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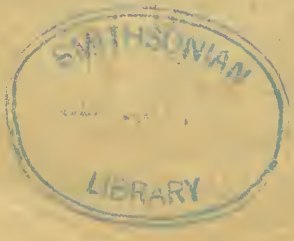
THE DECORATORS ASSISTANT

VOL. II. 1848.

W. GIBBS. LONDON.

A WEEKLY RECORD OF PAINTING, SCULPTURE, ARCHITECTURE, POPULAR SCIENCE &c.



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No.27. SATURDAY, NOV. 13, 1847. Vol.II.

THE Decorators Assistant AND WEEKLY RECORD OF POPULAR SCIENCE.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

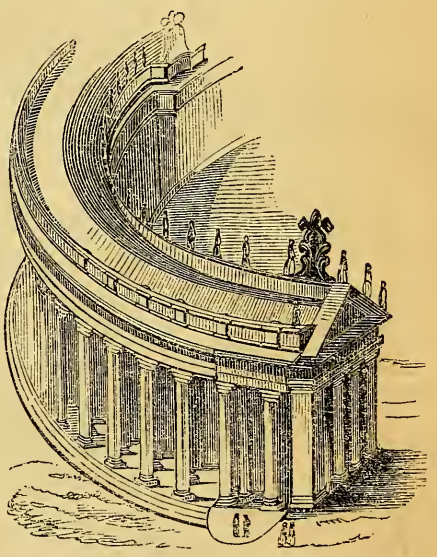
(Continued from paye 193.)

CRUDE (in painting), anything wanting finish; colours laid on roughly.

CHINESE ARCHITECTURE, a style partaking more of prettiness than of real utility. Containing such an elaboration of design, and requiring so much ornament in order to set it off effectively, no very durable materials can be selected for building. Sir W. Chambers states that wood and bricks which are simply

dried in the sun, or baked in an oven, are principally employed. The following engraving of a Chinese summer-house is an excellent specimen—light and chaste, its construction is more simple than the generality of such edifices in that country, and it seems very well adapted for erection in a garden.

COLONNADE, an archway composed of a flat



roof supported by pillars. The engraving represents part of that of St. Peter's at Rome.

COUCHANT (in heraldry), is understood of a lion or other beast when lying down but with

his head raised, which distinguishes the posture of *couchant* from *dormant* (which see).

COUNTER-FLORY (in heraldry), is said of a tressure whose fleurs-de-luce are opposite to others.

COUNTER-MURE, a wall built close to another, that it may not receive any damage from the contiguous buildings.

COUNTER-PASSANT (in heraldry), is when two lions are in a coat of arms, and the one

seems to go quite the contrary way from the other.

Counter-Quartered (in heraldry), denotes the escutcheon, after being quartered, to have each quarter again divided into two.

Counter-Salient (in heraldry), is when two beasts are borne in a coat of arms leaping from each other the contrary way.

Counter-Ermine (in heraldry), is the contrary of ermine, being a black field with white spots.

Crescent (in heraldry), a bearing of the

form of a half-moon. In architecture it signifies a building erected in the form of an arc.

Crest Tiles (in Gothic architecture), orna-

mental tiles plaeed at the top of the gabled roof.

Cramp, a piece of metal forming three sides of a square, or one side and two ends of an

oblong, employed to fasten stones in buildings, or the limbs of statues.

Veneering.—In the time of Pliny the art of veneering was a recent invention; and he descants, in his usual antithetical way on thus converting the cheaper into the most valuable woods, by plating them with these latter; and of the ingenuity of cutting a tree into thin slices and thus selling it several times over. The woods employed for this purpose were the citrus, the terebinth, various kinds of maple, box, palm, holly, ilex, the root of elder and poplar. The middle part of a tree, he observes, shows the largest and most curling veins, while the rings and spots are chiefly found near the root. The veneers, or plates, were secured, as at present, by strong glue.

Bricks.

(*Continued from page* 191.)

The Romans had several sizes of bricks. Vitruvius mentions that they had the didoron of the Greeks, and Pliny says that those chiefly used were a foot and a half long, and a foot broad; while, according to Alberti's observations, they have in some of their buildings, particularly in arch-work, bricks two feet square; besides which he mentions a kind used in pavements and borders that are about six inches by three, and an inch thick, being similar to the Dutch clinkers. Tavellæ are also mentioned by writers, and described as being seven by three and a half; they had also a sort called bipeda, which were two Roman feet in length; and Quartremere de Quincy describes three sizes that he found among their ancient buildings; the largest twenty-two inches square by twenty-one or twenty-two lines thick; the next sixteen and a half inches square, and from eighteen to twenty lines thick; and the smallest seven and a half inches square by one inch and a half thick. In addition to the quadrangular bricks here enumerated, Alberti directs attention to a right-angled triangular kind, still to be seen in the walls of Rome, more especially in the Aurelian portion, and four of which, he informs us, were made from one brick a foot square, and an inch and a half thick (corresponding in breadth to the tetradoron of the Greeks), by cutting it twice across diagonally before burning; and that the practice being to lay them with the right-angle inwards, the work seemed, externally, to consist of the square bricks from which they were formed; and De Quincy says that the small bricks above mentioned were halved diagonally, and used in the facing of rubble walls, the work being bonded by courses of the large square bricks at every four feet in height. These three-cornered bricks suggest the idea of building walls with a system of triangular facings and quadrangular fillings (if such is not what Alberti describes), in which the bond would be secured in the usual way by breaking the vertical joints in the face; in Palladio's time, bricks were termed quadrels, and with regard to their sizes, he says they may be larger or smaller according to the nature of the purpose for which they are intended.

In a description in the "Archæologia," of one of the most extensive Roman villas discovered in Great Britain, there are, a hearth formed of bricks about seven inches square; a mosaic pavement, bordered by three rows of black and red tiles, six inches square, laid chequer-wise, bounded next the wall by a row of bricks fifteen and a half by eleven inches; and piers of the præfurnium, two feet nine high, and seven inches and a half square, consisting of eighteen layers of bricks, with a larger one ten and a half square at top and bottom.

Vitruvius has handed down to us his professional impressions on the subject of brick-

making, and which will be found not to differ materially from the principles and practice of our own period. Treating of unburned bricks, he says that sandy, stony, or gravelly loam, should not be employed, because the straw that is put in the bricks would not combine well; they would be heavy, also very liable to swell, and disunite and dissolve on being much wetted; they ought to be made either of a red, a chalky white, or a coarse-grit, sandy earth, as these are pliable and unite well, and being light, are handled with facility in building. They should not be made in summer, because when dried in the intense heat of that season, they are parched outside, and, apparently, thoroughly dried, while the heart is but imperfectly so; and if used in that condition, their subsequent shrinkage causes unsightly fractures in the incrustation or plastering, as well as serious defects in the walls themselves; they ought, therefore, to be made either in the spring or autumn, when they dry more equally; but, he adds, to insure their being sufficiently seasoned, it is best not to use them before they have been made two years; and, indeed, at Utica, the law permits none to be used within five. This writer informs us that at Pitome in Asia, Calentum in the farther Spain, and also at Marseilles in Gaul, there were bricks made of a pumicosious earth, which would swim if thrown into water, being light and porous in their texture, replete with air, and impervious to wet. Alberti states that the ancients mixed marble with the red earth of which they made their bricks; and it appears that in order they might be burned the better, they made holes in the larger sorts when moulding them.

On turning our attention to the introduction and progress of the art in this country, we find, as already stated, that the earliest examples are in the ancient Roman walls, in which it appears in the form of arches and bonding to rag and rubble stone-work, courses being laid through, averaging four or five in number, at intervals of about three or four feet in height. The size of these bricks is mentioned by Stowe as being 17½ by 11¾ inches, and 1¼ inch thick. The Saxons and Normans both practised it (under the name of Tigel, whence our word Tile), and although it seems that they availed themselves largely of the Roman bricks, yet it also appears that they manufactured them, and in their later remains, even of varied and moulded forms, as in the abbey church of St. Alban's and the Priory of St. Botolph, at Colchester. But it was not until early in the fourteenth century that they were made in England similar to the present or Flemish mode, that is, oblong in form, and thick in proportion compared to the tile-like brick of the ancients; and at that period they were of different sizes, some being 12 by 6 by 3, others 10 by 5 by 2. The name of bricks belongs to the early part of the fifteenth century, at which time their price was about 6s. per thousand; up to this time they were only used after a fashion similar to that of the Romans, combined with flint and rag stone-work, in bonding tiers, piers at intervals in the solid walls, with lozenge interlacing of dark headers among the black even-dressed flint-work between, such being the general appearance of the castellated buildings of that period; and it was not until three-fourths of the century had gone by that the first houses entirely constructed of brick were erected. In the Tudor times very fanciful yet pleasing forms of moulded-work were introduced pertaining to the style of architecture that arose and reigned during that period; and which, after declining for some time and being superseded by the Romano-Italian style of Inigo Jones, in the outest of the Stuart dynasty, gave way to the forms and details of a more severe and classic school. It is said to have been Sir Richard Crispe, the friend of Charles the Fifth, who conceived the mode of making bricks according to the present practice, and we may date the perfection of the system of combination called English bond to that period. In 1605, a law was passed enjoining that all buildings should thenceforth be of stone or brick, and which was enforced with a fluctuating rigor up to that memorable æra in the history of London, when an insatiable element convinced its citizens of the unquestionable expediency of such an enactment. Then the "wooden walls" disappeared, and the geological position of the Great Metropolis denying it the advantages of stone, the use of brick from that time universally obtained.

About the reign of William and Mary, was imported to this country, along with other Dutch fashions, the mode of building distinguished by the name of Flemish Bond, and which soon, and indeed almost ever since, bore the bell, by reason of its plausible exterior. We are, now, however, more sensible of its counterbalancing inferiority as a bond, and what with the spreading use of compo, and the fact that the difference between it and the English bond is only discernible at a small distance from the work, together with a germinating disposition to return to the fashions of our forefathers, it is likely to drop into desuetude.

Fire and Waterproof Preparation.—Slake common stone lime in a close vessel, and when cool pass eight quarts through a fine sieve; add to it one quart of fine salt and two gallons of pure water. Boil and skim. Then, to every four gallons of this mixture, add one and a quarter pounds of rock alum, three-fourths of a pound copperas, half a pound potash, and five quarts fine beach sand. This wash will now admit any colouring matter that may be desired, and may be applied with a paint or whitewash brush, in the same manner as oil paints. A writer remarking on the good qualities of this preparation for roofs, says:—"It looks better than paint, will stop leaks in the roof, prevent moss from growing, and, when laid upon brick-work, will render it impenetrable to rain or moisture." A wash of this description might be beneficially applied to the roofs of houses, &c., instead of paints.

Argentine Steel.—Melt 500 parts of steel with one of silver and a description of steel will be produced far superior to that of the best common sort.

What is High Art?

At a meeting of the Decorative-Art Society, held on the 13th ult. (the opening of the present session), the first portion of a paper "On Art; its distinctions and purposes relatively considered," by Mr. Dwyer, was read. The leading questions arising from the subject, as set forth in the members' circular, were, What is high art? historical art? fine art? &c. Under what conditions do these become identical? and what is the relative value of each for the purposes of decorative art?

Mr. Dwyer introduced the subject by remarking, that amidst the multifarious writings extant upon art, the ambitious tendencies of this or that author in jealously upholding the dignity of a particular class of artists, or in vaunting forth the advantages arising from a given system of practice, would appear to have been the main considerations. For the most part, however, we should find that the study of nature is held to be the starting-point from which we are to be led away into a complexity of technicalities and metaphysical reasonings. As in writings, so it would be found in works. The architect, sculptor, painter, and poet, each attempts a mysterious grappling of mind with matter of fact, occasionally developing a high degree of intellectuality with much that is either unmeaning or not easily understood. Then, he observed, there is the continually varying misapplication of technical terms in art, arising from an absence of principle in giving fixed names to definite things, which renders it a matter of difficulty to understand the proper limits and distinctions which exist between even such terms as high art, historical art, fine art, &c. He had sought for precise definitions from living artists of good repute and long standing, but obtained none; he had heard much of reasoning, in small circles as it were, which convinced him that a more general and comprehensive knowledge of art in its various phases would be useful, indeed, among its professors. The ordinary criticisms of the day upon art were to him vague and meaningless, and would generally, if divested of doubtful technicalities and expressed in plain English words, expose their flimsy construction. In tracing the progress of art, the reader felt that it had been strangely handled, not alone from the restless ambition of some of its votaries and professors, but still more so by the wanderings of others after the indefinite. Princes and popes have at certain periods entertained a deference for its works, which at other times is wholly lost to observation; but he considered that the attention at present directed towards art, throughout Europe, would probably promote an unprecedented Progress. The spirit of popular agitation, which the Corn Laws now no longer engross, might attach its epidemic influence and searching powers to the arts in our country, with advantage to all. Nevertheless, he held art in itself to be capable only of slow progress, simply because that must arise solely from a succession of improvements in imitative skill. A parallel to the present demand for variety of style and character had not, he said, existed in any previous period. In painting, sculpture, and architecture, we may learn to discover distinctive features marking a period, and most clearly showing the development of progression. Mr Dwyer sustained this argument, by contending that the sameness of treatment in the works of most artists testifies to the tenacity with which copying or imitation clings to all, and that therefore it is essential to reflect and know how far the different schools of art have relation to each other in respect of imitation,—how much an artist has been indebted to previous examples,—before we can adjudge to him a qualitative rank. The reader then enumerated celebrated works by Greeks, Romans, Italians, Venetians, French, Flemish and Dutch, which, he maintained, were in harmony with the tastes and moral dispositions of the respective nations at the time they were produced, and also that art is in a great measure localised—dependent on certain rules, as developed by existing specimens, and by the position these held in the public estimation,—that it is essentially a thing of time, place, and circumstance. By judging of works of art upon a particular consideration of beauty, and by admitting one class of production as superior in rank to another, without reference to a comprehensive view of art generally, a great injustice had, he maintained, been engrafted on our received opinions upon art. There was, it was said, a strong resemblance in the results, to the choice of an inexperienced person, between one watch, having inferior mechanism in a gold case, and another containing good works, in a silver one—when the gold case was selected. It was unfortunate for art that its votaries had been too frequently influenced by a gold case. Distinctive ranks in the departments of art, the reader contended, were a great evil, and to equalise them would be a great good achieved. Until the difficulties attendant upon the operations of art are understood, and unjust prejudices removed—until painters in oil, water, encaustic, and fresco, cease to disparage each other's work, and to exaggerate the importance of their own, until all aristocracy in practice of art shall be dissipated, and art, in humble garb of plaster and clay, be looked upon as kindly as if in marble, until some new energy shall have swept away these prejudices, as unreasonable as unjust, and a combination of artists in one emulative course of comprehensive inquiry and dispassionate reasoning, shall contribute to that one great purpose called art—we must not, it was contended, look for a positive and marked progressive feature to be developed in our times. It was then explained, that art being essentially based upon ideality, with an accurate presentment of effects in form and colour, after nature, is constituted and regulated by certain principles in harmony with the prevailing taste, education, or fashion, so as to excite pleasing emotions; and that it is therefore necessary to specially advance education and train the mind, before the really beautiful in art can be properly appreciated, or the genius evinced receive a just and fair criticism.

Several instances were referred to, showing the power of art in expressing clearly and intelligibly to all whatever sentiment it is intended to impart,—as the "Laughing Faun" and the "Dying Gladiator," in sculpture; or the "Creation of Adam," by Michael Angelo; the "Transfiguration," by Raffaelle; and the "Last Supper," by Leonarda da Vinci, in pictures. These examples, it was said, testify to a mental or reasoning ideality, combined with a skill in depicting the essence of things material, and should therefore rank far above imitative skill in the abstract. Ideality is yet more severely tasked in connecting the several ideal embodiments into a grand whole, or complete picture, as in the "Last Judgment," by Michael Angelo. Art such as this, he said, might be called high art; but the qualification ought not to be attached to the works of an ordinary artist, whose vanity leads him to lay a surreptitious claim to take rank under such a banner.

The characteristics of Greek art, it was stated, are quite distinct from the examples last mentioned, although both have received great and well-deserved admiration. The Greeks, however, approached only to a perfect embodiment of physical beauty, without evolving the attributes of the higher powers of mental reasoning: this would arise simply from their progressive refinements being based chiefly on skilful imitation. Art had undoubtedly been extensively encouraged by the Greeks, from the great number of their works; and if, instead of pursuing the heroic vein, they had sought to impart a moral purpose (expressions to be taken in their broadest sense), then, indeed, would their productions have attained to a truly glorious eminence. It was the reader's opinion that their wonderful skill, when receiving additional purpose and meaning, would have created much nobler works through their embodiment of mental attributes. The frieze of the Parthenon, he contended, while he had the fullest appreciation of its beauties, ought not to be viewed in any other light than as a production in imitative art. Nature, he said, had been so faithfully studied and delineated, that very few inaccuracies could be discovered; but he deduced from this and the pervading similarity of features and vacant expression, not only that the models must have been of a superior class, but also that the Greek artists had relied upon their powers of imitating objects as they were seen by them.

The reader remarked that there are two distinct kinds of ideality in art,—one addresses the imagination only, and the other goes further, by appealing to the reflective and reasoning faculties. Several examples were then described to show that embellishment had formed the noblest intent and purpose of art in its best periods, and that, while the first artists of the middle ages painted to embellish, we paint to produce pictures.

After some remarks upon Haydon's writings, he submitted the inquiry: What is *high* art? Is it a term to signify something superior in merit? Is it a matter of theory or practice? Can it teach morality or put down vice? Had it a correlative in the sciences, such as high chemistry or high astronomy? He would be glad to learn the proprieties of art from its phraseology, and would continue his attempt in disentangling the subject at the next meeting.

Improvements in Casting Cylindrical Pipes.—Mr. Stewart, of Montrose, has taken out a patent for a new mode of casting iron water or gas pipes, by which a superior material is produced, at a less cost than by the usual method. The mould consists of a perpendicular cylindrical iron box, of the required size, with a shaft in the centre, longer than the mould, and communicating with machinery above, by which it is kept revolving, and, as it revolves, it gradually rises. At the bottom of this shaft is an instrument, which may be termed a "presser," or "rammer," consisting of an iron block having inclined tubular faces, of such smaller diameter than the box, as to leave the sand of the required thickness for the mould. On feeding the sand at the top of the box, it is distributed towards the sides, and the shaft and rammer gradually revolving and rising, press it with great force against the sides of the box, leaving the mould finished and perfectly cylindrical on its arriving at the top, ready for the insertion of the core. The amount of pressure against the sand is regulated by means of a counterpoise weight. The following are the advantages claimed by the patentee:—"1. A perfectly straight cylindrical pipe, of uniform thickness.—2. No parting or joint of any kind.—3. Dressed at one half the ordinary cost.—4. Less sand used than in any other way, and, of course, easier dried, if required.—5. The castings and sand easier removed from the boxes than in the ordinary way.—6. The flasks, or boxes, better calculated to resist the pressure of the metal than any now in use.—7. This method is the best for casting pipes perpendicularly that has hitherto been employed.—8. The greatest recommendation of all is, the simplicity of the apparatus, which requires the attendance of a boy only, who with my machine, as at present working, turns out easily six pipes, six inches bore, per hour."

Number of Pictures in English and Foreign Galleries.—National Gallery, London, 214 pictures; Vatican, Rome, 32; in the Gallery of the Capital, ditto, 225; each of the Academies of Bologna and Venice, about 280; Städel Institution, Frankfort, 380; Naples, 700, exclusive of the ancient paintings of Pompeii and Herculaneum; Berlin Gallery, 1,200; in the new Pinacothek at Munich, about 1,270 (these latter have been collected together from the various royal palaces and establishments of Bavaria; the Belvidere, Vienna, upwards of 1,300; in the Gallery of the Uffizi, at Florence, 1,200; Pallazzo Pitti, ditto, about 500; at Amsterdam, 386; in the Museum at the Hague, 304, and 173 in the King's Collection; at Antwerp, between 300 and 400; in the Louvre, 1,406, exclusive of the Spanish pictures; in the Museo of the Prade of Madrid, 1,833; and at Dresden, 1,850.

On the Application of Ornament.

HAVING already noticed the term composition in a general sense, we will now proceed to define its technicological meaning, and the position it occupies in a finished production.

The method of properly arranging component parts so as to produce a creditable whole forms the composition of a work. Much as the art of performing this is needed by the designer, but too little attention is paid in these days to its theory and practice; nor will a change take place in this respect until our artists possess a more determined self-reliance than they—or rather their works—at present indicate. To be able to judge exactly the effect the proportion of one body will have to that of another is a necessary knowledge to the composer—whether the work in hand be a painting or a beer jug:—in the one a fine picture may be spoiled by the displacement of a single figure, and in the other, the disproportion of the handle, the "belly," or the spout will render that a monstrosity which might have been an ornament. The following engraving represents an error of the latter description. It is a fictile Etruscan vase with a good—perhaps elegantly—shaped body; but is spoiled by the handles—they are too large, and out of all proportion, and the manner in which the handles project from the bottom of the cup is contrary to all good taste. The supports of the handles forming a line with the edge of the cup are also bad;—these things generally manage to betray their use, and are, therefore, better avoided.

In writing on signboards, &c., a similar error to that of the handles in the above example is often committed: thus, a small letter terminates in a flourish—sometimes the proportion between the both being that of one foot to an inch, and as a line drawn equal in all its parts does not look well, the swell necessary in the middle of the line leads off attention from the letter, to which it ought to form merely an ornament.

(To be continued.)

Mensuration of Solids.

1. A *solid* is a body contained under three dimensions, or extended in length, breadth, and thickness.

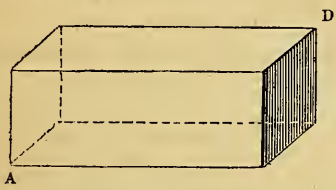
2. Solids are measured by cubes, whose sides are each one inch, one foot, or one yard, &c., and the solidity, capacity, or content of any figure is estimated by the number of such cubes contained in that body.

3. *Table of Solid or Cubic Measure.*

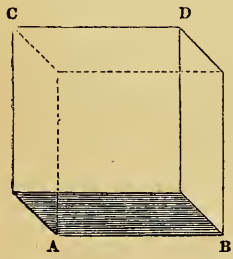
1728 inches	.. ..	make 1 foot
27 feet ..	.. ..	.. 1 yard

Imperial standard gallon contains 277·274 cubic inches.*

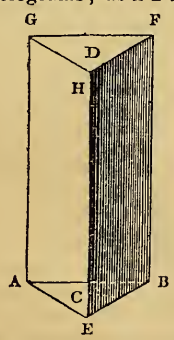
4. A *cube* is a solid contained by six equal square sides, as A D.



5.—A *parallelopipedon* is a solid contained by six rectangular sides or faces, every opposite two of which are equal and parallel; as A B C D.

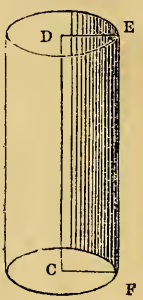


6.—A prism is a solid whose ends are two equal, parallel, and similar plane figures, and its sides parallelograms; as A E B, G H F.

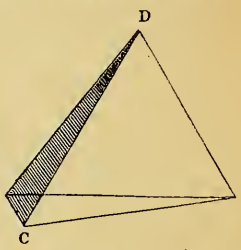


Obs.—It is called a *triangular prism* when its ends are triangles; a *square prism*, when its ends are squares; a *pentagonal prism*, when its ends are pentagons; and so on.

7.—A *cylinder* is a solid described by the revolution of a right-angled parallelogram C D E F, about one of its sides C D, which remains fixed.



8.—A *pyramid* is a solid whose sides are all triangles meeting in a point at the vertex, and the base any plane figure whatever.



Obs. 1.—It is called a *triangular pyramid* when its base is a triangle; a *square pyramid*, when its base is a square; a *pentagonal pyramid*, when its base is a pentagon; and so on.

Obs. 2.—A prism, or a pyramid, is regular, or irregular, according as its base is a regular or irregular plane figure.

(To be continued.)

Mode of Transferring a Print to Glass.—When a lithographic or other print is required to appear on glass, the glass is first coated with dilute copal varnish, and the paper containing the print is dipped in warm water; and while the varnish remains adhesive, the paper is placed on the varnish, with the print side down, and then gently pressed till all the parts adhere; or several folds of soft paper may be placed on the print, and a piece of plank or other weight placed thereon to keep the print and varnish in contact till both are dry. Then the print, being again moistened with water, may be peeled or rubbed off, leaving the ink of the print adhering to the glass. The several parts of the print may then be painted with appropriate colours on the glass, and finished with a ground coat over all.

Singular Discovery.—A gold mine has lately been discovered in the government of Irtusk, in Siberia, in which this metal is found in a state of complete alloy with silver, a mineralogical fact which is extremely rare.

* The imperial standard gallon weighs 10 pounds avoirdupois of distilled water. One cubic inch of distilled water weighs .525954 troy oz; or, .577047 avoir.

Leverage.

The process of raising a ladder is a good illustration of the variation produced in the character of a lever, by an alteration in the position of the power. When it is first lifted from the ground, by a force applied at one end, it is a lever of the second order, since its order of gravity, in which its whole length may be regarded as acting, is in the middle of its length; so that a power applied to its end will have an advantage of two to one. But when the ladder has been partly elevated the hands of the person raising it are made gradually to approach its foot, when they are moved in the position of the centre of gravity, they are acting neither at an advantage nor disadvantage; for though the top of the ladder will then be moving twice as fast as the hands, the bottom will not move at all, so that the average movement of the whole will be just the same as that of the hands: and when, in order to raise the ladder nearly to the upright position, the hands are made to act upon it still nearer its bottom, it becomes a lever of the third order—the weight being now more distant from the fulcrum than the power.

It is evident that, in levers of the first and second orders, we may gain any amount of power we please, by simply making the distance between the power and the fulcrum just so many times greater than the distance between the fulcrum and the weight. It was by Archimedes that this truth was first perceived; and he expressed it by saying, "Give me but a place where I may stand and I will move the world." The principle on which the assertion is made is perfectly correct, but he seems to have omitted one element—the time necessary to produce the effect. It has been already shown that the relative amounts of movement, of the power, and the weight will be proportional to their respective distances from the fulcrum; and if the arm, to which the power is applied, be increased to such an enormous length as would be necessary to gain the mechanical advantage required for such a purpose, the time that would be occupied in moving, even to the amount of an inch, and with the whole force of a man, a body of the weight of the globe would be quite inconceivable. This may be readily shown by a simple calculation. Taking the diameter of the earth at 7,930 miles, the number of cubic feet in it may be calculated to be 37,434,476,263,828,705,280,000; and, assuming each cubic foot to weigh 300 pounds, we shall have for the weight of the earth in pounds the number 11,530,342,879,148,611,584,000,000. Now supposing Archimedes to act at the end of his lever with a force of 30 pounds, one arm of it must be 384,344,762,638,287,052,800,000 times longer than the other, that he may move his mass with it: and one arm of the lever being this number of times longer than the other, the end of that longer arm must move exactly that number of times faster or farther than the end of the other; so that while the end of the shorter arm was moving one inch the end of the longer arm must move 384,344,762,638,287,052,800,000 inches; or, on the other hand, when Archimedes had made the end of the lever to which he had applied his arm move this number of inches he would only have raised up the earth, which was resting on the other end, to the amount of one inch. Now it is estimated that a man pulling with a force of 30 pounds, and moving the object which he pulls at the rate of 10,000 feet an hour, can work continually for eight or ten hours a day; this is the extreme of the power which a single man can apply. Each day, then, Archimedes could, at the utmost, move his end of the lever 100,000 feet, or 1,200,000 inches; and hence it may thus be readily calculated, that to move it through 384,344,762,638,287,052,800,000 inches, or to move the other end—that is the earth—one inch, would require the continued labour of Archimedes for 8,774,994, 580,737 centuries.—*Dr. Carpenter.*

New Steam Gauge.—The following letter has been addressed to a morning paper:—Sir, A most important invention has been submitted to me for my approval, patented by a Mr. Smith of Nottingham, and is intended to indicate the strength of steam in steam-engine boilers; it is particularly adapted for steam-boats, and can be placed in the cabin, on deck, or any other part of the vessel, where it may be seen by every passenger on board. It may also be fixed in the office of every manufactory where a steam-engine is used, at a considerable distance from the boiler. I am so much pleased with it that I have put one up at one of my own collieries; it is some distance from the boiler, and in another house, and works most beautifully, showing the rise and fall of the steam in the most delicate manner. The indicator is like the face of a clock, with a pointer, making one revolution in measuring from 1lb. to 100lb. upon the square-inch of the pressure of steam; it is quite from under the control of the engineer, or any other person, so that its indications may be relied upon, and the construction is so simple that it is scarcely possible for it to get out of order. I might give a full explanation of the machine, but I think it best to leave that to the inventor himself. The numerous and appalling accidents which have occurred from the bursting of steamboat boilers have indueed me to give you these observations, which I think desirable to be laid before the public. I may state that I have no pecuniary interest in the scheme; but being the first person to whom it has been shown, and the first to make use of it, I feel it a duty that I owe to the inventor, as well as the public, to make it as universally known as possible. The indicator is put up at Topton Colliery, near Chesterfield; and may be seen any day by any respectable person by inquiring either for Mr. Hindmarsh or Mr. Langlands.—George Stephenson, Tapton-house, Chesterfield.

White Copper—Britannia Metal.—Copper from 40 to 50lb., white arsenic 10lb., oil a sufficient quantity to make the latter into a paste, melted together. Used as an imitation of silver.

Adhesion of Nails.

Every carpenter is familiar with the use of the nail, and possesses a practical knowledge, more or less accurate, of the force of adhesion of different nails, and in different substances, so as to decide, without difficulty, what number, and of what length, may be sufficient to fasten together substances of various shapes, and subject to various strains. But, interesting as this subject unquestionably is, it has not been till within the last few years that the necessary experiments have been made to determine, 1st, the adhesive force of different nails when driven into wood of different species; 2nd, the actual weight, without impulse, necessary to force a nail a given depth; and 3rd, the force required to extract the nail when so driven.

The theoretical investigation points out an equality of resistance to the entrance and extraction of a nail, supposing the thickness to be invariable; but as the general shape of nails is tapering towards the points, the resistance of entrance necessarily becomes greater than that of extraction; in some experiments the ratio was found to be about 6 to 5.

The following table exhibits the relative adhesion of nails of various descriptions, when forced into dry Christiana deal, at right angles to the grain of the wood.

Description of Nails used.	Number to the lb. avoir-dupois.	Inches long.	Inches forced into the Wood.	Pounds requisite to extract.
Fine Sprigs	4560	0·44	0·40	22
Ditto	3200	0·53	0·40	37
Threepenny Brads	618	1·25	0·50	58
Cast-Iron Nails ...	380	1·00	0·50	72
Sixpenny Nails.....	73	2·50	1·00	187
Ditto	—	—	1·50	327
Ditto	—	—	2·00	530
Fivepenny Nails ...	139	2·00	1·50	320

The percussive force required to drive the common sixpenny nail to the depth of one inch and half into dry Christiana deal, with a cast-iron weight of 6·275lb. was four blows or strokes falling freely the space of 12 inches; and the steady pressure to produce the same effect was 40lb.

A sixpenny nail driven into dry elm, to the depth of one inch, across the grain, required a pressure of 357 pounds to extract it; and the same nail, driven endways, or longitudinally into the same wood, was extracted with a force of 257 pounds.

The same nail driven two inches, endways into dry Christiana deal, was drawn by a force of 257 pounds; and to draw out one inch, under like circumstances, took 87 pounds only. The relative adhesion, therefore, in the same wood, when driven transversely and longitudinally, is 100 to 78, or about 4 to 3 in dry elm; and 100 to 46, or about 2 to 1 in deal; and, in like circumstances, the relative adhesion to elm and deal is as 2 or 3 to 1.

The progressive depths of a sixpenny nail into dry Christiana deal, by simple pressure, were as follows;—

One quarter of an inch, a pressure of	24lb.
Half an inch	76
One inch	235
One inch and half	400
Two inches	610

In the above experiments great care was taken to apply the weights steadily, and towards the conclusion of each experiment, the additions did not exceed 10 pounds at one time, with a moderate interval between, generally about one minute, sometimes ten or twenty minutes. In other species of wood, the requisite force to extract the nail was different. Thus, to extract a common sixpenny nail from a depth of one inch out of

Dry oak, required	407lb.
Dry beach	667
Green Sycamore	312

From these experiments, we may infer that a common sixpenny nail, driven two inches into dry oak, would require a force of more than half a ton to extract it by a steady force.

Golden Glass.

The following remarks regarding the making of coloured glass are worthy of attention, inasmuch as its manufacture is daily becoming of more importance to glass-manufacturers. Not long after the time when the art of making the copper-red glass was lost, Kunkel appears to have discovered that gold melted with flint glass was capable of imparting to it a beautiful ruby colour. As he derived much profit from the invention, he kept his method a secret, and his successors have done the same to the present day. The art, however, has been practised ever since for the purpose of imitatng precious stones, &c., and the glass used to be sold at Birmingham, for a high price, under the name of Jews' glass. The rose-coloured scent-bottles, &c., now commonly made, are composed of plain glass, "flashed" or coated with a very thin layer of the glass in question. Numerous experiments have been made on this subject, and have been successful in producing glass of a fine crimson colour. One cause why so many persons have failed in the same attempt,* is suspected to be in the fact that they have used too large a proportion of gold; for it is certain that an additional quantity of gold beyond a known point, so far from deepening the colour, actually destroys it altogether. Another cause probably is that they have not employed a sufficient degree of heat in the fusion. It has been found that a degree of heat, judged sufficient to melt cast-iron, is not strong enough to injure the colour. It would appear, that in order to receive the colour, it is

* Dr. Lewis states that he once produced a potful of glass of beautiful colour, yet was never able to succeed a second time, though he took infinite pains, and tried a multitude of experiments with that view.

necessary that the glass should either contain a proportion of lead, or some other metallic flux. Bismuth, zinc, and antimony have been found to answer the purpose; but it has been attempted in vain to impart any tinge of this colour to crown-glass alone. Glass containing gold exhibits the same singular change of colour on being exposed to a gentle heat. The former when taken from the crucible is generally of a pale rose-colour, but sometimes colourless as water, and does not assume its ruby colour till it has been exposed to a low red heat, either under a muffle or in the lamp. Great care must be taken in this operation, for a slight excess of fire destroys the colour, leaving the glass of a dingy brown, with a blue transparency, like that of gold leaf. These changes of colour have been vaguely attributed to change of oxygenation in the gold, but it is obviously impossible that mere exposure to a gentle heat can effect any chemical change in the interior of a solid mass of glass, which has already undergone a heat far more intense. In fact, it is found that metallic gold gives the red colour as well as the oxide, and it appears scarcely to admit of a doubt, that in a metal so easily reduced, the whole of the oxygen must be expelled long before the glass has reached the melting point. It has long been known that silver yields its colour to glass while in the metallic state; and everything leads one to suppose the case is the same as to gold. There is still one other substance by means of which it is possible to give a red colour to glass, and that is a compound of tin, chromic acid and lime, but the trials do not lead us to suppose that glass thus coloured will ever be brought into use.

New Description of Fuel.—We learn that a discovery has been made, which promises to be of great advantage to all descriptions of manufacturers and artizans who use fuel either for the production of steam, for the fusion of metals, or for scientific and manufacturing processes. The inventor produces fuel of several different descriptions suitable either for domestic purposes, for engines, or for the production of great heat, and peculiarly valuable for the furnaces of foundries, as even at a white heat, with most perfect combustion, the material is consumed but very slowly. The great advantage of this material at the present time, when so much attention is paid to the health of large manufacturing communities, is, that it burns without any visible smoke, or with so little that it is scarcely perceptible. Its introduction into general use will, therefore, supersede all the numerous expensive contrivances for consuming smoke which have hitherto been brought before the public, and used, for the most part, with but small success. In steamers it will be particularly valuable, as, we understand, it burns readily, with great and durable heat, and does not send up even the smallest quantity of that nauseous and unsightly black vapour which occasionally poisons the atmosphere of our river.—*Liverpool Albion.*

Notices to Correspondents.

☞ Many correspondents having written to us to inquire the names and prices of particular books, we beg to state that a reply on our part would subject us to the Government advertisement duty of eighteenpence, and they will therefore perceive that it is entirely out of our power, without submitting to a pecuniary loss, to comply with their requests.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

QUERIES.

[In order to collect as much useful information as possible we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—I should feel very much obliged if any of your readers would inform me of any means of removing varnish that has cracked from oil paintings; the best method of repairing broken white marble slabs, also how magic lanterns and different coloured writing inks are made.—I am, Sir, your obedient servant, Timon. Brighton, Nov. 1, 1847.

Opticus.—The following are the dimensions of the great equatorial telescope in the new Observatory at Cambridge:—it is a frustum of a cone, 20 feet in diameter at its base, and 10 feet at its top, and about 40 feet in height; its base is, however, 20 feet below the surface of the ground. The object glass of the instrument is 15 inches in diameter in the clear; its focal length is 23 feet, and the length of the instrument, including the sliding tube, about 24 feet.

E. B. (Greenwich).—Count Rumford, in treating upon the position of fireplaces, recommends that they be brought forward as far as possible without diminishing too much the passage that must be left for the smoke, "and as this passage should be left perpendicularly over the fuel, its size will determine the projection of the fire into the room." Having taken great pains to determine, experimentally, the proper size that should be given to this passage, the average width from front to back of a parlour fire being taken at eight inches, he found, that when the back of the fireplace was of the right length, and the flue of the usual size, four inches was the best width for the smoke passage, at the part where it joined the flue, and he called this part the throat. Where the grate or box containing the fuel is small, three inches might do; "but, as it always is of importance to prevent those accidental puffs of smoke which are sometimes thrown into rooms, through the carelessness of servants putting on suddenly too many coals at once upon the fire; and as these accidents sometimes happened when the smoke passage was made very narrow, I found," says the Count, "all advantages and disadvantages being compared, that four inches is the best width" (Essays, vol. i. p. 326); and if it appears extraordinary that fireplaces of different sizes should have throats of the same width, it is to be considered that a long fireplace will have a long throat, and the size of the passage is the length multiplied by its breadth. The throat of a chimney should always be made to commence at the soffite of the mantel, or underside of the breast wall. The size of the back of the fireplace is next to be decided. The hearth recess fs generally built as wide at the back as in front, with the jambs parallel; but when the fire is brought forward, one third of the width of the hearth recess is the proper width of the back. "The form is perfect when the width of the back is equal to the depth of the fireplace, and the opening of the fireplace three times the width of the back."

Notice to the Trade.—Ornamental Designs made, and, if necessary, engraved, on the most reasonable terms, with punctuality and despatch. For particulars, &c., address (if by letter, post paid) to Mr. Wm. Gibbs, Ornamental Draughtsman and Engraver, at the Decorator's Assistant Office, 17, Holywell-street, Strand, London.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from paye 2.)

Cipolino Statuario (Italian), a name given to the Pentelic marble from Mount Penteles, near Athens, which resembles the Parian, but is somewhat denser and finer grained, with occasional greenish zones produced by green talc.

Colombier, a peculiarly-sized drawing-paper, generally 35 in. by 23½ in.

Crayon, a roll of colour, used in the same manner as a black-lead pencil, and either with or without an exterior covering. Crayons are both natural and factitious, and are of various colours. Black, red, and white crayons, which are generally employed for drawing on tinted paper, are usually termed *chalks* (see Chalk). To describe all the different descriptions would occupy too much space, therefore it must suffice for us to particularise the wax crayons, as the best for use. Plumbago or black-lead crayons, of various degrees of hardness, are the best for architectural drawings, and the outlining of water-colour paintings on paper or velvet. The brothers Joel, in Paris, employ as a crayon cement the following composition:—Shell-lac, six parts; spirits of wine, four parts; turpentine, two parts; colouring powder (such as Prussian blue, orpiment, white lead, vermillion, &c.), twelve parts; blue clay, twelve parts. The clay being elutriated, passed through a hair sieve and dried, is to be well incorporated by trituration with the solution of the shell-lac in the spirits of wine, the turpentine, and the pigment; and the doughy mass is to be pressed into proper moulds, so as to acquire the desired shape. They are then dried by a stone heat. *Lithographic crayons* are employed for drawing on stone, and upon their goodness greatly depends the beauty of the work. They should adhere firmly to the stone in such a manner as not to be detached under any ordinary circumstances. They ought to be sufficiently hard for the designer to obtain a fine point, so as to draw delicate and well-marked lines without their breaking; if they are either too dry or too porous they break in an instant; if they are too soft they become crushed, and form coarse and confused strokes. The following receipt has been employed with success:—Pure white wax (of the first quality), four parts; soap, dried, made of tallow and soda, two parts; white tallow,* two parts; gum-lac, two parts; lamp-black,† one part; oil copal varnish, one part. First melt the wax over a slow fire, and then add by degrees, and a little at a time, the gum-lac, broken into small fragments, incessantly stirring all the while with a spatula; then mix in the soap, previously reduced into fine shavings, and when the mixture is perfect pour in the oil varnish, with which the black has been previously ground up. Continue to heat and stir it continually, until the paste has acquired a convenient consistence, and which may be ascertained by forming a crayon in a mould with it, and letting it become cold. Then try it with a penknife, and see whether the parings are brittle. When the paste is sufficiently heated, form it into crayons, by pouring it into proper moulds.

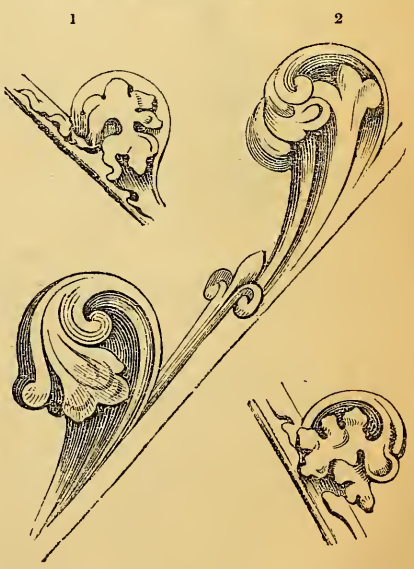
Crayon-Holder, an instrument formed of metal for the purpose of holding crayons. It resembles in construction a common pencil-

case, only that both ends are slightly bulged out, and have a slit on each side without being connected at the top by a circular rim.

Crayon-Paper, a paper manufactured expressly for crayon drawings.

Cream-Laid Paper (in drawing), a description of paper with a remarkably smooth and white edge, chiefly used for black-lead pencil drawing.

Crockets, small bunches of foliage employed in Gothic architecture to ornament canopies, spires, and pinnacles (see Finials).



Figs. 1 and 3 are from St. George's Chapel, at Windsor; and Fig. 2 from Salisbury Cathedral.

Crosier, the emblematical crook of a bishop, or pastoral rod.

(To be continued.)

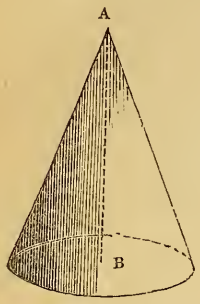
* In winter double this quantity should be used, in order to diminish the hardness of the crayon, caused by the lowering of the temperature.

† The black produced from smoke must not be used, but instead thereof, substitute that produced from charred rags, which is much finer, and is known by the name of German black.—*Lomet.*

Mensuration of Solids.

(*Continued from page 7.*)

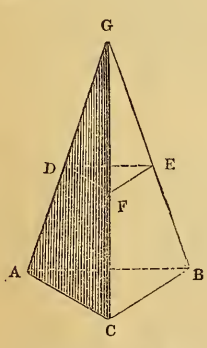
9. A *cone* is a round pyramid, of which the base is a circle, as A B.



Obs. 1.—A line (A B in the above figure) drawn from the vertex to the centre of the base, or through the centres of the two ends, is called the *axis* of a solid.

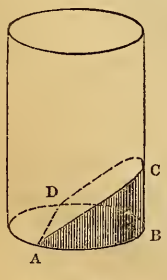
Obs. 2.—When the axis is perpendicular to the base it is a *right prism, pyramid,* or *cone;* otherwise it is *oblique.*

Obs. 3.—The *segment* of a pyramid, cone, or any other solid is a part D E F G, cut off from the top by a plane D E F, parallel to the base A B C.

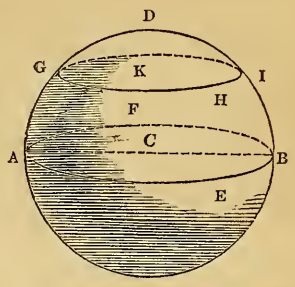


Obs. 4.—A *frustum* or *trunk* is the part A B C D E F, that remains at the bottom after the segment is cut off. *Figure above.*

Obs. 5.—An *ungula,* or *hoof,* is a part of a cylinder or cone, cut off by a plane, passing obliquely through the plane of the base, and one of the sides of the solid, as A B C D A.



10. A *sphere* is a solid described by the revolution of semi-circles about its diameter, which remains fixed.



Obs. 1.—The *centre of the sphere* is such a point (C) within the solid as is everywhere equally distant from the convex surface of it.

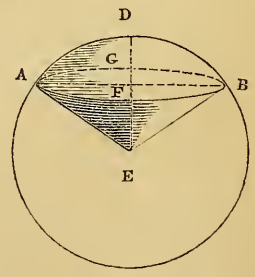
Obs. 2.—A *diameter of a sphere* is a straight line (A B) which passes through the centre, and is terminated both ways by the convex surface. This line is also called the *axis of the sphere.*

Obs. 3.—A circle (A E B F A) which divides the sphere into two equal parts, or *hemispheres,* is called a *great circle of the sphere.*

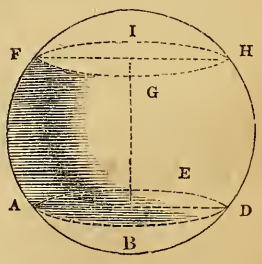
Obs. 4.—A circle (G H I K G) which divides the sphere into two unequal parts, is called a *less circle of the sphere.*

Obs. 5.—A *segment of a sphere* is a part (D) cut off by a plane, the section of which is always a circle (G H I K G), called the *base of the segment.*

Obs. 6.—A *sector of a sphere* is that which is composed of a segment (A D B F A) less than an hemisphere, and of a cone (A E B G A F).

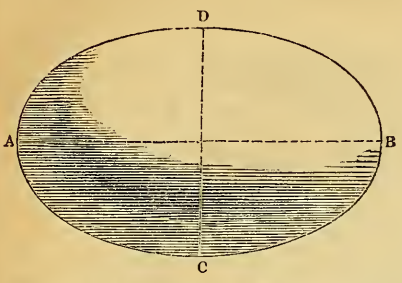


Obs. 7.—A *zone of a sphere* is that part which is intercepted between two parallel planes (A B D E A, F G H I F); and when these planes are equally distant from the centre (C), it is called the *middle zone of the sphere.*



11. A *spheroid,* or as it may be more properly called, an *ellipsoid,* is a solid generated by the revolution of a semi-ellipse about one

of its diameters, which remains fixed, as A B C D.



Obs.—There are two sorts of spheroids, *prolate* and *oblate*. The spheroid is called prolate when the revolution is made about the transverse diameter (A B), and oblate when it is made about the conjugate diameter (C D).

(To be continued.)

Varnishes.

(*Continued from page* 175, *Vol. I.*)

64. *Shell-lac as a Water Varnish.*

Dissolve one part of borax in twelve of boiling water, and add the whole to an equal quantity of white lac varnish, with which it will mix freely.

This varnish is useful in painting, where a firmer body is desirable than can be procured altogether in oils. It may also be used instead of the shell-lac varnish alone, as a vehicle in painting.

65. *White Shell-lac Varnish.*

Dissolve in an iron kettle one part of pearl-ash in about eight parts of water; add one part of shell-lac, and heat the whole to ebullition. When the lac is dissolved, cool the solution, and impregnate it with chlorine until the lac is all precipitated. The precipitate is white, but its colour deepens by washing and consolidation; dissolved in alcohol, lac bleached by the above process, yields a varnish which is as free from colour as any copal varnish.

[Chlorine (oxymuriatic acid) is made by mixing intimately eight parts of common salt and three of the black oxide of manganese in powder; put this mixture into a retort; then pour four parts of sulphuric acid, diluted with an equal weight of water, and afterwards allowed to cool, upon the salt and manganese; the gas will then be immediately liberated, and the operation may be quickened by a moderate heat. A tube leading from the mouth of the retort must be passed into the resinous solution, when the gas will be absorbed and the lac precipitated.—*Prof. Hare, Phil.*]

66. *Iron-Work Black.*

Put forty-eight pounds of foreign asphaltum into an iron pot, and boil for four hours. During the first two hours introduce seven pounds of red-lead, seven pounds of litharge, three pounds of dried copperas, and ten gallons of boiled oil; add one eight-pound run of dark gum with two gallons of hot oil. After pouring in the oil and gum, continue the boiling two hours, or until it will roll into hard pills like japan. When cool thin it off with thirty gallons of turpentine, or until it is of a proper consistence.

This varnish is intended for blacking the iron-work of coaches, &c.

67. *Black Japan.*

Put into the set-pot forty-eight pounds of Naples or any other of the foreign asphaltums (except the Egyptian), and as soon as it is melted pour in ten gallons of raw linseed oil; keep a moderate fire, and fuse eight pounds of dark gum anima in the gum-pot; mix it with two gallons of hot oil, and pour it into the set-pot. Afterwards fuse ten pounds of dark or sea-amber in the ten-gallon iron pot; keep stirring it while fusing; and whenever it appears to be over-heated and rising too high in the pot, lift it from the fire for a few minutes. When it appears completely fused, mix in two gallons of hot oil, and pour the mixture into the set-pot; continue the boiling for three hours longer, and during that time introduce the same quantity of driers as before directed; draw out the fire, and let it remain until the next morning; then boil it until it rolls hard, leave it to cool, and afterwards mix with turpentine.

68. *Varnish of Watin for Gilded Articles.*

Gum-lac, in grain, one hundred and twenty-five parts; gamboge, ditto; annotto, ditto; saffron, thirty-two. Each resin must be dissolved in one thousand parts, by measure, of alcohol of ninety per cent. Two separate tinctures must be made with the dragon's blood and annotto, in one thousand parts of such alcohol; and a proper proportion of each should be added to the varnish according to the shade of golden colour required.

69. *Gold Laquer.*

Put into a clean four-gallon tin one pound of ground turmeric, one ounce and a half of powdered gamboge, three pounds and a half of powdered gum sandarach, three-quarters of a pound of shell-lac, and two gallons of spirits of wine. After being agitated, dissolved, and strained, add one pint of turpentine varnish, well mixed.

(To be continued.)

To give Wood a Gold, Silver, or Copper Lustre.—Grind about two ounces of white beach-sand in a gill of water, in which half an ounce of gum-arabic has been dissolved, and brush over the work with it. When this is dry, the work may be rubbed over with a piece of gold, silver, or copper, and will in a measure assume their respective colours and brilliancy. The work may be polished by a flint burnisher, but should not be varnished.

Shell Gold.—Mash by grinding the cuttings of gold-leaf with thick gum-water and spreading the ground gold in pond-muscle shells. Shell silver is prepared in the same manner, using silver leaf instead of gold.

Starting Points.

TARTING points are of the greatest utility to the designer, as it is only by their means that a continuity of ornament can be effected, or that, indeed, a sufficient scope can be obtained for the fertile fancy of the decorator. The starting points generally adopted by the ancient Egyptians, had for their basis the cups and stalks of various plants—the cups most frequently being taken from the flower of the lotus or water lily, an engraving and description of which we have given in our first volume. The Grecians followed this system, altering, however, the stalks supporting the cups into the form of volutes, thus, in many cases, rendering the *flower* the support of the *stalk*.

Fig. 1.

Our first diagram represents the most simple form possible to be used.

The second is the lily.

Fig. 2.

Fig. 3 is another description of lily, used generally as a double starting point; that is to say, confining the two stems running transverse to each other; the basin or flower behind is the portion to be attached to it if requisite.

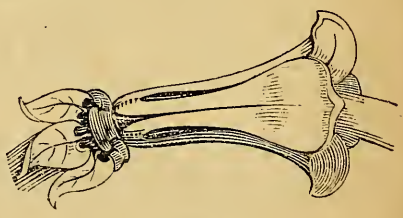


Fig. 3.

Fig. 4.

Either of these may be employed separately. The second figure has an advantage over the former one, as it has at the bell an opening or quirk which in *basso relievo* has a very powerful effect.

Fig. 4 is the cup of the convolvulus, and when well executed has a very pleasing effect.

Fig. 5.

Fig. 5 is that of the woodbine or honeysuckle and daisy cup. The hinder part is of the simplest construction, yet, withal, pleasing in effect. This starting point is usually employed in centre-running scrolls of three portions and is generally so formed as to prevent the eye traversing from their chief points.

Sculpture.

(*Continued from page* 197, *Vol. I.*)

The practice of executing statues of colossal dimensions and proportions, is of very high antiquity. The people of the East, from the most ancient times, have been celebrated for colossal sculpture. The pagodas of China and of India, and the excavated caverns of the East, abound with colossi of every denomination. The Asiatics, the Egyptians, and in particular the Greeks, have excelled in these works. The celebrated Colossus of Rhodes was reckoned one of the seven wonders of the world. This statue, which Muratori reckons among the fables of antiquity, was raised by the Rhodians, in honour of Apollo.

There are many contradictory accounts in ancient authors concerning this colossal statue of Apollo; but the following, gathered from several sources, is not devoid of interest, though mixed up with much fable. When Demetrius, king of Macedon, the son of Antigonus, laid siege to the city of Rhodes, because the Rhodians would not renounce their alliance with Ptolemy Soter, they were succoured by their allies and particularly by Ptolemy, so effectually, that the besiegers were compelled to abandon their enterprise. The Rhodians, in recognition of their regard for these services of their allies, and of the protection of their tutelary deity, Apollo, resolved to erect a brazen statue of the sun of prodigious size. Chares, the disciple of Lysippus, was intrusted with the project. He had scarcely half finished the work, when he found that he had expended all the money that he had received for the whole, which overwhelmed him so completely with grief and despair, that he hanged himself. Laches, his fellow-countryman, finished the work in the space of twelve years, and placed the enormous statue on its pedestal. Pliny does not mention the latter artist, but gives all the honour to Chares.

Scarcely sixty years had elapsed before this monster of art was thrown from its place by an earthquake, which broke it off at the knees; and so it remained till the conquest of Rhodes by the Saracens, in A.D. 684, when it was beaten to pieces and sold to a Jew merchant, who loaded above 900 camels with its spoils. Strabo, Pliny, and other ancient authors, who lived at the time that the Colossus of Rhodes is said to have been in existence, and who could have learned from contemporaries the truth or falsehood of the accounts of it, give its height at 70 cubits, or a hundred English feet. Other authors, who flourished since its destruction, report its height at 80 cubits. Pliny also relates other particulars, as that few persons could embrace its thumb, and that its fingers were as long as ordinary statues, which, calculated by the proportion of a well-made man, would make its height nearer to 80 than 70 cubits. Perhaps the latter dimension may relate to its real altitude to the crown of its head, and the greater to its altitude if erect. The statue was placed across the entrance of the harbour, with its feet on two rocks; and the Rhodian vessels could pass under its legs. Some antiquaries have thought, with great justice, that the fine head of the sun, which is stamped upon the Rhodian medals, is a representation of that of the Colossus.

One of the largest colossal figures in the world is the Sphynx. It is in the midst of a vast ocean of sand, and facing the second great pyramid on the eastern side. Its present appearance is represented beneath.

Sphynxes appear to have been used by the Egyptians, to show the beginning of the waters rising in the Nile; with this view, as it had the head of a woman and body of a lion, it signified that the Nile began to swell in the months of July and August, when the sun passes through the signs of Leo and Virgo.

From the deep interest which the Egyptians felt in this mighty river, the hieroglyphical

representations in the Sphynx were multiplied to a great extent. There is little more than the top of the Great Sphynx visible, which is more than 100 feet long. It is of one single stone, making part of the rock on which the pyramids are placed. Its head rises about twenty-nine feet above the sand. This, according to Thevenot, is twenty-six feet high, and fifteen feet from the ear to the chin; but Pliny assures us, the head was no less than one hundred and two feet in circumference, and sixty-two feet high from the belly, and that the body was one hundred and forty-three feet long, and was thought to be the sepulchre of king Amasis.

Some have suggested, that the well of the great pyramid led to this monster, and that the priests resorted thither at certain times to pronounce their oracles; alleging that a hole placed at the top of the Sphynx's head answered for some deceptive purpose; but this hole is only five feet deep, and communicates neither with the mouth nor with the inside of the colossal monster. The Arabs, who have a holy horror of all representations of men and animals, have disfigured its face with arrows and lances, which has acted much more than time upon the stone.

