνου (211^a 34-6). But both are cases of incidental motion.

13-17. καὶ . . . κινήσεως. The point here made seems to have no direct bearing on the main subject, but is of interest in itself. Aristotle maintains that while the parts of a body may be said to be moved in respect of the motion of the whole body, yet in consequence of this very motion the parts may have a motion distinct from it. E.g. a sphere may be rotating with a certain velocity; then both the speed of the inner parts and that of the parts near the circumference will be different from that of the body as a whole, which is the speed of the circumference itself.

21. εἴτ' . . . μέγεθος. S. 1026. 22-4 explains this as covering locomotion as well as increase-and-diminution, and this is possible though unusual.

21-2. εἴτ' ἐξ εἶδους . . . ἀντίφασιν refers to qualitative change and to generation-and-destruction; cf. ^a 19 n.

25-6. πᾶν . . . εἶχεν. Cf. 234^b 10-17, where it is pointed out that only the third alternative can be true.

29-30. τὸ γὰρ ἐν τῷ αὐτῷ εἶναι . . . ἦν. Cf. 239^a 26-9.

31-3. μοναχῶς . . . νῦν. This follows from 235^a 13-^b 5, where it was proved that the time of a movement, the movement, the being moved, the moved body, and that over which movement takes place, have the same διαίρεσις. There could therefore be an indivisible moved body only if there could be an indivisible time.

241^a 2. τοῦτο . . . πρότερον. Cf. 237^a 17-^b 22.

17-18. οὗτος . . . κινεῖσθαι, 'for that in which it is moved a distance equal to itself is a time, since everything that is moved is moved in time.' The gender of οὗτος is due to attraction.

19. δέδεικται πρότερον, 232^b 23-233^a 10.

20. αὐτὴν ἐκινήθη. The vulgate reading αὐτὴ ἐκινήθη does not

give the right sense. T. 203. 3 has τὸ ἴσον αὐτῆ and P. 819. 33 τὴν ἴσην εἶναι αὐτῷ. αὐτῆν, 'its own length', answering to ὅσον αὐτό^a 17, is plainly required.

27. ἦν. Cf. 225^a 1, 234^b 11.

ἡ ἐν ἀντιφάσει, i.e. generation and destruction; cf. 225^a 12-20.

28. ἡ ἐν ἐναντίοις, i.e. change of quality, size, or place; cf. 225^a 34-^b 5.

32. ἐξ ἐναντίων . . . ἀλλοιώσεις, 'for qualitative change always presupposes certain contraries.'

33. αὐξήσεως μὲν γὰρ (sc. ἄκρον) τὸ πέρασ κτλ. Prantl's emendation, though attractive, does not seem necessary.

^b 3-5. τὸ ἀδύνατον . . . ἀδύνατον. Aristotle wishes to exclude the sense of ἀδύνατον in which it stands for what is not strictly incapable of undergoing the change in question but is ἐν πολλῷ χρόνῳ μόλις κινούμενον or βραδέως ἀρχόμενον (226^b 11-12). A thing might be 'impossible to cut' in the loose sense of being hard to cut and yet be in process of being cut; but it could not be strictly impossible to cut and yet be in process of being cut.

7-9. οὐδε . . . μεταβαλεῖν. The distinction between *τηθηῆναι*^b 4 and *τέμνεσθαι*^b 6, and between *γενέσθαι* and *γίγνεσθαι* in ^b 6, is important; the point is that that of which the cutting cannot be brought to completion cannot be in course of being cut. The vulgate text should therefore be altered by reading τὸ μεταβαλεῖν in ^b 7 and μεταβαλεῖν in ^b 8, 9. Simplicius evidently read μεταβαλεῖν (1030. 32-1031. 1).

12-14. ἀλλ' . . . σκεπτέον. The question is considered at length in 261^a 27-265^a 12, where reasons are given for what is here in ^b 18-20 stated dogmatically.

BOOK VII. CHAPTER 1

On the text of this Book see Introduction 11-19, 116 f.

In this chapter Aristotle sets himself to prove two theses: (1) that whatever is in movement is moved by something (241^b 34-242^a 49, cf. 241^b 24-242^a 15); (2) that there is a first movent which is not moved by anything else (242^a 49-243^a 31, cf. 242^a 15-243^a 2).

241^b 37-242^a 49. εἰ . . . ἡρεμεῖν. The refutation of the possibility of a self-mover is directed against Pl. *Phaedr.* 245 d.

37. ἔστω [τὸ] εἰλημμένον. The omission of τό seems to be required by the sense and confirmed by εἰλήφθω in the alternative version, and by P. 874. 5.

43. ὑπό τινος, i.e. by anything other than its whole self.

242^a 37. τοῦτου δ' εἰλημμένου. It is just possible to justify γὰρ by supposing an ellipse: '(I make this point,) for if this be conceded,'

&c. But it seems more likely that γάρ is an emblema from ^a 38. The corruption is an old one, for it occurs in the other version (242^a 3).

38-49. ἐπεὶ . . . ἡρμεῖν. It is true that the movement of a whole AB involves the movement of a part ΓB, since if ΓB were at rest not AB but at most only the remaining part ΑΓ would be in motion. But Aristotle makes the mistake of supposing that this implies the causal dependence of the movement of AB on the movement of a part of itself ΓB. That this is false is shown by the fact that it is equally true that if ΑΓ were at rest AB could not be in motion, so that AB's motion, if it were causally dependent on that of ΓB, would be equally dependent on that of ΑΓ. The fact is that the general principle laid down in 241^b 44-242^a 37 is valid if ἄλλο means something outside the thing in question, but not valid if ἄλλο be taken to refer to a part of the thing in question; then the motion of the whole logically implies the motion of the part, but is not necessarily causally dependent on it.

38. εἴληπται [τὸ] κινούμενον. The omission improves the sense and is confirmed by S. 1039. 3 and by the other version (242^a 5). τό is an emblema from ^a 37.

40. πᾶν . . . διαιρετόν. This has been proved in 240^b 8-241^a 26.

43. κινήσεται, sc. τὸ AB.

51. κινουμένου. Though the MSS. of Simplicius give κινούμενον in 1042. 22, they give κινουμένου ib. 25, and this is clearly implied by the comment ib. 27-8.

52. κινήται. If Prantl's κινεῖται is kept, ^a 51-3 καὶ . . . οὕτως must be supposed to be a second clause depending on ἐπεὶ ^a 49, and ^a 50-51 εἰάν . . . κινουμένου must be supposed to be subordinate to the first ἐπεὶ clause. But this destroys the argument, which requires that only the first clause of the sentence, stating the general principle πᾶν τὸ κινούμενον ἀνάγκη κινεῖσθαι ὑπὸ τινος, should be dependent upon ἐπεὶ, all the rest of the sentence showing what follows from the principle. We must therefore read κινήται, which is actually the reading of the best MS.

57-62. ἐπεὶ . . . ἡ κίνησις. The grammar of the sentence may be put right either by inserting δ' in ^a 58 or by inserting οὖν in ^a 60. But the argument requires the latter change. 'Since the mover moves being moved (i.e. its moving is simultaneous with its being moved), the movement (i.e. the being moved) of the moved and that of the mover must be simultaneous (for the moving of the mover and the being moved of the moved are simultaneous); it is evident therefore that the movement (i.e. the being moved) of A, B, &c., will be simultaneous.' The argument turns on the general consideration that events that are simultaneous with the same event are

simultaneous with each other. Simplicius' ἄρα in 1043.3 implies that he did not read δ' in ^a 58, and his ὥστε in 1043.5 implies that he read οὖν or an equivalent in ^a 60.

^b 35. οἶον . . . ποιότητος, i.e. the generation or destruction of one substance is generically the same as that of another; one change of quality is generically the same as another.

41-2. εἴρηται . . . πρότερον, v. 4.

47-50. ἐνδέχεται . . . ἐνδεχόμενον. Whether the movements of the terms of the supposed infinite series A, B, Γ . . . are equal or form a series of movements increasing in magnitude, their sum is an infinite movement. We take one or other of these possible cases to be real, ignoring the third possible case, that in which the movements of A, B, Γ . . . are a series of movements decreasing in magnitude, in which case they would not form an infinite movement. Cf. 206^b 7-12.

53. τοῦτο δ' ἀδύνατον. Cf. 238^a 32-^b 22.

53-9. οὕτω . . . ἀδύνατον. Aristotle points out here that the argument of ^b 42-53 is invalid because it is not impossible that several things should in a finite time have motions which in sum are infinite, though it is impossible that one thing should have an infinite motion in a finite time. He therefore proceeds to point out (^b 59-63) that the series of moving and moved objects must be at least in contact (a point which he will prove in ch. 2) and thus must form a unity, and to argue that this must perform an infinite movement because the movements of its parts when added together are infinite. The argument is invalid, because there is in fact no 'movement EZHΘ' which anything suffers, but only movements E, Z, H, Θ which A, B, Γ, Δ respectively suffer, even if A, B, Γ, Δ are in contact.

54. τὸ ἐξ ἀρχῆς, sc. that there is a πρῶτον κινούν.

59. καὶ σωματικὴν κίνησιν. This is added to exclude the case in which movement is produced by something (τὸ ὀρεκτόν, τὸ ἐρώμενον, *Met.* 1072^a 26, ^b 3) acting on the mind. In that case there need not be and cannot be any contact or continuity between mover and moved. In *De Gen. et Corr.* 323^a 28-33 Aristotle says that when something moves something else without being moved, it touches it without being touched; but this is in a metaphorical sense of 'touches'.

65-7. εἴπερ . . . ὑπάρχον. Cf. ^b 47-50 n.

67-8. εἰ . . . ἐστίν. The MS. reading here is inconsistent with the end of the sentence, ἢ τὸ πεπερασμένον ἢ τὸ ἄπειρον. Prantl reads τῶν ἀπειρῶν for ἄπειρον, taking this with τῶν ΑΒΓΔ, but this produces rather an unnatural clause, and it seems more likely that ἢ πεπερασμένον ἢ has dropped out.

71. ἀμφοτέρως δὲ ἀδύνατον. Cf. 238^a 32-^b 22.

72. καὶ κινούμενον, i.e. καὶ τι πρῶτον κινούμενον. Simplicius' paraphrase (1047. 15) runs τὸ πρῶτως κινῶν μηκέτι αὐτὸ ὑπ' ἄλλου κινούμενον, which points to the reading μὴ κινούμενον. On the other hand the alternative version has (242^b 34) ἔσται τι ὃ πρῶτον κινήθησεται, which confirms the MS. reading here.

72-243^a 31. οὐδὲν . . . ἀδύνατον. The existence of a first mover has been proved not ostensively, but by a *reductio ad absurdum* of the opposite hypothesis; Aristotle here points out that the proof is as cogent as if it were ostensive; for if the opposite hypothesis were really one that could be true, no impossible result should follow from it.

CHAPTER 2

243^a 33-4. λέγω . . . μεταξύ. Cf. the definition of ἄμα in 226^b 21, ἄμα μὲν οὖν λέγω ταῦτ' εἶναι κατὰ τόπον, ὅσα ἐν ἐνὶ τόπῳ ἐστὶ πρῶτω.

39-40. πρώτη . . . κινήσεων. This is proved in 260^a 20-261^a 26.

19. ἀφ' αὐτοῦ. The sense requires this reading in place of ἀπ' αὐτοῦ of the MSS.

^b 1. τῆς . . . φορᾶς, sc. of the body that is thrown.

2. ἕως . . . κίνησις, i.e. so long as the impressed movement of the projectile prevails against its natural movement (e.g. against the gravitation of heavy bodies).

6-7. οἶον . . . κέρκισις. σπάθησις is the 'battening' or beating up of the weft threads to make them lie close together, κέρκισις the 'shedding' or dividing of the warp threads to permit of the passage between them of the shuttle containing the weft threads.

9-10. πλήν . . . εἰσιν. It was the view of Empedocles, Anaxagoras, and the Atomists that generation and destruction are nothing but σύγκρισις and διάκρισις. Now Aristotle cannot admit that generation and destruction are forms of pushing apart or pulling together, since that would destroy the fundamental distinction he draws between generation-destruction and the three kinds of κίνησις (cf. 225^a 12-^b9). He cannot admit that that which is coming into being, for instance, and is therefore not yet in being, is being pulled together; only that which already exists can be pulled together. He therefore has to make the σύγκρισις and διάκρισις involved in generation and destruction an exception to the general statement that σύγκρισις and διάκρισις are forms of pushing together and pushing apart.

11. ἡ σύγκρισις καὶ διάκρισις. Simplicius seems right in supposing this to be directed against those who made σύγκρισις and διάκρισις the primary forms of all locomotion and of all change; so far is this from being the case, Aristotle says, that they are not even a separate kind of change; all local movements are reducible to the four named in ^a 17 (S. 1051. 16-23). Simplicius adds that Alexander first gave

this interpretation, but added another, that *σύγκρισις* and *διάκρισις* are the widest genera of movement. Simplicius evidently read *ἡ σύγκρισις*; it seems as if Alexander first interpreted this reading, and then went on to interpret the alternative reading *ἡ σύγκρισις*. The latter reading derives some support from the alternative version in ^b 29, *καὶ πάντα δὴ κίνησις ἢ κατὰ τόπον σύγκρισις καὶ διάκρισις ἐστίν*. But the authority of the alternative version is very slight, and these words in it are simply the result of a misreading of *ἡ συγκρισις*. The other reading agrees much better with the general argument of the passage. ^b 7-10 brings *σύγκρισις* and *διάκρισις* under *ῥοις*, not *vice versa*. And it is not till ^b 16-244^a 4 that Aristotle brings *ὄχθις* and *δίνησις* under *ἐλξις* and *ῥοις*. He is therefore not at all in a position to say in ^b 10-11 that all kinds of movement are reducible to *σύγκρισις* and *διάκρισις*.

20-244^a 1. τὸ δ' ὄχθουν . . . δινούμενον, i.e. unless it happens to be a living being. But that case need not be considered, since Aristotle's object is to prove that τὸ πρῶτον κινῶν ἅμα τῷ κινουμένῳ ἐστί, which has already been proved of things that αὐτὰ ὑφ' αὐτῶν κινεῖται, i.e. of living things (243^a 12-15).

244^a 9-10. ὅταν . . . συνεχῆ. The best of Shute's MSS. (b) and Simplicius read τῆς χωριζούσης; the remaining three of Shute's MSS. read ἡ χωρίζουσα. The other version has in 243^b 24 μὴ χωριζομένη τοῦ (or τῆς τοῦ) ἐλκομένου. Both τῆς χωριζούσης and ἡ χωρίζουσα give a good sense; with the former τὰ συνεχῆ will mean τὸ ἔλκον and τὸ ἐλκόμενον, with the latter τὸ ἐλκόμενον and that which it is drawn away from. In view of the authority of b and Simplicius, the former reading is perhaps to be preferred. The reading of the other version gives a sense inferior to both of the others. τοῦ ἔλκοντος, which Simplicius omits, is probably a gloss introduced from version B; the reference of ἡ κίνησις is clear enough without it.

Diels thinks that ἡ χωρίζουσα (corrupted into ἡ ἡ χωρίζουσα, and then paraphrased by τῆς χωριζούσης) and μὴ χωριζομένη spring from a common origin in μὴ χωρὶς οὔσα. But there would be no great point in describing the movement of the ἔλκον as being μὴ χωρὶς from that of the ἐλκόμενον; and we should then have to suppose ἀπ' ἀλλήλων τὰ συνεχῆ to be a later addition put in to give a meaning to ἡ χωρίζουσα or τῆς χωριζούσης. But in S. 1054. 28 these words already occur. It seems more likely that the order of corruption was τῆς χωριζούσης—ἡ ἡ χωρίζουσα—ἡ χωρίζουσα—μὴ χωρὶς οὔσα—μὴ χωριζομένη.

11-14. τάχα . . . ἦν. This is a somewhat parenthetical reference to a possible objection. Aristotle has in the preceding account of ἐλξις had in mind an object which moves, and as it moves draws something after it. It now occurs to him that there are instances

of pulling in which the pulling body is not in movement; e.g. the supposed drawing of fire by a log of wood, or, he might have added, magnetic attraction. The difference between such a case and that which he has considered is, he maintains, unimportant. A resting body draws things to where it is, a moving body draws things to where it was just before. It is not so clear how he could have brought magnetic attraction under his general principle that *κινῶν* and *κινούμενον* must be in contact. Presumably not by pointing out the existence of a field of force extending between the two, but by suggesting that particles emanating from the attracting body effect the attraction (S. 1056. 1-3).

^b 2-245^a 5. ἀλλὰ . . . ἀλλοιούμενον. The purport of ^b 2-245^a 2 is to show that all ἀλλοίωσις is ἀλλοίωσις of a σῶμα in respect of its παθητικαὶ (or αἰσθηταὶ) ποιότητες by the action of the παθητικαὶ ποιότητες of another σῶμα. Because it is thus a case of action of body on body, therefore, Aristotle argues (245^a 2-5), it involves contact between the two bodies, as we have already found locomotion to do.

5-5 δ. τὸ πρῶτον ἀλλοιούμενον' (ὑπόκειται . . .) . . . ἀλλοιούμενον ὑπὸ τῶν εἰρημένων. ὑπὸ τῶν εἰρημένων is evidently in no direct connexion with what precedes it in Bekker, and Spengel was right in saying there must be a lacuna. Further, Prantl is on the right lines in his suggestion as to what is missing. Simplicius' commentary plainly shows that he had a fuller reading, and he certainly must have had the first part of what I have inserted (ὑπόκειται . . . ἀλλοιούσθαι) or something very like it (1057. 24-6). We find, further, that several MSS. have in the second version, in place of ὧν . . . τραχύτης ^b 19-20, the words ἅπαν . . . ἀλλοιούμενον ὑπὸ τῶν εἰρημένων, which supply a construction for ὑπὸ τῶν εἰρημένων and agree sufficiently with Simplicius' paraphrase in 1058. 8-15 (cf. T. 204. 16-205. 1). It would seem then that the writer of the archetype of our MSS. of the first version passed from one ἀλλοιούμενον ὑπο to another and omitted all that came between, but that part of what was thus lost got inserted wrongly into the second version.

5 α. τὰς παθητικὰς . . . ποιότητας (= τὰ αἰσθητά) are the third of the four kinds of ποιότητες recognized in *Cat.* 8 (along with ἐξεις, δυνάμεις, and σχήματα).

5 γ. ἢ τῶ μᾶλλον καὶ ἥττον τοῖς αὐτοῖς is difficult, but may perhaps be accepted in the sense 'or by the same sensible qualities, by having them in greater or less degree'. This anyhow must have been the sense of Aristotle's words at this point, whether the form in which they have been preserved is correct or not. Cf. S. 1058. 14-15.

6. ταῦτα . . . ποιότητος, i.e. these are determinate forms of an underlying determinable quality.

245^a 5-6. τῷ μὲν . . . σῶμα. Since the senses of sight, hearing, smell, and taste come later (^a 6-9), the present words presumably refer to the awareness by the sense of touch of the heat or coldness of distant objects (S. 1060. 8-12).

6-7. πάλιν . . . ὄψει. This agrees with the doctrine of *De An.* 418^a 31 that colour must act directly on τὸ κατ' ἐνέργειαν διαφανές, air, water, &c., in order to act indirectly on the eye.

7-8. τὸν αὐτὸν δὲ τρόπον . . . ἀήρ. For air as the medium of hearing and smell cf. *De An.* 419^a 25-30.

8-9. καὶ . . . χυμός. γέυσις is a differentiation of ἀφή, and therefore does not need a separate medium like air; the flesh of the percipient acts as medium between the sensible object and the ultimate sense-organ, the heart, as it does in the ordinary operation of ἀφή (though in the exceptional type of ἀφή referred to in ^a 5-6 a further medium is required).

15. ἀνάγκη . . . φθίνον. This is elliptical; the αὐξόν, i.e. that which is assimilated, must be in contact with the αὐξανόμενον, in order that assimilation should take place, and similarly the ἀπογινόμενον must be in contact with the φθίνον in order that diminution should take place.

^b 1. τοῦ κινουόντος . . . κινούμενον, the direct mover, or in other words (καί), the mover which is last of the movers as we proceed from the prime mover to the moved.

CHAPTER 3

Aristotle has in 244^b 5-6, 245^a 2-3 assumed that alteration is ὑπὸ τῶν αἰσθητῶν, i.e. that it is the alteration of the αἰσθηταί or παθητικαὶ ποιότητες of one body by the action on them of the corresponding ποιότητες of another body. He now sets himself to prove this. He does so by showing that neither change of shape (245^b 9-246^a 9) nor change of ξέσις (246^a 10-248^a 9) is alteration. He ignores the fourth kind of ποιότης recognized in the *Categories*, viz. δύναμις, perhaps on the ground suggested by S. 1062. 19-23, that it is not clear whether δυνάμεις are ποιότητες strictly speaking, but more probably because the fourfold division of ποιότητες had not yet been worked out by him.

245^b 11. τὴν πυραμίδα, the candle.

παρωνυμάζοντες, 'changing the form of the word'. Cf. the definition of παρόνυμα in *Cat.* 1^a 12, παρόνυμα δὲ λέγεται ὅσα ἀπὸ τινος διαφέροντα τῇ πτώσει τὴν κατὰ τοῦνομα προσηγορίαν ἔχει.

13. προσαγορεύομεν, sc. ἐκείνο ἐξ οὗ ἐστίν (^b 10), 'we still call by its original name'.

13-246^a 1. ὑγρόν . . . ὕλην. ^b 16-246^a 1 ὁμωνύμως . . . ὕλην connects more naturally with ^b 13-14 ὑγρόν . . . κηρόν than with ^b 15-16 καὶ οὐ μόνον . . . λέγομεν, and I have therefore treated the latter clause as parenthetical.

246^a 4-9. ἔτι . . . ἐστίν. If this section is to be relevant to the proof that the acquisition of a new shape is not ἀλλοίωσις, the coming into being of a man or a house is evidently regarded as an instance of σχημάτισις. The argument used in this section is that that which only comes into being by a certain process cannot be said to be altered by the process, since it did not exist before; though the material, which did exist before, is altered in the process.

13-16. ἀλλ' . . . βέλτιστος. For this definition of virtue cf. *Met.* Δ. 1021^b 20 ἡ ἀρετὴ τελειώσις τις ἕκαστον γὰρ τότε τέλειον καὶ οὐσία πᾶσα τότε τελεία, ὅταν κατὰ τὸ εἶδος τῆς οἰκειᾶς ἀρετῆς μηδὲν ἐλλείπη μόριον τοῦ κατὰ φύσιν μεγέθους. Hoffmann thinks that the definition in Δ is a later improvement on that found here, but his argument is not convincing.

15. [τὸ] κατὰ φύσιν. τό is absent in T. 206. 6, S. 1065. 15, and in the other version (^b 30), and is on the whole better away.

15-16. ὅταν . . . βέλτιστος. The reading of HI should be adopted here, unless βέλτιστος be regarded as a gloss, and καὶ ὅταν as an attempt to improve the construction when βέλτιστος had been introduced. The second version has simply ὅταν μάλιστα κύκλος ἤ (^b 30).

^b 4-6. τὰς μὲν γὰρ τοῦ σώματος . . . τίθεμεν. Aristotle took over the doctrine of the ἀρεταὶ τοῦ σώματος (health, strength, beauty) and of their dependence on proportion, from Plato (*Rep.* 591 b, *Phil.* 26 b, *Laws* 631 c). The doctrine appears in Aristotle's *Eudemus* (fr. 45 Rose) and in *Tóp.* 116^b 18, 139^b 21, 145^b 8, and seems to be characteristic of an early period of his thought, when he was still much under Plato's influence. This point has been brought out by Jaeger, *Arist.* 42 n.

11-12. οὔτε ἔστιν . . . οὐδεμία. Cf. 225^b 11-13.

15-16. καθάπερ . . . μορφῆν. Cf. ^a 4-8.

17. ἢ . . . πρώτοις, 'or whatever it may be in which the ἐξέεις directly reside'. Aristotle does not wish to stop to consider whether these are, as he himself thinks, bodies characterized by one or other of the qualities hot and cold, and by one or other of the qualities dry and wet, or whether some other account should be given, as by Anaxagoras, who makes the homoeomerous σπέρματα to be the vehicle of ἐξέεις, or by the Atomists, who assign this role to the atoms (S. 1069. 20-25).

19-20. ἢ μὲν γὰρ ἀρετὴ . . . παθητικόν. Both alternatives are given, because some would use πάθη only in a bad sense, while others would recognize both good and bad πάθη.

19. ὡδί. The vulgate reading ὡς δεῖ gives a good sense, but both S. 1069. 29 and the other version (247^a 23) have ὡδί ('in such and such a way').

20. ἢ ἐναντίως ἀπαθές, 'or impassive with the impassivity which is contrary to the passivity bestowed by excellence'.

247^a 6-19. γίγνεσθαι . . . ἀλλοιώσεις. In supporting his thesis that all ἀλλοιώσεις is ὑπὸ τῶν αἰσθητῶν (245^a 3), Aristotle is led to give an excessively physiological account of the genesis of virtue and vice. He speaks as if it were due merely to a waxing or waning insusceptibility to bodily pleasures and pains. In the *Nicomachean Ethics* he corrects this account by allowing for the fact that a man's attitude to pleasure and pain may be modified by such a motive as love of country or of friends, or by desire to realize the καλόν.

7-8. ἅπαντα γὰρ ἡ ἠθικὴ ἀρετὴ . . . σωματικός. This can be justified if we take 'bodily pleasures' to mean all those that are *ultimately* connected with the body, as distinct from the pleasures of pure thought. But Aristotle draws the distinction between bodily and mental pleasures otherwise in *E.N.* 1117^b 28, where ambition is said to be concerned with a mental pleasure.

13. τὴν τοιαύτην ἡδονήν, 'bodily' pleasure of any of the three kinds (118-9).

16-17. αἱ δ' ἡδοναὶ . . . αἰσθητικοῦ. According to Aristotle's more mature doctrine in *E.N.* 1174^a 13-1175^a 3 pleasure and pain are not ἀλλοιώσεις; pleasure is a τελείωσις, pain an ἔκστασις, and they take place ἀλλοιουμένων τινός (the organs of sense).

^b 2-3. πολὺ . . . λέγομεν. The moral virtues no doubt depend on a relation between contrary tendencies; but intellectual excellence is more obviously dependent on a relation, since ἐπιστήμη is essentially of an ἐπιστητόν.

For the rather unusual phrase πολὺ μάλιστα cf. 252^b 17.

5. ἄλλο, sc. τὸ κατὰ μέρος (^b 6).

6-7. ἐπίσταται . . . μέρει. This reading is supported by T. 206. 15, by Alexander *arist.* S. 1075. 2-3, and by the other version (247^b 20). The alternative reading, though supported by P. 877. 4-5 and by S. 1073. 24, 1075. 17, seems less appropriate to the context; it would refer to the deductive, not to the inductive process.

8-9. εἰ . . . εἶναι. Aristotle often points out that there is no generation of sense-perception; at one moment we do not perceive, at another we do, and that is all.

9. τὸ γὰρ χρῆσθαι. These words, preserved in S. 1075. 21-2, and represented in HI by the easily explained corruption τὸ γὰρ οἶσθαι, should certainly be restored.

11-12. τῷ γὰρ ἡρεμήσαι . . . λεγόμεθα. Aristotle hints at an etymological connexion between ἴστασθαι (cf. καθίστασθαι ^b 17) and ἐπίστασθαι, and in this he is probably right, ἐπίσταμαι being an old middle voice of ἐφίστημι.

12. λεγόμεθα, which I have restored from Shute's MSS., is rather more satisfactory than λέγομεν.

13. καθάπερ εἴρηται πρότερον, v. 225^b 15.

14-15. οὐ . . . πάλιν. We do not say that such a man has become *ἐπιστήμων* again, because he has never ceased to be so. All that has happened is that a cause which prevented the *functioning* of his *ἐπιστήμη* has been removed.

18-248^a 2. διὸ . . . κίνησις. The notion that youth is especially beset by bodily *ταραχή* seems to be derived from Pl. *Tim.* 43 a-44 b.

248^a 3. ὑπ' ἄλλων, i.e. ὑπ' ἔθους καὶ διδαχῆς, according to the doctrine of *E.N.* 1179^b 20-21.

4-6. καθάπερ . . . ἐγερθῆ. *χρήσεως*, the reading of Shute's MSS., gives a much better balance to the sentence than the *ἐγέρσεως* of Bekker and Prantl.

8-9. ἐν ἄλλῳ . . . συμβεβηκός, i.e. the moral and intellectual faculties of the soul are affected only incidentally, through the affection of the sensitive faculty.

CHAPTER 4

This is a particularly difficult chapter. The text is somewhat corrupt; the expression is even terser than usual. The discussion is highly aporetic; suggestions and objections follow each other with great rapidity, and the turns of thought are unusually difficult to follow. I have tried to indicate the course of the argument by an analysis which is rather longer than the original, and a good deal of the necessary commentary is contained in the analysis.

248^a 10-11. Ἀπορήσει . . . οὐ. The problem is stated rather vaguely, but the discussion shows that the question is whether every *κίνησις* is comparable with every other in respect of *velocity*.

11-13. εἰ . . . ἐλάττων. The argument is: 'if (1) every movement is comparable in speed with every other, i.e. equal to or greater or less than any other (which is the point at issue), and (2) movements of equal speed are those that cover equal distances in equal times (which is admitted), then there will be curvilinear movements which cover equal distances in equal times with rectilinear movements, and therefore curves which are equal to straight lines. But this is not so. Therefore (1) is untrue.'

It is not clear why Aristotle thought the consequence *ἔσται . . . ἐλάττων* ^a 12-13 to be a fatal one. One would have expected him to accept it as obvious that a curve may be longer or shorter than a straight line, even if he did not admit that it could be equal to one; for this is suggested by very obvious facts of experience. It seems probable that the fact on which he is relying is that a straight line and a curve are οὐ συμβλητά (^b 6), i.e. that there is no unitary line of which both are multiples, and that from this he wrongly

infers that a straight line cannot be either equal to or greater or less than a curve.

It should be noted, however, that the passage is aporematic, and that Aristotle does not necessarily hold that all the objections which he raises are incapable of being met.

21-2. ἀλλ' . . . ἀναντες, 'but if it were necessary from their very nature that one should move quicker or slower than the other, as it no doubt would be necessary if the one were moving downhill and the other uphill'.

^b3-4. ὤστ' . . . [τὴν Γ]. The usual punctuation, with a comma after δῖσει, and none after τῶ A, implies that the translation is 'therefore there will be a part of A in which B will traverse a part of the circle equal (to the straight line Γ traversed by the body Γ), while (lit. 'and') Γ will traverse the line Γ in the whole of A'. We not only get rid of this invertebrate sentence but get a thoroughly idiomatic one by deleting the comma after δῖσει and placing one after τῶ A, with the sense 'therefore there will be a part of A in which B will traverse a part of the circle equal to the (straight) line which Γ will traverse in the whole time A, viz. Γ'; and a still better one if we regard τὴν Γ as a gloss, similar to those with which the MSS. are studded in ch. 5.

4-6. ἀλλὰ . . . κινήσεις. In ^a19-^b4 Aristotle has set forth reasons for the *prima facie* view that circular movement is comparable with rectilinear. Here he returns to his old point (cf. ^a12), that, in spite of appearances to the contrary, such movements are not comparable because that would imply that a curve may be equal to a straight line in length.

6-7. ἀλλ' ὅσα . . . ἀσύμβλητα. I have printed the reading which fits the context best and accounts best for the variants. The misreading of πάντ' ἀσύμβλητα as πάντα συμβλητά led to the alteration of συνώνυμα into ὁμώνυμα.

In view of ^a15 and 249^a3 we should very likely read ἀλλ' (ἀρα) . . . ἀσύμβλητα;

II. ἐνταῦθα κακεῖ, i.e. in circular and rectilinear motion.

13-14. τὸ γὰρ πολὺ . . . συμβλητά. Simplicius and Pacius take the impossibility of comparing 'much water' with 'much air' to turn on the fact that 'much' may in either case mean 'much in volume' or 'much in weight' (δύναμις). But the ambiguity which Aristotle ultimately shows to exist in the word πολὺ is a different one, viz. that while it always means 'more than a certain standard or average amount', the standard is one that varies from case to case (^b17-18). It may depend for instance on comparative rarity. 'A lot of radium' would mean a much smaller absolute quantity of radium than 'a lot of iron' would of iron.

14-15. εἰ . . . συμβλητά, i.e. if it be denied that 'much' is univocal, at least 'double' is so; and yet two things that are respectively double are not comparable—since, of course, it all depends on what they are double of.

17-20. ἀλλ' . . . δύο. Aristotle points out the existence of a class of terms (relative terms, in fact) each of which is correctly defined by a certain form of words, but a form of words which contains a variable. 'Much' means 'so much and more', i.e. 'more than a certain standard or average amount', but leaves it indeterminate what that standard amount is. 'Equal' means 'of the same size as something else', but leaves indeterminate the size of that other. 'One' means 'containing a certain unit only once', but leaves the size of the unit indeterminate; so with 'two'; and so therefore with 'double', which means 'in the ratio of two to one' (^b 15).

The meaning of ^b 18 is entirely cleared up by the insertion of a comma after ἔτι. τοσοῦτόν τε καὶ ἔτι is the definition of ὑπερέχον which we get in *Met.* 1021^a 6.

18. καὶ τὸ ἴσον ὁμώνυμον. S. 1088. 26-7 καὶ ὁ τοῦ διπλασίου δὲ λόγος ὁ λέγων δύο πρὸς ἓν ὁμώνυμός ἐστι suggests that we should probably add, after ὁμώνυμον, the words καὶ τὸ διπλάσιον. This appears out of place in the καὶ τὸ δίπλασιον τόσον which Shute's MSS. have in ^b 18.

22-4. ὁ μὲν οὖν ἵππος . . . ἐν ἄλλῳ γάρ. καὶ κατὰ μέγεθος ὡσαύτως = καὶ πότερον μείζον (since size in the case both of the horse and of the dog resides in σῶμα). In the following words Aristotle points out that though λευκόν and μέγα are applicable both to ὕδωρ and to φωνή, what they directly reside in is different in the two cases.

For λευκὸν ὕδωρ, 'clear water', cf. *Il.* 23. 282, *Od.* 5. 70, &c.; for λευκὴ φωνή, 'a clear voice', cf. *Thyr.* 106^a 25.

25-249^a 2. ἢ . . . ἄλλῳ; Simplicius takes this to mean 'at that rate each term is univocal—equality for instance will always be the same, but will assume different forms in different subject-matters, and so with sweetness and whiteness'. But this is not a very effective *reductio ad absurdum* of the suggestion made in ^b 21-5. I am inclined to think that Aristotle reduces the suggestion *ad absurdum* by saying that at that rate *all* terms might just as well be said to mean the same thing at bottom as one another, any difference in their meaning being said to be due merely to the presence of the common quality in different subjects. This seems to me the more natural meaning of πάντα ἐν ποιεῖν.—The sense, and a comparison with 249^a 27, appear to require the insertion of τό after ταῦτό.

249^a 2-3. ἔτι . . . πρῶτον. The second objection to the suggestion made in 248^b 21-5 is that it presupposes that the same attribute can be present directly in more than one subject, whereas if we take

things quite strictly the same attribute can be present directly only in one subject—colour in surface, savour in juice (S. 1090. 18), &c.

3. τοῦ τυχόντος. The introduction of these words seems to be justified by S. 1090. 16, 1096. 2.

8-9. οὕτω . . . τοσονδί. The variants are best explained if we suppose τῶ . . . κινεῖσθαι to have been corrupted into τὸ . . . κινεῖσθαι, and this emended into τὸ . . . κινηθέν.

9-10. εἰ . . . ἡνέχθη. This clause, as it stands in the MSS., is very difficult. It is not clear whether τοῦ μήκους ἐν τῷδί means 'over a certain part of the (or its) μῆκος', or ἐν τῷδί means 'in a certain time' and τοῦ μήκους depends on τὸ μὲν, τὸ δέ. Simplicius accepts the first alternative and paraphrases εἰ μέντοι ἐν τῷ αὐτῷ χρόνῳ τὸ μὲν ὑποκείμενον ἐν εἴῃ ἢ εὐθείᾳ, αἱ δὲ κινήσεις διάφοροι, ὥστε κατὰ μὲν τὸ ἡμισυ τοῦ μήκους, τοῦτεστι τῆς εὐθείας, παρατεταμένον τι ἢ αὐτὸ τὸ ἡμισυ τοῦ μήκους ἀλλοιωθῆναι, κατὰ δὲ τὸ λοιπὸν ἐνεχθῆναι τι κατὰ φοράν κινούμενον (1092. 6-9). The difficulty of this interpretation is evident, and in particular it is clear that it requires not τὸ δ' ἡνέχθη but ἐν τῷδί δ' ἄλλο τι ἡνέχθη. The difficulty of the alternative interpretation is equally clear. Simplicius is probably right, however, in taking ἐν τῷδί to refer not to time, but to distance, and the clause is best interpreted as meaning 'if one thing has suffered change of quality along a certain part of its length, and another has been transported a distance equal to this'.

12-13. ὥστ' . . . περιφερῆς. These words are at first sight puzzling, but become intelligible if we realize (1) that ἐνεχθέντα is the emphatic word, and (2) that the grammatical structure is compressed and illogical but idiomatic. What Aristotle means is 'so that we must correct our original statement (^a8-9) and say "things that are *locally* moved an equal distance in an equal time are of equal speed"; but if we say this, we shall still be landed in the difficulty that we shall be making a straight line equal to a curve'. S. 1092. 17-20 explains the words exactly rightly. The more logical form would be ὥστε τὰ ἐν ἴσῳ χρόνῳ ἐνεχθέντα ἴσον μῆκος ἴσοταχῆ ἔσται· εἰ δὲ τοῦτο, ἴση ἢ εὐθεία καὶ ἢ περιφερῆς.

14. γένος = εἶδη ἔχον (^a 12).

15-16. ὁ μὲν γὰρ χρόνος . . . διαφέρει. I have restored the reading of Simplicius. κατ' ἐκεῖνα in S. 1093. 1 is probably, as Diels suggests, a corruption of καὶ ἐκεῖνα, which occurs *ib.* 7. Bekker's text ὁ μὲν γὰρ χρόνος αἰεὶ ἄτομος τῷ εἶδει. ἢ ἅμα κακεῖνα εἶδει διαφέρει; is identical with that of Alexander (S. 1093. 9), except that Alexander adds ὁ αὐτός before αἰεὶ; and Simplicius informs us that this reading (including ὁ αὐτός) was transferred from the other version.

ἀν δὲ τῷ εἶδει ἢ ἄλλα (sc. τὰ ἐφ' ὧν κινεῖται), καὶ ἐκεῖνα (sc. αἱ φοραί) εἶδει διαφέρει.

17. ὅτε δὲ ἐὰν ᾤ, i.e. if the organs with which the movements are performed differ.

18. τοῖς σχήμασιν, i.e. by the straightness or curvature of the path, and by this alone.

22-3. ἀλλὰ . . . πόλλα, 'but there are many other undetected cases in which there is a lack of a single genus', and therefore an impossibility of comparison.

23-5. εἰσὶν . . . ἀναλογία. Simplicius' comment (1096. 29-1097. 3) is excellent: αἱ μὲν . . . ὡσπερ αἱ ἀπὸ τύχης, αἱ δὲ . . . ὡς αἱ εἰκόνας πρὸς τὰ πρωτότυπα, αἱ δὲ ἐγγύς εἰσιν ἢ γένει ἢ ἀναλογίᾳ, γένει μὲν τὰ ἀφ' ἐνὸς καὶ πρὸς ἓν λεγόμενα (things proceeding from a common source or conducting to a single end, cf. *E.N.* 1096^b 27) . . . ἀναλογία δὲ . . . τὰ τὴν ἐν τῷ λόγῳ καὶ τῇ χρειᾷ ὁμοιότητα σφύζοντα, ὡς ἡ ἀρχὴ καὶ γὰρ ἡ πηγὴ καὶ ἡ καρδία καὶ μονὰς καὶ σημείον καὶ τὸ ἡγούμενον ἐν πόλει ἀρχὴ λέγεται. πολὺ, διπλάσιον, ἴσον, ἔν, δύο are presumably ὁμώνυμα of the analogical kind.

28-9. ὅτι ἐν ἄλλῳ . . . ταυτό; i.e., are we to say that there is a specific difference of quality where a quality manifested in different subjects appears different (as e.g. whiteness does when present in a horse and in a dog, 248^b 22), or only (and this is no doubt the alternative Aristotle would choose) when the quality is in its own nature different (as e.g. the λευκότης of water and that of a voice (ib. 24))?

Aristotle has said in ^a 2-3 that a single quality has only one direct subject. But here he is speaking of indirect or *per accidens* subjects. A surface is the only thing that can be directly white in the literal sense (248^b 23), but a horse and a dog can be indirectly white, because they both have surfaces.

^b 2-4. ἀλλὰ . . . μεταβάλλον, 'but was changed, with what qualification? We cannot say "was changed to an equal extent", since "equal" is appropriate only to quantity and to the definition of quantitative change (i.e. locomotion and increase-and-diminution); what corresponds in the case of qualitative change is likeness. But let us use a more general word and say "that is of equal speed which suffers the *same* change in an equal time." Here, as in ^a 19-20, 'the same' means 'specifically (not numerically) the same'.

5-10. πότερον . . . φοραί. As Aristotle laid down that φοραί, to be comparable, must be of the same kind, i.e. must be over paths of the same kind (^a 19-20), so here he says that ἀλλοιώσεις to be comparable must be of the same kind, i.e. must be in respect of πάθη of the same kind; identity in the subject of the πάθος is not enough to make the ἀλλοιώσεις comparable.

12-14. εἰ . . . ἀριθμῷ. καθ' αὐτὰ καὶ μὴ κατὰ συμβεβηκός is inserted to distinguish the very elements in changing things which are the

subjects of change (the ἐν ᾧ πρώτῳ of 248^b 23) from the changing thing as a whole. It is not difference in the latter (as between a horse and a man, S. 1100. 18) but difference in the former that creates difference between two κινήσεις. Thus ἀλλοιώσις differs from αὔξησις in genus, because τὸ ποιόν and τὸ ποσόν differ in genus. Change of colour differs from change of temperature in species because colour and temperature differ in species. Change of colour in one thing differs numerically from a precisely similar change in another because the colour of the one differs numerically from that of the other.

14-19. ἀλλὰ . . . ἄνισον; In ^b 5-11 Aristotle pointed out that it is the πάθος and not the subject that forms the basis of comparison between two ἀλλοιώσεις; identity or difference of πάθος makes the ἀλλοιώσεις like or unlike. He now points out that the subject also plays a part in the comparison; according as more or less of the subject is altered, the ἀλλοιώσεις will be equal or unequal.

16. εἰ ἰσοταχεῖς κτλ., 'to determine whether', etc.

18. εἰ . . . αὐτό. The sense obviously requires this reading. Most of the MSS. simply omit ἢ μὴ τὸ αὐτό through haplography, but E's reading εἰ τὸ αὐτὸ αὐτό preserves a trace of the original.

19. εἰ . . . ἄνισον. ἐκεῖνο ἰς τὸ ἀλλοιούμενον. ἴσον ἢ has dropped out by haplography.

21. τὸ αὐτὸ καὶ ἄτομον, 'two things which are identical, i.e. indivisible in species from one another.'

22-6. οὐ . . . μείζον. In dealing with qualitative change, we have a definite word to express the relation between two πάθη *a* and *b* which makes change to *a* ἀνισοτάχης with change to *b* occupying the same time; we call them ἀνόμοια (^b 23, cf. ^b 3). And we have separate words to express the difference of intensity of the two πάθη; we use the words μᾶλλον and ἥττον (^b 26). Similarly in dealing with change involving quantity, whether this be locomotion or increase-or-diminution, we have a word to express the relation between the spaces covered, or the increases-or-diminutions suffered, in changes which are ἀνισοτάχεις; we call them ἄνισα (cf. ^b 3, 19). And we have separate words to express the different quanta involved; we call them μείζον and ἔλαττον (^b 26). With regard to the generation or destruction of substances, we have (1) no word answering to ἀνόμοιον and ἄνισον, but have to use the word ἕτερον, which is not on a par with these since it is applicable in *all* the categories, and (2) no pair of words answering to μᾶλλον-ἥττον and μείζον-ἔλαττον. ^b 25-6 καὶ . . . μᾶλλον expresses the same point as ^b 22-3 οὐ . . . ἀνομοιότης.

In ^b 23-4 we have a passing reference to the Pythagorean and Platonic doctrine that the essence of things is numerical—a doctrine which Aristotle evidently treats as an open question, so that Jaeger

is justified (*Arist.* 313 n.) in regarding the reference as evidence of an early date for Bk. VII.

With the ordinary reading and punctuation, which begins a sentence with *καὶ εἰ ἔστιν κτλ.*, the connexion of this reference with the context is not clear, and the omission of the article before *πλείων καὶ ἐλάττων ἀριθμὸς* is unsatisfactory. I have tried to remedy both these faults by treating *οὐ . . . ἀνομοιότης* ^b 22-3 as parenthetical, and by adopting the well-attested *ἢ* for *καὶ* in ^b 23. *πλείων καὶ ἐλάττων ἀριθμὸς ὁμοειδῆς* then becomes an alternative to *ἕτερον* ^b 22. One *γένεσις* is greater than another if in equal times different substances—or, to put the matter more definitely, if the greater and the less of two numbers specifically alike—come into existence.

The reference in *πλείων καὶ ἐλάττων ἀριθμὸς ὁμοειδῆς* must be to the Pythagorean division of numbers into kinds such as

the triangular	∴	⋮
the square	∴	⋮
the pentagonal	∴	⋮

(*Nicom. Ar.* ii. 8-11, *Theo Sm.* 37. 7 to 41. 2, ed. Hiller).

The numbers within any one of these kinds were described as *ὁμοειδεῖς* (*Iambl. in Nicom. Arithm. Introd.* 70. 11, ed. Pistelli). We know that there was a form of Pythagorean-Platonic theory which assigned different numbers to different *σώματα* (cf. for instance *Alex. in Met.* 767. 12, which assigns 11 to fire, 13 to air, 9 to water). Various *σώματα* would then be arranged in different series according as their numbers were triangular, square, &c.; and Aristotle suggests that if this theory were accepted, the coming-into-being of *σώματα* (e.g. animals) corresponding to a greater and a smaller number in the same series, in equal times, would be unequal in speed.

CHAPTER 5

249^b 29-30. *ἀεὶ . . . ποσῶ.* It has been proved in 236^b 32-237^a 17 that everything that *κινεῖται* also *κεκίνηται*, and it is a natural inference from this that everything that *κινεῖ* also *κεκίνηκεν*. The point of the introduction of this observation here is this: It is Aristotle's object to discuss the proportions that exist between the four terms mover, moved, distance of movement, time of movement. Now the mere fact that A is moving B does not of itself guarantee that the movement covers a definite distance or occupies a definite time; what makes both the distance and the time definite is the fact

that every movement which is in progress must have already been in progress for a definite time, and must in that time have covered a definite distance.

30-250^a 28. εἰ . . . ἀνάλογον γάρ. The proportions established by Aristotle are the following:

If A moves B distance Γ in time Δ ,

(1) A moves B/2 distance 2Γ in time Δ (250^a 1-3),

(2) A moves B/2 distance Γ in time $\Delta/2$ (ib. 3),

(3) A moves B distance $\Gamma/2$ in time $\Delta/2$ (ib. 4-5),

(4) A/2 moves B/2 distance Γ in time Δ (ib. 6-7),

(5) A need not move $2B$ distance $\Gamma/2$ in time Δ (ib. 9-12),

(6) A/2 need not move B distance $\Gamma/2$ in time Δ (ib. 12-15).

(7) If A moves B distance Γ in time Δ , and H moves Θ distance Γ in time Δ , then A + H moves B + Θ distance Γ in time Δ (ib. 25-8).

250^a 9-15. καὶ . . . Ε. EK and S. 1105. 16-17 read ἀναγκαῖον for οὐκ ἀνάγκη in ^a 10, and EK and one MS. of Simplicius read δέ for δὴ in ^a 12. If for simplicity we eliminate the references to E and Z, the passage will then say 'if A/2 moves B/2 distance Γ in time Δ , A/2 moves B distance $\Gamma/2$ in time Δ , but if A moves B distance Γ in time Δ , it does not follow that A/2 moves B distance $\Gamma/2$ in time Δ '. This is very difficult, more especially since Aristotle has said in ^a 4-5 that if A moves B distance Γ in time Δ , A/2 moves B/2 distance Γ in time Δ . S. 1106. 12-14 tries to get over the difficulty by supposing that Aristotle is in ^a 9-12 dealing only with the case in which A/2 succeeds in moving B, and saying that if it does, it moves it only distance $\Gamma/2$ in time Δ , and proceeds in ^a 12-15 to correct himself by saying that it may not be able to move B *any* distance in time Γ . But it does not seem plausible to attribute to Aristotle so complete a *volte-face* within so short a passage. Cornford in *Class. Quart.* 26 (1932), 52-3 tries to defend the reading of EK by supposing ^a 9-12 to mean that A/2 can in time Δ *successively* move *two* weights each = B/2 distance $\Gamma/2$. But in the whole of the context (till ^a 25-8) Aristotle is speaking of a single force moving a single weight, and I do not think that in the context τὸ διπλάσιον τοῦ Z can mean anything other than 'a weight twice as great as Z'. I prefer therefore to adopt in ^a 10 the reading of HIJ, supported by Shute's four MSS. and by P. 880. 29. Themistius' summary (207. 4-13) knows nothing of the contradiction (or apparent contradiction) implied in the other reading. There is evidence that EK and Simplicius are here following an inferior tradition, for in ^a 15 they have πρὸς τὸ Z, of which nothing can be made. Further, S. 1106. 1-5 recognizes the existence of the reading οὐκ ἀνάγκη, and admits that the meaning it gives is ἀληθέστερόν τε καὶ τοῖς ἐπιφερομένοις συναδόν.

Four objections remain. (1) Prof. Cornford argues that, on the view which he rejects, the sentence beginning in ^a9 should begin not with *καί* but with *ἀλλ'*. It certainly would not have been surprising if it had begun with *ἀλλ'*. But the statement as it stands, with *καί*, becomes natural enough when we realize that the fact that if A moves B distance Γ in time Δ, A/2 moves B/2 distance Γ in time Δ is represented as depending on the fact that the ratio of force to mass remains the same (^a8-9). From this point of view it becomes not an apparently contradictory fact (such as would require to be introduced by *ἀλλά*) but a natural consequence, that when the ratio diminishes, the proportionality should not hold good.

(2) Prof. Cornford argues that, on the view he rejects, ^a12-15 merely repeat ^a9-12. But there is a difference, though not a very great one, between what is said in the two sections. In the one the mass is doubled, in the other the force is halved.

(3) The reading of EK might be thought to derive some support from ^b2 *καὶ τὸ διπλάσιον ἐν διπλασίῳ*. If this be taken to mean 'and an object twice the size is altered in twice the time' it would correspond to what is said in ^a9-12 with EK's reading. But in fact *τὸ διπλάσιον ἐν διπλασίῳ* states simply the converse of *ἐν διπλασίῳ διπλάσιον*, 'given twice the time, the object is altered twice as much, and given that the alteration is twice as great, twice the time is needed'.

(4) Prof. Cornford thinks that his interpretation here assists the true interpretation of 266^a 12-23. His interpretation of that passage is undoubtedly right, but any one who will consult my note on the passage will see that its true interpretation is independent of the interpretation of the present passage.

The argument is pretty evenly balanced between the two readings here, but seems to me to lean slightly towards that which I have adopted. *οὐκ* seems to have dropped out, and *δὴ* to have been consequently changed to *δέ*, through the assumption of an early copyist that in ^a9-12, as in what has preceded, a positive proportional relation was to be stated.

In ^a12 I have restored *κινεῖ*: Aristotle is careful to use the present or aorist tense in the protasis (^a5, 10, 16, 25) and the future in the apodosis (^a3, 6, 13, 17, 27). In ^a14 the sense requires the omission of the comma before *οὐδ'*, and is improved by the omission of *ἦ* before *ἀνάλογον*; Simplicius evidently had no *ἦ* (1107. 2, 10), though some MSS. read *ἦ* or *ἦ* in 1108. 10. In ^a15 *ὡς τὸ Α πρὸς τὸ Ε* is carelessly put for *ὡς τὸ Ε πρὸς τὸ Α*.

12-13. *τὴν τὸ Β . . . τὴν τὸ Β*. The feminine article might seem inappropriate to B, which is a *βάρος*, and in the rest of the passage the feminine form is used only with reference to a *δύναμις* (A ^a2, E ^a7) or to a *γραμμὴ* (Γ ^a2, 3, 10, 12, 14, 15). But in the diagram

all the terms were *represented* by γραμμαί, so that the feminine form is permissible.

19. εἰς τὸν ἀριθμὸν, sc. τῶν νεωλκῶν, into as many parts as there are ship-haulers.

19-21. διὰ τοῦτο . . . μέρος. S. 1108. 18-28 says that Zeno posed Protagoras with the question:—since the fall of a medimnus of millet makes a sound, must not one grain make a sound which is the same fraction of the whole sound as the grain is of the medimnus?

25-6. εἰ . . . τοσῶδε. None of the MS. readings is satisfactory, and it seems best to insert κινούντα, which derives some support from P. 881. 18 εἰ δύο τινὰ εἶεν κινούντα. καὶ ἑκάτερον has more authority than ἑκάτερον or Bekker's ἑκάτερον δέ, and may account for the unmeaning καί which EK has before the second ἑκάτερον.

31-^b1. καὶ τὸ ἀλλοιοῦν . . . χρόνῳ. The sense is improved by inserting a colon or dash before τὶ.

^b2. ἐν διπλασίῳ . . . διπλασίῳ. Neither διπλάσιον nor τὸ διπλάσιον can refer either (1) to mover, for an obvious reason, or (2) to moved, because then Aristotle would be asserting of ἀλλοίωσις what he denies of φορά in ^a 12-19, while he says the same principles apply to both (οὕτω ^a 28, ὥσπερ καὶ ἐπὶ τοῦ βάρους ^b 7). They must both refer to the amount of the change produced, and the phrase must mean 'when the time is doubled, the amount of change will be doubled, and *vice versa*'.

2-3. τὸ δ' ἥμισυ . . . διπλάσιον. Here ἐν ἴσῳ διπλάσιον must mean 'an object half as great as the original object will be changed twice as much in an equal time'. Therefore τὸ ἥμισυ must mean 'an object half as great'. ἢ ἐν ἡμίσει ἥμισυ may mean (1) 'or the original object will be changed half as much in half the time', or (2) 'or, given that the time is half the original time, the object changed will be half as great' (i.e. the converse of τὸ ἥμισυ ἐν ἡμίσει χρόνῳ, as τὸ διπλάσιον ἐν διπλασίῳ is the converse of ἐν διπλασίῳ διπλάσιον). But the absence of an article with ἥμισυ points to interpretation (1). In that case ἢ ἐν ἡμίσει ἥμισυ is parenthetical.

5-6. οὐκ . . . ἥμισυ. *Prima facie* this looks as if it were meant to state the point corresponding to that stated in ^a 12-15, i.e. the point that from the fact that a force A can alter an object B a certain amount in a certain time, it does not follow that a fraction of A can alter B any particular amount in any particular time, or indeed that t can alter it at all. On this hypothesis τὸ ἥμισυ must mean 'half the agent', but the statement 'half the agent will not necessarily change the patient in half the time' would be absurd. Logically we should want ἐν διπλασίῳ for ἐν ἡμίσει in ^b 5 and 6. But such an emendation would, in the absence of any external evidence, be too violent.

The statement may be explained in the light of 253^b 14-26.

Aristotle there points out that if raindrops wear away an object in a certain time, it does not follow that half of the number of raindrops wear away half the object in half the time, since the effect may come with a rush (*ἀθρόα* 253^b 25) towards the end of the time; and that this is true in general of ἀλλοιώσις (ib. 23). τὸ ἤμισον then in 250^b 5 is *object* of ἀλλοιώσει, and the point is that, as forces working simultaneously may produce a result of which each alone could produce no fraction (^a 12-15), so a force working continuously may in time produce a result of which it does not produce 1/n in 1/n of the time.

BOOK VIII. CHAPTER 1

250^b 14-15. οἶον . . . πᾶσιν. The comparison is apt, since ζωή is just the power of self-movement. Further, the comparison serves to justify the previous clause. If movement is to all natural things as life is to living things, they cannot exist without movement any more than living things could without life.

18-19. ὅσοι . . . φασιν, i.e. Anaximander, Leucippus, Democritus (S. 1121. 6). *Plac.* ii. 1. 3 adds Anaximenes, Archelaus, Xenophanes, and Diogenes of Apollonia.

21-2. ὅσοι . . . μὴ αἰεί. The vulgate reading gives no good sense. For the view that there is but one world does not itself lead to any corresponding belief in the eternity or non-eternity of movement (ὑποτίθενται κατὰ λόγον). Themistius' ὅσοι καὶ ἓνα κόσμον καὶ αἰδίων ὑποτιθέντες . . . ὅσοι δὲ ἓνα μὲν οὐκ αἰδίων δέ (209. 11-13) points to ὅσοι δ' ἓνα ἢ αἰεί ἢ μὴ αἰεί as being the true reading. Simplicius reads ὅσοι δὲ ἢ ἓνα ἢ μὴ αἰεί, but thinks (wrongly) that it may be interpreted as if it were ἢ ἓνα καὶ αἰεί, ἢ μὴ αἰεί καὶ ἓνα. With our reading we get the good sense 'those who think that there is but one universe and make it eternal or not eternal, make movement eternal or not eternal accordingly'.

24-6. φησὶν . . . διακρίναι, fr. 1, 13.

29-251^a 3. λέγων . . . κύκλον, fr. 17. 9-13 = 26. 8-12.

30. οὕτως ἢ μὲν ἔν. I follow Diels (1) in treating οὕτως as the beginning of the quotation, not as introducing it (S. 33. 26 gives it as part of the quotation), and (2) in reading ἢ μὲν (cf. ἢ δέ 251^a 2).

251^a 4-5. τὸ γὰρ . . . ὑποληπτέον. The reading of H evidently gives a better sense than the reading adopted by Bekker; viz. 'for we must suppose that he means by ἢ δὲ τὰδ' ἀλλάσσοντα that they alternate from the motion towards ἔν to motion towards πολλά, and *vice versa*'. The first three lines of the quotation insist on the rotation, the last two on the permanence of the rotation. There is no reference to rest during the μεταξὺ χρόνοι when Love and Strife are exactly balanced.

8-9. ἐκ τῶν διωρισμένων . . . πρότερον, in iii. 201^a 10. The present book is evidently regarded as not being part of τὰ φυσικά, which as usual means books i-iv only.

22. ἐπιστήσασιν, 'when we attend to it'. For ἐφιστάναι with τὴν διάνοιαν understood cf. Bonitz, *Index* 305^a 6-17.

προάγουσι. This is the preferable reading, because it is more likely to have been altered into προϊούσι than *vice versa*. For a similar usage cf. *Pol.* 1282^b 35.

τούτο, sc. τὸ ἄλογον φαίνεσθαι.

25. τούτο, the thing that was at rest and is in motion.

26-7. ἦν . . . κινήσεως. With these words we must understand 'and there must have been a change consisting in the removal of this αἴτιον τῆς ἡρεμίας'. This is brought out more fully in ^b 1-10.

28-30. τὰ μὲν γὰρ . . . μία. Aristotle actually makes no use of this distinction here, and in fact treats it as a digression, from which he returns to the main point in ἀλλ' οὖν κτλ. ^b 1. But he may have meant originally to make the point that if a thing which has a δύναμις ἐναντίων energizes first in the one and then in the contrary way, there must have been a prior change in it to account for this. E.g. a doctor who uses his knowledge first to cure and then to kill must have come under the influence of a new desire.

^b 4-5. ὡς . . . κινήτόν. Bekker's ὡς εἶναι κτλ. is unintelligible, and ἦν is confirmed by *Met.* 1048^a 6 and by ὡς ἦν δυνάμενα 251^b 6.

10-28. πρὸς δὲ τούτοις . . . κινήσεως. This section interrupts the main argument of the chapter. ^a 8-^b 10 proves that if motion be supposed to have had a beginning, there must have been a motion prior to that which is supposed to have been the first. ^b 28-25^a 5 proves that if it is supposed that motion will have an end, there will be a motion posterior to that which is supposed to be the last. ^b 10-28 adds a more general argument in favour of the eternity of time.

10-13. πρὸς δὲ τούτοις . . . εἶναι. To say that motion began or will end is to imply that there was a state of things before the state of motion began, or that there will be one after it is over. But if time is the number of motion (i.e. that in respect of which motion is measurable) this is to imply that there was something before, or will be something after, time; but before and after are distinctions drawn within time and cannot fall outside it.

12-13. εἰ . . . τις. Similarly in 219^a 8 Aristotle says that time is ἦτοι κίνησις ἢ τῆς κινήσεως τι. But he immediately rejects the first alternative, and finally concludes that time is ἀριθμὸς κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον (220^a 24). The view that it is κίνησις (sc. τοῦ ὄλου) is one of those held by Aristotle's predecessors (218^a 33).

15-17. καὶ . . . εἶναι. We have no fragments of Democritus to support this.

17-19. Πλάτων . . . φησίν. The reference is to *Tim.* 28 b, 38 b. Prof. Taylor in his note on *Tim.* 28 b 4 contends with much force that Plato's statement that the universe γέγονε is only διδασκαλίας χάριν, his object being logical analysis and not a description of the sequence of events.

The argument requires us to treat γεγονέναι in ^b 18 as an emblemata and to supply εἶναι in thought.

28-252^a 1. ὁ δ' αὐτὸς λόγος . . . κινουῖν. ὁ αὐτὸς λόγος, i.e. an argument answering to that by which Aristotle proved in ^a 8-^b 10 that movement has no beginning. He does not work out in full the corresponding argument to prove that movement will have no end, but it is not difficult to supply what is missing. He pointed out before that κινήτᾳ must have existed before the supposed first κίνησις (^a 9-17), and that it must have needed a κίνησις before the supposed first κίνησις to alter them from the state of ἡρεμία into that of κίνησις (^a 23-^b 10). Similarly here he points out that there will be κινήτᾳ after the supposed last κίνησις (^b 31-252^a 1). We have only to add the reflection that there will have to be a κίνησις after the supposed last κίνησις to alter them from the state of κίνησις into that of ἡρεμία.

252^a 1-3. καὶ τὸ φθαρτικὸν . . . ἐστίν. Aristotle now adds the reflection that if the supposed last μεταβολή be a φθορά, after this φθορά the φθαρτικὸν will still remain to be destroyed, and after it has been destroyed its φθαρτικὸν will still remain to be destroyed, and so *ad infinitum*. The readings τὸ φθαρτικὸν in ^a 1 and φθείρη ('has destroyed') in ^a 2 give the right sense. Most of the MSS. of Simplicius have φθείρη (1175. 12, 1177. 21). Hayduck's καὶ τὸ φθαρτὸν δὲ δεήσει φθαρῆναι ὅταν φθαρῆ is less attractive.

7-9. ὡς τὸ κρατεῖν . . . ἐξ ἀνάγκης. This thought is implied in the words of Empedocles (fr. 30):—

αὐτὰρ ἔπει μέγα Νείκος ἐνὶ μελέεσσιν ἐθρέφθη
 ἐς τιμᾶς τ' ἀνόρουσε τελειομένοιο χρόνιοιο
 ὅς σφιν ἀμοιβαῖος πλατέος παρ' ἐλλήλαται ὄρκου.

10-11. τάχα . . . εἴποιεν. μίαν ἀρχήν does not mean 'one principle' in general, but 'one principle of movement'. Anaxagoras is a pluralist, but recognizes only one principle of movement (νοῦς), as against Empedocles' two.

13. τὸ δ' ἄπειρον . . . ἔχει, e.g. the indefinite period of change bears no ratio to the indefinite period of rest.

19-22. διόπερ . . . τοιοῦτον. I.e. Empedocles at least treats the alternation of rest and motion as a law of the universe, while Anaxagoras merely introduces motion at one particular point of the world's history without suggesting why it should have begun then rather than sooner or later.

25. τὰ ὑποθεθέντα, i.e. φιλία and νεῖκος.

27-8 εἰ . . . μέρει, 'if he is to make his statement more specific by including the fact that these forces operate in turn'.

28. ὡσπερ ὅτι, i.e. ὡσπερ λέγει ὅτι.

34-5. ἐφ' ᾧ . . . ἐγγίγνεται. We have no fragments of Democritus that can be cited in support of this.

35^b-5. τοῦ δὲ ἀεὶ . . . οὐσῶν. Democritus claims generally that no cause need be sought for that which is eternal. This is true in some cases, i.e. there are eternal ἀρχαί for which no cause is to be sought beyond themselves (^b4-5). But it is not true in others; e.g. the equality of the angles of a triangle to two right angles is eternal, but nevertheless depends upon more fundamental principles, from which it is actually deduced by geometry.

CHAPTER 2

252^b 17. πολὺ . . . μάλιστα. Cf. 247^b 2-3 n.

τὸ τοιοῦτον . . . εἶναι φανερόν depends on ὀρώμεν, 'understood' from ^b 12.

26. ἐν μικρῷ κόσμῳ. The phrase is borrowed from Democritus (fr. 34).

27. καὶ εἰ . . . ἄπειρῳ. Aristotle adds this to allow for the possibility of there being a boundless universe beyond the world of which we have knowledge, i.e. beyond that of which the sphere of the fixed stars is the boundary. He does not believe in such a world himself, but others had done so (Anaximander and Anaximenes).

28. εἴπερ . . . ὄλον. In iii. 205^a 8-206^a 7 Aristotle has shown the impossibility of an infinite body's being either in motion or at rest. The whole reference to τὸ ἄπειρον here is a reference to a view which he believes to be untenable.

28-253^a 2. τούτων . . . ὕστερον. Aristotle admits here that rectilinear motion between opposite termini cannot be eternal and self-identical. This at least follows, he says, if it be admitted that the self-identity of the moved object does not guarantee the self-identity of the motion—though this may be disputed, whether for instance the movement of a single string (and therewith the sound it produces) is the same when it is in the same condition and is repeatedly struck in the same way. However we answer this question, he continues, there is nothing to prevent the possibility of a movement whose unity depends not on the unity of the thing moved but on the movement's own continuity and eternity. This is circular motion, which in ch. 8 he proves to be alone capable of being continuous and eternal.

253^a 2. οὐδὲν ἄτοπον, i.e. causes no difficulty for the believer in eternal movement.

6-7. διὰ τί . . . κινεῖται. This is the problem discussed in the next chapter.

11-20. τοῦτο . . . πάλιν. This passage is noteworthy as being (with 259^b 1-16) that in which Aristotle most distinctly gives up the ordinary description of living things as genuine initiators of movement. He gives here a thoroughly deterministic account, according to which, though thought and desire occur as links in the process, everything that a living thing does is in the last resort due to the action of the environment on the living body.

11-13. ὁρῶμεν . . . ἴσως. Aristotle is no doubt thinking of such movements as those of growth, decay, and respiration (259^b 9) set up in animal bodies by their environment.

20. ἐνούσης μέντοι τινός. In 259^b 13 this is said to be the distribution of food through the system, following upon the digestive process which is the cause of sleep; cf. *De Somno* 458^a 10-25.

20-21. ἀλλὰ . . . ἐπομένων, cf. 259^b 1-16.

CHAPTER 3

253^a 22-4. Ἀρχὴ . . . πάλιν. The starting-point of the inquiry which occupies chs. 3-5 is the same question which lies at the basis of the ἀπορία (mentioned in ^a 3-5), how the same thing can sometimes be moved and sometimes not be moved by the same mover; viz. the question why some things are sometimes in movement and sometimes at rest. But before asking why this is so, Aristotle has to show *that* it is so, and this is the subject of the present chapter.

30-32. ὅπερ . . . ἐστίν. Among the problems which Aristotle considers to be solved by adopting the last hypothesis (^a 28-30) are these: (1) The eternity of motion will not be disproved by the fact that motion is between fixed points (252^b 9-12), if it can be shown that not all movement is of this kind, i.e. that there is an eternal circular movement caused by an unmoved mover. (2) The origination of movement in an unmoved subject (252^b 12-16) will not show that movement has had a beginning, if it can be shown that there is an eternal movement. The establishment of the last hypothesis, including (a) an unmoved prime mover, (b) an always moving celestial system, (c) terrestrial things which are sometimes at rest and sometimes in motion, furnishes a complete cosmology and is thus the τέλος τῆς πραγματείας.

32. τὸ μὲν οὖν πάντ' ἡρεμεῖν, sc. φάναί.

34. καὶ . . . ἀμφισβήτησις. The denial of the existence of movement is an attack not on a mere detail of physical theory, but on the whole system of natural science. This is brought out in detail in ^a 35^b 6.

^b 2-6. ἔτι . . . κινήσεως. Cf. 184^b 25-185^a 5. The mathematician or the physicist cannot listen to objections to the ἀρχαί of his science, for without indemonstrable ἀρχαί no science is possible. That nature is a source of movement is no more disputable for the physicist than the existence of the unit is for the mathematician. Cf. *An. Post.* i. 1, 10.

6-7. σχεδόν . . . μέθοδον. Aristotle would not be likely to qualify the first of the two clauses by σχεδόν. We must therefore take σχεδόν as qualifying the whole statement 'we may almost say that the view that all things are in movement, while false, is less subversive of physical science than the other'.

7-9. ἐτέθη . . . ἡρεμίας, ii. 192^b 21. Cf. 251^a 8-9 n.

9. ὁμως . . . κίνησις. The vulgate reading, ὁμοίως κτλ., gives no good sense, and ὁμως, the reading of Vicomercatus, Camotius, and Pacius, gives the sense required. ὁμοίως may then be supposed to be due to the influence of ^b 4; the two words are often confused in MSS. (cf. 196^a 15, 197^a 21). Gaye's οὐχ ὁμοίως, 'not equally, sc. but more' (cf. *Pol.* 1303^b 10 οὐχ ὁμοίως ἀλλὰ μᾶλλον), gives an excellent sense but is less likely to have been corrupted.

12. ποίαν . . . πάσας. This is a *constructio ad sensum*; the full form would be πότερον μίαν κίνησιν λέγουσι (καὶ εἰ μίαν ποίαν) ἢ πάσας.

13-14. οὔτε γὰρ . . . μέσον. I.e. there is an intervening normal size at which growth ends and decay begins.

14-23. ἔστι . . . ἀπιέναι. In 250^a 17-19 Aristotle pointed out that the hauling of a ship is due to the cumulative *simultaneous* effort of the haulers, and that it must not be inferred that each of them hauls it a little way. Similarly he here points out that a process of growth or decay need not be continuous from beginning to end, but that there may be pauses in it followed by crises at which the cumulative *successive* action of some small force may produce a large effect.

25. ἀλλ' . . . πῆξις. Aristotle does not mean that solidification always is ἀθρόα, but that it sometimes is; cf. *Meteor.* 348^b 22.

26-8. ἔτι . . . μῆθέν. This is best taken as an argument against the possibility of continuous never-ending alteration of a single type, say falling ill. 'When something has fallen ill, there must be a time in which it will grow well, and the transition cannot take place in a moment; and the transition must be a transition to health and not to anything else'—so that it cannot be regarded as forming a stage in a continuous process of falling ill.

31-3. κατὰ τε τὸ φέρεσθαι . . . γῆς. It is of course the existence

of undetected movement, not of undetected rest, of which Aristotle means to say that it would be strange. But the introduction of ἡ μένων ἐπὶ τῆς γῆς is natural enough, since the sentence in effect means 'it would be strange if we did not know whether a stone was falling or resting on the earth'.

254^a 7. τὰς εἰρημένους μεταβολάς, i.e. from rest to motion and *vice versa*.