The learned Mr. Bryant observes, that the Sphynx seems to have been originally a vast rock of different strata; which, from a shapeless mass, the Egyptians fashioned into an object of beauty and veneration. It may hardly be necessary to add, that the features are of the Coptic cast.

Of other colossal statues, those which were executed by Phidias are among the most celebrated for beauty and elegance of workmanship. They were his Olympian Jupiter and Minerva of the Parthenon. The virgin goddess was represented in a noble attitude, 26 cubits or 39 feet in height, erect, clothed in a tunic reaching to the feet. In her hand she brandished a spear, and at her feet lay her buckler and a dragon of admirable execution, supposed to represent Erichthonius. On the middle of her helmet a sphynx was carved, and on each of its sides a griffin. On the ægis were displayed a Medusa's head and a figure of Victory. This colossal work was not only grand and striking in itself, but contained, on its various parts, curious specimens of minute sculpture in *basso relievo*, which Phidias is said to have brought to perfection.

His Olympian Jupiter was executed after the ungrateful treatment that he received from the Athenians, when he abandoned the city of his birth, which he had rendered celebrated by his works, and took refuge in Elis. Animated rather than subdued by the ingratitude of his countrymen, Phidias laboured to surpass the greatest works with which he had adorned Athens. With this view he framed the statue of Jupiter Olympius for the Eleans, and succeeded even in excelling his own Minerva in the Parthenon. This colossal statue was sixty feet in height, and completely embodied the sublime picture which Homer has given of the mythological monarch of the heavens.

(To be continued.)

Alabaster.

Alabaster is a stone usually white, and soft enough to be scratched by iron. There are two kinds of it: the gypseous, which is merely a natural semi-crystalline sulphate of lime; and the calcareous alabaster, which is a carbonate of lime. The oriental alabaster is always of the latter kind, and is most esteemed, because it is agreeably variegated with lively colours, and especially with zones of honey-yellow, yellow-brown, red, &c.; it is, moreover, susceptible of taking a marble polish.

The fineness of the grain of alabaster, the uniformity of its texture, the beauty of its polished surface, and its semi-transparency, are the qualities which render it valuable to the sculptor and to the manufacturer of ornamental toys.

The limestone alabaster is frequently found as a yellowish-white deposit in certain fountains. The most celebrated spring of this kind is that of the baths of San Filippo, in Tuscany. The water, almost boiling hot, runs over an enormous mass of stalactites, which it has formed, and holds the carbonate of lime in solution by means of sulphuretted hydrogen (according to M. Alexandre Brongniart), which escapes by contact of the atmosphere. Advantage has been taken of this property to make *basso relievos* of considerable hardness, by placing moulds of sulphur very obliquely, or almost upright, in wooden tubs open at the bottom. These tubs are surmounted at the top with a large wooden cross. The water of the spring, after having deposited in an external conduit or cistern the coarser sediment, is made to flow upon this wooden cross, where it is scattered into little streamlets, and thence lets fall upon the sulphur casts, a precipitate so much the finer the more nearly vertical the mould. From one to four months are required for this operation, according to the thickness of the deposited crust. By analogous processes, the artists have succeeded in moulding vases, figures of animals, and other objects, in relief, of every different form, which require only to be trimmed a little, and afterwards polished.

The common alabaster is composed of sulphuric acid and lime, though some kinds of it effervesce with acids, and therefore contain some carbonate of lime. This alabaster occurs in many different colours, and of very different degrees of hardness, but it is always softer than marble. It forms, usually, the lowest beds of the gypsum quarries. The sculptors prefer the hardest, the whitest, and those of a granular texture, like Carrara marble, and so like that they can only be distinguished by the hardness.

The alabaster is worked with the same tools as marble; and as it is many degrees softer, it is so much the more easily cut; but it is more difficult to polish, from its little solidity. After it has been fashioned into the desired form, and smoothed down with pumice-stone, it is polished with a pap-like mixture of chalk,

soap, and milk; and, last of all, finished by friction with flannel. It is apt to acquire a yellowish tinge.

Besides the harder kinds, employed for the sculpture of large figures, there is a softer alabaster, pure white and semi-transparent, from which small ornamental objects are made, such as boxes, vases, lamps, stands of time-pieces, &c. This branch of business is much prosecuted in Florence, Leghorn, Milan, &c., and employs a great many turning-lathes. Of all the alabasters, the Florentine merits the preference, on account of its beauty and uniformity, so that it may be fashioned into figures of considerable size; for which purpose there are large workshops where it is cut with steel saws into blocks and masses of various shapes. Other sorts of gypsum, such as that of Salzburg and Austria, contain sand veins, and hard nodules, and require to be quarried by cleaving and blasting operations, which are apt to crack it, and unfit it for all delicate objects of sculpture. It is, besides, of a gray shade, and often stained with darker colours.

The alabaster best adapted for the fine arts is pretty white when newly broken, and becomes whiter on the surface by drying. It may be easily cut with the knife or chisel, and formed into many pleasing shapes by suitable steel tools. It is worked either by the hand alone, or with the aid of a turning-lathe. The turning tools should not be too thin or sharp-edged; but such as are employed for ivory and brass are most suitable for alabaster, and are chiefly used to shave and to scratch the surface. The objects which cannot be turned may be fashioned by the rasping tools, or with minute files, such as variegated foliage. Fine chisels and graving tools are also used for the better pieces of statuary.

For polishing such works, a peculiar process is required: pumice-stone, in fine powder, serves to smooth down the surfaces very well, but it soils the whiteness of the alabaster. To take away the unevennesses and roughnesses, dried shave-grass (*equisetum*) answers best. Frictions with this plant and water polish down the asperities left by the chisel: the fine streaks left by the grass may be removed by rubbing the pieces with slaked lime, finely pulverised and sifted, made into a paste, or putty, with water. The polish and satin-lustre of the surface are communicated by friction, first with soap-water and lime, and finally with powdered and elutriated talc or French chalk.

Such articles as consist of several pieces are joined by a cement composed of quicklime and white of egg, or of well-calcined and well-sifted Paris plaster, mixed with the least possible quantity of water.

Alabaster objects are liable to become yellow by keeping, and are especially injured by smoke, dust, &c. They may be in some measure restored by washing with soap and water, then with clear water, and again polished with shave-grass. Grease spots may be removed either by rubbing with talc powder or with oil of turpentine.

The surface of alabaster may be etched by covering over the parts that are not to be touched with a solution of wax in oil of turpentine, thickened with white lead, and immersing the articles in pure water after the varnish has set. The action of the water is continued from twenty to fifty hours, more or less, according to the depth to which the etching is to be cut. After removing the varnish with oil of turpentine, the etched places, which are necessarily deprived of their polish, should be rubbed with a brush dipped in finely-powdered gypsum, which gives a kind of opacity, contrasting well with the rest of the surface.

Alabaster may be stained either with metallic solutions, with spirituous tinctures of dyeing plants, or with coloured oils, in the same way as marbles.

This substance has been hardened, it is said, by exposing it to the heat of a baker's oven for ten or twenty hours, after taking it out of the quarry, and giving it the figure, roughly, which it is intended to have. After this exposure, it must be dipped for two minutes in running water; when it is cold, it must be dipped a second time for the same period. On being exposed to the air for a few days, alabaster so treated acquires a marble-like hardness. I doubt the truth of this statement.—*Ure's Dictionary.*

Government School of Design.—The new arrangements at the School of Design are now nearly settled. The general superintendence will rest with three of the Board of Trade—three artists will form a local council—three masters or professors will teach and deliver lectures—and a fourth artist will superintend the general management of the provincial schools. The controlling three of the Board of Trade are Mr. Lefevre, Mr. Porter, and Mr. Northcote; the three artists composing the local council are Sir Richard Westmacott, Mr. Richmond, and Mr. A. Poynter; two of the masters or professors are to be Mr. Horsley and Mr. Townshend (the third there is some difficulty about); and the artist superintending the provincial schools is Mr. Wilson, the late director. Mr. Stevens has declined to continue in the office of under-master, and Mr. Le Jeune, another master, has also refused.

Heraldry of the Ancients.—The necessity of a distinguishing mark or badge in the time of war appears to have suggested the employment of certain symbols by the ancients to denote the bravery, policy, or guardian divinity of their respective states. The ancient standard of Persia was, as we learn from Xenophon, an eagle displayed on a shield. This eagle was the royal standard of Persia from the time of Cyrus the Great to that of Artaxerxes; an eagle was also the arms of Rome. Minerva, the tutelary goddess of Athens, was represented by an owl on the banners and coins of that state. Corinth bore a Pegasus; Tyre, a palm-tree; Ant och, a ram and a star; Chios, a sphynx. The royal arms of England are of so great an antiquity that it is almost impossible to assign a date for the assumption of them by the kings of England. —F. E.

Mosaics.

At the late meeting of the Institute of British Architects, Mr. M. D. Wyatt read a paper, "On Mosaics as applied to Architectural Decoration." He commenced by remarking on the propriety of selecting as decorative arts those varieties that seem most in accordance with the spirit of the age; and that each nation and race had possessed peculiar arts, invariably harmonising with the social condition of the people practising them. Mosaic, he observed, had, throughout the period during which it obtained, always strongly evidenced this connexion. It was to be traced from its Persian origin, through its Grecian developement, to its culminating point under Roman influence, and found to vary, *pari passu* with the alterations in the artificial character of society. Introduced in the days of Sylla, about thirty-five years before Christ, the first purpose to which it was applied at Rome was the decoration of the Temple of Fortune at Præneste (now Palestrina), where this interesting specimen yet exists. Leaving to the archæologist the task of following the progress of the art historically, the speaker proceeded to divide his paper into, firstly, a slight analysis of its conditions and capabilities; and secondly, the advantage of so studying its peculiarities as to enable the architect of the present day to take advantage of all those salient points which best fit it for modern introduction. The practice of mosaic, he remarked, naturally assumed two forms—the pictorial, or that in which the imitation of a picture or other existing object was aimed at, and the conventional, or that in which architectural or geometrical forms only were pourtrayed. In tracing the rapid developement of the former, Mr. Wyatt examined generally the scope and nature of the subjects represented on the walls and vaults, and in the pavements of the baths, temples, and dwellings, of the Romans; and dwelt especially on the admirable congruity that usually existed between the nature of the idea represented and the character of the apartment for the adornment of which it was destined. This harmony, fully carried out at Pompeii, was recommended for modern imitation. The introduction of pictorial representations in pavements was generally condemned, as both inconsistent and unpleasing. The universality of the employment by the Romans, and the beautiful architectonic effects produced by its use, were strongly dwelt on; as well as the probability that Constantine, on removing in the year 329 to Byzantium, took there with him many mosaic workers by whose efforts the first churches built by him were decorated. The art becoming traditional in Constantinople, in transmission changed its character, and the Greek mosaic started into life. The principal peculiarities of this variety were enumerated as consisting of the universal use of glass to the exclusion of any other material in the composition of the tesseræ of which the pictures were formed, and in the universal popularity of the gold ground as a field for all figures, &c. These mosaics covered originally every portion of the walls and vaults of the primitive churches; and their employment was retained more or less universally down to as late a period as 1506. Mr. Wyatt took occasion to refer to the great influence which the early use of mosaic—derived from the Byzantines—among the Mohammedan architects may have had in determining all the phases of the after-developement of their style. Returning to the progress of mosaic in Italy, the speaker enumerated a series of chronological examples of churches, &c.; and continued his sketch of the advancement of the art pictorially down to the period of the revival of learning,—when its peculiar Greek character declined, and its place was usurped in Tuscany by the modern Florentine or marble mosaic, in Rome by the modern Roman or vermiculated work. Should mosaic be employed in the new Houses of Parliament, Mr. Wyatt expressed his belief that this last must be the *modus operandi* adopted. The next division of the subject, on the nature, &c. of conventional mosaic, was briefly characterised as being based on geometrical forms; originally, when variously coloured marbles were the materials employed by the Romans, on the square and circle,—and subsequently when pavements were generally formed by the mediæval architects of porphyry and serpentine, on combinations of hexagons and triangles. As analogous to this variety the lecturer brought forward the Byzantine geometrical glass mosaic; which he described as principally made use of for the adornments of minor architectural details and church furniture, and as constituting a refined adjunct to the beautiful decorations of the pictorial mosaic.

Mr. Wyatt then urged attention to the æsthetic value of the study of the art of mosaic;—demonstrating the practical advantage that might be gained from it in each department of the Fine Arts. He dwelt more particularly on its capabilities as affording the most durable means of adding the graces of colour to those of form; on the fact that the mosaic monuments still existing afford the best academy for the student in polychromatic decoration; and especially on the value of that particlar form of design which was engendered by the material, and would, he asserted, if properly treated, harmonize alike with severe monumental style and with the more graceful ones springing from domestic requirements. He concluded by remarking that through the efforts of such manufacturers as Messrs. Minton and Mr. Singer excellent material could now be provided—and that patronage only was now wanting to thoroughly and entirely resuscitate the art.

Warming Railway Carriages. — In America a patent has been taken out for an improved mode of warming railway passenger trains by a combination of flues, connected, by elastic and flexible hose, with openings and registers in the bottom of the carriages.

Lac.

This is a substance well known in Europe under the different appellations of stick-lac, shell-lac, and seed-lac. The first is the lac in its natural state, encrusting small branches or twigs. Seed-lac is the stick-lac separated from the twigs, appearing in a granulated form, and probably deprived of part of its colouring matter by boiling. Shell-lac is the substance which has undergone a simple purification, as mentioned below. Beside these, we sometimes meet with a fourth, called lump-lac, which is the seed-lac melted and formed into cakes.

Lac is the product of the *coccus lacca*, which deposits its eggs on the branches of a tree called bihar, in Assam, a country bordering on Thibet, and elsewhere in India. It appears designed to answer the purpose of defending the eggs from injury, and affording food for the maggot in a more advanced state. It is formed into cells, finished with as much art and regularity as a honeycomb, but differently arranged; and the inhabitants collect it twice a year, in the months of February and August. For the purification, it is broken into small pieces, and put into a canvas bag of about four feet long, and not above six inches in circumference. Two of these bags are in constant use, and each of them held by two men. The bag is placed over a fire, and frequently turned, until the lac is rendered sufficiently liquid to pass throngh its pores, when it is taken from over the fire, and twisted in different directions by the men who hold it, at the same time dragging it along the convex part of a plantain tree, prepared for this purpose; and while this is doing, the other bag is heating to be treated in the same manner. The mucilaginous and smooth surface of the plantain tree prevents its adhering; and the degree of pressure regulates the thickness of the coating of lac, at the same time that the fineness of the bag determines its clearness and transparency.

In India, lac is fashioned into rings, beads, and other trinkets; sealing-wax, varnishes, and lakes for painters are made from it; it is much used as a red dye; and the resinous portion, melted and mixed with about thrice its weight of finely-powdered sand, forms polishing stones. The lapidaries mix powder of corundum with it in a similar manner.

The colouring matter is soluble in water; but one part of borax to five of lac renders the whole soluble by digestion in water, nearly at a boiling heat. This solution is equal for many purposes to spirit varnish, and is an excellent vehicle for water-colours, as, when once dried, water has no effect on it. Lixivium of potash, soda, and carbonate of soda, likewise dissolve it; so does nitric acid, if digested upon it in sufficient quantity forty-eight hours.

The colouring matter of the lac loses considerably in beauty by being kept by any great length of time; but when extracted fresh, and precipitated as a lake, it is less liable to injury.

Restoration of Old Paintings.

The usual commencement is with soft water and common yellow soap, with soft soap and water, or with ox-gall and water; the latter being stronger than soaps. When these have been well applied with a very soft sponge, containing not the least particle of grit or sand, the picture is to be washed with clean water, and made perfectly dry with old linen cloth or silk handkerchiefs, the latter are preferable. In using the ox-gall the best method would be to lay it on the picture (which is to be placed horizontally) with a brush, and when the first layer is dry to add another, afterwards allowing the gall to remain on the picture for two or three days; then with a sponge and plentiful supply of clean water, it will be perceived that a considerable quantity of various impurities have attached themselves to the gall, and are removed at the same time with it, leaving the picture so considerably improved in appearance, as sometimes to require little or nothing more.

Before much water is used in the first stages of picture cleaning, the state of the painting must be considered. for if the colour be much broken up, or cracked over the whole surface, it might be rather dangerous to apply much water in the first instance.

In cases of this kind we recommend, that the back of the picture be well saturated with copal varnish by several applications with a strong brush, previous to its being lined. This will in a great measure assist in attaching the ground on which the picture has been painted to the cloth, and perhaps entirely prevent the tendency that grounds, much broken into, have to leave the cloth; yet, when all has been done that can be, by varnishing the back, it will be still necessary to use no more water than is absolutely necessary, unless well assured that no size or glue has been used in the composition of the ground.

If more be necessary after these washings, as the removal of the varnish, &c., use a little smart friction with the finger, dipped previously into a box of *impalpable* pumice-stone powder; this will ascertain, by the peculiar smell produced, whether the varnish that has been used be mastic or not. If it be mastic, it may, by a continuance of the same process be rubbed off all the delicate parts of the picture without much risk of taking up the colours, as the varnish rises under the finger in the form of a white powder, which ceases to rise after the whole has been taken off. We must add, that after the varnish has begun to come off freely in powder, no more pumice-powder need be used.—*T. H. Fielding.*

Apparatus for Denoting Ensuing Changes in the Wind.—From good authority we learn that a French gentleman has invented a small apparatus, which will clearly denote the ensuing change of wind. The apparatus is small, and somewhat similar to a binnacle compass and about the same size. — *Patent Journal.*

Iron-girder bridges, formerly believed to have been made on a principle which insured their safety, having been found to be really not so, says a Manchester paper, it is important to know that further attempts are being made to construct bridges which shall, to a much greater extent, combine safety with economy and simplicity. Lately, says our authority, we saw a model of one which is said to combine these important properties, and is now exhibiting at the Town-hall warehouse, Cross-street. It is a perfect arch, composed wholly of iron; is 22½ feet long, 8 inches deep, 20 broad, and weighs about 6½ cwt. It combines the arch with the abutment bridge, and they can be used separately or together. All the tension parts are made of wrought-iron, and the compression parts of cast-iron. It is so constructed that the rafter and ring-post principle intersect throughout the whole of the structure; and there are chains at the bottom and centre for keeping the whole in a perfect state of tension, thus equally distributing the weight or pressure. The model now supports a weight of 50½ cwts., without having the abutments up; it, consequently, depends upon the chains entirely. We were told that, if the weight be taken off the centre of the arch, its curve would still be maintained without the slightest deviation: it possesses another important property, that of compensating itself against heat and cold.

A New Rotary Four-horse Power Engine in a Hat-box!—Mr. Elijah Galloway has patented what has hitherto been esteemed much more as the philosopher's stone of steam-power than a practicable invention, and is accordingly supposed to have solved the knotty problem of the greatest possible economy of fuel, weight, and friction of which steam-power is susceptible. A four-horse rotary engine under this patent is now at work at the factory of Mr. Tyrrell, engineer, at Deptford, in driving a furnace-blower, and it is said to be so wondrously portable as not to weigh more than two or three cwt., and not to occupy more than half the space of an ordinary hat-box! A steam-pipe from the boiler brings the steam into this little receptacle; an eccentric crank is turned by the rotary motion within it; and here is all the machinery said to be necessary to propel the largest engines, whether mining, marine, or locomotive! The Admiralty are said to have ordered an estimate for supplying the *Minx* with a fifty-horse power one. They could not do better, we think, than name such a little whirling machine the *Minx* itself, and keep it in a band-box.

Notices to Correspondents.

*** Part VI. of the Decorator's Assistant, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., and V. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

☞ Many correspondents having written to us to inquire the names and prices of particular books, we beg to state that a reply on our part would subject us to the Government advertisement duty of eighteenpence, and they will therefore perceive that it is entirely out of our power, without submitting to a pecuniary loss, to comply with their requests.

Notice.—Any of our readers having matured inventions, which they are desirous of communicating to the public, are informed that we shall always be ready to introduce such in our pages.

We shall always be happy to receive Extracts or Original Articles of a practical nature suited to the purposes of this Work.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—Having in my possession a valuable French crayon drawing, which is stained with common Spanish brown paint, mixed with linseed oil alone, I should be extremely obliged if any of your correspondents would inform me of a means for eradicating the same. The paper is of a dark greystone colour.—Yours truly, J. White.

Sir,—I would consider it a favour if any of your correspondents would inform me of the best method for making, casting, or squeezing wax—that description used by carvers for taking impressions of carved blocks.—I am, yours respectfully, A Constant Reader.

Sir,—Can any of your correspondents inform me how the crayons are made, such as painters employ for marbling shop-fronts?—I remain, Sir, yours truly, J. F. Nov. 11, 1847.

ANSWERS TO QUERIES.

Polishing Plaster Casts.—Sir,—Having tried the receipe proposed by "Ajax" in page 144, Vol. I. of the Decorator's Assistant, for polishing plaster casts, I beg to state that the result has proved unfavourable, the cast being discoloured in a few days.—Yours, &c., Etchings.

J. S. Perkins.—A very ingeniously-constructed lamp for burning coal naptha was described in the "Chemist," No. 93, vol. viii., p. 351, by Mr. Reuben Phillips, and which we think would answer all the purposes required by you. We have not space to transcribe the account.

W. A.—The method of wetting paper for bank-notes is as follows:—The paper is laid between two small boards, and put into a vessel of water; the vessel is then put under the receiver of an air-pump; the air is then exhausted and bubbles out of the paper; the air is then let in again, when it presses the water with such force as to drive it into the paper, and thereby preventing its being torn, as it would be if wetted singly.

J. F.—We will continue the articles in question. The page in question is intended to be cut off, and not bound up with the volume. A binder will easily understand the matter.

O. F. G.—Gold may be produced in an artificial manner by melting together 16 oz. of copper, 7 oz. of platina, and 1 oz. of zinc; but you will perceive that this process would be more expensive than the genuine article.

Z. B. (Nottingham).—We will communicate with you privately in a few days.

Bruntsfield (Edinburgh).—Your question respecting the problem will shortly be answered. We intend to devote an article to the French style of ornament. We will consider respecting your last request.

Inquirus.—You may brighten copper or brass a very good colour with soot and diluted nitric acid.

J. P. I.—We will endeavour to obtain the receipt for you; but we are not sure of finding it, as we forget the name of the work it originally appeared in.

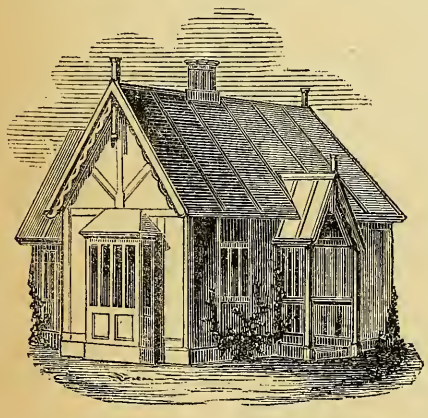
Notice to the Trade.—Ornamental Designs made, and, if necessary, engraved, on the most reasonable terms, with punctuality and despatch. For particulars, &c., address (if by letter, post paid) to Mr. Wm. Gibbs, Ornamental Draughtsman and Engraver, at the Decorator's Assistant Office, 17, Holywell-street, Strand, London.

Saturday, November 20, 1847.—Printed by W. Coole, Lumley Court, Strand.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

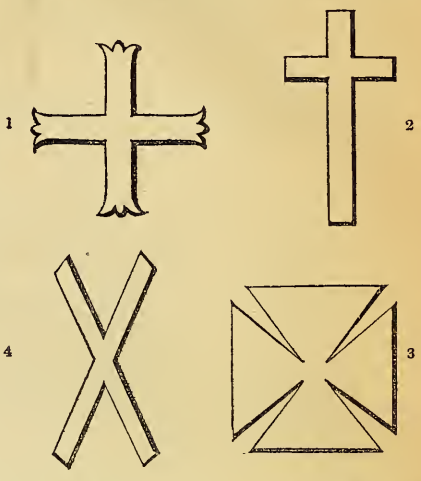
(Continued from paye 11.*)*

Cottage (in architecture), a detached building, generally consisting of a ground and upper storey. Cottages when properly constructed and suitably placed have a very picturesque appearance. (See Rural Architecture.) Some very useful hints respecting the construction of cottages, by Mr. Dearn, appear in the 24th volume of the "Repertory of Arts and Manufactures." His objections against the generality of cottages for the labouring poor are these:—That being of either lath-and-plaster work, or their walls composed of bricks of not more than four inches in thickness, and rough-cast, or rendered; in the first instance proving a weak defence against the weather; and in the latter subject to injury from the slightest causes, and also liable to dampness. To give stability and warmth, and at the same time save materials, Mr. Dearn

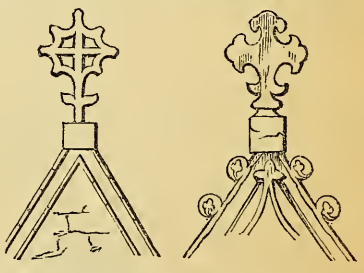


proposes to lay the foundation course, and the two following courses of the walls, in the usual old English manner, with alternate courses of headers and stretchers; and from this foundation the wall is to be raised to the required height by alternate courses of stretchers on edge, on the back and front of the wall, and heading courses to cover, leaving a vacant space between the stretchers of the width of half a brick. Bond timbers may be introduced as may be deemed necessary. It is stated that by this mode a saving of one-third, in the article of bricks, will be effected; that only one-half the quantity of mortar will be used; that less labour will be required; and that the walls will, by this mode, be entirely free from damp, and the expense at least less by one-fourth than the less eligible mode of lath-and-plaster building.

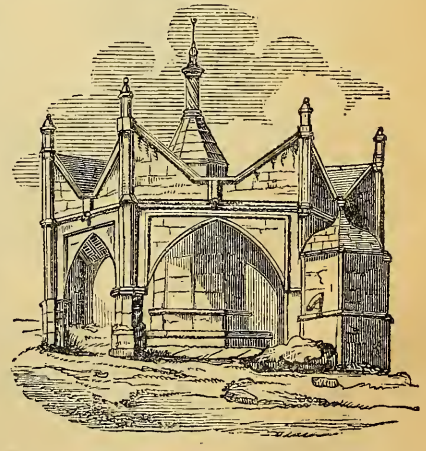
Cross, one straight body laid at any angle upon another. 1. Greek cross. 2. Latin cross. 3. St. George's cross. 4. St. Andrew's cross. Crosses of a highly-decorated and often peculiar form are of very frequent occurrence. We subjoin two; the first being



from the gabled roof of Norwich Cathedral, and the second from that of Salisbury Cathedral. The form of a cross has been pretty



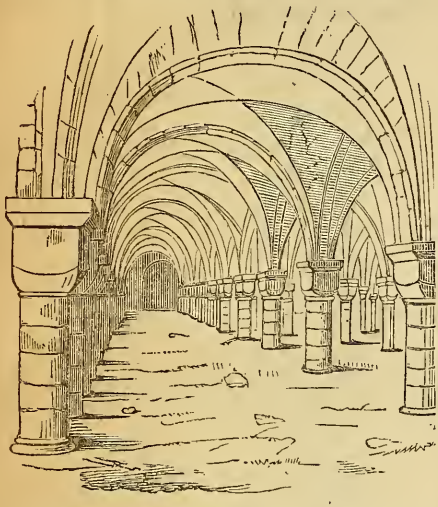
generally adopted by architects in the construction of churches and other religious edi-



fices; as, for instance, St. Peter's, at Rome, is of the form of a Greek cross, while St. Paul's,

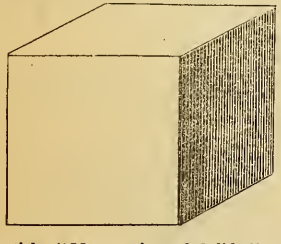
London, is that of a Latin one. There was also a very common species of architectural ornament for decorating cemeteries, market-places, or commemorating any remarkable event. The following is a representation of a market-cross at Glastonbury, in Somersetshire.

Crypta (in architecture), a subterraneous cell or vault for the interment of particular



families or persons, generally formed under a church. The engraving represents a crypt in Canterbury cathedral.

Cube (in geometry), a solid body consisting of six equal square sides.



[In the article "Mensuration of Solids," page 7, an unfortunate error occurred, the figures representing the cube and parallelpipedon being transposed, and that representing the first being also placed in a wrong position. We have, therefore, re-engraved the cube and inserted it in this place.]

Cubit, a measure of length employed by the ancients, equal to 1 ft. 5.952 in., English measure, exactly.

(To be continued.)

We learn that it is in contemplation of Government to establish auxiliary Schools of Design, and that more than one already-existing school in the metropolis, conducted by private individuals at their own risk, is likely to be converted to such a purpose.

Stain for New Oak.—Fresh lime-water is said to be a good stain for new oak.

Lilliputian Express Engine.

On the 23rd ult. an experimental trial took place upon the Eastern Counties Railway, to test the powers of a small locomotive engine of a novel description, designed and constructed by Mr. Samuel, resident engineer of the Eastern Counties line. It is of two horse power, runs upon four wheels, requires no tender, and not only carries sufficient fuel and water for its own consumption within the smallest possible dimensions, but is also capable of conveying seven persons (besides the engineer and stoker) in the after-part, which resembles an open Irish car. The total weight of this little locomotive *bijou* is 22 cwt., its extreme length, including boiler, car, and all, is only 12 feet 6 inches, and the height from the rails to the floor of the engine is not more than one foot. The little novelty left the Shoreditch station at half-past twelve o'clock, with a party of seven gentlemen. Mr. Samuel himself drove the engine, and a speed of forty miles an hour was soon attained. The perfect ease and steadiness of motion at this high rate of speed were remarkable in so light a vehicle. Three stoppages were made to take in water, and the party arrived at Cambridge at a quarter to three o'clock, having travelled the distance, 57 miles (exclusive of stoppages) in about an hour and three-quarters. At one time the rate of travelling was 43 miles an hour, and Mr. Samuel stated, that he had tested the powers of the engine to go at the rate of 47 miles an hour. Mr. Samuel's invention appears to be admirably adapted for newspaper and other expresses, since the consumption of coke is so exceedingly small that the company can afford to run this engine at one-fourth the present rate of charge for expresses. The engine is also found to be a useful and economical substitute for the larger locomotives, in those incessant visits of supervision along the line which form part of the duty of the resident engineer of a railway. We subjoin a few details of the proportions, &c.:—The boiler is tubular, having 34 tubes of $1\frac{1}{4}$ inch; diameter of boiler, 2 feet; height of boiler, 3 feet 6 inches; height to the top of the funnel, 7 feet 6 inches; stroke 6 inches. The supply of water is contained in a box under the feet of the passengers, and the economy of space is carried out to the fullest extent. The engine behaved admirably on crossing the points and rounding the curves of the line, and there appeared to be less rocking and jolting than is usually experienced in a first-class carriage of the usual size when travelling at the same rate of speed.

In India the plastered walls of rooms are stamped when moist, and worked into patterns, over which is spread a varnish of powdered talc, which closely resembles the richness and hue of new and unused frosted silver plate. This might be introduced in England, as a very cheap and elegant drawing-room decoration.

Cutlery.

Although cutlery, in the general sense, comprises the manufacture of all those articles denominated edge tools, it is more particularly confined to that of knives, forks, scissors, penknives, razors, and swords. Damascus was anciently famed for its razors, sabres, and swords. The latter are said to possess all the advantages of flexibility, elasticity, and hardness. These united distinctions are said to have been effected by blending alternate portions of iron and steel in such a manner, that the softness and tenacity of the former could prevent the breaking of the latter.*

All those articles of cutlery which do not require a fine polish, and are of low price, are made from blistered steel. Those articles which require the edge to possess great tenacity, at the same time that superior hardness is not required, are made of sheer steel. The finer kinds of cutlery are made from steel which has been in a state of fusion, and which is termed cast steel, no other kinds being susceptible of so fine a polish. Table knives are mostly made of sheer steel; forks are made almost altogether by the aid of the stamp and appropriate dies; the prongs only are hardened and tempered.

Almost all razors are made of cast steel, the quality of which should be very good, the edge of a razor requiring the combined advantages of great hardness and tenacity. After the razor blade is forged, it is hardened, by gradually heating it to a bright red heat, and plunging it into cold water. It is tempered by heating it afterwards until a brightened part appears of a straw colour. Though this is generally performed by placing them upon the open fire, it would be more equally effected by sand, or what is still better, in hot oil, or a fusible mixture, consisting of 8 parts of bismuth, 5 of lead, and 3 of tin; a thermometer being placed in the liquid at the time the razors are immersed, for the purpose of indicating the proper temperature, which is about 500 degrees Fah. Razors are ground crosswise, upon stones from four to seven inches in diameter, a small stone being necessary to make the sides concave. They are afterwards smoothened and polished.

The handles of high-priced razors are made of ivory and tortoiseshell; but, in general, they are of polished horn, which is preferred on account of its cheapness and durability. The horn is cut into pieces, and placed between two corresponding dies, having a recess of the shape of the handle. The dies are previously heated to about 500 degrees Fah., and placed with the horn, in a press of such power, that, allowing a man's strength to be 200 pounds, it will be equal to 43,000 pounds. By this process, the horn receives considerable extension. If the horn is not previously black, the handles are dyed black by a bath of logwood and sulphate of iron. The clear horn handles are sometimes stained so as to imitate the tortoiseshell.

The manufacture of penknives is divided into three departments; the first is the forging of the blades, the spring, and the iron scales; the second, the grinding and polishing the blades; and the third, the handling, which consists in fitting up all the parts, and finishing the knife. The blades are made of lhe best cast-steel, and hardened and tempered to about the same degree with that of razors. In grinding, they are made a little more concave on one side than the other: in other respects, they are treated in a similar way to razors. The handles are covered with horn, ivory, and sometimes wood; but the most durable covering is stag-horn. The most general fault in penknives is that of their being too soft.

The temper ought not to be higher than a straw colour, as it seldom happens that a penknife is so hard as to snap on the edge.

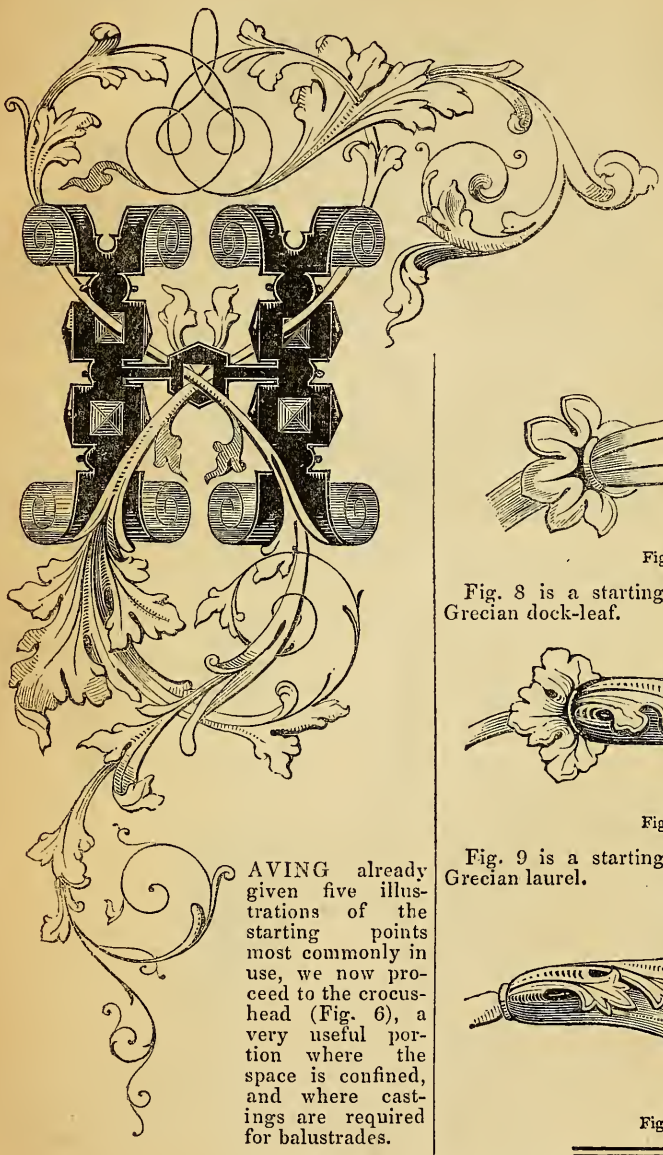
The beauty and elegance of polished steel is nowhere displayed to more advantage than in the manufacture of the finer kinds of scissors. The steel employed for the more valuable scissors should be cast steel of the choicest qualities: it must possess hardness and uniformity of texture, for the sake of acquiring a fine polish; and great tenacity when hot, for the purpose of forming the bow or ring of the scissors, which requires to be extended from a solid piece, having a hole previously punched through it. It ought also to be very tenacious when cold, to allow that delicacy of form observed in those scissors termed "ladies' scissors." After the scissors are forged as near to the same size as the eye of the workman can ascertain, they are paired, and the two sides fitted together. The bows and some other parts are filed to their intended form; the blades are also roughly ground, and the two sides properly adjusted to each other, after being bound together with wire, and hardened up to the bows. They are afterwards heated till they become of a purple colour, which indicates their proper temper.

Almost all the remaining part of the work is performed at the grinding-mill, with the stone, the lap, the polisher, and the brush. The very large scissors are partly of iron and partly of steel, the shanks and bows being of the former. These, as well as those all of steel, which are not hardened all over, cannot be polished; an inferior sort of lustre, however, is given to them by means of a burnisher of hardened polished steel, which is very easily distinguished from the real polish by the irregularity of the surface. By a combination of platinum and some other metals in fine cutlery, it has lately been much improved.

* We will shortly give a more scientific description of the peculiar properties of Damascus steel.—Editor.

New Railway Signal.—A signal of a new sort has been fixed to the guards' carriages on the South-Western, which consists of an enormous bell and a red flag. Upon the guard discovering anything wrong in the train, he causes the bell to ring very loud, and at the same time a red flag flies up, as a signal to the engine-driver.

Starting Points.



HAVING already given five illustrations of the starting points most commonly in use, we now proceed to the crocus-head (Fig. 6), a very useful portion where the space is confined, and where castings are required for balustrades.

Fig. 6.

Fig. 7 is the bell-head, which is but seldom used in the body of scroll-work, but is the starting point for the little cups and small springings of design, as represented in the annexed figure.

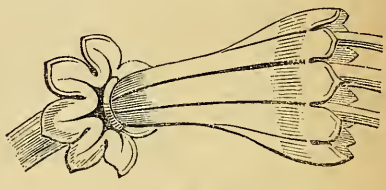


Fig. 7.

Fig. 8 is a starting point formed of the Grecian dock-leaf.

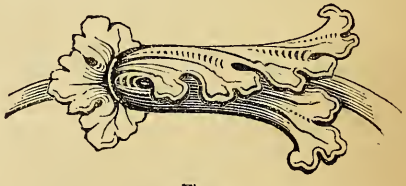


Fig. 8.

Fig. 9 is a starting point formed of the Grecian laurel.

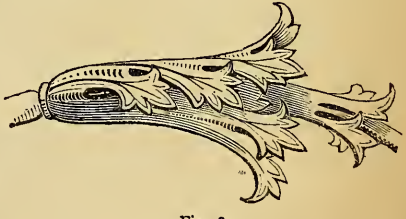
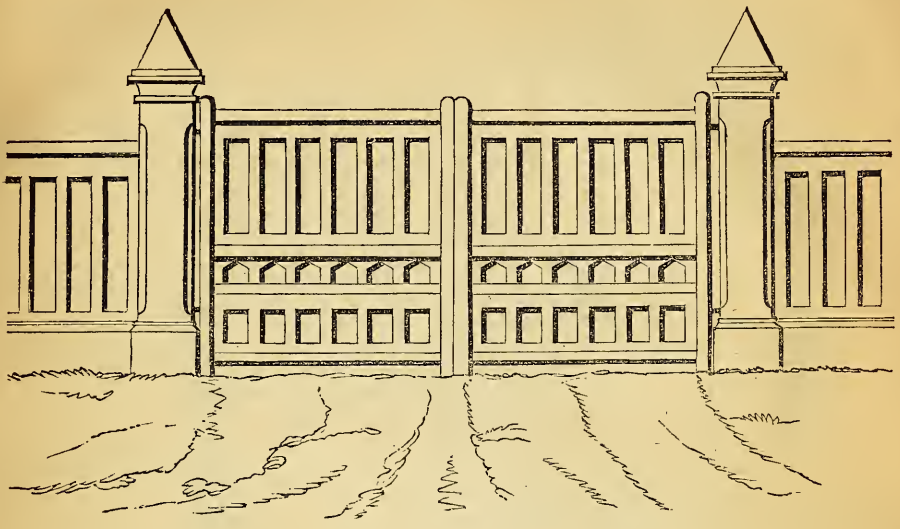


Fig. 9.

The Newcastle and Gateshead Whittle Dean Water-works have made great progress towards completion. The earthwork of the reservoirs at Welton has been executed. The store of water which they will contain will be about 250,000,000 of gallons,—the present consumption of Newcastle and Gateshead being rather less than 1,000,000 gallons per day. Of the twelve miles of iron aqueduct pipe, upwards of eight miles are laid.



AN ORIGINAL DESIGN FOR PARK GATES.

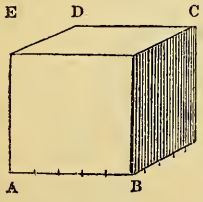
Mensuration of Solids.

(*Continued from page* 13.)

PROBLEM I.

To find the solidity of a cube, the length of one of its sides being given.

Multiply the given side by itself, and that product again by the side, and it will give the solidity required.



Example.—Suppose the side A B or D C of the cube A D is 5 inches, what is its solidity?

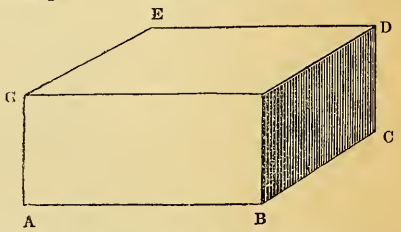
5
5
—
25
5
—
125 cubic inches = the solidity required.

PROBLEM II.

To find the solidity of a parallelopipedon.

Multiply the length by the breadth, and that product again by the depth or altitude, and it will give the solidity required.

Example 1.—What will be the solidity of



the parallelopipedon A D, whose length A B is 7 feet, its breadth B C 4 feet, and its thickness 3 feet?

7
4
—
28
3
—
84 solid feet = the solidity required.

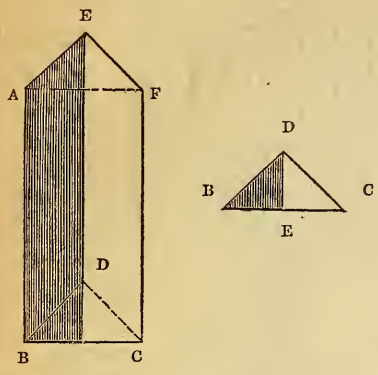
Example 2.—What is the solidity of a block of marble, whose length is 10 feet, its breadth $5\frac{3}{4}$ feet, and the depth $3\frac{1}{2}$ feet?

$\frac{3}{4}$) 10
5
—
50
$7\frac{1}{2}$
—
$\frac{1}{2}$) $57\frac{1}{2}$
3
—
$172\frac{1}{2}$
$28\frac{3}{4}$
—
$201\frac{1}{4}$ cubic feet.

PROBLEM III.

To find the solidity of a prism.

Multiply the area of the base by the perpendicular height of the prism, and the product will be the solidity.



Example 1.—What is the solid content of a prism whose altitude A B or E D is 10 feet, and whose base B C D is an equilateral triangle, of which a side is 2½ feet in length?

Let B D C be an equilateral triangle, and D B = 2½ feet. From D draw D E perpendicular to B C, then B E is equal to E C.

Now,

2.5
2.5
125
50
6.25

2) 2.5
1.25
1.25
625
1500
1.5625

6.25
1.5625
4.6875 (2.165 = D E.
4
41) 68
41
426) 2775
2556
4325) 21900
21625
275
2.165
1.25
10825
25980
2.70625 = area of base.
10 = height.
27.06250 = the solidity.

Otherwise:

Find the area of the base by the Problem before given for this purpose, thus:—

2.5
2.5
2.5
2) 7.5 = perimeter.
3.75 = half sum of sides.

3.75
2.5
1.25 = one of the three equal remainders.

3.75
1.25
1875
4500
4.6875
1.25
234375
562500
5.859375
1.25
29296875
70312500
7.32421875

7.32421875 (2.7063 = area of base.
4
47) 332
329
5406) 34218
32436
54123) 178275
162369
15906

2.7063
10
27.063 = solidity of prism.

(To be continued.)

HUSKISSON'S STATUE.—An offer has been made by Mrs. Huskisson, to the committee of Lloyd's, of the original marble statue of her late husband, by Gibson, for erection in the vestibule of the new rooms of that institution, and, we need scarcely say, accepted.

THE SNOW PLOUGH.—The Baltimore and Ohio Railroad Company have in use an engine of twenty-five tons, which, with the aid of a newly-constructed snow plough, that cost only fifty dollars, carries a heavy train up a steep ascent, through snow drifts eight and nine feet deep.

What is High Art?

At a meeting of the Decorative Art Society, on October 27, the second part of a paper on the above subject was read by Mr. Dwyer. In resuming, he wished it to be understood that his plan of treatment sought rather to embody and classify on broad considerations, than to judge of art in its details. Doubtless many differed from his opinions, and he had found prejudice to be the greatest difficulty to overcome in attaining to a proper estimation of art. We ought not, be said, to rely on a floating opinion, that this work is beautiful, or that commonplace,—this high art, or that low and vulgar: we should not be contented to receive all such dogmas as truth, without attempting to understand why or how far the intentions of art are evident to ourselves. Simplicity with purpose, he said, constitutes perfection in art; and although they are the most rarely developed, they are most readily recognised by a spectator. He then inquired, what constitutes historical art? Is it represented by battle scenes, massacres, processions, or reviews? He was of opinion that, in its true and nobler sense, we ought to find a combination of characteristics in persons, time, and place, harmonising with the event represented, and associated with mental attributes commanding reverential attention, and exciting an appropriate feeling of emulation in the beholder. It is rarely, he observed, that such *desiderata* are supplied in painting, and the accredited substitutes are too generally mere portraits and gatherings from old prints. The recent exhibition at Westminster Hall, professedly of historical art, would, he said, afford examples to convince us how far these principles have been understood and how applied. The picture of "Alfred inciting the Saxons to prevent the Landing of the Danes," displayed a high purpose,—an attempt to show in a simple fact what our navy once was, and lead us to respect the man who by his genius improved the defences of our country and laid the foundation for our present commercial greatness. Thus, there appeared much food for a reflective mind. On the other hand, "The Battle of Meeanee" could only excite a feeling of horror, and would, in his opinion, be more fitted for the Horse-guards than a decoration in the new palace at Westminster. In "Richard Cœur de Lion forgiving Bertrand de Gourdon," a moral lesson might be discovered —an embodiment of a noble principle in Christianity; while, on the other hand. "Edward's *generosity* to the People of Calais during the Siege of 1346," was too problematical in such respect. Attention was directed to a scriptural picture relating to the "Seven Acts of Mercy," in which the conditions of sickness, hunger, and the houseless, were expressed through the medium of English associations. This the reader considered praiseworthy, as appealing in English garb to English understandings, and thus rendering art more sympathetically urgent to good moral actions. It would be instructive, he said, for all to examine how much of high art, or rather *high purpose*, has emanated through the royal commission. He inferred, that out of much pretension there may be found a very few good works tending to promote the advancement of art. A more extensive acquaintance with the nature of mental emotions, and a greater variety in mental expressions, were mentioned, as being essentials for progress, and that to pourtray mental capacity in accordance with the character depicted, is the essence, or high art, as being beyond the capacity of imitative skill. An example such as "The Last Supper," by Leonardo da Vinci, would, it was said, impress an ordinary spectator, at the first glance, with the natural variety shown in the whole scene; yet the distinctive expressions of each personification are rendered in consonance with the event depicted.

The decorations for the new palace at Westminster, according to the comprehensive system laid down by the Fine Arts Commission, it was observed, afford an unexampled opportunity to artists for gratifying the desires of all who venerate painting only in its noblest workings. He hoped that the term decorations would not continue to be misunderstood, misinterpreted, and restricted in its meaning, as hitherto, by artists in general:—that the time had returned when all branches of the arts would be thought honoured in their application as decorations. He would ask, what had lately been the general estimation of a painting on a wall? why, mere ornamentation. Whereas, if stripped from auch a position and framed as a picture, it would have been recognised as of fine art, or high art. Again, he remarked, artistic workings in metal, such as jewellery, would, if in marble, take rank as fine art. These false distinctions, the reader contended, had led to an overflow of followers in certain divisions of art called professional, whilst in others, deemed industrial, an equally evident scarcity prevails. A skilful designer for manufactures, he argued, is as much an artist as the painter of landscapes or portraits, and, in his opinion, the designer required for his purposes abilities both mentally and manipulatively superior to the other. He instanced Holbein, who, as a painter of portraits, imitated admirably, but as a designer, he invented nobly; —Quentin Matsys, who, being recognised by artists, owing to his great abilities as a painter, displayed yet greater genius in his ironwork as a blacksmith; but, had he not painted, his name would not have been remembered by artists. Is it just, it was asked, to estimate art thus by clean hands, as it were? or, is it right to place imitative skill above ideal and constructive genius? It was remarked, that the public requires instruction before sound inferences, upon what constitute great excellence in the arts, can be popular, or an understanding of the parallels in artistic achievements can be fairly sustained. Successful works in art emanate only from a congenial source, and the taste of a nation must always influence their production. He had been much impressed by the opinion, that whatever is truly great or practically useful is always based upon simplicity, while that which is imperfectly

understood is usually overloaded with technicalities. The simple outltnes of Greek and Etruscan vases, he observed, have caused, perhaps, more obstruse geometrical investigations into conic sections than even the planetary systems; yet, in his opinion, geometry had not been brought to assist art in their formation. He had prepared a few drawings, which were exhibited, to show how simply the most refined forms are obtainable. From the beautifully curved outlines of leaves generally, he had been induced to make a few tracings, and he had been greatly surprised by the slight modifications necessary to impart that practical result—fine art design.

He next spoke of ornamental art, which class, he said, includes works by Raffaelle, P. Veronése, Tintoret, Rubens, Le Brun, Verrio, and other eminent painters. Sculpture he considered to be the ornamenting accessory to architecture. The ornamental designer has no status with the general public. The application of embellishment is almost unlimited, and nothing which consists of a combination of forms should be deemed beneath the range of art. Art, it was said, has but one general purpose and effect alike intelligible under every aspect; nevertheless, the broad distinctions in its practice, originating in human pride, have sapped its energies, and dissevered its entire frame into fragments, each of which is striving to maintain a separate existence and identity. Mr. Dwyer contended, that as all divisions or kinds of art are for the most part decorative, so then a combination uniting one branch with another, and strengthening all, would be most valuable.

It was then remarked, that it is among the applications of art which have been most perverted and misinterpreted, that remedies are necessary; that the fine arts, as we heve been instructed to name them,—architecture, sculpture, and painting,—are each imperfect and incomplete one without the other, and that, nevertheless, their association requires to be presided over and directed by the comprehensive purpose in the result or effect, which is decorative art. As an instance of what he intended to imply, he referred to the new British Museum as a fine specimen of architecture, but quite out of place, and having no harmonious association with anything surrounding it. This had not been the case with the style of building it was displacing, nor is the same deficiency evident in the new palace at Westminster. Indeed, the suggestions which have been entertained with reference to the bridge are proofs of a far better taste in that quarter. These examples, he said, also show that art is inevitably influenced by contingencies.

The reader remarked that there remained the great distinction between art and its application to arrange. In the one is the object, in the otber the means. He had now approached the main difficulty in his subject: how to hold the balance with justice to all interested in the progressive developement of the arts. With the Royal Academy of Arts and its accessories on the one hand, and the industrial arts with their commercial importance on the other, where could all meet on neutral ground to discuss and diffuse mutually a more correct appreciation of the beautiful? It would be remembered that each class has its own means and processes to attend to, but even where so many classes have one and a similar purpose, a mutual concentration and co-operation must be conducive to a general success. In conclusion, he hoped the term "decorative art" would soon be better understood as a combination of all pertaining to high art, fine art, and industrial art, in their general purpose of the embodiment of beauty and perfection with all things material.

Is Bad Work to be Paid for?—This is a question, says the *Iris*, which frequently arises in Sheffield, and one which it is often exceeding difficult to decide, especially as to work sent out to be done. In a recent instance, a quantity of stuff for files was given to a workman to cut, and instead of doing them properly himself, he employed a boy to cut the round part and a man to cut the flat, and the work was badly done. The wages were therefore refused, and a proposal was made that the workman should pay the worth of the iron and take the files for his wages. This he refused to do, and summoned his employer for 25s., which the mayor restricted to 20s., dismissing the summons, but ordering that sum to be paid, as he conceived that, though badly cut, the employer "might manage to get rid of them in some manner:" rather an equivocal recommendation, surely, from a magistrate. The defendant was by no means satisfied with the decision, especially as this was but one out of many instances in which he would be obliged to "get rid" of bad files "in some manner."

American Archæology.—Accounts from America assert, in rather a confused and unarchæological manner, that the remains of a primæval nation have been excavated on a mountain in the Kerr tract, about two miles from Lower Sadunsky, in Ohio. They lie at the depth of about forty feet from the surface, and consist of quantities of bones, weapons, and pipes. They are assumed to be extremely ancient; and the weapons, &c. vary considerably from all that have hitherto been discovered. It is remarkable that an immense number of lamellæ of talc have been dug up, with singular inscriptions. The head of a pipe is also extremely curious, and has some figures carved on it which might without much difficulty be rendered "1461." This, however, cannot possibly be the case, as these relics must have belonged to a very remote period.—*Literary Gazette.*

Society of Arts.—A charter of incorporation has been obtained from the Queen at the instance of the president, Prince Albert, for that society. An exhibition of works of decorative art and ornamental design, similar to that of last year, will take place in the great room of the Adelphi in the month of March next; and the exhibition of the Mulready paintings is promised for May.

On Expression in Relation to the Fine Arts.

Expression, says Le Brun, is a lively and natural resemblance of the objects which we are to represent. It is a necessary ingredient in every part of painting; and without it no picture can be perfect, as it is that which describes the true characters of things. It is by expression that the different natures of bodies are distinguished, that the figures seem to have motion, and that everything imitated appears to be real.

Expression subsists as well in the colouring as in the design; it is to be observed in the representations of landscapes, as well as in the general composition of figures. All substances, whether animate or inanimate, are capable of expression. The skill of the painter exhibits the hardness of one substance and the softness of another, its smoothness or roughness, its dryness or moistness, clearness or opaqueness, &c., in characters which cannot be mistaken.

Expression being, therefore, a representation of things according to their charactor, may be considered either with respect to the subject in general, or to the passions peculiarly relative to it.

First, with regard to the subject; it is first requisite that all and every part of the composition should be so adapted to the general character of the subjects that they should conspire to impress at the same moment one distinct sentiment or idea. Thus, for example, in a picture designed to give the representation of a joyful or a peaceful event, every object that is introduced should be of a pleasing or tranquil kind. If the subject be taken from history, its particular nature and character must be diffused through every part of the work; but wherever any circumstance occurs which counteracts or diminishes the general sentiment raised by the event represented, the insertion of such circumstance will, proportionately to its magnitude, destroy the general expression of the picture. Extraneous incidents are frequently introduced for the purpose of diversifying and giving variety to the expression; but they must be such as are neither contrary to the truth of the history, nor to the principal design of the subject.

The agreement of the whole ought to be particularly regarded, not only in the actions of the figures, but in the background, light and shade, and colouring. Whatever is the general character of the subject, whether serene, joyous, melancholy, grave, solemn, or terrific, the picture should discover that character to the first glance of the spectator. The Nativity of Our Saviour, his Resurrection or Ascension, must be distinguished from his Crucifixion or his interment as much by the general hue of the picture, the accessory ornaments, background, &c., as by the action of the figures. In viewing some of the finest religious subjects of the Italian school, sentiments of awe and devotion have been often experienced amongst the first impressions made on the spectator previous to his examination of the particular actions and countenances of the figures, and, therefore, evidently produced by the general distribution of the composition, or the general tone of the colouring. The works of Ludovico Caracci are justly celebrated by Sir Joshua Reynolds in his academic discourses for their powerful effect in the latter point. In the admirable cartoon by Raphael of St. Paul preaching at Athens, the expression of the whole work is just and forcible. The dignified air of the apostle impresses the spectator with reverence; his action is awful and authoritative without excess or extravagance; it is an action which assures us that he who uses it speaks with a power of conviction. The different sentiments of his audience are exhibited with equal skill and good sense. Some of his hearers appear angry, some malicious, some attentive, some reasoning within themselves on his doctrines, some disputing their truth, and some convinced. The very background has its meaning; it contributes to the demonstration or expression of that superstition against which the inspired orator directed his eloquence. In the power of distinct, peculiar, and appropriate expression no one has ever raised himself above Raphael, scarcely any one has ever equalled him.

There are, also, various kinds of accessory aids, which form a mode of artificial expression, practised by painters. In the cartoon where the people of Lyaconia are going to offer sacrifices to Paul and Barnabas, Raphael has shown the cause of their offerings by adventitious figures. In the foreground, the man who had been healed of lameness by those apostles, is the most eager to express his sense of the miraculous power exercised by them, and the individuality of this character is marked not only by a crutch on the ground under his feet, but by the more singular circumstance of an old man taking up the skirt of his garment, looking on the limb which he may be supposed to have remembered in its former crippled state, and expressing his admiration and devotion.

Of the same kind was the artifice used by the Greek painter Timanthes to express the prodigious size of a Cyclops. He placed round the sleeping monster several satyrs, supposed to be of the ordinary size of the human form, one of whom was measuring the thumb of the giant with his thyrsus, apparently with great caution, lest he should wake; others were running away, as if frightened; others gazing on him from a distance, as if not daring to approach him.

Another artificial mode of expression used by painters is the use of allegorical figures, representative of certain points of the subject. This art has also been derived from the ancients, who have left numerous examples of it; as in the bas-reliefs on the Antonine column at Rome, where the figure of Jupiter Pluvius is introduced to express the rain which fell when the Roman army was preserved by the prayers of the Theban legion. Raphael, in this manner, has personified the river Jordan in his

design of the children of Israel passing across the river of that name, and has represented him as pushing back and restraining the course of the waters with his arm.

F. E.

(To be concluded in our next.)

CARPENTERS' BENEVOLENT INSTITUTION.—A numerous meeting of carpenters was held on Tuesday evening, the 16th instant, at the Bell Inn, Old Bailey, for the purpose of adopting rules, previous to enrolment, for a Benevolent Institution, for the support of aged and infirm carpenters, and the erection of an asylum for the reception of members and their wives; Mr. Waltenbury in the chair. The secretary, on the part of the committee, reported that they had waited on the different societies, and the universal opinion was, that such an institution had been long since required, and they would give it their support. The secretary then read the proposed rules, which were afterwards put *seriatim* from the chair. The rules provide that any carpenter, on subscribing six shillings annually, shall become a member, and be entitled to vote at all general meetings. A like privilege is conferred on donors of ten guineas, and subscribers annually of one guinea, payable in advance. Any member, incapacitated by old age or infirmity from following his employment, may become a candidate for the benefits of the institution, and on his election will receive ten shillings per week from the funds until provided for in an asylum; and on the death of a member receiving relief (if married) the board of directors are empowered to assist the widow according as circumstances may require. The meeting then adjourned to the following Tuesday evening.

DECORATIVE ART UNION.—We have had lately placed in our hands the prospectus of a society bearing the above title. It is proposed to base it on the principle of the Art Union of London, but confining the prizes solely to specimens of decorative art, designed expressly for that purpose. The annual subscription is to be half-a-guinea, and the number of members indefinite. A charter of incorporation is to be applied for as soon as a sufficient number of members shall have enrolled.

Notices to Correspondents.

*** Part VII. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., and VI. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

☞ Many correspondents having written to us to inquire the names and prices of particular books, we beg to state that a reply on our part would subject us to the Government advertisement duty of eightcenpence, and they will therefore perceive that it is entirely out of our power, without submitting to a pecuniary loss, to comply with their requests.

NOTICE.—Any of our readers having matured inventions, which they are desirous of communicating to the public, are informed that we shall always be ready to introduce such in our pages.

We shall always be happy to receive Extracts or Original Articles of a practical nature suited to the purposes of this Work.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—Will any of your correspondents favour me with the weight of cast-iron plates 12″ by 12″; the weights of the thicknesses 1-8th in. to 1 in.; also the best method of making modelling wax.—Yours respectfully, LIGNARIUM.—Northampton.

ANSWERS TO QUERIES.

SIR,—In reply to your correspondent "Philo" respecting the measurement of French shades, I beg to offer the following, which is in use at a glass warehouse here:—*Round Shades*—Once the height added to three times the diameter. Example: height, 10 in.; diameter, 6 in.; make 28 in. *Oval Shades*—Once the height, twice the length, once the breadth, and 3 in. over. Example: height, 10 in.; length, 8 in.; breadth, 5 in.; make 34 in. *Square Shades*—Same calculation as above, but 5 in. over. Example: height, 10 in.; length, 8 in.; breadth, 5 in.; make 36 in.—Yours, &c., A PAINTER.—North Shields, Nov. 17, 1847.

LIGNARIUM (Northampton).—We are greatly obliged for the extracts; such are always acceptable to us. You have, however, sent some terms in the letters A and B, which have been completed in the "Glossary" some time back; we must reserve them for the "Appendix." We will see what we can do with regard to the rules for construction. Do you mean to send us the examples for striking ovals, &c., or require us to furnish them?

C. M. A. (Dumfries).—The corrosion of the bottoms of iron-built steam-boats may, it is said, be prevented by first coating with zinc; then a varnish, of which the basis is asphaltum; and then a poisonous paint, to prevent the adherence of marine plants and molluscous animals.

AN INVENTOR.—Our correspondent wants to found a new order of architecture—a style which, in his own words (and his own spelling, too) "shal partak of sevral principals, but of no componants—that his to sa, that it shal be funded on al the styles genrally employed, but that each shal be so intimate blended with is neighbour, as too bee in fakt a new style altogethir." He wants us to introduce it in our "pajes;" but we think that his lucid explanation will be quite enough for our readers.

R. T. (Canterbury).—If you will furnish us with any materials for such a treatise as you described in your letter of the 29th September, we should be greatly obliged.

A PAINTER (North Shields).—We said that we would give the remarks you inquire about on the completion of the receipts, and so we intend to do. Fluxes are any substances capable of promoting the fusion of earths or metallic ores. White flux may be made by deflagrating in a red-hot crucible a mixture of two parts of nitre and one of cream of tartar, and collecting the residuum. Black flux is obtained when equal parts of nitre and tartar are deflagrated. It owes its colour to the carbonaceous matter of the tartaric acid which remains unconsumed; the quantity of nitre being too small for that purpose.

NOTICE TO THE TRADE.—Ornamental Designs made, and, if necessary, engraved, on the most reasonable terms, with punctuality and despatch. For particulars, &c., address (if by letter, post paid) to Mr. Wm. Gibbs, Ornamental Draughtsman and Engraver, at the DECORATOR'S ASSISTANT Office, 17, Holywell-street, Strand, London.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from paye 22.)

Chymere (in heraldry), a coat worn by heralds.

Cinnabar, vermillion or red lead.

Circumferenter (in surveying), see Theodolite.

Clarion (in heraldry), a bearing of this

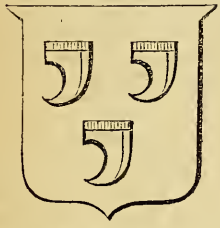
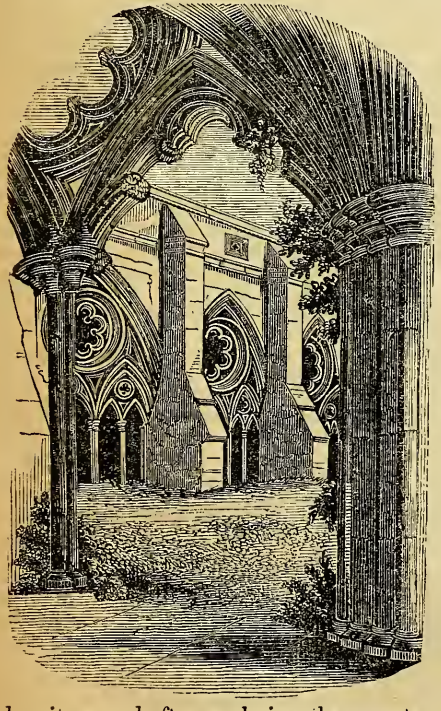


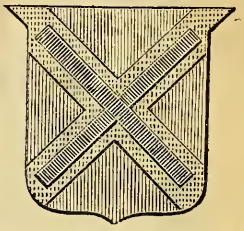
figure: *Ruby*, three *clarions*, *topaz*.

Cloister, the principal part of a regular monastery, consisting of a square peristyle or piazza, between the church, the chapter-house, and the refectory, having over it the



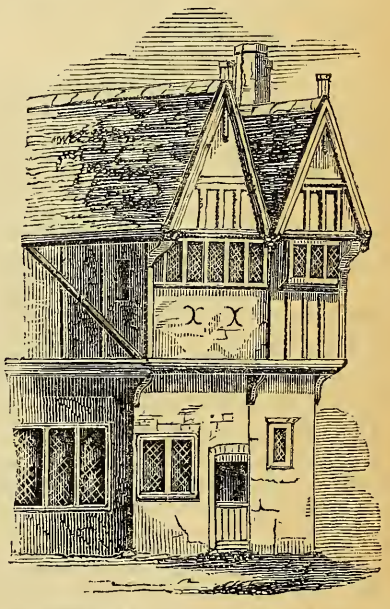
dormitory, and often enclosing the cemetery. According to Peter of Blois, the monks used to hold their lectures in them; Lanfranc says that their proper use was for the monks to meet and converse in at certain hours of the day. The principal cloisters in England are in the Gothic style. In Italy they are often arcades, supported on piers, or columns of various orders.

Cleche (in heraldry), any ordinary pierced through with the same figure, as below. He



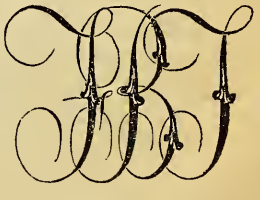
beareth *gules*, a *saltier cleche;* that is, one pierced through with another.

Coving, a term applied to the peculiarity in



old buildings of the upper stories projecting over the lower ones.

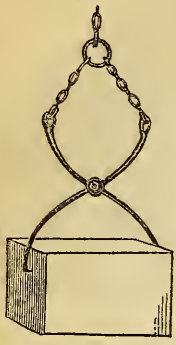
Cypher (in engraving), a peculiar disposi-



tion of the initials of a name, produced by interweaving the one with the other.

Closet (in heraldry), the half of a bar; the bar ought to contain the fifth part of the escutcheon.

Crab (in building), an instrument em-



ployed to raise large stones, &c.

(To be continued.)

Improvements in Photography.—M. Niepce de St. Victor finds that, if a sheet of paper on which there is writing or printed characters, or a drawing, be exposed for a few minutes to the vapour of iodine, and there be applied immediately afterwards a coating of starch moistened, by slightly acidulated water, a faithful tracing of the writing, printing, or drawing will be obtained. M. Niepce has also discovered that a great number of substances, such as nitric acid, phosphoric acid, chlorurets of lime and mercury, &c., act in a similar manner,—and that various vapours, particularly those of ammonia, have the effect of vivifying the images which are obtained by photography.

Oxide of Zinc for Paint.—A company has been formed at Paris, with a capital of £240,000, (6,000,000f.) for the purpose of making the oxide of zinc, to be used as a substitute for white lead, in painting. The company are erecting spacious premises near the river Seine, between Neuilly and Asnières, and have engaged to take 300 ton of zinc annually from the Vielle Montagne Company, for 50 years, and all the produce of the Nouvelle Montagne Company, and of the mines of Obernhof, in Nassau, for some years to come. Their process is to obtain the oxide of zinc directly from the Calamine.

Machine for Raising Heavy Bodies in Deep Water.—A new machine, of which a gentleman of Worcester, Massachusetts, is the inventor, designed for lifting heavy articles from the bottom of deep water, is thus decribed:—A large vessel, containing materials for generating gas, is let down to the bottom filled with water. The weight is attached, and the combustibles are ignited for the creation of the gas, which expels the water, and raises the vessel to the surface with a force of over 60lbs. to the cubic foot. The machine is said to be simple, cheap, and likely to be very useful.

Dial-Plates.

The dial-plates of clocks and watches are made in a variety of ways. In general they are composed of enamel upon a single plate of copper, unless they are more than a foot in diameter: larger ones are made in separate pieces, which are afterwards joined together; or they are made of glass, placed upon a white ground. Some dial-plates are made of silver, gold, and silvered or gilt-brass.

The enamelled dial-plates are formed of a thin plate of copper, enamelled upon both sides, and having hours, minutes, seconds, &c. painted upon the ground. To make one of these dial-plates, a thin plate of copper, of the requisite size, is taken, and hammered upon a slightly concave anvil of hard wood, with a convex-headed hammer, which speedily reduces it to the proper convexity; a hole is then made in the middle, which is enlarged with a tool put into it from the concave side, to retain the enamel when in a melted state. The copper plate is then placed upon the platine of the works, fitted to it by passing a tool through the centre holes of each, and being kept in its place by a vice, the holes for the screws, by which the dial-plate is to be fastened to the rest of the works, and that by which the key is to be introduced, are made; which last is to have a ridge round it, for the same purpose as that round the central hole. Copper wires are then forced into the holes by which it is to be attached to the works, and cut to the proper length, after which they are soldered. The plate is cut of such a size, that the edge may be hammered up to form a similar ridge round the whole face.

The copper plate being thus manufactured, it is cleansed, by being left a short time in water sharpened with a little sulphuric acid, until the surface is perfectly clean; it is then dipped in common water, and brushed with a brush of brass wires.

The enamel used ought to be very white; it is imported and sold by the ironmongers in flat cakes. The cakes are broken in a hardened steel mortar, and reduced, for the most part, into small pieces, about the size of small grains of sand, as nearly equal as possible. These are first washed in very clear water, and the milky liquor poured off, and left to settle, by which the finer powder is separated. The grains of enamel are then washed again several times with a clear water, and the settlings of the water that is poured off, kept as before, for enamelling the under surfaces of the plate.

The grains of enamel being thus well washed, they are put into a glass vessel, and sulphuric acid is poured on them, so as to float them about a quarter of an inch. The whole is stirred with a glass rod or spatula, and the acid left on the enamel for twelve hours, in order to dissolve away the metallic particles it has rubbed off the steel mortar, and which would foul the whiteness of the enamel when applied on the face of the plate. The nitric acid is then poured off, and the enamel washed

again with water, until all the acid is got rid of; after which it is again covered with clean water, and kept under it to preserve its cleanness and whiteness.

Not only the convex face of the dial-plate, or that on which the hours and minutes are to be painted, is enamelled, but also the concave face. This counter-enamelling, as it is called, is necessary, lest, when the enamel of the upper face is melted, the action of it on a plate, while hot, should change its curvature; upon which account both faces are enamelled at one and the same time.

The enamel is first put on the concave or under face, which is done, as has been just said, with the fine settlings obtained in washing the granular enamel. For this purpose, a tool is put into the centre hole, and the water being poured off the settlings, it is taken up with a steel spatula, and spread as equally and as thinly as possible over the concave surface; the tool is then taken out, and there is put in its place a bit of clean linen, which draws and absorbs the water; if this precaution were not taken, the counter-enamelling would fall off when the dial-plate was turned over.

To enamel the convex face the plate is turned over, a tool put in the centre hole, and there is spread over the whole surface a layer of the bruised enamel, as evenly as possible, taking care to well cover the edges of the dial-plate, and those of the various holes, to prevent the heat from burning them. To draw off the water which adheres to the enamel, a piece of fine linen is put round the edge of the plate, which draws out nearly all the moisture; and, in order that the particles of the enamel may arrange themselves properly, and be packed as close as possible, a few slight strokes are given to the tool in the centre hole. The neatness with which this is executed is essential; for to this is owing the beauty, polish, and glassy surface of the dial-plate, by reason that the enamel becoming well packed, there are, when it melts, no hollows below the surface, and hence the surface remains perfectly smooth. In order to be sure that no water remains in the enamel, the dial-plates are dried upon a square sheet of iron, turned up on the edges on three sides, and placed over a chafing-dish, where it has its temperature raised.

The preparation of the dial-plate being finished, it is introduced by degrees under a muffle placed in a furnace, in order that it may be heated gradually. The furnace used in London for this purpose has some peculiarities in its construction; but any muffle furnace, so long as it is well made, will suffice for the purpose. It is left in this state, until the enamel is perceived to begin to melt, when the sheet of iron on which the plate is placed, is turned round very gently, in order that the heat may effect every part of the dial-plate equally. When the polish of the surface shows that the enamel is melted, the plate is slowly withdrawn from the furnace, and left for some time at the mouth of the muffle, in order that the enamel may cool very slowly, as otherwise it would crack and split off the plate of copper.

After the first firing, the plate is again cleaned, as before, with water sharpened with sulphuric acid; and the under surface is examined, and if necessary, retouched with the settlings, as before. A fine layer of enamel is also spread over the convex face, and the plate is again exposed to the fire, with the same precautions as before: a third layer of the finest and whitest enamel is again spread on the upper or convex surface, and fired in the same manner; by which means the dial-plate receives all the beauty of which it is capable.

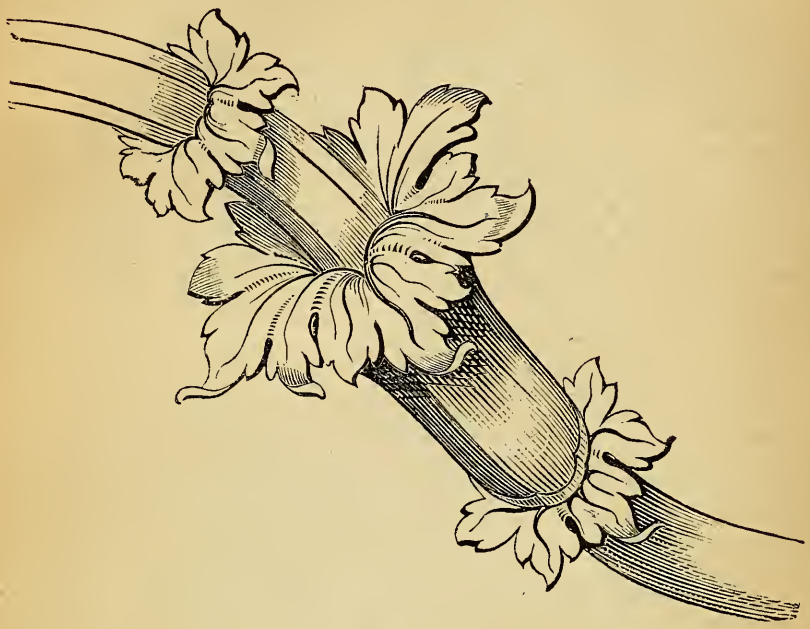
The hours, minutes, seconds, &c., are then enamelled on a convex face with a black, soft enamel, made for this purpose. It is ground very fine, in an agate mortar, with a pestle of the same substance, along with oil of spike, and spirit of turpentine. It is considered necessary that the enamel should be reduced to an impalpable powder, and therefore half-a-day is usually employed in grinding a single troy drachm. More oil of spike is then added, to render it sufficiently thin to flow from the pencil.

The place where the hour of twelve is to be placed having been marked from the first by a slight touch of the file, the dial-plate is then placed on a flat surface, and, by means of a pair of compasses, with one point blunt, and placed truly on the centre, and with the other bearing a black-lead pencil, the lines between which the hours and minutes are to be placed, are slightly traced on the surface. In order to divide these circles, a protractor with a moveable limb is used, and the place of the hours, minutes, seconds, &c. traced with black-lead: these are then painted, and when thoroughly dry, the dial-plate is again fired in the same manner as before, and is then finished.

The dial-plates of clocks, when they do not exceed twelve or fifteen inches in diameter are enamelled in the same way; but larger dial-plates are made in separate pieces, generally as many as there are hours on the face, and then joined together.

Highton's Electric Telegraph.—The Electric Telegraph on the Baden Railway was opened on the 15th of October last. The Government of Baden, before laying it down, appointed a commission to examine all the different electric telegraphs in use, and to report as to the best plan. In accordance with the recommendation of this commission, they adopted Highton's Patent Gold Leaf Telegraph; and the practical working of it gives them the highest satisfaction. Professor Eisenlohr, of Carlsruhe, who has been appointed by the government to superintend it, reports that the plan is so perfect that it must come into general use throughout the world. He states that, with one wire only, information is being transmitted at the rate of one hundred letters a minute, whilst the most complicated apparatus, and one that costs ten times as much, and requires a much more powerful current of electricity, gives not more than sixty or seventy, and is not so certain in its action. The words in the report of the learned professor are, "It excites the admiration of the world."

Lessons in Ornamental Drawing.



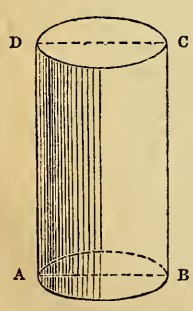
Mensuration of Solids.

(*Continued from page* 26.)

PROBLEM IV.

To find the convex surface of a cylinder.

Multiply the circumference of the base by the height of the cylinder, and the product will give the convex surface required.



Example.—Find the convex surface of the cylinder A B C D, whose length A D is 24 feet, and the diameter A B of its base equal to 3½ feet.

3.1416= circumf. of circle to diam. 1.
3.5

157080
94248

10.99560
24

439824
219912

263.8944 sq. ft. = convex surface req.

(To be continued.)

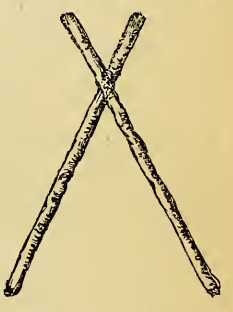
LIGHTING BY ELECTRICITY.—A renewed attempt has recently been made to accomplish this great end,—the "light of nature" itself, it may be;—a patent to that end having been taken out by Mr. Thomas Wright, of Cooper's-hill, Thames Ditton, the chief peculiarity of which consists in the method of producing a permanent light by continually presenting one or more points or surfaces of carbon, or other suitable material, to the path of an electric current.

Architecture.

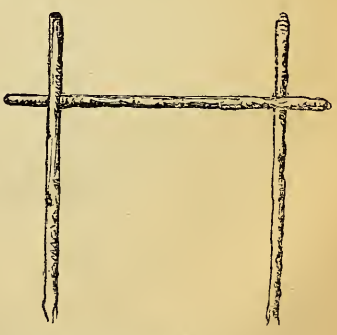
OEVAL with the exact state of the intellectual character of man at every period of the world's history, it is only necessary for us to regard with attention the many works of his head and hands, which the course of time has suffered to descend to us without material injury, in order to arrive at a definite opinion upon the state of Architecture.

It is but natural to suppose that man, following the instinctive example of meaner animals, early sought a shelter from the weather and the attack of wild beasts. Caves, fissures in rocks, and the hollows of trees, were, no doubt, his first resources; but as population began to increase, he being gifted with faculties susceptible of improvement, and possessed of a fondness for the companionship of his fellows, would mingle with them, and add some portion of their knowledge to his own experience. The pleasures he thus derived from the interchange of sentiment, conjoined to the strongest of all the impulses, that of self-preservation from the villainous of his own species, might induce him to feel disgusted with those dark and miserable habitations, and influence a wish to adopt some mode by which he might remediate the evil.

The Rev. W. Whewell, in his "Architectural Notes on German Churches," is of opinion that timber was the first material employed in construction; "But," says he, "whether the germ of all architecture was fashioned of two inclined beams, as thus—



or of two upright and of one transverse rafter, thus—



must for ever be buried in oblivion." The triangle is certainly the most simple, and would be the first to suggest itself, even from

the accidental circumstance of two pieces of wood being placed one against the other; and taking this hypothesis as being correct—and there is no tangible reason for doubting it—we have almost sufficient proof of the origin of the Gothic or pointed style being coëval with the origin of architecture itself! for here we have its very first principle displayed. Vitruvius relates that at first for the walls forked stakes were erected, with twigs disposed between them, the whole being covered with loam. "Others," continues this writer, "piled up dry clods of clay, binding them together with wood; and, to avoid rain and heat, they made a covering with reeds and boughs, but finding this roof would not resist the winter rains, they made it sloping and pointed at the top, plastering it over with clay, and by that means discharge the rain-water.

"That the origin of things was as above written, may be concluded from observing, that to this day, some foreign nations construct their dwellings of the same kind of materials, as in Gaul, Spain, Lusitania, and Aquitain, they use oak, shingles, or straw. The Colchians, in the kingdom of Pontus, where they abound in forests, fix trees in the earth, close together, in ranks to the right and left, leaving as much space between them as the length of the trees will permit; upon the ends others are laid transversely, which circumclude the place of the habitation in the middle; then at the top the four angles are braced together with alternate beams; and thus the walls, by fixing other trees perpendicularly on those below, may be raised to the height of towers, the interstices, which, on account of the coarseness of the materials, remain, are stopped with chips and loam. The roof is also raised by beams laid across from the extreme angles, gradually converging, and rising from the four sides to the middle point at the top, and then covered with boughs and loam. In this manner the barbarians made the testudinal roofs of their towers. The Phrygians, who inhabit a champaign country, being destitute of timber, by reason of the want of forests, select little natural hills, excavate them in the middle, dig an entrance, and widen the space within as much as the nature of the place will admit; above, they fix stakes in a pyramidical form, bind them together, and cover them with reeds or straw, heaping thereon great piles of earth. This kind of covering renders them very warm in winter and cool in summer. Some, also, cover the roofs of their huts with the weeds of lakes; and thus, in all nations and countries, the dwellings are formed upon similar principles. At Marseilles we may observe the roofs without tiles, and covered with earth and straw. At Athens the Areopagus is an example of the ancient roofs of loam; at the Capitol, also, the house of Romulus, in the Sacred Citadel, may remind us of the ancient manner of covering our roofs with straw.

"By these examples, therefore, we may be assured that the first inventions of building happened in the manner we have related; but at length mankind, by daily practice, improved, and, by repeatedly exercising their faculties and talents, arrived at the full knowledge of the art; those who were the most experienced professing themselves artificers. When, therefore, these things were thus far advanced, as Nature had not only given to mankind sense, in common with other animals, but had also furnished their minds with judgment and foresight, and had subjected other animals to their power, they from the art of building gradually proceeded to other arts and sciences, and, from a savage and rustic way of life, became humane and civilised. Then, when their minds became thus enlightened, and they became more judicious by experience and the advancement of the various arts and sciences, they no longer builded huts, but founded houses with walls constructed of bricks, stones, or other materials, covering the roofs with tiles."

Thus far reasons the ancient historian. In his "Encyclopædia of Architecture," Mr. Gwilt observes that, "it seems likely that bricks would have been in use for a considerable period before stone was employed in building;" but with this supposition we cannot agree. The natural caverns, &c., formed at the feet of rocks, would have naturally suggested the use of stone. The easy manner in which loose fragments could be piled, would no doubt urge the selection of it for building purposes; therefore, there is every probability that stones piled rudely one upon the other, and having their cavities filled up with mud, formed the second method of construction, that is, supposing timber to have been first employed; besides, on referring to Gen., chap. 11, v. iii., we find it stated, with reference to the building of the Tower of Babel—"And they said one to another, go to, let us make brick and burn them thoroughly, *And they had brick for stone*, and slime they had for mortar," thus clearly evidencing stone to be at that period (B.C. 2247) the common material employed.

Having thus briefly sketched the early history of architecture, we will now, previous to entering on a description of the various orders and their respective origins, present our readers with some preliminary remarks, necessary for the proper consideration of the subject.

The five orders of classical architecture are composed of certain elementary forms, few in number and simple in their nature, but which are, nevertheless, the essential parts of every classical architectural composition. These forms have two distinct divisions, which may be termed the principal and the subservient parts. The former consists of such parts as were essential in the construction of the wooden hut, which, according to Vitruvius, was the type of classical architecture. Thus, the shaft of the column, and the abacus of the capital, are said to be imitations of the trunks of trees with flat stones laid on their tops, on which the tie-beams of wood rested that supported the stratum of materials composing the roof; the plinth of the base is derived from the stones on which these trunks of trees rested. In like manner, the ends of the beams which supported the roof gave rise to the triglyphs

in the frieze of the Doric order; the modillions, mutules, &c., arose from the ends of the rafters of the roof, which were seen resting on the beams; and the thickness of materials which covered the roof is represented by the corona. The subordinate forms called mouldings, have been devised in order to ornament the principal parts; and also to support, strengthen, protect, and unite them, as well as to regulate their distribution.

(To be continued.)

On Expression in Relation to the Fine Arts.

(*Concluded from page* 30.)

Secondly, with regard to the passions and affections peculiar to the subject, the general rules consist in proper division and distinction of them, as shown in brute or rational animals, in young or old, in male or female, in cultivated or savage. The passions of brutes are few and simple; those of the rational animal many and various. The powers of expression in the one are more confined than in the other. A man can move his eyebrows more readily than the brutes, and can give greater variety to the direction of the eyes, &c.

Children and savages, less accustomed to the use of reason, express their passions more directly than cultivated men; the first necessarily, without habitual modes of disclosure or disguise. Respecting the difference of age and sex, the expressions of vigorous manhood wear a free, bold, and resolute appearance; those of women and age are more tender, reserved, and feeble. Condition, or rank of life, also demands a difference of expression. The demeanour of a magistrate, or other person invested with public honours, is more grave and reserved than that of the populace, whose external motions are, for the most part, rude and disorderly.

The several expressions of action, in running, striking, pointing, asking, forbidding, affirming, idling, avoiding, pursuing, starting, and many other modes, are obviously various, and require a fitness of attitude and a proper delineation of the corresponding and assisting parts of the body, and other accessories. For the painter of animals, nothing is more necessary than the study of the characteristic expressions of the brute creation, which are severally as various as their species, not only on account of the singular diversity of qualities and instincts with which they are endowed, but of the different modes in which they exhibit passions of a similar nature. As it is, therefore, in the human figure, and still more particularly in the human countenance, that expression is most effectually and exquisitely displayed, it is to man that our observations must be principally directed in this part of the subject, for the study of which there is no perfect school but that of Nature.

The affections of the soul may be expressed by attitude and by countenance. There are few strong emotions of our mind which may not, in a great measure, be shown by the first. Fear, surprise, horror, admiration, humility, pride, and many other affections, are visible in the air and turn of the body; but as this mode of expression admits of a very extensive range, it is next to impossible to define the precise rules by which it is to be governed. Next to the general action of the body and the turn or air of the head, the hands claim a principal share in the expression of our sentiments. It is by them we approve, condemn, admit, refuse, entreat, admonish. The hands raised together towards heaven express devotion; folded they denote idleness and sometimes despair; wringing the hands denotes grief; waving one hand from us, prohibition; extending it towards any one, acceptance and benevolent intentions; laying the fore-finger on the mouth enjoins silence; the same finger extended while the others are closed in the hand, shows and points to a particular object.

That by the countenance the particular and immediate disposition of our minds is indicated is indisputable; and not this only, but our general qualities and capacities are to be found by the same index. Let two men, a wise man and a fool, be placed together, dressed and disguised as you please, one will never be mistaken for the other; the distinction between them will be discernible at the first glance of the eye, as these characters are most strongly stamped upon the face so as to be read by every spectator. In the same manner, our good or ill nature, our gentleness, ferocity, humility, or pride, are discoverable in the countenance in all their various degrees. The lines and forms by which these general tendencies, or settled habits of our minds, are expressed, are, of all others, the most difficult to be defined.

It is remarkable that Leonardo da Vinci, in his "Treatise on Painting," has observed that, between the expression of laughing and that of weeping, there is no difference in the motion of the features, either in the eyes, mouth, or cheeks, but in the brows only; those who weep raising the brows and bringing them close together above the nose, and forming many wrinkles on the forehead, while those who laugh have them elevated and extended.

Of expression in sculpture, Sir Joshua Reynolds has given it as his opinion that it is necessarily of a much more confined kind than in painting; an assertion which cannot be disputed, inasmuch as the materials of sculpture are more limited. He instances the celebrated group of Laocoon and his sons, in which he says the whole expression consists in the representation of bodily pain in general, and asserts that sculpture is incapable of admitting the mixed delineation of pain and parental affection.

F. E.

File-Cutting Machine.—A patent has at length been taken out by a Mr. E. Vickers, of Sheffield, for cutting files by machinery. By this invention, it is said, the difficulties are avoided by the machine being so arranged as to imitate the manual process now in use.

Remarks on Architecture, &c.

In these remarks it is proposed first to lay down, and explain as familiarly as possible, some of the chief fundamental principles of the art, including nothing but what may be called the postulates, or self-evident truths, which are really very few and simple, and on which it will be endeavoured to found all the remarks it may be necessary to make. The chief difficulty in the way of the free reception of the truth of these principles, and the propriety of their application to our every-day circumstances, is that of divesting the mind of prejudice, or that effect of long habit in viewing objects of a particular character as perfect, or least without at the time feeling conscious of their defects. Almost the whole of architectural rule may be comprised in one idea, which applies equally as a test of excellence in all the arts, viz., fitness or propriety. It is unnecessary to adduce any proof or even illustration of this, as it would obviously be useless to argue with one who would deny that a thing is good or excellent, in proportion as it serves the purpose for which it was intended, without redundancy or deficiency, and as it accords with propriety of feeling and character. This principle applied to works of architecture ought to enable a competent and unprejudiced mind, on viewing a building, to ascertain at once, or, at least, to form a tolerable conjecture, as to its purpose and destination.

This fundamental principle may be considered under three heads, viz. :—1st, Convenience; 2nd, Construction; and 3rd, Character, including Form and Enrichment. All these departments are of course modified and controlled by economy, and also combine with and control one another.

Convenience determines the number, size, and arrangement of the different portions of the edifice, according to their use and purpose. This portion must, of course, be left entirely in the hands of the architect, but when this distribution is determined, the next subject demanding attention, and which is, perhaps, the least regarded, is construction. This includes consideration of material, climate, and durability. As to material, that is obviously the most proper to be used which possesses in the highest degree the requisite strength, durability, and resistance to climate. There are three classes of materials commonly used in buildings—1st, those which are best adapted to resist compression, as brick, stone, &c.; 2nd, those best adapted to resist cross strain, as wood; and 3rd, those which resist tension, as iron. Now, it is important to remark, that from the totally different qualities of these three classes of materials, they require in construction a totally different mode of treatment; thus, the first class are obviously best suited for external and internal walls, those parts of the building, in short, on which all the rest must depend;—the second class are best adapted for horizontal and oblique bearings, as in floors and roofs, and the third are calculated for ties, and for various other minor purposes. Of course, there are peculiar circumstances in which the application of these materials may vary, but the above are the general and obvious uses to which they are best applied. The climate also exercises (or we should say ought to exercise, for in this country it does not) a very considerable influence, not only on the material employed in building, but also on the forms and features, as pitch of roofs, &c.

Brick is best adapted for plain walls, because, if well burnt, it is more durable than stone, more impervious to weather, and in many places is much cheaper. But, on the other hand, brick cannot be used where cutting is required; here its place can only be supplied by stone; but there is a very simple method of ornamenting brick buildings, which seems to be almost unknown or forgotten amongst us, viz., by moulding the bricks into different forms and ornamental devices, and by using bricks of different colours, as red, blue, and white. In this way a true artist would be able to produce many beautiful and picturesque effects; bands or string courses might be thus formed, either by impressed patterns or by different coloured bricks, chimnies might also be made highly ornamental, all which would be in perfect propriety, and might be obtained at a trifling cost, without the use of stone at all. However, the judicious use of stone in combination with brick, as round the windows, doors, &c., and in cornices, gives rise to many striking effects which could not be obtained by brick alone. This mixture of materials is most properly employed in ordinary dwelling-houses, or where very little carving is required; but where this is abundant and elaborate, as in a church, the use of brick should, perhaps, be discarded altogether, as it would form too small a proportion of the wall to justify its introduction, on the score either of durability or economy. This was, no doubt, one reason amongst others why the churches of the middle ages were almost invariably built of stone.

As for timber and plaster buildings, we do not think there is much probability of their becoming general, though instances do now and then occur of houses, not indeed of timber, but of brick painted to imitate the old style of timber houses.

The uses of timber in construction are so obvious, from the nature of the material, that it would be difficult to go very far wrong.

In treating of construction, we cannot omit saying a few words regarding the use of cast-iron, which at the present day is so very extensively used in building. Had we gone on right principles, this material would very likely have modified considerably the character of our architecture (for, in all ancient and independent styles, the nature of the materials employed has modified their character more than any other cause), instead of which we keep on in the same track of columns, pilasters, architraves, &c., attempting to emulate and imitate the style of a distant age and country, with totally different wants and climate; while with a false shame we attempt to conceal our own real constructive resources; from which, under proper direction, we might rear a national style, in accordance with our national charac-

ter and civilisation. At the same time, we confess that the question, how far and in what manner cast-iron may consistently be used in constructive architecture, is not easily solved. But we may safely lay it down as a rule, that its use must be in accordance with our fundamental rule of fitness and propriety: and therefore that it cannot properly be used where, if it is seen at all, it cannot assume the character and appearance belonging to the material itself. We frequently see portions of stone buildings which are most exposed to injury from being chipped and broken, as base courses, plinths, balustrades, &c., constructed of iron, and painted to resemble stone; under the false notion that the beauty of the parts will remain with, and depend upon, the sharpness of their preservation. Now, even supposing that the beauty of stone work did depend (which we by no means grant) on its perfect preservation, we contend that such contrivances are bad in principle, are never satisfactory even when quite new; and, in a very short time, the parts become so rubbed and polished, as to lose what little character of stone they at first possessed; and their very sharpness become a defect. We would far rather see genuine honest stone, even if it were a little chipped: indeed, we do not think a little damage of this sort, here and there, in exposed situations, where it is only to be expected, at all detracts from the beauty of stonework where there is any. To come at once to the point—we believe that for ordinary building purposes, in the style, usually adopted in this country, iron cannot be considered a proper material. We may, perhaps, at some future time, have ingenuity enough to give it an appropriate and characteristic appearance, and then it may be properly brought into general use.

It must, however, be understood, that the above remarks do not apply to iron when used in fireproof buildings. Here a new element is introduced, and the style and material have to be modified accordingly. Now, as in this class of buildings wood cannot be introduced, iron comes to our aid most opportunely, and may be used without reserve as a substitute for wood. It may, indeed, be considered a most valuable and indispensable material for such purposes. It should, however, in all cases assume a characteristic form. With the above important exception, the chief value of iron is in engineering and machinery, not in architecture.

We come now to the consideration of character, including form and enrichment. One of the chief causes of all the bad architecture of the present day, is a want of propriety and consistency between the outside and the inside of a building. The proper method of designing, and that which was followed by the architects of the middle ages, is, first to get a good and convenient plan, and on that to raise an exterior possessing the appropriate qualities of beauty or grandeur most consistent with its purpose. Our system is, we might say almost universally, the direct contrary to this; we either design the exterior first, and adapt the plan to that, or we arrange the plan or interior with reference to some imagined exterior; and in either case we very often spoil both inside and out. We put up with inconvenience in the plan, for the sake of effect in the elevations; and we so study and constrain the latter, that, whether in a symmetrical style or not, they seldom possess the expected beauty or charm, even if they possess any beauty at all.

This is one of the evil consequences of copying the style of a distant age and country, and disregarding our own peculiar climate and manners, and the architecture which arose out of them. Our climate requires high-pitched roofs to throw off the water; we must have chimnies for the escape of smoke, numerous and spacious windows, variety in the parts and purposes of our buildings; all which are utterly at variance with the classical styles. On the other hand, we have no occasion for columns, entablatures, open porticos, and colonnades, which are absolutely necessary to the classical styles. Our requirements and wants are all internal; Grecian architecture is all external. Hence it follows, that classical architecture is not fitted for this country; and our surprise at its being so persisted in is the greater, from the numberless examples still remaining of a style actually the birth and produce of our own soil. What can be more absurd than building private mansions after the manner of Roman palaces, and Chrstian churches in the likeness of Greek temples. Some indeed seem to consider that we have at length had enough of such imitations, and to think that, for the sake of relief, we had better try what we can do with other styles; and we accordingly now import from Italy, Switzerland, Egypt; and we shall no doubt very soon have specimens after the Chinese fashion. But, as we cannot import with them the peculiar manners which created them, we detach them from that which gives them character and meaning.

Even when the true national style is chosen, the application of it frequently betrays an utter ignorance of the rules of propriety. The many fine remains of castles and abbeys which adorn our land are no doubt worthy of admiration, but there is just as much propriety in imitating them in our modern dwelling-houses, as there would be in a man going about in a monk's habit and cowl, or adopting the manners and defence of the twelfth century.

As regards enrichment, the grand rule for its regulation, as laid down by Pugin, is, that "we should decorate our construction, instead of constructing our decoration." All the parts or features of a design should be useful first, and then ornamental or plain, as determined by propriety and consistency. No part should be constructed for the sole sake of ornament or effect, or which has not some significance. The essential parts of a fabric should be the only medium for rendering it beautiful, and this rule exists, irrespective of any particular style.

PROGRESS OF THE TELEGRAPH.—The Electric Telegraph Company have now upwards of 2,000 miles of wires laid down and in active operation.

EFFECT OF SMOKE ON BUILDINGS.—In a lecture by Dr. Guy lately delivered at the City of London Literary Institution, he directed attention to "the smoke nuisance," pointing it out as not merely a contaminator, to a considerable extent, of pure air, so necessary to good health, but as most expensive to the community at large, in relation to the frequent occasion which it gives for the washing of linen, for painting, and cleansing of paint and gilding, as productive also of disfigurement of our most beautiful public buildings. In illustration of the damages inflicted by the smoke nuisance, he showed that the expense, by the wear and tear of clothes incurred by washing, and of furniture by cleaning, amounts to half a million sterling per year, and that between the ill effects of the smoke, and of bad drainage, a million and a half of money has been computed to be lost yearly to the public. Now all that might be saved by a legislative enactment which would compel manufacturers and others on the one hand, to consume their own smoke, and which, on the other, would create a thorough system of good drainage in our towns, and compel an abundant supply of pure water to every house, with proper ventilation. As an instance of the disfigurement of public buildings by smoke, he directed attention to the new palace at Westminster, which, in the short space of a few years, has been sadly blackened by the volumes of dense smoke poured forth by our river steam-boats. And when they reflected on the immense sum of money already expended, and yet to be be expended on that building, and on its costly carvings, and on the richly-wrought works of art with which it is to be decorated, they must agree with him that measures ought to be enforced to suppress the smoky nuisance. The lecturer then pointed out the means of abating the nuisance, and as an example of the saving which large consumers, including manufacturers, might, on principles of science and economy, effect by consuming their own smoke, he instanced a manufacturer at Bradford, who saved fully £500 a year by the adoption of the art. One means by which the dense volumes of smoke vomited forth from factory chimneys and steamboats might be greatly abated, was by feeding the fire frequently with coals in small quantity, instead of at long intervals with a large quantity. Another reason why men should endeavour to suppress the smoke nuisance, was founded on the benefits which such an accomplishment would confer upon the spread and value of the arts. At present, in consequence of its deteriorating effects, men of taste in the arts were deterred from expending money on them to the extent they otherwise would.

Notices to Correspondents.

*** Part VII. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., and VI. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

NOTICE.—Any of our readers having matured inventions, which they are desirous of communicating to the public, are informed that we shall always be ready to introduce such in our pages.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—Could any of your correspondents inform me how violins are stained and polished so as not to injure the tone of the same? I am, yours respectfully, A SUBSCRIBER. South Ockendon, Essex, Nov. 25, 1847.

ANSWERS TO QUERIES.

MARBLING CRAYONS.—Sir,—The composition of marbling crayons, as used by painters, is merely common pipeclay moistened with water to the consistence of glazier's putty, and tinted with lamp or blue black, then rolled into the shape of a pencil, air dried, and it is fit for use. With the above, the most delicate vein, in all its beautiful varieties of shape and tint, may be faithfully represented by a skilful practitioner. Coloured crayons, for the same purposes, are prepared in the same manner, only that the colours for tinting must be ground in water and incorporated with the pipeclay. I am, Sir, yours very respectfully, A PAINTER. Wisbech, Nov. 20, 1847.

MODELLING WAX.—Sir,—The following is the receipt for preparing modelling wax, inquired for by "Lignarium:"—Take a quarter of a pound of virgin wax, a pennyworth of flake white, half a teaspoonful of Venice turpentine, and a little spirit of turpentine; melt them down together. I am, Sir, yours, &c., M. C. H. Gravesend, Nov. 25, 1847.

R. E. W. (Manchester).—You may prepare canvas in the same manner as the specimen sent by first coating it thinly with size, letting it dry, and then giving it a coat of oil colour, well thinned with turpentine, and letting it dry in an exposed situation.

AN APPRENTICE (Liverpool).—You have no remedy, as the accident proceeded entirely from your own incaution, not to say wilfulness.

W. WEBSTER.—The preparations can be applied in the manner stated. Fine sand will only suffice for the purpose.

N. S. T. (Dublin),—We do not care so much for the manner in which the letters of our correspondents are worded, as for the sense they convey. Of course it cannot be expected that every man should be possessed of a facility of composition like "N. S. T."

ANTIQUARIENSIS (Southwark).—Tumuli were small mounds of earth of a conical shape, raised as a memorial over the remains of the dead, by the early nations of antiquity.

A CARPENTER (Leeds).—Good, sound, and practical information on the various technicalities of your profession is indeed a desideratum, and for that reason we shall always be happy to receive any contributions bearing upon the subject. We have ourselves in contemplation to compile a treatise on carpentry from the best sources; but we must first devote some little time to collecting the different authorities.

C. J. N.—Your strictures upon us come with an ill grace, since two out of three of your queries have been given in articles inserted in the DECORATOR'S ASSISTANT within the last fortnight. To the third we can only reply no.

MARC ANTONY.—Peruse Dr. Ure's "Dictionary of Arts, Manufactures, and Mines," and no doubt you will obtain the required information.

CONTRIBUTIONS THANKFULLY DECLINED.—"Origin of the Corinthian Capital" (a plagiarism from ourselves); "Egyptian Antiquities;" "Azote and Carbon."

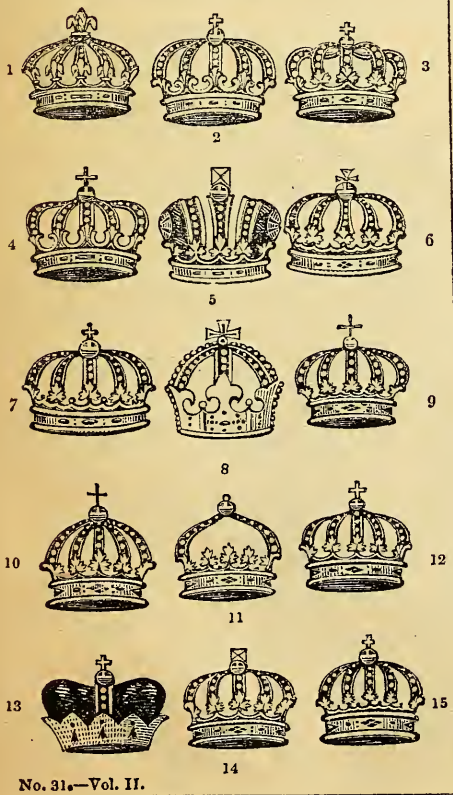
QUESTIONS TOO TRIVIAL OR INAPPROPRIATE.—"Logarithm," "Josias," "L. M."

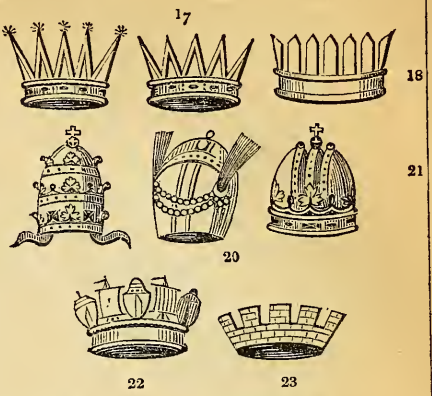
An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from page 32.)

Crown, a coronet worn by a sovereign. By the ancients, crowns were also given to victorious generals, &c.

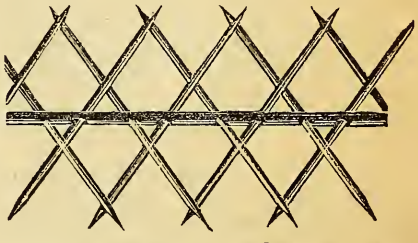
Crown of England.





1. France.
2. Spain.
3. Portugal.
4. Denmark.
5. Russia.
6. Prussia.
7. Poland.
8. Bohemia.
9. Sardinia.
10. Sicily.
11. Holland.
12. Orange.
13. Hanover.
14. Hungary.
15. Sweden.
16. Celestial.
17. Eastern.
18. Vallery.
19. Papal.
20. Turkish.
21. Roman Catholic Bishop.
22. Naval.
23. Mural.

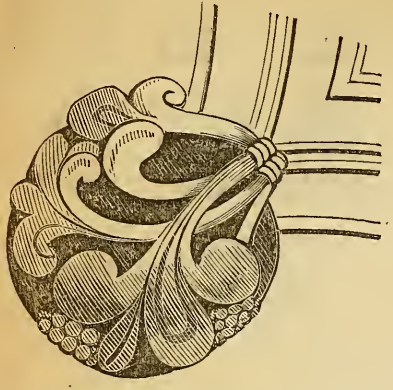
Chevaux de Frieze, large joists or pieces of wood stuck full of wooden pins, armed with



iron, used to stop up breaches, or to secure the passages of a camp.

Cusp, a term applied by Sir James Hall, in his "Essay on the Origin of Gothic Architecture," to the pendants in the Gothic style. Assembled, they form trefoils, quatrefoils, &c.

Foliated Cusp.



Coal-Cellar Plate, a square or circular iron plate, let into a hole made in the pavement in front of a house, in order to admit coals into the cellar beneath, and fastened on the inside by a chain secured to a hook or staple in the wall. Some plates have a bull's-eye in the centre, formed either of glass or talc, in order to admit light into the cellar. An important improvement has been lately made by Mr. John Greenfield, of Broad-street, Golden-square, with regard to the construction of cellar-plates. The ordinary exterior form is preserved, but the body of the plate is shaped in such a manner as to admit of the insertion of two blocks of asphalte, wood, &c., so as to secure passengers from slipping. In the centre are holes for the admission both of light and air to the cellar. From the peculiar shape of the edge of the plate, which is as follows,

A

A, flange.

it is not liable to tip up. This invention is registered under the Act for the Protection of Articles of Utility, No. 1259, dated Nov. 12th, 1847.

(To be continued.)

Nelson Monument.—The four battle bas-reliefs for the Nelson monument were entrusted by the Woods and Forests to Messrs. Watson, Woodington, Ternouth, and Carew. All are in progress, but Mr. Carew is the farthest on, and has just completed, and is now showing to his friends and the public, the full-sized model, in clay, of the death of Nelson, intended for the recess facing Parliament-street. The compartment is fourteen feet square, the figures introduced some sixteen in number, and near seven feet high. The general arrangement of the group reminds one in part of West's large picture of the same incident. The modelling is careful throughout, and the figure of the dying Nelson not unskilfully managed. The cost of each compartment is £1,000, but the Government, it is understood, supplies the metal, and undertakes the charge of transferring the plaster to bronze in the foundry at Woolwich.

Ventilation.

In the ventilation of rooms, &c., says M. Lassaigne, it is frequently supposed that the lower layers of the air are those which are principally spoiled by respiration. In 1842, Leblanc showed that, at the close of the performance in one of the Paris opera-houses, the upper layers of air contained 0·0043 carbonic acid; the lower ones, on the contrary, only 0·0023. It may be objected to this experiment, that in this case the greater portion of the carbonic acid arose from the illumination, and that, moreover, no very accurate result could be obtained on account of the nature of the locality. The author made his experiment in a small lecture-room in which 55 persons had breathed for more than 1½ hour, and in which, as far as it was possible, all communication with the external atmosphere was cut off. The capacity of the lecture-room amounted, deductions made for furniture, to 280,000 litres. If we subtract 3,520 litres as the average volume of 55 persons, there remains for the air contained in the lecture-room 276,480 litres. Two samples of the air were examined (half-past 12 o'clock in the morning), one of which was collected near the ceiling, the other near the ground. The air, confined over mercury, was first passed through caustic potash to remove the carbonic acid, and the oxygen then determined by means of phosphorus. The following are the results:—

	Air from the ceiling.	Air from the ground.
Oxygen	19·80	20·10
Nitrogen	79·58	79·35
Carbonic acid	0·62	0·55

100·00 vols. at 30 bar. and 60 deg. F.

We find, therefore, likewise, in this case the quantity of the carbonic acid contained in the upper strata somewhat greater than in the lower, if, indeed, the difference must not be ascribed to an error of observation, for it is generally established that the carbonic acid remains pretty much alike in the lower and in the upper strata. If we admit that there is 0 0005 carbonic acid contained in ordinary air, and that the air examined contained 0·0058, consequently eleven times more carbonic acid, we obtain for the lecture-room 1603·78 litres, and after deducting the usual amount of carbonic acid contained in the air, 1465·6 litres; consequently for each of the 55 persons that breathed in the lecture-room 26·64 litres for 1½ hour, and 17·76 litres for 1 hour=0·281 of the volume of the body=32·85 grm. carbonic acid at 32 deg. F. and 29·8 barometric pressure = 8·96 grms. carbon. In a second experiment, the air near the ground of the lecture-room contained 0·0043, that from the ceiling 0·0049. The smaller quantity of carbonic acid found in this case appears to have arisen from a slight change of air having occurred.

Improvement of Pulleys.—A patent has been taken out in America for increasing the adhesiveness of the surface of pulleys, drums, &c., by a coating of India-rubber, or some other gum of similar nature.

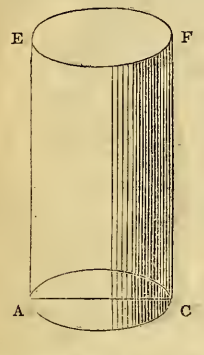
Mensuration of Solids.

(*Continued from page* 34.)

PROBLEM V.

To find the solidity of a cylinder.

Multiply the area of the base by the perpendicular height, and the product will be the solidity.



Example.—What will be the solidity of the cylinder A F, whose diameter A C is 20 inches, and perpendicular height A E 40 inches?

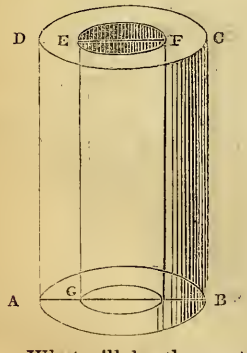
.7854	20
400	20
314.1600	400
40	

12566.4000 cubic in. = solidity required.

PROBLEM VI.

To find the content of the solid part of a hollow cylinder.

From the content of the outer cylinder subtract the content of the inner cylinder, and the difference will be the solidity required.



Example.—What will be the content of the solid part of the hollow cylinder A C, whose diameter A B is 12 inches, the diameter E F 8 inches, and the height A D 20 inches?

.7854	12
144	12
31416	144
109956	

113.0976 = area of circle A B.

113.0976
20

2261.9520 = content of A C.

.7854	8
64	8
31416	64
47124	

50.2656 = area of circle E F.

50.2656
20

1005.3120 = content of G F.

2261.952
1005.312

1256.64 cubic in. = solidity required.

(To be continued.)

ARTIFICIAL LAPIS LAZULI.—Of all the achievements of inorganic chemistry, the artificial formation of lapis lazuli was the most brilliant and the most conclusive. This mineral, as presented to us by nature, is calculated powerfully to arrest our attention by its beautiful azure-blue colour, its remaining unchanged by exposure to air or to fire, and furnishing us with a most valuable pigment, Ultramarine, more precious than gold! The analysis of lapis lazuli represented it to be composed of silica, alumina, and soda, three colourless bodies, with sulphur and a trace of iron. Nothing could be discovered in it of the nature of a pigment, nothing to which its blue colour could be referred, the cause of which was searched for in vain. It might, therefore, have been supposed that the analyst was here altogether at fault, and that at any rate its artificial production must be impossible. Nevertheless, this has been accomplished, and simply by combining in the proper proportions, as determined by analysis, silica, alumina, soda, iron, and sulphur. Thousands of pounds weight are now manufactured from these ingredients, and this artificial ultramarine is as beautiful as the natural, while, for the price of a single ounce of the latter, we may obtain many pounds of the former.

TO SILVER IVORY.—Immerse a small slip of ivory in a weak solution of nitrate of silver, and let it remain until the solution has imparted to it a deep yellow colour; then take it out and immerse it in a tumbler of clear water, and expose it in the water to the rays of the sun. After it has been exposed thus for about three hours, the ivory acquires a black colour, which, on being burnished, soon becomes changed to a brilliant silvery one.

A DESIGN FOR A GOTHIC NICHE.

Architecture.

(*Continued from page* 35.)

THERE are generally said to be five orders of architecture, — namely, the Tuscan, the Doric, the Ionic, the Corinthian, and the Composite. There are, however, says Mr. Alison, properly only four, and some writers have further reduced them to three. What constitutes an order is its proportions, not its ornaments. The Composite having the same proportions as the Corinthian, though very different with respect to its ornaments, is properly, therefore, considered, a corrupted Corinthian.