9-10. οὕτε . . . πρότερον. It is not clear whether (1) Aristotle means, as his language strictly implies, that αὔξησης, as well as βίαιος κίνησις, involves the *unnatural* movement of what was previously at rest, or (2) the construction is loose and he means only that αὔξησης involves the movement of what was previously at rest, and βίαιος κίνησις involves the unnatural movement of what was previously at rest. On the first interpretation, the reference will be (as Alexander took it to be, S. 1201. 14) to the rising of food in the body that is being nourished by it, contrary to its natural tendency to fall. It seems to me more likely that S. 1201. 19 is right in adopting in effect the second interpretation and suggesting that so far as αὔξησης goes Aristotle is simply referring to his proof in 253^b 13-23 that αὔξησης is interrupted by periods of rest.

10-11. γένεσιν . . . λόγος. γένεσις and φθορά, as much as αὔξησης and βίαιος κίνησις, involve rest before γένεσις or φθορά begins and after it ends, and are therefore irreconcilable with the theory in question.

12-14. εἰς ὃ . . . ἐντεῦθεν. ἐν τούτῳ and ἐντεῦθεν are probably inserted with special reference to φθορά, τοῦτο being more applicable to ἀλλοίωσις and αὔξησης-φθίσις.

16. τοὺς πάλαι λόγους. The reference is probably to ch. 1, where Aristotle has argued against the view that motion is not continuously going on in the universe. But the point at issue is not the same one: to prove that there has always been and always will be motion is not to prove that there are any particular things which always have been and always will be in motion. Aristotle may have specially in mind here his arguments against the theory he ascribes to Empedocles, of a cycle in which rest and movement succeed each other (252^a 5-32).

16-22. ἀρχὴν . . . ὅτε δὲ κινεῖσθαι. Aristotle here refers back to the enumeration of possible views in 253^a 24-30. The subdivisions of the third view (τὰ μὲν κινεῖσθαι τὰ δ' ἡρεμεῖν) are stated thus in the two passages (taking the vulgate reading in 254^a 21).

(α) τὰ μὲν κινούμενα κινεῖσθαι ἀεὶ
τὰ δ' ἡρεμοῦντα ἡρεμεῖν 253^a 26-7.

(β) πάντα πεφικνέαι ὁμοίως κινεῖ-
σθαι καὶ ἡρεμεῖν 253^a 27-8.

πάντα ὅτε μὲν ἡρεμεῖν ὅτε δὲ
κινεῖσθαι 254^a 20.

(c) τὰ μὲν αἰὲ τῶν ὄντων ἀκίνητα τὰ μὲν αἰὲ ἡρεμεῖν τὰ δὲ αἰὲ
εἶναι, τὰ δ' αἰὲ κινούμενα, τὰ δ' κινεῖσθαι αὐτῶν, τὰ δ' ὅτε μὲν
ἀμφοτέρων μεταλαμβάνειν 253^a ἡρεμεῖν ὅτε δὲ κινεῖσθαι 254^a
28-30. 21-2.

The first subdivision is thus omitted in the vulgate reading in the present passage, and that although the view in question is that which has just been refuted in ^a 3-15, and though it is referred to in ^a 34-5 and in ^b 3-4. Clearly therefore the text is defective. It is easily remedied by inserting ἢ τὰ μὲν αἰὲ ἡρεμεῖν, τὰ δὲ αἰὲ κινεῖσθαι in ^a 21. We then get the *a*, *b*, *c* of 253^a 26-30 in the order *b*, *a*, *c*.

23. ὅτι . . . πρότερον, 253^a 32-^b 6.

25. καθάπερ . . . ἀκίνητον. The reference is to Melissus, cf. 185^a 32, 186^a 16.

29-30. ἢ γὰρ φαντασία . . . δοκοῦσιν, cf. *De An.* 428^b 11.

30-3. ἀλλὰ . . . ἀρχήν, cf. 193^a 4-9.

33-5. ὁμοίως . . . ἡρεμεῖν, cf. 253^b 6-254^a 1, 254^a 3-15.

CHAPTER 4

254^b 9. ὅσα . . . κινούμενοις. Cf. 224^a 22 οἷον ὅταν λέγωμεν τὸ μουσικὸν βαδίζειν, ὅτι ᾧ συμβέβηκεν μουσικῶ εἶναι, τοῦτο βαδίζει.

10. καὶ . . . μόριον. Cf. 224^a 25 ὑγιάζεται γὰρ τὸ σῶμα, ὅτι ὁ ὀφθαλμὸς ἢ ὁ θώραξ.

14-24. τό τε γὰρ αὐτὸ ὑφ' αὐτοῦ κινούμενον . . . κινήσεως. What answers to τε ^b 14 is καὶ ^b 20, so that ^b 15-20 κινεῖται . . . συνεστηκός is parenthetical. The effect of the sentence is to compare the division into τὰ ὑφ' ἑαυτῶν and τὰ ὑπ' ἄλλων κινούμενα with that into τὰ φύσει and τὰ βία κινούμενα, and point out that while all ὑφ' ἑαυτῶν κινούμενα are φύσει κινούμενα, some ὑπ' ἄλλων κινούμενα are φύσει and some are βία κινούμενα.

17-20. διὸ . . . συνεστηκός. When the animal moves itself (or rather, as Aristotle points out ^b 28-33, when the moving principle in it, i.e. the soul, moves the body), it moves naturally; when on the other hand the body is not being moved as an integral part of a living being, but as so much earth, water, &c., it may move either naturally, if it moves to the region proper to it, or unnaturally, if it moves under the influence of some force to the opposite region.

23-4. ἔτι . . . κινήσεως. παρὰ τὰς θέσεις, e.g. when a man walks on his hands; παρὰ τοὺς τρόπους τῆς κινήσεως, e.g. when he rolls along the ground instead of walking (S. 1208. 18).

24-6. καὶ μάλιστα . . . κινούμενον. Aristotle has in 12-24 divided things that are moved directly or *per se* into (*a*) those that are moved

by themselves, (*β*) those that are moved by other things naturally, (*γ*) those that are moved by other things unnaturally. He now points out that the fact that movement is always caused by some agent is clearest in (*γ*), i.e. in the unnatural movements of lifeless things (^b 24-7), and next to them in (*α*), i.e. in the natural movements of living things (^b 27-33), and least clear in (*β*), the natural movements of lifeless things (^b 33-255^b 31).

27-8. μετὰ δὲ τὰ παρὰ φύσιν . . . αὐτῶν, sc. φανερά ἐστιν ὑπό τινος κινούμενα.

33. τῆς . . . διαιρέσεως, i.e. of the classification in ^b 20-22.

255^a 7-10. καὶ ἰστάναι . . . κάτω. Moving in the opposite direction is not the same as stopping, so that ὥστ' . . . κάτω does not really follow from καὶ ἰστάναι ἂν ἐδύνατο αὐτὰ αὐτά. But, though the passage is careless, Aristotle probably wrote it as it stands. The power of moving downward may be regarded as a sort of natural corollary of the power of checking upward movement.

10-11. ἄλογον . . . κινούσιν, i.e. the elements might be expected, if they initiate movement, to initiate change of quality and quantity as well as of place. Cf. what Aristotle says of living things, 259^b 6-11.

15. τούτων, sc. fire and the like.

18-28. ἀλλὰ . . . ὑπάρχει. Lifeless things moving naturally, no less than when moved by some living thing (^a 17-18), are moved by something. This becomes evident when we divide the causes of movement. These (τὰ κινούντα = αἱ αἰτίαι), no less than κινούμενα, may be divided into τὰ φύσει and τὰ παρὰ φύσιν. There are things that cause movement not by their own nature, such as the lever, which causes movement upward not by its own nature but by its downward movement (which is imposed on it from without) and by its position relatively to the fulcrum and to the object to be moved. But there are other things which merely by being actually of a certain nature tend to convert to that nature things that are potentially of it. These are φύσει κινούντα, and the things that are thus converted are φύσει κινητά.

25. τὴν ἀρχὴν τὴν τοιαύτην, i.e. τοῦ κινεῖσθαι.

26-8. καὶ . . . ὑπάρχει, i.e. a thing may, in the course of acquiring a certain quality, incidentally come to be of a certain size (or in a certain place), but this is irrelevant to its passage from potential to actual possession of the quality.

30-3. ἐπεὶ . . . κάτω. The meaning of this is brought out by the whole passage ^a 33-^b 31. A thing exists δυνάμει at two different stages. There is the δύναμις which precedes the formation of a ζῆσις. What transforms this into a ζῆσις is a ποιητικόν, e.g. a teacher teaching a learner, or a hot substance heating a cold one. But when the ζῆσις (or second δύναμις) has been set up, there may be

hindrances which prevent it from being actualized in an *ἐνέργεια* (e.g. actual knowing, or actual rising). What transforms the *ξέσις* into an *ἐνέργεια* is something that removes the hindrance; and superficially it might seem that this is what imparts the *κίνησις* or *ἐνέργεια* to the *δυνάμει κινούμενον* or *ἐνεργοῦν*. But on a deeper view what imparts the *κίνησις* or *ἐνέργεια* is that which transformed the first *δύναμις* into a *ξέσις*.

34^b 5. ἀεὶ . . . ἀγνοία, 'whenever that which can act and that which can be acted on are both present, that which has a capacity comes to be actually what it was potentially; e.g. (1) when a capable teacher meets a capable learner, the learner does not remain as he was but from being potentially one thing (sc. *ἐπιστήμων*) becomes potentially another (sc. *θεωρῶν*) (for the man who possesses knowledge but is not exercising it no doubt still is in a sense only potentially possessed of knowledge, but not in the sense in which he was so before he learned); and (2) when he is in this state, if nothing hinders he exercises the activity of knowing; if he did not, he would be in the opposite state, that of ignorance'. The two parts of the illustration from the case of knowledge illustrate (1) the passage from *δύναμις* to *ξέσις* (or, as the schoolmen call it, from *potentia prima* to *actus prior* or *potentia secunda*) and (2) from *ξέσις* to *ἐνέργεια* (or from *potentia secunda* to *actus secundus*).

In ^a 35 most of the MSS. and Simplicius have *γίνεται ἐνίστε ἐνεργεία*, and Simplicius makes a creditable effort to justify *ἐνίστε* by pointing out (1) that even if *ποιητικόν* and *παθητικόν* meet, the latter is not actualized unless the former is in full and unimpeded activity, (2) that while in bodily matters the meeting of *ποιητικόν* and *παθητικόν* is enough, in the case of teaching and learning choice and a lapse of time are necessary as well. The fact remains that *ἐνίστε* after *ἀεὶ* produces an intolerably weak sentence. Aristotle would be most unlikely so to weaken the statement of what he means to be a universal principle, and he may well have thought that *ὅταν ἅμα τὸ ποιητικόν καὶ τὸ παθητικόν ὄσιν*, if understood intelligently, contains all the necessary qualifications. There is some good evidence of the early absence of *ἐνίστε*, and it bears to my mind the marks of a gloss by a cautious commentator or scribe. Alexander had *ἐνίστε*, but he also had the inferior reading *καὶ οὐχ ἀπλῶς ἐν ἀγνοία* in ^b 5; and he knew of MSS. which had not *ἐνίστε* (S. 1214. 10).

Hayduck's proposal of *εἰ* for *ἀεὶ* in ^a 34, and of *ὁμοίως δὴ* preceded by a colon in ^b 5, is attractive, but *ἀεὶ* and *δέ* are both well attested. Hayduck later abandoned this proposal and suggested instead *γίνεται ἔγγιον τοῦ ἐνεργεῖν* in ^a 35, but this has little probability on palaeographical grounds, though attractive on grounds of sense

(cf. *De Gen. An.* 735^a 9 ἐγγυτέρω καὶ πορρωτέρω αὐτὸ αὐτοῦ ἐνδέχεται εἶναι δυνάμει, ὡσπερ ὁ καθεύδων γεωμέτρης τοῦ ἐργηγορότος πορρωτέρω, καὶ οὗτος τοῦ θεωροῦντος).

^b 5-7. ὁμοίως . . . ἐμποδίξει. Here ἤδη πῦρ illustrates ἕξις, and καίει δέ illustrates ἐνέργεια. We are to understand that the potentially hot is made actually hot (or, when the degree of heat is great, turned into fire) by what is actually hot (cf. ^a 22-3).

8-11. ὁμοίως . . . κωλύη. This case also illustrates the actualization of the potential by what is actual. For it is by the action of what is hot and therefore light that the potentially light water is transformed into actually light air.

11-12. ἐνέργεια . . . ἦ. What is already light is prevented from behaving as such, i.e. from rising, when it is held down in the uncongenial lower region by bodies above it. And similarly, of course, what is already heavy may be prevented from falling, when it is held up in the uncongenial upper region by bodies below it.

23-4. καὶ . . . κωλύη, i.e. that which normally is of a certain size expands to occupy the corresponding space when it ceases to be compressed. It then passes from being δυνάμει ποσόν in the second sense to being ἐνεργεία ποσόν.

24-8. ὁ δὲ . . . βάλλοντος. He who removes an obstacle, e.g. the pillar which prevents the roof from falling, or the weight which prevents the buoy from rising to the surface of the water, moves the thus freed object only incidentally, by removing an obstacle to its natural movement, as the wall from which a ball rebounds moves it only by changing the direction of its movement.

32-3. τὰ τε βία . . . ἄλλου, cf. 254^b 24-7.

33-4. τῶν δὲ φύσει . . . κινεῖται, cf. 254^b 27-33.

35-256^a 2. τὰ μὴ ὑφ' αὐτῶν . . . λύσαντος, cf. 254^b 33-255^b 31.

256^a 1. τοῦ γεννήσαντος . . . βαρῦ, i.e. the hot substance which by acting on a cold but potentially hot substance made it actually hot and therefore light; or the cold substance which by acting on a hot but potentially cold substance made it actually cold and therefore heavy. Cf. 255^a 22-3, ^b 8-11.

CHAPTER 5

256^a 4-5. ἦ . . . αὐτὸ. τὸ κινουῦν is not the subject of the sentence; ἅπαντα τὰ κινούμενα ὑπὸ τινος κινεῖται is to be understood (cf. ^a 2-3). Therefore δι' αὐτὸ τὸ κινουῦν should be read instead of the vulgate δι' αὐτὸ τὸ κινουῦν, and δι' αὐτό for δι' αὐτό in ^a 5.

5-6. καὶ . . . πλειόνων, i.e. if we work back from the thing that is finally moved, we come, either directly or after certain intermediates, to that which moves by itself.

15. εἰ . . . [κινουμένου]. One or other of Spengel's emendations seems necessary to bring the clause into line with ὑπὸ κινουμένου ὑπ' ἄλλου^a 14 and to provide a proper antithesis to ὃ οὐχ ὑπ' ἄλλου πρῶτον^a 16; and the omission of κινουμένου is the more probable of the two. εἰ ὑπ' ἄλλου must then be taken as a brief way of stating the alternative εἰ ὑπὸ κινουμένου ὑπ' ἄλλου.

16-19. εἰ . . . πρῶτον. The argument may be expanded thus: 'if the immediate mover *X* is something not moved by anything else, there need not be a mover *Y* of the other type (one that moves by being moved); for (if *X* needed a *Y* to move *Z*, it would need a *Y'* to move *Y*, a *Y''* to move *Y'*, and so on, but) there cannot be an infinite series of moved movers, since in an infinite series there is no first term.'

25. τοῦ αὐτὸ αὐτῷ κινούντος. Aristotle constantly uses this grammatically irregular form, to avoid suggesting the meaning 'the same', which the grammatically correct τοῦ αὐτοῦ αὐτῷ κινούντος would suggest. Cf. 257^b 13, 27, 258^b 23, 259^a 1.

28. οὐ . . . αὐτῷ. In ^a 32-3 τινι alone is used in opposition to αὐτῷ, so that in ^a 28 the τινι alone is sufficient, without Spengel's ἄλλω.

31-32. εἰ . . . κινοῦν. With Bekker's reading (ταύτην in ^a 31), the two clauses are completely tautologous. Pacius' reading ταύτη removes the tautology. ταύτη and ταύτην of course refer to the hand.

32. ὅταν . . . ἕτερον, 'when there is at each stage a fresh mover moving by means of something.'

^b 5-7. ἦτοι . . . αὐτό. That which Aristotle first supposes to be *per accidens*, and next to be *per se*, is not the dependence of the being moved of the κινούμενον on the being moved of the κινοῦν, but the being moved of the κινοῦν (cf. the statement of the second alternative in ^b 28 εἰ μὴ κατὰ συμβεβηκὸς ἀλλ' ἐξ ἀνάγκης κινεῖται τὸ κινοῦν).

7-9. πρῶτον . . . ὄντων. If the κινούμενον's being moved depends on the κινοῦν's being moved, and if the κινοῦν need not be moved, then the κινούμενον need not be moved, and there may be a time at which nothing is in movement. In ^b 8 either τὸ κινοῦν or τὸ κινούμενον will give good sense, but τὸ κινοῦν has the support of ^b 28 and of S. 1225.25.

12-13. δέδεικται . . . εἶναι, in ch. 1.

14. τοῦτο, i.e. that there must be a mover which is not moved by anything else.

17-19. συμμεταβάλλει . . . τινός. E.g. the hand which throws a stone must remain in contact with it (and therefore move with it) for a certain time, though it then lets go.

22-3. καὶ . . . αὐτοῦ. Prantl reads καὶ ὁ κινεῖ μέν, ὑπ' ἄλλον δὲ (κινεῖται), ἀλλ' οὐχ ὑφ' αὐτοῦ. He has the support of FHIJ for the position of οὐχ, but no MS. support for the alteration of κινεῖται to κινεῖ or for the insertion of κινεῖται. It is impossible to be sure what Simplicius read, but 1227. 10-21 lend some support to Prantl. T. 223. 5 taken by itself would seem to support him, but the reference to an αὐτοκίνητον ib. 7-11 supports E's reading. The motive of Prantl's alteration is to get an intermediate between τὸ κινουῦν and τὸ κινούμενον answering to the intermediate in ^b 16, τὸ ᾧ κινεῖ, which κινεῖ καὶ κινεῖται, i.e. the instrument with which something moves something else—such as a stick (^a 6). But the threefold classification in ^b 20-24 is of a different nature from that in ^b 14-15 (developed in ^b 15-20). The earlier classification depends on the parts played by each of three things in a limited chain of causation; A moves B, B is moved by A and moves C, C is moved by B. B and C play different parts in this particular series, but in themselves they are of the same nature, for C (e.g. a stone) can proceed to move something else just as B (e.g. a stick) has moved it. The classification in ^b 20-24 is of three different kinds of thing. There are the things that can be in movement but cannot originate movement (^b 21-2), the things that can be in movement and can originate movement (i.e. that can move themselves) (^b 22-3), and the things that can originate movement but cannot be in movement (^b 24)—in other words, inanimate things, animate things, and God.

30-31. ἥτοι . . . κινήσεως. Bekker's ὥστε cannot stand, and ὥς γὰρ seems the best emendation.

34-257^a 3. δεῖ . . . ῥίψεως. As regards the first alternative, that a thing must be moved with the same movement which it causes, Aristotle merely points out that this principle must be pressed to its conclusion; the two movements, if they are to be the same, must be precisely the same; and this he leaves to be refuted by its own absurdity.

257^a 3-7. ἥ . . . κινήσεις. The second alternative, that the two movements must be different, Aristotle refutes by pointing out that there are not enough kinds of movement to suffice for the infinitely many movements.

7-14. τὸ δὲ πάλιν ἀνακάμπτειν . . . ἀναγκαῖον. The third possibility (a variant of the second), that A should cause movement X and be moved by B with movement Y, that B should move A with movement Y and be moved by C with movement Z, that C should move B with movement Z and be moved by D with movement X, Aristotle refutes by arguing that it reduces itself to the first. For if B moves A, and C moves B, and D moves C, then *a fortiori* D moves A, and moves it with movement X, i.e. with the same

movement which A itself causes. He would be justified in saying that, in the case supposed, A is moved by D, the remote cause of its movement, and as a result of a movement of type X, but not justified in saying that it is moved by D *with* movement X, and therefore does not succeed in reducing the third possibility to the first.

14. ἔτι . . . ἄλογον. It cannot be said that the section ^a 14-25 brings out any greater absurdity than has already been shown to exist in the view Aristotle is opposing. Simplicius thinks the present proof brings out the absurdity more because it is more general than the argument in 256^b 3-257^a 14, which divided the problem into its parts (256^b 7-27, 27-257^a 14). It seems to me more likely that Aristotle's present language is used rather carelessly.

17. [καὶ ὑγιάζον]. There is no point in the addition of these words, and no trace of them in S. 1231. 9.

22. ὡςπερ εἶπομεν πρότερον, ^a 7-12.

23-5. τὸ μὲν οὖν . . . εἶναι. τὸ εὐθύς (^a 18) is ἀδύνατον, since it leads to the plain contradiction involved in a thing's being and not being in a certain state at the same time (^a 12-14). τὸ δέ, i.e. τὸ διὰ πλειόνων (^a 18), is, though not demonstrably ἀδύνατον, an unconvincing figment. Why should we suppose that that which causes change of quality, for instance, must suffer change of size?

33-258^b 9. ἀναγκαῖον . . . ἀκίνητον. This section is devoted to discussing the way in which it is possible for a thing to move itself. Aristotle first (^b 2-12) shows that it is not possible for the whole thing through and through to be setting itself in motion, and concludes (^b 12-13) that one part of it must be causing movement and one part suffering it. This might conceivably happen in either of three ways: (1) by each of two parts moving the other—which Aristotle shows to be impossible in ^b 13-26; (2) by one or more parts moving themselves while others remain unmoved—which he shows to be impossible in ^b 26-258^a 5; (3) by one part moving the other part—which he accepts as the true view and expounds in 258^a 5-^b 9.

34-^b 1. τοῦτο . . . φύσεως. S. 1233. 25 says that the reference is to book v, and Diels refers to v. 228^a 20 ff. But vi. 234^b 10-20 is the only passage that deals with this precise point. In any case it is noteworthy that the phrase ἐν τοῖς καθόλου τοῖς περὶ φύσεως refers here not to one of the first four books (commonly called τὰ περὶ φύσεως) but to one of the group v, vi, viii (commonly called τὰ περὶ κινήσεως).

^b 6. ἔτι . . . κινήτόν, cf. 251^a 9-16.

8. ἔστιν . . . ἀτελής. Movement is the incomplete actualization of a movable, since its complete actualization is the thing produced by

the movement. Building is the incomplete, the house the complete, actualization of the buildable. Cf. iii. 1.

12. ὅσων . . . συνώνυμον, i.e. where that which imposes a certain quality on something must have that quality itself; i.e. wherever the causing of the movement is natural to the mover; cf. 255^a 21-3.

13. τοῦ . . . κινούντος. Cf. 256^a 25 n.

15-20. οὔτε . . . μεταξύ. The argument is this: If A moves B and B moves C, A may truly be called the first mover of C, and more truly its mover than B. But if each moves the other, and therefore each indirectly moves itself, there is no priority between the two and neither can be called the first mover. I have restored in ^b 16 the *lectio difficilior* αὐτὸ ἐαυτό, which is supported by S. 1237. 31, 1238. 6.

17-19. διχῶς . . . αὐτῷ, cf. 256^a 4-5.

20-23. ἔτι . . . ἀκίνητον. Aristotle has shown in 256^b 4-257^a 27 that the first mover is either unmoved or self-moved; thus there is a mover that is not moved by anything except (at most) by itself. And if so, being moved by something else is not necessarily implied in being a mover. Take, then, one of the parts of the self-mover which on the theory in question are supposed to move each other (^b 13-15). If it is moved by the other part, that is merely *per accidens* and may therefore be supposed not to happen. Then we are left with one part that is moved and another that moves without being moved, and so the theory is refuted.

23-5. ἔτι . . . εἶναι. This hardly differs from the argument in ^b 20-23. It differs from it only by pointing to the fact which necessitates that there must be either an unmoved or a self-moved mover (cf. ^a 26-7), viz. that this is involved in the eternity of movement (which has been proved in ch. 1).

25-6. ἔτι . . . θερμαίνεται. It might be supposed that while part A moves part B with movement X, part B moves part A with movement Y. But this possibility is removed if we reflect that, for Aristotle, for A to move B κατὰ φύσιν is to impart to B a characteristic that A has already (^b 9-10). If, therefore, there is to be any necessary relation between the action of A on B and that of B on A, and these are not merely associated *per accidens*, B's action on A must be that of reflecting on to A the characteristic it is at the same time getting from A. Thus A and B will have both to be and not to be in possession of the characteristic which they are at the same time imparting and receiving; which is absurd. Cf. 256^b 30-257^a 3.

27. τοῦ . . . κινούντος, cf. 256^a 25 n.

31. τοῦτ' . . . κινούν, i.e. the part will be what is strictly the self-mover, and the whole will not be a self-mover *per se* or strictly, but

only in virtue of a part of itself. But it is the *modus operandi* of a genuine self-mover that we are inquiring into.

258^a 1-2. τῆς ὅλης . . εἶναι. Here, after refuting the other possible *modi operandi* of a self-mover, Aristotle states what its *modus operandi* must be—that one part moves without being moved, and the other is moved without necessarily causing motion.

3-5. εἴτι . . . Α. Alexander took this as a second refutation of the view that a whole moves itself by each of its parts moving itself. He supposed the refutation to proceed as follows: 'Each of the self-moving parts will also move another part. For if they did not do so, the whole would not be self-moved, but a mere aggregate of self-moved parts. If each of the parts does move another, each will move itself and also be moved by another, and if the movement of the whole is a single movement, all the parts will be moved and moving with the same movement, so that each part will be moved by itself and by another with the same movement; which is absurd. But if it were moved with different movements by itself and by another part, that would be still more absurd; for the whole would not then be self-moved with a single movement.' Simplicius rightly observes that this meaning cannot be extracted from Aristotle's words, and takes the section as directly supporting what Aristotle has just said, τῆς ὅλης τὸ μὲν κινήσει ἀκίνητον ὃν τὸ δὲ κινηθήσεται, by the consideration that that is necessary εἴπερ ἡ ὅλη αὐτὴ αὐτὴν κινεῖ.

Aristotle has now evidently concluded one section of his argument, that in which he refutes the views (1) that a self-mover as a whole moves itself as a whole (257^b 2-13), (2) that it has two parts moving each other (^b 13-26), (3) that one or more of its parts are self-moving (^b 26-258^a 1), and has concluded that it must have a part which moves and a part which is moved (258^a 1-2). He now adds the general reflection that this shows that the notion of a self-mover cannot be strictly correct, since it involves describing the motion of the whole *both* as due to the whole *and* as due to a part (^a 3-5).

In ^a 4, as often elsewhere, the MSS. are divided between the forms κινήσεται and κινηθήσεται. It seems to me probable that Aristotle uses κινήσεται when the meaning is 'will be in movement', and κινηθήσεται when there is a distinct reference to an agent. I therefore follow HK and Simplicius in reading κινήσεται . . . κινηθήσεται.

9-18. ἔστω . . . κινεῖ. This section proves the statement just made, that a self-moving whole must consist of a part which moves without being moved, and of a part which is moved and may or may not move. The point is proved by showing that while there may be a self-moving whole of the type ABΓ where A moves B and

B moves Γ, the removal of Γ leaves a self-moving whole AB, in which B moves nothing. Since the presence of a part which both moves and is moved is thus unnecessary to a self-moved whole, the *pure* type of a self-moved whole is found only in a whole of two parts, one moving and not moved, the other moved and not moving.

20-21. ἀπτόμενα . . . θάτερον. Aristotle states both alternatives, because he has not yet shown whether the *κινῶν ἀκίνητον* is a mind or a body. If mover and moved are both bodies, they must be in contact, to allow of the action of one on the other; for Aristotle does not believe in action at a distance. He has argued against its existence in vii. 1, but does not refer to this argument here, but treats the point as self-evident. If one of the two things is a mind, the two cannot properly be said to be in contact, but to make action between them possible he thinks there must be a quasi-contact on the part of the mind, though there cannot be even this on the part of the body. Cf. *De Gen. et Corr.* 323^a 31 ὥστε εἴ τι κινεῖ ἀκίνητον ὄν, ἐκεῖνο μὲν ἂν ἄπτοιτο τοῦ κινήτου, ἐκείνου δὲ οὐδέν· φημὲν γὰρ ἐνίστε τὸν λυποῦντα ἄπτεσθαι ἡμῶν, ἀλλ' οὐκ αὐτοὶ ἐκείνου.

21-5. εἰ . . . κινούμενον. The vulgate reading, which omits ἄψεται ἐκότερον ἐκότερον and δῆ, and has a comma before δῆλον, makes no good connexion, and Alexander and Philoponus suppose the words εἰ . . . συνεχές (^a 21-2) to be an anacoluthon, with something like οὐπω δῆλον to be understood. But this is quite unsatisfactory, and I think that I alone has preserved the right apodosis. The question whether the mover and the moved ἄπτεται ἐκότερον ἐκότερον turns precisely on the question whether the mover is a continuum, i.e. a body. That the moved is a continuum has been proved already, in vi. 234^b 10-20 (referred to recently in 257^a 34). In δῆλον δῆ κτλ. Aristotle returns to the main point of the present passage.

26. ἢ τὸ A . . . ἢ τὸ B. For these forms cf. Bonitz, *Index* 109^b 60-110^a 3. ἢ τὸ A = ἢ ἐφ' ἧ κείται τὸ A.

27. τὸ δὲ Γ . . . ἀδύνατον γάρ. The balance of authority is against these words, and they look like a mistaken gloss on μόνον. τὸ B μόνον means 'B, and not A'; the glossator took it to mean 'B, and not any third part'.

27-^b 4. ἀπορίαν . . . ἐνεῖναι. Aristotle here considers an ἀπορία arising from the divisibility of the moved and, it may be, also of the mover. For if a part of the former or of both be removed, the remainder will still presumably move or be moved, so that the original whole will not be *primarily* self-moved, but self-moved in virtue of a part of itself. Aristotle replies that the divisibility of the moved, or of both moved and mover, does not prevent the whole from being self-moved. If one or both were actually divided and the one still

acted on the other, that would make the whole not a primary *αὐτοκίνητον*. But so long as they are merely divisible, it is possible that if they were divided their parts would no longer have the same nature, i.e. in respect of the power of acting or being acted on. Thus their mere divisibility does nothing to prevent the whole from being a primary self-mover.

In ^b 3 *φύσιν* has better authority than *δύναμιν* (S. 1246. 16, 25).

^b5-6. *εἴτε . . . πρῶτον*, 'whether the series is closed at once by that which is moved, and moved by something, being moved by the first, unmoved mover'.

CHAPTER 6

On three passages in this chapter which Jaeger regards as later additions, cf. Introduction, pp. 10, 101-2.

258^b 10. 'Ἐπεὶ . . . διαλείπειν. This has been proved in ch. 1.

12-13. *ἕκαστον . . . λόγον*. The reference is to the individual souls.

14. *πάσης ἐκτὸς μεταβολῆς*. Bekker's reading *πάσης τῆς ἐκτὸς μεταβολῆς* would have to mean 'in respect of all outside change', i.e. change from outside. But this use of the genitive would be difficult, if not impossible; and the first mover must be free not merely of all change from outside, but of all change whatever. *πάσης ἐκτὸς μεταβολῆς* gives the good sense 'removed from all change', and is confirmed by P. 837. 35, S. 1251. 17. These words have the effect of asserting that the prime mover is not merely free from *κίνησις* in the sense in which it is limited to *φορά*, *ἀλλοίωσις*, and *αὔξεισις-φθίσις*, but also from *γένεσις* and *φθορά*, i.e. is eternal.

15. *καὶ ἀπλῶς . . . συμβεβηκός*. For the distinction between that which is moved *per se* and that which is moved *per accidens* cf. 224^b 21-30. A man walking *κινεῖται ἀπλῶς*, a man sailing in a ship *κινεῖται κατὰ συμβεβηκός*.

16-22. *ἔστω . . . τοῦτο*. These sentences state two concessions Aristotle is ready to make, carrying on the thought expressed in ^b 12-13, that it need not be maintained that *all* unmoved movers are eternal. The unmoved movers which he is willing to concede not to be eternal are presumably animal souls, which in his view have a beginning and an end in time.

Since *ἔστω* introduces the proof looked forward to in *ᾧδε*, we should read *δὴ* and not *δέ* after it.

18-20. *τάχα . . . τοιοῦτον*. Aristotle has in 234^b 10-20 shown that everything that *μεταβάλλει* must be divisible. Anything without parts, then, cannot, in particular, undergo *γένεσις* or *φθορά*, which form one species of *μεταβολή*, but must pass instantaneously from being to not-being or *vice versa*.

22-259^a 6. ἀλλ' . . . κινήσεως. Though there may be non-eternal unmoved movers, the unmoved mover or movers which is or are the cause of the being of self-movers (i.e. of living things), when they exist, and of their not-being, when they do not exist, must be eternal. For, since a self-mover must be an extended thing (though this need not be true of every movent), its coming to be or ceasing to be is a μεταβολή, and demands a cause. The ultimate cause of some things coming into being and others ceasing to be, and of this happening continuously, cannot be (1) any one non-eternal thing (Aristotle assumes as self-evident that the cause of continuous, i.e. eternal, movement cannot be a single non-eternal thing), nor (2) a number of non-eternal things, successively bringing different things into being; such a series cannot be the cause of what is eternal and continuous, since that which is such a cause must be eternally and necessarily so, but the terms of such a series are infinite in number and not simultaneous. Hence, even if (1) many unmoved movers or (2) many self-movers perish and are succeeded by others which successively set different things in motion, there must be, including them in its action and apart from each of them, something which causes some things to be and others not to be, and change to be continuous; this causes the movement of the successive perishing movers, and they cause the movement of all other things.

23. τοῖς . . . κινουσίν, cf. 256^a 25 n.

24-6. τὸ μὲν γὰρ . . . εἰρημένων. The point of the sentence must be to justify the statement that non-eternal self-movers must have a cause of their at one time being and at another not. This is established by the fact that *qua* moved they must have magnitude and therefore have parts, so that their passing to or from being is a μεταβολή and must have a cause. The clause τὸ δὲ κινούν . . . εἰρημένων is in the precise context relatively unimportant, and is added by way of setting aside the possible objection that the supposed cause of the being and not-being of the self-movers must itself have a further cause. The objection fails, because it is only *qua* moved that self-movers must have magnitude and therefore need a cause to explain their coming into being, and it does not follow that a mover pure and simple needs a cause beyond itself.

28-9. οὐδ' . . . ἕτερα. Neither the text of E nor that of Λ gives a good sense. The words must refer to the same possibility as τὸδε μὲν ἀκίνητον ὃν τὸδε κινεῖ, ἕτερον δὲ τοδί 259^a 2-3, and I have adopted a reading which gives this sense, and is in close agreement with T. 223. 25 οὐδὲ γὰρ ἐκεῖνο ἔστιν εἰπεῖν, ὅτι τῶν φθειρομένων τούτων ἀρχῶν αἰετῆς ἐφεξῆς γίνεται ἡ προλαβοῦσα, with P. 838. 15 οὔτε ἄλλης μὲν ἄλλο ἐτέρας δὲ ἕτερον, and with S. 1252. 26 μήτε οὕτως ὡς τῶν μὲν ταδί κινούντων, τῶν δὲ ἕτερα. The copyists took the genitives to depend

on οὐδέν instead of on αἴτιον, and introduced κινούντων to patch up the sense. For the corruption ΔΙ-ΔΕΙ-ΑΕΙ cf. 246^b 19, 216^b 26, 259^a 16. An emendation suggested by Gaye, τῶν μὲν αεί, is grammatically rather doubtful, and involves amending τούτων to τῶν, which S. may have read.

30. τὸ . . . οὕτως ἔχειν, 'to be the cause of that which is eternal and continuous'. This must itself be an eternal and necessary attribute of that which possesses it, and therefore cannot be inherited by a successive series of transient beings.

32-259^a 5. δῆλον . . . μεταβολῆς. The apodosis begins not with καὶ 259^a 1 but with ἀλλ' ib. 3, which must therefore be preceded by a comma, not by a colon. Bekker's εἶναι ἀρχαὶ τῶν ἀκινήτων μὲν κινουσῶν δέ is not idiomatic Greek; it should be εἶναι τῶν ἀρχῶν κτλ. E's readings suggest that the text has been tinkered at, and it seems best to treat εἶναι ἀρχαί as a gloss on εἶναι (due to ^b 20-21), and to read κινούντων with E¹.

259^a 1. τῶν αὐτὰ ἑαυτὰ κινούντων, cf. 256^a 25 n.

9-10. τῶν αὐτῶν . . . ληπτέον. Cf. 188^a 17-18 n.

15. δέδεικται . . . εἶναι, in ch. 1.

21. τὰς ἀρχάς [τῶν κινούντων]. If the received text is right, it means 'the moving principles in the things that cause movement', and the reference must be, as S. 1256. 35 says, to the souls of animals (cf. ^b 1-16). But it would be a very vague way of referring to them. It seems to me much more likely that τῶν κινούντων is a gloss, and that τὰς ἀρχάς means 'the beginnings of our argument'. ^a 22-^b 6 is in fact a review of the course of the argument from ch. 3 onwards. I have found no example of the phrase αἱ ἀρχαὶ τῶν κινούντων elsewhere in Aristotle.

22-7. τὸ μὲν δὴ εἶναι . . . αὐτῶν. This was proved in ch. 3.

27. δείκνυσιν περὶ αὐτῶν. S. 1257.19 has ἐλέγχει ταῦτα τὰ τῆς διαιρέσεως τμήματα. Aristotle's phrase must mean 'prove the state of the case about the alternatives', viz. that they are not exhaustive.

27-^b 11. ἐπεὶ . . . κίνησιν. We might suppose the apodosis to begin either with ταῦτα δὴ ^b 3 or with τοῦτο δὴ ^b 6; but the latter is the only proper apodosis, and ταῦτα δέ should be read in ^b 3.

28. ἐκατέρου. This is the reading to which E's ἐκάτερον obviously points.

30. θέντες . . . κινεῖσθαι. This is the substance of ch. 4.

31-^b 1. καὶ τοῦτ' . . . κινεῖ. This is the substance of ch. 5. 256^a 4-257^a 31.

31-2. καὶ κινούμενον . . . αεί. αεί, 'at each stage', i.e. if a particular κινοῦν derives its motion from another, that other is either self-moved or moved by another, and so on.

33-^b 1. τῶν κινουμένων . . . ἀκίνητον. κινουμένων μὲν is at first

sight difficult, coming after τῶν κινουμένων. Simplicius' paraphrase, ἀρχαὶ τῶν κινουμένων ἐφάνησαν δύο, προσεχῆς μὲν τὸ ἑαυτὸ κινοῦν κτλ. (1257. 28) lends some colour to the supposition that προσεχῆς should be read for κινουμένων. But the MS. reading is right. The origin of the movement of τὰ κινούμενα is, among κινούμενα (i.e. if we go no further back than κινούμενα), the αὐτοκίνητον, but if we go further back and take account of *all* the terms in the causal series, the ἀκίνητον. This is the authentic doctrine of ch. 5. For a similar expression of it cf. 261^a 25 καίτοι φάμεν τοῦτο εἶναι τῶν κινουμένων καὶ κινούντων ἀρχὴν καὶ πρῶτον τοῖς κινουμένοις, τὸ αὐτὸ αὐτὸ κινοῦν.

^b1. πάντων . . . ἀκίνητον. This is the substance of ch. 5. 257^a 31–258^b 9.

3–6. ταῦτα . . . δοκεῖ. Cf. 252^b 17–28, 253^a 7–20.

6–7. μίαν . . . κινεῖ, 'they move themselves with only one kind of motion'.

7. αὐτά. The sense is much improved by reading this for αὐτά, and the reading is confirmed by S. 1258. 13.

11. τὸ περιέχον, the environment, but especially the atmosphere, which Aristotle thinks of as initiating respiration.

12. ἐνίων, sc. κινήσεων, e.g. growth, sleep, waking.

19. καὶ τῇ μοχλείᾳ κινοῦν ἑαυτό. If a lever is to continue to lift a weight, it must keep in contact with the weight as the latter moves. Aristotle's thought is that similarly the soul as it moves the body must keep in contact with the body, and thus by moving the body incidentally moves itself. The sense is slightly improved by reading καὶ τῇ μοχλείᾳ for καὶ τὸ ἐν τῇ μοχλείᾳ. καὶ τὸ ἐν is a scribe's careless repetition of καὶ τὸ ἐν earlier in the line.

24. ἀκίνητον . . . συμβεβηκός. The sense requires the omission of Bekker's μή; the phrase means 'not movable even *per accidens*'. Cf. 258^b 14–15 τὸ ἀκίνητον . . . καὶ ἀπλῶς καὶ κατὰ συμβεβηκός. μή is due to a scribe who thought that καί meant 'and', and that the words after it must express an attribute which could be coupled with ἀκίνητον.

καθάπερ εἴπομεν, in ch. 1.

26. μενεῖν. From the nature of the argument it is clear that this word depends on μέλλει ^b 24. It must therefore be written μενεῖν. Cf. T. 224. 21 διατελέσειν.

30–31. τῶν ἐν τῷ οὐρανῷ . . . φορές, 'to some actuating principles of things in the heavens, viz. the actuating principles of those things which are moved with more than one movement'. The reference is to the sun, moon, and planets, which (unlike the 'fixed' stars) have a complex orbit. The theory which Aristotle provisionally accepts (*Met.* A. 8) is that each of these bodies is set in a sphere which is the innermost of a set of spheres which form a connected system, each having its poles set in the surface of the sphere next outside it,

so that the innermost sphere of each set (and therefore the planet) is moved *per accidens* by each of the other spheres of its own system, as well as by the ἀπλανῆς σφαῖρα. What Aristotle here points out is that such incidental movement ὑφ' ἑτέρου does not disqualify that which suffers it from causing a continuous movement, such as the movement of the sun, moon, and planets actually is. Thus the effect of ^b 28-31 is to set aside a possible objection to Aristotle's remark in ^b 20-22, arising from the actual perpetuity of the planetary movements.

It is not quite clear whether by the ἀρχαὶ τῶν ἐν τῷ οὐρανῷ Aristotle means the spheres which carry round the planets, or the 'intelligences' which move these spheres; and perhaps he did not ask himself the question. Perhaps, as it is to the souls of animals that τὸ κατὰ συμβεβηκὸς ὑφ' αὐτοῦ φέρεσθαι belongs, it is to the intelligences that he thinks of τὸ κατὰ συμβεβηκὸς ὑφ' ἑτέρου φέρεσθαι as belonging. The spheres themselves would probably not be called ἀρχαί (sc. κινήσεως).

260^a 5-7. τὸ δὲ κινούμενον . . . ἦδη. There is no trace of ὑπὸ τοῦ κινουμένου μὲν in Themistius or Simplicius or in Philoponus' lemma, but its omission is very easily explained by haplography. Philoponus adds εἰ δὲ γράφοιτο ὑπὸ τοῦ κινουμένου μὲν, ὑπὸ τοῦ ἀκίνητου δὲ κινουμένου, and this seems much more likely to be an alternative reading known to him than a conjecture of his own. Further, even his lemma has δέ, not ἦ, after ἀκίνητου, and this would be meaningless without ὑπὸ τοῦ κινουμένου μὲν. His lemma therefore represents an intermediate stage of the tradition, after ὑπὸ τοῦ κινουμένου μὲν was lost and before the remaining words were patched up by altering δέ to ἦ. 'That which is moved by what is moved, indeed, but moved by what is unmoved' is the sun, moon, and planetary system, which are moved by the sphere of the fixed stars, which is moved by the unmoved first mover. In particular, it is the sun which by being ἐν ἐναντίοις τόποις (^a 8), i.e. by being, owing to the obliqueness of the ecliptic to the equator, at one time far removed from any given part of the earth and at another relatively near to it, causes the alteration of summer and winter, of seed-time and harvest, and the whole permanence in change which characterizes the terrestrial regions (*De Gen. et Corr.* 336^a 31-^b 19, *Met.* 1071^a 15, 1072^a 10-12).

7. ἦδη. The use of ἦδη here is idiomatic, and akin to a common use of οὐκέτι. When A has an attribute M and B has not, B is said to be οὐκέτι characterized by M. So when A is not characterized by an attribute M and B is, B is said to be ἦδη characterized by M. The first named κινούμενον is not, but the κινούμενον by which it is moved is, moved directly by the ἀκίνητον.

If ἦδη be read after ἔχειν, as in E, it can be similarly explained.

9. ἢ εἶδεσιν. The suggestion is, I think, that the sun, moon, and planets not only come to occupy contrary places but also come to form as a whole different configurations, and that these also have an effect on terrestrial things. It cannot be meant that these bodies acquire contrary qualities, for *φορά* is the only change they are subject to. Nor can they, as the Greek commentators suggest, be said to be ἐν ἐναντίοις εἶδεσιν merely because they cause different εἶδη (e.g. heat and cold) in terrestrial things. Simplicius may be right in thinking that the words are a reminiscence of Pl. *Phaedr.* 246 b ψυχὴ πᾶσα παντὸς ἐπιμελεῖται τοῦ ἀψύχου, πάντα δὲ οὐρανὸν περιπολεῖ, ἄλλοτ' ἐν ἄλλοις εἶδεσι γιγνομένη.

11-12. ὁ . . . ἠποροῦμεν, 253^a 22-4.

14-17. τούτου . . . μεταβάλλειν. μεταβάλλειν means 'alternate between movement and rest'. Therefore we must read in ^a 15 διὸ ἀεὶ κινεῖται, not διὸ ἀεὶ μεταβάλλει, which would obscure the opposition between the two classes of things (τὰ μὲν, τὰ δέ').

17. ὥσπερ εἴρηται, ^a 3-5.

CHAPTER 7

260^a 21-3. σκεπτέον . . . κινήσεων. The questions whether any movement can be continuous, and if so what it is, are postponed to 261^a 27-265^a 12; the discussion from here to 261^a 26 is concerned with the question, 'which is the primary movement?'

23-6. δῆλον . . . πρώτην. The argument is: 'if there must always be movement, and if a certain kind of movement (ἡδε) is necessarily primary and continuous, the movement which is caused by the first mover must be of the kind which alone is necessarily single, continuous, and primary'. The words are intended to show the importance of the question, 'which is the primary and continuous movement?', by reminding the reader that the answer to this question is the answer to the question, 'what is the nature of the movement imparted to the world by the first mover?'

For the pleonasm in δῆλον . . . ὡς . . . ὅτι cf. 190^b 17, 233^a 13.

31-2. τροφή . . . ἐναντίον, cf. *De An.* 416^a 21.

^b 6. ἀνάγκη . . . κινήσεων, 'there must, first of all the movements, always exist locomotion'.

11-12. καθ' ἃς . . . οὐσιῶν. This is an incidental reminder that σύγκρισις and διάκρισις, which obviously involve *φορά*, lie at the basis of γένεσις and φθορά, as well as of ἀλλοίωσις (^b 7-10).

24. δειχθήσεται δ' ὕστερον, in ch. 8.

30-33. ἀλλ' . . . ἐστίν. Aristotle here states a possible objection, which he answers in 261^a 1-12.

261^a 2. οὐ γιγνόμενον. Aristotle is not, of course, denying that a

parent has itself undergone γένεσις. What he is saying is that it is not in and by suffering γένεσις that it generates its offspring, but in and by suffering a movement of locomotion (cf. κινεῖσθαι^a 6).

7. καὶ τούτου ἕτερον πρότερον. The reference may be either to grandparents, &c., or to the sun, or indeed the whole celestial system, whose rotation is as much involved in the birth of animals as is the φορά of the parent. ἄνθρωπος ἄνθρωπον γενῆ καὶ ἥλιος (194^b 13).

13. καὶ ἐπ' ἀρχὴν ἰόν, 'and still in movement to the fully developed nature which is the originative source of the whole development'.

16. τοῦ ὄργάνου, which is lacking in E²K and in P. 900. 26-7, seems likely to be an intelligent gloss.

17. καὶ . . . ζώων, i.e. zoophytes. These stationary animals all, according to Aristotle, lived in water (*H.A.* 487^b 7). He mentions 'several kinds of oyster' (ib. 9, 14), holothuria (ib. 15), pinnae (ib. 528^a 33, 588^b 15), razor-fishes (ib. 588^b 15), and the whole class of testaceans (ib. 16, *De Part. An.* 683^b 5).

23-6. μάλιστα . . . κινούν. The argument is:—φορά is the κίνησις of the αὐτοκίνητον; the αὐτοκίνητον is the first of κινούμενα; therefore φορά is the first of κινήσεις.

29. νῦν, 260^b 23. πρότερον perhaps refers to 253^a 29.

33. αἱ κινήσεις, sc. αἱ ἄλλαι κινήσεις (^a 31).

^b 1-2. τὸ δὲ μὴ αἰεὶ κινούμενον . . . ἡρεμεῖν. This follows from the fact that if that which is moving from state A to state B was not previously for some time at rest in state A, it must have been simultaneously moving to and from state A.

3-4. ὁμοίως . . . μεταβολῶν, 'in the case of the changes'. In ^b 1-3 Aristotle has been dealing with κινήσεις, which are from contrary to contrary (viz. ἀλλοιώσις, αὔξις and φθίσις). He now passes to μεταβολαί which are not κινήσεις and are from contradictory to contradictory, viz. γένεσις and φθορά. Cf. 225^a 34-^b 9.

8. τὰς κατ' ἀντίφασιν μεταβολάς, i.e. γένεσις and φθορά.

10. τῷ λόγῳ. Bekker's τῷ ὄλῳ is apparently a mere slip.

10-12. οὐδ' . . . εἰς τὸ μὴ ὄν. ἡρεμία can, strictly speaking, belong only to that to which κίνησις (as distinguished from μεταβολή, i.e. excluding γένεσις and φθορά) can belong (202^a 4, 226^b 14, 230^a 15).

14. ἐν τοῖς πρότερον, i.e. in the case of κίνησις (as distinct from γένεσις and φθορά), considered in ^b 1-3.

CHAPTER 8

261^b 30. εἰ . . . συνεχῆς. This means not 'if neither of the simple movements is continuous', but 'if one of the simple movements is discontinuous'.

31. καὶ πεπερασμένην. Aristotle assumes that there is no movement along an infinite straight line, since he has proved in iii. 5, 8 that there is no actual infinite μέγεθος.

36-262^a 6. τίς . . . διαφοραί. In order to state definitely the ἐν ᾧ of a movement, you must state the termini of the movement. Now if one movement is from A to the contrary of A, and another from the contrary of A to A, their *termini a quibus*, being contraries, are therefore specifically different, and so are their *termini ad quos*; the ἐν ᾧ of the one is therefore specifically different from that of the other, and the two movements are therefore not continuous; and in particular the directions named in 261^b 34-6 are specific differences of place, so that two movements in reverse directions are not ἐν ἀδιαφόρῳ κατ' εἶδος and are therefore not continuous.

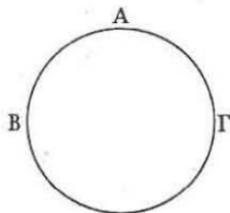
262^a 1. δῶρισται πρότερον, v. 4.

2-5. τρία . . . μέγεθος, cf. 227^b 24-6.

3. ἢ θεός. S. 1278. 34 (cf. P. 907. 25) thinks that this is a reference to the *primum mobile*, which is certainly in Aristotle's view θεῖον, if not strictly θεός. More probably, God is taken as an illustration of a single substance (cf. *Met.* 1028^a 17 ἄνθρωπον ἢ θεόν, as instances of substance), without the suggestion that this particular substance could actually be subject to movement—though in the context this choice of an example is misleading.

4-5. τοῦτο . . . μέγεθος. τόπος, πάθος, εἶδος, μέγεθος are the ἐν ᾧ of φορά, ἀλλοίωσις, γένεσις-φθορά, and αὔξεισις-φθίσις respectively.

8-12. καὶ ἐπὶ κύκλῳ . . . ἄνω.



A body moving from A to and through B, and a body moving from A to and through Γ, will in time obstruct each other, even if each of the movements singly is a movement that can go on continuously round the circle without coming to a point at which it must turn back, as a movement along a finite straight line must. As Simplicius

says, it is not ἀνάκαμψις but ἀντικίνησις that is the condition of contrariety and the cause of mutual obstruction.

Bekker has a colon after Γ^a 10, a full stop after γάρ^a 10, no stop after ἀνάκαμψις^a 11, and a comma after ἀλληλα^a 11-12. The present change of punctuation is clearly needed.

12. ἀλλ' . . . ἄνω. While the contrariety of the movements referred to in^a 6-12 is proved by the fact that they obstruct each other, the non-contrariety of the movements from B to A and from B to Γ in the figure



is proved by the fact that they do *not* obstruct each other.

15-17. οὐ . . . πάλιν. κύκλω φέρεσθαι is one case of κύκλον φέρεσθαι, viz. that in which movement is not merely along a circle but round and round the circle without turning back.

20. τὸ μέσον . . . ἐστίν. I.e. the μέσον is end relatively to the beginning, beginning relatively to the end.

24. ταύτη, the reading of E², has more point than ταύτην, and derives some support from T. 228. 30 ὅταν στηῖ ἐπ' αὐτοῦ τὸ φερόμενον.

28-31. ὅταν . . . ὄλω. Aristotle rejects the suggestion that when a body moves continuously there has been a process of coming to be, and another process of ceasing to be, at any point on its route, since that would (or so he assumes) imply that for a finite time it was at that point. It is only at a moment that it is at any point. It is not there for a time, though it no doubt is there within the whole time of which the moment is a cross-section.

31. τῷ ABΓ is evidently a mistaken gloss; it is clear from^a 27-8 that the time of the movement could not be designated ABΓ.

^b 6-7. ὡσπερ . . . νοήσειεν. In Aristotle's view, the fixing of attention on a point in a line actualizes it, and gives it the double function of end and beginning, just as a body's stopping at it would. Cf. 263^a 23-^b 3.

8-21. διὸ . . . χρόνω, The diagram Aristotle has in mind is the following:



A moves from the extremity of E, and Δ from the extremity of Z (^b 12, 19). The ἀπορία is, that if, in comparing two bodies moving

with equal velocities over equal distances, we take account of the fact that one passes through points on the way, and ignore the fact that the other does so, we seem to be driven to the conclusion that the latter will cover the distance before the former. The solution (stated in ^b 17-21) consists in pointing out that though the former passes through points, it does not pause at them.

15-16. οὐ . . . ὑστερίζει. The vulgate has οὐκ ἄρα ἄμα. But the proposition that A has not reached and left B at the same moment is not a conclusion from the proposition that Δ finishes its journey before A, but the premiss from which that proposition is reached. γάρ, not ἄρα, is what is wanted, and οὐκ ἄρα in the MSS. is due to anticipation of ^b 17. S. 1285. 31-3 has καὶ τὴν αἰτίαν αὐτὸς εἶπεν διὰ τοῦ οὐχ ἄμα ἄρα . . . αὐτοῦ· οὐ γὰρ ἄμα γέγονε τὸ A ἐπὶ τῷ B καὶ ἀπογέγονεν ἀπ' αὐτοῦ. His quotation here has shared the corruption, but τὴν αἰτίαν and the words following the quotation show that he had οὐ γὰρ ἄμα. For confusion in MSS. between γάρ and ἄρα cf. ^b 2.

16-17. εἰ . . . ἴστασθαι, 'for if it reaches and leaves B simultaneously, it will not fall behind; to fall behind, it must pause at B'.

17-21. οὐκ . . . χρόνω. To say that when A had got to B, Δ was simultaneously moving from the extremity of Z is to imply that there was a time during which A was in the position of having reached B and being at B, and from this arises the paradox described in ^b 10-17. The paradox is avoided by seeing that it is not during a time but at a moment that A is at B.

The sentence is improved by treating εἰ . . . ἄμα as parenthetical.

22. ἐπὶ τῆς συνεχούς, sc. κινήσεως. But Gaye's ἐπὶ τοῦ συνεχῶς, sc. κινουμένου, is not unlikely to be right; it gives a neater opposition to τοῦ ἀνακάμπτουτος.

23-4. εἰ . . . φέροιτο. ἢ τὸ H, sc. στιγμῆ, has hitherto stood for a point, and τὸ Δ for a moving body. H is now used for a body at point H, and Δ for the point from which body Δ started.

28. ἀλλὰ . . . λεκτέον. The solution offered in ^b 17-21 for the problem about continuous movement cannot be applied to movement to and fro.

263^a 1. καὶ . . . ὠσαύτως. As the point Δ is the end of the line regarded from below, and the beginning of it regarded from above, it is the end of the upward and the beginning of the downward movement.

3. ἐπὶ τῆς εὐθείας ἀίδιον. Bekker's ἐπὶ ἀίδιον τῆς εὐθείας is apparently a mere slip.

4-6. τὸν αὐτὸν δὲ τρόπον . . . διεξελθεῖν. The reference is to the first of Zeno's four paradoxes about motion, which has been previously discussed in 233^a 21-31 (cf. 239^b 11-14).

5. καὶ ἀξιούοντας is quite out of construction, and there is no trace of it in S. 1288. 37. It seems to be the result of an emblemata from ^a 7.

11. ἐν . . . τοῖς πρώτοις λόγοις, vi. 233^a 21-31.

13. ἐν ἀπείρῳ χρόνῳ, i.e. in a time which is infinite in the sense of being infinitely divisible.

14-15. ὁμοίως . . . χρόνῳ. It has sometimes been denied that this point was overlooked by Zeno; but cf. Intro. 73-4.

18-21. ἂν . . . διαιρέσεις. The problem, stated in reference to time and without reference to a distance to be covered, will take the form 'how can it be possible, in a finite time, to get through the infinite number of moments which is involved in the infinite divisibility of time?' Aristotle's answer consists in stating that in any finite continuum, whether it be temporal or spatial, there is not actually an infinite number of cross-sections (moments or points). Cross-sections are brought into being only when movement along a line is arrested, or when a line is actually divided, or when a time or a line is divided in imagination by the process of counting parts of it. But in passing through a time we do none of these things; we pass continuously, and the cross-section never emerges into actuality. A time or a line is incidentally divisible without limit, but its true nature is something different (^b 7-9), viz. to be continuous and undivided. To speak of it as if it actually contained an infinity of cross-sections is to speak of the continuous as if it were discontinuous.

Though the problem Aristotle sets himself in ^a 18-21 is one about time, it is in principle a problem about the nature of any continuum, and hence in his solution he takes no pains to isolate the problem about time but uses language which refers primarily to the continuity of a line, or of a movement (e.g. in ^a 27). Thus the word to be supplied with τὴν συνεχῆ in ^a 23 is γραμμῆν.

22. ἐν τοῖς ἄρτι λόγοις, 262^a 19-^b 21.

27. ἢ γὰρ συνεχῆς κίνησις συνεχοῦς ἐστίν, 'for continuous movement is relative to, i.e. is movement over, a continuum'.

29-30. οὐ . . . στήσει, 'he will not make the movement continuous, but will arrest it'.

^b 9-26. δῆλον . . . εἶναι. To avoid the difficulty involved in admitting that at one moment a thing may both be and not be possessed of a certain quality, Aristotle here states the equally difficult view that while a moment belongs both to the time which ends at it and to that which begins at it, it 'belongs to the later, i.e. to the later qualification, for the thing' (^b 10, 15), i.e. the thing is in it qualified only by the quality which it has in the subsequent period. Thus, since there are no consecutive moments, there is no last moment at which the thing has its earlier quality, or has not its later quality, but there is a first moment at which it *has* its later quality.

15. ΑΓΒ. Bekker's ΑΒΓ is apparently a mere slip.

16-19. τούτο . . . ἀμφοῖν. Aristotle here states the situation as it would be on the assumption that a thing which changes quality at a moment has its earlier quality during the whole time that terminates in the moment (εἰ πάντα τὸν χρόνον τοῦτον ἦν λευκόν); in ^b 20-26 he supplies the needed correction.

21. τοῦ ὑστέρου. The MS. reading τὸ ὕστερον gives no good sense, while τοῦ ὑστέρου brings the sentence into line with ^b 10, 15. This reading receives some confirmation from P. 845. 31 ὥστε τὸ γ τῆ ὑστέρα διαθέσει δοτέον τῆ κατὰ τὸ λευκόν, and from S. 1295. 23 τὸ δὲ Γ ἀρχὴν τοῦ ἐν τῷ δευτέρῳ χρόνῳ ὄντος τοῦ οὐ λευκοῦ ποιητέον.

22. (τὸ) λευκόν. I have inserted τό on the analogy of 264^b 3, 5.

23-4. ὥστε . . . εἰπεῖν. Hitherto Aristotle has been supposing a case of change from white to not-white. But he might just as well have taken a case of change from not-white to white; hence the alternatives here stated.

24-6. ἢ ὅτε . . . εἶναι. Aristotle here states the alternatives of which one or other would have to be admitted if the principle he lays down in ^b 23-4 is not admitted. If we do not admit that at the moment of change the thing simply has its later character, we must either say that, though it has acquired it, it has it not, or that it both has it and has it not.

264^a 4-6. φανερόν . . . παντί, sc. and therefore τὸ ἐν ᾧ γέγονε cannot be a time, but only a moment.

7-9. οἷς . . . συμβαίνειν. The distinction is that which Aristotle often expresses by the antithesis φυσικῶς-λογικῶς. The reference in οἷς . . . εἰσιν is to the arguments he has advanced in 261^b 27-263^a 3 to prove that circular φορά alone can be continuous (the section in answer to Zeno, 263^a 4-264^a 6, being treated as a digression). These arguments were drawn from the specific φύσις of circular and of rectilinear motion. The arguments he is now going to use (^a 9-265^a 10) turn on general logical considerations with regard to opposites, and have a bearing not merely on φορά but on every kind of κίνησις; and they are actually used in ^b 28-265^a 10 to show that no κίνησις except φορά can be continuous.

14. ὁμοίως . . . ἄλλων, i.e. in the case of ἀλλοίωσις and of αὔξησης-φθίσις as well as of φορά.

14-19. τὸ δὴ ἀπὸ τοῦ Α . . . ἔστιν. Aristotle here traces the absurd consequences to which the principle laid down in ^a 9-11 leads, if we assume that movement to and fro is continuous. In ^a 19-21 he draws the conclusion, that to-and-fro movement is *not* continuous.

14-16. τὸ δὴ ἀπὸ τοῦ Α . . . κινούμενον. δῆ seems to suit the argument better than δέ, since Aristotle here proceeds to apply to an imaginary case the general principle laid down in ^a 9-14.

18-19. ἄμα . . . ἔστιν, i.e., on the principle just laid down, the body is moving from Γ to Α though it is not yet, and has not yet been, at Γ.

23. τῶν εἰρημένων . . . κινήσεων, viz. φορά, ἀλλοίωσις, ἀΐησις-φθίσις, which were in v. 2 shown to be the only possible kinds of κίνησις.

30. ἀπὸ τοῦ Γ. Bekker's ἀπὸ τοῦ Α is apparently a mere slip.

32-3. αὕτη . . . κινήσει; cf. 229^b 28-230^a 7.

^b 4. καὶ μὴ . . . χρόνον, i.e. if the thing does not remain white for some time.

6-8. ἔτι . . . μελανίας; The time within which to-and-fro motion falls is continuous, but it does not follow that the motion is continuous. It falls into two parts of which the later is not continuous with the former, but successive to it. There is nothing of the same kind, i.e. no motion, between the two, but only an ἡρεμία, and they therefore conform to the definition of the successive (226^b 34). They could not conform to the definition of the continuous (227^a 10), viz. that two things are continuous when they have the same limit. For in order that getting white and getting black, for instance, should have the same limit, i.e. that the last phase of the one should be identical with the first phase of the other, the ἔσχατον of whiteness would have to be identical with the ἔσχατον of blackness, i.e. the whiteness of the thing in its last moment of getting white would have to be identical with its blackness in its first moment of getting black; which Aristotle assumes to be impossible.

15-16. ταύτη . . . πλείστον, 'for this has points that are contrary in place, e.g. those at the ends of a diameter; for these are at the greatest possible distance from each other'. The reading τὰ κατὰ διάμετρον gives the best sense, and seems to have been read by Simplicius (1307. 33).

Aristotle has primarily in mind here circular movement, and that suggests to him, as a contrasted example of rectilinear movement, movement along the diameter. Pacius thinks the reference is to movement along the diagonal of a square, opposite movements along a diagonal being called ἐναντίαι, while those along a side are merely ἀντικείμεναι because the extreme points are in this case less distant from each other; but this seems less probable.

16-17. ἀντικείμενή . . . μῆκος. ἐναντία are of course one special kind of ἀντικείμενα. The doctrine laid down seems to be that movements in opposite directions along a straight line are ἐναντίαι because the corresponding termini of the two movements are at a greater distance from each other than any other two points on the line; opposite movements along any line are not necessarily ἐναντίαι because if the line is curved the corresponding termini of the two movements need not be the most distant from each other, though

they are furthest from one another *along the curve*. If the curve is an arc of a circle greater than a semicircle its end points are not those that are most distant from each other.

The movement from A and the movement to A involved in round-and-round motion are neither *ἐναντία* nor *ἀντικείμενοι* in the sense defined, and therefore there is no reason why they should not occur simultaneously (^b 12), and no reason why such motion should not go on for ever (^b 17).

18-19. ἡ μὲν γὰρ κύκλω κίνησις . . . αὐτό, 'for circular movement is movement of a thing from itself to itself', i.e. from its original place back to its original place. The reading *αὐτό* is better attested and gives a rather better sense than *τὸ αὐτό*.

19-21. καὶ . . . αὐτοῖς. Circular motion is never repeatedly between the same limits (since it has no definite starting-point or finishing-point), while rectilinear motion must, if it is to go on, be repeatedly between the same limits.

23-4. ἀνάγκη . . . ἀντικείμενας. This follows from the fact that if a movement is continuous, the moving thing is all the time moving towards the goal of the movement (^a 9-11). Thus if rectilinear movement from A to B and back again were continuous, the moving thing would be at the same time moving to B and to A.

24-5. οὐδ' . . . περιφερεία, i.e. in any arc, as distinguished from the complete circle.

26. ταῦτα κινεῖσθαι. Here and in ^b30 this phrase is used in the sense which is expressed in ^b20 by *ἐν τοῖς αὐτοῖς*, that of movement over the same ground or between the same limits.

27-8. ἡ δὲ τοῦ κύκλου . . . τέλειος. I.e. the fact that the circle comes back to its starting-point makes any production of it, such as can happen with a straight line, impossible, and renders it a line complete in itself.

28-265^a 2. φανερόν . . . πολλάκις. Like all *φορά* except circular *φορά*, the other kinds of *μεταβολή* do not proceed without limit in the same direction. A change from white to black, for instance, can only be followed by a change from black to white, and this will be through the same intermediates as was the change from white to black, and cannot be continuous with it any more than to and fro *φορά* between A and B can be continuous.

265^a 2-7. δῆλον . . . λέγουσιν. The reference is to Heraclitus (cf. *Met.* 987^a 32 ταῖς Ἡρακλειτείοις δόξαις, ὡς ἀπάντων τῶν αἰσθητῶν αἰεὶ ρεόντων), and to Anaxagoras (187^a 30 καὶ τὸ γίγνεσθαι τοιόνδε καθέστηκεν ἀλλοιοῦσθαι, and *De Gen. et Corr.* 314^a 13, to the same effect). In ^a 5 *ἐστίν* is pretty clearly a gloss by a scribe who thought the construction was *τὸ κινεῖσθαι (ἐστίν) ἀλλοιοῦσθαι*. In fact *ἀλλοιοῦσθαι* depends on *ἀνάγκη*.

CHAPTER 9

265^a 14. ὡσπερ . . . εἶπομεν, 261^b 28.

16-17. τῆς δ' εὐθείας . . . μᾶλλον. This is proved as follows: motion along an infinite straight line is impossible (^a 17-20); circular motion is *simple* as compared with to-and-fro rectilinear motion (^a 20-21), and *perfect* as compared with rectilinear motion in one direction (^a 21-2).

18. τὸ γὰρ οὕτως ἄπειρον οὐκ ἔστιν. This has been proved in iii. 5, 8.

22-4. πρότερον . . . ἄφθαρτον. In 260^b 17-19 we have a threefold division of the senses of πρότερον: (1) οὐ μὴ ὄντος οὐκ ἔσται τᾶλλα, ἐκείνο δὲ ἄνευ τῶν ἄλλων, (2) τὸ τῷ χρόνῳ, (3) τὸ κατ' οὐσίαν. φορά is shown to be prior to other κινήσεις in these three respects ib. 19-29, 29-261^a 12, 261^a 13-23. Simplicius holds that φύσει here answers to the first of the three senses in 260^b 17-19, and λόγῳ to the third. But it is to be noted that in 261^a 14 φύσει πρότερον is used apparently as synonymous with πρότερον κατ' οὐσίαν. And the argument used there to prove that φορά is προτέρα κατ' οὐσίαν, viz. that that which emerges later in the order of development is prior in nature (261^a 14), has little to do with priority λόγῳ. I think therefore that the senses of πρότερον here do not exactly answer to those in 260^b 17-19. χρόνῳ is common to both classifications, and φύσει here seems to answer to κατ' οὐσίαν there. But the first of the senses named there is ignored here, and the second of the senses named here (λόγῳ) is ignored there. The λόγῳ πρότερον is that which is prior in definition; and the argument Aristotle has in mind must be this, that the ἀτελές can only be defined as that which is not τέλειον, and is therefore λόγῳ ὕστερον than the τέλειον. The priority of the perfect to the imperfect, of the imperishable to the perishable, in φύσις, λόγος, and χρόνος corresponds to the priority of actuality to potentiality in οὐσία, λόγος, and χρόνος asserted in *Met.* 1049^b 10-12 and proved ib. 12-1050^b 6, as the argument in 265^a 24-7 corresponds to that in 1050^b 6-24.

27^b 8. εὐλόγως . . . συνεχῶς. The contrast between the straight line and the circle is put in two ways: (1) the straight line has beginning, middle, and end, all distinct, the circle has not (^a 29-30, 32-4); (2) beginning, middle, and end are *on* the straight line, while they are not *on* the circle but *inside* it, since the centre plays all three parts (^a 30, ^b 2-8).

34^b 1. ὥστ' . . . μηδέποτε. As in ^a 30-31 ὥστ' . . . τελευτήσεται stated the consequence for a moving body of the fact that the straight line has a definite beginning, a middle, and an end, so this

ὅστε clause states the consequence for a moving body of the fact that on the circle all points alike are beginning, middle, and end. The consequence is that a body moving along it is in a sense always at a beginning and at an end, and in a sense never so: always so, because any point on the circle may be treated as the starting-point and the finishing-point of a movement round the circle; never so, because no point is marked out by its position for this role, and the choice is arbitrary.

There is no difficulty in 'understanding' τὸ κινούμενον (as P. 849. 2, S. 1315. 26 do) as the subject of the clause. The *τινα* of FH1J has all the appearance of a gloss, and there is no trace of it in T. 232. 32-3, nor in S. 1315. 26, 30, 35.

^b 3-4. καὶ . . . ἐστίν. The centre is the ἀρχή of the circle (or sphere) in the sense in which a point may be said to be the ἀρχή of a straight line (Iambl. *in Nic. Ar. Intr.* 57. 7 Pistelli), a straight line of a plane, or a plane of a solid; viz. because the circle (or sphere) may be regarded as produced by symmetrical fluxion from it in two (or three) dimensions (P. 849. 8); or again because it is that, equidistance from which is the constitutive principle of the circumference (T. 233. 1, S. 1316. 13). It is the τέλος of the circle in the sense that it is that into which the circle would finally contract (P. 849. 10), or because it is that in which all the radii terminate (T. 233. 2, S. 1316. 14).