Every order consists of three great parts, or divisions:—the base, the column, and the entablature; and the governing proportions relate to this division. The whole of them compose the wall, for what answers to the wall of a common building, and supports the roof.

There is one great difference, however, to be observed between a common wall and that assemblage of parts which constitutes an order. A common wall is intended to support a roof, and derives its proportions in a great measure from its destination. To an order, the consideration of a roof is unnecessary; it is generally so contrived as not to appear; the weight which is supported, or appears to be supported, in an order is the entablature. The fitness of a wall consists in appearing adequate for supporting the roof. The fitness of an order, or of the proportions of an order, it should seem also from analogy, reasonable to conclude, consists in their appearing adequate to the support of the entablature, or the weight which is imposed on them.

That this is really the case, and that it is their being expressive to us of their fitness, that the proportions of these different orders appear beautiful, may, perhaps, seem probable from the following observations:—

I. The appearance of the proportions themselves seems very materially to lead us to the conclusion. In all the orders the fitness of the parts to the support of their peculiar weight, or appearance of weight of entablature, is apparent to every person, and constitutes an undoubted part of the pleasure we receive from them. In the Tuscan, where the entablature is heavier than in the rest, the column and base are proportionably stronger. In the Doric and Ionic, which are between these extremes, the forms of the column and base are in the same manner proportioned to the reciprocal weight of their entablature; being neither so strong as the one, nor so light as the other.

If the beauty of such proportions is altogether independent of fitness, and derived from the immediate constitution of our nature, it is difficult to account for this coincidence; and as the beauty of fitness in these several cases is universally allowed, it is altogether unphilosophical to substitute other causes of the same effect until the insufficiency of this is clearly pointed out.

II. The language of mankind upon this subject seems to confirm the same opinion. Whenever we either speak or think of the proportions of these different orders, the circumstances of weight and support enter both into our consideration and expression. The term proportion, in its general acceptation, implies them; and if this term is not used, the same idea, and the same pleasure, may be communicated by terms expressive of the support for weight. Heaviness, and slightness, or insufficiency, are the terms most generally used to express a deviation on either side from the

proper relation; both of them obviously including the consideration of support, and expressing the want of proportion. When it is said that a base, or column, or entablature is disproportioned, it is the same thing as saying, that this part is unfitted to the rest, and inadequate to the proper end of the building. When it is said, on the other hand, that all the several parts are properly adjusted to their end, and that the base appears just sufficient for the support of the column, and both for that of the entablature, every person immediately concludes that the parts are perfectly proportioned; and we apprehend it is very possible to give a man a very perfect conception of the beauty of these proportions, and to make him feel it in the strongest manner, without ever mentioning to him the name of proportion, merely by explaining them to him under the consideration of fitness, and by showing him from example that these forms are the most proper which can be devised for the end for which they are destined. If our perception of the beauty of proportion in such cases were altogether independent of any such considerations, we think that these circumstances in language could not possibly take place, and that it would be as possible to explain the nature and beauty of proportions by terms expressive of sound or colour, as by terms expressive of fitness of propriety.

III. The natural sentiments of mankind on this subject seem to have a different progress from what they could naturally have if there were any absolute beauty in such proportions discoverable by the eye. It cannot, surely, be imagined that an infant will perceive, or does perceive, the beauty of such proportions in the same manner as he perceives the object of any other external sense. It is not found, either, that the generality of mankind, even when come to mature age, express any sense of the absolute beauty of such objects. It is true, indeed, that very early in life we are sensible of disproportion in building, because the ideas of bulk and support are so early and so necessarily acquired, and the eye is so habituated to judge of weight from visible figure, that what is fit for the support of weight is very soon generally ascertained. What a common person, therefore, expresses upon the view of such proportions is rather satisfaction than delight. It is not the proportions that most affect him; it is the magnificence, the grandeur, and costliness which such buildings usually display; and though he is much pleased with such expressions, he is generally silent with regard to the beauty of those proportions with which the connoisseurs are so much enraptured. If the proportions, on the contrary, were something absolutely beautiful, in such objects the progress of taste would be reversed; the admiration of the infant would be given to those proportions long before he was able to judge of their fitness; and the satisfaction which arises from the pleasure of fitting would be the last ingredient in his pleasure, instead of being, as it is now, the first.

(To be continued.)

Application of Geological Science to the Choice of Building Materials.*

The best way to obtain a true knowledge of the nature of the stone, is to look at it in the neighbourhood of the quarry; and, having thus obtained some idea of the action of the weather upon it, one may go into the churchyard, and study the condition of the tombstones, which, being erected in every imaginable direction, are liable to every phase of exposure, and will inevitably show how disintegration is most likely to be produced. A good idea of the value of stone for common use may be formed thus:—for stone to be good for ordinary purposes, it must possess several qualifications. It must be of a tolerable even texture, for if it is very uneven it will be acted upon irregularly by the weather. It should possess a moderate degree of hardness, for if it is too hard, it cannot be worked, except at great expense; or, if too soft, it cannot bear the requisite amount of pressure. If it is very absorbent of water, it will be unfit for external work, as, in that case, the expansive action of frost would be very injurious. Many of the cathedral churches in England show the results of this particular action of the weather, in cracks and crushes, often in portions of the structures which render the condition of the whole very precarious. Great care should be taken to put stones of a laminated or fissile character into the building, in the same way as that in which they exist in the quarry, unless, indeed, they exhibit there a great inclination to the horizon.

The effect of atmospheric action upon stones, being a matter of great importance in forming an estimate of their positive and relative value, the possibility of devising some measure of their various qualities, in this respect, is evidently a question of importance. A Frenchman, named Brard, discovered, some time ago, a method which, although not infallible, afforded a pretty accurate indication of the effects of atmospheric action, and which has often been adopted for the trying and describing the qualities of different stones. This method consists of boiling cubes of stone, selected from different parts of the block to be tried, in a saturated solution of Glauber salts, for a certain time. The cubes are then to be suspended by a string, completely isolated from the touch of anything else, over a vessel full of the solution in which they have been boiled, taking care that no fragments of stone detached in the boiling remain in it. Twenty-four hours afterwards, the cubes will be found covered with small crystals of salt, which are to be got rid of by plunging the cubes into the solution over which they were suspended; this is to be done every time crystals of salt are thrown out. The experiment should last four days, and at the end of that time, the amount of disintegration, by the effects of frost and weather, will be indicated by the weight of the

* From a lecture delivered by Prof. Ansted, at King's College, London.

particles of stone found in the solution, which have been forced out by the salt.

Besides the quality of disintegration, there are a number of others necessary to be studied, in order to arrive at a true estimate of the value of stones. The chemical composition of stones, and their power of cohesion, are also of the greatest importance, and must all be considered carefully.

Passing over the new red sandstone and lias, we come to the *oolitic rocks*, which are very extensive. They are generally arranged in three groups—the upper, consisting of limestone, with clay below; the middle, of another limestone, with clay below; and the lower, of a variable group chiefly limestones, containing a few clays and a few sandstones. The most important of these beds are the lower part of the lower division, and the upper part of the upper division. This is the case in England and, to a certain extent, in France,—the *Caen stone* being a continuation of that worked in the west of England, and, probably, of the same age and condition as the Bath stone.

Several useful limestones are obtained from the upper oolites; but, of all these, the *Portland stone* is most extensively known. There are different kinds of Portland stone, varying in value according to the manner in which the different beds are placed, a knowledge of which is very important to the English architect. The most valuable qualities of this stone are its hardness and weight—though both these are qualities which tend to make it expensive, both in quarrying, in carriage, and in working. It is a tolerably pure carbonate of lime, of which there is in its composition 95 per cent., with 1 per cent. each of silica and carbonate of magnesia. This is a very good mixture, and the stone possesses an even grain, and is exceedingly durable. Its colour is generally a creamy white, and it is often the whitest of the oolites found in England. It is therefore a handsome stone when first worked; but it is liable to blacken very soon when exposed to the action of smoke. All stones, more or less, blacken in London; but none more so, or sooner, than Portland stone, and it appears to resist the pyroligneous acid in smoke rather less than others. The west front of St. Paul's Cathedral, which was built entirely of Portland stone, is a remarkable instance of this, being now, though only erected a moderate time, completely covered with soot. The Reform Club, the Goldsmiths' Hall, and many other buildings in London, are, nevertheless, built of this stone. Its cohesive power is not so great as might have been expected from its specific gravity, which is 2·145. It bears heavy weights, however, exceedingly well. In St. Paul's for instance, though there is a vast accumulation of materials, there is no appearance whatever of the stone being crushed. It is, however, more remarkable for its hardness than for its cohesive power.

The next stone I shall describe is one of a very different quality, and it is that quarried at *Bath*,—a material so soft and so easily worked, that its cost in London is considerably less than that of Portland stone. Bath stone is so soft in the quarry, that it can almost be cut like cheese; but it hardens to some degree afterwards by exposure. It is not so uniform in quality as Portland stone, there being three distinct kinds, which differ in several important points, and in value. The great faults of Bath stone are its softness, which no amount of exposure can overcome; the lowness of its cohesive power, which make it certain to be crushed with only a moderate weight; and its lightness. Its specific gravity differs very greatly indeed from that of Portland stone, being only 1·839. For these reasons it is more adapted for ornamental purposes; though there are some public buildings, and many private houses, built of it, probably on account of its cheapness. It is not at all good for such purposes, however, as may be seen by an inspection of Henry VII's Chapel, in Westminster Abbey, where this stone, of which that edifice was built, being exposed under circumstances in no degree unfavourable, is very much decomposed and decayed, and the freshness of its workmanship everywhere lost. Pieces of Portland stone, on the contrary, which were intended for St. Paul's Cathedral, though rejected and probably of inferior quality, bear the marks of the chisel as fresh as possible to this day. Many of the buildings at Oxford are of Bath or Heddington stone, and in that city it has peeled to such a degree as to give the various colleges the appearance of falling to ruin. The carbonate of lime, in its composition, does not differ much in quantity from Portland stone, being 94½ per cent. as compared with 95. It has, however, 2½ per cent. instead of 1, of carbonate of magnesia, which is an important difference, and there is an entire absence of silica. Its disintegrability is, however, widely different—Portland stone, being exposed by Brard's process to an action supposed to be equivalent to two centuries of exposure to the weather, lost only 2·7 grains; while Bath stone, subjected to the same process, lost 10 grains.

The next stones of this class are those of Rutlandshire and Northamptonshire, of which most of the beautiful churches in the middle of England, remarkable for their good condition, are built. The best of these are the Ketton and Barnack stones. The Ketton is a pure oolite, having a rather coarser grain than the Portland, and not quite so good in appearance. It is, however, better than the Portland, inasmuch as it is worked much easier, and is, therefore, cheaper. It is also not so heavy, and yet quite heavy enough; its cohesive power is greater, and, though at first inferior in colour, it rather improves than otherwise by exposure. The church of St. Dunstan, in Fleet-street, was built of this stone, and, though not very old, has been erected long enough to show the character of the stone. Its specific gravity is 2·045,—not materially varying from Portland stone, from which it differs in a very marked manner in its composition. It contains 92 per cent. of carbonate of lime, and 4 of carbonate of magnesia, with a little silica. It was much used in Cambridge in the construction of the colleges there, and looks remarkably well; and has been employed in the modern repairs of Ely and Peterborough

cathedrals. Its loss by disintegration is 3·3 grains.

The next stone is the Barnac, which is more a shelly rag than a regular oolite: its colour is somewhat inferior, being a white mottled stone, and, therefore, not handsome. It consists of 93 per cent. of carbonate of lime, and 3·8 of carbonate of magnesia; and its cohesive power is only two-thirds of that of Ketton stone. Its disintegration is very great by Brard's process, being 15 grains; but experience has proved that it stands vety well, and thus shows that Brard's method cannot always be depended upon.

Besides these, there are limestones which enjoy a local reputation, such as that of Chilmark, in Wiltshire, which is remarkable for its cohesive power, and that of Ancaster, in Lincolnshire, and others.

The cretaceous beds do not afford building materials, the only chalk used for that purpose being those lower beds, locally called clunch, which is a very durable material for ornamental work, in situations where it is neither exposed to the weather nor to violence. For instance, the small chapels in Ely Cathedral, decorated with carvings of this material, have, after several centuries, preserved the freshness of even the most delicate portions.

The next group is that of the magnesian limestones, which are chiefly quarried in Derbyshire, Nottinghamshire, and Yorkshire. These are exceedingly valuable, as they not only stand exposure well, but are of a beautiful texture. The excellent qualities of the stone quarried at Bolsover have been well tested in Southwell Church, Nottinghamshire, in which it has been exposed for many centuries, that edifice being now in better preservation than any other of the same period in England. This stone has become celebrated of late years in consequence of its being selected as the best material that could be obtained in England for the new Houses of Parliament. Though cheaper than Portland stone, it is greatly superior in every quality of importance. Its colour is good, its structure uniform, it can be obtained in blocks of any required magnitude, its specific gravity is greater than than that of any other limestone, while its cohesive power is four times that of Portland stone. It was this high cohesive power which made it so decidedly the best stone for the new Houses of Parliament, where the enormous quantity of material to be supported, particularly in the Victoria Tower, rendered this important quality in an unusual degree so indispensable. Added to its other good qualities, on being subjected to Brard's process, any disintegration is scarcely perceptible. It appears to be, in short, the best building stone produced in England.

Of the sandstones much need not be said. There are a great variety of them, but very few can be called good for building; and those which are good are so hard, that it is unlikely they will ever be used, except locally. They are chiefly the old red sandstone, the millstone grit and the coal grit; but, among these, there are some exceedingly bad, and others can only be used in a rough state, as they will not make ashler.

Construction of Fire-Proof Strong-Rooms.

The difficulty of constructing an efficient fire-proof room for the preservation of papers is considerable, the need for ventilation warring with the necessity of being inaccessible to fire. The trustees of the Bridgewater Estate have recently constructed at Hulme, in Manchester, a room of this sort, at a cost of about £400, concerning which the following particulars may be interesting to our professional readers:—A back parlour has been gutted for the purpose, and a safe of the dimensions of five yards square has been built, from the ground, of fire-proof bricks and cement, the roof being composed of the same materials and supported by three arches of iron. The wall is formed of two very strong fire-proof shells, the space between them all round being filled with a non-conducting substance. The entrance is down a flight of several steps. The door-jambs, lintel, and threshold, are of solid-iron, clamped, or built in by long flange-like projections, at three points on each side, to the main wall of the building, so as to be immovable. The door consists of three parts—the fraud-proof plate, the lock-case, and the fire-proof chest, which is filled with a patent composition which at a certain temperature becomes steam, finds entrance to the safe, and, saturating the papers, prevents them from firing. The bolts are fourteen in number, five on each side, two at the top and two at the bottom. The whole door turns upon thick iron pivots springing from the top and bottom, and working in sockets, cavities in the lintel, and threshold of the door. As thorough ventilation is necessary for the preservation of deeds, papers, &c., channels for the passage of air are prepared in the room, and a ventilator provided at the top; but this very necessary arrangement to some extent defeats, as we have said, the purpose of the trustees, by rendering the room liable to fire within. A party going into the place with a candle or lamp, as must always be the case, on account of the total exclusion of light, might drop a spark among any loose papers, and, the door being shut, the current for ventilation might possibly fan it into a flame, and the whole contents be consumed. To guard against this, the sides of the room have been fitted up with ranges of iron shelves, supported by iron pillars, and to occupy these shelves the trustees have fire-proof iron safes, in which to deposit the title-deeds, books, and vouchers.

Interior Decorations at the Olympic Theatre.—We understand that Mr. Hurwitz, of Brydges-street, is engaged in decorating the interior of the Olympic Theatre for the new lessee. From the specimens of this gentleman's capabilities which we have seen at the Royal Adelaide Gallery and other places, we are assured that his present labours will be highly successful.

Bookbinding.

At the opening of the Society of Arts, on the 10th of November, Mr. J. Cundall read a paper "On Ornamental Art as applied to Ancient and Modern Bookbinding." He commenced by stating, that the earliest records of bookbinding prove that the art has been practised for nearly 2,000 years, previous to which time books were written on scrolls of parchment. Some inventive genius, however, to whom the Athenians erected a statue, at length found out a means of binding books with glue. The rolls of vellum, &c., were cut into sheets of two and four leaves, and were then stitched somewhat as at the present day. Then came the necessity for a covering. The first book-covers appear to have been made of wood, probably merely plain oaken boards, which were afterwards succeeded by valuable carved oak bindings; these were followed by boards covered with vellum or leather, and specimens of such of great antiquity still exist. The Romans carried the art of bookbinding to a considerable perfection, and some of their public officers had books called Diptycks, in which their acts were written. An old writer says, that about the Christian æra, the books of the Romans were covered with red, yellow, green, and purple leather, and decorated with silver and gold. In the thirteenth century some of the Gospels, Missals, and other service books for the use of the Greek and Roman churches, were covered in gold and silver; some were also enamelled and enriched with precious stones and pearls of great value. In the fifteenth century, when art was universal, such men as Albert Durer, Raphael, and Giulio Romano decorated books. The use of calf and morocco binding seems to have followed the introduction of printing, and there are many printed books bound in calf with oaken boards, of about the fifteenth and beginning of the sixteenth centuries; these are mostly stamped with gold and blind tools. The earliest of these tools generally represent figures, such as Christ, St. Paul, coats of arms, &c., according to the contents of the book.

In the reign of Henry the Eighth, about 1538, Grafton the printer undertook to print the great Bible, for which purpose he went to Paris, there not being sufficient men or types in England; he had not, however, proceeded far before he was stopped in the progress of this book, when he returned to England, bringing with him presses, type, printers, and bookbinders, and finished the work in 1539. Henry the Eighth had many books bound in velvet, with gold bosses and ornaments, and in his reign the stamping of tools in gold appears to have been introduced. In the reign of Queen Elizabeth some exquisite bindings were done by embroidery; the queen herself used to work the covers with gold and silver thread, spangles, &c. Count Grolier seems to have been a great patron of the art on the Continent, and all his books were bound in smooth morocco or calf, ornamented with gold. The style of the books of Maioli was very similar to that of Golier or those of Diana of Poicteers, the specimens done for her being among the finest ever produced, and were no doubt designed by Petit Bernard. Roger Paine was the first Englishman who produced a really good binding, and some of his best works, such as French romances, were powdered with the fleur-de-lis. His books on chivalry had suitable ornaments: on poetical works he used a simple lyre, and carried the emblematical style of binding as far as emblems ought to be used. The following bill of his for binding a work is a curiosity, and shows how moderately he charged:—

Vanerii prodium Rusticum Parisiis, MDCCLXXIV.

Bound in the very best manner, in the finest green morocco, the back lined with red morocco; fine drawing-paper, and very neat morocco joints inside; there was a few leaves stained at the foredge, which is washed and cleaned 0 0 6

The subject of the book being Rusticum, I have ventured to putt the Vine Wreath on it. I hope I have not bound it in too rich a manner for the Book: it takes up a great deal of time to do these vine wreaths. I guess within time I am certain of measuring and working the different and various small tools required to fill up the vine wreath, that it takes very near three days work in finishing the two sides only of the book; but I wished to do my best for the work, and at the same time I cannot expect to charge a full and proper price for the work, and hope that the price will not only be found reasonable but cheap 0 18 6

The author, after alluding to the numerous specimens of modern bindings which have of late been produced to the public, and regretting their want of originality, concluded by urging the necessity of attempting something original, and suitable to the advancing and improving taste of time. Then we may hope that, ere long, ornamental art in bookbinding will be wedded to our present perfect execution, and that the ninteenth century will be able, like the fifteenth century, to boast of a style of its own.

Mr. Henry Cole, assistant keeper of the Public Records, exhibited a number of very curious and beautiful specimens, among which was one of Henry the Seventh's time, containing the deeds relating to Henry the Seventh's Chapel at Westminster, and in which the monks undertook to pray for the soul of the king, as its founder, as long as the world is.

THE GOODWIN SANDS.—A plan has been proposed by an eminent civil engineer to erect a secure beacon-light on the Goodwin Sands by means of Dr. Pott's atmospheric pile-driving system, by the aid of which it is thought that the treacherous quicksand may be completely pierced through, and a firm foundation arrived at.

STREET ARCHITECTURE.—We allude with pleasure to an instance of a novel taste which we hope will not long remain a solitary one. Park-lane, notwithstanding that it is one of the *habitats* of opulence, rank, and fashion, has hitherto shown such doings in brick and mortar, and such a jumble of wretched attempts at design, that the "Baker-street" style becomes tasteful by comparison with it. Here, however, an architectural specimen of very superior quality now presents itself at No. 19. The size of the edifice in question is not remarkable—the frontage being not more than from twenty to twenty-five feet. It is a lofty stone front—consequently of narrow or "upright" proportions; in the later perpendicular style of Gothic, with a noble oriel window carried up the height of both the first and second floor. Immediately above that projecting bay is a single large window of the same width; and the elevation is finished by a parapet and two gabled lucarnes over it in the roof. This conveys no more than a very general idea of the outline and scheme of the elevation with regard to its principal features; in which respect the design might still be the same, and yet a very poor one—noticeable only as an attempt at something different from usual practice. But here we have far more—the style adopted being fully exemplified in some its most valuable qualities. To excellence of detail is added excellence of execution; and there is, moreover, the very rare merit—a merit not always found in some of the best ancient exemplars—of perfect completeness and attention to finish and embellishment throughout. The ornateness which characterises the oriel is extended to all the other features and members. The richness which marks that feature is not made to appear too ostentatious for the rest owing to the rest being comparatively poor and tame. The architect, if we are correctly informed, is Mr. Moffat. For whose residence it is erected we know not—but it is seemingly for some one who cares for, and can appreciate, beauty of design.—*Athenæum.*

FREE EXHIBITION OF MODERN ART.—It is rumoured that the new Association of Artists have taken the fine gallery lately occupied by the Chinese Exhibition for the free exhibition of the pictures painted by its members, the number of whom is stated to be one hundred. "This," says a correspondent of the *Builder*, "is really gratifying, to find that artists have at length done for themselves that which for years has stared them in the face as being the one thing needful,—to provide a place where they may *stand* or fall fairly by their own act—by their merits or demerits." We hope it may prove so.

GOVERNMENT SCHOOL OF DESIGN.—The new appointments at the school, now all complete, are,—Mr. William Dyce, A.R.A., master of the class of ornament; Mr. Richard Redgrave, A.R.A., master of flower-drawing and occasional lecturer; Mr. Henry Townsend, master of class of form; Mr. J. C. Horsley, master of class of colour; Mr. C. J. Richardson, master of geometrical, architectural, or perspective drawing; Mr. Burchett and Mr. Denby, assistant masters.

Notices to Correspondents.

*** Part VII. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., and VI. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

NOTICE.—Any of our readers having matured inventions, which they are desirous of communicating to the public, are informed that we shall always be ready to introduce such in our pages.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—Can any of your correspondents inform me whether there is any preparation mixed with colours for painting dissolving views and magic lantern slides, and what it is? Also, whether water colours can be used or are used? Also, the names of the colours generally used for the above purposes?—Yours respectfully, F. E. South Lambeth, Nov. 27, 1847.

ANSWERS TO QUERIES.

MARBLING CRAYONS.—Sir,—In reply to the inquiry of your correspondent "J. F." concerning the making of crayons employed by decorative painters in the imitation of marbles, allow me to inform him that they can be made by mixing the ordinary colouring substances (sienna, drop-black, or whatever else may be required, after triturating to an impalpable powder) with mucilage or solution of gum arabic, so as to form a thick paste. This should be moulded into convenient or pencil-like shapes, and subjected to the heat of a sandbath, or baked in an oven heated with a slow fire.—I am, Sir, yours, &c., JOHN GREET. Leamington, Nov. 29, 1847.

ELASTIC MOULDS.—Sir,—Your correspondent "L. G. L." having inquired respecting the method of making elastic moulds, I beg to inform him that glue forms the best substance for the purpose; but if not intended for immediate use, a little treacle should be added, in the same way as for printing rollers. — Your humble servant, GEORGIUS. Liverpool.

A PAINTER WISHING TO IMPROVE HIMSELF.—The method of colouring scroll-work is decided by taste not by rule. We will see what we can do with regard to your suggestion shortly.

NEMO (Wilsdon).—The danger to iron-built vessels in actual conflict is much less than is attendant upon those built of wood: on the first, the shots have a less fatal effect—they generally passing clean through and leaving a smooth hole which can easily be stopped up; while on the second the contusion does more damage, sometimes splitting and jagging the surrounding timbers past all hope of remedy.

C. C. C.—You must wait a bit, friend treble C, and give us a little time; Rome, you must know, was not built in a day, therefore you must not expect us to prepare "a chapter devoted to the best method, clearly elucidated, concerning Daguerreotype manipulation," at an hour's notice. Meanwhile, we may state that, as we intend shortly to present such an article, we shall be very much obliged to any of our correspondents who may forward any hints respecting the same.

JOHN GREET (Leamington).—Thanks for your kind wishes.

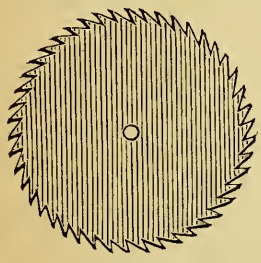
An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from page 42.)

Caulking, is the operation of filling up the seams of planks, on the sides or bottoms of ships, with untwisted ropes and pitch, to which the name of oakum is given. After this operation is completed, appropriate iron implements called caulking-irons, are used, to cover the work with a mixture of pitch, tar, and tallow, as low as the ship draws water.

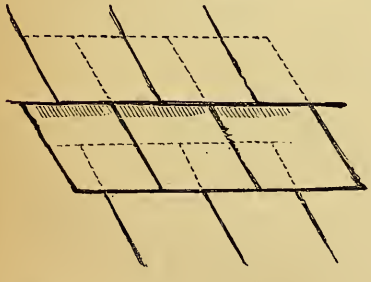
Caulking, or Cocking, the old mode of fixing the binding joists of a floor, or the tie-beams of a roof, was by dove-tailing into the wall-plates.

Circular Saw, a saw of a wheel shape, fixed on an axle, employed for various purposes, but more particularly for cutting veneering plates. These saws are made of all



sizes, from an inch to seventy feet in circumference; the smaller ones being turned by means of a common lathe, while steam power is used for giving motion to the larger ones.

Cover, that part of a slate which is hidden

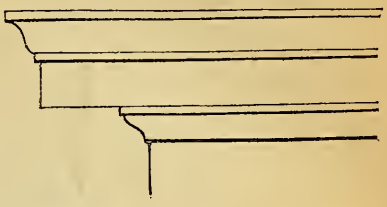


or covered.

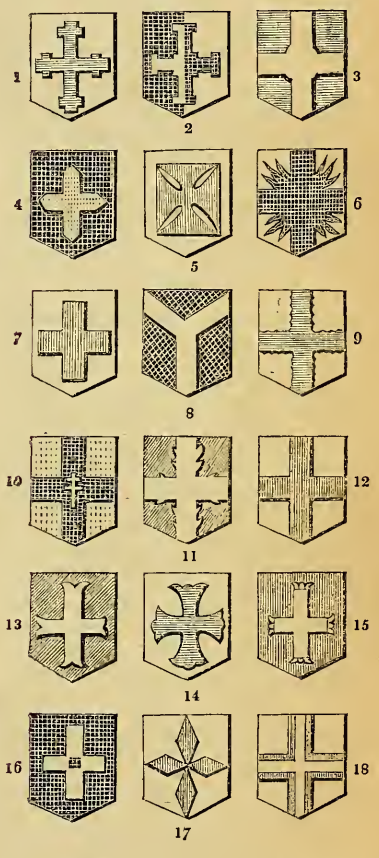
Cup, a drinking vessel susceptible of a great

deal of ornament. Both the figures given are from antique originals, and are capable of suggesting very many beautiful designs.

Cornice, the upper part of the entablature.



Crosses in Heraldry.



1. C. Crosslet.
2. Potent.
3. Nowy.
4. Pointed.
5. Maltese.
6. Rayonnant.
7. Humetty.
8. C. Pall.
9. Engrailed.
10. Patriarchal.
11. Raguly.
12. St. George.
13. Moline.
14. Patonce.
15. Fleury.
16. Pierced.
17. Fusils in C.
18. Voided.

(To be continued.)

Gilding.

Having already detailed the history of this art (see vol. i., page 83), we will now proceed to give some description of its application, &c.

The gold prepared for painting is called shell gold or gold powder, and may be obtained by amalgamating one part of gold with eight of quicksilver, and afterwards evaporating the latter, which leaves the gold in the form of powder; or otherwise the metal may be reduced to powder by mechanical trituration. For this purpose gold leaf must be ground with honey or strong gum-water for a long time, and when the powder is sufficiently fine, the honey or gum may be washed off with water.

For cold-gilding, by friction, a fine linen rag is steeped in a saturated solution of gold till it has entirely imbibed the liquor; this rag is then dried over a fire, and afterwards burned to tinder. Now, when anything is to be gilded, it must be previously well burnished; a piece of cork is then to be dipped, first into a solution of salt in water, and afterwards into the black powder; and the piece after it is burnished, rubbed with it.

For water gilding, the solution of gold may be evaporated till it is of an oily consistence, suffered to crystallise, and the crystals dissolved in water be employed instead of the acid solution. If this be copiously diluted with alcohol, a piece of clean iron will be gilded by being steeped therein; or add to the solution about three times its quantity of sulphuric æther, which will soon take up the nitra-muriate of gold, leaving the acid colourless at the bottom of the vessel, which must then be drawn off. Steel dipped into the ætherial solution for a moment and instantly washed in clean water will be completely and beautifully covered with gold. The surface of the steel must be well polished, and wiped very clean.

For the method called Grecian gilding, equal parts of sal-ammoniac and corrosive sublimate are dissolved in nitric acid, and a solution of gold is made in this menstruum; upon this the solution is somewhat concentrated, and applied to the surface of silver, which becomes quite black; but on being exposed to a red heat, it assumes the appearance of gilding.

The method of gilding silver, brass, or copper, by an amalgam is as follows:—Eight parts of mercury and one of gold are incorporated together by heating them in a crucible. As soon as the gold is perfectly dissolved, the mixture is poured into cold water, and is then ready for use.

Before the amalgam can be laid upon the surface of the metal, this last is brushed over with dilute sulphuric acid, in which it is of advantage that some mercury may have been dissolved. Some artists then wash the metal in clean water and scour it a little with fine sand previous to the application of the gold; but others apply it to the metal while still wet with the sulphuric acid. But in both cases, however, the amalgam must be laid on as uniformly as possible, and spread very evenly with a brass-wire brush, wetted from time to time with clean water. The piece is then laid upon a grate over a charcoal fire or in a small oven or furnace adapted to this purpose. The heat drives off the mercury and leaves the gold behind. Its defects are then seen and may be remedied by successive applications of more amalgam and additional application of heat. The expert artists, however, make these additional applications while the piece remains in the furnace, though the practice is said to be highly noxious on account of the mercurial fumes. After this it is rubbed with gilders' wax, for which the following is the receipt:—Beeswax, 4 ounces; verdigris, 1 ounce; and sulphate of copper, 1 ounce; then expose it to a red heat, which burns off the wax; and lastly, the work is cleaned with the scratch-brush, and burnished, if necessary, with a steel tool. The use of the wax seems to consist merely in covering defects by the diffusion of a quantity of red oxide of copper, which is left behind after the burning.

The method of gilding of iron by mere heat will be found described in vol. i., page 168 of this work.

The gilding of buttons is performed in the following manner:—When the buttons, which are of copper, are made, they are dipped into dilute nitric acid to clean them, and then burnished with a hard black stone. They are then put into a nitric solution of mercury, and stirred about with a brush till they are quite white. An amalgam of gold and mercury is then put into an earthen vessel with a small quantity of dilute nitric acid, and in this mixture the buttons are stirred until the gold attaches to their surface. They are then heated over the fire till the mercury begins to run, when they are thrown into a large cap made of coarse wool and goats' hair, and in this they are stirred about with a brush. The mercury is then volatalised by heating over the fire in a pan.

Painting with gold upon porcelain or glass is done with the powder of gold which remains behind after distilling the *agua regia* from a solution of that metal. It is laid on with borax and gum water, burned in, and polished. The gilding of glass is commonly effected by covering the part with a solution of borax, and applying gold leaf upon it, which is afterwards fixed by burning.

Gilding in oil is performed by means of gold size. It consists of drying oil (*i. e.*, linseed oil boiled upon litharge), and mixed with yellow ochre. It is said to improve in its quality by keeping. This is laid upon the work; and when it has become so dry as to adhere to the fingers without soiling them, the gold leaf is laid on and pressed down with cotton. (This method of gilding is proper for work intended to be exposed to the weather.)

The method of gilding in burnished gold consists in covering the work with parchment size and whiting, thinly laid on at five or six different times. This is covered with a yellow size made of Armenian bole, a little wax, and some parchment size; but in this, as in most other compositions used in the arts, there are variations which depend on the skill or caprice of the artists. When the size is dry, the gold is applied upon the surface previously

wetted with clean water. A certain number of hours after this application, but previous to the perfect hardening of the composition, the gold may be very highly burnished with a tool of agate made for this purpose. (This gilding is fit only for work within doors, for it readily comes off upon being wetted.)

We will resume this subject.

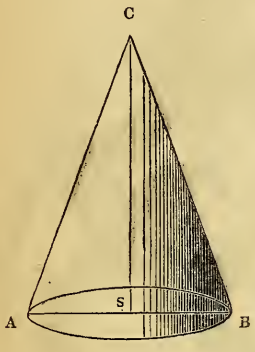
Mensuration of Solids.

(*Continued from page* 43.)

PROBLEM VII.

To find the convex surface of a right cone.

Multiply the circumference of the base by the slant height, or the length of a side of the cone, and half the product will be the surface required.



Example 1. — Determine the number of square feet contained in the outward surface of a square pyramid, each side of its base being $3\frac{1}{2}$ feet, and a perpendicular from the vertex upon one of the sides being $8\frac{3}{4}$ feet?

3.5
8.75

4375
2625

2) 30.625

15.3175 = area of one face of pyramid.
4

61.2700 = surface.

Example 2.—The diameter A B of a right cone A B C is 3 feet, and the slant height or side A C is 16 feet; determine the convex surface of the cone.

3.1416 = circumf. of circle to diam. 1.
3

9.4248 = circumf. of circle to diam. 3.
16

2) 150.7968

75.3984 sq. ft. = convex surface.

(To be continued.)

TRANSFERENCE OF PAINTINGS.—The preservation of the paintings on plaster, with which certain of the ceilings in the old rooms of the British Museum were decorated being deemed impracticable or not desirable, they were given up to destruction, and were for the most part knocked to pieces. Dowling, a modeller, being anxious to save some of them, applied himself to transfer some of the groups to canvas, chiefly from the library, and has succeeded admirably. With a paste composed of equal quantities of boiled oil, flour paste, and glue, he fastened a cloth to the whole surface of the painting proposed to be removed, and formed a frame work in front, to support the painted plaster when loosened from the wall behind. He then cut away the timber work (in some cases brickwork) to which the plaster was attached, and, with scrapers, gradually removed the plaster from the back of the picture till the colour began to show, leaving a surface of about the thickness of a penny-piece. With a similar paste to that first mentioned, the painting was fastened to canvas strained on a frame, and the picture being freed from the cloth on the face of it by the application of warm water, and afterwards cleaned with soap and water, the operation was complete, The patience and ingenuity of Dowling are so praiseworthy, that we consider it but an act of justice to mention the circumstance, and to say that the various portions he has thus preserved, some of them large groups, are at his lodgings, No. 12, Drury-lane.—*The Builder.*

TO TIN IRON.—Metal to be tinned must be cleansed, if new work, by putting it in a pickle, —a mixture of sulphuric acid and water,— then scoured with sand, and cleansed in water; but if old, the pickle should be a mixture of muriatic acid and water. It is then ready for tinning. The article should be placed on the fire, and sufficient heat applied to melt the tin. Care should be taken that too great a heat should not be applied, or the article will be burned; it must be rubbed well with a piece of sal ammoniac placed between two wires, likewise some powder sprinkled upon it, to keep the metal from oxidating; apply the tin, wipe it over with a piece of tow, then the work is finished.

BUILDING IN EGYPT.—As I sat near the window of the hotel, I saw the process of building as carried on in Egypt. Camels are there employed in bringing stones. The workmen carry what are not unlike carpet bags, slung across their shoulders, made of leather, and having a large round hole at the top, and a small one at one corner of the bottom, which is tied with a string. In these they bring water for the lime. Others mixed the mortar, which was taken to the builders by women, in square boxes, and which they carry upon their heads. I saw also that several men had got skins of the goat and wild boar, in which they carried water. The skin is taken off as whole as possible; the legs are tied fast, so as to prevent the water from escaping, and the water is poured in at the neck: these, with the hair on, looked like dead pigs hanging from the men's shoulders.—*Lowthian's "Visit to Jerusalem."*

A DESIGN FOR A CENTRE-PIECE.

Architecture.

(*Continued from page* 46.)

NTERING further into the subject, we may remark that the nature of these proportions themselves seems very strongly to indicate their dependence upon the expression of fitness. The beauty of such forms (on the supposition of their absolute and independent beauty) must either consist in their beauty, considered as individual objects, or in their relation to each other. If the effect arises from the nature of the individual forms, then it must obviously follow that such forms or proportions must be beautiful in all cases. I think, however, there is no reason to believe this to be the case; the base of a column, for instance (taken by itself, and independent of its ornaments, which, in this inquiry are entirely excluded from consideration), is not a more beautiful form than many others which are given to the same quality of matter. The peculiar form which its proportions give to it, is very far from being beautiful in every other case, as it would necessarily happen, if it were beautiful in itself, and independent of every other expression. A plain stone of the same magnitude may surely be carved into very different forms from those which constitute the bases of many of the orders, and may still be beautiful. In the same manner the column (considered as in the former case, merely in relation to its peculiar form, and independent of its ornaments), is not more beautiful as a form, and perhaps not so beautiful as many other forms of a similar kind. The trunk of many trees, the mast of a ship, the long slender Gothic column, and any other similar objects, are to the full as beautiful. when considered merely as forms, without any relation to end, as any of the columns in Greek architecture. If, on the contrary, these forms are beautiful in themselves, and as individual objects, no other similar forms could be equally beautiful, but such as had the same proportions. The same observations will apply equally to the form of the entablature. It would appear, therefore, that it is not from any absolute beauty of these forms, considered individually, that our opinion of their beauty in composition arise. If it is said, on the other hand, that the beauty of proportion in such cases arises in relation of such parts, and that there is something in the relations of these forms and magnitude, in itself beautiful, independent of any consideration of fitness, there seem to be equal difficulties. Besides the relation of fitness for the support of the weights, the only relations which take place among these parts, are the relations of length and breadth, and the relation of magnitude. If this beauty arises from the relation of length, it is necessary to show, that such a proportion of these parts, in point of length, is solely and permanently beautiful. If from both together, then the same proportion only ought to be felt as beautiful, in all cases to which the relations of length and breadth can apply. If again this beauty arise from the relation of magnitude, it is necessary in the same manner to show that their magnitudes or quantities of matter, have in fact no other beautiful proportions, but those which take place in such order; but as it is very obvious that there is no foundation for supposing there is any such law in our nature, and that on the contrary in innumerable cases of all such relations, different and contrary proportions are beautiful; it cannot be supposed that such proportions are absolutely beautiful from any of these relations. The only relation, therefore, that remains, is the relation of fitness, and if the same inquiry is carried on, I believe it will soon be found that a certain proportion of parts is necessarily demanded by this relation, and very probably also, that this certain proportion is, in fact, in each of these orders, according to the particular weight or bulk given.

If an order is considered as an assemblage of weight, and parts to support that weight, our experience immediately leads us to conceive a proper relation of those parts to their end. If the entablature be considered as the weight, then of course a certain form and size is demanded for the support of it, and in the base for the support of both. A plain stone, for instance, set on its end, has no proportion further than for the purpose of stability. If it appears firm it has all the proportions we desire or demand; and its form may be varied in a thousand ways, without interfering with our sense of its proportions. Place a column, or any other weight, on this stone, immediately another proportion is demanded, viz., its proportion to the support of this weight. The form supported has, however, no proportion further than is necessary for its stability. It may be more or less beautiful in point of form from other considerations, but not on account of its proportion. Above this again place an additional body, immediately the intermediate form demands a new proportion, viz., to the weight it supports; and the first, or base, demands also another proportion, in consideration of the additional weight which is thus imposed upon it. In this supposition, it is obvious, that the consideration of fitness alone leads us to expect a certain proportion among each of these parts. The parts are beautiful or pleasing, just as they answer to this demand; and where the parts are few, and experiments easy, it seems not difficult at last to arrive at that perfect proportion which satisfies the eye, as sufficient for the purpose of support or stability. If we leave, therefore, everything else out of consideration, the consideration of fitness alone seems to account both for the origin of such proportions in architecture, and for the pleasure which attends the observation of them.

But granting that the doctrine of original beauty of proportion be abandoned as inconsistent with experience, and that of the influence of the expression of fitness be adopted, yet it may still be doubted if this is sufficient to account for the delight felt from the orders of architecture, or the uniform adherence to the established proportions.

It is acknowledged that the mere consideration of fitness is insufficient to account for the pleasure derived from the established orders. But it is observed, that this pleasure arises from their proportions; and that, in fact, when these proportions only are considered. the pleasure that is generally felt is not greater than that which we experience when we perceive in any great work the proper relation of means to an end.

The proportions of these orders, it is to be remembered, are distinct subjects of beauty, from the ornaments with which they are embellished, from the magnificence with which they are executed, from the purposes of elegance they are intended to serve, or the scenes of grandeur they are destined to adorn. It is in such scenes, however, and with such additions, that we are accustomed to observe them; and while we feel the effect of these accidental associations we are seldom willing to examine what are the causes of the complex emotion we feel, and readily attribute to the nature of architecture itself the whole pleasure which we enjoy. But besides these, there are other associations we have with these forms, that still more powerfully serve to command our admiration, for they are the Grecian orders; they derive their origin from those times, and were the ornament of those countries which are most hallowed in our imaginations; and it is difficult for us to see them, even in our modern copies, without feeling them to operate upon our minds as relics of those polished nations where they first arose, and of that greater people by whom they were borrowed. While this species of architecture is attended with so many and so pleasing associations, it is difficult for even a man of reflection to distinguish between the different sources of this emotion; or in the moments when this delight is felt, to ascertain what is the exact protion of his pleasure which is to be attributed to these proportions alone; and two different causes combine to lead us to attribute to the style of architecture itself the beauty which arises from many other associations.

Impressions of Medallions, &c. in Copper.—Reduce finely pulverized oxide of copper in a current of hydrogen at a temperature below redness. Sift the powder through crape, and place it on the model, from four to five inches in thickness, and then press in a vice, or first with the hand and then with a hammer. The impressions obtained are perfect, but have little cohesion unless heated to redness previous to being exposed to the atmosphere. After this operation they acquire more tenacity than melted copper, and as their volume retracts, the impression becomes more distinct. Copper powder for this purpose is obtained far more easily, of better quality, and without loss of time, by precipitating a solution of sulphate of copper with zinc, and boiling. The precipitate of copper is then boiled for a few instants in weak sulphuric acid to remove the last traces of oxide or zinc; then washed with water, and dried in a tubulated retort over the water-bath by passing over it a current of hydrogen. This precipitate of copper has so strong an affinity for oxygen that it is difficult to prevent it from changing into protoxide; and if mixed with half an atomic weight of precipitated sulphur and rubbed together, they combine in a few instants with evolution of light forming proto-sulphuret of copper.

Why were early Railways Circuitous?—A history as interesting and extraordinary as a romance might be written of the difficulties encountered and conquered by the early projectors of railways. Nothing less than golden arguments of the purest mint would induce noble and gentle landholders to give assent to roads which trebled their estates in value: and vast loss of money and of time was incurred in making those circuits which now excite our wonder and regret, in order to allay the fears of cities, lest conflagration—and universities, lest contamination—should attend the near approach of steam power.—*Sidney's Railway System.*

Review.

A Catechism on the Steam-Engine. By JOHN BOURNE, C. E.—London: *J. Williams and Co.*

A CORRECT knowledge of the various minutiæ connected with the construction and working of steam-boilers and engines is of the utmost importance at the present time, both to the practical engineer who plans, and the mechanic who constructs, those powerful instruments, in which the maximum of power is concentrated, as it were, into the minimum of space. The name of Mr. Bourne is already well known to the public as that of the author of a work on the "Steam-Engine," which may justly be pronounced as the most complete and practical treatise of its description ever penned—we refer to the quarto work published under the implied editorship of the "Artisan Club." From an inspection of the present work it is easy to perceive that Mr. Bourne has striven hard to advance his former reputation even still more; and the result is that he has been eminently successful, not only in producing a book destined to become a *requisite* in the hands of all connected with the subject on which it treats, but also in securing an enviable position in the foremost ranks of the engineering writers of the age.

The only fault we have to find with Mr. Bourne's present work is that it has been put into the form of a catechism; but even in this respect it may be doubted whether this is really one.

Our space will not allow us to extract largely, we will therefore select at random from the vast store of information with which the work abounds.

Steam-boiler explosions form, at the present time, a doubly interesting subject, and on which Mr. Bourne remarks as follows:—

"The chief cause of boiler explosions is, undoubtedly, too great a pressure of steam, or an insufficient strength of boiler; but many explosions have also arisen from the flues having been suffered to become red-hot. If the safety valve of a boiler be accidentally jammed, or if the plates or stays be much worn by corrosion while a high pressure of steam is nevertheless maintained, the boiler necessarily bursts; and if from an insufficiency of water in the boiler, or from any other cause the flues become highly heated, they may be forced down by the pressure of the steam, and a partial explosion may be the result. The worst explosion is where the shell of the boiler bursts, but the collapse of a furnace or flue is also very disastrous generally to the persons in the engine room, and sometimes the shell bursts and the flues collapse at the same time; for if the flues get red-hot, and water be thrown upon them either by the feed pump or otherwise, the generation of steam may be too rapid for the safety valve to permit its escape with sufficient facility, and the shell of the boiler may in consequence be rent asunder. Sometimes the iron of the flues becomes highly heated in consequence of the improper configuration of the parts, which by retaining the steam in contact with the metal, prevents the access of the water: the bottoms of large flues upon which the flame beats down, are very liable to injury from this cause, and the iron of flues thus acted upon may be so softened that the flues will collapse upwards with the pressure of the steam. The flues of boilers may also become red-hot in some parts from the attachment of scale, which from its imperfect conducting power will cause the iron to be unduly heated; and if the scale be accidentally detached, a partial explosion may occur in consequence. It is found, however, that a sudden disengagement of steam does not immediately follow the contact of water with the hot metal, for water thrown upon red-hot iron is not immediately converted into steam, but assumes the spheroidal form and rolls about in globules over the surface. These globules, however high the temperature may be on which they are placed, never rise above the temperature of 205 degrees, and give off but very little steam; if the temperature of the metal be lowered, the water ceases to retain the spheroidal form, and comes into intimate contact with the metal, whereby a rapid disengagemeut of steam takes place. If water be poured into a very hot copper flask, the flask may be corked up, as there will be scarce any steam produced so long as the high temperature is maintained, but so soon as the temperature is suffered to fall below 350 degrees or 400 degrees, the spheroidal condition being no longer maintainable, steam is generated with rapidity, and the cork will be projected from the mouth of the flask with great force. One useful precaution against the explosion of boilers from too great an internal pressure, consists in the application of a steam guage to each boiler, which will make the existence of any undue pressure in any of the boilers immediately visible; and every boiler should have a safety valve of its own, the passage leading to which should have no connection with the passage leading to any of the stop valves used to cut off the connection between the boilers; so that the action of the safety valve may be made independent of the action of the stop valve. In some cases stop valves have jammed, or have been carried from their seats into the mouth of the pipe communicating between them, and the action of the safety valves should be rendered independent of all such accidents. Safety valves, themselves, sometimes stick fast from corrosion, from the spindles becoming bent, from a distortion of the boiler top with a high pressure,

in consequence of which the spindles become jammed in the guides, and from various other causes which it would be tedious to enumerate; but the inaction of the safety valves is at once indicated by the steam guage, and when discovered, the blow-through valves of the engine and blow-off cocks of the boiler should at once be opened, and the fires raked out. A cone in the ball of the waste steam-pipe to send back the water carried upwards by the steam should never be inserted; as in some cases this cone has become loose, and closed up the mouth of the waste steam pipe, whereby the safety valves being rendered inoperative the boiler was in danger of bursting. If the water be carried out of the boiler so rapidly by priming that the level of the water cannot be maintained, and the flues or furnaces are in danger of becoming red-hot, the best plan is to open every furnace door and throw in a few buckets full of water upon the fire, taking care to stand sufficiently to the one side to avoid being scalded by the rush of steam from the furnace. There is no time to begin drawing the fires in such an emergeney, and by this treatment the fires, though not altogether extinguished, will be rendered incapable of doing harm. If the flues be already red-hot, on no account must cold water be suffered to enter the boiler, but the heat should be maintained in the furnaces, and the blow-off cocks be opened, or the mud-hole doors loosened, so as to let all the water escape; but at the same time the pressure must be kept quite low in the boiler, so that there will be no danger of the hot flues collapsing with the pressure of the steam. Plugs of fusible metal were at one time in much repute as a precaution against explosion, the metal being so compounded that it melted with the heat of high-pressure steam; but the device, though ingenious, has not been found of any utility in practice. The basis of fusible metal is mercury, and it is found that the compound is not homogeneous, and that the mercury is forced by the pressure of the steam out of the interstices of the metal combined with it, leaving a porous metal which is not easily fusible, and which is therefore unable to perform its intended function. In locomotives, however, and also in some other boilers, a lead rivet is inserted with advantage in the crown of the fire-box, which is melted out if the water becomes too low, and thus gives notice of the danger. All boilers in actual use should be proved at least once a year by forcing water into them by the hand feed-pump until the safety-valve is lifted, which should be loaded with at least twice the working pressure for the occasion. If a boiler will not stand this test, it is not safe, and either its strength should be increased or the working pressure should be diminished."

We will, perhaps, shortly return to this book; but in the meantime advise all who can afford it to purchase for themselves.

JENNINGS'S PATENT JOINTS.—An important improvement has been lately effected by Mr. G. Jennings, of Great Charlotte-street, Blackfriars-road, consisting in a new method of joining pipes, &c., together without using solder.

Mortar.

MORTAR is the calcareous cement used in building, compounded of burnt limestone and sand. Limestone or chalk, slowly calcined till all its carbonic acid gas is expelled, loses about 44 per cent. of its weight, and becomes what is called slacked lime, on the application of water, falling into a fine powder: suddenly formed into a stiff paste with water, this powder becomes hydrate of lime, assuming a solid form, and, as it attracts carbonic acid from the air, hardens, and constitutes the common builder's mortar. Hydrate of lime, without any other ingredient, whilst in a moist state, falls away and is dissolved in water. Alumina, silica, and manganese produce the same effects with lime, but in an inferior degree. If any substance in powder, which contains much iron, be added to this mortar, its hardness and compactness is much increased, and it also acquires the property of hardening under water, and is denominated Roman cement, or water mortar. In these combinations, if the lime should be in excess, it separates, either crystallising or forming stalactes; by which it appears that a definite proportion of the materials is necessary to form the best cement.

Various additions are made to mortar, for the purpose of increasing its hardness or tenacity, which for this purpose must be reduced to a fine powder, and the whole intimately kneaded together, and wrought to a smooth consistence: puzzolana, terras, iron ores, basalt, and other similar substances, in considerable variety, with sand of various descriptions. Common limestone (the *chaux maigre*, or poor limestone, of the French) consists of nearly pure carbonate of lime. It slacks freely, and produces white lime, and, with the addition of sand, good common mortar. The species of lime includes chalk, marble, &c. Chalk lime is seldom sufficiently burnt, and more quickly absorbs carbonic acid than stone lime. Silicious limestones give a buff colour. Those stones which are almost entirely constituted of pure carbonate, as is the case with respect to most of the varieties of marble or limestone called rich, when burned, slacked, and made into paste, will retain their softness under water, or otherwise excluded from the air, for almost any length of time; whilst those stones in which calcarious matter is found mixed with sand, silex, alumine, and iron, and which are called meagre limes, if treated in the same manner, quickly harden under water, and in time form a kind of freestone, which cannot be easily broken: from this circumstance it is called hydraulic lime. Mortar of this lime, when exposed to the air to dry, acquires a crumbly consistence; and these kinds of lean lime, which contain an excess of silex, are found unfit for hydraulic cement. The rich lime, exposed to the air, mixed with a due proportion of sand, acquires a great degree of hardness. Puzzolanas are either natural or artificial. The natural are found in situations which have been acted upon by subterraneous heat. They all consist of

silex, alumine, oxide of iron, and a little lime; their properties vary greatly, silex or clay being the predominating ingredient; the lime and iron sometimes, though rarely, wanting. The scoria of forges and furnaces, broken pottery, and pulverised brick or tile, are artificial substances analogous to puzzolanas. One class of puzzolanas, containing a large proportion of clay or argil, resist the action of sulphuric acid: another class, with a less proportion of clay, easily dissolve with this acid, and abandon the clay, which immediately subsides. From very rich slacked lime, with sand alone, or with puzzolana, which resists the action of sulphuric acid, we obtain a mortar which, placed under pure water, remains always soft, or acquires a feeble consistence. Exposed to the air, this mortar soon acquires a crumbly consistence, but never hardens. If the same experiment be made with a puzzolana readily decomposed by sulphuric acid, a mortar is obtained, which soon sets under water, and becomes gradually harder, but, exposed to the air, it dries quickly, and consequently never becomes very hard. Since the quality of natural hydraulic lime depends on the mixture of various ingredients, with only a certain proportionate quantity of clay, combined by heat, it is natural to suppose that an artificial mixture of the same materials, submitted to heat, would produce a compound of equal efficacy. Experience has abundantly confirmed this opinion, and it is now known that an artificial hydraulic lime may be prepared almost in any place, at a moderate price, and superior to the natural.

M. Berthier is of opinion, that with one part of common clay, and two parts and a half of chalk, a very good hydraulic lime may be made, which sets as quickly as Parker's cement. He concludes, that a limestone, containing six per cent. of clay, affords a mortar precisely hydraulic. Lime containing from fifteen to twenty per cent. is very hydraulic; and when from twenty-five to thirty, it sets almost instantly, and may therefore be held to be a true Roman cement. But an argillaceous limestone, which, when slacked, increases in bulk from one to three parts upon ten, and which when in the form of a slacked paste will take from one hundred to one hundred and sixty or one hundred and eighty measures of sand, will afford, at a moderate cost, a cement equally fitted to resist the changes of weather, and the constant exposure to a running stream. A little magnanese added to mortar, gives it the property of hardening under water. Limestone is frequently found combined with this mineral, which gives it a brown colour when burnt.

Sharp coarse sand is the best for mixing with the lime, and it should be divested of the clay or mud which generally adheres to it. If sea-sand be used, it will require to be freed from alkaline salts, and other impurities, by washing in fresh water; but for the purpose of mixing or slacking the lime, sea water is injurious, as it prevents the mortar from becoming perfectly dry. In drying, sand is not diminished in magnitude, but lime, shrinks much, therefore the greater the proportion of sand, the sooner the mortar sets, and the harder it will be when dry; but though many valuable treatises have been written on the subject, and nice experiments made, the exact proportions of the lime and sand, have not yet been ascertained. According to Vitruvius, the Romans prescribed three parts of coarse sand to one of lime; and, according to Pliny, four of the former to one of the latter. The usual proportions of the London builders, is two loads and a half of sand, to thirty-seven bushels of lime.

If the mortar be well beaten, it will take a greater proportion of sand, and will be proportionably improved; and it is agreeable to an observation of Mr. Smeaton, that one measure of unslacked lime, well beaten, will always require two measures of sand for mortar of any kind; and the greater the proportion of sand, the more it is to be beaten.

The mixture of fine and coarse sand is found to improve the composition of mortar, and Dr. Higgins gives the following, as the best proportions of each. Newly-slacked lime, 1 part; coarse sand, 4 parts; fine sand, 3 parts. The addition of one quarter of the quantity of the lime, of burnt bone ashes, improved the composition, giving a greater degree of tenacity, and causing it to dry without cracks.

Mortar is best made in a vault or cellar, and kept covered up from the air; when used, it must be beaten up, and brought to a proper consistence.

Grout is a diluted kind of cement, sufficiently fluid to fill up the irregular spaces between the stones of rough walls; if it be made of mortar that has been well beaten in the making, and kept a long time, it will then set in a few days; but if new-made mortar be used, the grout will be a long time before it hardens, or perhaps it will never properly set.