7-8. διὰ δὲ τὸ τοῦτο μένειν . . . συνεχῶς. The rotating sphere is in a way at rest because every part of its surface is moving round its stationary centre and not towards it; and for the same reason there is no limit to its movement and it can move continuously. Bekker's reading διὰ δὲ τοῦτο μένει κτλ. is rather feeble, and has against it the fact that τε almost certainly means 'both', not 'and' (cf. ^b 1 as amended). There is much more of an argument if the immobility of the rotating sphere is made to depend on the immobility of its centre, and T. 233. 3-6, P. 849. 12-16, S. 1316. 20-23 take the argument so. This points either to the reading διὰ δὲ τὸ τοῦτο μένειν or to διότι δὲ τοῦτο μένει, and I have preferred the reading which corresponds the better with διὰ τὸ ἔξω εἶναι τοῦτο τῆς περιφερείας ^b 4.

8-II. συμβαίνει . . . ἄλλων. Aristotle finds a further proof of the primacy of circular motion in the fact, obvious in itself and noted by him in 223^b 19, that the motions of the heavenly bodies form the measure for (i.e. the measure of the time occupied by) all other movements; the two characteristics, being primary and being the measure, imply each other.

II-16. ἔτι . . . ἐκτός. That circular motion alone can have uniform velocity is used as a further argument for its primacy.

In saying that things moving with rectilinear movement move

faster as they get farther from the state of rest, it is unlikely that Aristotle was speaking with any empirical knowledge of the acceleration of falling bodies. He is reasoning from the *a priori* assumption that the natural movement of bodies will accelerate as they recede from the alien influence of the 'unnatural' region from which they start, and come more under the congenial influence of the 'natural' region to which they are moving. Unnatural or compulsory movements, on the other hand, have, according to him, a tendency to slacken in speed as the initial force wanes (230^b 25). ἀφίστηται is perhaps used rather than φέρεται to suggest the thing's removing itself, not being moved by an external force.

A body moving round a circle never gets farther from its ἀρχή or nearer to its τέλος, since the centre, which is equidistant from all points on the circumference, is both its ἀρχή and its τέλος.

13-14. πάντα . . . θάττον. The omission of the comparative in the ὅσῳ clause is an idiom of which Aristotle is fond (*E. N.* 1116^a 31, 1117^a 24, *Poet.* 1451^b 28), and πλεῖον was probably added later to complete the more regular construction.

19-22. διάκρισις . . . αὐτῶν. The reference is to Empedocles; cf. for instance fr. 26. 5-6.

22-3. καὶ . . . πρῶτον. Cf. Anaxagoras, fr. 12.

23-9. ὁμοίως . . . φασίν. The reference is to Leucippus and Democritus. Democritus ascribed to the atoms only the local movement called περιπάλαξις, and by this accounted for the generation and destruction and qualitative change of all compounds (*S.* 1318. 33-1319. 5, cf. fr. 168).

30-2. τὸν αὐτὸν δὲ τρόπον . . . διακοσμοῦσιν. The reference is to Anaximenes and his school. Cf. 187^a 12-16.

32-266^a 1. ἔτι . . . κίνησιν. The reference is to Plato and the Platonists. For the description of the soul as self-mover cf. *Phaedr.* 245 c-246 a.

266^a 6. ὅτι . . . χρόνον, cf. chs. 1, 2.

7. καὶ . . . κινήσεως, cf. 5. 256^a 4-257^a 31, where it is proved that the source of movement is something that is not moved by anything outside itself.

ἔτι . . . κινήσις, cf. 7. 260^a 20-261^a 28, where it is proved that φορά is the primary κινήσις, and ch. 9, where it has been proved that circular φορά is the primary φορά.

8. καὶ . . . εἶναι, cf. 7. 261^a 28-^b 26, in which it is shown that φορά is the only κινήσις that can be eternal, and ch. 8, in which it is shown that circular φορά is the only φορά that can be so.

8-9. καὶ τὸ κινουὺν . . . ἀκίνητον, cf. 5. 257^a 31-258^b 9, 6. 259^a 20-^b 31.

CHAPTER 10

266^a 10-11. "Οτι . . . διορίσαντες. As a preliminary to proving that the prime mover cannot have magnitude (i.e. must be immaterial), Aristotle proves three things: (1) that nothing finite can cause movement for an infinite time (^a 12-24), (2) that no finite magnitude can have infinite force (^a 24-^b 6), (3) that no infinite magnitude can have finite force (^b 6-24). The meaning of the first proposition and its relation to the second are not very clear. Simplicius takes its meaning to be that no finite *force* can cause movement for an infinite time (1321. 19-21). This then, taken with the second proposition, that no finite body can have an infinite force, justifies the conclusion that no finite body can produce movement for an infinite time.

This is an attractive interpretation, but against it are the following facts: (a) In ^a 12-24 there is no explicit reference to a finite *force*. That which is proved to be, if finite, incapable of producing movement for an infinite time is τὸ κινεῖν, and this we naturally assume to be, like the κινούμενον, a body, and its finitude to be finitude of size. (b) In ^a 24 the second proposition is represented not as a fresh premiss but as a generalization of the first (ὅλως). (c) In ^b 25-6 only propositions (2) and (3) are mentioned in the summing up, which is what might be expected if the second is a generalization of the first, but not if it is an independent point. (d) In 267^b 22-4 propositions (1) and (2) are stated in the form 'that that which is finite cannot have infinite force (proposition 2) and that a thing cannot be moved an infinite time by that which is finite'. Since τὸ πεπερασμένον in the first clause clearly means 'a finite magnitude', it is natural to suppose that in the second clause too it means that, and not 'a finite force'. The fact that the two propositions are mentioned side by side might seem to confirm Simplicius' view, but I take the explanation of this to be that Aristotle first puts the more general statement and then adds 'and (sc. in particular) that a thing cannot be for an infinite time moved by a finite body (1)'. Since the doctrine from which Aristotle starts is that movement is eternal, the second clause particularizes the first in the form in which it fits in with the doctrine and gives the result that the cause of the movement in the world cannot be a finite magnitude, and therefore (since there are no infinite magnitudes) cannot be a magnitude at all.

I think therefore that Simplicius' view must be rejected. But, since Aristotle in ^a 12 does not draw a distinction explicitly between a πεπερασμένον μέγεθος and a πεπερασμένη δύναμις, it may well be that the distinction escaped his notice until he explicitly draws it in ^a 25.

The argument to prove the first proposition is vitiated by a failure to distinguish two meanings of *κινεῖν ἀπειρον χρόνον*:—(1) to cause movement to go on for an infinite time, (2) to take an infinite time to cause a body to move, sc. a certain distance. The datum which the proposition is to be confronted with is that movement goes on eternally, and therefore what Aristotle ought to be proving is that no finite body can cause such movement. But what he proves is that a finite body cannot take an infinite time to cause movement, sc. over a given distance. This is quite different from what he ought to be proving. But the difference is concealed from him by his tacit assumption (supposed to be justified by vii. 2) that one body can be in movement as a result of the influence of another only so long as the other body is continuing to act on it, and is in fact still in contact with it. He has in fact no conception of the First Law of Motion, that if a body has once been set in motion it will continue to move till it is acted on by some fresh force. If his assumption were right, to prove that a finite body cannot take an infinite time to make a finite body move would be equivalent to proving that a finite body cannot cause another to move for an infinite time.

The third proposition is not vital to Aristotle's proof that the prime mover is immaterial, and hence, though it appears in the summary in ^b 25-7, it does not appear in the summary in 267^b 22-4. Indeed, since he is convinced that there cannot be an *ἀπειρον μέγεθος* (267^b 20-22), consideration of the question what it could or could not do if it existed cannot assist his main purpose. But the proposition that a finite *μέγεθος* cannot have an infinite *δύναμις* naturally leads him on to consider incidentally whether an infinite *μέγεθος*, if there were one, could have a finite *δύναμις*. He thus gets the result, interesting in itself, though irrelevant to his main thesis, that an infinite *μέγεθος* and a *μέγεθος* having infinite *δύναμις* are identical.

15-23. *ἔστω . . . κίνησιν*. The general nature of the argument is plainly this:—Let a finite force A be supposed to move a finite body B in an infinite time Γ . Now a part of A (Δ) will move a part of B (E) in a time Z which is less than Γ and therefore finite. Then, A and B being finite, I shall, by going on adding to Δ and E parts each equal to Δ and E respectively, exhaust A and B, but I cannot exhaust the infinite time Γ by taking from it finite times each = Z. Therefore A will move B not in the infinite time Γ but in a part of it.

The problem is, how does Aristotle reach the conclusion that Δ will move E in a time less than Γ ? S. 1322. 8-14 supposes that it must be because Δ is a larger fraction of A than E is of B, and that

ἐν πλείονι γὰρ τὸ μείζον means 'for the greater the weight, *relatively to the force*, the longer the force will take to move the weight'. But there is nothing in the text to suggest that Δ is a greater fraction of A than E is of B, and it is contrary to all probability that Aristotle should make this assumption, and still more so that he should make it silently. Prof. Cornford has shown (*Class. Quart.* 26 (1932). 53-4) that the assumption is unnecessary. The crucial words mean ' Δ , then, will not move E in a time = Γ ; for it would take a longer time to move the greater weight B than it takes to move the lesser weight E, and therefore the latter time, being less than a certain other time, is not infinite'.

The suggestion in ^a 19-22 is that if Δ moves E in time Z and $A : \Delta = B : E = n : 1$, A will move B not in the infinite time Γ but in the finite time nZ . Actually, on the principle laid down in 250^a 4-9, A will move B in the time Z, since the movements of parts of B by parts of A are not successive but concurrent. But if Aristotle had taken this point, it would only have strengthened his general case.

18. ὁ χρόνος ὁ τὸ Z. The MS. reading ὁ τοῦ Z appears to be an impossible way of saying 'the time Z'. I have therefore written ὁ χρόνος ὁ τὸ Z, 'the time indicated in the diagram by the symbol Z'. For the idiom cf. ἡ τὸ Γ (sc. γωνία) *An. Post.* 94^a 31, τὴν τὸ AB (sc. πρότασιν) *An. Pr.* 54^a 8, τὴν τὸ Δ κίνησιν *Phys.* 231^b 27, &c. For the full formula see 258^a 26 n.

19-22. οὕτω . . . Γ . The feminine articles in ^a 19, 20, 21 are explained by the fact that the κινούνη and the κινούμενον were represented in the diagram by γραμμαί.

23-6. ὅτι . . . δῆλον. Aristotle has proved that a finite body cannot cause movement for an infinite time. The proposition he is now to prove is a more general one (ὅλως); he is to prove that a finite body cannot have an infinite power, i.e. cannot move an infinite body, or move any body for an infinite distance, any more than it can cause movement for an infinite time.

26^b 6. ἔστω . . . ἔχειν. The argument is:—An infinite force will produce a given effect in a shorter time than any finite force would, say the time A. A finite force F will produce the same effect in a time greater than this, say nA . Then by the principle of virtual velocities (vii. 249^b 27-250^a 9) a finite force nF will produce the same effect in time A, i.e. in the same time as the supposed infinite force; which is absurd. Therefore no infinite force can reside in a finite body.

30. καὶ . . . ἄλλου. I follow E² in reading πλείον, which seems to be implied by P. 850. 23 σφοδρότερον. πλείω, however, is just possible, with κίνησιν understood.

31. ἀλλὰ . . . οὐδένα, sc. in which the supposed infinite power in a finite body will do its work.

31-3. εἰ . . . πεπερασμένη τις. Aristotle no doubt used the diagram

A B

in which B stood for the production of A.

In ^a 33 I have restored ἐν τῷ δὲ AB for the unmeaning ἐν ᾧ δ' ὁ AB. S. 1324. 31 has ἐν πλείονι χρόνῳ τῷ AB.

^b 6. οὐ . . . πεπερασμένην, sc. δύναμιν ἐνδέχεται εἶναι (cf. ^a 25).

7-8. καίτοι . . . πλείω, 'true, a greater force may reside in a smaller bulk of one kind of body than resides in a greater bulk of another; but then *a fortiori* a still greater force will reside in a larger bulk of the first kind of body'.

These clauses are meant to forestall an obvious objection. It might be said 'there may be a greater force in a smaller body than there is in a larger body, and on the same principle there may be less force in an infinite body than there is in a finite'. Aristotle answers 'in virtue of the different constitutions of two bodies, the smaller may have the greater force; but given the same constitution the larger the body the greater the force; and therefore if we take a large enough quantity of the weaker type of body it will have more force than any given quantity of the stronger'.

8-20. ἔστω . . . ὠρισμένου. Aristotle's object is to prove that if there were an infinite body (which he holds to be impossible), it could not have a finite force. He supposes an infinite body AB, and a finite part of it BΓ moving body Δ in time EZ (which is presumably a multiple of the time E in which AB moves Δ). He then points out that if we multiply BΓ successively by 2, 2ⁿ BΓ will by the principle of virtual velocities move Δ in time $\frac{EZ}{2^n}$. Now we shall never exhaust the infinite body AB by taking a finite multiple of a finite part, but with each doubling of the body we take we shall get a smaller time (^b 12-14), from which Aristotle silently deduces that, since 2ⁿ BΓ is less than AB, but by taking *n* large enough we can make $\frac{EZ}{2^n}$ as small as we please, AB does its work in less than any determinate time.

At this point the interpretation becomes doubtful. With the vulgate reading in ^b 15-16 πάσης δὲ πεπερασμένης δυνάμεως, we have a complete proof of the infinity of the force in the words ^b 14-15 ἄπειρος ἄρα ἢ δύναμις ἔσται: πάσης γὰρ πεπερασμένης ὑπερβάλλει δυνάμεως. I.e., the infinity of the force is proved directly from the fact that by taking multiples of BΓ we shall never exhaust AB. And then a second

proof of the infinity of the force is offered in ^b 15-20, viz. that the time taken by 2ⁿBΓ to move Δ, however small, is still a definite time, and that AB, being greater than 2ⁿBΓ, will move Δ in a still smaller time, and therefore must have a greater force than 2ⁿBΓ, i.e. than any finite magnitude however great. S. 1341. 40-1342. 5 takes the passage so.

But the whole passage ^b 8-20 has all the appearance of being meant to be a single argument, and an argument turning on the time factor. If a second argument were meant to begin in ^b 15, it should be introduced not by πάσης δὲ πεπερασμένης but by ἔτι δὲ πάσης πεπερασμένης or by words to that effect. I think therefore that K is right in reading εἴ γε πάσης πεπερασμένης. Then, treating ^b 17-19 εἰ . . . ἀναλογίας as parenthetical, we get the well-knit argument: 'every finite force takes a finite time to do its work; the force of an infinite body takes less than any finite time to do its work; therefore it exceeds any finite force; therefore it is infinite'.

E¹ omits ^b 15-16 ὑπερβάλλει . . . πεπερασμένης, so that we have the choice between the authority of K and that of Δ and Simplicius; and in such circumstances K is often right.

18. κατὰ τὴν ἀντιστροφὴν τῆς ἀναλογίας, 'in inverse proportion'.

19-20. ἄπειρος . . . ὠρισμένου. We have here a *constructio ad sensum*, 'Every force that exceeds every definite force, just like any number or magnitude that exceeds every definite number or magnitude, is infinite'.

20-24. ἔστιν . . . δύναμιν. The argument is: if we suppose an infinite body A to have a finite force B, we can find a finite body C with a force D which is a proper fraction of B, say B/n. Then nC will have force B, i.e. a finite body will have the same force as an infinite body; which is absurd. Therefore no infinite body has a finite force.

27-267^a 20. περὶ δὲ τῶν φερομένων . . . αὐτοῦ. Before using for the establishment of his main thesis the results reached in ^a 12-^b 24, Aristotle considers a problem that confronts his doctrine (held to have been proved in ch. 4), that whatever is in movement is being moved by something; viz. how it is that movement apparently can go on when the moving thing is no longer in contact with, and therefore presumably no longer being influenced by, the movent. He first considers the suggestion (^b 30) that the movent, when it moves the moving body, at the same time sets in motion a medium such as air, which then by being itself in movement keeps the moving body in movement; and replies that this does not escape the difficulty, since it is equally hard to see how the air, which is moving forward and therefore no longer in contact with the original movent, can nevertheless continue to be in movement. Even if the

original movent imparts to the medium, as a magnet does to iron, the power of producing movement in other things, that can be so only so long as the medium is itself being acted on by the original movent. The solution, he says (267^a 2-7), is to be found in the view that while the medium continues to move only so long as the original movent moves it, it retains the power of causing movement when the original movent has ceased to move it. This power can go on through several intermediaries. It begins to cease as the transmitted power of causing movement becomes less, and finally ceases when only movement, and not the power of causing movement, is transmitted. This movement, and therewith the whole movement, ceases when the cause of it ceases to cause it. Cf. 215^a 15-17 n.

The view that is criticized is Plato's doctrine of *περίωσις*, expounded in *Tim.* 79 a-e as the explanation of breathing and applied in 80 a to the movement of projectiles. The instance of the magnet (267^a 2) is also borrowed from Plato (*Tim.* 80 c).

33. ἀλλ' . . . πεπαύσθαι, sc. ἀνάγκη.

267^a 1-2. καὶ . . . ἐκίνησεν. Bekker's καὶ εἰ ποιεῖ ὡσπερ ἡ λίθος, οἷον κινεῖ ὃ ἐκίνησεν gives no tolerable sense, and οἷον τε κινεῖν should undoubtedly be read, as in ^a 3. It is recorded only in E², but K has τε κινεῖ, and H and Simplicius have κινεῖν. We thus get the sense 'even if, as the magnet does to the iron, the first movent makes that which it moves capable of imparting movement'.

3-5. ὅτι . . . κινεῖσθαι. Bekker's comma before, and τοιοῦτον after, ἡ τὸν ἀέρα give no good sense. All the MSS. have τοιοῦτον in that position; some of them have it and some omit it after ἄλλο. In all probability it was written above the line in the archetype, and succeeding copyists made varying attempts to deal with it. Its true place is obviously after ἄλλο.

7. κινεῖ τι ἄλλο. Bekker has κινεῖται τι ἄλλον, which gives no very good sense. E²K's κινεῖ τι ἄλλο gives just what is wanted, and the other readings may easily have been derived from it.

9-10. ὅταν . . . μόνον, i.e. 'when the earlier of two consecutive terms in the series makes the later not to be a movent but only to be in movement'.

12-15. αὐτῆ . . . ἀλλήλων, i.e. though the explanation given in ^a 2-12 explains how there can be temporal continuity between a series of movements of different things, this is not the continuous movement of an eternal *mobile* by a single mover which Aristotle has proved in chs. 1-6 to exist, and whose movent he is now seeking to prove to be immaterial. For (1) the movement he has been explaining is not in an eternally moved *mobile*, but in things that are capable of rest as well as of movement, i.e. the terrestrial

elements; and (2) though it has temporal continuity and therefore seems to be continuous, it is not genuinely continuous, since it is not movement of one thing but of things that are either successive (i.e. with nothing of the same kind between them) or at most contiguous (i.e. with nothing at all between them), and again there is not one movent but consecutive movents; while continuous movement is movement of one thing by one thing (259^a 18).

15-16. διὸ . . . κίνησις, i.e. air and water (cf. 266^b 31, 267^a 3, 4) are particularly fitted to act as transmitters of such movement because their parts, in contrast with the parts of solids, are easily shaken out of their continuity (διαίρετός ὄν^b 14) and compelled by impact from without to impinge one on another in the way described in ^a 2-8.

16-20. ἦν . . . αὐτοῦ. Some thinkers (Aristotle is thinking of such passages as Pl. *Tim.* 79 b-80 c) say this propagation of motion from one thing to another is mutual replacement, but that will not explain the facts; only the account given in ^a 2-12 will do so. In mutual replacement, A's pushing B into C's place, B's pushing C into D's place . . . Y's pushing Z into A's place must all occur, and all cease, simultaneously. But the fact to be explained (cf. 266^b 28-30) is the continuous movement of a single projectile, when this can no longer be explained by reference to a single original movent, since that has ceased to be in contact with the moved.

21-^b 2. ἐπεὶ . . . ἀκινήτου. Bonitz argues that we should read τὸ δέ in ^a 24, and a colon after ὄν in ^a 25, making the two sentences into one, with συνακολουθεῖν . . . αὐτό^a 26 as its principal clause. But τὸ δέ in ^a 24 is the reading not of E, as Bonitz thought, but only of E², and τὸ δὴ, with the punctuation I have adopted, is quite satisfactory.

21. ἐπεὶ . . . συνεχῆ. This has been proved in chs. 1, 2.

23-4. οὐ . . . συνεχῆς, i.e. 'for otherwise it will not be continuous'.

25-6. εἰ . . . αὐτό, i.e. if that which causes movement is itself in movement, it has to keep pace with that which it moves, in order to move it (cf. 256^b 17).

^b 1-2. ὥστε . . . ἀκινήτου, i.e. so that, in order to avoid an infinite regress, we must suppose that the series has a limit, viz. in movement by what is unmoved.

3. οὕτω, i.e. ἀκίνητον ὄν.

5-7. δεῖ . . . ἀρχαί. In order that the movement produced should be uniform, not only must the movent be unchanging, but the moved must be in an unchanging relation to the movent. The movent must therefore be either at the centre or at the circumference of the moving sphere; for these are the generative principles of the sphere; i.e. the sphere may be regarded as produced by

uniform expansion from the centre, or by uniform contraction from the circumference.

The centre has been already described in 265^b 3 as the ἀρχή of the circle or sphere, and it is easy to see that from another point of view the circumference may be so regarded.

In ^b 5 πρὸς ἐκεῖνο must be read, not πρὸς ἐκείνου; for the moved clearly suffers change from the mover, though not in respect to it. For πρὸς ἐκεῖνο cf. ^b 17.

In ^b 6 ἀνάγκη δέ is better attested than ἀνάγκη δὴ, but as between δέ and δὴ (particularly with ἦ following) authority counts for little. With the reading δέ, the previous sentence is left completely in the air. I think therefore that we should read δὴ and suppose that the necessity for the moved to remain in the same relation to the mover is used as an argument for locating the mover either at the centre or at the circumference. The outer celestial sphere, the sphere of the fixed stars, whose motion it is that is in question, is always symmetrically situated to its circumference, along which it is always rotating, and to its centre, round which it is always moving at an equal distance; and it is not symmetrically situated to any point outside the circumference, or to any point within it save the centre.

If this interpretation is adopted, αὐται γὰρ αἱ ἀρχαί is rather loose, since it gives a different reason for selecting these as the possible positions for the mover. (It is possible, though I would not stress this, that we should read αὐται γὰρ καὶ ἀρχαί. καί and αἱ are often confused.) But this does not appear to be an insuperable objection.

8-9. τοιάυτη . . . κίνησις. The evidence is pretty well divided between κύκλου and ὄλου, but κύκλου makes the reference of ἐκεῖ much more intelligible. The reading ὄλου may have arisen from the writing of κύκλου as οου.

9-15. ἔχει . . . ἐχομένην. Aristotle has in ^a 24-^b 5 recapitulated the proof offered in 257^a 33-258^b 9 to show that the prime mover is unmoved. He now confirms this by pointing out that movement by a κινούμενον has not the requisite unity or continuity.

II. τῷ ἐφεξῆς εἶναι συνεχῶς, 'continuously only in the (improper) sense that the pushes come successively', i.e. without anything else of the same kind coming between them (which is the definition of 'successive' in 226^b 34-227^a 1).

II-13. ἢ γὰρ . . . ἄλλου, 'for wherever movement is by a κινούμενον, to give it even the appearance of continuity either the movent must itself repeatedly push or pull or both, or the causing of movement must be taken over by one thing after another'.

13. ὡσπερ . . . ῥιπτουμένων, 266^b 28-267^a 8.

13-14. εἰ . . . κινούμενος. Bekker makes these words begin a new sentence, and reads εἰ δὲ διαιρετός . . . ἀλλ' ὡς αἰ κινούμενος. A much

better sense is got by adopting our punctuation and reading, which is that of S. 1356. 12-13. The sense is 'if the explanation of the movement of projectiles is that air by virtue of its easy divisibility pushes them on, a different part of the medium imparting movement at each moment'. Cf. ^a 15-16. ἡ τὸ ὕδωρ spoils the grammar, and is probably a gloss.

20-21. ἄπειρον . . . φυσικοῖς, iii. 5; cf. 251^a 8-9 n.

22-4. ὅτι . . . νῦν, 266^a 24-^b 6, ^a 12-24.

Second Version of VII. 1-3

CHAPTER I

241^b 26. ἄλλο . . . κινουῦν. Prantl restored these words from EF.

242^a 3-4. τούτου . . . γενομένου. I have read δέ for γάρ, as in the first version at ^a 37.

6. πᾶν . . . ἦν. This has been proved in vi. 240^b 8-241^a 26.

28. ἐκάστην. I have restored the reading of E; cf. first version, ^a 62.

^b 5. τῆς οὐσίας ἢ τοῦ γένους. These words could not be allowed to stand if we supposed this second version to be by Aristotle. The first version has οἶον οὐσίας ἢ ποιότητος (^b 35).

7-8. ταῦτα . . . πρότερον, v. 4.

17-19. καὶ . . . κινεῖσθαι. If the series of movements starts with one of maximum size (that of A) and continues with others of progressively smaller size, that does not necessarily yield an infinite sum; the series may be convergent, and Aristotle is aware of this. On the other hand, if the terms of the series are equal or increase progressively from a finite initial term (the movement of A), the sum must be infinite. Thus the assumption which suits Aristotle's purpose is the latter assumption, and I have therefore adopted the reading of E in preference to the vulgate reading in ^b 17. This corresponds better, too, with the first version (^b 47-50).

25. κατὰ τοπὸν καὶ is probably an emblem from the first version (^b 59).

27. ἢ συνεχές. Comparison with the other version (^b 62) shows that Spengel's conjecture is not improbably right.

τὸ δὲ ἐνδεχόμενον εἰλήφθω, 'let that which is alleged to be possible be assumed to be actual'.

30. διαφέρει . . . ἄπειρον, sc. εἶναι τὸ ΑΒΓΔ. Cf. the other version ^b 63-4.

30-31. ὁμοίως . . . πεπερασμένον. The argument seems to require the insertion of ἄπειρον; 'for in either case either an infinite or a finite body will move *an infinite distance* in a finite time'. Cf. the other version, ^b 69-71.

CHAPTER 2

243^a 22. ἐν αὐτῷ. The sense requires this, not the vulgate ἐν ἑαυτῷ.

^b 23. ὅταν ἦτοι. Simplicius' reading (1055. 1) is evidently preferable to the vulgate ἦτοι ὅταν.

24. μὴ . . . ἐλκομένου. μὴ χωριζομένη is used in the sense expressed in ^a 27 by μὴ ἀπολείπεται. But the phrase probably originates in a corruption of the first version, 244^a 9, ὅταν θάπτων ἢ κίνησις ἢ τῆς χωριζούσης (or ἢ χωρίζουσα) ἀπ' ἀλλήλων τὰ συνεχῆ. If there the alternative reading ἢ χωρίζουσα was corrupted into μὴ χωρὶς οὐσα, this might easily have been paraphrased by μὴ χωριζομένη τῆς τοῦ ἐλκομένου.

25. καὶ αἱ λοιπαὶ . . . αὐταί, sc. κινήσεις. The sense requires us to excise ἔλξεις and to read αὐταί instead of the vulgate αἱ αὐταί.

29. καὶ πᾶσα . . . ἐστιν. This seems to be a paraphrase of what I take to be the mistaken reading in the other version (^b 10) οὐδ' ἐστιν ἄλλο τι γένος κινήσεως ἢ σύγκρισις καὶ διάκρισις.

244^a 27-8. τὸ γὰρ ποιὸν . . . εἶναι. This is an inaccurate and un-Aristotelian paraphrase of what we have in the other version at ^b 5b-6 ἅπαν . . . εἰρημένων.

^b 22. καὶ τῷ τούτων τι seems to be a dittograph of κατὰ τὸ τούτων τι in ^b 21.

245^a 20. τὸ τῆς ἀλλοιώσεως (cf. ^b 23, 246^a 29, ^b 26, 247^a 25, 27, 30, 248^b 27). The only recorded instance of this idiom in a genuine work of Aristotle is in *De Resp.* 472^b 9, τὸ τῆς ἀναπνοῆς. The periphrasis is characteristic of the late date of this version.

21-2. τὸ πάσχον . . . ἄμα. This is a bad paraphrase of the first version ἄμα ἐστὶ τὸ ἔσχατον ἀλλοιοῦν καὶ τὸ πρῶτον ἀλλοιούμενον (^a 4). τὸ ποιῶν, not τὸ πάθος, is what is wanted to balance τὸ πάσχον.

26. ὡσαύτως . . . ἀναισθήτων is probably an emblemata from the first version, ^a 10.

^b 17. ἀνὰ μέσον . . . κινουμένου has all the appearance of a gloss.

CHAPTER 3

245^b 21-5. τῶν γὰρ ἄλλων . . . ταῦτα. ἄν τις ὑπολάβοι ἐν τε and ἀλλοίωσιν ὑπάρχειν seem to be emblemata from the first version ^b 6, 8. These words having been inserted, γὰρ was put in (in ^b 23) to make the construction right. τὸ σχῆμα is a gloss which spoils the construction of the clause it is in.

26-7. ἐξ οὗ . . . μορφῆν. The language is un-Aristotelian. The phrase in the first version τὸ σχηματιζόμενον . . . οὗ λέγομεν ἐκείνο ἐξ οὗ ἐστιν (^b 9-10) is good Aristotelian language.

246^b 24. τὸ . . . διατιθὲν περὶ τὴν φύσιν, 'that which places the thing in its natural condition'. Without εἶ, the phrase does not seem to be Aristotelian.

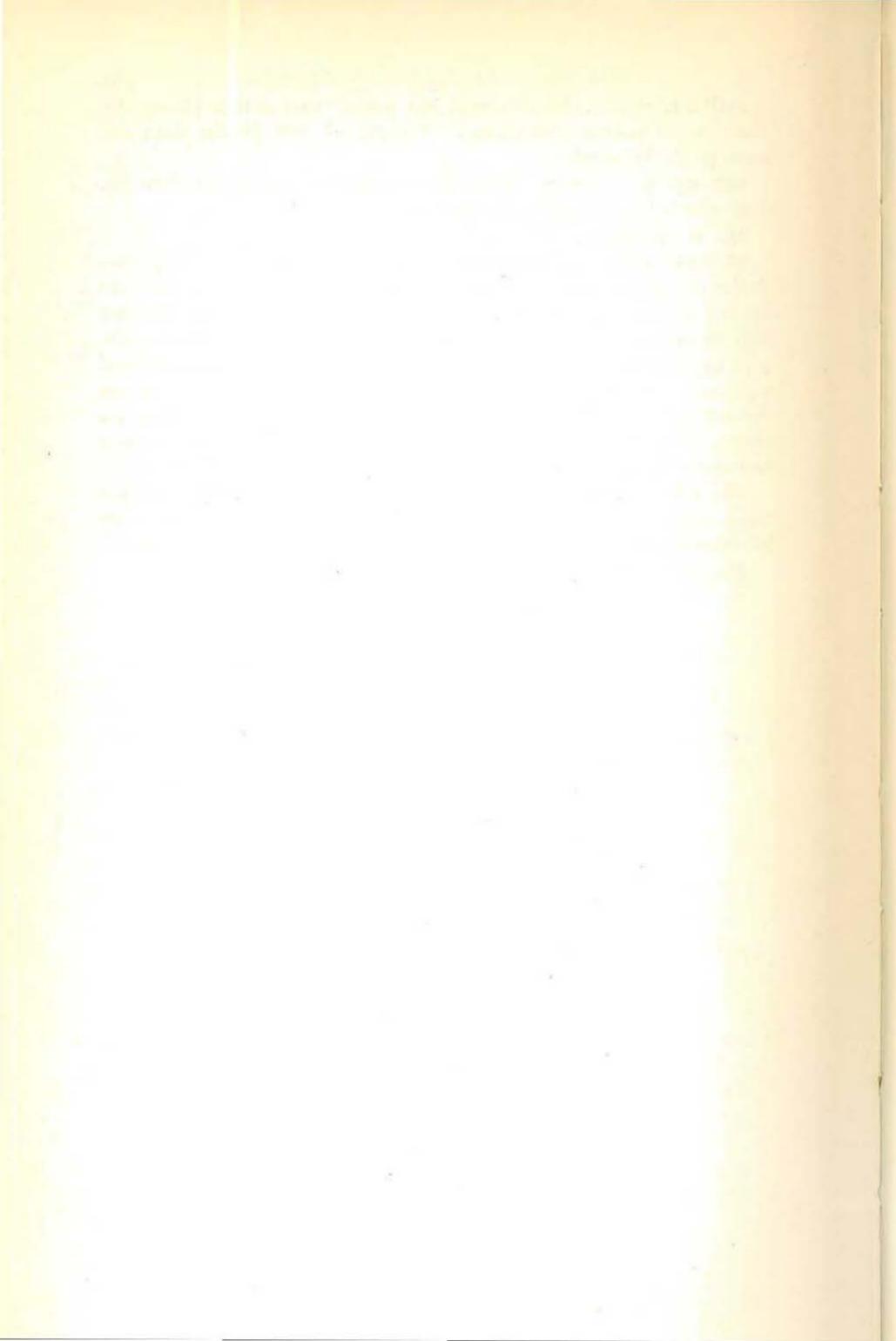
247^a 23. ἡ . . . ἀρετῆ. Here the second version departs from the first, which has ἡ ἐναντίως ἀπαθές (246^b 20).

25. τὸ τῆς ἡδονῆς. Cf. 245^a 20 n.

28^{-b} 20. ἀλλὰ . . . ἐπιστήμην. In the first version (^b 1-7) two theses are maintained:—(1) that ζῆεις of the noetic part of the soul are not ἀλλοιώσεις, (2) that there is no γένεσις of them; and the fact that τὸ κατὰ δύναμιν ἐπιστήμον οὐδὲν αὐτὸ κινήθην ἀλλὰ τῷ ἄλλο ὑπάρξαι γίγνεται ἐπιστήμον is offered as an argument for (2). In the second version, by misunderstanding, thesis (2) is omitted, and the words answering to those just quoted are given as a second argument for thesis (1), and through ignorance of the meaning of τὸ κατὰ δύναμιν ἐπιστήμον these words are paraphrased by κατ' οὐδεμίαν δύναμιν κτλ.

28. οὐδ' . . . μέρει. Spengel's emendation is pretty certainly right, especially in view of 248^b 27-8 τὸ τῆς ἀλλοιώσεως . . . ἐν τῷ αἰσθητικῷ μέρει τῆς ψυχῆς, ἐν ἄλλῳ δ' οὐθενὶ πλὴν κατὰ συμβεβηκός.

30. τὸ τῆς ἐπιστήμης. Cf. 245^a 20 n.