Common mortar, even when thoroughly dry before the water is admitted, is by no means well adapted to the purpose of lining reservoirs or aqueducts; but if a certain portion of burnt clay be mixed with the lime, the mortar will set and harden under water. To give this property to cement, various ingredients have been added: coal-ashes, wood-ashes, coal-cinders, brick-dust, or burnt clay, pumice-stone, unslacked powder of quicklime, forge-scales, roasted iron ore, wakke, or compact basalt, cellular basalt, puzzolana, &c.

In the construction of the Eddystone lighthouse, Mr. Smeaton used equal quantities of puzzolana and Aberthaw lime, as the mixture best calculated to withstand the utmost violence of the waves, continually beating against the fonndation of that building. Two bushels of slacked lime, from Aberthaw, one bushel of puzzolana, and three of clean sand, will form a good water cement; and in various parts of England, as at Tinker's-hill, near Ludlow, and places bordering on Wales, a peculiar kind of lime is found, which, if properly prepared, forms, with sand only, a mortar which will set and harden under water. The substance called puzzolana was discovered by the Romans near the town of Puteoli, not far from Mount Vesuvius, and was first used for buildings bordering the bay of Baiæ, some of

which were built in the water. The only preparation this substance requires, is pounding and sifting, in which state, when mixed with lime, it is found to possess, in the highest degree, all the requisite properties of a water cement.

(To be continued.)

PORTRAIT PAINTING.—We can hardly account for the manner in which this branch of the fine arts, has of late years, not merely degenerated in point of execution, but also fallen into the hands of a set of artistic quacks, claiming no superiority of character over those who under the guise of doctors hired a caravan and a clown, and perambulated the country half a century since. We cannot turn the corner of a street without encountering a glass case full of inexplicable figures cut out of black paper and pasted on millboard, or else crammed with imaginary likenesses (!) of nobodies, labelled "In this style 5s.;"—even on board the river steam-boats, we may any day perceive a parcel of men in shabby coats with scissors and black paper in their hands entreating to be allowed to take portraits at the exceedingly small charge of threepence a head! We are no enemies to cheapness in anything—on the contrary, we uphold a system having for its object to lower the prices of valuable articles; but when we perceive announcements informing the public that excellent likenesses may be obtained of a certain society of *artists* at a price for which no man entitled to bear the name could afford to take up a pencil, we cannot help feeling disgusted not only with those who pursue, but also with those who support, such a system.

COUCH'S STONE-EMBALMING LIQUID.—Mr. Couch having submitted to our inspection specimens of his admirable invention, we are enabled to speak in terms of high commendation of what, even in these days of wonders, must be considered a great novelty. For many years past Mr. Couch has directed his attention to the various qualities of stones and earthy matters, and, being a practical man, has at length succeeded in producing a composition which, after being applied in a fluid state, quickly assumes the durability and hardness of stone, and which admits of the very highest degree of polish. In addition to this quality, different colours may be blended with it, so that imitations of marbles of all kinds may be readily produced. It is impervious to moisture, and therefore calculated to resist all variations of weather and changes of temperature. Not the least useful of its properties is that of its being capable of being moulded into the most elaborate patterns, so that chimney-pieces, brackets, cornices, and mouldings may be rendered durable and highly ornamental. For chess tables, wash-hand stands, and pillars it is eminently serviceable; indeed, we know not of any portion of a building from the foundation to the roof to which it may not be usefully applied. There cannot be a doubt that it only requires to be generally known to be brought into extensive use. We shall, in a future number, give details of this invention.

Notices to Correspondents.

*** Part VII. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., and VI. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability o their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be intresting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—I should feel greatly obliged if any of your intelligent correspondents would inform me of the manner in which I may square up the following dimensions, so as to bring them into reduced brickwork:—*Footings*—85 feet in length, 1 course, 5 half-bricks thick; 84 feet, 1 course, 4 do. do.; 4 feet 3 in., 1 course, 4 do. do.; 2 feet 3 in., 1 course, 3 do. do.—I remain, Sir, your obedient servant, H. J. Brixton-road, Dec. 6, 1847.

ANSWERS TO QUERIES.

WEIGHT OF CAST-IRON PLATES.—Sir,—In answer to the inquiry of "Lignarium" respecting the weight of cast-iron plates, I beg to state that they generally average 5lbs. per foot superficial ⅛ in.; 10lbs., do. do., ¼ in.; 20lbs., do. do., ½ in.; 40lbs., do. do., 1 in.—Your obedient servant, HENRY JAMES. London, Dec. 6, 1847.

MARBLING CRAYONS.—We give insertion to the following letter, because it contains some extra information to that which has been given by our two previous correspondents:—"Sir,—In the 28th number of the DECORATOR'S ASSISTANT, 'J. F.' wishes to know how the crayons are made, such as painters employ for marbling shop-fronts, I beg to inform him that they are made of common Venetian red and lamp-black ground in water, with a little pipeclay to bind them. For imitating Sienna marble, have one crayon of Venetian red, and a brown one, made of black and red; a green one, made of crome yellow and black, with a little pipeclay to bind it, is useful. With my best wishes for the success of your publication, I am, Sir, yours respectfully, A SUBSCRIBER. Glasgow, Dec. 1, 1847."

H. G. (Doncaster).—We saw an announcement, about two or three months ago, of an achromatic lamp-glass, patented, we believe, by Messrs. M'Neil and Co., of St. Martin's-lane. The peculiarity of the invention consists in substituting for the glass chimneys at present in use chimneys made of blue or rather grey glass, either ground or polished, as the case may be. The effect of this simple introduction of a coloured medium, through which the light of the flame passes, is to get rid of the red or yellow glare of the artificial light, and to produce a pure white light, similar, or closely approaching, daylight. The relief given to the eyes by this means is at once experienced, and the aid afforded to artists, and painters more particularly, is obvious.

A MECHANIC (North Briton).—It is not safe to employ much metal in buildings constructed of masonry, unless, indeed, it be well protected from atmospheric influences; as an instance of this we may cite the well-known case of the church of St. Marylebone, London, the steeple of which, some years since, was nearly thrown down by the alternate elongation and contraction of some iron cramps placed at the top of the spire for additional security, without, however, being properly protected from the weather.

B. B. H. T. (Manchester).—See the answer to "A Carpenter" in No. 30.

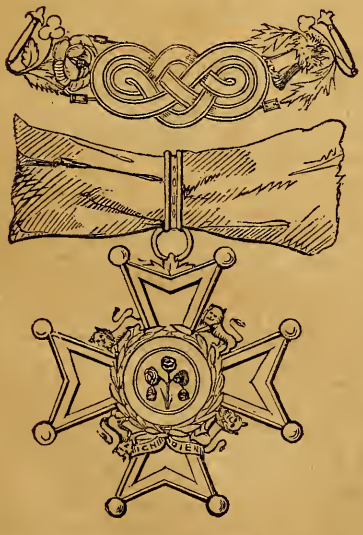
An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from page 51.)

Camaieu (in painting), a painting wherein there is only one colour, and where the lights and shades are of gold, wrought on a golden or azure ground This peculiar method is generally employed to imitate *basso relievos* on panels, &c., and when well managed has a very pretty effect.

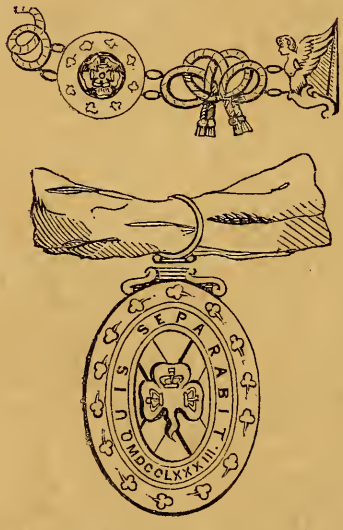
Collar, an insignia worn by the knights of the different orders on grand occasions.

1. *Collar of the Order of the Garter.*



2. *Collar of the Order of the Bath.*

3. *Collar of the Order of the Thistle.*



4. *Collar of the Order of St. Patrick.*

(To be continued.)

The Electric Telegraph versus Time.—In a letter received by a gentleman of Manchester from a friend in Indiana, United States, is the following passage relative to the electric telegraph in that state:—"That wonderful invention, the magnetic telegraph, passes through our country from the eastern cities, communicating intelligence almost instantaneously. News has been transmitted from Philadelphia to Cincinnati, a distance of 750 miles, on one unbroken chain of wires. Of course, as Cincinnati is ten degrees west of Philadelphia, or forty minutes of time later, the news is that much ahead of the time."

Artistic Societies.

THE SOCIETY OF ARTS.

Monumental Brasses.—At a meeting of the above society on the 1st of December, a paper was read by Mr. Archer, on engraving, with reference to monumental brasses and incised stones. The author commenced by referring to the very early period at which the art of engraving appears to have been known and practised by the lapidary and goldsmith, and the probability that those to whom the art was known were subject to a precise code of laws and connected with the priestly office, these laws having the effect of regulating the productions according to a given standard, set up by the heads of their order—thus giving a singular uniformity to the numerous examples of antique art, whether in painting, sculpture, or engraving. After alluding to the Egyptian, Etruscan, Greek, and Roman specimens of engraving, and similarity and common origin, he proceeded to point out the various purposes to which the art of engraving on brass was employed—such as the representation of geographical diagrams. In the time of Herodotus, edicts and public records were sometimes inscribed on brass tablets, a striking instance of which occurs in the preservation, down to the present time, of the will and acts of the Emperor Augustus. Having touched upon some few instances of the ancient practice of the caleographic art, the author proceeded to detail some particulars of that process, as it appeared at the general revival of art during the middle ages. In the eighth century, by a law of Kenneth, king of Scotland, it was enjoined, that a cross should be put on every grave-stone (*i. e.* coffin-lid): and this appears to have been done in three ways—1st, by the use of incised lines drawn round the object; 2d, by producing the form in low relief; and 3d, by a wholly excised figure. The use of sepulchral crosses appears to have originated with the general revival of art in the 13th century. One of the earliest specimens, is that of Sir Roger de Trompington, who died in 1289. The brasses of the 14th and 15th centuries contain, besides the effigies of warriors, churchmen, ladies, and civilians, many examples of beautiful decoration, derived from the architectural practice of the time, and different combinations of the letters I.H.S., composing the sacred monogram, appear in the brasses of the 15th and beginning of the 16th centuries. At the time of the reformation, these sacred monuments appear to have become obnoxious, and were, accordingly, swept out of the churches with an unsparing hand, few (comparatively) having escaped destruction; of some of these, however, the author produced rubbings; and, having traced the history down to the 19th century, and referred to the latest of that period (prior to those produced under his own direction), proceeded to urge the desirableness of possessing, as a nation, a complete collection of the rubbings of the crosses of this country, as illustrative of the costume and history of bygone times; and the propriety of such a collection being deposited in the British Museum. The author then concluded his paper, by calling attention to the cartoons of several monuments, recently executed by himself, by a new process of working in brass, and which he promised to communicate to the society at an early period.

Great Iron Bridge for Russia.—A contract having been entered into between the Russian government and Mr. Vignoles, engineer, for an iron suspension-bridge, to be erected over the Dnieper, at Kieff, the first shipment of machines and ironwork was lately made at Liverpool, in the British barque, Flirt, Mr. A. Dove, master. The articles shipped consist of various massive pieces of iron, of prepared forms, in packages numbered from 1 to 320, and weighing in all 274 tons. They consist of sheeting pile and foundation pile-weights, five-inch diameter shafts and couplings, cylindrical pieces and stands, with bolted pedestals, besides fourteen cases of bolts and nuts. They have been prepared at a foundry at Bolton, and are consigned to Odessa, whence they will be drawn by bullock carts 400 miles to Kieff.

Ventilation of Rooms.—A simple and effective method of ventilating apartments consists in making an aperture of sufficient size in the ceiling for the insertion of an ordinary funnel, the broad end of which must be turned downwards, while to its spout may be affixed a piece of tubing long enough to convey the foul air out of the building. The best plan for this purpose is to conduct the tubing horizontally, as this will be a security against a counter current of cold air. This method has been tried in several instances, and has been found eminently successful.

Measuring Tapes.—The following letter on this subject has been addressed to the Editor of the *Builder* :—Sir: Very simple things are not to be always despised. The following improvement in measuring tapes seems both simple and obvious, yet I have never seen it adopted, except by myself. I claim no praise for the improvement, but I wish to make it public, if you think it worth making public, merely for the benefit of measurers and tape-makers. Instead, then, of having a round ring at the end of the tape, have a small brass D, the straight side being equal to the width of the tape. The consequence is, the tape will wear much longer, and it can be more accurately adjusted to a tape than a ring. The strain of the tape on a ring is at the two edges, causing the tape to wear, and in a very short time the ring to come off. In the D form the strain of tthe tape is equal throughout its breadth. I dedicate this improvement to Messrs. Chesterman and Bottow, for their excellent metallic tapes, if they choose to adopt it.—I am, Sir, &c., J. Blenkarn, Ollerton, Notts.

Mechanics' Institutions, &c.

WESTMINSTER MECHANICS' INSTITUTION.

Artifician Light and Coal-gas.—On the 2nd of December, Mr. Wright delivered a lecture at the Westminster Mechanics Institution on the above subject, illustrated by various models and numerous instructive experiments. The lecturer commenced with some very eloquent remarks upon the sun, as the source of light and heat, and the beneficence of the Deity in implanting in the mind of man a strong desire to imitate the works of Nature. The animal, the vegetable, and mineral worlds, abound with substances fitted for the production of light, awaiting only the intelligence of man to form the necessary combinations, and so completely have these been fashioned, by the accumulated discoveries of many generations, to minister to our wants and comforts, that our nights now differ little in brilliancy from our days. In the present age the masses enjoy luxuries that were denied to princes a few centuries since, even so lately as 1558. Prof. Beckman assures us that the courts of the king's palace in France, were lighted with vases, containing pitch, tar, and other like matters, which must have resembled the lamps now only used in front of the booths at our public fairs. At the present time every street and alley in this great metropolis is lighted by a subtle invisible fluid, which ramifies through the city like blood through our veins, leaving the desired quantity at every point, and thus by a slight movement of the hand we can command a light of the most dazzling brilliancy or of the feeblest character. We have lights without smoke and lamps which require neither trimming nor replenishing, and yet will burn from year to year with as much certainty and regularity as if a priest of the Magi sat behind them to watch the sacred flame. It would be impossible at the present time to determine what description of light was first used. The probability seems to be in favour of wood. There has, no doubt, been a time when the only artificial light used was that from the fires employed for domestic purposes. The Romans were in the habit of using a chafing dish placed in the centre of their apartments, filled with hard wood to give out heat, and resinous wood for light. The lecturer then adverted to the great antiquity of the oil-lamps, of their being in use when the children of Israel sojourned in the wilderness, of the seven-branched candlestick described in the book of Exodus, and the frequent mention of the subject in other parts of Scripture; —reference was also made to the practice of the Romans, in illuminating their streets on the occasion of particular festivals. Among modern cities, London and Paris contend for the honour of the introduction of street lighting, the date of the origin of which is about the middle of the 16th century. Having given a brief out-line of the progress of artificial light, the lecturer proceeded to describe the characteristics of the elementary bodies whose combinations form artificial light. The peculiar properties of oxygen, hydrogen, nitrogen, and carbon, were explained and experimentally illustrated; the theory of latent heat and combustion came under review, coal-gas, its manufacture, and variation in quality was ably explained, the lecturer pointing out that while the gas of some companies gave out a great degree of heat, that of others was considerably superior in illuminating power, the London gas having the former peculiarity, that of the north of England the latter. The form, construction, and history of various lamps, the Argand, the carcel, the camphine, the shadowless, and many others, were described and illustrated; also Palmer's candles and the peculiarity of their manufacture. The best form of burners and the principles of their construction was also adverted to, as well as a machine for weighing gas.

Composition Ornaments.—Thousands have admired the perfection of the figures produced by the looking-glass and picture-frame manufacturers, on the corners and other parts of their elegant gilt frames; but the art has been kept so close a secret among the craft, that not even the apprentices of the trade have been allowed to know the secret of this peculiar art till near the expiration of their term of apprenticeship. We shall here describe the whole process as practised by the best burnish gilders at the present time. The composition becomes nearly as hard as stone, and the art will furnish an agreeable amusement to many, who are not connected with that branch of business. Process:—Dissolve one pound of glue in one gallon of water; in another kettle boil together two pounds of rosin, one gill of Venice turpentine, and one pint of linseed oil. Mix all together in one kettle, and continue the boiling, stirring them together till the water has evaporated from the other ingredients: then add finely pulverised whiting till the mass is brought to the consistence of soft putty.—This composition will be hard when cold; but being warmed it may be moulded to any shape by carved stamps or prints; and the moulded figures will soon become dry and hard, and will retain their shape and form more permanently than carvings of wood. They may be fastened with common glue on either plain surfaces or mouldings.—*Scientific American.*

Achromatic Glasses.—An American paper states, that a tubular telescope has been exhibited at the fair of the American Institute. The glasses were imported from Paris, but were ground polished by the maker, Mr. Fitz, of New York. The size is 6½ in. by 10 ft. focus; it is intended for Columbia College; has been severely tested on the nebulæ and double stars, Saturn's rings, &c., and has given complete satisfaction. It is said, Mr. Fitz's glasses are equal to the German, and he is the first American optician who has been so successful.

A DESIGN FOR A CORNER, TO MATCH THE CENTRE-PIECE GIVEN LAST WEEK.

NEW MOTIVE POWER.—The *Courrier de Lyons* of the 24th ult. mentions the following discovery of a new motive force:—"It is now some time since the idea of employing æther as a propelling force was suggested. Our townsman, M. Tremblay, has reduced this theory to practice. A machine worked by the steam of æther has been in full operation for the last six days in a glass-cutting manufactory in the Guillotiere. Its power is equal to that of twenty horses."

ANOTHER ROTARY ENGINE.—Messrs. Dunham and Co., of New York, have constructed a new description of rotary engine, which is stated, in a New York paper, to be superior to anything yet invented—having a solidity and steadiness of motion the writer never observed before in a rotary engine when loaded. There is, unfortunately, no description—all we can learn is, that it is like a drum, 4 ft. long and 12 in. in diameter.—*Mining Journal.*

TINKERING THE ANGELS.—It is a novelty to find the old custom of mending the parish angelicals brought down to our own times, in Salopian localities; but so it is. For example:—

The Churchwardens of L———
To Benjn. Evans,

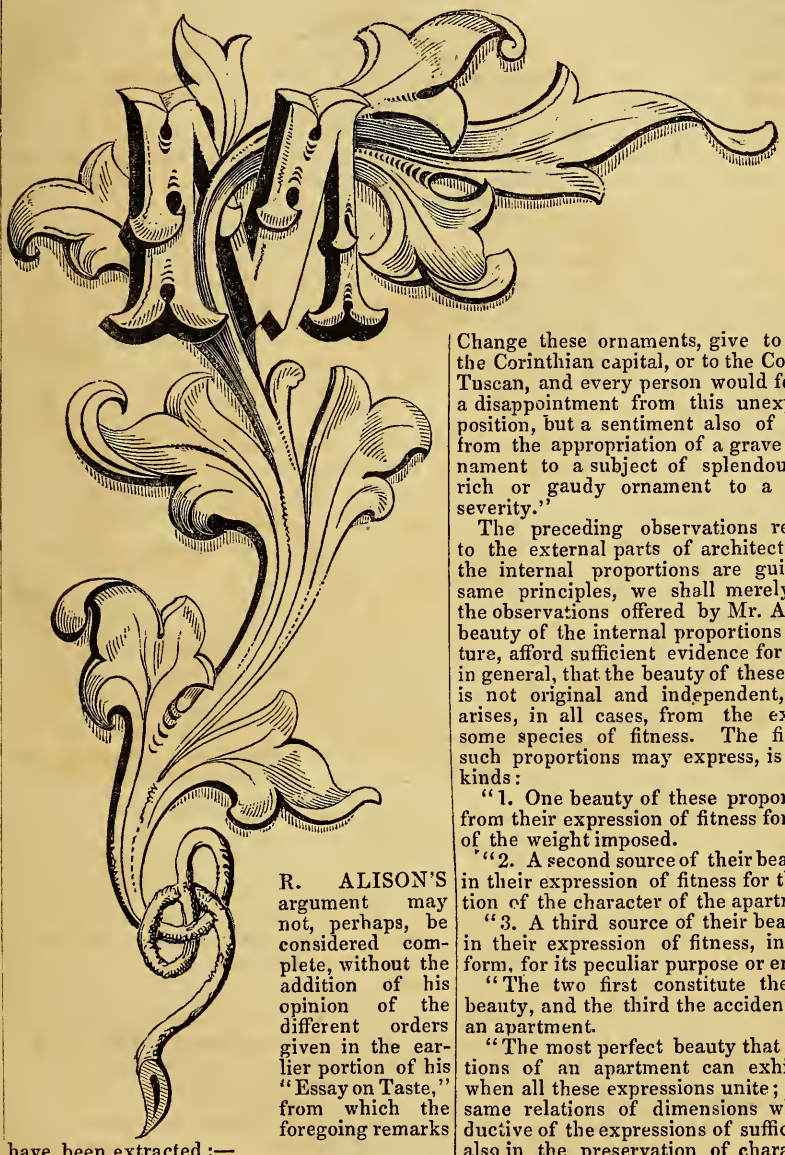
		s.	d.
1847.	for repairing the church.		
Feby. 7.—	Making a new wing to a angel	3	6
	Making a new angel: you fund the stuf	8	6
	Repairing the leg of a cherry-bum	2	6
		14	6

—*Eddowes' Shrewsbury Journal.*

NEW APPLICATION OF THE CENTRIFUGAL GOVERNOR.—Among the latest fruits of American ingenuity, is a horse-power, to which a centrifugal governor (like that used in steam-engines) is attached, which of its own accord pulls up the horses when they go too fast, and begins whipping them the moment they loiter.

Architecture.

(*Continued from page* 55.)



R. ALISON'S argument may not, perhaps, be considered complete, without the addition of his opinion of the different orders given in the earlier portion of his "Essay on Taste," from which the foregoing remarks have been extracted:—

"The orders of architecture," he states, "have different characters from several causes, and chiefly from the different quantity of matter in their entablatures. The Tuscan is distinguished by its severity; the Doric by its simplicity; the Ionic by its elegance; the Corinthian and Composite by their lightness and gaiety. To these characters, their several ornaments are suited with consummate taste. Change these ornaments, give to the Tuscan the Corinthian capital, or to the Corinthian the Tuscan, and every person would feel not only a disappointment from this unexpected composition, but a sentiment also of impropriety from the appropriation of a grave or sober ornament to a subject of splendour, and of a rich or gaudy ornament to a subject of severity."

The preceding observations relate wholly to the external parts of architecture; but as the internal proportions are guided by the same principles, we shall merely state, that the observations offered by Mr. Alison on the beauty of the internal proportions of architecture, afford sufficient evidence for concluding, in general, that the beauty of these proportions is not original and independent, but that it arises, in all cases, from the expression of some species of fitness. The fitness which such proportions may express, is of different kinds:

"1. One beauty of these proportions, arises from their expression of fitness for the support of the weight imposed.

"2. A second source of their beauty, consists in their expression of fitness for the preservation of the character of the apartment.

"3. A third source of their beauty, consists in their expression of fitness, in the general form, for its peculiar purpose or end.

"The two first constitute the permanent beauty, and the third the accidental beauty of an apartment.

"The most perfect beauty that the proportions of an apartment can exhibit, will be when all these expressions unite; or when the same relations of dimensions which are productive of the expressions of sufficiency, agree also in the preservation of character, and in the indication of use."

From the whole of the foregoing discussions and illustrations, Mr. Alison has drawn the following conclusions:—

"That the principal sources of the beauty of forms are: 1st, the expression which we connect with peculiar forms, either from the form itself, or the nature of the subject formed; 2dly, the qualities of design, and fitness, and

utility, which they indicate; and 3dly, the accidental associations which we happen to connect with them.

"All forms are either ornamental or useful.

"The beauty of merely ornamental forms appears to arise from three sources:

"1. The expression of the form itself.

"2 The expression of design.

"3. Accidental expression.

"The real and positive beauty, therefore, of every ornamental form, will be in proportion to the nature and the permanence of the expression by which it is distinguished. The strongest and most permanent emotion, however, we can receive from such expressions, is that which arises from the nature of the form itself. The emotion we receive from the expression of design, is neither so strong nor so permanent; and that which accidental associations produce, perishes often with the year which have it birth. The beauty of accidental expression is as variable as the caprice or fancy of mankind. The beauty of expression of design varies with every period of the art. The beauty which arises from the form itself is alone permanent, as founded on the uniform constitution of the human mind. Considering, therefore, the beauty of forms, as constituted by the degree and permanence of their expression, the following conclusions seem immediately to suggest themselves.

"1. That the greatest beauty which ornamental forms can receive, will be that which arises from the expression of the form itself.

"2. That the next, will be that which arises from the expression of design or skill. And

"3. That the least, will be that which arises from accidental or temporary expression.

"In all those arts, therefore, that respect the beauty of form, it ought to be the unceasing study of the artist to disengage his mind from the accidental associations of his age, as well as the common prejudices of his art; to labour to distinguish his productions by that pure and permanent expression, which may be felt in every age, and to disdain to borrow a transitory fame, by yielding to the temporary caprices of his time, or by exhibiting only the display of his own dexterity and skill."

The reader who has attentively perused this slight sketch of Mr. Alison's valuable investigations, will, we doubt not, agree with us, that he has distinctly established the true principles of architecture; and we trust that the liberal-minded artist will perceive, that the direct path to eminence in his profession is precisely marked out, and that he has no longer cause to dread being entangled in uncertainty and confusion.

Sawing Iron.—It is often forgotten by smiths that iron, when heated, may be put into a vice, and the ends may be readily split by a suitable saw. A saw fit for this purpose should be thicker at the edge than at the back, and with uniform teeth, one-twelfth of an inch apart. The saw when used must be often dipped in water, to prevent its becoming too much heated. It may be mentioned that a bar of iron, of almost any size, may be sundered, while hot, by the simple application of common brimstone.

Fire-Proof Safes.

Property to an immense amount in title-deeds, foreign securities, &c., is now incapable of insurance from fire, on account of the excessive risk such articles are exposed to. A receptacle for articles of this nature has been devised which would afford for them perfect security from conflagration, and which might be constructed at an expense so moderate as might enable private persons to adopt it,—bankers, for instance, who usually hold in trust securities of very considerable value. It has been planned from a combination of the several expedients devised, and successfully introduced, by the late Sir I. Bentham, whilst Inspector-General of Naval Works, for the protection of the royal dockyards from fire, for the conservation of gunpowder in case of fire on board ship,—and for giving light to ships' powder magazines. The proposed receptacle may be briefly described as follows:—

Where it can be constructed underground,—a chamber, of which the walls, floor, and roof, should be made perfectly water-tight, a cistern of water covering the roof. The interior of the chamber either to be fitted up with a number of cells of metal, capable of being closed water-tight, or with separate moveable water-tight cases,—the cells or cases being for the reception of the property to be secured against fire,—these cells or cases being arranged in the middle of the receptacle, so as to leave a clear space between them, the walls, and the roof.

Pipes, communicating with the interior of the receptacle, to be conveyed from the cistern, by which means, in case of danger from fire, water to be let into the receptacle itself, so as to fill it completely round and above the water-tight cells or cases. The cistern to contain a quantity of water more than sufficient to fill the interior of the receptacle; and means to be provided for replenishing the cistern in case of evaporation or other loss of water. To render the flow of water into the receptacle self-acting in case of fire, the pipes of communication to be plugged with fusible metal: thus, should a neighbouring conflagration be such as to raise the water in the cistern to a boiling heat, the plugs would melt, consequently water would enter from the cistern to the receptacle, fill it, and preserve intact the contents of the cells and cases. After the danger ceased, the water would of course be pumped out of the receptacle. The entrance would be most securely made through the roof and cistern above, by means of a cased trap-door closing water-tight, so as when not in use to be covered with water. For giving light when needful to the interior of the receptacle, safety-lamps, encompassed by a double casing of glass, filled between with water; the pipes for supplying air, and for conveying away the foul air, to be siphon-shaped, so contrived that no sparks could issue from them. Where such a receptacle could not conveniently be constructed under ground, the wall to be enclosed in an interior one at some distance from it; the interval to form a cistern filled with water

easily replenished like the cistern on the roof.

To dry and ventilate the receptacle, a ventilator, such, for instance, as that proposed by Dr. Hales a century ago, might be used; that is, a kind of wooden air-pump of very simple construction; means, at the same time, being provided to supply the place of moist air extracted by other air drawn from a chamber where it would be already dried and warmed.

As gunpowder, whether in bulk or in cartridges, was found to keep perfectly in Sir Samuel's water-tight cases, there can be no doubt but that parchments or papers might be equally well preserved in a suitable cell or case, supposing always that they were dry when inserted.—*Correspondent of the Builder.*

Manufacture of Iron in Great Britain.—In a report on this subject made to the British Association, at their last meeting, Mr. Porter stated, that in 1788 the whole quantity of pig-iron made in England and Wales, amounted to no more than 61,300 tons; of which 48,200 were made with coke of pit-coal, and 13,100 from charcoal: in the same year the amount raised in Scotland was 7,000 tons. In 1796 the quantity, owing to Watt's improvement of the steam-engine, was nearly double, being 125,079 tons. Ten years later, namely, in 1806, itwas found to have more than doubled, being—England and Wales 234,966 tons, Scotland 23,240 tons, total 258,206 tons. In 1823, this quantity had risen to 482,066 tons, and in 1830 it was further increased to 678,417 tons. Since then a great saving has been effected in the fuel required, and in Scotland the production of iron has risen from 37,500 tons in 1830 to nearly 500,000 tons in the last twelve months. In 1836 every iron-work in Great Britain was visited by M. F. Le Play, chief engineer to the Paris Board of Works, and he estimated the amount produced that year at 1,000,000 of tons. The quantity of iron made in 1840 was 1,343,400 tons; but, in consequence of the commercial depression, this fell to 1,046,428 tons in 1842, being a depreciation of 22 per cent. It is the opinion of the iron masters, that, since 1840, nearly all the increased production of iron in the kingdom has been drawn from Scotland. The make of pig iron there, for the first six months of 1845, was 260,000 tons. From the cost of production, combined, perhaps, with other causes, the amount of production in England for 1845 was only 917,500 tons, being 238,000 tons less than the production of 1840. Up to the beginning of the present century, nearly two-fifths of all the iron used in this kindom was imported from the north of Europe; but in 1806 this proportion had fallen to one-eighth, and foreign iron is now only imported for the manufacture of steel. Our exports, on the contrary, have so increased as to become an object of national importance. In 1827 we exported 92,313 tons, at the declared value of £1,215,561. In 1845 we exported 351,278 tons, at the declared value of £3,501,895. There is room for a very extended increase in the use of iron in England.

Ship Canal through the Isthmus of Suez.

It is known that the Viceroy of Egypt has, for many years cherished hopes of seeing executed a means of transit for European commerce and correspondence between the Mediterranean and the Red Sea, more efficient than the clumsy and inconvenient means at present used for the transport of the passengers and dispatches of our Indian empire between Alexandria and Suez. This project has been obstructed by causes independant of its material or mechanical difficulties, and arising altogether out of the conflicting interests and reciprocal jealousies of the great European states. It was the object of Mehemet Ali to surmount these obstacles, by inducing the several governments supposed to be interested, to join in the execution of so grand an enterprise as that which would have intersected the Isthmus of Suez, by a great high road for European commerce. In this, however, he failed. He then had recous to the more promising expedient of trying to awaken the spirit of private enterprise among the great commercial and finanical interests of Europe, and in this he seems to be at the point of success. The last dispatches from the Levant brought the intelligence that the agents of a joint company, formed of capitalists and merchants of London, Paris, and Vienna, had arrived, or were *en route* for the theatre of the projected operations. In this matter, Mr. Stephenson, the well-known engineer of the Liverpool and Manchester Railway, represents the English interests; M. Talbot, the French; and M. Negrelli, the engineer of the railway between Vienna and Trieste, the Austrian.

The purpose of the colossal project is to cut a ship canal between Suez and the ancient Pelusium, following very nearly the course of the ancient canal, traces of which exist on the Isthmus. The projected canal is to have width and depth sufficient to float a first-rate man-of-war. A port will be constructed at Suez, and another at Pelusium. From the reports which have reached us, it appears that surveys have already been made to a sufficient extent to remove all doubt as to the practicability of the project within those limits of expenditure which would secure the support of prudent capitalists. The chief doubt rested on the construction of the proposed port at Pelusium; but M. Negrelli has already made a survey and estimates sufficiently exact to leave no fears on that head.

The near prospect of the realisation of such a project has revived the idea, long since suggested, of a railway following the same route. It is not impossible, however, that both projects may be realised, and that even with advantage to each other. The works necessary for the one will be equally available for the other, and every one conversant with engineering will perceive in how many ways each, in actual operation, may aid the other. It would be a glorious spectacle to behold those wonders of art and science—the locomotive, the ship, the railway, and the canal at work upon the sands of deserts that were for centuries untrodden

save by the pilgrim and the camel. Yet such a result may be far from remote.

The company we refer to has been constituted for several months back, and has devoted its inquiries to the question between a railway and a canal. It has decided in favour of the latter. It is proposed to divide the execution of the works between the engineers of the nations above-named. The English engineer, Mr. Stephenson, is to construct the port of Suez; the Austrian engineer, M. Negrelli, is to take charge of the port of Pelusium; and the French engineers are to construct the canal.—*Indian Examiner.*

THEORY WITHOUT PRACTICE IN ARCHITECTURE.—There is a class of study essentially important to the young architect, and that is practice. He may have acquired all the principles which govern science. He may have studied monuments, learnt the rules of proportion, and made himself thoroughly acquainted with the whole sphere of art. But, unless he be also versed in the practical details, it would be dangerous to himself and fatal to his employer, if he undertook a building of any importance. He has a conscientious duty to perform: not only to design well, but to execute the work in the soundest manner and with the least cost. Young men, carried away by the enthusiasm to which the fascinating attraction of the art of drawing gives rise, find it irksome to enter into the details of construction, the cost of materials, measuring and valuation. But if an architect wishes to possess all the means, by which he may realise his conceptions, he must go through this ordeal, he must visit and study works in progress: and when he becomes better acquainted with the subject, he will find a growing interest in the pursuit. There is no moment of his life, at which the true architect ceases to study and acquire knowledge: and no source is too despicable for him to gain information. The labouring artisan has many mechanical contrivances, by which he may accomplish his task and execute his work. From him the architect, whether as a student or as the more advanced practitioner, may learn much. In fact we must not only be satisfied that a thing is done, but know how it is done; and eagerly avail ourselves of the knowledge of the workman. By not being ashamed of asking questions at any period of our career, we gain their respect and win their confidence. How many a young man is there, who leaves an office without any acquaintance with these departments of the profession! He commences business thus inadequately prepared. His very first commission involves him in inextricable difficulties. He is at the mercy of the builder, the workmen, and all employed. A sense of his ignorance in this respect preys on his mind. He resolves to devote his energies to make himself thoroughly versed in the practical details of construction, and he passes years and years devoted to this; and thus employs time, which, had he been better trained, could have been more beneficially and honourably appropriated. He had still to learn his profession.—*Professor Donaldson's Architectural Maxims.*

Sculpture.

(*Continued from page* 71.)

CONTINUING our remarks upon colossal statues, we may here direct attention to the famous group over the gate of the lions, at Mycenæ, which is doubly interesting, from the fact of its being the earliest specimen of Greek art with which we are acquainted.

It has been supposed by some that the figures represented in the above engraving are not those of lions but of wolves; but we think quite contrary. It will be seen on an inspection of the legs of the animals that they are too massive to be those of wolves, while even the very structure of the body would seem to favour our opinion.

THE GATE OF LIONS.

But, however, this may be, to quote the words of a learned writer on the subject:—"They are now to be seen placed, one at each side of a cone-shaped column, the apex of which is gone—the whole sculptured on a block of dove-coloured limestone. This block surmounts the architrave of the portal, which is also of dove-coloured limestone, *palombino*, and fills up a triangular gap in the masonry of the wall, formed by an oblique approximation of the wide courses of stone, continued from each extremity of the lintel to the apex above its centre."

It may be remarked, that the walls of Mycenæ, although they belong to what is called Cyclopean architecture, were executed at a time when improvement had commenced; for the blocks are accurately fitted to one another, and do not leave interstices, that are filled up, as at several other places, with smaller stones. Most singular is the following passage in Mr. Mure's description:—"It is not very easy to understand how there ever could have been room for the heads of the animals at all, at least for that of the one on the left side of the spectator. The upper stones of the side ma-

sonry of the triangular opening are evidently in their original position; and, between them and the abacus of the central column, it were difficult for the liveliest imagination to find a place for a head at all in proportion to such a body."

(To be continued.)

Observations on Design.

Design, in its plainest sense, may be considered as a creative faculty, acquired by copying simple forms. The study is as unlimited as nature, and not confined to any particular sphere or region. Want of means and opportunity may check the student's progress towards perfection; but whatever may be the prejudiced opinion of the world, there is no partiality in the bestowal of the endowment requisite for becoming eminent; whilst talent in the humblest grade is sometimes found equal to the most studied and refined, when combining members for the purpose of forming some great superstructure.

It is but falling back on the observations of others to state, that the greatest masters in the school of design were those whose works are marked with an astonishing degree of simplicity in construction; but it may be further noticed, that he who effects by some plain principle of science what takes in others a combination of complex forces, has made the greatest progress towards perfection. This simplicity can only be retained by keeping in view the unalterable laws of material, and making them subservient to the purpose. And in all instances where labour or solidity is wanting or thrown away, it must arise from aiming at unnecessary durability, or from ignorance of the detailed members into which every design must be subdivided.

As an example, man is the masterpiece of design in the world. The original intention is fully carried out, both as a whole and in the minutest section. It is impossible, according to our ideas of creative power, to introduce into so small a compass, composed of such fragile material, more action and force than a man is capable of exerting. The simplicity apparent in every movement is the consequence of perfect articulation; and the leverage and deflection of the members are all regulated by a general law. From the beginning he was a labourer, and toiled for his sustenance, combining within him all the strength suitable to his calling. By degrees he raised himself from the earth as a mere drudge, and, by transferring a portion of his own mechanism to metal and wood, learned to mentally direct what he before physically executed.

Our improvements in mechanical arts, our inventions, and our wonderful discoveries, are nothing more than segmental copies from ourselves, excepting that the motive power requires a complex arrangement, in consequence of the system being fragmentary; and it is very possible, since we have so far progressed in the knowledge and application of those forces, that we may still approximate to perfection, and ultimately bring the manual labour of the civilised world altogether within the range of machinery. Still, let the degree of perfection be what it may, it is nothing more than a copy forced on man by necessity, and therefore cannot take an exalted range as a section in the School of Design, notwithstanding which, we learn from our knowledge of the subject, that in order to progress with confidence, where the imagination may have its greatest license, we must not lose sight of first principles for an instant.

These fundamental axioms are learned by every person when first about to enter the field of construction; but they are not followed out subsequently. Can it be that our knowledge is so ample, that we may substitute ideas which shall safely supersede those pointed out by scholastic laws? We require ornament and convenience, which cannot always be reconciled with purity of construction; and though we quit for a moment what was established centuries ago, and confirmed in accuracy by the lapse of ages, we fancy we never wander so far as to render our designs inharmonious. Limited means suggest alterations, and it is prudent that economy should be practised either in a private or a national undertaking.

In this does the proof of ability consist. In producing perfection is true genius to be found. An ordinary architect may design a faultless specimen of construction, and carry out the same, as long as his means are not limited; but to introduce this purity of style and requisite convenience with niggardly economy, can only be achieved by the man of intrinsic judgment. As long as prejudice and chimera are the leading ideas in formations arising from the mind, we must not be surprised at any innovation forced upon us, however disproportioned or monstrous it may appear; yet must the world grieve that the architects of the Choragic monument and of the Wellington statue drew inspiration from the same source with such different results.—*Correspondent of The "Builder."*

Diamonds.

The diamond is the chief of stones, the hardest and most luminous, even phosphoric in the dark. Among the ancients the perfect crystals were alone valued. They were not aware of that property which enables modern diamond-workers to produce such brilliancy—viz., the use of its own powder as the cutting agent: many stones which, with our skill, are of enormous value, would have been rejected by them. Though said by Pliny to be so hard as to indent the hammer that strikes rather than break, in the direction of its axis of crystallisation it fractures readily. This quality is used in the first stage of manufacture. It was in the year 1476 that Louis de Berghem, of Bruges, first discovered the property of powdered diamonds and the mode of application. Roses and table diamonds were the only kinds that he produced. The most per-

fect shape for reflection or refraction of light is that which is called the brilliant, being two truncated pyramids united at their bases,—the upper bearing to the lower in height above the girdle or line of junction the proportion of five to ten, leaving the plane of truncation, or the cutlet of the lower pyramid, one-fifth the superficies of the upper, or, as for distinction it is termed, the table. The sides of the upper pyramid are covered with triangular facets: those which have their bases on the bases of the pyramid are called skill-facets; those radiating from the table are called star-facets. Those in a well-cut stone meet half-way down the sides. The lower pyramid is similarly treated,—the skill-facets being to the cutlet-facets as three to two in length. This is the best form for bringing out the brilliancy of the diamond: if the sides are too perpendicular, the light is radiated from the eye of the spectator; if too horizontal, a flatness of lustre arises, for the light passes more easily through the crystal in the direction of its poles than transversely through the laminæ; it is therefore in a thin brilliant less reflected. Experience has found that the discovery of larger diamonds bears a fixed proportion to that of smaller, so that the price is regulated accordingly,—the rule of calculation being that as the square of the weights so must be the value. So jealous are the Indians of the size of their diamonds, that when they work them they make the facets follow the form in which the stone is found, be it perfect or imperfect crystal; but rather than this small loss, they frequently are content with them unwrought. Stones of extraordinary size are claimed as the property of the prince, and transmitted as heir-looms through generations, a small dot being made in some part of the stone by each possessor. The finest collection of gems in the world is in the possesession of of the Shah of Persia, obtained by the plunder of Delhi about two centuries ago. Cardinal Mazarin, in the reign of Louis XIV., was the first that wore a brilliant. This truly scientific arrangement is therefore but of modern invention. Extraordinary value attaches to some diamonds. The largest diamond in the world is in the possession of the Great Mogul, in form and size equal to half a hen's egg, weighing about 700 carats; supposing it to be worked and fine, giving £8 as the value of a single carat stone, and applying the rule of geometrical progression, the result is enormous. The next in size is the Brazilian diamond, in the possession of the King of Portugal, weighing 250 carats. The third is an oriental diamond, bought by Catherine, Empress of Russia, for £90,000, and an annuity of £4,000. The fourth is the Pitt or Regent diamond, bought by the Duke of Orleans for £100,000, now in the crown of France. To those of merely material conceptions such values may be indications of folly; but to those who regard gems as symbols of ideas, as without doubt they have been, and even now are held, money seems but a poor parallel. The supplies of Europe are chiefly drawn from Brazil. The famed mines of Golconda are no longer worked, and but a limited quantity, in value about £100,000 per year, is still sent from Allahabad in Hindoostan. The great influx of diamonds, which followed their discovery in South America, alarmed the holders about the year 1735, lest diamonds should become as plentiful as pebble-stones. They fell greatly in value, but have since regained their worth, and have for years maintained a value rather increasing than diminishing with the growing wealth of the world.

Notices to Correspondents.

NOTICE.—All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the DECORATOR'S ASSISTANT, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** In answer to several subscribers who have addressed us on the subject, we beg to state that the two first pages of the weekly numbers of this work are intended to be cut off previous to binding. This will not make the least difference with regard to the appearance of the volume.

*** Part VII. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., and VI. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability o their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—I should be obliged to any of your correspondents who could inform me how to make and apply the enamel with which common German clock faces are coated.—Yours, &c., A REAL ADMIRER. Stepney, Dec. 11th, 1847.

W. M.—At present we have so much on hand that we cannot insert a lengthy article at a moment's notice. In about two or three weeks we will accede to your wishes by giving a full detail of what you require.

HERALD (Manchester).—The present crown of England was made for the coronation of King Charles II., and is embellished with pearls and precious stones. There is a mound of gold on the top of it, enriched with a band or fillet of gold, embellished also with precious stones. Upon the mound is a cross of gold, embellished likewise with precious stones, and three very large oval pearls, one of them being fixed on the top, and two others pendant at the ends of the cross. It is composed of four crosses *pattee*, and as many *fleur-de-lis* of gold, placed on a rim or circlet of gold, all embellished with precious stones. From these crosses arise four circular bars or arches, which meet at the top in the form of a cross. The cap within the crown is of purple velvet, lined with white taffeta and turned up with ermine.

MR. A. FAIRBROTHER, of Oxford, is thanked for his enclosure; the design shall he made use of shortly. We shall at all times be thankful for similar favours.

ERRATUM.—In answer to "A Mechanic," last week, *for* "church of St. Marylebone," *read* "church of St. Mary-le-Bow."

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from page 61.)

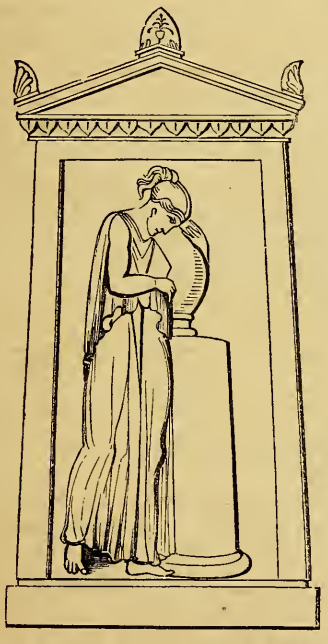
Cames, slender rods of cast lead, of which glaziers make their turned or milled lead for joining the panes or "quarrels" of glass.

Carcase (in building), a term applied fo the four walls and the roof of a house before the internal fittings have been put in.

Carver, a cutter of figures or devices in wood.

Cements (in building, &c.), substances employed for producing cohesion between different materials, descriptions of many of which will be found interspersed through the first and present volume of this work.

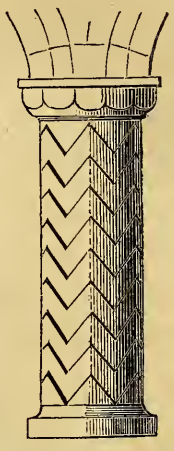
Cenotaph, an honorary tomb or monument, distinguished from other monuments in being empty, the individual it is to memorise having received interment and funeral honours in



some distant land, or having perished at sea: these latter are commonly distinguished by the figure of a ship, or the representation of a wreck at sea.

Ceruse, see White Lead.

Circular Order (in architecture), this is the name given to the style of architecture which prevailed from the sixth century till about the year 1135. The peculiarity of the style consists in the employment of semi-circular arches supported by short round columns, of which the accompanying illustration is a specimen. The entrance to the Temple Church, London, presents an excel-



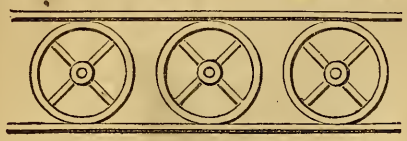
lent example of this style of architecture.

Colour (in painting), is that appearance which all bodies present to the eye on their surface. Various colouring substances are employed in order to impart agreeable effects to bodies which are not naturally pleasing to our sense of vision; these are called *paints*, and are prepared from various sources, animal, vegetable, and mineral. The proper application of colours to bodies is one of the most difficult arts that can be imagined. Displayed merely for the gratification of one sense, that of vision, they produce no direct sensation upon those appetites, either mental or corporeal, to which ordinary objects generally appeal; and, therefore, the grand aim in colouring is to create, by harmoniously blending the different hues, a feeling which, by striking suddenly and forcibly on the eye, shall enter by the ordinary channels of the intellect upon the mind, and impress, as it were, a feeling of delight and pleasure. Gaudiness in colouring can never appeal but to the vulgar intellect, and is never allowable in any production having a pretension to taste or symmetry of execution; it forms, however, a but too common subterfuge with many, who endeavour by its means to gloss over a faulty design or an error of conception. The doctrine of colours should form one of the first studies of the young artist who wishes to pave for himself a road to wealth or fame; and he can only learn it thoroughly by paying the utmost attention to natural objects, wherein he will see displayed the best examples from the hand of Nature.

Corinthian Modillion, the projection

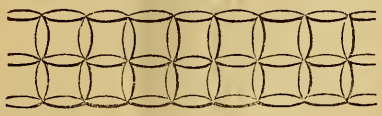
under the corona of the Corinthian capital, resembling a bracket.

Crossed Circle Moulding, used in Saxon



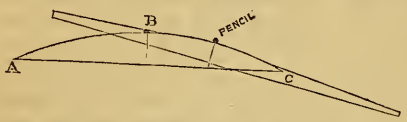
architecture.

Crossed Pointed Moulding, used in Saxon



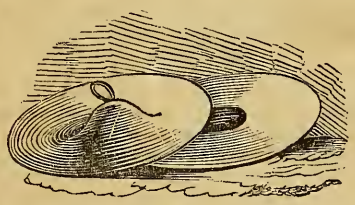
architecture.

Cyclograph, a triangular instrument employed for describing a segment of a circle when the centre is inaccessible on account of the distance, the altitude of which should be half the altitude of the segment, and in length



equal to the segment, or the whole height and twice the length. Three pins in the former case being placed in the points A B C, and two in the latter, namely A C, a pencil being held at the apex, and the cyclograph slided along, describes the segment A B C.

Cymbals, very ancient musical instruments formed of brass, from which a sound is pro-



duced by striking one smartly against the other. Representations of cymbals are of frequent occurrence on ancient sculptures.

Cypress, a description of wood much prized from its solidity and heaviness, as well as from the property it possesses of resisting decay and the attack of insects. It has a peculiar aromatic smell.

(To be continued.)

Oakum Picker.—The *Kennebec Journal* (America) says, "A machine has been constructed for picking oakum. It will pick 50lbs. in 30 minutes, and can be worked by hand, horse, water, or steam-power." The quantity, which can be picked by the old hand process, is not above 70 or 80lbs. per day.

Review.

A Guide to the proper Regulation of Buildings in Towns. By Professor Hosking.—London: *Murray*, Albemarle-street.

The construction of edifices is a subject so closely connected with the sanitary measures which *ought* to be—pity it is we cannot say *are*—adopted in all large towns, that a reformation in the one respect is sure to bring about one in the other. A house if built badly becomes a standing irreparable nuisance during the course of a century, perhaps two, or even more, according to the stability of its construction, and the quality of the materials employed;—it behoves us, then, ere we commence that which may perchance become a fruitful source of disease in our own and after generations, to look about us, and inquire of ourselves whether that which we are going to do is right or wrong; but the attention required for this is so seldom bestowed, that we have but little hope of improvement until a Parliamentary enactment shall have placed a penalty over the heads both of the architect and builder. The suburbs of all large towns are rapidly becoming populated, and we see edifices of all descriptions daily rising up around us; these, for the most part, are, like the pedlar's razors, "made to be sold," that is, composed in the worst manner, of bad bricks, piled on an unstable foundation, and plastered over with stucco made to imitate stonework. This method of proceeding is pecuniarily and physically injurious to the inhabitants: the frequent calls made upon their purses for repairs, and the various causes of illness continually floating in an atmosphere surrounded by damp walls, together with the sickly odour of half-baked bricks, &c., all conspire as much to empty the pockets of money as they empty health from the bodies of the unfortunate occupiers.

On a subject so vitally important then, to all classes of the community as the proper construction of our homes, Professor Hosking has produced an able and interesting treatise. The Professor's name is that of a man well known among the architectural and building pro-

fessions; but however great his reputation may be, this work is destined, we may safely predict, to add much more to it.

We make one extract, as a specimen of the Professor's style:—

With regard to brick and stone—"One important principle which ought to be always had in view in the employment of these materials in ordinary buildings is for the most part wholly lost sight of, if indeed it be at all recognised in the modern practice of building. Brick or stone, or brick and stone together, with mortar as a setting material—not only as a cement for the purpose of sticking the materials together, but as a means of rendering excessive labour upon the beds and joints of stones unnecessary, and to make up for the casual unevenness of the beds of bricks, and to adapt them to the various forms required to be produced—being capable of producing any and almost every kind of structural erection required in building, without permanent aid from any other materials, are best employed when they are employed in such a manner as to be free from dependence upon other and less trustworthy materials. The most perfect erections as buildings are those in the composition of which this principle has been understood and applied, and in the execution of which it has been fairly practised. To save in the quality or quantity, or in both, of materials, and to economise labour, or to satisfy the judgment of ignorant constructors, brick and stone walls are too commonly made to depend wholly or in great part upon timber in bond and in plates; and as timber takes its place for such purposes most frequently in situations where its bad tendencies are most mischievous, and in such manner as to bring its objectionable qualities into operation almost of necessity, the brick and stone walls of most modern erected buildings, such as houses, in our English towns, are rendered highly inflammable, and are much exposed to early decay, and liable thereby to become dangerous, even if they escape becoming so from access of fire to the timber. If adventitious aid be given to brick or stone walls by foreign materials, the materials ought to be at the least harmless, and the aid superfluous. Iron in bulk is a most improper substance to incorporate with walls, because of its great susceptibility of heat; but iron used in thin laminæ, as hoop-iron laid in walls in the bed-joints of the brick or stone, cannot be productive of any bad consequences to the structure, whilst it affords the means of tying together walls which, because of recesses and voids, whether for doors and windows, or as flues, may be slighter or less solid than they ought to be.

"As bricks are commonly made of the same form, and come to the hands of the builder practically of the same size; and as bricks, even where stone is principally used, are requisite, if not essential, for many of the purposes of dwelling-houses and such like buildings, the thicknesses of walls are conveniently determined to be as they can be produced in brickwork, that is to say, of so many bricks or half-bricks. Practically, too, brick walls take a middle place among walls of brick and stone together, and walls wholly of stone. Some kinds of stone are harder and more durable than bricks are commonly produced, whilst some kinds are softer and less adapted to withstand the action of the weather than bricks of average quality are found to be; but bricks come to the hands of the workman regular and unvarying in form, and that form the best adapted for the arrangement in the construction of a wall which, under the designation of bond, gives such a degree of consistency to the structure that a weight placed upon the top of a well-bonded wall in any place is carried by the wall in every part throughout its whole thickness, and throughout a greater or less proportion of the length, according to the height of the wall, and so in degree as to a weight imposed upon the wall at any intermediate level.

"Bond in brickwork is most conveniently and most effectively formed and maintained by disposing the bricks in their courses either endwise and lengthwise (technically, header and stretcher), alternately brick and brick, or course and course; that is to say, that the bricks in every course should be laid alternate header and stretcher, or that the courses should consist of all headers and all stretchers alternately. The former arrangement—alternate header and stretcher in the same and in every course—is known in this country as Flemish bond; and the latter — alternate courses of header and stretcher—is distinguished by the term English bond. Neat work in face can be produced more easily with Flemish bond, but English bond has the reputation of being the best bond structurally.*

"The arrangement of alternate header and stretcher in the same course is that which most prevails in building walls with stone; or rather, the bonding of stone walls is best effected by that kind of arrangement, whilst, indeed, alternate courses of headers and stretchers in a stone wall would be both unsightly and absurd."

"* Why the two arrangements described above should be distinguished by the names they bear is a matter of uncertainty; at least, it is unknown to the author, who supposed, in common with most other people with whom he had conversed upon the subject, that alternate header and stretcher in the same course was the practice in Flanders, and generally in the neighbouring countries on the continent; whilst the term English bond seemed to imply that the arrangement which bears that designation is peculiar to England. A visit made a few years ago to the countries where Flemish bond ought most to abound, if the name be properly applied, enabled the author to observe what had never, to his knowledge, been remarked by any person who had published his remarks, and what was quite unknown to every one to whom he has stated, since his return, what he had observed. At Rotterdam and at the Hague, at Antwerp, at Brussels and at Liege, at Cologne, at Mayence, and at Frankfort, and again throughout the north-eastern parts of France, brick walls are built according to the arrangement distinguished in England as English bond; and Flemish bond is unknown—at least no single example of it fell under the author's observation in any of the towns and countries indicated, although his attention was called to the subject by the quay walls at Rotterdam before he set foot on shore."

A DESIGN FOR A CENTRE-PIECE FOR A FRAME—LOUIS FOURTEENTH STYLE.

Architecture.

(*Continued from page* 65.)

THE first subject which now claims our attention is that *of columns and their measures*. The columns of all the orders are constructed upon nearly the same principles, and are all divided into three primary parts or divisions, namely, the *base*, the *shaft*, and the *capital*, excepting the Doric order, which has no base. The lowest or thickest part of the shaft is used by architects as the universal scale or standard whence all the measures which regulate and determine heights and projections are taken; and this scale or standard must be understood before any architectural design can be commenced.