INDEX VERBORUM

84^a-99^b = 184^a-199^b, 0^a-67^b = 200^a-267^b

ἀγαθός 92^a 17, 95^a 26, 97^a 25
 ἀγγεῖον 9^b 29, 12^a 14
 ἀγένητος 3^b 8, 51^b 15
 ἀγών 6^a 22
 ἀδιάρετος 31^b 3, 41^a 26
 ἀδιάφορος 62^a 2
 ἀδιεξίγητος 4^a 14, 7^b 29
 ἀδρυνόμενος 30^b 2
 ἄδρυσσις 1^a 19
 ἀδύνατος 85^a 30, 41^b 5
 αἰεὶ 96^b 10, 99^b 24, 21^b 3, 52^a 35, 59^a 16
 ἀήρ 89^b 7, 12^a 12, 13^a 2, 4, 26 [16^b 18]
 ἀθάνατος 59^b 25
 Ἀθήναζε 2^b 13
 ἀθρόος 86^a 15
 αἰδῖος 3^b 30, 63^a 3
 αἰδιότης 52^b 3
 αἰσθησις 88^b 32, 89^a 7, 44^b 10
 αἰσθητικός 53^a 19
 αἰτία 94^b 20, 98^a 22, 9^a 20
 αἰτία *ci.* ἀρχαί, στοιχεῖα 84^a 11, 13
 πῆξι καὶ πῶσα 94^b 16-95^b 30, 98^a 14-
 9^b 9 πολλὰ τοῦ αὐτοῦ 95^a 5-16
 ἀλλήλων 95^a 9 προτέρως καὶ ὑστέ-
 ρως *ib.* 29 κατὰ συμβεβηκός (*καθ'*
 αὐτό *ib.* 32-^b 6, 96^b 25, 97^a 13, 98^a 9,
 57^a 30 δυνάμενα) (*ἐνεργούντα*
 95^b 4 αἰτίων ἀκρότατον *ib.* 22
 ἔξω) (*ἐντός* 97^b 20, 36 ἕνεκά του
 98^b 10 *τετραχῶς* 7^b 34, 9^a 20
 αἰών 51^a 1
 ἀκίνησια 2^a 4, 5, 28^b 3
 ἀκίνητος 84^b 16, 98^a 17, 26^b 10, 58^b 12,
 60^a 3, 61^a 16
 ἀκολουθεῖν 20^a 6, 9, 28^b 30, 35^b 1, 10
 ἀκολουθεῖ μεγέθει κίνησις 19^a 11, ^b 15,
 20^b 24
 ἄκρος 95^b 22, 24^b 32, 62^b 12, 19
 ἀλήθεια 88^b 30, 91^a 25, 63^a 18
 ἀλλοιοῦσθαι 44^b 2, 5^b, 45^a 3, 5, ^b 3-48^a 9
 ἀλλοιώσις ἀθρία 86^a 15, 53^b 25) (*μετα-*
σχημάτισις etc. 90^b 8 *def.* 1^a 12, 2
^b 25, 26^a 26, 43^a 9 οὐχ ὀμαλῆς 23^b
 21 ἐπὶ τὸ μᾶλλον καὶ ἧττον
 26^b 2 τάναντία ἄκρα ἀλλοιώσεως
 41^a 31, 60^a 33, 61^a 34 ὑπὸ τῶν
 αἰσθητῶν 45^b 4 *ci.* πάθος 46^a 3,
 48^a 13) (*τελειώσις etc.* 46^b 2 τὰ
 πρὸς τι οὐκ ἀλλοιώσεις *ib.* 11 αἰ
 ἦδοναι καὶ αἰ λύπαι ἀλλοιώσεις 47^a 16
 ἡ κακία καὶ ἡ ἀρετὴ οὐκ ἀλλοιώσεις *ib.*
 19 πῶς ἰσοταχῆς 49^a 29

ἀλλοιωτικός 57^a 24
 ἄλογος 52^a 24
 ἄλσις 1^a 19
 ἄλως 98^b 22
 ἄμα 18^a 25, 26^b 18, 21, 43^a 4, 34
 ἁμαρτάνειν 13^a 24
 ἁμάρτημα 99^b 4
 ἁμαρτία 99^a 33
 ἁμέγεθες 67^a 23
 ἁμέρες οὐκ ἔστιν ἕσχατον τοῦ ἁμεροῦς
 31^a 28 οὐδὲν τῶν συνεχῶν ἁμέρες
 33^b 32 ἁμέρες ἁμεροῦς ἐχόμενον
 36^b 12, 37^b 7 κίνησις οὐκ ἔστιν ἐν
 τῷ ἁμερεῖ 39^a 4 οὐ κινεῖται 40^b 8,
 58^b 25 (*cf. ib.* 18) *def.* 40^b 12 (*cf.*
 31^b 3) τὸ κινουῦν πρώτων ἁμερές
 66^a 10-67^b 26
 ἁμεταβλησία 30^a 10
 ἁμετακίνητος 12^a 15
 ἁμιγῆς 56^b 25
 ἁμορφία 90^b 15
 ἁμορφος 91^a 10
 ἁμπελογενῆ 99^b 12
 ἁμυδρῶς 17^b 33
 ἁμφισβήτησις 53^a 34
 ἁμφορεῦς 10^a 32
 ἁμῶς γέ πως 96^a 16
 ἀνάβλεψις 47^b 8
 ἀναγκάζειν 88^b 30
 ἀναγκαῖον 98^b 11, 99^b 34-0^b 8
 ἀνάγκη 96^b 12, 99^b 34-0^b 8
 ἀναμρεῖν 87^b 26
 ἀνασθησία 18^b 26
 ἀναίσθητα 87^b 1, 45^a 10
 ἀνακάμπτειν 57^a 27, 61^b 32, 33, 62^a 14,
 17, ^b 22, 65^a 21
 ἀνάκαμψις 62^a 11
 ἀνακλασθεῖσα 55^b 27
 ἀναλογία 15^b 29, 66^b 19
 ἀναμεταξύ 43^a 15
 ἀναμρεῖν 21^a 3, 38^a 22, ^b 11
 ἄναντες 2^a 19, 48^a 22
 Ἄναξαγόρας ἐν καὶ πολλὰ εἶναι φησὶ 87^a
 22 ἄπειρα τὰ στοιχεῖα *ib.* 26, 89^a 17,
 3^a 20 τὸ ἄπειρον στηρίζειν αὐτὸ αὐ-
 τὸ 5^b 1-24 τὸ κενὸν ἐξελέγχει 13^a 24
 νοῦς 50^b 24, 56^b 24, 65^b 22 (*cf.* 52^a 10)
 Ἄναξιμανδρος 87^a 21, 3^b 14
 ἀνάπαλιν 94^a 9
 ἀναρμοστία 88^b 14
 ἀνατροπὴ 95^a 14
 ἀνδριαντοποιικὴ 95^a 6

ἀνδρόπρωρα 98^b32, 99^b11
 ἄνθρωπος 93^b8, 12, 94^b13, 98^a26, 2^a11
 ἀνιάτρος 91^b6
 ἀντεστραμμένως 6^b5, 27, 15^b31
 ἀντίθεσις 25^a11
 ἀντικείμενον (ὑποκείμενον)
 90^b13 (cf. 90^a18) ἀντικείμενα
 1^b24, 25^b25, 27^a7 ἀντικείμενη
 ἀπόφασις 25^a19 ἀντίκειται κινήσει
 ἡρεμία 29^b25, 61^b18 ἡρεμία ἀντι-
 κείμενα 30^a1 μεταβολαὶ ἀντικεί-
 μена ib. 8, 61^b21 κινήσεις ἀντι-
 κείμενα 64^b13
 ἀντικινεῖν 57^b21, 23
 ἀντιμεθίστασθαι 9^b25, 11^b27
 ἀντιμετάστασις 8^b2
 ἀντιπερίστασις 15^a15, 67^a16, 18
 ἀντιστροφή 66^b18
 ἀντιστροφῶς 65^b8
 ἀντίφασις 87^a5, 24^b29, 25^a12, 27^a8,
 35^b13, 16, 61^b8
 ἀντιφερόμενον 15^a30
 Ἀντιφῶν 85^a17, 93^a12 (-αλῶς)
 ἄνω 88^a24, 5^b32, 12^a27, 17^a3, 55^b21,
 57^a11
 ἄνωθεν 63^a1
 ἀνώλεθρος 3^b14
 ἀνώμαλος 28^b16
 ἀνωμάλως 38^a22, 65^b12 (-αλῶς)
 ἀνώνυμος 26^a20
 ἀξιολόγως 3^a1
 ἀξιῶν 52^a24
 ἀόρατος 4^a4, 26^b11
 ἀύριστος 96^b28, 1^b26, 9^b9
 ἀπάθεια 17^b26
 ἀπαθής 12^b32, 26^a29, 46^b19, 20, 55^a13
 ἀπαλλαγῆ 29^a24
 ἀπαλλάττεσθαι 5^b9
 ἀπαντήσεις 8^a8
 ἀπαντητέον 63^a4
 ἀπαρτίζειν 5^a32
 ἀπατᾶσθαι 29^b4
 ἀπαντος 59^b25
 ἀπειρία 3^a12
 ἀπειρον 2^b30-8^a23 opiniones philoso-
 phorum 85^a33, ^b17, 3^a3, 15, 20,
 6^b28 ἐν τῷ ποσῷ 85^a33 κατ'
 εἶδος (κατὰ πλῆθος 87^b9 ἐν
 τῷ συνεχεῖ 0^b17 τοῦ ἀπείρου οὐκ
 ἔστιν ἀρχή 3^b7 ἡ πίστις ἐκ πέντε
 3^b15-25, 8^a5-22 ποσαχῶς 4^a3
 κατὰ πρόσθεσιν, διαίρεσιν 4^a6, 6^a15,
^b16, 33^a19, 24 χωριστὸν εἶναι οὐχ
 οἷον τε 4^a8-6^a8 δυνάμει εἶναι 6^a18
 κατὰ συμβεβηκὸς ὑπάρχει 4^a29 ἐπὶ
 τὴν αὐξήσιν 4^b3, 7^b28 def. 4^b20,
 7^a1, 7 κατ' ἐνέργειαν 6^a16 ἔστι
 τῷ ἄλλο καὶ ἄλλο λαμβάνεσθαι ib. 27
 ἐπὶ καθαιρέσει 6^b13 ἐν μεγέθει
 κινήσει, χρόνῳ 7^b21 αἴτιον ὡς ὕλη

7^b35 εἰς ἀπειρον ἰέναι, βαδίζειν,
 προίεναι 9^a25, 10^b27, 56^a17, 28, 29,
 25^b34, 42^a54, ^b33 τοῦ ἀπείρου
 οὐθὲν ἔστι μόνον ἢ καταμετρήσει 38^a
 12 ἀπειρον πρὸς ἀπειρον οὐδένα
 λόγον ἔχει 52^a13 ἀρχαὶ ἀπειροί
 84^b18 ἀπειρα τῷ εἶδει 5^a22
 ἀπειρος δακτύλιος 7^a2 τὰ ἀπειρα
 διελθεῖν etc. 33^a22, 38^a33, 63^a6, ^b4,
 65^a20 ἐν ἀπείρῳ χρόνῳ ἀδύνατον
 πεπερασμένην κινεῖσθαι 37^b23-38^b22
 ἀπειροὶ κόσμοι 50^b18 τῶν ἀπείρων
 οὐδὲν πρῶτον 56^a18 οὐδὲν πεπερασ-
 μένον κινεῖν ἀπειρον χρόνον etc. 66^a
¹⁰-24
 ἀπεράντως 4^b21
 ἀπεργάζεσθαι 99^a16
 ἀπίστια 13^a15
 ἀποβάλλειν 30^b29, 47^a18
 ἀπογίνεσθαι 45^a14, 62^a29, 32, ^b16, 20
 ἀποδοτέον 98^b5
 ἀποκείσθαι 92^b1
 ἀπόκρισις 87^b29
 ἀπολείπειν 11^a2, 35^b9, 43^a28
 ἀπόρημα 11^a10
 ἀπορία 85^b11, 2^a21, 8^a33
 ἀποτετμημένη 2^b8
 ἀποτυγχάνεσθαι 99^b3
 ἀπουσία 91^a7, 95^a13, 7^a12
 ἀποφαίνεσθαι 4^a32
 ἄπτεσθαι (πεπεράνθαι 8^a11 def.
 11^a34, 26^b23, 31^a22 ἀπτόμενα
 παθητικά καὶ ποιητικά ἀλλήλων 12^b
 32 (cf. 42^b60) (ἐφεξῆς, συνεχές
 27^a18, 21, 24, 31^b4 ὅλον ὅλον ἄπτε-
 σθαι 31^b3 metaphoricè 91^b35, 94^a
 21, 3^a2 ἀπτός 14^a1 [16^b20])
 ἄπωσις 43^a19, ^b15
 ἀραιώτητες 60^b10
 ἀράχνης 99^a22
 ἀράχνοιον 99^a27
 ἀρετή αἱ μὲν ἀρεταὶ αἱ δὲ κακίαι τῶν
 ἔξω 46^a11, 30 τελειώσις τις 46^a
 13, 20, ^b28, 47^a2 τῶν πρὸς τι 46^a
 30, ^b3-8 ποιεῖ ἢ ἀπαθὲς ἢ ὠδὶ
 παθητικόν 46^b19 (cf. 47^a3) περὶ
 ἡδονᾶς καὶ λύπας 47^a8, 24
 ἀριθμῆν 23^a25, 63^a25
 ἀριθμὸς δοκεῖ ἀπειρος εἶναι 3^b24 ἕνα
 πλείω 7^b7 διχῶς 19^b6 ὁ ἀπλῶς
 (τις 20^a27) (συνεχῆς 20^b3 ἢ
 τὸ ἡριθμημένον ἢ τὸ ἀριθμητόν 23^a24
 ὁ αὐτὸς εἰ ἴσος ἑκάτερος 24^a2 ἀριθμῶ
 ἔν 90^a15 (cf. 42^a69), 62^a21, 63^b13
 τὸ μηδὲν πρὸς ἀριθμόν 15^b13 ἐν
 ἀριθμῶ εἶναι 21^a11, ^b11
 ἀριστέρος 5^b33, 29^b8, 61^b35
 ἀρμύζειν 9^a9, 14^b23
 ἀρμονικῆ 94^a8
 ἀρρῦμστος 93^a11

ἄρρωστία 53^a 33
 ἄρτι 22^b 12
 ἄρτιον 3^a 11
 ἀρχαῖοι 91^a 23, 94^a 19, 96^a 8
 ἀρχή ci. αἴτιον, στοιχείον 84^a 11, 13, 88^b 28 quot 84^b 15-86^a 3, 89^a 11-91^a 22 ἀνελεῖν τὰς ἀρχάς 85^a 2 (cf. 53^b 2) τινὸς ἡτιῶν 85^a 4 τάναντια ἀρχαί 88^a 19-89^a 10 οὐ καθ' ἰποκειμένον 89^a 30 τὸ ὑποκειμένον ἀρχή ib. 3: ἀρχή τοῦ κινεῖσθαι 92^b 21 (cf. ib. 28, 94^b 29, 98^a 36, 11) τὸ τέλος ἀρχή τοῦ λογισμοῦ 0^a 22 τοῦ ἀπέριου οὐκ ἔστιν 3^b 7 οὐκ ἔστιν ἀρχή μεταβολῆς 36^a 14 οὐ συνάπτει τῇ ἀρχῇ τὸ πέρασ 64^b 27
 ἀρχιτεκτονική 94^b 2
 ἀσαφής 84^a 19
 ἀσκοί 13^a 26
 ἀστρολογία 93^b 26, 94^a 8
 ἀσυλλόγιστος 85^a 10 [86^a 8]
 ἀσύμβλητα 17^a 10
 ἀσυμπέραντος 86^a 25
 ἀσχημάτιστος 91^a 2
 ἀσχημοσύνη 88^b 20, 90^b 15
 ἀσώματος 9^a 16
 ἄτακτον 52^a 11
 ἀταξία 90^b 15
 ἀτέλεια 61^a 36
 ἀτελεύτητος 4^a 5
 ἀτελής 1^a 6, 3^b 2, 57^b 8, 61^a 13, 65^a 23
 ἄτομος ἄτομα μεγέθη 87^a 3 (cf. 6^a 17)
 ἄτομον νῦν 22^b 8, 41^a 25 (cf. 35^b 33)
 εἶδος 27^b 7 ἀδύνατον ἐξ ἀτόμων εἶναι τι συνεχές 32^a 24 τὸ ἐφθαρμένον καὶ τὸ γεγονὸς ἐν ἀτόμῳ τὸ μὲν ἐφθαρταὶ τὸ δὲ γέγονεν 36^a 6 ἄτομοι χρόνοι 63^b 27 ἄτομα σώματα 65^b 29
 αὐξάνειν 9^a 27, 45^a 12, 50^a 29, 30
 αὐξέειν 8^a 17, 43^a 38, 45^a 12, 15, 50^a 29
 αὐξή 6^b 28, 32
 αὐξήσις)(φθίσις 1^a 13, 26^a 31, 28^b 21, 41^a 32, 33, 43^a 9 νοητική 8^a 22 κατὰ τόπον 11^a 15, 13^b 5 οὐχ ὁμαλῆς 23^b 20 οὐκ ἐναντία αὐξήσει 30^a 25 πρόσθεσις τις 45^a 27 ὑστέραι γενέσεως 61^a 10
 αὐτό, τό, ἀπλῶς 1^a 32 (cf. 2^b 20) ἀριθμὸς ὁ αὐτὸς 24^a 2
 αὐτόθεν 51^a 21
 αὐτοκίνητος 58^a 2
 αὐτόματος 97^b 15, 16 τὸ αὐτόματον 95^b 31-98^a 13 διαφέρει τύχης 97^a 36, 120, 35 ci. μάτην 97^b 22-32 ὑστερον νοῦ καὶ φύσεως 98^a 10
 ἀφαιρεῖν 53^b 20, 66^b 3
 ἀφαιρέσις 87^b 33, 90^b 7, 45^a 29
 ἀφανῆ 93^a 5
 ἀφή 13^a 9, 27^a 17
 ἀφθαρτον 92^a 28, 3^b 8, 65^a 24

ἀφιέναι 16^a 20, 26^a 23, 53^a 33
 ἀφίστασθαι 91^b 10, 65^b 14
 ἀφωρισμένον 8^a 6
 Ἀχιλλεύς 39^b 14
 ἀχώριστα 88^a 6
 ἀψοφία 44^b 17
 βαδίζειν 85^b 29, 97^b 24, 22^b 10, 31^b 31, 32^a 5
 βάδισις 27^b 18, 28^a 17, 49^a 17
 βάθος 9^a 5
 βάρος 15^a 25, 50^a 9
 βαρὺ κάτω πέφυκε φέρεσθαι 0^a 2, 1^a 8, 5^b 27, 12^a 25, 55^b 16 μένει ἐπὶ τοῦ μέσου 5^b 15 πυκνὸν 17^b 17 (cf. 60^b 9)
 βασιλεύς 10^a 21
 βέλτιον 59^a 11, 60^b 22
 βία 15^a 1, 30^a 29
 βίαιος 15^a 2, 30^a 30, 54^a 9
 βουγενῆ 98^b 32, 99^b 5, 11
 βραδύ 18^b 16, 32^b 16
 βραδυτής 28^b 29
 βῶλος 5^a 12, 12^b 22
 γεγρά 8^b 21, 54^b 22
 γένεσις ἀπλῆ 86^a 14, 93^b 21, 25^a 13 def. 1^a 14, 25^a 12-17 οὐχ ὁμαλῆς 23^b 21 ἰστοαχῆς 49^b 20 εἶναι καὶ μὴ εἶναι ἀνευ γενέσεως καὶ φθορᾶς 58^b 17 ἀδύνατον εἶναι πρώτην 61^a 8 τὰ περὶ γένεσιν φυσικὰ 91^a 3 (cf. 60^b 31, 61^a 15) ἀνελεῖν τὴν γένεσιν 91^b 13 γένεσις βίαιος 30^a 31 αὐξήσις κτλ. ὑστέραι γενέσεως 61^a 11
 γενετῆ 93^a 7
 γενῶν 87^a 15, 56^a 1, 57^b 10
 γένος 89^a 14, 126, 119, 9^a 4, 10^a 18, 27^b 12
 γεωμέτρης 85^a 1
 γεωμετρικός 85^a 16, 17
 γῆ 14^b 14, 32
 γῆρᾶν 30^a 28
 γήρανσις 1^a 19
 γηράσκειν 21^a 31
 γίγνεσθαι ἐκ μὴ ὄντος, ἐξ ὄντος 87^a 28, 91^b 9-27 τὰ ἀπλᾶ, τὰ συγκείμενα 89^b 32, 90^a 9 δεῖ ὑποκεῖσθαι τὸ γιγνόμενον 90^a 15, 34 γίγνεσθαι μετασχηματίζει etc. 90^b 5 τὸ γιγνόμενον συνθετὸν 90^b 11 (cf. ib. 20) τὸ γεγόμενον ἀνάγκη τέλος λαβεῖν 3^b 8 (cf. 61^a 13) γίγνεται οὐδὲν ἀνευ τοῦ κινεῖσθαι 22^b 23 τὸ γεγονὸς ἐν ἀτόμῳ γέγονεν 36^a 6 τὸ γεγονὸς ἀνάγκη γίγνεσθαι πρότερον καὶ τὸ γιγνόμενον γεγονέναι 37^b 10, 15 δ ἂν ᾗ πρότερον μὴ ὄν, ἀνάγκη γίγνεσθαι ὄν 63^b 26 γενητός 1^a 14
 γιγνώσκειν 84^a 12

γλυκαίνεσθαι 44^b7, 23
 γνώμονες 3^a14
 γνωρίζειν 84^a12
 γνώριμος 84^a16
 γνωριστική 94^b4
 γόμφιος 98^b26
 γόμφος 27^a17
 γραμμή φυσική, μαθηματική 94^a10,
 11, 22^a16 άτομοι 6^a18, 33^b13
 οὐκ ἐκ στιγμῶν 15^b18, 31^a24, 41^a3
 διαιρείται πάσα 20^a30 συνεχές 31^a
 25 στιγμῶν μεταξύ γραμμῆ 31^b9
 γραφεῖον 48^b8

 δαιμονιώτερον 96^b7
 δακτύλιος 7^a2
 δεικνύει 93^a4, 59^a27
 δεκτικός 48^b21, 49^a2
 δεξιός 5^b33, 29^b8, 61^b36
 Δημόκριτος ἀρχὰς ἀπέριους 84^b21
 ἐπὶ μικρὸν τοῦ εἶδους ἤψατο 94^a20
 πασπερμία 3^a21 οὐδὲν ἕτερον ἐξ
 ἑτέρου γίνεσθαι τῶν πρώτων ib. 33
 κενόν 88^a22, 13^a34 ἀδύνατον
 ἀπατα γεγονέναι 51^b16 ὡς οὕτω
 καὶ τὸ πρότερον ἐγίγνετο 52^a34
 διὰ τί 94^b19, 98^a23 διὰ πασῶν 94^b28,
 95^a31 δι' οὐ 15^a29, ^b11 δι'
 αὐτό 56^a4 διὰ πλειόνων ib. 6
 διαδοχῆ 28^a28
 διάθεσις 93^a15, 25
 διαίρειν 84^b12, 11^a29, 35, 15^b16, 20^a5,
 39^b19, 23, 54^b31
 διαίρεσις ἀπειρον κατὰ διαίρεσιν 4^a7,
 6^b4, 17, 33^a20, 25 (cf. 36^b15, 37^b
 8, 63^a21) ταῦτο καὶ κατὰ ταῦτο
 ἢ διαίρεσις καὶ ἡ ἔνωσις 22^a19 σχή-
 ματος 24^a9 (cf. 49^a5) τὸ μὴ ὄν
 τὸ κατὰ διαίρεσιν 25^a21 τὸ νῦν
 χρόνον διαίρεσις 62^a30
 διαίρετός 4^a11, 31^b16, 32^b25, 34^a11,
^b10 (cf. 42^a39), 21-35^b5
 διαιτητής 6^a13
 διακοσμεῖν 65^b32
 διακρίνειν 52^a27, 59^b13, 65^b21
 διακρίσις 87^a31, 3^a27, 43^b8, 11, 28,
 60^b11, 65^b19
 διαλαμβάνειν 13^a33, 28^b6, 54^b29,
 64^a20
 διαλέγεσθαι 85^a6, 19
 διαλείπειν 20^a8, 26^b28, 28^b4, 8, 58^b10
 διάλεκτος 4^a16
 διαλύειν 85^a17, 4^b33
 διαμένειν 60^a18
 διάμετρος 21^b24, 22^a5, 64^b15
 διανέμειν 43^b11
 διανοητικός 47^a28
 διάνοια 92^a16, 96^b22, 97^a2, 98^a4, 47^b
 11, 53^a34
 διαπορεῖν 10^b31, 17^b30, 18^a30, 66^b27

διαρροῦν 99^b10
 διάστασις 2^b17, 4^b20, 6^a6, 8^b14
 διάστημα ἐν πρὸς δύο 2^a18 ὁ τόπος
 διαστήματα ἔχει τρία 9^a4 διάστημα
 μεταξύ τῶν ἐσχάτων 11^b7 (cf. ib.
 9, 19, 12^a3, 13^a28, 14^a5, 20, 16^b16,
 32) τὸ αὐτὸ διάστημα 23^a1 (cf.
 16^a35, 37^b35)
 διαστολή 17^b15
 διαφέρειν 24^a8
 διαφορά 13^b8, 26^a28, 49^a4
 διάφορος 15^a12, 28^b30
 διαφύεσθαι 50^b31
 διδάξει 2^a32, ^b2
 διδασκαλικός 2^b7
 διδόναι 63^b20
 διεξελεθῆναι 4^b9, 63^a6, ^b4
 διεξίναμι 6^b9, 38^a23, 66^b13
 διέξοδος 4^a5
 διέρχεσθαι 4^a3, 32^a4, 63^b7, 65^a19, ^b6
 διέναμι 4^a4, 32^a2, ^b19, 38^a36
 διάστασθαι 2^b18, 4^b21
 δίνη 96^a26, 14^a32
 δίνησις 43^a17, ^b17, 44^a2
 διορίζειν 84^a15, 96^b32, 1^b17, 13^b24,
 18^a9, 34^a14
 διόρισις 13^b26
 διχοτομεῖν 39^b19
 διχοτομία 87^a3, 7^b11, [14,] 39^b22
 δίκων 39^b16
 δίωσις 43^b3, 4, 7, 9
 δόγματα 9^b15
 δόξα 13^a22, 53^b1, 54^a29
 δύας 92^a11, 20^a27
 δύναμις τοῦ κινεῖσθαι καὶ ἡρεμεῖν 59^a26
 δυνάμει (ἐντελεχεία 86^a3, 93^b8,
 0^b26, 1^a10, 20, 2^a12, 57^b7, 58^a32
 (cf. 91^b28, 95^b4, 27) ci. ὕλη 93^a
 31-^b8, 7^a22, 17^a23, ^b9 δυνάμει
 εἶναι τὸ ἀπειρον 6^a18, ^b13, 8^a6 τὸ
 δυνάμει πλεοναχῶς λέγεται 55^a31
 = ἰσχύς 50^a2, 7, 66^a25-^b24
 δύνασθαι 95^b4, 1^a35, 6^a24
 δυνατόν 51^b1, 56^b11
 δυσκίνητον 26^b12
 δυσκολία 11^a10, 39^b11
 δυστυχία 97^a27
 δυσχερῆ 25^a30

 ἐγγύτερον 95^b2, 97^a24, 60^b3
 ἐγείρεσθαι 53^a20, 59^b13
 ἐθέλειν 95^a25
 εἰδέναι 84^a10, 87^b11, 94^b18
 εἶδος κατ' εἶδος (κατὰ πληθος 87^b9
 ci. μορφή, λόγος 93^a31, ^b4, 19, 94^b26,
 9^a22 ci. αἴτιον 94^b26, 95^a21, 98^a24
 ἐν τῇ ὕλῃ 10^a21 τῶ εἶδει ἐν, δύο
 86^a19, 90^b24 τὰ ἐναντία διαφορὰς
 καὶ εἶδη 87^a20 κινήσεως εἶδη 1^a9
 (cf. 56^b31) τόπου εἶδη 5^b32

τόπος οὐκ εἶδος 9^a 21 (cf. ^b 3, 23)
 εἶδη ci. τόποι 60^a 9
 εἰδότης 88^a 5
 εἰλησις 97^a 23
 εἰλικρινῶς 87^b 4
 εἰμαρμέναι 30^a 32
 εἶναι πολλαχῶς λέγεται τὸ ὄν 85^a 21,
 86^a 25 (cf. 6^a 21) τὸ εἶναι τι
 85^b 22, 25, 86^a 29, 90^a 17, 91^a 1,
 1^a 32, 2^b 16, 4^a 23, 13^a 19, 19^a 21, ^b 11,
 29^a 18 (cf. 2^b 9, 17^a 24, 19^b 27, 22^a 20,
 29^a 29, 62^b 9) οἱ μὲν τὸ ἔστιν ἀφείλον
 85^b 27 (cf. ib. 30) ὅσα ἀπλῶς ὄντα
 90^b 2 ὄν ci. οὐσία 91^a 12 τὸ εἶναι
 τίνος 21^a 5, 9, ^b 5, 15, 27, 31 τὰ
 αἰεὶ ὄντα 21^b 3 εἶναι καὶ μὴ εἶναι
 ἄνευ γενέσεως καὶ φθορᾶς 58^b 17 μὴ
 ὄν 86^b 9, 87^a 5, 25^a 20
 εἶργειν 5^b 11
 εἰς ὃ 24^a 35, ^b 7, 28^b 26, 29^a 25
 εἰσιόντα 59^b 12
 εἰσπνευσις 43^b 26
 εἰσπνοή 43^b 12
 ἐκ ἐξ οὗ 86^a 19, 93^b 18, 94^b 24,
 95^a 19, 24^b 2 οὐ μόνον τότε γίνε-
 σθαι ἀλλὰ καὶ ἐκ τοῦδε 90^a 6
 ἐκρίνειν 87^a 20, 23, ^b 23, 24, 88^a 1
 ἐκκρισις 87^b 21
 ἐκκριτικά 43^b 14, 27
 ἐκκρούειν 64^a 10
 ἐκπνευσις 43^b 26
 ἐκπνοή 43^b 12
 ἐκπυρρῆζειν 14^a 33
 ἐκστασις 41^b 2, 46^a 17, ^b 2, 47^a 3
 ἐκστατικός 22^b 16
 ἐκτείνειν 55^b 23
 ἐκτελέθειν 50^b 31
 ἐκτρέπεσθαι 91^a 26, ^b 32
 ἐκφυόμενα 53^b 15
 ἐλαιόπρῃρα 99^b 12
 ἐλαττον 32^b 13
 ἔλιξ 28^b 24
 ἔλκειν 44^a 3
 ἔλληψις 87^a 17, 89^b 11
 ἔλιξις 43^a 17, ^b 5, 14, 25, 44^a 8, 16, 20
 Ἐμπεδοκλῆς μῆγμα 87^a 22 πεπερα-
 σμένα λαμβάνει 88^a 17, 89^a 15 τοῦ
 εἶδους ἤψατο 94^a 20 οὐκ αἰεὶ τὸν
 ἀέρα ἀνωτάτω ἀποκρίνεσθαι 96^a 20
 ἐν μέρει κινεῖσθαι καὶ ἡρμεῖν 50^b 26,
 52^a 20 φιλία καὶ νεῖκος 52^a 7
 verba citantur 96^a 22, 98^b 32, 99^b 9,
 50^b 30
 ἐμπύπτοντα 14^a 23
 ἐμποδίζειν 99^a 11, ^b 18, 15^a 21, 55^b 7
 ἐμποδιστικός 15^b 11
 ἐμποιεῖν 50^b 26
 ἐμπροσθεν 5^b 32, 39^b 16
 ἐμφαίνεσθαι 0^b 17
 ἐμφυτος 92^b 19

ἐμψυχον 55^a 7, 59^b 2, 65^b 34
 ἐν ποσαχῶς 10^a 14 ἐν ἐαντῷ ib. 25
 ἐν χρόνῳ 20^b 32-22^a 9 ἐν ᾧ =
 χρόνος 24^a 35, 36^b 3, 66^a 14 ἐν ᾧ
 κινεῖται 26^b 30, 27^b 19, 24, 29, 35^a 35,
 62^a 4
 ἐν οἱ λέγοντες εἶναι ἐν τὰ πάντα 85^a 22
 πολλαχῶς λέγεται 85^b 6, 27^b 3 δυνά-
 μει) (ἐντελεχεία 86^a 3 ἐν τὸ σῶμα
 τὸ ὑποκείμενον 87^a 13 ἀριθμῷ
 90^a 16, 62^a 21, 63^b 13 (cf. 92^a 2,
 2^a 20) τὸ ἐν ἀδιαίρετον 7^b 6 ὁ
 ἀριθμὸς ἓνα πλείω ib. 7 ἐν μᾶλλον
 ἢ πολλὰ δεῖ νομίζειν 59^a 8
 ἐναντίον τὰναντία ἀρχαί 88^a 19-
 89^a 10 ὑπ' ἀλλήλων πάσχειν ἀδύ-
 νατον 90^b 33 (cf. 91^a 5) τὸ ἐναντίον
 ὀρέγεσθαι τῆς αὐτοῦ φθορᾶς 92^a 19
 φθαρτικά ἀλλήλων ib. 22 πάντα
 μεταβάλλει ἐξ ἐναντίου εἰς ἐναντίον 5^a 6
)(ἀντίφασις 24^b 29, 25^a 12 κατὰ
 τόπον 26^b 32, 29^b 7-9, 64^b 15 ἐπι-
 στήμη τῶν ἐναντίων μία 51^a 30 τὸ
 αὐτὸ πλείον ἐναντίον 61^b 16
 ἐναντιότης 87^a 20, 19^a 24
 ἐναντιώσις 90^b 27, 17^a 23, 26^a 26, 29^a 23,
 30^b 11, 61^b 36
 ἐναπολαμβάνειν 3^a 11, 13^a 27
 ἐνδέχεσθαι 3^b 30
 ἐνδιδόναι 87^a 1
 ἐνεκα οὐ ἔνεκα 94^a 27, ^b 33, 98^a 24,
^b 4, 99^a 32, ^b 19, 0^a 14, 22, 34, 43^a 32
 διχῶς τὸ οὐ ἔνεκα 94^a 36 ἐνεκά του
 96^b 21, 98^b 17, 28, 99^a 11, 12, 0^a 8
 τίνος ἔνεκα 98^a 20, 0^a 33
 ἐνέργεια 91^b 28, 28^a 14, 51^a 9, 55^a 35
 ἐνεργεῖν 95^b 5, 17, 28, 2^a 6, 51^a 9, 55^b 21
 ἐνεργητικός 2^a 17
 ἐνεστῶς 22^b 14
 ἐνόησις 22^a 19
 ἐντελέχεια τοῦ δυνάμει ὄντος ἢ τοιοῦτον
 1^a 11 (cf. ib. 17, 28) ci. ὕλη 13^a 7
 ἀτελής 57^b 8 ἐντελεχεία) (δυνά-
 μει 86^a 3, 93^b 7, 0^b 26, 1^a 10, 20, 2^a 11,
 57^b 7, 58^b 2
 ἐντιθένα 16^a 33
 ἐντὸς αἰτίου 97^b 37
 ἐνυπάρχειν 87^a 32, ^b 15, 91^b 16, 92^a 30,
 93^a 10, 94^b 24, 33^b 35, 35^b 3, 38^b 15
 ἐνωσις 22^a 20
 ἐξαιρεῖν 18^b 26
 ἐξαίφνης 22^b 15
 ἐξελέγχειν 13^a 23
 ἔξις 93^a 25, 23^a 19, 45^b 7, 22, 46^a 10
 ἐξιστάναί 16^a 28, 21^b 3, 22^b 15, 61^a 20
 ἐξω αἰτίου 97^b 20, 36
 ἐξωθεῖν 53^b 16
 ἐξωτερικός 17^b 31
 ἐπαγωγή 85^a 14, 24^b 30, 29^b 3, 52^a 24
 ἐπακολουθεῖν 43^a 19