The universal architectural scale *is* and is *called* a diameter, being the diameter of the lowest or largest part of the column; and, unlike the foot, inch, or yard, is as various as are the diameters of the several columns. The diameter, of course, implies the chord of the circle, which forms the bottom of the column. Half of this diameter, or the length of the radius which forms the circle, is called a *module*, and is used as well as the *diameter* as a primary standard of mensuration by some writers upon architecture. These measures of length are subdivided as follows:—

Diameter	60 parts
Module	30 „

each part being the same in length, and denominated a *minute*.

Both mensurations are the same, only under different denominations; as, for instance, one author says a column, which always includes the base, shaft, and capital, is six diameters twelve minutes high, while another would say of the same column and its admeasurements that it is twelve modules and twelve minutes, both meaning the self-same admeasurements.

The column being the principal figure, it is essentially necessary that it be perfect in its proportions, according to the rules handed down to us by the ancients, which teach us that the height of the column should be measured by its diameter without a remainder, according to the different proportions of each order, of which, as we have before remarked, there are five—none exceeding ten nor less than seven diameters in height. Those of eight and ten are accounted perfect, the rest are inferior. The proportions of the five orders are as follow, including base and capital:—

Name.	Height.
Tuscan	7 diameters.
Doric	8 „
Ionic	9 „
Corinthian	10 „
Roman, or Composite ..	10 „

Of Entablatures.—The entablature is the

horizontal part of an order that is supported by the column, and consists of the *cornice*, *frieze*, and *architrave*, which differ essentially in all the orders. The cornice forms the upper division, and it has been well remarked that "there is as great a characteristic difference between cornices of the several orders, as between the capitals of the columns; and in a good style of art they never encroach upon each other."

The Corinthian cornice is richest and loftiest in proportion—the fullest of members and enrichments of all the orders. It is known by its graceful proportions, its modillions, dentels, and sculptured members.

The Ionic cornice is of graver proportions, has no modillions, and very seldom, in the best examples, dentals, which had better always be left to the rich and gay Corinthian. Harmony of proportion, beauty of profile, particularly in the cymatium; breadth of parts, especially in the corona, are the leading features which characterise this order.

The Doric cornice is lower in its proportions than either of the others; has a greater comparative projection, and is known by the masculine character of its cymatium, which is always, in the purest examples, a beautiful echinus; by its mutules and drops, one of which is over every triglyph and metope of the frieze.

The frieze forms the middle compartment or division of the entablature. The frieze is the best situation in an entablature for sculptures and inscriptions, and many of the finest of the ancient temples have had their friezes superbly decorated. The splendid metopes of the Elgin marbles were ornaments of the frieze of the Parthenon, and the Phigaleian marbles of the Temple of Apollo Epicureios, at Phiguleia. The frieze of the Temple of Jupiter Olympius, at Elis, bore sculptural representations of the chariot-race of Pelops and Oenomaüs. Bucklers of gold, which were part of the spoil after the battle of Marathon, were suspended, according to Pausanias, in the frieze of the Temple of Apollo, at Delphos, which gave rise to sculptural imitations of them in many metopes of the Doric frieze. Among the most celebrated friezes of modern times, that of the Royal Exchange at London deserves at least a passing notice.

The architrave is the chief or principal beam in a building, lying horizontally on the summit of the column, and forming the sustaining portion of the entablature. The form and number of the mouldings, faces, and members of which an architrave is composed, varies according to the character of the order to which it is to be applied. In the Tuscan order it is a plain surface, surmounted by a fillet; in the Doric order it has sometimes two faces; in the Ionic and Corinthian it has sometimes two, and at others three faces; and in the Composite always three.

Having set forth a rule for the proportions of columns, we must now state that the entablatures must bear a proportion to them in each order. On this point Palladio has given a rule which cannot be subjected to any considerable alteration without the just proportions of the columns be altered, and, consequently, spoiled. He makes the entablatures of the Tuscan and Doric to be to their columns one to four; and the Ionic, Corinthian, and Composite, as one to five. The proportions of the entablature in each order is explained as follows:—

Tuscan.—One and three-fourths of the diameter, which is one-fourth of seven diameters.

Doric.—Two diameters, which is one-fourth of eight diameters.

Ionic.—One and four-fifths of the diameter, which is one-fifth of nine diameters.

Corinthian.—Two diameters, which is one-fifth of ten diameters.

Composite.—The same as the preceding.

Of Pedestals.—The pedestal is a solid body of a round or square form, serving to support the column, and is divided into three parts, namely, the *base*, the *die*, and the *cornice*. No particular proportions can be laid down for the pedestal, but it is usual to allow it one-fourth or one-third of the height of the column; including the entablature; and this being divided into nine parts, two are for the base, one for the cornice, and six for the die, which latter is of similar dimensions with the plinth of the column. Pedestals vary both in their shape and ornaments, according to the order of architecture which surmounts them.

(To be continued.)

Mensuration of Solids.

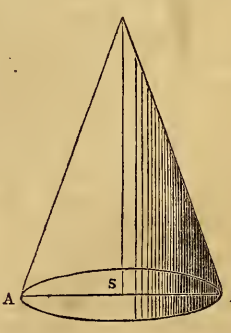
(*Continued from page* 53.)

PROBLEM VIII.

To find the solidity of a cone or pyramid.

Multiply the area of the base by the perpendicular height of the cone or pyramid, and one-third of the product will be the solidity.

Example 1.—Find the solidity of the cone



A B C, the diameter A B of whose base is 20 feet, and the altitude C S 25 feet.

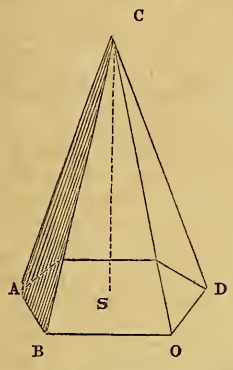
.7854 = area of circle to diam. 1.
400

314.16 = area of base.
25

157080	20
62832	20
3) 7854.00	400

2618 cubic feet = solidity required.

Example 2.—Determine the solid content of the hexagonal pyramid A B O D C, one of the



equal sides of its base being 40 inches, and the perpendicular height c s being 80 inches.

2.598 = area of a regular hexagon
1600 whose side is 1.*

4156.9218	40
80	40
3) 332553.728	1600

110851.242 cubic in. = solidity req.

(To be continued.)

Amianthus Cloth, or Incombustible Cloth, is made as follows:—Expose amianthus to steam, separate the fibres with the hand, spin and weave it along with one-third the quantity of flax, or cotton; and afterwards throw it into the fire to burn the cotton away. The cloth will be found well formed, and uninjured by the fire. It has been used as an enveloping dress for those who have to enter burning houses, or to inclose substances which are to be burnt, and yet the ashes of them to be retained.

Electric Telegraph in the United States.—The following is a table of the electric wires finished, in progress, and contemplated, as far as is known:—Finished and working, 3,047; in progress, 2,812; contemplated, 2,000=7,859. As many of these have two wires, the length of wire may be safely estimated as exceeding 11,000 miles.—*New York Herald.*

* See table to the problem for finding the area of a regular polygon, page 163, vol. i.

Photography on Paper.*

Since the discovery of Daguerre, numerous attempts have been made, with greater or less success, to obtain on paper those images which Daguerre's process produces only on metallic plates. From its porous nature, paper thoroughly imbibes the chemical preparations used in the photographic process, and offers, accordingly, this great advantage over metallic plates, that, whilst the images formed on the latter are only superficial, and liable to be wiped or brushed off by contact with other bodies, those on paper are perfectly fixed, and admit of reproduction to any extent.

Daguerre and others, have recommended various processes for photography on paper; but the results are either uncertain or the processes difficult of execution

The object of M. Guillot Saguez's paper is to examine the chemical phenomena in which the real modifications of the process, as applied to paper, consist.

M. Guillot Saguez's theoretical views are by no means merely speculative, but are the results of close and attentive observations made during the last three years. Before describing the mode of preparing the papers, it is necessary to mention certain conditions indispensable to ensure a successful result. In the first place, all the substances employed must be of the greatest purity. The gallic acid especially, which, on account of its scanty solubility in water, we are almost compelled to use at a lower degree of concentration than could be wished, must be perfectly free from admixture of tannic acid; the nitrate of silver, the hyposulphite of soda, and the iodide of potassium, must, in like manner, be free from admixture of foreign substances. The quality of the object-glass is also of considerable importance.

Preparation of the Negative Paper.—Take very smooth and fine letter-paper, of perfectly equal textures throughout, and sufficiently strong to resist the action of a water-bath for twelve hours without tearing. The paper must be perfectly white, and at all events rather inclined to yellow than to blue. Too much stress cannot be laid upon the fineness of the paper, experience having shown that, *cæteris paribus*, images are formed the more speedily the finer the paper; other advantages of fine paper are, that it absorbs water more readily and thoroughly, and becomes transparent in less time than the courser sorts.

No. 1.—*Negative Paper Solution*:—

Iodide of potassium. . .	5 parts
Distilled water.	120 parts.

Take a piece of paper about an inch longer than the unpolished glass of the camera, dip it for one minute into the above solution, and suspend it subsequently for twelve hours in the air by fastening two of its corners to a line. It will speedily acquire a rose tint, which will

* From a paper lately read before the French Academy of Sciences, by M. Guillot Saguez, of Paris.

deepen considerably in the course of a few days, and turn finally violet, when it may be considered ready for solution No. 2. The iodide of potassium with which the paper has been impregnated is here unquestionably decomposed by the action of the oxygen of the air, hydriodic acid being liberated. The process need not be conducted in a darkened room, and the paper may be prepared in any quantity long before required for use, provided always it be kept perfectly free from moisture.

When it is wished to take a photographic image, spread over the surface of a glass plate, kept especially for the purpose, a teaspoonful of the following preparation :—

No. 2.

Nitrate of silver	5 parts
Acetic acid	10 parts
Distilled water.....	60 parts.

And, seizing the iodised paper gently by two of the corners, lay it even on the glass, taking care to blow on the back of the paper to remove all the air bubbles between the paper and the glass. After a few seconds the paper acquires a marbled appearance with white spots, and after a short time the whole surface assumes a white tint.

The surface of the paper in immediate contact with the solution has now become very sensible to the action of light, and can be placed in the camera obscura to receive the photographic impression. This operation is to be conducted in a room from which daylight has been most carefully excluded.

Before proceeding further we will here first briefly examine the chemical changes suffered by the paper in the second process. The iodised paper, upon coming in contact with the solution of nitrate of silver (No. 2), receives a solid coating of white iodide of silver, excessively liable to decomposition by the action of light; in this operation a change of bases has taken place; the nitric acid has left the silver and united with the potassium, forming a nitrate of potass soluble in water, and which plays no part in the photographic process; and the iodine has combined with the silver, to form an iodide, or rather a sub-iodide, of silver. It is deemed preferable to call the compound formed a sub-iodide, since, though in all other respects identical with the common iodide, it yet comports itself differently to the light.

It is of the highest importance that the respective proportions of the two substances employed should be exactly as above prescribed; if they are used in equal proportions the compound formed will be insensible to the action of light. This fact of the difference between the respective photographic properties of the iodide and sub-iodide of silver has been ascertained by a series of comparative experiments. Another fact which will serve to corroborate our assertion that the operation will not succeed if the iodine be employed in too large a proportion to the silver, is, that the precipitate which forms upon the addition of a few drops of solution of nitrate of silver to a solution of iodide of potassium will be redissolved by heat upon addition of iodide of potassium in excess.

Formation of the Negative Picture.—The paper is now to be placed between two sheets of white paper, well soaked in water, to ensure its perfect adhesion to the glass of the camera obscura, upon which it is then placed evenly and carefully, the air bubbles that might get between it and the surface of the glass being expelled by blowing on the surface of the paper. The time during which the paper should remain in the camera varies according to the time of day, the position of the model, the quality of the object-glass (whether short or long focus), &c., but, *cæteris paribus*, to take a picture in the shade requires an exposure of from 30 to 45 seconds' duration; practice, however, will here prove the best guide. The frame, closed again and covered with a piece of dark cloth, is then to be taken back into the room where the paper has been prepared. Spread about a teaspoonful of a mixture of equal parts of a saturated solution of gallic acid and a concentrated solution of nitrate of silver carefully and evenly over the surface of a perfectly clean glass plate, kept for the purpose, and place the paper carefully on it, with the side that has been exposed to the light turned to the glass; a transparent picture will speedily make its appearance. The paper is then to be taken off the glass and kept suspended from a line until the blackened parts have acquired the requisite degree of intensity. If the operation has been properly performed, four or five minutes will suffice to give a perfect negative picture; the paper is then to be kept three or four hours in a basin of very clear water, which must be renewed at first four or five times per hour, and afterwards, at least, once an hour. All these operations should be conducted in a darkened room. The effect produced by the action of light on the surface of paper imbued with the sub-iodide of silver arises from the light separating the iodine from the silver, and liberating the oxide of silver, and that in particles of such minuteness that the finest gradations of tint can be obtained in the positive picture to be subsequently produced.

It will now be readily conceived why, in acting with the nitrate of silver, the picture formed should be negative; the emission of the rays of light from the model, proceeding in the proportion of the refrangibility of the colours composing them, tends to separate the oxide of silver from the sub-iodide, which latter substance is naturally black, and rendered still more so by its combination with the gallic acid. The acetic acid, which is present to some extent in the solution, has for its object to make the saline solution penetrate more readily into the very substance of the paper, and thus to aid and accelerate the photographic process. In fact, experience has proved that, *cæteris paribus*, the less the proportion of acetic acid, the less rapid is the action of the light. As the paper is not allowed to remain long enough in the camera to develop the picture, the latter is subsequently made apparent by the contact of the gallic acid with the oxide of silver liberated, and which instantaneously

forms with the acid a black gallate of silver, insoluble in water and insensible to the action of light. The subsequent washings have for their object to dissolve and wash out the salts, and to remove from the white part of the paper the sub-iodide of silver, which would otherwise turn black upon exposure to the light. The negative picture or type is then finally taken out of the water, and dried by placing it between folds of blotting-paper; when dry it is to be immersed for three or four minutes in a solution of bromide of potassiuum.

No. 3.

Bromide of potassium	5 parts
Distilled water.....	270 parts.

This seizes upon the excess of silver and forms with it bromide of silver, which may then be readily removed by repeated washings.

The negative picture is thus fixed, and may now serve as a type for as many positive pictures as we wish. Iodide of potassium, cyanide of potassium, and hyposulphite of soda act in the same way as the bromide of potassium, but, having a more powerful action, these salts are likely to attack the black parts, a result which it is desirable to avoid. On this account it is also better to apply the bromide only for a very short time, for experience has shown that if the dipping be too protracted the negative picture is entirely effaced.

(To be concluded in our next.)

Progress of Science.—At the annual *soiree* of the Leeds Mechanics' Institution, Professor Johnstone, of Durham University, in introducing the subject which he had been requested to bring under consideration—"Chemistry and the fine arts applied to the improvement of manufactures"—said, iron had been made by Babbage to do what the mind of man scarcely could do; at least, his invention worked out calculations which the minds of a very few men were able to follow. New dominion had been given to man over dead matter, and not merely over iron, but over almost every other kind of matter. As an instance, it might be observed, that a few years ago a philosopher at Copenhagen remarked that the influence of the galvanic stream turned the magnetic needle. It was thought to be a mere matter of curiosity at the time, but the following up of that idea had resulted in the electric telegraph, a machine which conveyed thoughts like lightning, and would enable them to converse with their friends at Kamschatka almost as speedily as with their friends at the other end of the room. The learned professor then rapidly glanced at several other modern discoveries of science, especially those arising out of the distillation of coal, which not only yielded gas, but naptha and ammonia, some of which had not only led to new applications of Indian-rubber and the manufacture of asphalte, but to the discovery of gutta percha, an article which possessed peculiar properties of its own, and which was likely to beat the tanner out of the market, as it had begun to take the place of leather on the soles of our feet.

Lambeth Palace Iron Bridge.

DESIGNED BY THOMAS MOTLEY, C.E., BRISTOL.

We extract the following description from some remarks which accompany a beautiful lithographic engraving of the proposed bridge :*—It is proposed to be constructed on a plan suggested by Mr. T. Motley, in 1826—a large model of which was made the following year, with a view of getting a bridge of the kind adopted over the Thames, from Charing-cross to King's-arms-stairs, with an arcade of shops on the upper part, and a carriage and footway under—which was inspected, and highly approved of, by many of the most eminent mathematicians, noblemen, &c.; and was deemed by that eminent engineer, Tredgold, as the first of the kind ever projected to be composed entirely of iron on the principle—viz.: the bow and string—with a corresponding horizontal line on the crown of the arch, connected with the lower tie-line by vertical bars, at suitable distances, through the arch—thereby constituting, as Dr. Lardner described it, a skeleton beam, by confining the arch between two parallel horizontal lines, so as to afford the convenience of a road, or arcade, above, and a carriage and footway below: on which plan a foot bridge was subsequently constructed by Mr. Motley, for the directors of the Newcastle and Carlisle Railway, at Newcastle; and the principle has been adopted for a bridge at Newcastle, over the river Tyne, and is now being erected under the direction of Robert Stephenson, Esq., M.P., in several spans, of 120 feet each, for conveying the railway on the top, with a carriage and footway under—one of which spans has been tested with a load of 600 tons!—thus proving the soundness and safety of the principle—which principle is adopted in constructing beams (entirely of wrought-iron), at Paris, for supporting the lofty and ponderous fronts of buildings, instead of cast-iron girders. The design exhibits seven arches, of 100 feet clear span each, which, including the piers, will make the bridge upwards of 800 feet long. It is proposed to construct each span with 8, or more, ribs, or arches; and to make the floor upwards of 70 feet wide—so as to allow, if thought desirable, of two carriage-ways, about 16 feet each, and two footways of from 8 to 10 feet wide, and two rows of shops, and a room over, about 12 feet square, and a similar room over the footway, of 8 or 10 feet by 12 feet. The whole of the frame work and frontage to be constructed with wrought and cast-iron, with a substantial timber or iron floor; and, if advisable, a promenade, of about 18 or 20 feet wide, may be made on the top of the structure, with a footway, to connect them, over each span.

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* London: published at the *Mining Journal* office, Fleet-street.

Chinese Bricks.—As the Chinese are excellent potters, it is not to be wondered at that they are also excellent brick makers. This is sufficiently apparent not only in respect to the perfect forms and durability of their common building bricks and tiles, but in the great variety of forms and different sizes of their bricks. For common wall-work in courses, their bricks in dimensions resemble those of Europe; but, in so warm a climate as that of the south of China, many ornamental lozenged openings are required in the walls of houses, to promote ventilation; and many ornamental projections, either vertical, horizontal, or curvilinear, are required by the national taste. To execute these features, the builder never need cut a brick; the proper forms are furnished by the brickmaker according to orders issued from the architect. Hence there are moulded headers for plinths, beveled stretchers for sills, the same for lintels, &c. For mullions they have bricks of various sizes and designs, which fit as parts of the general structure with great exactness, whether as referable to ornamental effect, or security of the building. Economy in all things is the ruling passion of the Chinese; and to this may be attributed the pains they bestow in preserving every particle of their brick-earth; and saving the time of the builder, which would be lost in reducing his bricks to the required form; and which, it seems, they consider more than compensates for the expense of the moulds.

Lamp-black.—Lamp-black is prepared principally by the combustion of refuse and residuary rosin left by the distillation of turpentine. It is burnt in a furnace, so constructed that the dense smoke arising from it may pass into chambers hung with old sacking, where the soot is deposited, and, from time to time, swept off, and sold without any further preparation. When lamp-black has been heated red-hot, it may be regarded as a very pure form of charcoal, for it burns entirely away, and leaves no residuary ash: when, however, the products of its combustion are closely examined, traces of water are always found, and, therefore, probably a small quantity of hydrogen is chemically combined with charcoal. A substance analogous to lamp-black, may be formed by passing the vapour of turpentine, alcohol, or several of the oils, through tubes heated to a bright red heat; at that high temperature, they are more or less perfectly decomposed, and a quantity of impalpable charcoal collects in the tubes, in which, however, as in lamp-black, traces of hydrogen may be detected. Lamp-black has been principally used in the manufacture of printers' ink; but Messrs. Martin and Grafton have taken out a patent for making this black from common coal tar by a very ingenious process.—*Professor Holmes.*

Forging and Welding.—If a piece of iron is filed while hot, the filings appear to increase in temperature as they fall to the ground. I am inclined to think that such is the fact, for if a piece of iron be taken welding hot from a forge fire, and subjected to a blast from the mouth, or common house bellows, it may be kept hot, or even wasted by the action of the blast; I have been informed, that nail-makers have a small pair of bellows fixed in front of their anvil, to blow on the iron while working it, to keep it hot. Perhaps some of your readers may be able to tell who first put this plan in practice? It may be worth considering whether nail-making is the only branch of art it can be applied to. As a practical smith, I have an idea that its use might be very greatly extended; for example, the welding of railway-tyres, forging-axles, making cranks, shafts, anchors, &c. At all events, a trial on some heavy work might be made by any one having the opportunity, at a very little, or no expense.—*Correspondent of "Mechanics' Magazine."*

Notices to Correspondents.

Notice.—All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the Decorator's Assistant, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** In answer to several subscribers who have addressed us on the subject, we beg to state that the two first pages of the weekly numbers of this work are intended to be cut off previous to binding. This will not make the least difference with regard to the appearance of the volume.

*** Part VII. of the Decorator's Assistant, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., and VI. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without encroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—I should be exceedingly obliged if any of your mechanical readers would supply some information respecting jockey weighing machines—the mode of attaining the power and proper balance weights.—I am, Sir, yours, Lignarium. Northampton, Dec. 18th, 1847.

M. T. (Glasgow).—The monument erected in the Place Vendome, Paris, in order to commemorate the successful result of Bonaparte's arms in the German campaign of 1805, bears the following inscription, and not the one which you have inquired about:—"This monument was erected in honour to the Grand Army, by Napoleon the Great. Commenced xxvth August, 1806; finished, xvth August, 1810, under the direction of D. V. Denon. MM. J. B. Lepere and L. Goudoin, architects."

Lignarium (Northampton).—We shall be happy to receive examples of the description you mention as early as convenient.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(Continued from page 61.)

Cherubim (in painting and sculpture), a species of ornament generally composed of an

infant's head with two wings affixed thereto. They are employed chiefly to ornament the corners of slabs, keystones of arches, &c.

Cymatium (in architecture, the upper moulding of a cornice, of which there are two descriptions, the first being called *cyma recta*

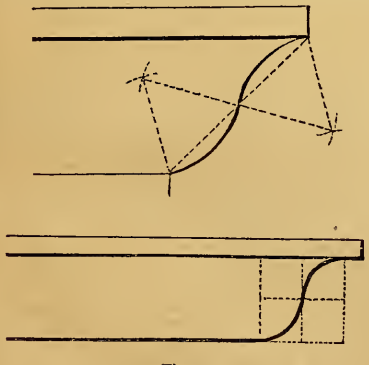


Fig. 1.

(Fig. 1) from the circumstance of its being composed of a concave and convex moulding; and the second (Fig. 2) *cyma reversa* (also

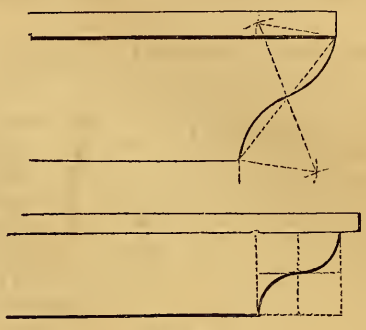
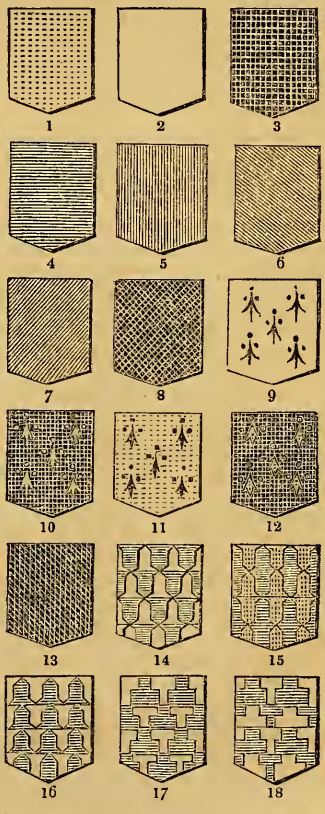


Fig. 2.

called *cyma talon* or *ogee*) from the circumstance of the above order being reversed.

Colours in Heraldry.—



1. Or (or gold).
2. Argent (or silver).
3. Sable (or black).
4. Azure (or blue).
5. Gules (or red).
6. Vert (or green).
7. Purpure (or purple)
8. Sanguine.
9. Ermine.
10. Ermines.
11. Erminois.
12. Pean.
13. Tenné.
14. Vair.
15. Counter-Vair.
16. Vair-en-point.
17. Potent.
18. P. C. Potent.

(To be continued.)

Book and Periodical Illustrators.

Many of our readers have, no doubt, at various times, admired the tasteful manner in which the books and periodicals of the present day are "got up" with regard to the illustrations usually accompanying the letter-press, and we think that a few words on the subject will not be deemed out of place in the pages of a Magazine having for its object not merely the dissemination of a knowledge of the Fine Arts themselves, but also a knowledge of the different styles and qualities of their best professors.

We have just laid down copies both of "Punch" and the "Comic Almanack," and must confess that we have some serious qualms as to whether George Cruikshank or John Leech should take precedence in a sketch which we design to include all the celebrated "periodical" artists in the order in which they stand in public opinion. We might well say, in the words of the hero of Gay's "Beggars' Opera," a little altered—

> How happy could we be with either,
> Were t'other designer away;
> But while they both please us together,
> How shall we the compliment pay?

But George Cruickshank has the precedence of time, however; and if he has met with a successful rival in "good works," we will, at least, give him the honour of age, and allow him that position which he has so long enjoyed amongst the delineators of men and manners—called, from their faithful portrayal of real life, "comic artists" or "caricaturists."

The works of George Cruikshank are well known to every one, and every one who has seen them has acknowledged them to be the efforts of a great artist, who has somehow or the other possessed himself of the key of Nature's storehouse of mirth and merriment. His characters are all those of the world we live in, and partake no more of caricature than can be ascribed to them by those who have felt their satire—a class which, we blush to own, is as numerous as the various creations of Cruikshank's fruitful pencil.

Cruikshank has often been described as Hogarth's successor; true, he has taken up the pencil of that great master, but, unlike most successors, he is no copyist; originality forms the prevailing feature of all his works, and, what is more, he never copies himself—a defect which even Hogarth himself was not entirely free from. There are few subjects which this artist has not chosen for the display of his peculiar talent, and, without the least attempt at exaggeration, he has produced food both for laughter and contemplation; his works are all mirrors—or rather, Daguerreotypes—reflecting images which philosophers might not disdain to moralise upon. Where, we would ask, could a more perfect picture of men subjected to all the various passions and feelings of our human nature be found than in he illustrations to Boz's "Oliver Twist?" t

The child, for the first time introduced into the company of morally and physically d? graded beings, standing half amazed, half frightened, at the scene he perceives before him, forms a striking contrast to the figure of the wretched Jew, who, on the morning of his execution, sits with his chin supported by his hands in the condemned cell—every lineament of his face bespeaking not remorse but a sort of sullen fear—not a hope that life might still be spared him that he might retrace his steps to the path of virtue, which he had so long forsaken, even, indeed, if he had ever entered it, but a longing for life, that he might still remain the same hardened incorrigible wretch that he had been before. In satire, too, what laboured production of the brain of genius ever concocted one half so touching, half so true—for the artist depicted the thoughts, if not the words, of thousands of our fellow-beings—as the plate representing Oliver in the parish workhouse asking the cook for more food? The innocent yet earnest look of the boy—the surprised and bewildered appearance of the guardian of the soup-kettle—and the astonished gaze of Oliver's companions, astounded at his temerity in asking for enough to fill his belly, form a picture which we could have wished had not been too real.

But George Cruikshank is not without his faults—his style is deficient in many of those minor qualities which most generally lay an artist open to censorious criticism—at least with those who imagine the powers of an artist should be shown more in the execution than in the idea, and, unhappily, there are too many such.

In most of George Cruikshank's pictures the calve of the human leg assumes an uniform appearance with the ankle, and the waist is always placed too high up in the body; but this latter circumstance is easily to be accounted for: thirty years ago, George Cruikshank had won popularity, and at that period the fashionable costume amongst a class which George loved to depict, namely, the dandies, was so formed as to make the bust as full as possible, and to render the body itself very like a dice-box in shape; that fashion has, however, been now superseded in all save the eccentric fancy of this illustrious artist; and, as a bit of advice, we would urgently intreat of him to spare us a little in the eyes of posterity, for, however great may be our vices, we are not straight-laced in body as well as in mind.

Amongst the later productions of George Cruikshank, we may particularly advert to a series of cartoons representing the progress of a drunkard from a happy home to the madhouse, having tripped over the gallows in his journey of vice. This work is a national benefaction, and a legacy to succeeding ages. It shows us what we *might* become, and furnishes the foolish infatuated wretch who makes himself the slave of the "Bottle" with a thermometer of his existence, pointing out to him the points at which he may be reclaimable, and, if he heeds not the warning, with his inevitable doom.

The ink with which the above was written was scarcely dry ere we received the pleasing

intelligence that a subscription for a testimonial to George Cruikshank has been set on foot in Liverpool, and that the movement is spreading to the metropolis. "If," says our contemporary, the *Athenæum*, "its extension shall be measured by that of the artist's popularity, or by the amount of his long contribution to the amusement of his age, his friends will have reason to be well satisfied with the result of their project in his behalf."

(To be continued.)

Mensuration of Solids.

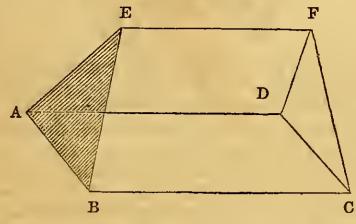
(*Continued from page* 77.)

PROBLEM IX.

To find the solidity of a wedge.

Add twice the length of the base to the length of the edge; then, this sum, the height of the wedge, and the breadth of the base, being multiplied together, will give a certain product, one-sixth whereof is the solidity required.

Example.—How many solid feet are there in a wedge whose base is 5 ft. 4 in. long and 9 in. broad, the length of the edge being 3 ft. 6 in., and the perpendicular height 2 ft. 4 in.?



Here 64 in. = B C, the length of the base.
9 in. = A B, breadth.
42 in. = E F, length.
28 in. = perpendic. height of wedge.*

Therefore,

64
2
—
128
42
—
170
28
—
1360
340
—
4760
9
—
6) 42840
—
7140 cubic inches.

1728 { 12) 7140
12) 595.0000
12) 49.5833
4.1319 cubic feet = [solidity req.

* The altitude of the wedge is a straight line drawn from any point in E F perpendicular to the place A B C D.

PROBLEM X.

To find the solidity of a prismoid.

To the sum of the areas of the two ends add four times the area of a section parallel to the two ends and equally distant from them; and this sum being multiplied by one-sixth of the height, will give the solid content of the prismoid.

Example.—Find the number of imperial gallons contained in a brewer's guile tun in the form of a prismoid, whose greater end measures 12 feet by 8, and lesser end measures 9 feet by 6, the altitude being 9 feet.

12
8
—
96 = area of greater end.

9
6
—
54 = area of lesser end.

2) 14 — 7
2) 21 — 10.5
10.5 — 7 — 73.5 — 4 — 294.0 = four times the [area of the middle section.

96
54
294
—
444
1.5 = 1-6th of the altitude.
—
2220
444
—
666.0 cubic feet = solidity.

Now, one cubic foot contains 6.232 imperial gallons; therefore,

666
6.232
—
37392
37392
37392
—
4150.512 imp. galls. = content req.

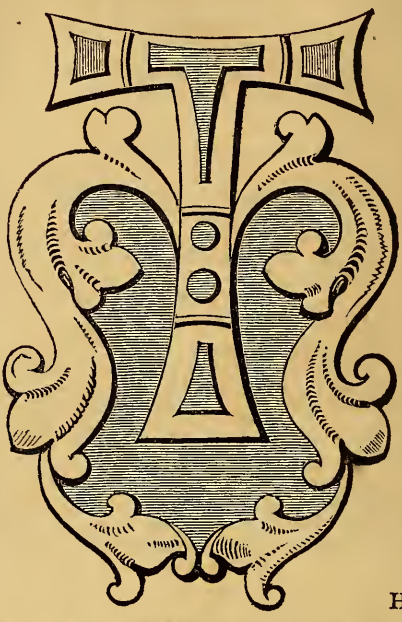
(To be continued.)

A Brazilian Steam Frigate.—A fine steam frigate, built of wood, with engines by Rigby, and built for the Brazilian Government, was launched a few days since from the building-yard of Mr. Royden, Liverpool. She is named the Affonso, after the late son of the Emperor of the Brazils. Her burden is 884 tons; the model being something similar to that of Her Majesty's ship Fury. Her armament will consist of two 68 and four 32 pounders, with engines, &c., complete. She is expected to draw 12 feet only. We understand that the Affonso is to be commanded by the brother of Marquis Lisboa, the Brazilian Minister to London.

A DESIGN FOR A FINGER-PLATE FOR A DOOR.

Architecture.

(*Continued from page 76.*)



HE FIVE ORDERS IN GENERAL, AND THEIR PRINCIPAL PARTS.—Each of the five orders in architecture is divided into three principal parts from the base line upwards, namely, the *pedestal*, the *column*, and the *entablature;* these are again respectively divided into three essential parts as follow:—1. The pedestal into the *base*, the *die*, and the *cap*. 2. The column into the *bass*, the *shaft*, and the *capital*. 3. The entablature into the *architrave*, the *frieze*, and the *cornice*. Other smaller divisions are called *members*, whether they be square or curvilinear, and are more or less numerous, according to the respective orders to which they belong.

THE TUSCAN ORDER.

The Tuscan order, as an antique, exists only in the works of Vitruvius, the description in which, being very obscure, has left a wide field for the ingenuity of modern architects. Among these Palladio composed two profiles; one from the description of the ancient master, and the other, according to his own idea of a simplification of the Doric. That of Vignola, however, has been most generally approved and adopted.

The base of this order consists of a simple torus, with its fillet; it is, as are in general in all the Roman orders, accompanied by a plinth.

The proportions, according to Sir W. Chambers, are as follow: the column, fourteen modules; the entablature, three modules, fifteen minutes. Of the former, the base occupies one module; the shaft (including the as-

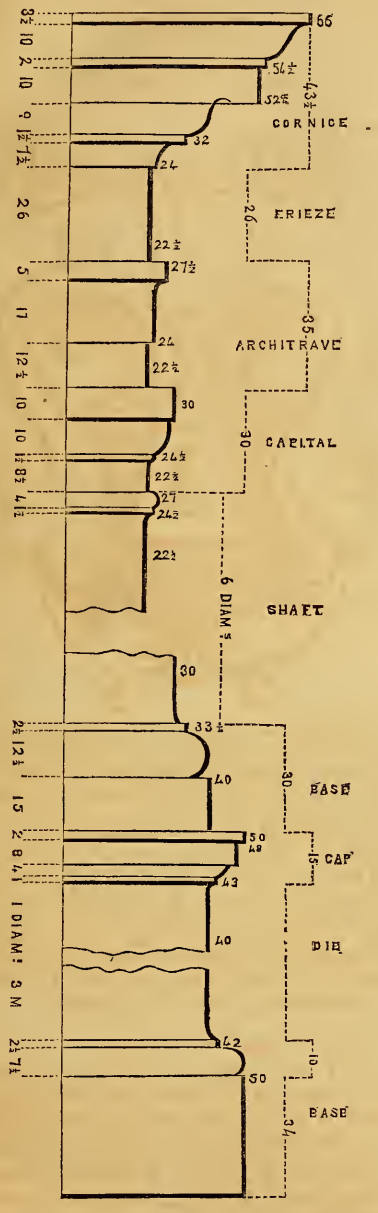
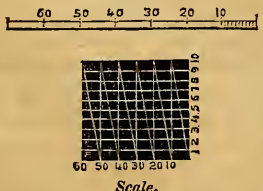


Fig. 1.



Scale.

tragal, which divides it from the capital), twelve modules, and the capital one. Of the latter, the architrave (including the fillet), thirty-one minutes and a half; the frieze, the same; and the cornice, forty-two minutes.

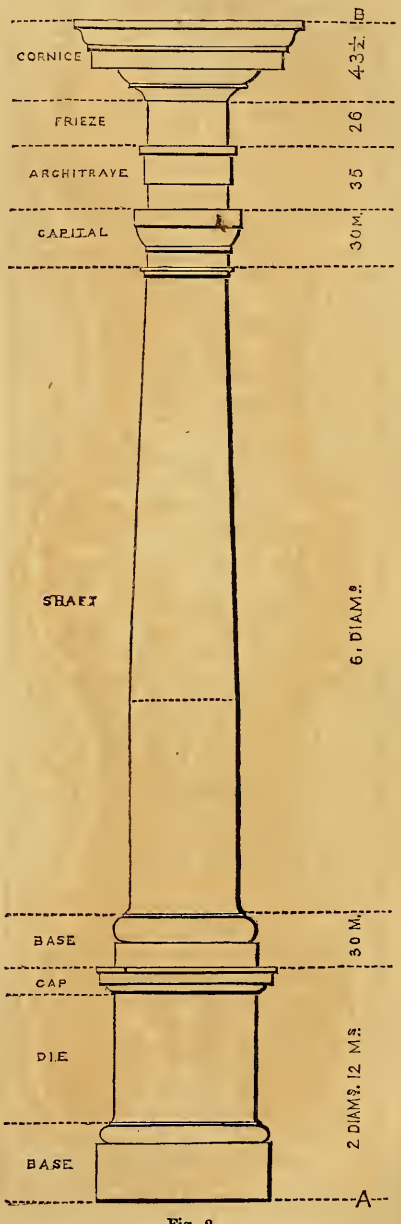


Fig. 2.

In the accompanying engraving (Fig. 2) the whole height A B is divided into five equal parts, one of which comprises the pedestal; the remaining height is again divided into five parts, one of which is devoted to the enta-

blature; the remainder is subdivided into seven equal parts, one of which is the diameter of the column, which is divided into sixty equal parts, or *minutes*, which forms the scale for measuring the height and proportions of the members (Palladio's Tuscan order). The following notes will be found useful:—The entablature always contains one-fourth of the column; the shaft diminishes from one-third of its height; the pedestal occupies one-fifth of the whole height of the order; the whole height of the order, including pedestal, is eleven diameters.

The intercolumniations, in all the orders except the Doric, are the same; viz., the eustyle, which is most common and beautiful, four modules, twenty minutes; the diastyle, six modules; and the aræostyle, seven modules.

The Tuscan order admits of no ornaments, nor flutes in the columns; but rustic cinctures are sometimes represented on the shaft.

The uses of the Tuscan order are entirely peculiar to its own character, which is that of strength and solidity, and, therefore, adapts it for the construction of prisons, arsenals, &c., and also the inferior parts of large buildings. Its appearance partakes more of gloom than of grandeur, but it possesses the quality of striking the eye and of arresting attention.

(To be continued.)

Photography on Paper.

(*Concluded from page* 79.)

Preparation of the Positive Paper.—The paper should possess the same qualities as that used for the negative, except as regards fineness, for, as the light has not to pass through the paper, it is better to have it of stouter texture, in order to permit the absorption of a larger quantity of the preparation employed.

Take a sheet a little larger than that of the negative paper, and expose one of its sides for a few seconds to the following solution, taking care to mark the side which receives the solution:—

No. 4.

Chloride of sodium	1¼ part
Distilled water	30 parts.

When the paper seems to have absorbed as much as it can, press it between folds of blotting-paper, and expose the marked surface subsequently for some time to the following preparation:—

No. 5.

Nitrate of silver	5 parts
Distilled water.....	30 parts.

After this hang the paper up to dry in complete darkness. The dipping in the silver solution may, without inconvenience, be repeated a second time, if it be thought that the paper has not sufficiently imbibed the solution. The dipping in the silver solution gives rise to a change of bases, and to the formation of chloride of silver and nitrate of potass. The silver solution being concentrated the paper becomes covered on one of its sides with the chloride of silver, a salt very sensible to the action of light, which decomposes it, and liberates the black oxide of silver. When the paper is perfectly dry it is ready to be used. The paper thus prepared should always be used in the course of the same day, as, notwithstanding the greatest care to guard it against the action of light, it will invariably acquire a rose tint within twenty-four hours of its preparation. The negative paper is then to be placed on the positive paper, the two sides previously acted upon being placed againt one another. The two papers thus arranged are then to be placed between two glass plates, and exposed to the sun or to diffused light. If it be wished to have a very dark picture, the border of the positive paper should have turned green before taking it from the light; but if a less dark picture be required, a bronze colour will be the guide, and, if a very light picture be desired, the paper should be removed from the action of the light as soon as the border of the paper has acquired a blue tinge.

To fix the positive picture, the paper is to be washed in a dark room in cold water during three or four hours, changing the water frequently; these repeated washings will serve to remove as much as possible of the chloride of silver. After this, immerse the paper in the following solution:—

No. 6.

Hyposulphite of soda ..	30 parts
Distilled water	300 parts.

The picture now loses its intensity, and takes a reddish tint; the dipping is to be continued until the white parts acquire a slightly yellow tint, and the black a greater intensity. This operation may last from half an hour to four hours, according to the greater or less intensity of colour which the picture may be desired to exhibit. The picture is now to be kept immersed in water (frequently renewed) for an hour, at the least, in order to remove the hyposulphite of soda, which, were it permitted to remain, would attack and destroy the picture; the total amount of this salt is indicated by the washings losing the sweet and nauseous taste which characterises them at first. The picture is then to be dried between folds of blotting-paper, and placed near a gentle fire, which removes all moisture, and assists in the decomposition of the hyposulphite. This salt has a very evident action on the chloride of silver, which it decomposes; but it appears that, if the operation happens to be protracted too long, the hyposulphite itself undergoes decomposition, the sulphur combining with the silver to form a sulphuret of silver which is perfectly insensible to light. If the picture, before being placed to the fire, exhibits a reddish tint, it will quickly lose this, and assume a fine black tint. This fact, pointed out for the first time by M. Guillot Saguez, and which can alone give the certainty that the picture is immutably fixed, cannot be too strongly insisted upon.

The photographic pictures produced in strict accordance to these directions have been found after the lapse of eighteen months perfectly unaltered.

On the Comparative Value of Simplicity in Architecture.

There are few operations of the mind more subtle and more fallacious, than is that by which we are led to regard as identical the properties and attributes of objects that are frequently presented to our notice in close association, while they remain essentially distinct from and independent of each other. We need not wander, in search of illustration to this remark, beyond the field which our present subject opens before us. The common recurrence of such descriptive phrases as "simply beautiful," "dignified simplicity," "graceful and chaste simplicity," has unquestionably done much to create in many minds an opinion that simplicity is one with chastity and grace, with dignity and beauty. Nor is it matter of surprise, that, in an age like the present, when all are critics, and all seekers after novelty, we should find many who, from an aversion to the extravagances of a depraved taste, adopt the opposite extreme, and, affecting a false refinement, assert the supreme importance of simplicity, be it only for the paradox which the opinion offers to vulgar minds. This opinion has, indeed, received such support, that some writers have given to simplicity the very highest place among the requisites for architectural composition; making it no less essential to the mass, than is harmony to the proportions, or beauty to the details. If, then, such distinction be claimed for this quality in art, it cannot be considered unimportant to examine the validity of such claims, as far as supported by the nature, tendency, and exemplifications of the principle of its observance. This is, indeed, the more necessary, as the principle cannot be said spontaneously to commend itself to the feelings; and therefore, in order to be maintained at all, requires the stronger support of the judgment. It may, perhaps, be fairly questioned at the outset, whether that can be an absolute rule of taste, which approves itself so imperfectly, to our natural perceptions; those perceptions which are not inapt in determining upon the existence of the harmony of fitness, and the beauty of ornament; but, without insisting upon this doubt, we may examine the nature of the quality in question under some of its more ordinary applications, and perceive how far it is usually productive of the results attributed to it.

Assuming that simplicity in any work of art consists in the fewness of its component parts, and assuming also that it is the object of art to gratify the imaginative faculties of the mind without offending the judgment, we may, on asking whether, such limitation of component parts is calculated to satisfy the demands of the imagination, safely anticipate an answer in the negative. If, too, simplicity be all-important to works of taste in one department, what shall exclude its authority from those in another, the gratification to be attained being derived from the same sources? Is it by rendering the parts of their machinery as few as possible, that the epic poet, the dramatist, the legendary historian, produce their most gratifying illusions? And if one or two able pens of our own times have (though not uniformly) made simplicity the garb of much beauty, has not the easy assumption of the dress tempted their many imitators to conjure up only impersonations of the ridiculous? Were, indeed, the objects of taste and of the fine arts the same with those of the useful and commercial arts, simplicity would be of paramount importance; as, in the latter, the economy of labour demands the employment of the least complex apparatus for the attainment of a given result; —in the former case, however, the self-imposed toil of the imagination is its own reward; its real weariness arising from that monotony which it is the ultimate tendency of simplicity to produce.

Much of that which has been urged by many in praise of this quality arises, as we hinted at the commencement, from their having confounded it with other coëxistent features in nature and in art. That the simple and the grand frequently stand combined is unquestionable; yet it is equally true that our impressions, in such cases, are produced alone by the grand; and that the grand is the result of size, which becomes effective just in proportion as the form of the beholder is, by comparison with itself, reduced to insignificance. From what other cause arises the majesty of the ocean, or of the Alpine heights, which, as illustrations from nature of abstract simplicity, do not excel the pond or the hillock? It is true that what would interfere with the simplicity of these objects would interfere likewise with their grandeur; but for this reason, that, by interrupting the effect of continuity, it would destroy also the impression of size. And if simplicity is not to be confounded with dimension, neither is it to be mistaken for grace. How both may be united in the productions of the chisel is known to every one who has seen the Elgin Marbles; but that grace is no inseparable companion to simplicity is equally obvious to all who have paid any attention to remaining examples of Egyptian sculpture. Were we to pursue the examination of this characteristic in its varied connection with the tastes and refinements of life, it would not be difficult to show to how great an extent it has been mistaken for other and higher qualities. What is more common, for instance, than for the simplicity of a musical air to be considered identical with its sentiment and expression? Yet it cannot be denied that Handel himself has left examples of the manner in which simplicity may be made ridiculous, had we not the daily testimony of our ears to the fact. Nor, in the labours of learning, are the nature, the beauty, the sublimity, of such literary remains of past days as the English Bible and Prayer Book to be confounded with the circumstance of their simplicity of style; matters quite as distinct from each other as, in the history of character, are the oft-sung joys of rustic life from mere clownish ignorance, or the innocence of childhood from the emptiness of the idiot. It may

be objected, that in thus viewing simplicity as at once non-essential and liable to excess, we are not doing justice to its claims; and that any quality in art or science may be rendered ridiculous by being overstrained in application. This remark, however, is only true as it regards qualities or excellences that are comparative; it is not correct as to those which are absolute. Absolute excellences can never be carried to an extreme. No work of art was ever too grand, too graceful, too harmonious; since grandeur, grace, and hårmony are designations of absolute excellence. While, again, that some works may be too complex and too ornamental is no less certain than that others may be too simple or too poor; these terms being expressive of the extremes of qualities of comparative excellence, those of variety and ornament. The very circumstance, therefore, that simplicity is a quality comparative and indefinite, manifestly invalidates its claim to the place of an essential and absolute excellence in architecture, and in art generally. If any pretension whatever could be sustained for its authority as an absolute principle, it must be by its reduction to its primary elements. Thus received, and applied to architecture, it would render the sphere the most beautiful of all figures; the pyramid of three sides the next in merit; the ordinary pyramid, of four sides, the next; after which would come the cube of six equal sides, followed, at an uncertain interval, by the cube of the parallelogram. How little this scale of classification accords with the principles of taste developed in architecture, ancient or modern, we shall be at no loss to determine; at one glance anticipating the monotonons absurdity that would usurp the place of art, were we to consult such a scheme of approximation in the pursuit of beauty.

While, however, we deny to simplicity the character of an absolute and essential excellence in architecture, let us not by any means be supposed to assert that it is the reverse of an excellence. The truth is, as before stated, that simplicity is a quality of comparative and uncertain value; to be regarded in a negative light as standing alone, but assuming a different degree of importance as associated with varieties of circumstance;—a cypher, which gives and receives significancy as attached to integral terms of admitted import. Thus, when simplicity, as a relative, subserves the ends of harmony as an absolute principle, its efficiency is not be questioned. This it does by a regard to locality, association, and significancy. The round tower that frowns from the wild rock, and the long line of massive columns, occupying, like hoary, earth-born giants of a forgotten age, the Egyptian plain, are objects imposing in their simplicity; but transfer the tower in imagination to the level lawn, and the Egyptian temple to some gently varied and wooded vale, and, interesting as they would continue to be for majestic antiquity, their simplicity would cease to charm for want of the harmony of situation and accompaniment. Nor, on the ground of significancy and appropriation, will the simplicity that befits the dwelling of the citizen admit of its being magnified into the characteristic of an abode for the prince, any more than the plainness of the portico where the Stoic anciently discoursed would have been appropriate to the scenes in which modern Rome displays her religious pomps. Thus, again, simplicity is valuable where it promotes a desired expression of strength, as in the architecture of quays, prisons, &c. It is obvious, however, that this reason for its adoption ceases when the character of firmness is less requisite than that of elegance.

On the whole, we are inclined to think that the praise which has been lavished by many on the principle of simplicity in architecture, has had its origin in a twofold error, both negative and positive. On the one hand, its advocates have not considered the ultimate tendency of their position when carried out to its legitimate results; inasmuch as to make the approach to beauty identical with the approximation to simplicity is a rule which terminates in a *reductio ad absurdum*, constituting that most beautiful which is most blank. On the other hand again, the positive error consists in their having mistaken for this principle of simplicity, another, which not unfrequently, indeed, developes itself under the same aspect; the fundamental and all-important principle of *unity*. We should find no difficulty in proving that all the excellences which are supposed educible from the former belong inseparably to the latter; while the latter disposes of unnumbered difficulties which beset the former. As to the principle of unity, it is necessary to premise, that it has, architecturally, a twofold reference; regarding, on the one hand, form and distribution, and, on the other, expression of style and purpose: the first embracing the symmetrical, the second the picturesque. Whatever praise such examples of Grecian art as the Parthenon and Theseum may have received on the ground of simplicity, it is rather for the merit of unity of form that we consider them admirable; and, though in our modern cruciform churches in the pointed style, that unity of form is not so entirely acknowledged by the eye, the unity of expression and of character is generally more than enough to satisfy the demands of taste. Again, we should scarcely select King's College Chapel, at Cambridge, as a model of simplicity; while, as an example of the supreme beauty of unity, apart from the subject of detail, it stands forth among human works in glorious pre-eminence. What the advocates for strict simplicity and Greek imitations may think of the merits of such piles as Salisbury Cathedral, and the royal residence at Windsor, to say nothing of the collegiate edifices, we know not; it is enough to know that there are those (few though they be) who talk of the impressive and the beautiful, and who can yet deny that any but works after classic models deserve the title of architecture. With respect to the last-named structures, however, we think it undeniable that they exhibit little of simplicity, with much of unity of expression; and in which of these qualities, therefore, the command of emotion principally resides, we leave to the feelings of all, who have any, to determine.

It may, perhaps, be objected, that the more closely we follow the dictates of simplicity, the more likely shall we be to render the productions of art intelligible, and their images susceptible of being at once apprehended by the eye, and permanently retained by the memory. All these advantages, however, must necessarily be insured by a regard to the principles of unity. Superfluous and irregular members of design are as much opposed to unity as to the simple and the intelligible; and whether the degree of subdivision and of ornament be greater or less, a structure characterised by unity cannot fail to leave upon the attentive mind an impression at least as distinct as would attend the inspection of a work of extreme simplicity. It may, indeed, well admit of a doubt, whether the highest pleasures which architecture is calculated to produce are those attendant on an immediate comprehension of a given subject, since, as a science for the eye and the imagination, as well as the judgment, it is its province amply to provide for the researches of curiosity. Under all circumstances, however, be the character of composition simple or elaborate, unity demands its place as the crowning excellence. We the rather insist upon this, as opposed to the boasted claims of simplicity, from a conviction that, in elevating secondary or indeterminate subjects to the rank and authority of essentials, we are inflicting injury on art, impeding our own progress, and encouraging the suspicions of those who stigmatise modern practitioners with a want of inventive power.

E. T.

Shakspere—Extraordinary Drawing.

A work of the very finest art has been submitted to our inspection, in the form of a pen-and-ink portrait of Shakspere, with a representation below it of the Stratford premises, which were recently sold at the Auction Mart, for £3,000. This really wonderful and very beautiful production is by Mr. J. Minasi, the prince of pen-and-ink artists. The public have already had numerous proofs of the exquisite performances of that gentleman, who, with quill and ink-bottle as his only materials, has executed some of the most exquisite and minutely-finished pictures which it could be desired to behold. We have had many opportunities of noticing Mr. M.'s remarkable performances. In the present instance, however, he seems to have surpassed, in our humble opinion, his preceding efforts. The subject of his portrait is among the highest and noblest that could be selected; and the artist appears to have risen therewith above all his former works of similar style and execution. He has taken as his original one of the most pleasing of the various portraits of the immortal bard, known to connoisseurs in such matters, as the "Chandos Portrait;" and that portrait he has copied in a truly surprising and exquisite manner. The effect is happier far than that of the finest and most elaborately-finished engraving; singularly conspicuous for softness, beauty, and delicacy of touch. Indeed, the real and astonishing merits of the production are not adequately appreciated until the picture is inspected by a powerful glass, whereby its most minute and marvellously pains-taking execution is sufficiently perceived. It is then only that the astonished inspector of the portrait sees how countless and almost incalculably small are the lines with which the artist's magic pen has produced the soft and charming effects of this beautiful work. We are glad to hear that the highest lady in the land is to have this great artistic curiosity submitted to her inspection. It deserves the most exalted as well as the most generous patronage. The finest and most elaborately-executed engraving, could not, we believe, do anything like justice to the excellence of this original. The expression of the face, the glorious and majestic elevation and breadth of the forehead, and the intellect displayed in the eye, are all displayed with marvellously happy effect. Beneath the portrait is a very clever *fac-simile* of the poet's signature; while beneath that again, Mr. Minasi has placed appropriate words, "*Arde ancora la Fiamma del Tuo inesauribile Genio.*" The artist has exhibited the sacred flame of genius surmounting the head of the bard. This is an earnest and enthusiastic, if not altogether judicious, homage and reverence to the great Shakspere's surpassing intellect. The lower portion of the picture is occupied by a beautifully executed pen-and-ink drawing of the Shakspere House at Stratford, and the adjoining premises—adding much to the completeness and attraction of the production. We shall anxiously and curiously watch the effect of this exquisite work of art. It ought to be attended by decided benefit toone who has for many years achieved far more excellence and reputation, as a gifted and peculiarly laborious artist, than of the worldly profit which should likewise have rewarded such industry and ingenuty as he possesses. It is gratifying to learn that Mr. Minasi, notwithstanding his advanced age, still engages himself with instructing parties in the art in which he is so eminent, able, and successful.—*Morning Advertiser.*

Free Exhibition.—The Society for the Encouragement of Arts and Manufactures have prepared a free exhibition of specimens, illustrating the progress of lithography in England, comprising the highest works of art by the most eminent artists and lithographers, and *free tickets* of admission may be had of all members of the society, and of Mr. Mortlock, 250, Oxford-street; Mr. Phillips, 359, Oxford-street; Mr. White, 210, Regent-street; Messrs. Graves, 6, Pall-mall; Messrs. Colnaghi, 13, Pall-mall East; Mr. Cundell, 12, Old Bond-street; Mr. Pickering, 177, Piccadilly; Mr. Milledge, 65, Fleet-street; Messrs. Greensill, 148, Strand; Mr. Tenant, 149, Strand; Mr. Bell, 186, Strand; Messrs. Smith and Elder, Cornhill; and Mr. Moon, Threadneedle-street, &c. The exhibition is open every day from ten till four, and will close on the 8th.

Madame Warton's "Walhalla."

We paid a visit this week to this popular place of amusement and instruction, because, at Madame Warton's, art is combined with the gratification of the passing hour; the "Walhalla," therefore, falls strictly within our province.

We have heard some persons speak slightingly of the "Walhalla" on moral grounds, but our honest opinion is, that such an exhibition as the *poses plastiques* is calculated to refine as well as to amuse the mind. To the pure all things are pure. If we object to seeing Madame Warton's personation (and beautiful it is) of "Venus Rising from the Sea," we might reasonably turn away our eyes from the glowing canvas of Titian; and should her exquisite embodiment of "Lady Godiva" offend us, Landseer's painting of the wife of the grim old earl ought to make us put our hands before our eyes.