ἐπακτικῶς 10^b 8
 ἐπαμφοτερίζειν 5^a 28, 59^a 25
 ἐπεκτείνεσθαι 16^b 29, 17^b 9
 ἐπιβλέπειν 90^a 14, 59^a 21
 ἐπιγίγνεσθαι 59^a 2
 ἐπιζευγνύουσι 26^a 27
 ἐπιλανθάνεσθαι 21^a 32
 ἐπίπεδα 93^b 24
 ἐπισκεπτέον 95^b 36
 ἐπισκοπεῖν 18^b 9, 64^a 8
 ἐπίστασθαι 47^b 11
 ἐπίστασις 96^a 36
 ἐπιστήμη 27^b 13, 47^b 10
 ἐπιστήμων 47^a 29, ^b 2-18, 24, 25, 55^b 23
 ἐπιστηγός 89^a 13, 91^a 8
 ἐπιτελεῖν 99^a 16
 ἐπιφάνεια 9^a 8
 ἐπιχειρεῖσθαι 99^b 2
 ἐπωσις 43^a 18, 26
 ἔρανος 96^b 34
 ἐργάζεσθαι 3^a 31
 ἔργον πρὸ ἔργου 51^a 5
 ἔριστικός 85^a 8
 ἔριστικός 86^a 6
 Ἐρμῆς 90^b 7
 ἔρωτων 63^a 15
 ἔσχατον 94^a 30, 32, 33^a 18, 25, 42^a 66,
 44^b 4, 45^a 4
 ἑτεροίωσις 17^b 26
 ἑτερότης 1^b 20, 49^b 23
 εὐδαιμονία 97^b 4
 εὐδαιρέτος 15^a 31, ^b 11
 εὐεξία 95^a 9, 46^b 5
 εὐεργός 94^a 34
 εὐηθικώτερον 18^b 8
 εὐθεία 48^a 13, 19, 20, ^b 5, 61^b 29, 62^a 12-
 63^a 3, 64^a 28, ^b 19, 65^a 15 εἰς εὐθύ
 17^a 20
 εὐθυφορία 27^b 18
 εὐλόγως 97^a 12, 31, 12^b 30, 20^b 24,
 56^b 13
 εὐπράξια 97^b 5
 εὐρύστερνος 8^b 31
 Εὐρώπη 24^b 21
 εὐτυχεῖν 97^b 2
 ἐφάρμοττειν 1^b 14, 28^b 25
 ἐφέτης 27^a 4, 18, 59^a 17, 20, 67^a 14, ^b 11
 def. 26^b 34, 31^a 23, ^b 8
 ἐφετόν 92^a 17
 ἐφιστάναι 51^a 22, 62^a 24
 ἐχόμενος 27^a 6, 10, 36^b 12, 37^b 8, 67^a
 15, ^b 15

 Ζεὺς 98^b 18
 ζῆν 61^a 16
 Ζήνων 9^a 23, 10^b 22, 33^a 21, 39^b 5-40^b 7,
 50^a 20, 63^a 5
 ζῶη 50^b 14

ζῶον 52^b 22, 53^a 12, 54^b 15, 65^b 34
 ζωτικόν 55^a 6

 ἦδη 22^b 7
 ἦδοναί 47^a 8, 24
 ἦθικός 47^a 7
 ἦλιος 94^b 13
 ἦλος 11^a 21
 ἡμέρα 6^a 22, 31, 30^b 5
 ἡμικύκλιον 64^b 24
 ἡμισυς 63^a 5, 23, 26, 28, ^b 8
 Ἡρακλείτειος 85^a 7
 Ἡράκλειτος 85^b 20, 5^a 3
 ἡρεμῖν def. 21^b 12, 26^b 14, 34^a 32, ^b 5,
 39^a 13, 15, 26 (cf. ^b 1), 40^b 30 ἢ
 ἡρεμεί ἢ κινεῖται πᾶν 32^a 12, 38^b 23
 [39^b 5] οὐκ ἐνδέχεται ἡρεμίζεσθαι τὸ
 ἡρεμοῖν 38^b 26 ὡς Ἐμπεδοκλῆς ἐν
 μέρει κινεῖσθαι καὶ ἡρεμῖν 50^b 27
 ἡρεμεί τινα τῶν ἀντικειμένων ἡρεμοῖν
 64^a 23
 ἡρέμησις 26^a 7, 30^a 4, 31^a 2, 38^a 18, 51^a 26
 ἡρεμία def. 2^a 5 ὁ χρόνος ἡρεμίας μέτρον
 21^b 8 στέρησις 26^b 15, 29^b 25,
 64^a 27 κινήσει ἐναντία ἡρεμίας 29^b 23-
 31^a 4, cf. 64^a 24 ἡρεμία ἀντικεί-
 μεναι 30^a 1 παραχῆς ἡρεμία 47^b 30
 ἡρεμίζεσθαι 38^a 21, ^b 25, 48^a 2
 ἥρωες 18^b 24
 Ἡσίοδος 8^b 29
 ἡσυχάζειν 52^b 19
 ἦττον 26^b 7, 29^a 2

 θάπτον 15^a 25, 22^b 33, 32^a 25, 33^b 20
 θεά 9^b 20
 θεῖν 40^b 19
 θεῖος 92^a 17, 96^a 33, ^b 6
 θεμέλιος 0^a 4, 37^b 13
 θερμαντόν 24^a 30
 θερμόν 55^a 23, 60^b 9
 θέσις 85^a 5, 88^a 23, 5^b 34, 54^b 24
 θεωρεῖν 4^b 10, 8^a 33, 55^b 2
 θεωρητέον 93^b 23, 94^a 14
 θεωρία 0^b 24, 7^b 28, 50^b 17
 Θῆβηθεν 2^b 13
 θίξις 2^a 7, 8
 θριγκός 46^a 18
 θριγκουμένη 46^b 19
 θύραι 13^b 2

 ἰᾶσθαι 49^a 31
 ἰάτρευσις 93^b 14, 15, 1^a 18, 2^b 28
 ἰατρική 93^b 14, 15
 ἰατρός 92^b 24
 ἰδέαι 93^b 36, 3^a 8
 ἴδιος 89^b 32, 9^a 33
 Ἴλιον 22^a 23, ^b 11
 ἰσάζειν 4^b 13
 ἰσοπαλές 7^a 17

ἰσόπλευρον 24^a5
 ἰσοταχῆς 16^a20, 32^a20, ^b16, 49^a13,
 29, ^b20
 ἰσοταχῶς 37^b27, 38^a4
 ἰσάναμι 30^b26, 31^a5, 38^b23-39^a10,
 62^a8
 ἰσχυασία 94^b36
 ἰσχυρός 13^a26
 ἰσχὺς 50^a6, 8, 18

 [κάδος 11^b3, 5]
 καθαίρειν 37^b9
 καθαίρεισι 6^b13, 29, 31, 7^a23, 8^a21
 καθεύδειν 18^b24, 59^b12
 καθίστασθαι 47^b17, 25, 48^a2, 27
 καθόλου 84^a23, 89^a5, 0^b22, ^b23,
 47^b6, 20, 64^a21
 κακία αἱ μὲν ἀρεταὶ αἱ δὲ κακίαι τῶν
 ἔξεων 46^a11, 30 ἢ κακία φθορά
 46^a16, ^b30 τῶν πρὸς τι 46^a30, ^b3-8
 ἐκστάσις 46^b1, 47^a3 περὶ ταῦτα
 ὑφ' ὧν ἀλλοιοῦνται τὸ ἔχον 46^b18
 ποιεῖ παθητικὸν ἢ ἐναντίως ἀπαθές
 46^b20 (cf. 47^a23) κακίας ἀποβολή
 47^a21
 κακοποιόν 92^a15
 καμπύλον 94^a7
 καρπός 99^a25
 κατακλυσμός 22^a23, 26
 καταλαμβάνειν 96^a4, 39^b15
 καταμετρεῖν 21^a2, 33^b3, 37^b28, 38^a7,
 12, 41^a13, 66^b23
 καταναλίσκειν 66^a19
 κατανοεῖν 11^a12
 κάταντες 2^a20, 48^a22
 καταπατεῖν 97^b11
 κατάστασις 47^b30
 κατατήκειν 21^a31
 κατατρίβειν 53^b15
 κατηγορία 92^b17, 0^b28, 1^b27, 25^b5,
 27^b5, 42^b5, 35
 κατορύττειν 93^a13
 κάτω def. 12^a26 θέσεως ἄνω κάτω
 88^a25 (cf. 5^b32) κατὰ τὴν φοράν
 τὸ μὲν ἄνω τὸ δὲ κάτω 1^a7 (cf. 29^b7,
 61^b34) ἡμῖν)(ἐν τῇ φύσει 8^b15, 18
 κάτωθεν 62^b32
 κανστικός 51^a16
 κανστόν 51^a15, ^b32
 κέγχρος 21^a22, 50^a20
 κεκλασμένη 28^b24
 κενόν 8^b26, 13^a12-17^b28 Demo-
 criti 88^a23, 13^a34, 65^b24 Pytha-
 goreorum 13^b23
 κέντρον 40^b16, 65^b3
 κεραιδομένη 46^a28
 κεράμιον 11^b4
 κεραμῖς 46^a27
 κέραμος 46^a18
 κεραιδομένη 46^a19

κέρκις 43^b7, 28
 κεφάλαιον 16^a8
 κηρός 45^b11
 κιβώτιον 7^a10
 κινεῖν def. 2^a6 ἀρχὴ τοῦ κινεῖσθαι
 92^b21 τὸ κινήσαν πρῶτον 98^a19
 (cf. 43^a32, 14, 43^a8, 24, ^b1) ὅσα
 κινούμενα κινεῖ 98^a27 (cf. 1^a24, 2^a3,
 30) τὸ κινεῖν ἐνεργεῖ θίξει 2^a6
 (cf. 43^a32-45^b2, 66^b30) εἶδος ἀεὶ
 οἰσεται τι τὸ κινεῖν 2^a9 κινεῖν)
 (κινήτικον ib. 17 κινούμενον καθ'
 αὐτό)(κατὰ συμβεβηκός 11^a17, 24
^a27, ^b23, 26^a19, 41^b38, 54^b7-14
 γίγνεται οὐδὲν ἄνευ τοῦ κινεῖσθαι
 22^b23 ἔστι νῦν κενεῖσθαι καὶ
 ἄλλο 23^b1 κινεῖν, κινούμενον, εἰς ὃ
 κινεῖται 24^b6 κινεῖν, κινούμενον,
 ἐν ᾧ, ἐξ οὗ, εἰς ὃ 24^a34 (cf. 19^a10)
 τι τὸ κινούμενον, ἐν τινι, ποτέ 27^b24
 (cf. 62^a3) κινεῖσθαι)(κενεῖσθαι
 31^b29, 36^b32-37^a9)(ἡρεμεῖν
 32^a12, 38^b23 [39^b6] (cf. 84^b16)
 κινεῖται τὸ κινούμενον ἐν χρόνῳ 34^b8,
 41^a15 (cf. 39^b1) διαιρέσεις τοῦ
 κινεῖσθαι 35^a16 ἐν ἀπειρῷ χρόνῳ
 ἀδύνατον πεπερασμένην κινεῖσθαι κτλ.
 37^b23-38^b22 τοῦ κινεῖσθαι οὐκ
 ἔστιν τι πρῶτον 39^a2 τὸ ἄμερὸς οὐκ
 ἐνδέχεται κινεῖσθαι 40^b9, 58^b25
 ἅπαν τὸ κινούμενον ὑπὸ τινος κινεῖται
 41^b34-43^a31, 56^a14 τὸ ὑφ' ἑαυ-
 τοῦ κινεῖσθαι 41^b39 (cf. 57^a27-58^b
 9, 58^b24) κύκλω, ἐπὶ τῆς εὐθείας
 κινεῖσθαι 48^a20 τὰ κινούμενα
 εἶδει διαφέρει 49^b12 ἅμα κινεῖ
 καὶ κενεῖται ib. 29 τὸ κινεῖσθαι
 γίγνεσθαι τι καὶ φθεῖρεσθαι 54^a11
 φύσει κινεῖσθαι 54^b17, 21, 55^a28
 ἀρχὴ οὐ τοῦ κινεῖν ἀλλὰ τοῦ πάσχειν
 55^b30 κινούμενον, κινεῖν, ᾧ κινεῖ
 56^b15 (cf. ^a22) τὸ πρῶτον κινεῖν
 58^b10-60^a19, 66^a10-67^b26 (cf. 1^a
 27, 42^a53) τὸ τελευταῖον τῶν κιν-
 ούντων 56^a9 τὸ κινεῖν ἤδη ἐνεργ-
 γεία ἔστιν 57^b9 κυρίως κινεῖται τὸ
 κινούμενον κατὰ τύπον 66^a1 οὐχ
 οἶόν τε οὐδὲν πεπερασμένον κινεῖν
 ἀπειρον χρόνον ib. 12
 κινήματα 32^a9, 41^a4
 κινήσις)(στάσις, ἀκινήσις, μονή 92^b14,
 28^b6, 3, 29^a7, ^b29, 30^b18 τί
 ἔστι 0^b12-1^b15, 2^a7 (cf. 1^b31,
 29^a32, 51^a9, 57^b8) οὐκ ἔστι παρὰ
 τὰ πράγματα 0^b32 κινήσεως ἔστιν
 εἶδη ὅσα τοῦ ὄντος 1^a8 (cf. 92^b14,
 25^a34-26^a26, 43^a36, 60^a27, 61^a9,
 31-6) opinioniones philosophorum
 1^b16-2^a12, 50^b15-51^a5 συμβαί-
 νει θίξει 2^a7 (cf. 43^a32-45^b2) ἔστιν

ἐν τῷ κινήτῳ 2^a13-^b22, 24^b25 ἡ
 βία ἢ κατὰ φύσιν 15^a1 (cf. 30^b18,
 54^a9) κινήσεως πρὸς κίνησιν πάσης
 ἐστὶ λόγος 16^a9 (cf. 48^a10-49^b26)
 συνεχῆς διὰ τὸ τὸ μέγεθος εἶναι συ-
 νεχῆς 19^a12 (cf. 31^b18-32^a17,
 32^a23-33^b32) ci. χρόνος 19^b16,
 20^b12-21^a9, 22^a31, 31^b19, 35^a11,
 13, 16 ἐξίστησιν τὸ ἐπάρχον 21^b3
 ὁμαλῆς 23^a2, 28^b15-29^a6 ἐκ τινος
 καὶ εἰς τι 24^b1 (cf. 29^b29) ἐξ
 ἐναντίου ἢ εἰς ἐναντίον 26^b3 (cf. 61^a
 33) (μεταβολή 25^a34-^b5, 29^a31,
^b14 (cf. 25^a26, 32) οὐκ ἐστὶ κινή-
 σεως κίνησις 25^b15 μία πολλαχῶς
 27^b3-29^a6 (cf. 42^a65, ^b41, 59^a18,
 62^a1, 67^a22) τρία περὶ ἃ ἡ κίνησις
 27^b23 οὐκ εἶδη κινήσεως τάχος καὶ
 βραδυτῆς 28^b29 ποία κίνησις ἐναντία
 κινήσει 29^a7-^b22 κινήσει ἐναντία
 ἡρεμία 29^b23-31^a4 ἐν μόνῃ τῇ
 κατὰ τὸ ποιὸν ἐνδέχεται ἀδιαίρετον
 εἶναι 36^b17 οὐκ ἐστὶν ἐν τῷ ἡμερεῖ
 39^a4 Ζήνωνος λόγοι 39^b5-40^b7
 αἱ τῶν μερῶν ἑτεράι εἰσι 40^b13 οὐκ
 ἐκ κινήματων 41^a3 (cf. 32^a8) αἱ
 κατὰ τόπον ἀνάγονται εἰς τέτταρα εἶδη
 43^a18 ἡ φορά πρώτη τῶν κινήσεων
 43^a39, 60^a20-61^a26, 65^b17-66^a5
 (cf. 8^a31) αἰεὶ ἦν καὶ αἰεὶ ἐστὶ
 50^b11-53^a21 οἷον (ζῆτις 50^b14
 ἐνδέχεται τινα εἶναι συνεχῆ καὶ αἰδιον
 61^a30 ἐστὶ τις ἀπειρος, ἡ κύκλω
 61^b27-65^a12 αἱ ἐναντία ἰστάσιν
 ἀλλήλας 62^a6-12 (cf. 64^a28, ^b12-28)
 κινήτικόν 2^a14-16, 55^a21, 57^a15, 20
 κίων 55^b25
 κλέψυδρα 13^a27
 κλίνη 92^b16
 κοινός 89^b31, 90^b25, 9^a32
 κόλλα 27^a17
 κομῆ 97^a1
 Κορίσκος 19^b21, 27^b32
 κοσμοποιεῖν 50^b16
 κοσμοποιία 96^a22
 κόσμος 96^a25, 3^b26, 6^b23, 50^b18,
 52^b26
 κοῦφον 1^a8, 5^b27, 12^a25, 17^b18, 55^b11,
 60^b9
 κρατεῖν 43^b2
 κρίνεσθαι 23^b27
 κρίσιμος 30^b5
 κρίσις [16^b19]
 κυβερνᾶν 3^b11
 κύκλος 84^b11, 22^b2, 46^a15, 48^b6
 κύκλω 17^a19, 48^a20, 65^a14, 25
 κύκλος τὰ ἀνθρώπινα πράγματα 23^b24
 ὁ κύκλος ἡρεμεῖ 40^a29-^b7 κατὰ
 κύκλον (Empedocles) 51^a3 ἐστὶ
 τις ἀπειρος κίνησις, ἡ κύκλω 61^b27-

65^a12 κύκλω) (κύκλον φέρεσθαι
 62^a15
 κυκλοφορία 23^b19, 33, 27^b18 τῶν
 φερῶν πρώτη 65^a13-^b16
 κύλισις 1^a18, 27^b18
 κυμαίνειν 16^b25, 17^a16
 κυρτόν 22^b3
 κυρτότης 17^b3
 κύων 99^a2
 κωλύειν 55^b7
 λαμβάνειν 47^a18
 λαμπάς 28^a28
 λάπαξις 97^b24
 λεαίνειν 98^b26
 λέξις 85^b28
 λευκαίνειν 24^b18, 49^b17
 λεύκανσις 24^b15, 27^b8-11, 30^a23
 Λεύκιππος 13^a34
 λευκόν 88^b24, 1^a5, 48^b22
 λευκότης 17^b7, 24^b15
 λευκοῦσθαι 85^b29
 ληπτικός 43^b14, 27
 λήψις 29^a25, 45^b8, 46^b13, 47^a5
 λίθος 97^b10, 53^b16, 67^a2
 λίνος 7^a17
 λογικός 2^a22
 λογικῶς 4^b4
 λογισμός 0^a23
 λογιστικόν 10^a30
 λόγος) (ὀνόματα 84^b10 τὰ λόγους
 ἕνεκα λεγόμενα 85^a6 (cf. ib. 8) ὀρι-
 στικὸς λόγος 86^b24) (αἰσθησις
 88^b32, 89^a4-9 τοῦ τί ἦν εἶναι
 94^b27, 2^b12) (τύχη 97^a19 τὸ
 οὐ ἕνεκα ἐν τῷ λόγῳ 0^a15 εἶδος καὶ
 λόγος 9^a22 (cf. 93^a31, ^b5, 94^b27,
 10^a20) τῷ λόγῳ ἄλλο 19^b20 (cf.
 62^a21, 63^b13) λόγοι ὁμώνυμοι
 48^b17 πρότερον λόγῳ 65^a23
 Λύκειον 19^b21
 Λυκόφρων 85^b28
 λύπαι 47^a8
 λύσις 86^a23, 63^a15
 λώπιον 85^b20, 2^b13
 μαθήματα 94^a8, 98^a17, 0^a15
 μαθηματικός 93^b23-94^a12, 3^b25, 8^b23,
 22^a15
 μάθησις 1^a18, 2^a32, 27^b13
 μακρός 20^b2
 μαλακόν 17^b18, 60^b9
 μανθάνειν 87^a8, 29^b4
 μανόν 88^a22, 16^b22, 30, 35, 17^b10, 12
 μανότης 87^a15
 μάνωσις 12^b3, 17^a12, 60^b11
 μαρτυρεῖν 65^b17
 μαρτύριον 13^b21
 μάταιος 97^b25

- μάτην 97^b 22-32, 3^b 5
 μάχασθαι 54^a 8
 μέγας 87^a 17, 92^a 7, 3^a 16, 9^b 35, 52^b 27
 μέγεθος ἄτομα μεγέθη 87^a 3 οὐκ
 ἔστιν ἰλάχιστον μέγεθος 88^a 12 (cf.
 39^a 21) μαθηματικὰ μεγέθη 3^b 25
 μέγεθος αἰσθητῶν ἄπειρον 4^a 1 (cf. 6^a 16,
 67^b 21) ci. χρόνος 19^a 10-25, 33^a
 14 (cf. 33^b 15, 63^a 15) ἀκολουθεῖ
 τῷ μεγέθει ἢ κινήσει 19^a 11 οὐκ
 ἐνδέχεται ἄπειρον εἶναι δύναμιν ἐν
 πεπερασμένῳ μεγέθει οὐδ' ἐν ἀείρῳ
 πεπερασμένην 66^a 10-^b 27 ἀνάγκη
 τὴν μίαν κίνησιν μεγέθους εἶναι ἐνός
 67^a 21
 μέδιμος 50^a 22
 μεθίστασθαι 16^b 1, 47^b 14
 μέθοδος 84^a 11, 0^b 13, 51^a 7, 53^b 7, 61^a 30
 μέθυ 85^b 9
 μελάνια 44^b 17, 64^b 8
 μέλανις 27^b 8, 30^a 23
 Μέλισσος 84^b 16, 85^a 9-86^a 22, 7^a 15,
 13^b 12, 14^a 27
 μερίζειν 4^a 34
 μέρος ἀπορία περὶ τοῦ μέρους καὶ τοῦ
 ὅλου 85^b 11-16 ἢ αἰσθησις τοῦ κατὰ
 μέρος 89^a 8 (cf. 47^b 20) τὰ μέρη τῶν
 ζῴων 92^b 9 τὰ μέρη τὰ ἐν τῷ λόγῳ
 94^b 29 (cf. 10^a 19) τόπου μέρος
 8^b 12 τὸ μέρος ἐν τῷ ὅλῳ)(τὸ
 ὅλον ἐν τοῖς μέρεσιν 10^a 16 μετρεῖ
 τὸ μέρος, καὶ σύγκειται τὸ ὅλον ἐκ τῶν
 μερῶν 18^a 7 ἐπίσταται τὰ καθόλου
 τῶν ἐν μέρει 47^b 6
 μέσος 19^a 27, 24^b 33, 29^b 19, 62^a 19-28,
 64^b 32
 μεσότης 51^b 20
 μεσσοθεν 7^a 17
 μεταβάλλειν κατ' οὐσίαν, κατὰ ποσόν,
 κτλ. 0^b 33 ἐξ ἐναντίου εἰς ἐναντίον
 5^a 6 (cf. 35^b 6) κατὰ συμβεβηκός,
 τῷ τούτου τι μεταβάλλειν, τῷ αὐτῷ
 κινεῖσθαι 24^a 21-30 (cf. ib. 30-34,
 16-26) τετραχῶς 25^a 3 τὸ
 μεταβάλλον ἀνάγκη διαιρετὸν εἶναι
 34^b 10, 36^a 30 (cf. 36^a 27-35)
 ἀνάγκη τὸ μεταβεβηκός, ὅτε πρῶτον
 μεταβεβηκκεν, εἶναι ἐν ᾧ μεταβέβλη-
 κεν 35^b 6-30 ἐν ᾧ πρῶτω μετα-
 βέβληκεν τὸ μεταβεβηκός, ἀνάγκη
 ἄτομον εἶναι ib. 32-36^a 7 οὐκ ἔστιν
 ἐν ᾧ πρῶτω μεταβάλλει 36^a 7-27 (cf.
 19-37^b 22) ἐν τῷ νῦν οὐκ ἔστιν
 μεταβάλλειν 37^a 14 τὸ ἀκίνητον
 οὐδὲν μεταβάλλει πρὸς τὸ κινούμενον
 60^a 5
 μεταβλητός 51^a 15
 μεταβολή μεταβολῆς ἔστιν εἶδη ὅσα
 τοῦ ὄντος 1^a 8 πᾶσα ἐν χρόνῳ 22^b 31
 μᾶλλον εἰς δ' ἢ εἰς οὐ κινεῖται ὀνομάζεται
 24^b 8, 29^a 25 ἕκ τινος εἰς τι 25^a 1,
 34^b 11, 41^a 27, 52^b 10 (cf. 27^a 7,
 35^b 13, 61^a 33) μεταβολῆς etymon
 25^a 1 ἀνάγκη τρεῖς εἶναι μετα-
 βολάς 25^a 7-^b 3 οὐκ ἔστι μεταβολῆς
 μεταβολή 25^b 15-26^a 23 διαφέρει
 κινήσεως 29^a 31 (cf. 25^a 34-^b 5, 29^b
 13) ἀντικειμένη 30^a 8 (cf. 61^b 21)
 συνεχῆς 35^b 24 οὐκ ἔστιν ἀρχή
 μεταβολῆς 36^a 14 τρία ἔστιν ἃ
 λέγεται κατὰ τὴν μεταβολὴν 36^b 2
 οὐκ ἔστιν οὐδεμία ἄπειρος 41^a 26, 12
 (cf. 65^a 11)
 μεταλαμβάνειν 33^a 5
 μεταληπτικόν 9^b 12, 14
 μεταξύ 26^b 23, 27^a 9, 31^b 8
 μεταρρυθμίζειν 85^b 28
 μετάστασις 16^a 30
 μετασημάτις 90^b 5
 μεταφορητός 9^b 29
 μετρεῖν 18^a 6, 65^b 10
 μέτριον 61^b 19
 μηδέν 15^b 13
 μήκος 9^a 5, 29^b 7, 63^a 14
 μήτηρ 84^b 14, 92^a 14
 μήγμα 87^a 23
 μινύναι 87^b 1
 μικρός 87^a 17, 92^a 7, 97^a 28, 30, 3^a 16,
 10^a 1, 52^b 26
 μικτός 61^b 29, 65^a 15
 μνεία 96^a 17, 65^b 18
 μόλις 17^b 32, 26^b 11
 μονάς 6^b 31, 27^a 28
 μοναχού 3^b 27
 μοναχῶς 85^b 31, 40^b 31, 51^a 28
 μονή 5^a 17, 29^a 8, 28-30^b 21
 μορφή)(ὑποκείμενον, ἕλη 90^b 20,
 91^a 10, 93^a 30, 99^a 31 ci. εἶδος
 93^a 30, 4, 19 ci. φύσις 93^a 30-
 21 ci. τί ἐστίν 98^b 3 ci. τέλος
 98^b 3, 99^a 31)(στήρσις 1^a 4 ci.
 σχῆμα 45^b 7, 22, 46^a 1
 μοχλία 59^b 20
 μοχλός 55^a 22
 μυθολογούμενα 18^b 24
 μυριάκις 58^b 32
 μυριστόν 18^a 28
 μύρμηξ 99^a 23
 ναυπηγική 99^b 29
 νείκος 50^b 28, 52^a 8, 26, 65^b 21
 νεωκλία 53^b 18
 νεωκλός 50^b 18
 νήτη 24^b 34, 48^b 8
 νήφων 48^a 5, 26
 νόσις 93^b 34, 8^a 16, 22^a 16
 νοητά 4^b 1, 9^a 18
 νοητικός 8^a 22, 47^b 1
 νοῦς 98^a 10, 3^a 31, 50^b 26, 56^b 25, 65^b
 22

νῦν, τό ci. χρόνος 18^a6-20^a26, 21^a
 13-17, 22^a10-20, 33^b33-34^b9, 41^a
 15, 62^a30 οὐ μέρος χρόνου 18^a6,
 20^a19 πέρας χρόνου 18^a24 (cf. 22^a
 33, 34^a5, 5, 62^a30) συνάπτουσι
 τῷ πρότερον νῦν τὸ ὕστερον 18^b25
 τὸν χρόνον ὀρίζει 19^b12 ἔστι μὲν
 ὡς τὸ αὐτό, ἔστι δ' ὡς οὐ τὸ αὐτό ib.
 12-28 συνεχῆς ὁ χρόνος τῷ νῦν, καὶ
 διήρηται κατὰ τὸ νῦν 20^a5, 22^a10-20
 duo sensus 22^a20-24 ἄτομον νῦν
 22^b8 τῶν νῦν αἰεὶ μεταξύ χρόνος
 31^b10, 37^a6, 10 ἀδιαίρετόν ἐστι,
 καὶ ἐν ἀπαντι χρόνῳ ἐνυπάρχει 33^b
 33-34^a24 οὐθὲν ἐν τῷ νῦν κινεῖται
 οὐδ' ἡρεμεῖ 34^a24-9, 37^a14, 39^b2,
 41^a24 ἀδύνατον καὶ εἶναι καὶ νοῆσαι
 χρόνον ἀνευ τοῦ νῦν 51^b20 χρόνον
 διαίρεισι 62^a30
 νωδὸν 25^b5

Ἔσθθος 16^b26

ὅ ποτε ὄν 19^a20, 14^b18, 26, 20^a8,
 23^a27

ὄγκος 3^b28, 9^a3, 13^a17, 16^b6, 39^b34
 ὄδε τόδε τι 91^a12, 14^a12

ὄδος 20^b30

ὄδοις 98^b24, 0^b6

οἰκεῖος 12^b33, 46^b9, 53^b34, 64^a7, 12^b
 οἰκία 88^a15

οἰκοδόμησις 1^a18, 1^b9

οἰκοδομικόν 96^b26

οἶνος 85^b9, 48^b8

ὄιστός 39^b7, 30

ὄλον 84^a24, 86^b25, 95^a21, 7^a9, 10^a16,
 16^b25, 18^a33, 28^b14

Ὀλύμπια 6^a24

ὄμαλῆς 23^b19, 28^b16, 28, 67^b3

ὄμαλός 23^a1, 28^b20, 23, 29^a3

Ὀμηρος 21^b32

ὀμογνωμονεῖν 87^a35

ὀμοειδής 88^a13, 5^a13, 12^b1

ὀμόζυξ 97^b11

ὀμοιομερής 3^a21, 12^b5

ὀμοιότροπος 51^a31

ὀμοιοσητικῶς 51^b14

ὀμοταχῆς 37^a1, 48^a11, 49^a8

ὀμοταχῶς 36^b35

ὀμοῦ 87^a29, 3^a25, 50^b25

ὀμωνυμία 49^a23, 25

ὀμώνυμος 2^a28, 28^a25, 48^b9, 49^a4

ὀμώνυμος 45^b16, 46^a22

ὀνόματα)(λόγος 84^b10

ὀξύς 24^b33, 48^b8

ὄπερ ὄν 86^a33-87^a11 ὄπερ ἔν 86^a34

ὄπληκοσούν 87^b13, 7^b32

ὄπισθεν 88^a25, 5^b33

ὄποισοῦν 89^a24, 53^b23, 65^a33

ὄποσαπλασιονοῦν 4^b17

ὄποσοσούν 13^b8

ὄποτεροσούν 34^b19, 38^b3

ὄπτικῆ 94^a8, 11

ὄπωσοῦν 2^b5

ὄρεςις 53^a17

ὄρξειν 93^b2, 9^a5, 14, 19^a22, 20^b16

ὄρισμός 98^a17, 0^a35

ὄριστικός 86^b23

ὄρμάν 39^b17

ὄρμή 92^b18

ὄρος 61^a34

ὄτιοῦν 88^a34

οὐδὲ μὴν 45^a11

οὐδένων 34^b33

οὐλοφύεις 99^b9

οὐρανός τὸν οὐρανὸν ἀπὸ τοῦ αὐτομά-
 του γενέσθαι 96^a33 εἶναι τὸ ζῆω τοῦ
 οὐρανοῦ ἀπειρον 3^a7, 25 (cf. 13^b23)
 οὐ που ὅλος 12^b8 ἐν τῷ οὐρανῷ πάν-
 τα ib. 17 κυμαεῖ 17^a13 ἐν τῇ
 κέγχρω 21^a22 τὸν οὐρανὸν γεγον-
 ἐναι (Plato) 51^b19 τῶν ἐν τῷ οὐ-
 ρανῷ εἶναι ἀρχαί 59^b30

οὐσία)(ποσά, ποιά 85^a23 (cf. ib. 34)

οὐδὲν τῶν ἄλλων χωριστόν παρὰ τὴν

οὐσίαν ib. 31 ἐν τι γένος 89^a14, 23

οὐθενός τῶν ὄντων οὐσία τάναντία

89^a29 πᾶς ἐκ μὴ οὐσιῶν οὐσία

ἂν εἶη; ib. 33 ἀπλῶς γίνονται αἱ

οὐσία μόνον 90^a33 (cf. 25^a16) ci.