It is no slight advantage to the artists of the present day that they are furnished with so fine an opportunity of studying drawing from the figure as is afforded them by Madame Warton and her coadjutors. Not long since, drawing from the nude figure, though essentially necessary to the sculptor and the painter, was so expensive a matter that very few artists could afford the needful sum. Now, however, for a mere trifle, the finest manly forms, and the most exquisite specimens of womanly beauty may be seen at the "Walhalla;" and compositions from the old and modern masters be witnessed, just as though the originals of the models for those famous pictures stood living and breathing before him.

Landseer, great artist as he is, has shown his appreciation of Madame Warton's symmetry by selecting her as his sitter for his forthcoming picture of "Lady Godiva;" and beautifully has Madame Warton placed it on her stage in Leicester-square. Lady Godiva is represented seated on a white charger, caparisoned in crimson, riding naked with modestly down-cast eyes through the deserted streets of Coventry; her "rippled hair," as Tennyson calls it, flows down, partially concealing her charms. To those who have seen Madame Warton (and who has not?) we need not say how beautifully chaste is her delineation of "Lady Godiva." Fine as her former efforts have been, this last exceeds them all.

Our space will not allow of our noticing all the *tableaux*, but we cannot help mentioning the "Grecian Harvest Home," "Eve tempting Adam," and "Mars and Venus." Others there are, perhaps, quite as beautiful, but our artistical friends must go for themselves; and let them take our word for it, that, at the "Walhalla," they will not only gratify the eye, but acquire the material which will be invaluable to them in the pursuit of their fine profession.

Notices to Correspondents.

NOTICE.—All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the DECORATOR'S ASSISTANT, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** In answer to several subscribers who have addressed us on the subject, we beg to state that the two first pages of the weekly numbers of this work are intended to be cut off previous to binding. This will not make the least difference with regard to the appearance of the volume.

*** Part VIII. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., VI., and VII. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—I should feel obliged to any of your correspondents if they would inform me of the processes used in making specula for telescopes, the proportions of the alloy, &c., for casting, and the substances used for grinding and polishing, &c. As platina is very expensive, I should prefer an alloy without that metal.—Yours respectfully, W. H. Islington, December 30, 1847.

A CONSTANT READER (Blandford-street).—You cannot be much of a "constant reader," or else you would have perceived that we have already given directions for making crayons in page 11 of the present volume of this work. With regard to the preparation of water colours, we will shortly give an article on the subject.

AMATEUR.—You may paint wood with common oil colours, and they will remain firm if you cover the painting with a strong varnish. Japan ware is thus painted.

C. R.—The second volume will be completed with No. 51; No. 52 will form the title-page, preface, and index.

W. P. A. (Bermondsey).—Any bookseller will obtain for you the back numbers of our work, they are all in print at present, but it is impossible to say how long they will remain so, as at present the stock on our shelves is rapidly decreasing.

STRADELLA; OR, THE POWER OF SONG. By F. GLASSE, Esq. London: *E. Dipple*, 42, Holywell-street, Strand.—A pleasing romance, created, no doubt, by the brain of an enthusiast—redolent of sentiment which charms and delights our mind, while it soars with our imagination through many a blissful scene of beauty, love, and peace, exposing alternately sunshine and storm, emblematical of the smiles and tears which form the limits of our feelings in this world.

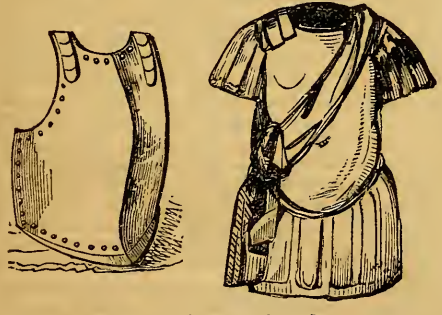
A WELL-WISHER (Birmingham).—Thanks for the extracts, they shall be made use of. We are much obliged for your recommendations of this work among your friends; we only wish that the rest of our subscribers would do likewise, we should then be able to add more to what has already been praised so much. At present the acquisition of every fresh subscriber is of importance to us, and we take it as an act of friendship on the part of our readers to endeavour to increase our circulation. Surely, such a small boon is not too much for us to ask, who labour willingly—and, we flatter ourselves, well—for the public good.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 81.)

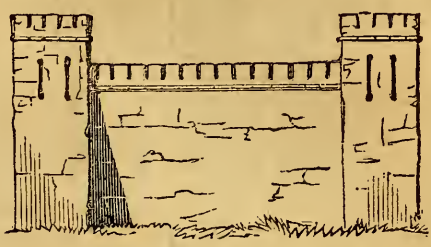
Clay, a mixture of decomposed minerals, occurring in beds near the surface of the earth. The varieties of clay are of various important applications in pottery, in manufacturing stone-ware and porcelain, in constructing furnaces for metallurgic operations, &c.—Some of the principal varieties are *indurated clay*, or *clay stone*, which is clay in its highest state of induration. It is soft, but not easily diffused in water, and does not form with it a ductile paste.—*Porcelain clay*, so named from the use to which it is applied, is white, with occasional shades of yellow and gray. It is dull and opaque; feels soft; in water it falls to powder, and when kneaded, it forms a ductile paste. It is in general infusible by any heat that can be raised.—*Potter's clay* and *pipe clay* are similar, but less pure, generally of a yellowish or grayish colour, from the presence of iron.—*Loam* is the same substance mixed with sand, oxide of iron, and various other foreign ingredients.—The *boles*, which are of a red or yellow colour, are of a similar composition, and appear to owe their colonrs to oxide of iron. They are distinguished by their conchoidal fracture.—The *ochres* are similar to the boles, containing only more oxide of iron.—*Fuller's earth* has an earthy fracture, sometimes slaty, is dull and opaque. In water it falls to powder without forming a ductile paste. It is used to remove grease from cloth.—*Tripoli* is found loose or indurated; its fracture is earthy; it feels harsh and dry; does not adhere to the tongue. It is used for polishing the metals and glass.

Cuirass (in military costume), is that portion of defensive armour covering the back and breast. Cuirasses were anciently made of various materials, sometimes felt and cloth,



placed in layers, being employed for the purpose; but in more modern times the various metals, such as gold, silver, brass, and iron have been generally used.

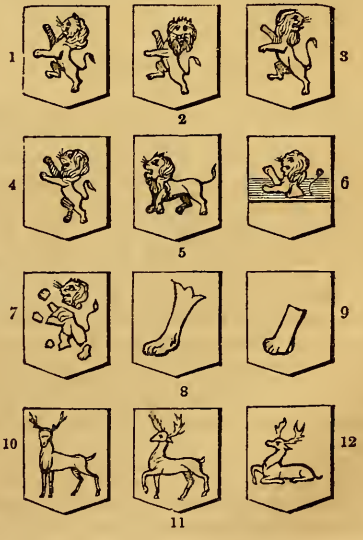
Curtain, a perpendicular wall serving to screen any object from view. In architecture, a curtain signifies that part of the wall of a fortification or rampart that is constructed between two bastions, thus :—

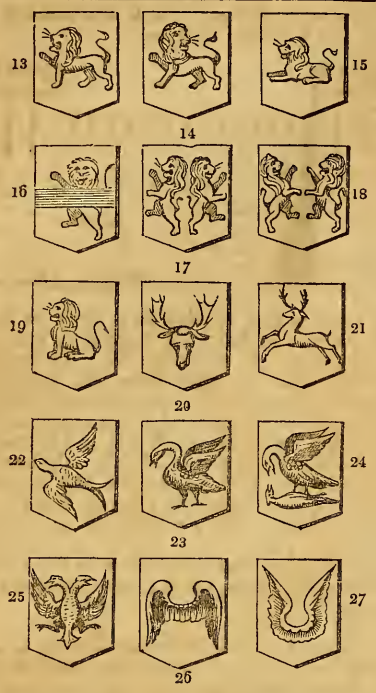


The term is also applied to a cloth or large veil, capable of being contracted or enlarged at pleasure. In theatres, &c., the curtain serves to hide the stage from the spectators during a cessation of the performance; for this purpose there are generally two curtains, one of which is called the *drop-scene*, and is lowered at the end of the act, the other is only lowered when the play is finished; the first is always painted, and is frequently of great beauty, the subjects being either allegorical or views of celebrated places; the second is generally formed of green baize. Anciently the curtain rose from the stage, but it is now lowered from the top.

Curtain-Arm, a sort of hook serving to support the end of a window curtain when drawn, and formed of various materials. An original design for a curtain-arm will be found in vol. i., p. 140 of this work.

Charges (in heraldry), signify whatever figure, &c., is borne in the field of a coat-of-arms. We may take the lozenge as an example. The shape is the same as that of a pane of glass in old casements. In this form the arms of maidens and widows should be borne. The true proportion of the lozenge is to have its width three parts in four of its height.





1. Rampant
2. R. Guard
3. R. Regard
4. Saliant
5. Statant
6. Naissant
7. Dismembered
8. Erased
9. Couped
10. At Gaze
11. Tripping
12. Lodged
13. Passant
14. Passant Reg.
15. Couchant
16. Debruised
17. Addorsed
18. Combattant
19. Sejant
20. Cabossed
21. Courant
22. Volant
23. Roussant
24. Trussing
25. Displayed
26. Inverted
27. Erect.

(To be continued.)

Architectural Antiquities.—The subject has often been mooted, but never with that success which such an important proposition might reasonably be expected to deserve; that a repository for specimens of ancient architecture should be established in the British Museum, from which the student might obtain that practical information for which he is at present compelled to travel through the country;—surely a boon of such inestimable value as this would prove to be, should not be denied by a British Government to a British public. Scattered about this country are the remains of many a venerable pile which ere long will sink under the accumulated effects of time and inattention; yet in these are alone preserved the remnants of the architecture of long-passed ages;—these fragments ought to be at once rescued and deposited in some place of security. We intend shortly to propose a place for an architectural museum of this description.

The Theory of Painting;

DEDUCED FROM THE "DISCOURSES" OF SIR JOSHUA REYNOLDS.

From young students an implicit obedience to the *rules of art*, as established by the practice of the great masters, should be exacted; and they should be taught to follow, not to criticise, those models, which have passed through the approbation of ages, they alone forming suitable guides for the early efforts of their pencils. The false and vulgar opinion that rules are the fetters of genius should never be allowed to gain ground in the mind of the young artist, they are fetters only to men of no genius, in the same manner that armour, which upon the strong is an ornament and defence, becomes, when placed upon the weak and misshaped, a load, and cripples the body which it was made to protect. It is true that when the students arrive at maturity in their art, a deviation from first principles may be allowable; but it is best not to destroy the scaffold until we have raised the building. The genius of those students who have arrived at an advanced and critical period of study should always be carefully watched over, for on its nice management their future turn of taste depends. At this period it is natural for them to be more captivated with what is brilliant than what is solid, and to prefer splendid negligence to painful humiliating exactness. A facility in composing, a lively and what is called a masterly handling of the chalk and pencil, are, it must be confessed, captivating qualities to young minds, and become, of course, the objects of their ambition. They endeavour to imitate these dazzling excellences, which they will find no great labour in attaining. After much time spent in these frivolous pursuits, the difficulty will be to retreat; but it will then be too late; and there is scarce an instance of return to scrupulous labour after the mind has been debauched and deceived by this fallacious mastery. In painting there is no royal road to perfection, and therefore the onward leaps of an impetuous disposition serve merely to retard if not totally to destroy the arrival of an end which can only be obtained by legitimate study and the closest attention. All the great painters of whom we have any authentic account received their fame not merely as the crown of their desire, and the happy termination of their labours; but as a fresh incitement to increased industry. To be convinced with what persevering assiduity they pursued their studies, we need only reflect on their method of proceeding in their most celebrated works. When they conceived a subject, they first made a variety of sketches, then a finished drawing of the whole, after that a more correct drawing of every separate part—heads, hands, feet, and pieces of drapery, they then painted the picture, and after all retouched it from the life. The pictures thus wrought with such pains, now appear like the effect of enchantment, and as if some mighty genius had struck them off at a blow.

Quickness of drawing is often aimed at more than correctness, students instead of vieing

with each other which shall have the readiest hand, should be taught to contend who shall have the purest and most correct outline; and instead of striving which shall produce the brightest tint, or, curiously trifling, shall give the gloss of stuffs so as to appear real, let their ambition be directed to contend which shall dispose his drapery in the most graceful folds, which shall give the most grace and dignity to the human figure. In drawing from lay and human figures the productions of the student but too frequently betray that want of truth which results from their copying the model exactly as it appears before them, without paying attention to anything beyond the general attitude and outline; thus leaving out what it should be the grand aim of the painter to produce, fidelity of expression, and a degree of liveliness adapted to the peculiar manner in which the figure is drawn. This is the obstacle that has stopped the progress of many young men of real genius, and it may be doubted whether a habit of drawing correctly what we see will not give a proportionable power of drawing correctly what we imagine. He who endeavours to copy nicely the figure before him, not only acquires a habit of exactness and precision, but is continually advancing in his knowledge of the human figure; and though he seems to superficial observers to make a slower progress, he will be found at last capable of adding (without running into capricious wildness) that grace and beauty which is necessary to be given to his more finished works, and which cannot be got by the moderns, as it was not acquired by the ancients, but by an attentive and well-compared study of the human form.

The facility of drawing any object that presents itself, a tolerable readiness in the management of colours, and an acquaintance with the most simple and obvious rules of composition, are in painting what grammar is in literature—a general preparation for whatever species of the art the artist may afterwards choose for his more particular application. The power of drawing, modelling, and using colours, is very properly called the "language of the art;" and it is to the study of this language that the student should devote his best attention, for it is obviously upon a knowledge of it that he must build the foundation of his future career, which will be more or less stable according to the presence or absence of elementary instruction.

When the artist is once enabled to express himself with some degree of correctness, he must then endeavour to collect subjects for expression; to amass a stock of ideas to be combined and varied as occasion may require. He is now in the second period of study, in which his business is to learn all that has been known and done before his own time. Having hitherto received instructions from a particular master; he is now to consider the art itself as his master. He must extend his capacity to more sublime and general instructions. Those perfections which lie scattered among various masters, are united in one general idea, which is henceforth to regulate his taste and enlarge his imagination. With a variety of models thus before him, he will avoid that narrowness and poverty of conception which attends a bigotted admiration of a single master, and will cease to follow any favourite where he ceases to excel. This period is, however, still a time of subjection and discipline. Though the student will not resign himself blindly to any single authority when he may have the advantage of consulting many, he must still be afraid of trusting his own judgment, and of deviating into any track where he cannot find the footsteps of some former master.

The third and last period emancipates the student from subjection to any authority but what he shall himself judge to be supported by reason. Confiding now on his own judgment, he will consider and separate those different principles to which different modes of beauty owe their original. In the former period he sought only to know and combine excellence, wherever it was to be found, into one idea of perfection; in this he learns what requires the most attentive survey, and the most subtle disquisition, to discriminate perfections that are incompatible with each other.

He is from this time to regard himself as holding the same rank with those masters whom he before obeyed as teachers; and as exercising a sort of sovereignty over those rules which have hitherto restrained him. Comparing now no longer the performances of art with each other, but examining the art itself by the standard of nature, he corrects what is erroneous, supplies what is scanty, and adds, by his own observation, what the industry of his predecessors may have left wanting to perfection. Having well established his judgment, and stored his memory, he may now, without fear, try the power of his imagination. The mind that has been thus disciplined, may be indulged in the warmest enthusiasm, and venture to play on the borders of the wildest extravagance. The habitual dignity which long converse with the greatest minds has imparted to him, will display itself in all his attempts; and he will stand among his instructors, not as an imitator, but as a rival.

These are the different stages of the art, and the last overcome it only remains to direct the view to distant excellence, and to show the readiest path that leads to it.

It is indisputably evident that a great part of every man's life must be employed in collecting materials for the exercise of genius. Invention, strictly speaking, is little more than a new combination of those images which have been previously gathered and deposited in the memory; nothing can come of nothing; he who has laid up no materials can produce no combinations.

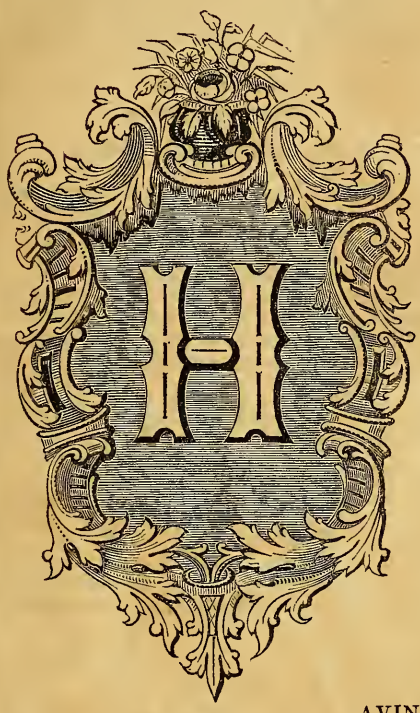
A student unacquainted with the attempts of former adventurers, is always apt to overrate his own abilities; to mistake the most trifling excursions for discoveries of moment, and every coast new to him for a new found country. If by chance he passes beyond his usual limits, he congratulates his own arrival at those regions which they who have steered a better course have long left behind them.

(To be continued.)

A DESIGN FOR A PANEL.

Architecture.

(*Continued from page* 86.)



HAVING already given a description of the Tuscan order, we now proceed to that of

THE DORIC.

The origin of this order has been thus described by Vitruvius:—"Dorus, son of Hellen and the nymph Orises, reigned over Achaia and Peloponnesus. He built a temple of this order, on a spot sacred to Juno, at Argos, an ancient city. Many temples similar to it were afterwards raised in the other parts of Achaia, though at that time its proportions were not precisely established;"—but as, of course, this account is merely fabulous, it is now universally rejected. Mr. Edmund Arkin remarks that this order arose out of the primeval wooden edifices constructed by the ancients; and as experience in that peculiar style of building had imparted knowledge to the architects of the form best suited both to preserve simplicity and unity and to resist the combined influence of time and weather, the Doric order "emphatically called *the first Grecian order*"—the first-born of architecture—while it preserved the indubitable marks of the model from which it had been constructed, at the same time evidenced the birth of a spirit of improvement which rapidly progressed until it attained the powers of producing beauty and security—and while it provided a shelter for the man it was not forgotten that that man had also a mind which required that his house should be formed as well to please the eye as to protect the body.

"In contemplating a capital example of this order, as, for instance, the Parthenon at Athens, how is our admiration excited at this noblest as well as earliest invention of the building art! What robust solidity in the column! What massy grandeur in the entablature! What harmony in its simplicity, not destitute of ornament, but possessing that ornament alone with which taste dignifies and refines the conception of vigorous genius; no foliage adds a vain and meretricious decoration, but the frieze bears the achievement of heroes; while every part, consistent in itself, and bearing a just relation to every other member, contributes to that harmonious effect which maintains the power of first impressions, and excites increasing admiration in the intelligent observer. So in the immoral statue of Glycon, the form of heroic vigour is crowned with beauty, dignity, and grace. Other orders have elegance, have magnificence, but sublimity is the characteristic of the DORIC alone!"

The poet Thomson, thus eulogises the architectural productions of Greece:—

"By Greece refined,
And smiling high to bright perfection brought,
Such thy sure rules, that Goths of every age,
Who scorned their aid, have only loaded earth
With laboured heavy monuments of shame,
Not these gay domes that o'er thy splendid shore,
Shot all proportion up.
First unadorned
And nobly plain, the manly DORIC *rose;*
Th' Ionic then, with decent matron grace,
Her airy pillar heaved; luxuriant last,
The rich Corinthian spread her wanton wreath.
The whole so measured true, so lessened off
By fine proportion, that the marble pile,
Formed to repel the still or stormy waste
Of rolling ages, light as fabrics looked,
That from the magic wand aerial rise.
These were the wonders that illumined Greece
From end to end."

The most perfect example of the Greek Doric order is the Parthenon, or Temple of Minerva, in the Acropolis at Athens, erected under the administration of Pericles, who lived about B.C. 450. The proportions of this singularly fine specimen are as follow:—

The column (including the capital), ten modules, twenty-eight minutes and a half; the whole entablature, three modules, twenty-seven minutes and three-quarters; the capital, twenty-seven minutes and three-quarters; the architrave (with its fillet), one module, twelve minutes and three-quarters; the frieze, to the square member of the corona, one module, nineteen minutes; and the cornice, twenty-six minutes. Diameter of the column at the top, one module, sixteen minutes.

Of the variation of this order employed by the Romans very few ancient examples exist. It is, therefore, principally indebted for its existence

to the modern Italian architects, who, having little of antiquity before their eyes, appear to have bestowed more attention upon this order than the others, and it must be confessed that they have made of it a very elegant design, though, as before observed, essentially different from the original and true Doric. The proportions, according to Sir W. Chambers, are as follow: the base, thirty minutes; the shaft, thirteen modules, twenty-eight minutes; and the capital, thirty-two minutes; the architrave, thirty miuutes; the frieze to capital of triglyph, forty-five minutes; and cornice, forty-five minutes. Upper diameter of column, fifty minutes.

In no example of antiquity is the Doric column provided with a base, so, in order to supply this defect, most architects have employed the *attic base*, which is common to all the orders except the Tuscan, though belonging, perhaps, more particularly to the Ionic.

It consists of two tori, with a scotia and fillets, between the upper of which, in this version, resembles an inverted ovolo. The fillet above the upper torus is always connected with the shaft by a curve, as is also that under the capital, for which reason they are commonly considered as part of the shaft. The *plinth*, or square member beneath, is usually understood, in Roman architecture, to be an indispensable appendage to the base, though Palladio has omitted it in his Corinthian order; but it is rarely found in the Greek specimens. To save this order, however, from the sad humiliation of being obliged to borrow a shoe when required to wear one, Vignola provided it with this appendage. His base consists of one large torus, with one considerably smaller resting upon it, surmounted by the fillet.

The most striking peculiarity in this order is the *triglyph* (supposed by Vitruvius to be the end of the joists laid transversely on the beam of the architrave), which forms the technical distinction between the Greek and Roman Doric, being in the former always placed at the corner of the entablature, and in the latter, invariably over the centre of the column. The triglyph is surmounted by the mutule in the Greek, and in some Roman examples inclined, but in most modern profiles horizontal; on its soffit are represented guttæ, or drops. The spaces between the triglyphs on the frieze, called metopes, in the modern Doric, are invariably perfectly square, and generally enriched with sculptures. Those which formerly adorned the metopes of the Parthenon were brought to this country by Lord Elgin, and now form the principal part of the collection which is known by his name at the British Museum. In the modern order these sculptures are most commonly an alternate bull's scull, and patera. The extreme projections of all these ornaments should be less than that of the triglyph itself, thus keeping a due subordination between mere decorations and essential parts. All the Greek Doric columns are fluted, and in both Greek and Roman this is performed without fillets between, as in the other orders. The intercolumniations in this order differ from those of the others, on account of the triglyph, the metopes being required to be exactly square. They are as follow: the coupled columns of course must stand under adjoining triglyphs; this make their distance, at the foot of the shaft, twenty-one minutes. The next intercolumniation is the monotriglyph, having one between the columns; the distance is three modules. The diastyle—two triglyphs, five modules and a half. The aræosistile, which has three between, eight modules.

(To be continued.)

Mensuration of Solids.

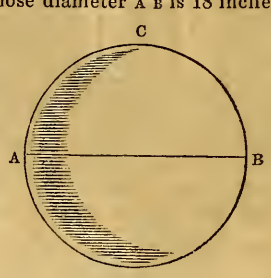
(*Concluded from page* 83.)

PROBLEM XI.

To find the solidity of a sphere.

Multiply the cube of the diameter by .5236, and the product will be the solidity.

Example.—What is the solidity of the sphere A C B, whose diameter A B is 18 inches?



18
18

324
18

5832
.5236

34992
17496
11664
29160

3053.6352 cubic in. = solidity.

END OF MENSURATION OF SOLIDS.

To make Chinese Sheet Lead.—The operation is carried on by two men; one is seated on the floor, with a large flat stone before him, and with a moveable one at his side. His fellow-workman stands beside him with a crucible filled with melted lead, and having poured a certain quantity upon the stone, the other lifts the moveable stone, and dashing it on the fluid lead, presses it out into a flat and thin plate, which he instantly moves from the stone. A second quantity of lead is poured in a similar manner, and a similar plate formed, the process being carried on with singular rapidity. The rough edges of the plates are then cut off, and they are soldered together for use

The Future of Art.

To gaze beyond those narrow limits with which futurity encompasses us, and to predict with certainty as to the maturity of that of which we have, as yet, only seen the infancy, is a task of no enviable character;—years may probably have to elapse, ere the prophecy will be fulfilled, and the prophet, if right, will, most likely, be forgotten; but if wrong, he will be despoiled of his fair fame by the merciless hand of disappointed expectation;—but with regard to art, the task is less dangerous: the shrewd observer of mankind may at once detect a popular feeling,—and to discover whether that feeling be stable or not is a question solved by considering the length of its previous duration, and the object for which it exists.

All results have their origin in something:—the waters issuing from a spring, mayhap, form a stream; that stream, at the end of its course, joins a river; and that river empties its tide into the sea;—so it is with those common passions of our nature by which we are all influenced:—a gaze at a beautiful object creates love; love quickly merges into desire; and desire prompts us to obtain possession;—in all these gradations of feeling we may perceive the secret spring which actuates the progress of humanity, it was this power which Nature exercises over our minds that first led man from the intellectual darkness by which he was surrounded—and it was this power that ultimately placed at his disposal the resources of the earth. The contrast afforded to his miserable state of existence—suffering, as he was, under that worst species of slavery, the bond of ignorance—by almost every surrounding object, first fired his soul with a love of liberty; an easily acquired insight into natural properties, gave him the means of unshackling his fetters; and his unrestrained freedom soon paved the way to civilisation; civilisation led to moral refinement; and here, allying himself with education, in the work of intellectual and social progress, with her aid he soon discovered that the mind, itself, was formed by God to labour with the arm; and that his most powerful assistant was knowledge.

We are all well aware that beauty has as much influence over our intellect as sweetness has over our palate; it forms, indeed, an intellectual luxury for a property of our nature which should never be sated with coarser food. Man, in his present state of existence, partakes of two principles in his composition—mental and corporeal; the latter requires nutritious food for its adequate support, and unless this is provided an incipient decay germinates in his body, leading first to sickness, and then to a premature death. Then is it not unreasonable to suppose that the first principle is self-sustaining, when we are fully aware that starvation aberrates the mind, and leads to idiotcy; and *vice versa*, that grief in the mind wastes away our physical functions, and attenuates our frames. The fact is, that the two principles of our nature are so closely connected that all evils inflicted upon the one produce corresponding effects upon the other. It matters but little whether the vacuity exists either in the belly or the brain—to produce real happiness in life *both* must be filled.

From a perusal of the above, the reader will at once perceive that beauty forms part of the natural intellectual food of man; and this view is further supported by the fact of its being the antidote of ugliness, in the same manner that honey corrects the taste of the acid or the bitter—both of which are detrimental to our bodily health.

Art, therefore, is the legitimate caterer to our intellectual appetite; and it is only by her cultivation that we will be enabled to produce a purer feeling in the minds of the multitude than that with which it has been hitherto pervaded.

We can already obtain a glimpse of the future of art by regarding attentively the popular feeling of the present day, and may safely predict that the time is not far distant when beauty will be once more installed among us—beauty, pure and noble, that has ever been a willing guest to the heart willing for her reception.

The "Art Manufacture."—A facetious contemporary has lately animadverted, and in our opinion very justly, too, upon the excessively high prices affixed by Felix Summerly to the articles forming his "Art Manufacture." "Art in domestic utensils," says he, "will never be popularised and appreciated by the general public, when beer jugs are sold at eighteen shillings. We have casts of celebrated statues for half a crown or less. Why should not Mr. Felix Summerly's beer vessel be cast or moulded in some homely but appropriate material and sold for something like a corresponding price? The idea of making household things artistically beautiful is a very excellent one. But household things to be put to household usage must not be too expensive to be occasionally broken and replaced. That, in the very nature of things, must be their destiny. We repeat to Mr. Felix Summerly, that we should like to see his shop prosper; but if he would succeed, he must, in shop phrase, ticket his goods with lower figures. We should be loath to think that the principal art looked to in the Art Manufacture was the art of getting as much money as possible out of people's pockets. A fair and liberal remuneration we should be delighted to see undertaker and artist receive, and we are convinced that a large disposal of these certainly very beautiful articles at a lower price would be an infinitely better commercial speculation than the necessarily limited sales to be effected at the present very exorbitant rate charged for them." With these sentiments, as we have stated above, we entirely coincide; without cheapness forming one of the qualities of the productions of art, they lose the greater portion of their value;—besides, the very spirit of the age should, we think, be a sufficient guide to Felix Summerly in regulating the prices of the articles he produces to the world.

Scientific Societies.

LIVERPOOL POLYTECHNIC SOCIETY.

Corrosion of Iron.—Mr. T. Spencer recently read a paper, before the Liverpool Polytechnic Society, "On iron, its active and inactive states," wherein he made some observations on rust. Iron, he said, above all the useful metals, had the greatest affinity for oxygen: in other words, its surface became sooner subject to rust than all other metals and substances, setting aside the alkaline earths. In our climate this undesirable property was witnessed more than in other countries: in Upper Egypt instruments of polished steel might be kept in the open air without losing their brilliancy. Dry atmosphere, although it contains 20 per cent. of free oxygen, would not alone cause iron to rust. The atmosphere had always, however, in combination with it what was called aqueous vapour, but which was in reality steam. We might immerse the most brilliant polished steel in oxygen gas without a change taking place on its surface. Neither oxygen nor steam could of itself corrode iron. Let it be remembered, these bodies were the only ones to which it was exposed. Under what circumstances, then, did this general and all-pervading action take place? An answer to this was given by a simple experiment. If one end of a slip of polished iron were kept in pure water while the other end was in the atmosphere, it would seem that the part of the iron which first corroded was at the surface of the water, and this long before the ends of the iron were acted upon. It required a mixture of air and water, what was usually termed dampness, neither the one nor the other being able to produce the effect alone. Steel filings became rusty in water. Why? Because they absorbed the oxygen in the water. If a second quantity of filings were put in they would not rust, because the oxygen had been already subtracted. The reader showed by experiment that a coating of carbon effectually prevents iron from oxidation, and that it can protect it from a body so strong as even aquafortis itself. If the aquafortis were diluted with water, however, the protective power no longer exists. We all knew, he said, that should a piece of this metal be immersed in nitric or sulphuric acid, a great action ensued, fumes were given off, whilst the iron itself was dissolved; the result was owing to the strong affinity of this metal for oxygen: if gold were immersed, no such action took place. Iron had the same action on a solution of silver or copper, so that precipitation ensued. He (Mr. S.) could well conceive how astonished the experimenter must have been when he discovered that, by a simple means, clean bright iron, without protection, might be placed in nitric acid, without any decomposition taking place, and that the act of immersion, which generally destroyed, should now preserve; but more extraordinary still, its hitherto active surface had become so "catalepsed," if he might use the term, that it might be plunged into a strong solution of copper or silver without these metals being precipitated, or having its brilliancy diminished. He showed by experiment, that if a piece of platinum or of gold were placed at the bottom of a vessel containing nitric acid, and a piece of iron immersed and placed in contact with it, the action which would otherwise ensue was destroyed. If there was, however, the slightest scratch or abrasion on the surface of the metal, the protecting influence was gone. A piece of solid carbon also imparts a protective property to iron, little short of that given it by platinum.

Builders' Benevolent Institution.—On the 3rd January the managing committee of this Institution met to balance the half-yearly account, when they had the pleasure of finding the balance exceed their expectations, remembering that the great pressure of the times must affect the affairs of the class of persons more especially connected with the building interest. The committee, notwithstanding they have only commenced operations during a short period of six months, have invested a considerable sum in the Government securities, and have also a considerable sum yet remaining in the hands of the bankers. It is to be hoped that the various classes in the building trades (as the Institute combines and relieves almost all connected with building) will give their united assistance in carrying out its laudable and philanthropic object, it being necessary to raise a sufficient sum to invest, in order to realise an income sufficient to enable the committee to grant and continue relief.

Invention of Glass.—It might contribute to dispose us to a kinder regard for the labours of one another, if we were to consider from what unpromising beginnings the most useful productions of art have probably arisen. Who, when he first saw the sand or ashes, by a casual intenseness of heat, melted into a metalline form, rugged with excrescences and clouded with impurities, would have imagined that in this shapeless lump lay concealed so many conveniences of life as would, in time, constitute a great part of the happiness of the world? Yet, by some such fortuitous liquefaction was mankind taught to procure a body, at once, in a high degree, solid and transparent; which might admit the light of the sun, and exclude the violence of the wind; which might extend the sight of the philosopher to new ranges of existence, and charm him, at one time, with the unbounded extent of material creation, and at another with the endless subordination of animal life; and, what is of yet more importance, might supply the decays of nature, and succour old age with subsidiary sight. Thus was the first artificer in glass employed, though without his knowledge or expectation. He was facilitating and prolonging the enjoyment of light, enlarging the avenues of science, and conferring the highest and most lasting pleasures; he was enabling the student to contemplate nature, and the beauty to behold herself.—*Dr. Johnson.*

Book and Periodical Illustrators.

(Continued from page 83.)

Who that has scanned over the pages of "Punch," dipped into his "Almanack," or surveyed the no less inviting contents of his "Pocket Book," has not bestowed, at least, a tributary laugh to the comic humour of the inimitable Leech? We say *inimitable*, because he is not equalled, let alone surpassed, in his peculiar style by any artist of the day. His designs are all broad, dashing, and vigorously satirical—sketches of life taken with a free hand, a well-pointed pencil, and a heart ever alive to the promptings of Momus. Leech does not exhibit so much sarcasm as Cruikshank; but his designs are not on that account less true to their purpose: Cruikshank aims at shaming folly—Leech gives it its portrait to laugh at; both are successful, although each pursues a different road in order to arrive at the same end; yet Leech, when he likes, can be as pathetic as Cruikshank; and although he does not impart such a horrible aspect to misery, he possesses the like power of loosening our sympathies and of softening our hearts to the "still small voice" that resides within.

There is no artist of the present day who has obtained a well-grounded popularity in such a comparatively short space of time as John Leech; pleased with even the first displays of his talent, the public soon learned to appreciate and set a true value on the works of an original genius, and his celebrity, although it shines as bright as seven suns, has not yet arrived at its meridian.

As a political caricaturist, John Leech has no rival, and the many volumes of "Punch" which have been published will be as much prized by after generations as are the works of Hogarth by us. In his designs, Leech depends not merely upon the ephemeral attraction of distorted countenances and bodies of distinguished public characters; but holding constantly in view the distinction between the keen razor of satire and the blunt oyster-knife of vulgar malice, he endeavours as much as possible to make natural expression and action the symbols of the meaning his pictures have to convey. When Hogarth quarrelled with Churchill, he drew a caricature which represented that individual in the form of a bear, with a quart pot in his paw; and although this, at the time it was executed, might have been readily decyphered, and its signification made out, yet in a time like our own, when the public taste has become refined, such a picture would create no other feeling than one of disgust for the artist on our part.

We are no enemies to the artist who employs his genius for the purpose of correcting either public or private abuse; but, on the contrary, we are most decidedly of opinion that even the fact of our artists having the power to do so, evidences a great stride in the onward march of intellectual improvement; and we would as much contribute to the honour and glorification of the artist who should apply himself to such a patriotic purpose, as to that of the legislator, the soldier, or the sailor, who have striven for their country's good either in the senate, on the tented field, or the quarter-deck.

Ever since its commencement, John Leech, in connection with Richard Doyle (son of John Doyle, *the* "H.B."), has been the principal artist of the "London Charivari."

The name of Hablot K. Browne is that of one who, under the fanciful cognomen of "Phiz," has contributed not a little to the service of literature by his admirable illustrations. There is a quaintness about the productions of this artist which nearly approaches the style of Cruikshank, indeed some portions of "Phiz's" style seems to be borrowed both from Cruikshank and the late George Seymour. All his plates are highly finished, and although this racy style precludes much elaboration, correctness and delicacy of outline, with a peculiar neatness of finish, form the agreeable peculiarity of his works.

Browne was first brought directly before the public in a remarkable manner. The original edition of the "Pickwick Papers," published by Messrs. Chapman and Hall, had their illustrations executed by the late George Seymour; and at the time of that artist's committing suicide he had in hand a plate which was required for the forthcoming number of that work; it was in an unfinished state, and in order not to delay the publication, it was entrusted to Browne, at that time comparatively unknown as an artist, to finish; and he executed his task with so much ability that he became a greater favourite even than his predecessor. "Phiz" is now one of our most popular and prolific artists.

(To be continued.)

The New Anti-laminating Rail, on trial at the Paddington terminus, has, it is said, been found to answer. It has been down five months, and exhibits no marked sign of wearing or abrasion on the surface, though the ordinary rails, in much less time, have gone to pieces. It was invented by Mr. Thorneycroft, the iron master, and will probably be adopted on the Oxford, Worcester and Wolverampton, and be usefully applied to both broad and narrow guage.

Railway Patents in France.—The following is a statement of the number of patents (original and improvements) for inventions connected with railway construction, which have been obtained in France:—In 1843, 19; in 1844, 22; in 1845, 88; in 1846, 131—total, 260. Of these not above three or four have been carried out so as to realize any advantages to the inventors, and those are of English origin—one of which is that of Mr. Stephenson, who receives a premium of £50 for each machine adopting his patent improvement.

To Remove Rust from Iron.—The easiest method of removing rust from iron is rubbing it with a rag dipped in oil of tartar. The rust will disappear immediately.

Tessellated Tiles.

Tessellated tiles are formed of two differently coloured clays, and imbedded in the other, and disposed so as to form an ornamental device. The tile is first made in clay of one colour, with a depression afterwards to be filled with clay of the other colour, and this depression is formed by the aid of a mould. In the first place, the modeller models in stiff clay an exact representative of one of the tiles, about an inch thick, cutting out to the depth of about a quarter of an inch the depression which constitutes the device. When this is properly dried, a mould is made from it in plaster of Paris, and from this mould all the tiles are produced one by one. The ground colour of the tile is frequently a brownish clay, with a yellow device; but this may be varied at pleasure. Let the colour be what it may, however, the first clay is mixed up very thick, and pressed into the mould by the aid of a peculiarly-shaped press. On leaving the press it presents the form of a damp, heavy, unicoloured square tile of clay, with an ornamental device formed by a depression below the common level of the surface.

The second coloured clay, so far from being made stiff like the first, has a consistence somewhat resembling that of honey; and herein lies one of the niceities of manufacture, for it is necessary to choose clays which will contract equally in baking, although of different consistence when used. The tile being laid on a bench, the workman plasters the honey-like clay on it, until he has completely filled the depressed device, using a kind of knife or trowel in this process. The tile, in this state, is then allowed to dry very gradually for the long period of eight weeks, to accommodate the shrinking of the clays to their peculiar natures. After this, each tile is scraped on the surface with an edge tool, till the superfluous portion of the second clay is removed, and the two clays become properly visible, one forming the ground and the other the device. In this state the tiles are put into a "biscuit kiln," where they are baked in a manner nearly resembling the baking of porcelain, but with especial reference, as to time and temperature, to the quality of the clays. From the "biscuit kiln" they are transferred to the "dipping room," where they are coated on the upper surface with liquid glaze by means of a brush. Lastly, an exposure to the heat of the "glaze kiln" for a period of twenty-four or thirty hours causes the glaze to combine with the clay, and the tiles are then finished.—*Dodd's "British Manufactures."*

To Cast Figures in Imitation of Ivory.—Make isinglass and strong brandy into a paste with powder of egg-shells finely ground; you may make it whatever colour you please; but cast warm water into your mould which should be previously oiled over. Leave the figure in the mould to dry; and on taking it out you will find that it bears a strong resemblance to ivory.

Notices to Correspondents.

Notice.—All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the Decorator's Assistant, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** In answer to several subscribers who have addressed us on the subject, we beg to state that the two first pages of the weekly numbers of this work are intended to be cut off previous to binding. This will not make the least difference with regard to the appearance of the volume.

*** Part VIII. of the Decorator's Assistant, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., VI., and VII. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—I should feel obliged if any of your correspondents would inform me of the manner in which Venetian blinds are repainted. I am, Sir, your obedient servant, J. P. Tring. Hulme, Manchester, Jan. 4, 1848.

ANSWERS TO QUERIES.

Preparation of Glass for Painting Transparencies.—Sir,—In answer to "C. S.," page 176, vol. i., I beg to state the glass requires no preparation beyond that of being well cleaned. The colours are prepared in the ordinary manner, and are laid on rather thick.—Yours, &c., Artisticus, Walworth.

Bronzing Gas-Fittings, &c.—Sir,—The appearance for which "A. G. F." requires an explanation (see p. 184, vol. i.) is produced by applying bronze to those parts of the fittings standing out in relief, and painting the crevices with a green colour.—I am, Sir, your humble servant, C. E. Jan. 1, 1848.

J. C. (Newcastle-upon-Tyne).—In all cases it is much more economical to purchase glass in crates than in squares. Before we can tell you the superficial contents in feet of the crate, you must inform us, first, what description of glass you require; and secondly, its particular quality.

A Painter's Apprentice (Glasgow).—Soft soap is prepared in quite a different manner from hard soap, more oil being employed in order to render it liquid; potash, too, is used instead of soda as the alkaline ingredient. Dodd gives the following as the analysis of soft soap of good quality:—alkali, 9 parts; oil and tallow, 42 parts; water, 49 parts: total, 100 parts.

L. A.—Mix the colours more than moderately thick, and add as much driers as possible. With regard to the distemper colours, of course the first rule must suffice.

An Odd Fellow (Caerphilly).—It is very strange that we cannot teach our correspondents the difference between the *editor* and *publisher* of a work; surely it is as easy to address a letter to the one as the other. If you address a note to Mr. Weale, the architectural publisher, Holborn, he will forward you his catalogue, which contains the names and prices of several works treating on the subject you inquire about. The plates would cost from about half-a-crown upwards.

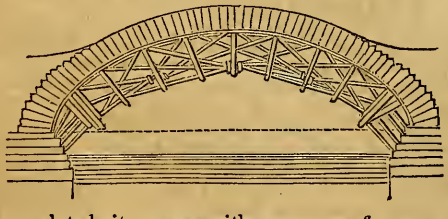
An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Concluded from page* 92.)

CHARGES (*concluded*).

28. Niant
29 Embowed
30. Hauriant
31. Gutté
32. Vambraced
33. Crescent
34. Indorsed
35. Jess'd & Bill'd
36. Pelican
37. Fretted
38. Nowed
39. Pegasus
40. Increscent
41. Decrescent
42. Star.

CENTERING (in bridge building), the preliminary operation to forming the arch of a bridge. It is effected by placing on the piers a framework of wood constructed as in the following engraving, over, and to the figure or pattern of, which the brick or stone work, as the case may be, is built and adapted. It must be remembered, that when the arch is



completed, it presses with enormous force on the wooden frame. In order to get over this difficulty in the way of their removal, the base of each line of timbers rests on a series of wedges, so that every blow of the hammer applied to the point of the wedge, tends to facilitate the removal of the centre, and in this way the enormous masses of stone, forming the arches of New London Bridge, were brought into a state of equilibrium in mid-air, and afterwards left to support their own leviathan framework.

CHECKY (in heraldry), a border or ordinary having no more than two chequers.

COGNIZANCE (in heraldry), the crest. (See *Coat-of-Arms.*)

CONCAMERATE (in architecture), to vault or arch.

CONGE (in architecture), a French term having the same meaning as *Cincture.*

CO-SECANT, the secant of an arc, which is the complement of another to 90 degrees.

COUNTER-CHANGED (in heraldry), a mutual changing of the colours of the field and charge in an escutcheon, by reason of one or more

lines of partition, as in the figure; he beareth, *party per pale argent* and *gules* a *bend counterchanged.*

COUNTER-COMPONED (in heraldry), a border or any ordinary having only two rows of chequers of two different colours.

CYBIUM, an ancient drinking vessel,

fashioned like a boat.

(To be continued.)

A BEAUTIFUL ORNAMENT FOR GLASS OR SLATE.—Spread on a plate of glass a few drops of nitrate of silver previously diluted with double its quantity of rain water; place at the bottom of it, and in contact with the fluid, a zinc or copper wire, bent in any form you please, and let the whole remain undisturbed in a horizontal position; in a few hours a beautiful crystallisation of metallic silver will arrange itself around the wire, and continue to increase until the whole of the fluid has been acted on by the wire.

The Theory of Painting;

DEDUCED FROM THE "DISCOURSES" OF SIR JOSHUA REYNOLDS.

(*Continued from page* 93.)

The productions of such minds are seldom distinguished by an air of originality; they are anticipated in their happiest efforts; and if they are found to differ in anything from their predecessors, it is only in irregular sallies and trifling conceits. The more extensive, therefore, the young artist's acquaintance is with the works of those who have excelled the more extensive will be his powers of invention; and what may appear still more like a paradox, the more original will be his conceptions. But the difficulty now is to determine what ought to be proposed as models of excellence, and who ought to be considered as the properest guides.

To a young man just arrived in Italy, many of the present painters of that country are ready enough to obtrude their precepts, and to offer their own performances as examples of that perfection which they affect to recommend. The modern, however, who recommends himself as a standard, may justly be suspected as ignorant of the true end, and unacquainted with the proper object, of the art which he professes. To follow such a guide, will not only retard the student, but mislead him.

On whom, then, can he rely, or who shall show him the path that leads to excellence? The answer is obvious: those great masters who have travelled the same road with success, are the most likely to conduct others. The works of those who have stood the test of ages have a claim to that respect and veneration to which no modern can pretend. The duration and stability of their fame is sufficient to evince that it has not been suspended upon the slender thread of fashion and caprice, but bound to the human heart by every tie of sympathetic approbation.

There is no danger of studying too much the works of those great men; but how they may be studied to advantage, is an inquiry of great importance.

Some who have never raised their minds to the consideration of the real dignity of the art, and who rate the works of an artist in proportion as they excel or are defective in the mechanical parts, look on theory as something that may enable them to talk but not to paint better; and confining themselves entirely to mechanical practice, very assiduously toil on in the drudgery of copying, and think they make a rapid progress while they faithfully exhibit the minutest part of a favourite picture. This is a very tedious and erroneous method of proceeding. Of every large composition, even of those which are most admired, a great part may truly said to be *commonplace*. This, though it takes up much time in copying, conduces little to improvement. General copying can only be considered as a delusive kind of industry; the student satisfies himself with the appearance of doing something; he falls into the dangerous habit of imitating without selecting, and of labouring without any determinate object; as it requires no effort of the mind, he sleeps over his work; and those powers of invention and composition which ought particularly to be called out and put in action, lie torpid, and lose their energy for want of exercise.

How incapable those are of producing anything of their own, who have spent much of their time in making finished copies, is well known to all who are conversant with the art of painting.

To suppose that the complication of powers, and variety of ideas necessary to that mind which aspires to the first honours in the art of painting, can be obtained by the frigid contemplation of a few single models, is no less absurd than it would be in him who wishes to be a poet, to imagine that by translating a tragedy he can acquire to himself sufficient knowledge of the appearances of nature, the operations of the passions, and the incidents of life.

The great use in copying, if it be at all useful, should seem to be in learning to colour; yet even colouring will never be perfectly attained by servilely coping the model before you. An eye critically nice can only be formed by observing well-coloured pictures with attention; and by close inspection and minute examination, the student will discover, at last, the manner of handling, the artifices of contrast, glazing, and other expedients, by which good colourists have raised the value of their tints, and by which nature has been so happily imitated.

It must be noted, however, that old pictures, deservedly celebrated for their colouring, are often so changed by dirt and varnish, that we ought not to wonder if they do not appear equal to their reputation in the eyes of inexperienced painters or young students An artist whose judgment is matured by long observation, considers rather what the picture once was, than what it is at present. He has by habit acquired a power of seeing the brilliancy of tints through the cloud by which it is obscured. An exact imitation, therefore, of those pictures, is likely to fill the student's mind with false opinions, and to send him back a colourist of his own formation, with ideas equally remote from nature and from art, from the genuine practice of the masters, and the real appearances of things.

Following these rules, and using these precautions, when the student has clearly and distinctly learned in what good colouring consists, he cannot do better than have recourse to nature herself, who is always at hand, and in comparison of whose true splendour the best coloured pictures are but faint and feeble.

However, as the practice of copying is not entirely to be excluded, since the mechanical practice of painting is learned in some measure by it, let those choice parts only be selected which have recommended the work to notice. If its excellence consists in its general effect, it would be proper to make slight sketches of the machinery and general management of the picture. Those sketches should always be kept at hand for the regulation of the student's style. Instead of copying the

touches of those great masters, copy only their conceptions; instead of treading in their footsteps, let him endeavour only to keep the same road; let him labour to invent on their general principles and way of thinking; let him possess himself with their spirit; and consider with himself how a Michael Angelo or a Raphaël would have treated the subject; and work himself into a belief that his picture is to be seen and criticised by them when completed. Even an attempt of this kind will rouse his powers.

But as mere enthusiasm will carry him but a little way, we will recommend a practice that may be equivalent to, and will perhaps more efficaciously contribute to his advancement, than even the verbal corrections of those masters themselves, could they be obtained. What we would propose is, that he should enter into a kind of competition, by painting a similar subject, and making a companion to any picture that he considers as a model. After he has finished his work, let him place it near the model, and compare them carefully together. He will then not only see but feel his own deficiencies more sensibly than by precepts or any other means of instruction. The true principles of painting will mingle with his thoughts. Ideas thus fixed by sensible objects, will be certain and definite; and sinking deep into the mind, will not only be more just but more lasting than those presented to him by precepts only; which will always be fleeting, variable, and undetermined.

This method of comparing his own efforts with those of some great master, is indeed a severe and mortifying task, to which none will submit but such as have great views, with fortitude sufficient to forego the gratifications of present vanity for future honour. When the student has succeeded in some measure to his own satisfaction, and has felicitated himself on his success, to go voluntarily to a tribunal where he knows his vanity must be humbled, and all self-approbation must vanish, he requires not only great resolution but great humility. To him, however, who has the ambition to be a real master, the solid satisfaction which proceeds from a consciousness of his advancement (of which seeing his own faults is the first step), will very abundantly compensate for the mortification of present disappointment. There is, besides, this alleviating circumstance. Every discovery he makes, every acquisition of knowledge he attains, seems to proceed from his own sagacity; and thus he acquires a confidence in himself sufficient to keep up the resolution of perseverance.

Most students must have experienced how lazily, and consequently how ineffectually, instruction is received when forced upon the mind by others. Few have been taught to any purpose, who have not been their own teachers. We prefer those instructions which we have given ourselves, from our affection to the instructor; and they are more effectual, from being received into the mind at the very time when it is most open and eager to receive them.

(To be continued.)

Chinese Canals, &c.

Of the external civilisation of China, we have a striking proof and a standing monument in the construction of so many canals that intersect the whole country, and in everything connected therewith. As the extraordinary fertility of the soil is produced by the many rivers of greater or less magnitude that intersect the country, but which, at the same time, threaten the flat plains with inundation, it is the first object and most important care of government to avert the danger of such inundations, to distribute the fertilising waters in equal abundance over the whole country, and thus, by means of canals, to maintain in all parts the communication by water, which is, at the same time, of equal benefit and importance to industry and internal commerce. In no civilised state are establishments of this kind so extensively diffused and brought to so high a state of perfection as in China. The great Imperial Canal, which extends to the length of 120 geographical leagues, has, it is said, no parallel on the earth. Although the construction of canals, and all the regulations on water carriage could have attained by degrees only to their present state of perfection, still this alone would prove the very early attention which this people had bestowed on the arts of civilised life. Mention is often made of them in the old Chinese histories and imperial annals; and the canals of China, like the Nile in Egypt, were ever the objects of most anxious solicitude to the government. These annals, whenever they have occasion to speak of those great inundations and destructive floods which are of such frequent occurrence in Chinese history, invariably represent the attention bestowed on water-courses and water regulations as the most certain mark of a wise, benevolent, and provident administration. On the other hand, the neglect of this most important of administrative concerns is ever regarded as the proof of a wicked, reckless, and unfortunate reign; and in these histories some great calamity, or even violent catastrophe, is sure to follow, like a stroke of divine vengeance, on this unpardonable neglect of duty. Together with the Imperial Canal, the great Chinese wall, which extends on the northern frontier of China Proper, to the length of 150 geographical leagues, is another no less important and still standing monument of the comparatively high civilisation which this country had very early attained. Such is the height and thickness of this wall, that it has been calculated that its cubic contents exceed all the mass of stone employed in all the buildings in England and Scotland; or, again, that the same materials would serve to construct a wall of ordinary height and moderate thickness round the whole earth!—*Frederick Von Schlegel's "Philosophy of History."*

Utrecht Church.—This curious old structure has been burnt down, through defects in the stoves it is thought.

Lessons in Drawing.

THE TREFOIL.

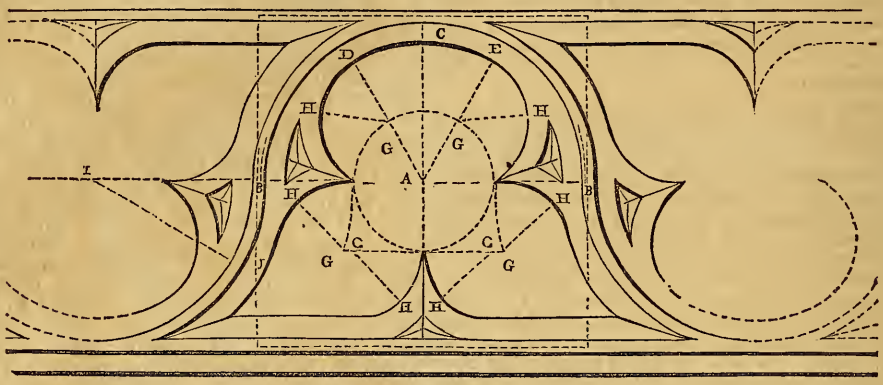


Fig. 1.

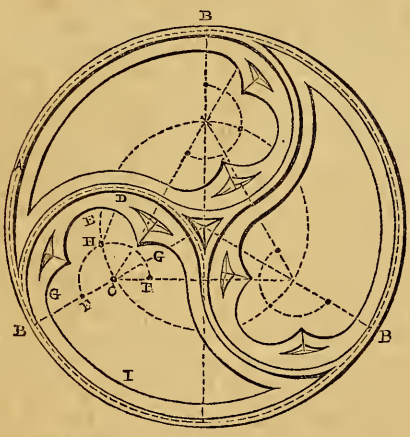


Fig. 2.

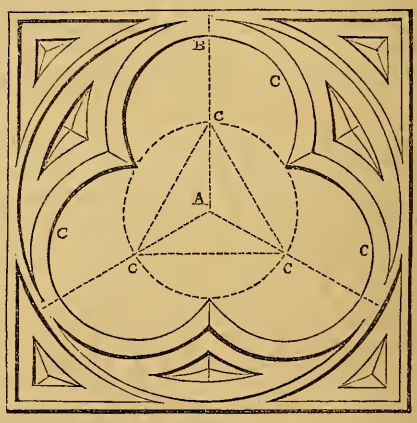


Fig. 3.

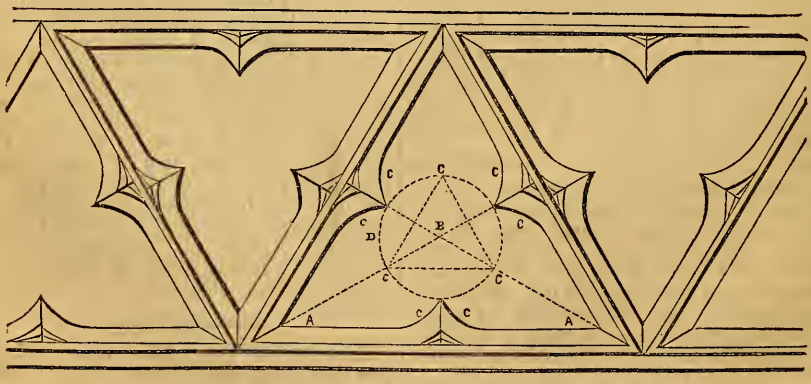


Fig. 4.

Fig. 1.

To draw a trefoil parapet between two given distances, it is first necessary to form a horizontal line upon which any number of equal divisions may be marked; when this is effected, describe on each alternate division, as at A, the semicircle B B; the ends of the parapet to terminate with a quarter of a circle. Determine the width of the mouldings B C; then take half the distance between A C, and strike the dotted circle; from I strike the dotted line terminating at G; from A strike the arc D E; from the points G strike the arcs H; and from the point I strike the lower arc J, which will give the form required.

Fig. 2.

Describe the circle dotted at A, then divide it into three equal parts, B B B; on the line C take a division something less than half, for if half were to be taken the circles would overlap, so that the circles meet at the perpendicular line; the contour of the figure will then be produced. The mouldings must now be placed on each side of the one now formed, that being retained as a centre. From the point C strike the semicircle D; and after determining the width of the moulding D, take half the width C E, and strike the semicircle F F. From the points F F strike the arcs G G, and from the point H strike the semicircle E, the arc I being struck from the centre of the circle.