τόδε τι, ὅν 91^a11, 14^a12 τὰ φύσιν

ἔχοντα οὐσία 92^b33 ci. φύσις 93^a9,

20)(συμβεβηκόσι 3^b33 ci. τὸ

εἶναι 21^b31, 63^b9 τὸ ποιοῦν τὸ ἐν

τῇ οὐσίᾳ 26^a28 ἥκιστα τῆς οὐσίας

ἐξίσταται τὸ κινούμενον τῶν κινήσεων

ἐν τῷ φέρεσθαι 61^a20

ὄφθαλμία 28^a2

ὄχησις 43^a17, 17

παθήματα 16^b5, 60^b8

πάθησις 2^a23-22

παθητικόν 2^a23, 12^b32, 26^a29, 46^b20,

55^a35

πάθος)(οὐσία 85^a34 τὰ πάθη ἀχώ-

ριστα 88^a6, 13 καθ' αὐτὸ πάθος

4^a19)(ὕλη 9^b10 ci. ἑτεροίωσις

17^b26 (cf. 45^a20, 46^a2, 48^a15) τὰ

πάθη, εἰς ἃ κινούνται τὰ κινούμενα,

ἀκίνητα 24^b11 ὀμάνυμος τῷ πάθει

προσαγορευόντες τὴν ὕλην 45^b16,

46^a22

παιδία 84^b12, 47^b19

πάλαι 22^b14

παλαιός 96^a14

πάλιν καὶ πάλιν 20^b13, 27^b17, 67^b11

πάν 98^a13, 7^a12, 12^b16, 18

πανσπερμία 3^a21

πάντη 15^a24, 22^a17

παράδειγμα 94^b26

παρακολουθεῖν 21^a24
 παραλογίζεσθαι 86^a10, 39^b5
 παράλογον 97^a18
 παρανήτη 48^b9
 παράπαν 92^a16
 παραπλήσιος 28^a7
 παρεμφαίνεσθαι 12^a8, 24^a1
 παρήκων 22^b1, 34^a14
 Παρμενίδης ἀκίνητον εἶναι τὴν ἀρχὴν
 84^b16 πεπερασμένον τὸ ὄν 85^b18, 7^a15 τὰ ὄντα ἐν εἶναι 86^a7,
 22-87^a11 ἐριστικῶς συλλογίζεται
 86^a7 (cf. 85^a9) θερμὸν καὶ ψυχρὸν
 ἀρχὰς ποιεῖ 88^a20 ἀπλῶς γίγνεσθαι
 τὴ ἐκ μὴ ὄντος 92^a1
 παρουσία 91^a7, 95^a14
 Πάρων 22^b18
 παρώνυμα 7^b9
 παρωνυμάζειν 45^b11, 28
 πάσχειν 25^b14, 45^b13
 πατήρ 84^b13
 παύειν 48^a27, 62^a8
 παχύτερον 15^a31
 περαίνειν 3^b21, 7^a16, 8^a11, 23^b6
 πεπερασμένος 84^b18, 85^b18, 89^a15,
 5^a31, 18^a23, 59^a9, 66^a12-27
 πέρας 85^b18, 9^a9, ^b10, 18^a23, 64^b27
 περιέχειν 95^a32, 3^b11, 7^a31, ^b1,
 11^b11-15, 21^a28 περιέχον 46^b6,
 22, 53^a13, 16, 59^b11
 περίστασθαι 17^a19
 περιλαμβάνειν 6^b10
 περίοδος 23^b28
 περιπατεῖν 94^b33
 περιτιθέειν 3^a13
 περιφέρειν 17^b3, 40^b2, 64^b25
 περιφερέειν 23^a3, 48^a12, 64^b9, 65^a32
 περιφορά 65^b9
 πέττειν 59^b12
 πηδάλιον 94^b5
 πηλός 88^a14
 πήξις 53^b25
 πήχυς 21^a3
 πίθος 13^b17
 πικραίνεσθαι 44^b23
 πιλεῖσθαι 13^b16, 16^b24, 30^b3
 πίλησις 17^a15
 πίπτειν 95^a15, 43^b16
 πίστις 13^a15, 24^b30, 54^a35, 62^a18
 πιστός 54^a32
 πλάγιον 62^a12
 πλάσμα 54^a5
 πλάσματώδης 57^a23
 πλάτος 9^a5, 29^b8
 Πλάτων μέγα καὶ μικρόν 87^a17, 3^a15,
 9^b3 (cf. 3^a4, 8, 6^b27) χρόνον
 γενῶν μόνος 51^b17 Τιμαίους 9^b11,
 10^a2 ἀγραφα δόγματα 9^b15
 πλήθος 87^b8
 πλήττειν 24^a33

πλίνθος 88^a15
 πλοῖον 95^a14, 40^b19
 ποίημα 2^a24
 ποίησις 92^b29, 2^a23
 ποιητικόν 2^a23, 12^b32, 55^a34
 ποιόν 85^a23, 1^a5, 26^a27
 ποιότης 85^a34, 26^a28
 πολλαπλασιάζειν 37^b33
 Πολύλειτος 95^a34, ^b11
 πορεία 20^b30
 πορρώτερον 95^b2, 60^b4
 ποσόν 85^a23, 1^a6
 ποτέ 22^a25-9
 ποτίζειν 99^a34
 που 6^a2, 8^a29, 12^b9-14
 πράγματα, κύκλος τὰ ἀνθρώπινα 23^b25
 πραγματεία 94^b18, 98^a30, 53^a32
 πράξις 0^a23
 πρίειν 0^b5
 πρίον 0^a10
 προάγειν 84^a19
 προαίρεσις 96^b18, 97^a7
 προαπορεῖν 8^a35
 πρόβλημα 13^b3
 προεπορεύεσθαι 8^a35
 προέχον 39^b27
 πρόθεσις 64^b11
 προίετα 84^a24
 πρὸς τι 94^b9, 0^b28, 25^b11, 46^b4, 11
 προσαγορεύειν 91^b11
 προσαγορεύειν 87^b3, 88^a21
 προσάπτειν 85^b30
 προσγίγνεσθαι 45^a13
 προσηγορία 10^b2
 πρόσθεν 88^a25, 61^b35
 πρόσθεσις 90^b6, 4^a7, 6^a15, ^b3, 45^a27
 προσλαμβάνειν 39^b19
 προσωρίζεσθαι 52^a27
 προστιθέειν 66^b2
 πρόσφυσσις 27^a17
 πρότερον 18^b25, 19^a14-2, ^b12-28, 20^a9, 25, 23^a4, 9, 27^a19, 51^b10, 60^b18, 61^a14
 προχειρίζεσθαι 0^b23
 Πρώταρχος 97^b10
 πρώτιστα 8^b31
 πρῶτος ἐναντιώσεις πρῶται 89^b23
 πρῶτον ἐνυπάρχον 93^a10 (cf. 90^b18,
 93^a29) def. 9^a1, 35^b33 τόπος
 ὁ ἴδιος ἐν ᾧ πρώτῳ 9^a33, 11^a28, 26^b22
 συνεχὲς οὐκ ἔστι πρῶτον 39^a21 πρῶ-
 τον κινουῖν 43^a32, 14, 45^a8, 25, 56^a9,
 60^a25 πρῶτον ἀλλοιούμενον 44^b5, 45^a5 πρῶτον δεκτικόν 48^b21,
 49^a3 τῶν ἀείρων οὐδὲν πρῶτον
 56^a19 πλεοναχῶς 60^b16 διότι
 πρώτη, μέτρον τῶν ἄλλων 65^b10
 πρῶτως κινουῖν 58^b4, 8
 πτήσις 49^a18
 πτύσις 43^b13, 27

Πυθαγόρειος 3^a 4, 4^a 33, 13^b 23, 22^b 18
 πυκνότης 60^b 10
 πυκνούσθαι 13^b 18, 14^a 33
 πυκνωσις 60^b 8, 11
 πῦρ 5^a 4, 14^b 14, 17^a 1
 πυραμῖς 45^b 11
 πυρῆται 28^a 28
 ῥεῖν 28^a 9, 65^a 6
 ῥίζα 99^a 28
 ῥηπτέιν 15^a 14, 57^a 2, 66^a 28, ^b 30, 67^b 13
 ῥίς 94^a 6
 ῥίψις 43^a 20, 44^a 21, 57^a 3
 ῥοπή 16^a 13
 ῥυθμίζειν 45^b 9
 Σαρδῶ 18^b 24
 σαφέστερα 84^a 17
 σεμνότης 7^a 19
 σίδηρος 17^b 19
 [σίδηρου 16^b 19]
 σιμός 86^b 22, 94^a 6
 σιμότης 94^a 13
 σίτος 30^b 2
 σκαληνές 24^a 5, 11
 σκέπη 99^a 26
 σκευαστά 95^a 17
 σκέψις 85^a 20
 σκληρόν 17^b 17, 60^b 9
 σοφώτατος 22^b 17
 σπάθησις 43^b 6, 28
 σπυθήρ 5^a 12, ^b 22
 στάδιον 39^b 33
 σταλαγμός 53^b 15
 στάσις 92^b 14, 95^a 23, 28^b 6, 64^a 21
 στερεῖσθαι 8^b 27
 στερεόν 93^b 24
 στέρσις συμβεβηκός 90^b 27 καθ'
 αὐτὸ μὴ ἐν 91^b 15)(ἕλλη 92^a 3-6
 (cf. 8^a 1) εἶδος πως 93^b 19)(μορφή
 1^a 5 (cf. 91^a 14) ἢ κίνησις οὐ στέ-
 ρησις 1^b 34 τὸ κενὸν στέρσις 15^a 11
 ἢ ἱερέμια στέρσις 26^b 15, 64^a 27
 στερητικός 1^b 26
 στηρίζειν 5^b 2, 7, 19
 στιγμή 12^b 24, 15^b 18, 20^a 10, 20,
 27^a 28, 31^a 25, ^b 9
 στοιχεῖα 84^a 11, 14, 87^a 26, 88^b 28,
 89^b 16, 95^a 16, 4^b 33
 στρεβλοῦν 13^a 26
 συγγενές 12^b 31, 23^b 13
 συγκείσθαι 18^a 7
 συγκρίνειν 65^b 22
 σύγκριστις 87^a 31, 43^b 8, 11, 28, 29,
 60^b 11, 65^b 20
 συγκυρεῖν 96^a 22
 συγχεῖν 84^a 22
 συλλαβή 45^a 16
 συλλογίζεσθαι 86^a 6
 συμβαίνειν 85^a 12, 86^a 10, 87^a 36, 14^a 2,

36^a 16, 42^b 19, 42^b 73, 64^a 9 συμβέ-
 βηκεν 20^b 24, 56^b 14
 συμβεβηκός καθ' ἰποκειμένον λέγεται
 86^a 34 def. 86^b 18)(τί ἐστίν
 93^b 27 ὅρουσ τῶν συμβεβηκῶν
 94^a 3 τῶν συμβεβηκῶν ἄλλα
 ἄλλων πορρώτερον 95^b 1 συμβεβη-
 κός καθ' αὐτὸ 3^b 33 οὐκ ἀναγκαῖον
 56^b 10 κατὰ συμβεβηκός)(καθ'
 αὐτὸ 92^b 23, 96^b 23-9, 98^a 6-9, 11^a
 18, 24^b 23, 26^a 19, 49^b 13, 54^b 7-14,
 (cf. 95^b 4, 97^a 12, 24^a 27)
 συμβλητός 48^a 10-49^a 8
 συμμεταβάλλειν 56^b 17, 67^b 2
 συμμετρία 46^b 5, 21
 σύμμετρος 21^b 25
 συμπεραίνεσθαι 86^a 24
 συμπεράσμα 95^a 18
 συμπιλεῖσθαι 16^a 31, ^b 29
 συμπίπτειν 98^b 27
 συμπλέκεσθαι 89^b 5, 95^b 10
 σύμπτωμα 99^a 1
 συμφύειν 12^b 31, 27^a 25
 συμφυές 55^a 12
 σύμφυσις 13^a 9, 27^a 23, 27
 σύμφυτα 53^a 12
 [συναγειν 17^b 12]
 [συναγωγή 17^b 15]
 συναίτιος 92^a 13
 συνακολουθεῖν 88^b 26
 συνάπτειν 18^b 25, 54^a 16
 συναυξέσθαι 12^b 24
 σύναψις 27^a 15
 συνδεῖν 22^a 15
 συνείρειν 62^a 16
 συνεφέλκειν 44^a 11
 συνέχεια 86^a 28, 22^a 10
 συνέχεσθαι 27^a 12
 συνεχής εἰς ἀπειρον διαιρετὸν τὸ συν-
 χές 85^b 10, 0^b 20, 32^b 24, 39^a 22 (cf.
 31^a 24, 32^a 24, 33^b 17, 31, 34^a 7,
 63^a 28) τὸ ἀπειρον ἐμφαίνεται πρῶ-
 τον ἐν τῷ συνεχεῖ 0^b 18 διὰ τὸ τὸ
 μέγεθος εἶναι συνεχές καὶ ἡ κίνησις
 ἐστίν συνεχής, διὰ δὲ τὴν κίνησιν ὁ
 χρόνος 19^a 12 ἢ συνεχής, ὁ χρόνος
 μακρὸς καὶ βραχύς 20^b 2 def. 27^a 10-
 23, 31^a 22 ὅλον ὅλου ἀπτόμενον οὐκ
 ἐστὶν συνεχές 31^b 4 διχῶς ἀπειρον
 τὸ συνεχές 33^a 25 πᾶν τὸ συνεχές
 τοιοῦτον ὥστ' εἶναι τι συνάνημον
 μεταξύ τῶν περάτων 34^a 8 πῶς
 ἐνδέχεται συνεχές τι αὐτὸ ἐαυτὸ κινεῖν;
 55^a 12)(διηρημένον 11^a 30, 34
 (cf. 17^a 3, 42^b 62, 44^a 10)
 συνεχῶς 26^b 27
 σύνθεσις 90^b 8, 95^a 21, 25^a 21
 σύνθετον 87^b 12, 88^b 10, 90^b 11, 4^b 11
 συνθετή 65^a 21
 συνθλίβειν 14^b 1

συνιέναι 13^b16, 16^b24
 συνίστασθαι 92^b13, 93^a36, 50^b15,
 54^b31
 συνοράν 41^b32
 συνώνυμον 34^a9, 57^b12
 σύνωσις 43^b3-10
 σύστασις 99^b5
 συστοιχία 1^b25
 σφαίρα 18^b1, 6, 40^a29, 55^b28, 65^b2
 σφαιροειδής 93^b30
 σφενδόνη 7^a3
 σφίγγε 8^a31
 σφοδρός 43^a20, 44^a22
 σχήμα 88^a24, 24^a5, 45^b6, 22, 46^a1, 2,
 23
 σχηματίζειν 88^b19, 89^b9, 45^b9
 σώμα 4^b5, 20, 5^b31, 8^b8, 53^a16, 65^b29
 σωματικός 9^a15, 14^a12, 42^b25, 60
 σωρός 12^b6

 τάξις 88^a24, 96^a28, 52^a12
 ταραχή 47^b18, 29, 48^a1, 26
 ταχύς 18^b15, 32^a25
 τέλειον κατά τὸ ποσόν 1^a6 (cf. 26^a31)
 ci. ὅλον 7^a9, 28^b13 ὅταν λάβῃ
 τὴν αὐτοῦ ἀρετὴν, τέλειον ἕκαστον
 46^a14, 28 ἢ τὸ κέντρον κίνησις
 μόνῃ τέλειος 64^b28 πρότερον τὸ
 τέλειον τοῦ ἀτελοῦς 65^a23
 τελειότης 7^a21, 61^a36
 τελειοῦσθαι 60^b33, 61^a17
 τελείωμα 46^a17
 τελειώσις 46^a26, 2, 28, 47^a2
 τέλος ci. οὐ ἔνεκα 94^a27, 0^a34 (cf.
 99^a8) ἢ φύσις τέλος 94^a28, 99^a31
)(ἔσχατον 94^a32 καὶ ἡμεῖς τέλος
 ib. 35 αἴτιον ὡς τὸ τέλος 94^b32
 ἢ μορφή τέλος 98^b3, 99^a31 ἀρχὴ
 τοῦ λογιζομένου 0^a22
 τέμνεσθαι 50^a18
 τέρατα 99^b4
 τετραγωνισμός 85^a16
 τέφρα 13^b21
 τέχνη 93^a16, 31, 94^a21, 1^b1, 99^a15-21,
 30
 τεχνικόν 93^a32
 τήμερον 18^a29
 τί ἐστιν 93^b27, 94^b10, 98^b3 τί ἦν
 εἶναι 85^b9, 94^a21, 27, 95^a20, 98^b8
 τιθέναι 43^a31, 52^a24, 56^b11
 τμήματα 85^a16
 τοίχος 55^b28
 τομή 62^b20
 τόπος ἐστὶν τόπος τις ἐκάστων αἰσθη-
 τοῦ 5^a10 (cf. 5^b31, 6^a1, 12^b29) τό-
 που εἶδη 5^b31-6^a7, 8^b12 (cf. 61^b36,
 62^a5) doctrina Aristotelis 8^a27-
 13^a11 ὅτι ἐστὶν, δηλον 8^b1-9^a2
 ci. χώρα 8^b7, 9^a8, 15 ἔχει τινα
 δύναμιν 8^b10 ἔχει ἀπορίαν τί ἐστι

92^a-30 ci. ὕλη ib. 21, 11^b7, 29-
 12^a2 neque forma neque materia
 9^a31-10^a13 (cf. 14^a14) κοινός)(
 ἴδιος 9^a32 τί ἐστὶ 11^b5-12^a30
 ἀκίνητος 12^a18 (cf. 24^b5, 12) def.
 12^a21 τὸ ἐν τόπῳ εἶναι ib. 31-13^a
 11 κίνησις κατὰ τόπον 25^b9, 62^a28
 ci. ἄμα, χωρὶς 26^b21-3 οἰκείοι
 τόποι 53^b34
 τραγέλαφος 8^a30
 τραγωδεῖσθαι 39^b25
 τρίγωνον 0^a17, 30, 24^a4, 52^b2
 τρίπηχον 6^a4
 Τροία 22^a26
 τροφή 60^a31
 τρυφή 30^b2
 τύχη Aristotelis doctrina 95^b31-98^a13
 def. 96^b31 ἀόριστα ἀφ' ὧν τὸ ἀπὸ
 τύχης 97^a9 τοῦ ἀόριστον εἶναι
 δοκεῖ ib.)(λόγος ib. 19 ἀβέβαιος
 ib. 31)(ταυτόματον 97^a37, 21, 33
 ὕστερον νοῦ καὶ φύσεως 98^a10 τῶν
 κατὰ συμβεβηκός αἰτίων 99^b23

 ὑγιάζειν 92^b25, 95^b19, 24^a25, 26^a22,
 28^a1, 29^b4, 56^b32, 57^b5
 ὑγιάνσις 25^b31, 28^a2, 29^a26, 30^a22
 ὑγιαντὸν 24^a30
 ὑγιαστικόν 57^a17
 ὑγιαστὸν 57^a17
 ὑγίεια 94^b33, 46^b4, 21
 ὕδωρ 13^a2
 ὕειν 98^b18
 ὕλη ἀμθμητὴ 90^b25)(στέρησις 92^a
 3-34 (cf. 8^a1) ἐγγὺς καὶ οὐσία πως
 92^a6 τὸ πρῶτον ὑποκειμενον ἐκά-
 στω 92^a31, 93^a29 (cf. 26^a10) ci.
 φύσις 93^a29, 94^a13, 99^a31 ci. δυ-
 νάμει 93^a28-8, 7^a22, 17^a22-3, 10
 τῶν πρὸς τι 94^b9 αἴτιον ὡς ὕλη
 95^a8, 98^a24 ci. ἀνάγκη 99^b34-0
 8 εἶδος οὐκ ἔχει 7^a26 [cf. 91^a10]
 ci. τόπος 9^a21, 6^b-10^a13, 11^b7, 29-
 12^a2, 14^a13 ci. τὸ ἀόριστον 9^b9
)(πέρας, πάθη ib. 11 οὐ χωρίζεται
 τοῦ πράγματος 9^b23, 11^b36, 14^a15,
 17^a24 τὸ αὐτὸ ὕλη καὶ ἐτελέχεια
 13^a6 ci. κενόν 14^a13 μία τῶν
 ἐναντιῶν 17^a22
 ὑπαρχή 47^b29
 ὑπάτη 24^b34
 ὑπέκειν 15^a22
 ὑπέιναι 26^a10
 ὑπερβάλλειν 6^b18-29, 7^a34, 3, 33^b3,
 35^a7
 ὑπερέχειν 87^b3, 15^b12-19, 21^b30
 ὑπεροχή 87^a16, 89^b10, 15^b17
 ὑπνος 53^a19
 ὑπόθεσις 95^a18, 99^b34, 53^b5
 ὑποκείσθαι 90^a15, 34 ὑποκειμένη

φύσις, ὕλη 91^a8, 93^a29 σῶμα
 ὑποκείμενον 87^a13 ὑποκείμενον
 89^a31, 90^b2, 13, 20, 24, 8^a1, 25^a3
 καθ' ὑποκειμένον 85^a32, 89^a30, 4^a24
 ὑπολείπειν 3^b19, 24, 22^a29, ^b6, 36^b14
 ὑπομένειν 90^a10, 92^a13
 ὑποσπᾶν 55^b25
 ὑποτιθέναι 89^a28, ^b1, 3^a17
 ὑστερίζειν 62^b16
 ὕστερον 23^a11 cf. also πρότερον
 ὑφιστάμενον 55^b24

 φαῖον 24^b34, 29^b17, 34^b18
 φάρμακον 99^a35
 φέρεσθαι 26^a34, 43^a11, 61^b29
 φθαρτικός 92^a21
 φθειρέσθαι 18^a14-20, 22^b24, 36^a5,
 37^b18, 59^a2
 φθίνειν 43^a39, 45^a14
 φθίσις 1^a14, 11^a15, 26^a31, 28^b21,
 41^b1, 43^a10, 45^a28, 53^b22
 φθιτόν 1^a13
 φθορά 1^a15, 3^b9, 22^b25, 25^a18, 32-5,
 46^a16, 47^a20, 58^b18
 φιάλη 94^b25
 φιλία 50^b28, 65^b21
 φιλοσοφία 85^a20, 91^a24, 92^a36, 94^a36,
^b14, 3^a2
 φιλότης 52^a26
 φλόξ 17^b6
 φοιτᾶν 96^b36
 φορὰ κατὰ τὴν φορὰν τὸ μὲν ἄνω τὸ
 δὲ κάτω 1^a7 def. 1^a15 κίνησις
 κατὰ τόπον 8^a32, 26^a33, 43^a36-9,
 60^a28 αἱ φοραὶ τῶν φυσικῶν σωμά-
 των 8^b8 (cf. 14^b13) κινήσεως
 τῆς κατὰ τόπον τὸ μὲν φορὰ, τὸ δὲ
 αὔξησις καὶ φθίσις 11^a15 γνώριμον
 ἢ φορὰ διὰ τὸ φερόμενον 19^b30 εἶδη
 τῆς ὑπ' ἄλλου φορᾶς 43^a16 πρώτη
 ἢ φορὰ τῶν κινήσεων 43^a39, 60^a20-
 61^a28, 65^b17-66^a5 τὰ ἐν τῷ
 οὐρανῷ ὅσα πλείους φέρεται φορὰς
 59^b31 τίς φορὰ πρώτη 61^a28-
 63^a3, 64^a7-65^b16 (cf. 41^b20)
 πᾶσα φορὰ ἢ κύκλω ἢ ἐπ' εὐθείας ἢ
 μικτῆ 65^a14
 φορητόν 1^a15
 φορτικός 85^a10 [86^a9]
 φροεῖν 47^b11
 φρόνιμος 47^b18, 24
 φύειν 93^b17, 99^a10, 50^b30, 55^b15
 φύλλα 99^a25
 φυσικός, ὁ 94^a16, ^b10, 98^a22-^b9, 0^a32,
 53^a35, ^b5 οἱ φυσικοί 84^b17, 86^a20,
 87^a12, 28, 5^a5 φύσις λέγεται τὸ
 φυσικόν 93^a33 τὰ φυσικώτερα τῶν
 μαθημάτων 94^a7 γραμμῆ φυσικῆ
 ib. 10 ἢ φυσικῆ ib. 26, 98^a28
 τὰ φυσικά 94^b8, 0^a31, 3^b3 φυσικά

σώματα 8^b8 φυσικὰ ἐναντιώσεις
 17^a23 ἀλλοιώσεις φυσικαὶ 30^b4
 φυσικόν τὸ ὁμοίως ἔχειν ἐν ἀπάσαις
 61^b25 *Physica* nominantur 51^a9,
 53^b8, 67^b21
 φυσικῶς 98^a23, 36, 1^a24, 4^b10
 φυσιολογοὶ 3^b15, 5^a26, 6^b23, 13^b1,
 65^a3
 φύσις ἢ περὶ φύσεως ἐπιστήμη 84^a15
 οἱ περὶ φύσεως 87^a35, 93^b29, 3^a18
 (cf. 50^b16) ὑποκειμένη φύσις 91^a8
 (cf. ^b34, 93^a9-30, 94^a12, 99^a31)
 περὶ φύσεως 92^b8-93^b21 ἀρχὴ
 τοῦ κινεῖσθαι καὶ ἡρεμεῖν 92^b21 (cf.
 0^b12, 53^b5, 54^b17) ὡς ἔστιν, πει-
 ρᾶσθαι δεῖκνύναι γελοῖον 93^a3-9 ci.
 οὐσία ib. 9, 20 ci. μορφή ib. 30-^b21
 (cf. 94^a12) ἐπεὶ ἡ φύσις διχῶς,
 περὶ ποτέρας τοῦ φυσικοῦ; 94^a12-27
)(τέχνη ib. 22, 99^a18, ^b30 ἡ φύσις
 τέλος 94^a28)(διάνοια 96^b22, 98^a4
 τῶν ἐνεκά του αἰτίων 98^b10-99^b33 (cf.
 96^b22) τὰ φύσει ἢ αἰεὶ οὕτω ἢ ὡς
 ἐπὶ τὸ πολὺ 98^b35 (cf. 52^a12, 17)
 τὸ ἀναγκαῖον ἐν τοῖς κατὰ φύσιν γιγνο-
 μένοις 0^a16 ἐν τῇ φύσει)(ἡμῖν 8^b
 18 αἱ φύσεις (Pythagorei) 13^b25-
 7 πᾶσα κίνησις ἢ βία ἢ κατὰ φύσιν
 15^a2 (cf. 14^b14, 30^a18-31^a17, 55^a
 29) ἢ κίνησις οἷον ζωῆ τις οὐσα τοῖς
 φύσει συνεστῶσι 50^b14 ἐν τοῖς
 φύσει δεῖ τὸ πεπερασμένον καὶ τὸ βέλ-
 τιον ὑπάρχειν 59^a11 (cf. 60^b23) τὸ
 τῇ γενέσει ὕστερον τῇ φύσει πρότερον
 61^a14 (cf. 65^a22)
 φυτόν 87^b16, 90^b4, 92^b10, 99^a27, ^b10,
 61^b16
 φανή 4^a4, 12, 17

 χαίρειν 98^b15
 χάος 8^b31
 χειρόκμητα 92^b30
 χελιδῶν 99^a26
 χορδή 52^b33
 χρῆσθαι 94^b2
 χρόνος 17^b29-24^a17 dubitationes
 17^b29-18^b20 ci. τὸ νῦν 18^a6-
 20^a26, 21^a13-17, 22^a10-20, 33^b33-
 34^b9, 41^a15, 62^a30, ^b21 def.
 18^b21-20^a26 οὔτε κίνησις οὔτ'
 ἄνευ κινήσεως 19^a1 (cf. 51^b28) ci.
 μέγεθος 19^a10-25, 33^a14 (cf. ^b15,
 63^a15) ἀριθμὸς κινήσεως 19^b1,
 20^a24, ^b8, 23^a33, 51^b12 ὁ ἅμα ὁ
 αὐτός 19^b10, 20^b5, 23^b3-12 ἀκο-
 λουθεῖ τῇ κινήσει 19^b16, 20^b25 συν-
 εχῆς τῷ νῦν, καὶ διήρηται κατὰ τὸ νῦν
 20^a5 (cf. ib. 26, ^b2, 22^a10-20, 34^a14,
 62^a30) ἐνδέχεται χρόνον εἶναι τὸν
 αὐτὸν πάλιν καὶ πάλιν, οἷον ἐνιαυτὸν

20^b14 τὴν κίνησιν τῶ χρόνῳ με-
 τροῦμεν καὶ τῇ κινήσει τὸν χρόνον
 20^b15 (cf. ib. 31, 21^a5) τὸ ἐν
 χρόνῳ εἶναι 21^a4-26 φθορᾶς αἴτιος
 21^b2 (cf. 22^b16-27) σοφώτατον
 22^b17 πᾶσα μεταβολὴ ἐν χρόνῳ
 22^b31, 23^a15 ci. ψυχῇ 23^a16,
 21-9 εἶναι δοκεῖ κύκλος τις 23^b29,
 32 ἀδύνατον ἐξ ἀδιαιρέτων εἶναι
 31^a21-33^b32 (cf. 37^a5, 39^b8, 41^a3,
 63^a12) ἐν ᾧ μεταβάλλει χρόνῳ
 πρῶτον οὐθέν ἐστιν 36^a36 λέγεται
 ἐν χρόνῳ μεταβάλλειν καὶ ὡς ἐν πρώτῳ
 καὶ ὡς καθ' ἕτερον 36^b20 χρόνος
 ἐστὶν ἐν ᾧ πρώτῳ ἴσεται 39^a8
 εἰς ἄπειρα μεριστός ib. 9 (cf. 63^b27)
 χρόνος οὐκ ἐστὶ πρῶτος 39^a21 εἴπερ
 αἰ χρόνος ἐστίν, ἀνάγκη καὶ κίνησιν
 αἰδιον εἶναι 51^b10-28 οὐκ εἰ συνε-

χῆς ὁ χρόνος, καὶ ἡ κίνησις 64^b7 χρό-
 νος παρήκων (=γεγονώς 34^a12) καὶ
 μέλλων 22^b1, 34^a14
 χρῶμα 88^b24, 27^b7
 χρωματίζεσθαι 49^a6
 χώρα 8^b7, 9^a8, ^b12, 15
 χωρίζειν 44^a10 χωρίζεσθαι 43^b24
 χωρίς 26^b22
 χωρισμός 13^b25
 χωριστόν 85^a31, 86^b28, 93^b4, 34, 94
^b14, 13^a32
 ψοφεῖν 50^a20
 ψόφος 26^b11
 ψυχῇ 23^a17, 21, 28, 65^b32
 ψυχρόν 60^b10
 ὠθεῖν 15^a14, 16, 56^a25
 ὤσις 43^a17, 24, 44^a7

INDEX TO THE INTRODUCTION AND COMMENTARY¹

- Adrastus 1
 Alcidas 656
 Alexander of Aphrodisias 16, 18, 19, 103, 108, 115
 Allan, D. J. 107
 Anaxagoras 20 f., 26, 37, 49, 58, 459 f., 515, 528, 531, 578, 655 f., 671, 675
 Anaximander 482, 547, 549, 588, 687, 690
 Anaximenes 459, 490, 503, 545 f., 548, 552, 690, 720
 School of 483, 491, 545
 Andronicus 1, 5
 Anniceris 530
 Antisthenes 469
 Apelt, O. 469
 Apollonius of Perga 633
 Arabo-Latin translation 114
 Archimedes 467, 556, 588, 591
 Archytas 542, 547, 596
 Aristotle, cross-references in his works
 1-3, 11
 ancient lists of his works 4-6, 18
 his natural philosophy:
 the factors of change—matter, form, privation 19-24
 nature as internal source of change 24-6
 his dynamics 26-33
 the four causes 33-8, 41-2
 chance 38-41
 necessity 42-4
 change 44-8
 the infinite 48-53
 place 53-8
 the void 58-63
 time 63-9
 continuity 69-71
 the paradoxes of Zeno 71-85
 the prime mover 85-94
 the development of Aristotle's theology 94-102
 Arnim, H. von 97
 Asclepiades Bithynus 656
 Asclepius 511
 Aspasius 537, 568, 572
 Atomists 27, 58, 62, 480 f., 547, 583, 586 f., 589, 593, 671, 675
 Averroës 104, 592
 Bäumker, C. 655
 Bailey, C. 515
 Bernays, J. 509
 Binary construction 533, 540, 608, 624
 Björnbo, A. A. 465
 Bonitz, H. 104, 459-61, 485, 489, 493, 502, 511, 520, 523, 525 f., 554, 558 f., 562, 590, 593 f., 599, 605, 613, 615 f., 619 f., 623 f., 629 f., 632, 640, 646, 653, 727
 Brandis, C. A. 468
 Broad, C. D. 78-80
 Brochard, V. 81, 84
 Bryson 467
 Burnet, J. 471 f., 481, 487, 501 f., 505, 543, 655 f.
 Bywater, I. 640
 Callippus 10
 Camotius, J. B. 692
 Cantor, G. 75, 84
 Carteron, H. 17
 Categories 47-8
 Celestial spheres, and their movers 100-102
 Chrysippus 604
 Cicero 95
 Coriscus 9
 Cornford, F. M. 495, 500, 520, 531, 544, 563, 576, 584, 590 f., 627, 629, 684 f., 723
 Cross-references:
 i. 191^b 29 (to *Met.* Θ (?)),
 192^a 35-6 (to *Met.* Ζ, Α. 7-9),
 192^b 2 (to ii, etc.),
 ii. 193^b 21 (to v, *De Gen. et Corr.* i),
 194^a 35-6 (to *De Philosophia*),
 iii. 201^a 26 (to viii),
 207^b 34 (to ii),
 iv. 213^a 4-5 (to *De Gen. et Corr.* i),
 221^b 13-14 (to iii),
 v. 224^b 11 (to iii),
 vi. 231^a 21-2 (to v),
 239^a 13 (to v),
 241^b 12-14 (to viii),
 vii. 242^b 41-2 = vii β. 242^b 7-8 (to v),
 247^b 13 (to v),
 vii β. 242^a 6 (to vi),
 viii. 251^a 8-9 (to iii),

¹ This index is merely supplementary to the *Index Verborum*: e.g. under 'Plato' will be found only references to passages in which Aristotle does not explicitly mention him.

Cross references (*contd.*):

- viii. 253^b7-9 (to ii),
 257^a34-^b1 (to vi),
 263^a11 (to vi),
 267^b20-21 (to iii)
- Damas I, 4, 15
 Darius 525
 Dedekind, R. 84
 Deidier, Abbé 83
 Democritus 21, 49, 490, 514 f., 525,
 529, 687, 690, 720
 Denniston, J. D. 533, 590, 611
 Diels, H. 6, 18, 103-6, 109, 465 f., 472,
 483, 493 f., 499, 522 f., 530, 537,
 545-7, 556, 564, 572, 581, 583, 596,
 620, 657 f., 672, 687, 700
 Diogenes of Apollonia 459, 490, 503,
 528, 545, 548
 Diogenes Laertius 4-6, 15, 19, 659
 Duhem, R. 31, 53
- Ecpphantus 583
 Edel, A. 48
 Eleatics 20, 23
 Empedocles 21, 37, 42, 459, 485, 489,
 503, 528-31, 538, 545, 591, 655-7,
 671, 693, 720
 Epicureans 27, 515
 Erasmus 12
 Eretrian school 469
 Euclid 467
 Eudemus 3, 15, 18, 463, 465, 522, 562
 Eudoxus 52, 95, 102, 556
 Évellin, F. 84
- Favorinus 659
 Fobes, F. H. 107, 109
- Gaye, R. K. 655 f., 661, 663 f., 666,
 692, 706, 713
 Gomperz, H. 655
 Gomperz, T. 582 f., 657
 Gorgias 655 f.
 Gottschlich, E. 599
 Greek commentators, as authorities for
 the text 103-5, 112-13, 115-17
 Guthrie, W. K. C. 98
- Haas, A. E. 26
 Hamelin, O. 505, 507, 516, 528, 530
 Hardcastle, J. H. 29
 Hardie, R. P. 493
 Harpocraton 503
 Hayduck, M. 552, 594, 649, 696
 Heath, Sir T. 465-7, 543, 604
 Heiberg, J. L. 465
 Heidel, W. A. 484
 Heraclides Ponticus 656
 Heraclitus 490, 503, 552, 717
- Hermippus 5, 18 f.
 Hesychius 4-6, 15, 18 f.
 Hippasus 490, 503
 Hippos 459, 503
 Hippocrates 459, 538
 Hippocrates of Chios 463-6
 Hirzel, R. 504, 522
 Hoffmann, E. 13, 16-19, 675
 Honeim 114
 Howald, E. 5, 18
- Idaeus 483, 545
- Jaeger, W. 7, 9 f., 17 f., 96, 102, 510,
 619, 675, 682
 Joachim, H. H. 595
- Kant, I. 63
- Laas, E. 104, 478, 492, 495, 501, 564,
 572, 590
 Lachelier, J. 663, 665
 Last, H. 582
 Leucippus 582, 655 f., 687, 720
- Mansion, A. 103, 114
 Megarian School 469
 Metrodorus 582
 Milhaud, G. 543
 Moment, the 64-8
 Montucla, J. E. 465
 Morel, G. 12
- Natorp, P. 468
 Neuhäuser, J. 482
 Noel, G. 74, 81, 84
- Occam 487
 Offner, M. 472
- Pacius, J. 456, 461, 468, 478, 490,
 498, 552, 662, 678, 692, 698, 716
 Pais, E. 597
 Parmenides 21, 72, 489, 503, 656 f.,
 659
 Physics, the nature of the science 33-6,
 41-2
Physics, structure of the 1-19
 order of its writing 6-8
 when and where written 9-11
 vii 3, 8, 11-19
 vii, the two versions 11-15, 18-19
 vii, marks of early date 17-18
 Plato 9 f., 17 f., 27 f., 32, 37 f., 48, 70,
 94-6, 480, 491, 530, 536-8, 554,
 585, 588 f., 596, 609, 657, 675, 677,
 720, 726 f.
 Platonists 23, 34, 497, 506 f., 548, 557,
 628, 682 f., 720
 Plutarch 27, 71

750 INDEX TO INTRODUCTION AND COMMENTARY

- Porphyry 459, 480, 489, 534, 582, 638
 Powell, J. U. 581
 Ptolemaeus Peripateticus 4, 6
 Pythagoreans 48, 459, 488 f., 538 f., 541 f., 548, 557, 582, 596, 604, 628 f., 655 f., 682 f.

 Rodier, G. 7
 Rohde, E. 597
 Russell, Lord 75, 81 f., 84

 St. Vincent, G. 83
 Sauppe, H. 503
 Schenkl, H. 114, 555
 Schwegler, A. 621
 Shute, R. 13, 116
 Simonides 680
 Smith, J. A. 623
 Spengel, L. 534, 673, 729, 731
 Stallbaum, G. 655
 Stilpo 469
 Stobaeus 583
 Stölzle, R. 559
 Susemihl, F. 488, 504

 Tannery, P. 7 f., 84, 458, 483, 597, 655 f.
 Taylor, A. E. 542 f., 545, 566, 689
 Teleology in nature 42-4
 Tennemann, W. G. 583
 Thales 459, 490, 503, 545, 552, 610, 720
 Theiler, W. 528
 Theophrastus I
 Timaeus 488
 Torstrik, H. 19, 459 f., 494, 514 f., 517-19, 522 f., 598 f., 602, 604-7, 610-13, 629

 Vicomercatus, F. 692
 Virtual velocities, principle of 30, 684 f., 723 f.

 Wilson, J. Cook 611, 640

 Xenocrates 480, 554, 656
 Xenophanes 489
 Xuthus 583

 Zeller, E. 6, 469, 479, 483 f., 544, 593, 656
 Zeno 53, 70-85, 476, 542, 579, 642

αεί and δεῑ confused in MSS. 593
 αὐτόματος 523

δέ *in apodosi* 590

ἐνεκά του 39, 517 f.

ἡρέμησις 623

κίνησις and μεταβολή 7 f., 45 f.

ὁ ποτε ὄν 598

τὸ τῆς ἀλλοιώσεως 14, 730

ὑπέρ = περί 14

φύσις 501 f.

ὥστε *in apodosi* 590, 623, 640, 643