Fig. 3.

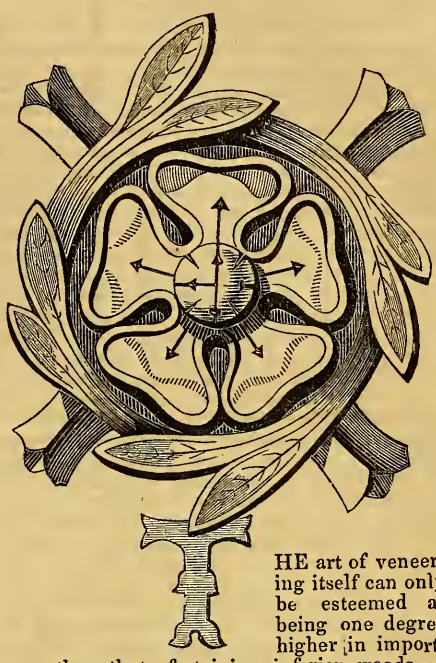
Describe the outer circle and divide it into three equal parts, then take half the distance from the centre A to the outside, and strike the dotted circle; from the points C C C strike the semicircles C C C.

Fig. 4.

Another description of parapet formed by rule as above. First form a triangle, and divide the sides into two equal parts; then draw a line from the centre to the points A A, the intersecting of which will produce the centre B; divide the line from the point B to the triangle into three equal parts, two of which will give the size of the circle D; from the points C C C describe the arcs C C C, and the form will be obtained.

EXPERIMENTS ON CAST-IRON.—Some experiments made at the Crane Foundry on the relative strength of cast-iron, *chilled* and *unchilled*, showed that the process of chilling gave a superior strength of 17 per cent. The following experiment was tried on four bars, cast in the form of a double-faced railway rail, 1¼ in. deep, ½ in. wide at top and bottom, and ¼ in. in the centre—the length of each bar was 18 in., and 15 in. between the supports. No. 1 was cast in green sand; No. 2 in dry sand; No. 3 cast in a chill; and No. 4 in a chill, and afterwards annealed. No. 1 weighed 32·5 ozs., bore 1,232 lbs., and deflected ·130 in. No. 2 weighed 30·5 ozs., bore 1,008lbs, and deflected ·114 in.; No. 3 weighed 34·75 ozs., bore 784lbs., and deflected ·053 in.; and No. 4 weighed 34·5 ozs., bore 2,520lbs., and deflected ·148 in. The advantages in favour of cast-iron, treated as No. 4, is evidently little less than 100 per cent. over No. 1, and 300 per cent over No. 3.

Imitation of Foreign Woods.



THE art of veneering itself can only be esteemed as being one degree higher in importance than that of staining inferior woods so as to combine the excellence of those of a superior description with the cheapness of the other, must certainly rank; and as every species of information upon such a subject must be extremely valuable, we here present the translation of a paper on the "Imitation of Foreign Woods," presented by M. Morin at a late meeting of the Société d'Encouragement:—

"The colouring of wood is entirely a chemical art, and consists in dyeing the ligneous fibre by the introduction of colouring matters into the substance of the wood. This art applied to the woods the growth of our own soil, has for its object to replace in cabinet work and other ornamental purposes, the more expensive woods which we at present import from foreign countries, such as mahogany, rosewood, ebony, &c., and which can by this process be completely rivalled, as well in beauty and richness of colour, as in variety of shade and accidents of veinage. All the attempts made up to the present time to colour large or even small pieces of wood, have afforded only products but little made known, and but little sought after; on the one hand the expenses of the preparation have appeared too high, and on the other, the coloured woods have almost always presented tints and shades in themselves false, or deficient in general in harmony, strength, and durability; such woods, therefore, could not, on these accounts, enter into competition with the woods of foreign growth.

"When I commenced my new researches, the colouring of woods appeared to me to be still in the state of experiment, there being, if I may so say, only a theoretical consumption, without any direct or useful applications.

"This want of success in so many instances, in an age when industry is making such rapid strides, has discouraged the greater number of experimenters, and has made it appear that so far as relates to the application of coloured woods to useful purposes, the difficulties were insurmountable; so that for some years the preparation of coloured woods has been almost forgotten or abandoned, and the researches have been directed only to the methods for the preservation of wood, more especially for that employed in the construction of our railways.

"I sometimes think that the experimenters have for the most part wanted patience; and that in their researches, too often left to hazard, they have neglected the most elementary principles of organic chemistry, and of vegetable physiology; and have not paid sufficient attention to the modes adopted for dyeing vegetable tissues similar to, or analogous with, those of our indigenous woods. It is by applying the well known and admitted principles of dyeing to the colouring of woods, and by studying the physiological organisation of the wood, that I have arrived at the removal of the difficulties which others have experienced, and have been enabled to place the colouring of woods on what I consider a solid basis.

"It has always appeared to me that the most simple and natural plan of colouring wood was to apply the process made use of in dyeing cotton, flax, and hemp, which are all vegetable substances. What, then, is the process employed for dyeing these? We first submit the cotton, the flax, or the hemp, to certain preparatory operations, which have for their object to bring their fibres or their tissues into the best possible condition to receive and fix the colours to be employed; without these needful preparations, dyeing is almost impossible, or if it does take place, neither solidity nor durability are obtained. The same preparation is absoultely necessary for woods, and hence, in my opinion, the failure of other experiments on the colouring of wood, because they have neglected these preparations. In my researches on the subject, I have had numberless difficulties to surmount, for we cannot always apply purely and simply to the colouring of woods the same processes which are used for cotton, flax, and hemp. Woods in their variable natures and constitutions present different conditions, which it is necessary to take into account in colouring them, nor can blocks and square pieces of wood be managed and treated as parcels or skeins of cotton, flax, or hemp.

"The principle of the colouring of woods, thus well established and determined, the next point is to adapt to this principle the modes of impregnation or injection at once the most simple, rapid and economical. I will, now, therefore, enter into some general explanations.

"The art of dyeing or colouring of wood, consists of fixing in the vegetable fibre all the colours, as well as the shades of tints, in such a manner as that they will not undergo alteration from the agents to which they are or can be exposed. Air, and especially light, are the most ordinary causes of the alteration of colours, and this alteration depends on the adhesion, more or less powerful, of the colouring matter to the woody fibre. To prepare the wood to combine with the colouring matter, I first submit it to the operations of washing it with an alkaline solution, or of bleaching it (*lessivage ou blanchement*); this previous operation renders the woody fibre as clean as possible, after which the colouring matter is more readily absorbed, and adheres with greater force to the vegetable fibre.

"In certain cases the wood is bleached in order that it may reflect the light in a less degree, and that the tints produced by the colouring matter may become more pure and brilliant. After the washing, follows the introduction of mordants, in order to obtain the colour or shade required. The mordants act as intermediaries between the colouring particles and the woody fibre to be dyed, to facilitate their combination, and at the same time modify their action.

"When the wood has undergone these preparations it is perfectly ready to be coloured. It is not always necessary to commence with the washing, especially if it be wished to obtain deep shades or tints; but the washing is quite indispensable when it is wished to remove from the wood all matters which, by their re-action, can in any way modify or alter the colouring effect required to be produced. Thus, for example, tannin being very suitable to render the colours imparted by Brazil wood durable, those kinds of wood which contain tannin should not be washed. But if we require to use a salt of iron in the colouring of a wood, in which the tannin would injure the tints and shades wished to be produced; in that case the washing should be thoroughly performed. I have carried my researches still further, and have endeavoured to overcome the resistance offered in many cases by the woody fibre to the operations of dyeing. It is well known that animal substances have the property of entering most completely into combination with colouring matters, and thus to form colours solid and durable. To communicate this property to woody fibre, the idea presented itself to my mind, of animalising the wood, which I effect by washing it with sheep's dung, or a weak solution of urine, &c. Having thus established the basis of the art of colouring wood, the next consideration is the best method of injection or impregnation. From what has already been said, it will be seen that all the operations of colouring cannot be performed either by simple immersion, or steeping, or by the action of a vacuum, or of pressure in a case or cylinder perfectly air-tight, or by vital suction, or by the ordinary methods of filteration. The principle by which I effect the impregnation of wood is not new, but the applications which I have made are new, and the results at which I have arrived appear to me preferable to all others I know. The injection or impregnation is made

either by means of an exhausting pump, or a force pump.

"In the former case, one of the ends of the piece of wood is placed in contact with the liquid, and the other end in connection with one of Stoltz's rotatory pumps. In the second case, the liquid is introduced by the pressure exercised on the liquid by means of a force-pump; and I have for these two modes of operation expressly prepared apparatus which will permit the introduction and complete passage through the wood of any kind of liquid, hot or cold, whatever may be the size or hardness of the wood."

Varnishes.

(Continued from page 13.)

70. *French Polish.*

Dissolve one part of gum mastic and one part of gum sandarach in forty parts of spirit of wine, and then add three parts of shell-lac. This process may be performed by putting the ingredients into a loosely corked bottle, and then placing it in a vessel of water heated to a little below 173 deg., Fah., or the boiling point of spirit of wine, until the solution be effected; the clear solution may then be poured off into another bottle for use.

[The mode of application necessary for French polish differs from that of ordinary varnishes, being effected by rubbing it upon the surface of the material requiring polishing with a fine cloth, and using oil and spirit of wine during the process. In applying it to large surfaces, use a rubber formed of a flat coil of thick woollen cloth, such as drugget, &c., which must be torn off the piece in order that the face of the rubber, which is made of the torn edge of the cloth, may be soft and pliant, and not hard and stiff, as would be the case were it to be cut off, and therefore be liable to scratch the soft surface of the varnish. This rubber is to be securely bound with thread, to prevent it from uncoiling when it is used; and it may vary in its size from one to three inches in diameter, and from one to two inches in thickness, according to the extent of the surface to be varnished. The varnish is to be applied to the middle of the flat face of the rubber by shaking up the bottle containing it against the rubber; it will absorb a considerable quantity, and will continue to supply it equally, and in a due proportion to the surface which is undergoing the process of polishing. The face of the rubber must next be covered by a soft linen cloth doubled, the remainder of the cloth being gathered together at the back of the rubber to form a handle to hold it by, and the face of the cloth must be moistened with a little raw linseed oil* applied upon the finger to the middle of it, and the operation be commenced by quickly and lightly rubbing the surface of the article to be polished in a constant succession of small circular strokes; and the operation must be confined to a space of not more than ten or twelve inches square, until such space is finished, when an adjoining one may be commenced and united with the first, and so on until the whole surface is covered. The varnish is enclosed by the double fold of the cloth, which, by absorption, becomes merely moistened with it, and the rubbing of each piece must be continued until it becomes nearly dry. The rubber may, for a second coat, be wetted with the varnish without oil, and applied as before. A third coat may also be given in the same manner; then a fourth, with a little oil, which must be followed, as before, with two others without oil; and thus proceeding until the varnish has acquired some thickness, which will be after a few repetitions, and depends on the care that has been taken in finishing the surface. Then a little spirit of wine may be applied to the inside of the rubber after wetting it with the varnish, and being covered with the linen as before, it must be very quickly and uniformly rubbed over every part of the surface, which will tend to make it even, and very much conduce to its polish. The cloth must next be wetted a little with spirit of wine and oil without varnish, and the surface being rubbed over with the precautions last mentioned, until it is nearly dry, the effect of the operation will be seen; and if it be found that it is not complete, the process must be continued, with the introduction of spirit of wine in its turn, as directed, until the surface becomes uniformly smooth, and beautifully polished. The work to be polished should be placed opposite to the light, in order that the effect of the polishing may be better seen. In this manner a surface of from one to eight feet square may be polished at once, and the process, instead of being limited to the polishing of rich cabinets or other smaller works, can now be applied to tables, and other large pieces of furniture with very great advantages over the common method of polishing with wax, oils, &c. In some cases it is considered preferable to rub the wood over with a little oil applied on a linen cloth before beginning to polish; but the propriety of this method is very much doubted. When the colour of the wood to be polished is dark, a harder polish may be made by making the composition of one part of shell-lac, and eight parts of spirit of wine, and proceed as before directed. For work polished by the French polish, the recesses or carved work, or where the surfaces are not liable to wear, or are difficult to be got at with the rubber, a spirit varnish made without lac, and considerably thicker than that used in the foregoing process, may be applied to those parts with a brush or hair pencil, as is commonly done in other modes of varnishing. French polish is not proper for dining tables, nor for anything where it is liable to be partially exposed to considerable heat.]

* This may be either coloured with alkanet root or not.

(To be continued.)

Artistic Societies

SOCIETY OF ARTS.

Lithography.—At a meeting of this society on the 22nd ult., Mr. S. Williams read a comunication "On the Progress of Lithography in England," and observed that lithography was an art comparatively new to us, scarcely half a century having elapsed since its discovery and introduction; yet how rapid, how brilliant, had been its progress! To the great masses of the people, who were more familiar with, and more accustomed to, the highly-finished productions of the steel-engraver, lithography was new, and was too apt to be regarded as an accessory of art. Lithography had however attained, and was well deserving a far higher position; it was an ally, not an enemy to engraving. In its present state, the artist could by its aid produce pictures conveying his peculiar style and character, that the engraver could never hope to approximate. The discovery of lithography was, like that of many other important inventions, the effect of accident. About the year 1795, Sennefelder, an actor of some pretensions to histrionic fame, who had quitted the stage to become dramatist, being in needy circumstances, and not having the means to print his productions, was in the habit of writing them backward on plates of copper, with a hard greasy ink, and from these taking impressions on paper. Copper being too expensive, he next tried tin, but with little success. He then had recourse to Kelheim-stone. He procured these in slabs, polished them, and covering them with a composition, wrote upon them with a steel-pen, and applying acid, bit in the writing. From these he took impressions. But this was not lithography; etching on stone having been practised long before. Accident, however, revealed to him the true method. He says, "I had just succeeded in my little laboratory in polishing a stone-plate which I intended to cover with etching ground, in order to continue my exercises in writing backward, when my mother entered the room, requiring me to write a washing bill, it so happened there was not a morsel of writing paper or ink at hand, nor had we any one to send for a supply of these materials. As the matter would admit of no delay, I resolved to write with my ink, prepared with wax, soap, and lamp-black, upon the stone I had just polished; some time after requiring this stone for use, the writing being as I had left it, it occurred to me whether I could not bite in the stone with acid, leaving the writing in relief; and thus was lithography discovered. Here, again, however, Sennefelder was is another difficulty: he was without the means to turn his invention to any benefit to himself, being unable to employ a printer to carry out his ideas; he, therefore, determined to become a journeyman printer and learn for himself. The sight of a sheet of music in a shop window, induced him to apply his new art to this purpose, and the printing of music was the first subject that lithography was practically applied to; gradually it became more extensively known; Baron Aretin, in Munich; Count Lastegrie, in Paris; and Mr. Ackerman, in London, fostered the rising art. In 1819, Sennefelder's account of lithography appeared, the frontispiece being a portrait of the author, executed by himself; the countenance, it may be remarked, exhibiting an indomitable will and energy. Mr. Hullmandel, who also partakes largely of the persevering skill and patience of his predecessor in this art, was the first to perceive that the difficulties that prevented the progress of lithography, were chiefly of a chemical nature; he, therefore, studiously applied himself to the study of that science, and, having mastered it, introduced many important improvements. The first work published under his superintendence, was a series of views illustrative of Belzoni's travels. The stone most favourable for lithographic purposes, is a calcareous slate peculiarly tenacious of grease, and imbibing water with avidity. Stones of the best quality are procured from the quarries of Solenhoffen, in Bavaria, much of the beauty of the drawing depending on the goodness of the stone. Among many others that have been tried as a substitute for the Bavarian, is the Bathlias; but this has been found too soft. To an artist with a feeling for his art, a free and vigorous hand, a keen perception of form, lithography offers peculiar advantages; and the success that has attended even the first efforts of those possessed of these qualifications, is certainly an inducement to artists generally to make the attempt. The drawing having been made with a hard greasy ink, the printer subjects the stone to the action of dilute nitric acid, leaving the drawing slightly in relief. The stone is then washed with turpentine, leaving only the grease in the stone. In this state it is ready for press. Previous to taking impressions, a wet sponge is passed over the surface of the stone; as the grease in the stone repels the water, so the water in turn repels the greasy ink. Considerable nicety is required in the manipulation, and attention to the minutiæ connected with this art: thus, if the granulated surface of the stone is too open, the drawing will be coarse; if too fine, the light tints will be clogged up; in short, the drawing should be executed with a light free hand, and at once, as it cannot be retouched without injury. Again, if the acid is too powerful, the tints will be bit away; if too weak, the dark tints will be dull and heavy. The various methods used in the practice of lithography were explained. Our limited space will not permit us to follow these in their details. In the chalk mode, the drawing is made with hard black grease on a granulated stone. In the ink mode, liquid grease is used. In the engraved mode, the surface of the stone is incised with an etching point, and the incisions filled with grease. In the transfer mode, the drawing is made on prepared paper, and from thence transferred to the stone. Mr. Hullmandel introduced a method of graduating the neutral tints. This important improvement enables the artist to produce very beautiful atmospheric effects. Harding's "Sketches at Home and Abroad," Roberts's, Stanfield's and

Haghe's sketches, and many others, are executed in this superior style of lithography. In its application to printing in colours, Mr. Owen Jones's success in illuminated printing, deserves especial mention. This gentleman, while visiting the Alhambra in Spain, was so struck with the exquisite beauty of this gorgeous specimen of Moorish architecture, that he made drawings of every portion of the building, copying with minute fidelity every part of its superb decoration; after his return to England he produced his magnificent work, "The Alhambra," executed in illuminated lithography, by himself. When it is stated that every colour is printed from a separate stone, some faint idea may perhaps be formed of the arduousness of the task; thus the outline is drawn in black ink; then transferred to as many stones as there are colours to be introduced; thus the parts that are to be red are filled in on one stone; another is used for blue, and so on, throughout the series; and these, when printed, must "register" with mathematical precision. Mr. Hullmandel's invention of lithotint, and his improved process of drawing with the stump on stone, the process of zincography, and its extensive application, also the anastatic process was referred to, and sanguine hopes entertained of its increasing usefulness. The paper concluded with a suggestion for the establishment of a lithographic club, the object of which should be the production of first-class lithographs, by the best artists, and produced with every care; members to be entitled to one copy of each work.

The Secretary then proposed the immediate formation of a lithographic club; several gentleman present put down their names as subscribers. The subscription, we understood, was to be one guinea per annum.

Discovery of an Oil Spring.—A few months since (see vol. i., p. 115) we announced the formation of a company in France, having for its avowed purpose the extraction of oil from a strata of rock in the vicinity of Autun; but it appears that Nature has already provided for its production in another way, for, according to the *Patent Journal*, generally an excellent authority with regard to the scientific affairs of our Gallic neighbours, a very precious discovery has recently been made at Petite Rossille, in the department of the Moulle. Soundings were being taken, when a flow of oil, perfectly pure and fine, was suddenly discovered at a depth of 121 metres. The force of the flow is one metre in ninety.

New Patent Rotary Engine.—The statement made with regard to this invention in a former number (see p. 20, *ante*) has been now in every way confirmed. In addition to the information we have already given respecting it, we may state, upon the authority of Captain Fitzmaurice, the officer appointed by the Admiralty to report upon its capabilities, that it works at a velocity without any perceptible friction, that it has no "dead point," and works at full power up to the size required.

Ivory Paper.

The objections urged against the employment of ivory for portraits, &c., are, its high price; the impossibility of obtaining plates exceeding very moderate dimensions, and the coarseness of grain in the larger of these; its liability, when thin, to warp by changes of the weather; and its property of turning yellow by exposure to the light, owing to the oil which it contains. The superiority of ivory paper to ivory itself, consists firstly, in the colours laid on not being liable to get injured from the effects of the transudation of the animal oil, as in the case of ivory; secondly, the possibility of obtaining superficial dimensions, much larger than the largest ivory, the colours being washed off the ivory paper more completely than from ivory itself; and the process may be repeated three or four times on the same surface, without rubbing up the grain of the paper. It will also, with proper care, bear to be scraped with the edge of a knife, without becoming rough. Traces made on the surface of this paper by a hard black-lead pencil, are much easier effaced by means of India-rubber, than from common drawing-paper; and thirdly, it is superior to ivory itself, in the whiteness of its surface, in the facility with which it receives colour, and in the greater brilliancy of the colours when laid on. Owing to the superior whiteness of the ground, together with the extremely fine lines which its hard and even surface is capable of receiving, it is peculiarly adapted for the reception of the most delicate kind of pencil drawings and outlines.

The following details of the method of preparing this paper may not prove uninteresting to many of our readers:—

Take a quarter of a pound of clean parchment cuttings, and put them into a two-quart pan, with nearly as much water as it will hold; boil the mixture gently for four or five hours, adding water from time to time to supply the place of that driven off by evaporation; then carefully strain the liquor from the dregs through a cloth, and, when cold, it will form a strong jelly, which may be called size, No. 1; return the dregs of the preceding process into the pan, fill it up with water, and again boil it as before for four or five hours; then strain off the liquor, and call it size, No. 2; take three sheets of drawing-paper (outsides will answer the purpose perfectly well, and being much cheaper, are, therefore, to be preferred); wet them on both sides with a soft sponge dipped in water, and join them together with the size, No. 2. While they are still wet, lay them on a table, and place upon them a smooth slab of writing slate, of a size somewhat smaller than the paper, and turn up the edges of the paper and glue them on the back of the slate, and then allow the paper to dry gradually. Wet, as before, three more sheets of the same kind of paper, and glue them on the others, one at a time, carefully removing all air-bubbles, by wiping from the centre outwardly. Cut off with a knife what projects beyond the edges of the slate; and when the whole has become

perfectly dry, wrap a small flat piece of slate in coarse sand-paper, and with this rubber make the surface of the paper quite even and smooth; then glue on an inside sheet, previously wetted, which must be quite free from spots or dirt of any kind; cut off the projecting edges as before, and when dry, rub it with fine glass-paper, which will produce a perfectly smooth surface; now take half a pint of the size, No. 1, melt it by a gentle heat, and stir into it three table spoonfuls of fine plaster of Paris. When the mixture is completed, pour it out on the paper, and with a soft wet sponge, distribute it as evenly over the surface as possible, then allow the surface to dry slowly, and rub it again with fine glass-paper. Lastly, take a few spoonsful of the size, No. 1, and mix with it three-fourths its quantity of water; unite the two by a gentle heat, and when the mass has cooled, so as to be in a semi-gelatinous state, pour about one-third of it on the surface of the paper, and spread it evenly with the wet sponge; when this has dried, pour on another portion in the same manner, and spread it; and afterwards the remainder, and diffuse it uniformly: when the whole has again become dry, rub it over lightly with fine glass-paper, and the process is completed. It may now be cut away from the slab of slate, and is ready for use.—The quantity of ingredients above mentioned, is sufficient for a piece of paper 17½ inches by 15½. Plaster of Paris gives a perfectly white surface; oxide of zinc, mixed with plaster of Paris, in the proportion of four parts of the former to three of the latter, gives a tint very nearly resembling ivory; precipitated carbonate of barytes, gives a tint intermediate between the two.

Notices to Correspondents.

NOTICE.

To House Decorators, Grainers, Cabinet Makers, &c.—Beautifully coloured Specimens of the various Woods and Stones will be presented to our Subscribers monthly. The first Plate is in the hands of our Engraver, and will be shortly ready for delivery. Each Plate will contain four Specimens, while its size will adapt it for binding in the Work. A series of Articles will also be commenced, describing the different varieties of Wood and Stone.

Notice. —All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the Decorator's Assistant, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** Part VIII. of the Decorator's Assistant, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I., II., III., IV., V., VI., and VII. still continue on sale. As the demand for the Back Numbers of this Work is very great, and as there is every probability of their soon becoming exceedingly scarce, new Subscribers are respectfully requested to complete their Sets without delay.

Vol. I. is now ready, beautifully bound in scarlet cloth, gilt and lettered, price 5s. Embossed Cases may be had for binding in, price 1s. 3d. each.

ANSWERS TO QUERIES.

Reduced Brickwork.—Sir,—In answer to "H. J." I beg to forward the following:—85 ft. at 1 course thick eq. 21 ft. 3 in. super. at 2½ bricks thick, mult. by 5 div. by 3 eq. 35 ft. 5 in. at 1½ brick thick; 84 ft. at 1 course thick eq. 21 ft. super. at 2 bricks thick, mult. by 4 div. by 3 eq. 28 ft. at 1½ brick thick; 4 ft. 3 in. at 1 course thick eq. 1 ft. 0 in. 9 sec. super. at 2 bricks thick, mult. by 4 div. by 3 eq. 1 ft. 5 in. at 1½ brick thick; 2 ft. 3 in. at 1 course thick eq. 6 in. 9 sec. super. at 1½ brick thick.

ft.	in.		ft.	in.	sec.
85	0	.. ..	35	5	0
84	0	.. ..	28	0	0
4	3	.. ..	1	5	0
2	3	.. ..	0	6	9

Total 65 4 9 = contents at 1½ brick thick.

Timon.

Sir,—I beg to inform "H. J." that the proper way to measure brick footings is to multiply the length and height together, and the product by the number of half-bricks in thickness, and ultimately divide the product by 3, and the quotient will be the answer in reduced feet, which, if they exceed 272, they may be divided by that number, and the number of rods will be the quotient, and the remainder feet of the standard thickness, or 1½ brick thick. Example:—

ft.	in.	
85	0	
0	3	height of 1 course.
21	3	
0	5	

a lf-brick, or standard thickness } 3) 106 3 (35 5-12 ft. of stan. thickness.

The same rule serves for the other dimensions, and the whole must ultimately be added together. Another way is to find the average dimensions, and work it in one operation, thus—half-brick thick:—

	ft.	in.	
5	85	0	
4	84	0	
4	4	3	
3	2	3	
4) 16 (4 aver. of half-bricks.			
No. of dem. 4)	175	6 (43	10 plus aver. of length
height		0	
		43	10
		4	
	3) 175	4 (55 ft. 1 in. of the standard thickness	

Yours, &c., Lignarium.

A. Farbeother (Oxford).—It was a typographical error, to which all compositors are liable in "setting up" their copy. Choragic monuments were monuments erected by the ancient Greeks in honour of those who gained a prize at Choragus, or leader of the choruses, in their games. We are obliged for your offer, and shall gladly avail ourselves of it. Your design is in the hands of our engraver.

Libra (Chatham).—"Register" is preserved at the common hand printing presses by means of what are technically called "points," which are small strips of iron, on the flat surface at one end of which are placed small steel pins; these are so placed on the "tympan" as to allow of their piercing every sheet of paper "laid on," so as to hold it in a straight position. "Points" are not used, and neither are they required, for printing by means of machines; but as many people have a *penchant* for the old method, and send in work to a printing office with an order that it be executed by the hand-press, printers very often affix points to the cylinders of their machines in order to deceive their customers into a belief that their injunctions have been obeyed.

W. L. (Islington).—The problem you have sent for solution is very old and very simple. Reduce the square sides of an acre to a circle, and take half the diameter; there will be a difference of about as 21 : 22, which has been calculated to 100 decimals; but the above rule is sufficient for all practical purposes.

Erratа.—In the paragraph headed "Architectural Antiquities," page 92, *ante*, second line from bottom, *for* "place" *read* "plan;" and in page 95, first column, 15th line from top, *for* "Mr. Edmund Arkin" *read* "Mr. Edmund Aikin."

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 101.)

Casque, a helmet.

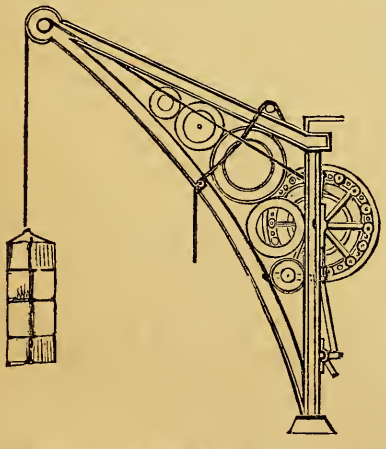
King.

Nobility.

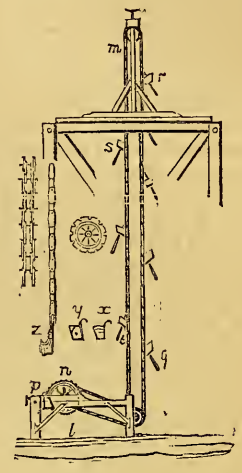
Knight.

Esquire.

Crane, a machine employed to raise or lower heavy weights, &c. The commonest form is merely that of a beam laid horizontally on the top of a perpendicular one, and having a pulley at the extremity of the arm. But as this would not prove sufficient for the various purposes to which the crane is required to be applied, some very ingenious and elaborate pieces of mechanism have been invented, of which the following may serve as an example :—



Under this term we may also include an ingenious invention made by Dr. Spurgin for facilitating the operations of bricklayers, &c., by raising bricks, mortar, &c., for which purpose labourers are commonly employed. *m p l* is an endless chain turning round three wheels, the necessary motion being given by the wheel *n*. The hods are affixed to the chain as at *t s*, and after being drawn up to the scaffolding shown in the engraving, are emptied of the contents, and lowered by being affixed to the opposite side of the chain as at *r g*. The figures *x y* show an improvement suggested by the inventor, consisting in the employment of pails of the shape shown, by which means the space occupied by the handles of common hods will be entirely done



away with. *z* shows one of these pails attached to a portion of the chain. The furthest figure to the left is a front view of the chain. The detached wheel shown in the engraving is that employed for giving motion to the chain.

Cupola, a dome.

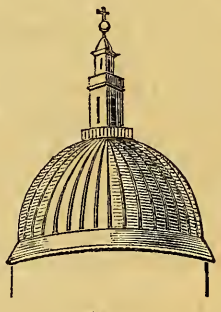


Fig. 1.

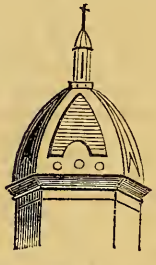


Fig. 2.

(To be continued.)

Central Heat of the Earth.

The theory which assumes that at a certain depth below the surface of the earth, a volcanic influence is existant, sufficiently powerful to preserve matter in a state of igneous fluidity, is well known to every one acquainted with the science of geology. This theory, however, although it might have appeared probable at a period when but little attention was paid to the subject, is soon dispelled upon the application of calm reason to its consideration. Necessarily confined as are geological researches to a comparatively small section of the earth, there are but few data upon which even a plausible conjecture can be founded as to the state of its centre, but everything tends materially to upset the doctrine of Leibnitz with regard to the above-mentioned circumstance. Thus we have in the sea, for instance, a conclusive proof that the temperature of water diminishes from the surface downwards at the mean rate of one degree in twenty-eight fathoms in temperate latitudes, and one degree in twenty-five fathoms in the tropics. Why, then, are we to suppose that the contrary is the case with regard to the earth? "The upturned strata of the earth," says a writer in the *Westminster Review*, "expose rocks which, when in their original horizontal position, are in some instances supposed to have been buried upwards of twenty miles below the present surface; but a rupture even of this extreme depth is, as compared with the distance of the centre from the surface (3,956 miles) but as the scratch of a pin on the rind of an orange." That there are many volcanoes which have their origin at a very great depth below the earth's surface, we by no means intend to deny, but these, it should be remembered, are but merely isolated cases of unfrequent occurrence, and in no instances of sufficient magnitude to warrant us in the belief that they are fed by an inexhaustible fire, pervading the very heart of nature.

In Lyell's "Principles of Geology" we find the following most conclusive argument adduced:—

"In Mr. Daniel's recent experiments, for obtaining a measure of the heat of bodies at their point of fusion, he invariably found that it was impossible to raise the heat of a large crucible of melted iron, gold, or silver, a single degree beyond the melting point, so long as a bar of the respective metals was kept immersed in the fluid portions. So in regard to other substances, however great the quantities fused, their temperature could not be raised while any solid pieces immersed in them remained unmelted, every accession of heat being instantly absorbed during their liquefaction. These results are, in fact, no more than the extension of a principle previously established, that so long as a fragment of ice remains in water, we cannot raise the temperature of the water above 32 degrees Fah. If, then, the heat of the earth's centre amount to 450,000 degrees Fah., as Mr. Cordier deems highly probable—that is to say, about twenty times the heat of melted iron, even according to Wedgewood's scale, and upwards of 160 times according to the improved pyrometer—it is clear that the upper parts of the fluid mass, could not long have a temperature only just sufficient to melt rocks. There must be a continual tendency towards a uniform heat; and, until this were accomplished by the interchange of portions of fluid of different densities, the surface could not begin to consolidate. Nor, on the hypothesis of primitive fluidity, can we conceive any crust to have been formed until the whole planet had cooled down to about the temperature of incipient fusion.

"It may be said that we may stand upon the hardened surface of lava current while it is still in motion—nay, may descend into the crater of Vesuvius after an eruption, and stand on the scoriæ while every crevice shows that the rock is red-hot two or three feet below us; and at a somewhat greater depth, all is, perhaps, in a state of fusion. May not, then, a much more intense heat be expected at the depth of several hundred yards or miles? The answer is, that, until a great quantity of the heat has been given off, either by the emission of lava, or in a latent form by the evolution of steam and gas, the melted matter continues to boil in the crater of a volcano. But ebullition ceases when there is no longer a sufficient supply of heat from below, and then a crust of lava may form on the top, and showers of scoriæ may then descend upon the surface and remain unmelted. If the internal heat be raised again, ebullition will recommence, and soon fuse the superficial crust. So, in the case of the moving current, we may safely assume that no part of the liquid beneath the hardened surface is much more above the temperature sufficient to retain it in a state of fluidity.

"It may assist us in forming a clearer view of the doctrine now controverted, if we consider what would happen where a globe of homogeneous composition placed under circumstances analogus, in regard to the distribution of heat, to those above stated. If the whole planet, for example, were composed of water, covered with a spheroidal crust of ice 50 miles thick, and with an interior ocean, having a central heat about 200 times that of the melting point of ice, or 6,400 degrees Fah.; and if, between the surface and centre, there was every intermediate degree of temperature between that of melting ice and that of the central nucleus, could such a state of things last for a moment? If it must be conceded in this case, that the whole spheroid would be instantly in a state of violent ebullition—that the ice (instead of being strengthened annually by new internal layers) would soon melt, and form part of an atmosphere of steam—on what principle can it be maintained that analogous effects would not follow in regard to the earth, under the conditions assumed in the theory of central heat?"

Enamel.

Enamels are vitrifiable substances, and are usually arranged into three classes, namely, the transparent, the semi-transparent, and the opaque. The basis of all descriptions of enamel is a perfectly transparent and fusible glass, which is rendered either semi-transparent or opaque by admixture with metallic oxides.

White enamels are composed by melting the oxide of tin with glass, and adding a small quantity of magnesia in order to increase the brilliancy of the colour. The addition of oxide of lead or antimony produces a yellow may be obtained from the oxide of silver. Reds are formed by an intermixture of the oxides of gold and iron, that composed of the former being the most beautiful and permanent. Greens, violets, and blues are formed from the oxides of copper, cobalt, and iron; and these, when intermixed in different proportions afford a great variety of intermediate colours. Sometimes the oxides are mixed before they are united to the vitreous base.

The principal quality of good enamel, and that which renders it fit for being appled on baked earthenware or on metals, is the facility with which it acquires lustre by a moderate or cherry-red heat, more or less, according to the nature of the enamel, without entering into complete fusion. Enamels applied to earthenware and metals possess this quality. They do not enter into complete fusion; they assume only the state of paste, but of a paste exceedingly firm; and yet when baked one might say that they had been completely fused. There are two methods of painting on enamel: on raw or on baked enamel. Both these methods are employed, or may be employed, for the same object. Solid colours, capable of sustaining the fire necessary for baking enamel ground, may be applied in the form of fused enamel on that which is raw, and the artist may afterwards finish with the tender colours. The colours applied on the raw material do not require any flux; there is one, even, to which silex must be added, that is, the calx of copper, which gives a very beautiful green; but when you wish to use it on the raw material you must mix with it about two parts of its weight of silex, and bring the mixture into combination by means of heat. You afterwards pulverise the mass you have thus obtained in order to employ it. To obtain good white enamel, it is of great importance that the lead and tin should be very pure. If these metals contain copper or antimony, as is often the case, the enamel will not be beautiful. Iron is the least hurtful to its appearance.

All the colours may be produced by the metallic oxides. These colours are more or less fused in the fire according as they adhere with more or less strength to their oxygen. All metals which readily lose their oxygen cannot endure a great degree of heat, and are unfit for being employed on the raw materials.

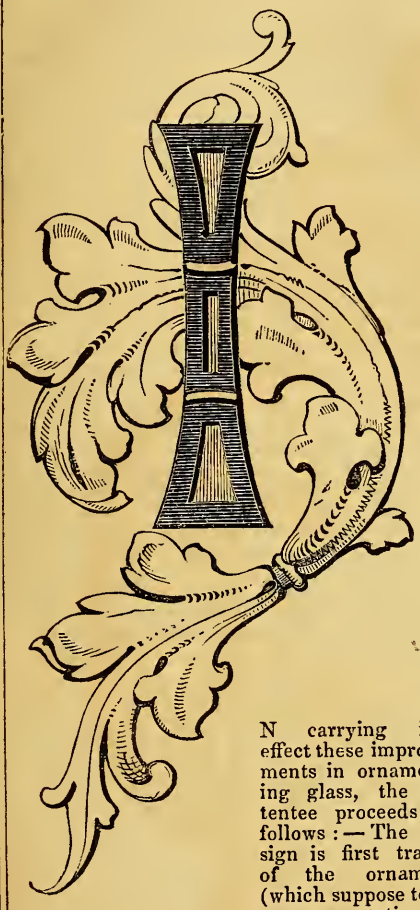
Purple.—This colour is the oxide of gold, which may be prepared in different manners, as by precipitating, by means of a muriatic soltion of tin, a nitra-muriatic solution of gold, much diluted in water. The least possible quantity of the solution of tin will be sufficient to form this precipitate. The solution of tin must be added gradually until you observe the purple colour beginning to appear; you must then stop, and having suffered the colour to deposit itself, put it into an earthen vessel and let it dry slowly. The different solutions of gold, in whatever manner precipitated, provided the gold is precipitated in the state of an oxide, always give a purple colour, which will be more beautiful in proportion to the purity of the oxide; but neither the copper nor silver with which gold is generally found alloyed injure this colour in a sensible manner; it is changed, however, by iron. The gold precipitate which gives the most beautiful purple, is certainly fulminating gold, which loses that property when mixed with fluxes. Purple is an abundant colour; it is capable of bearing a great deal of flux, and a small quantity communicates its colour to a great deal of matter. It appears that saline fluxes are better suited to it than those in which there are metallic calces. Those, therefore, which have been made with silex, chalk, and borax; or, white glass, borax, and a little white oxide of antimony, with a little nitre, as we have already mentioned, ought to be employed with it. Purple will bear from four to twenty parts of flux, and even more, according to the shade required. Painters in enamel generally employ for purple a flux, which they call brilliant white. This flux appears to be a semi-opaque enamel, which has been drawn into tubes, and afterwards blown into a ball at an enameler's lamp. These bulbs are afterwards broken in such a manner that the flux is found in small scales, which appear like the fragments of small hollow spheres. Enamel-painters fix this flux with a little nitre and borax. This matter, which produces a very good effect, was employed without attempting to decompose it. It may be a very fusible common white enamel, which has been blown into that form. It is to be remarked, that purple will not bear a strong heat; and the colour is always more beautiful if the precipitate is ground with the flux before it has become dry.

(To be continued.)

Glazing.—A mixture of equal parts of oxide of lead and ground flints is found to be a durable glaze for the common cream-coloured ware, and is generally used for that purpose. These materials are first ground to an extremely fine powder, and mixed with water to form a thin liquid. The ware is dipped into this fluid and drawn out. The moisture is soon absorbed by the clay, leaving the glazing particles upon the surface. These are afterwards melted by the heat of the kiln, and constitute a uniform and durable vitreous coating.

A DESIGN FOR A PANEL.

Eliza Tonge's Improvements in Ornamenting Glass.*



IN carrying into effect these improvements in ornamenting glass, the patentee proceeds as follows:—The design is first traced of the ornament (which suppose to be a representation of a group of flowers) on the back of the plate or sheet of glass to be ornamented. The patentee here remarks that the whole of the processes hereinafter described, are performed on the back of the sheet or piece of glass to be ornamented, and the ornament produced is viewed from the front of the glass; that is to say, the said ornament is seen through the glass. The tracing of the outline of the group of flowers may be executed in black varnish or any other dark-coloured varnish or paint. The patentee next proceeds, by the use of some transparent neutral colour, to accomplish the drawing of the group of flowers; that is to say, to produce the representation of the group of flowers, the drawing and shading of which is completed, but which possesses no positive or local colour.

When the neutral colour is sufficiently dry and hard, the next proceeding is to apply a positive or local colour to the several parts of the design in manner following:—the colours preferred by the patentee are either transparent or semi-transparent, and each of the said colours are mixed with Canada balsam; copal or mastic varnish, or other transparent vehicle, may be employed, but giving preference to Canada balsam for the purpose. In using the said colours it is better to apply the same colour (green for instance) to all parts of the ornament requiring such colour, and allow it to harden before another colour is introduced, as there is danger in the one colour running into another, if two or more colours are applied at the same time. Thus all the parts of the group requiring a particular colour, have that colour applied till it is completed and allowed to harden, and then another colour is applied to the parts requiring such variation; this is allowed to dry as before, and so on till the whole of the colours have been applied separately. The colours, after being mixed, which it will be unnecessary to describe, as the same is well understood and forms no part of this invention, are applied by means of a style or pointed stick, the balsam being taken up on it; this style is then held in a vertical position, the balsam forming a drop on the point of the stick or stile, which is held over that part of the glass to be tinted of that peculiar colour; the drop of balsam, on being allowed to touch the glass, is transferred to that surface, and assumes as near as possible a semi-globular appearance. The whole of the parts of the design requiring one particular colour, having been tinted in this way, the plate of glass is inverted; that is to say, it is placed in a horizontal position, with the drops of balsam depending from the plate, which position has the effect of retaining it in the semi-globular form, and prevents it spreading over any other part of the surface of the glass; in this position the balsam is allowed to dry and become hard, when another colour is applied in a similar manner, and thus the design is made up until the whole of the colours are complete; and at those parts where depth or intensity of colour is required, additional coats of colour are put on until it attains a thickness of perhaps a quarter of an inch. Having completed the design, as regards the colouring, those parts of the glass that are exempt from colour are coated with a black or dark paint, so as to render it opaque at those parts. The back of the coloured parts of the design are next covered, or have a surface of foil applied thereto, so as to reflect the design and render it visible from the front of the glass, and it is preferable to destroy the uniformity of the foil before applying it, which may readily be done by crumpling it in the hand. The back of the plate of glass is then covered by some protective covering, so as to prevent the design from being injured; this covering is well understood as being applied to designs on glass, and therefore need not be described. Plates or pieces of glass painted or coloured in this way may be used for panels and brooches, or in any situation where the colour is reflected; and in-

* Patent dated July 3rd, 1847. Enrolled January 3rd, 1848.

stead of foil being used as the reflecting surface, the back may be coated with a white or light coloured paint. Having described the nature of the invention and the manner of carrying the same into effect, the patentee desires it to be understood that she does not confine herself to the precise detail, as that may be varied without departing from the principle of the invention, and that the claims are for the method of ornamenting glass by the processes hereinbefore described; that is to say, by tracing and drawing the said design with a neutral transparent colour, such vehicle being applied in sufficient thickness to give the required depth and intensity of colour, and the said design completed by the application of foil to the back thereof, whether the production of the said design be effected by the method hereinbefore described, or by any ther method of effecting the same.

Architectural Societies, &c.

ROYAL INSTITUTE OF ARCHITECTS.

Ornamental Leather Hangings.—At a meeting on the 10th of January Mr. Poynter read a paper on the above subject, illustrated by a number of fine specimens contributed by Mr. Pratt. The reader ably traced the history of this material, showing its use in Egypt at a very early period, and giving numerous instances of its occurrence in old buildings. In the sixteenth and seventeenth centuries, after its use had been revived, it was very extensively employed. A fine leather was used, on which figures were either impressed, or merely painted. It was not certain that there was any manufactory of it in England: it was chiefly imported here from Belgium and France. Where it was first generally used in modern times was doubtful—some thought Spain, others Venice. It was, at all events, certain that at Venice, in the seventeenth century, the use of leather hangings was universal. The first step in the process of preparing the leather, after joining the skins, was to silver the whole surface; parts which were required to look like gold were varnished with coloured varnish. After being silvered, the leather was laid on blocks, on which the forms required had been cut, and passed through a press. The borders and more minutely decorated portions were executed with metal stamps, such as bookbinders used,—a more costly process. At Blenheim, in what was called the "Titian Gallery," the paintings were executed on leather, and were, as every one knew, not by Titian. The reader described some fine examples existing at Rouen, also one that was exhibited, of which the subject was Antony and Cleopatra,—one of a series which formerly belonged to the celebrated Lord Clarendon. He trusted that when museums were formed illustrative of the arts of the middle ages, specimens of ornamental leather hangings would not be wanting. Mr. Crace remarked, that in Paris they employed plaster moulds to give the impress to the leather, and used much flock to ornament the face of it.

Scientific Societies.

INSTITUTION OF CIVIL ENGINEERS.

Artificial Stone.—On the 11th of Jan., a paper was read, descriptive of Mr. Frederick Ransome's process for making artificial stone. The *modus operandi* was described as follows:—broken pieces of silica (common flint) being subjected for a time to the action of caustic alkali, boiling under pressure in a close vessel, formed a transparent silicated solution, which was evaporated to a specific gravity of 1,600 (distilled water being 1,000), and was then intimately mixed with given proportions of well-washed sand, broken granite, or other materials, of different degrees of hardness. The paste thus constituted, after being pressed into moulds from which the most delicate impressions were readily received, was subjected to a red heat, in a stove or kiln, by which operation the free or uncombined silica of the raw materials united with the excess of alkali existing in the solution, thus forming a semi-vitreous compound, and rendering the artificial stone perfectly insoluble. This production is said to be well adapted for decorative art and for architectural purposes; busts, vases, flooring-tiles, steps, balustrades, mouldings, capitals, shafts and bases of columns, &c. Even grinding-stones and whetstones for scythes have been made. It was stated to be already extensively manufactured at Ipswich, and was thought to admit of extensive application where elaborately carved stone would be too expensive.

Ingenious Fraud.—A notorious "maker of old masters," who has generally a modern artist of renown for sale, was a short time ago at Norwich, where he exhibited a very beautiful "Etty," for which he demanded a large sum. A gentleman took the bait, offered "pounds instead of guineas," and the offer was declined. Next day, however, the gentlemen resolved upon the purchase; but on application to the vender, he was much chagrined to find the picture upon which he had set his heart, had been "just sold." Upon further inquiry, he learned that "perhaps" the purchaser—a connoisseur and shoemaker in the vicinity—might be induced to part with his bargain "for a reasonable bonus." Of course, under this arrangement, the picture was soon transferred to the custody of the "lucky" gentleman. Not long afterwards, however, he discovered he had been robbed; that the picture was a forgery—Mr. Etty never having seen it. Upon threatening proceedings against the dealer, the gentleman was coolly informed that his remedy was not against the dealer, but against the shoemaker, from whom the picture had been bought. It is needless to add that the shoemaker had not a sixpence in the world beyond his share of the plunder, and that application to the law was out of the question.—*Art Union.*

Painting in Oil.

The origin of painting in oil has usually been attributed to the Van Eyck, or early Flemish school, Antonella da Messina, who studied under Van Eyck, having first introduced it into Italy; but recent critical writers have awarded the honour of the invention to the Greeks, while others, proceeding still farther, have stated that the Egyptians were probably acquainted with the advantage of oil as a vehicle for pigments—referring for their authority to stone sculpture figures in the British Museum, which are painted with an unctious vehicle appearing to be oil.

Many of the ancient medical writers seem to have been acquainted with the peculiar properties of walnut, linseed, poppy, and other oils, while Galen mentions the drying properties of linseed and hempseed—and on nut oil is more decisive; and Pliny observes that all resins may be dissolved in oil. Aetins, who wrote at the end of the fifth and the beginning of the sixth century, mentions a drying oil in reference to works of art. The passage is curious, and is as follows:—"The medicinal uses of walnut oil are the same with linseed and other oils; but it has a use beside these, being employed by gilders and encaustic painters; for it dries and preserves gildings and encaustic paintings for a long time;" but with all these we do not find oil mentioned as being applied to paintings; and Mr. Eastlake remarks that it was only used at this early period as a preservative varnish for the gilded articles, and not as a mordant for the application of the gilt. Cennini, however, speaks of the application of oils combined with other ingredients as mordants for gilding—but later writers only speak of glutinous mordants. It is, therefore, clear, says Mr. Eastlake, that an oil varnish composed of inspissated nut oil, or of nut oil combined with a dissolved resin, was employed on gilt surfaces and pictures with a view to preserve them at least as early as the fifth century. It may be added, that a writer who could then state, as if from his own experience, that such varnishes had the effect of preserving works for a long time, can hardly be understood to speak of a new invention. Leonardo da Vinci, writing a thousand years after Aetius, recommends as a varnish nut oil thickened in the sun. The Lucca manuscript, published by Muratori—placed by Mabillon in the time of Charlemagne—describes a varnish composed of linseed oil (lineleon) and a needless variety of resins, with which gums even appear to be intermixed, while nut oil is nowhere mentioned in it. The age of Charlemagne was an æra in the arts; and the addition of linseed oil to the materials of the varnisher and decorator may thus, on the above evidence, be assigned to it.

Between the tenth and twelfth centuries Eraclius, or Heraclius, is supposed to have written his treatise "De Artibus Romanorum." Mr. Hendrie observes of him, "The art of Eraclius is the school of Pliny, increased, it is true, by Byzantine invention, but yet essentially Roman:"—and again, "The treatise of Eraclius likewise proves the existence of the art of mixing colours with oil, and of the preparation of canvasses, skins, or panels, with colours ground in linseed oil for the purpose of paintings which were afterwards to be executed in colours ground in the same oil."

Linseed oil varnish composed of simpler materials—as sandarac and mastic resin boiled in the oil—is found to have been used for some time after this in all known recipes. An unsuccessful attempt was made in the fourteenth century to introduce nut oil. That vehicle, so long discarded, was attempted to be restored by the Van Eycks at the commencement of the fifteenth.

"Thenceforward the (nut or linseed) oil varnish, as distinguished again from varnishes composed of resins dissolved in essential oils, still continued to be exclusively used till the close of the fifteenth or beginning of the sixteenth century; when the Italians, who had already adopted a different system from the first improvers of oil painting, began to employ essential oil varnish."

The foregoing authors form the connecting links of a history which brings us down to the time of the earliest known authority in modern Italian Art, Cennino Cennini. He received from his master, Agnolo Gaddi, the scholar of Giotto, such traditions of processes or methods as Cimabue himself had adopted from the Greek practice. That the men in Cennini's time availed themselves of such information as the early writers abound with is shown by Vasari's account of Antonio Venziano, a fellow pupil of Cennini—who quitted painting for medicine in consequence of having studied Dioscorides.—All these notices, then, go to show that the Van Eycks were not the inventors of the art of oil painting. Cennino Cennini, the first to treat of modes of manipulation, tells us how to paint in oil on walls, on panels, on iron, or on any other surface—how to prepare walls for painting in oil—how to prepare an oil fit for tempering colours, and also fit for mordants, by boiling it over the fire—again, how to prepare good and perfect oil by baking it in the sun, and how to grind colours in oil.—Such statements do not, however, show that this material was applied to the painting of the human form. Oil incorporated with varnish is seen to be in Cennini's time applied as a coating to protect gilding; and to be employed as a varnish for tempera pictures, while it was used in draperies and ornamented portions of the work. The flesh always appears dry and flat—the consequence of the tempera; and the inspissated or thickened oil makes the surface of either draperies or ornaments of such early pictures seem embossed.—This varnish, "vernice liquida," not particularly described by Cennini, was composed according to Mr. Eastlake, of amber or sandarac and linseed oil, with and without concrete turpentine, *pece Greca*. In England, in the thirteenth and fourteenth centuries, the notices in the account-rolls are numerous of the employment of oils and varnishes. That the great improvement in oil-painting (ultimately leading to its general use)

was first made in Flanders is naturally accounted for "by the necessity of counteracting the effects of a humid atmosphere on painted surface by hydrofuge or oleoresinous preparations."—That the Van Eycks carried the process of oil-painting farther, in point of delicacy and refinement, than had been previously done may be inferred from a reference to the picture by one of these artists in our own National Gallery compared with such specimens of anterior times as exist here or abroad. The Strasbourg MS. of the fifteenth century, but recording practice of an earlier date, must not be forgotten amongst the documents tending to show the early use of oil; but the mention of its employment—in the different public buildings at Westminster as well as in Italy—is so constant that attempt at further enumeration here would be mere prolixity. Horace Walpole, the Rev. Mr. Bentham, Mr. Smith Raspe, and others, have all shown that painting in oil was practised in England from very early time up to the fifteenth century.

(To be concluded in our next.)

The Patent Elastic Infant Gymnasium; or, Baby Jumper.—Under the above title there has lately been introduced to the notice of the public an invention made by an ingenious American (Mr. G. W. Tuttle). Its object is the very laudable one of supplying a *nurse* free from all the vices to which mortal nurses are heir, and into whose care an infant may be confided, its safety and pleasure being counted upon as a matter of course. But all the panegyrics we could pen from this till doomsday would hardly suffice to exhibit the good qualities of this piece of mechanism so well as a brief description. Imagine to yourself, then, gentle reader, suspended from a book affixed to the ceiling, or any other convenient place in an apartment, a strong elastic spring, tastefully concealed by means of a covering of silk or any other material which fancy may dictate for the purpose; from this are dependant two silken ropes to which a loop is fastened by means of four others, which is intended to prevent the least compression of the chest or restraint on the motions; and a dress or coat, inside of which is affixed a strong band serving for a seat, terminates the whole. This, then, is the machine. The infant, being properly secured within the dress, is left to itself; its slightest movement serves to set the "jumper" in motion, and to produce an agreeable gymnastic exercise at once conducive to the health and amusement of the child. In cases of curvature of the spine, and the various bodily malformations to which infants are peculiarly liable, this invention is truly invaluable, while the pleasure it is sure to afford to young children must be sufficient recommendation for its adoption in the nursery. In point of price, too, its economy forms an important feature. In conclusion, we advise all who are blessed with the fruits of connubial love to pay a visit to the proprietors' establishment, which is at No. 137, Strand, London.

Delicate Test for Gold.—W. Maugham, Esq., in a communication made to the Editor of the *Pharmaceutical Times*, states that he has found the following method of determining the presence of gold of considerable service in examining ores supposed to contain that metal: He first digests about five grains of the ore, finely powdered, in strong nitric acid, for the purpose of removing all the sulphurets; that portion of ore which is insoluble in nitric acid is then to be well heated on a piece of platinum foil, so as to drive off any remaining sulphur, and is next to be digested in *aqua regia*. From the solution thus obtained, when it has become clear, take a drop or two by means of a glass rod, and place it upon a piece of white porcelain, so as to form a streak. Warm the porcelain over the flame of a spirit-lamp, and, when the liquid portion of the solution has evaporated, throw on the spot where it was placed a jet of flame by means of a blow-pipe: if any gold be present it will be indicated by a beautiful and characteristic purple colour, which, to a certain extent, will disappear when the heat is withdrawn. The same colour may be made to appear and disappear at will by heating and cooling the spot in question. This spot in some instances is not to be distinguished whilst the porcelain remains cold, except by its being duller than the glaze of the porcelain. A very minute portion of gold may be discovered by this method. To accustom the eye to judge of the purple colour produced in the manner described, first practise with what is known to be a solution of chloride of gold of a given strength, diluting it from time to time with water, for the purpose of observing to what extent the dilution may be carried, so that under the blowpipe-flame the presence of gold by the peculiar colour produced shall be rendered manifest.

Water-Colour Painting. — There is no style of art so interesting to the mass of the people of this country as the truly English school of water-colour painting, and in no other country is there any approach to the excellence of our own artists. We are, therefore, delighted to find that the National Gallery has received an addition to the pictures at present exhibiting in the shape of one of the pictures by Turner selected by the trustees from the Vernon collection. The room appropriated for the exhibition is the small one on the left of the entrance; the picture, the well-known one of Venice, being hung between two of those recently bequeathed by Mr. R. Simmons. Beneath the picture the trustees have placed a small tablet, on which is inscribed "Venice. By J. M. W. Turner, R.A. Presented by Robert Vernon, Esq., being one of the extensive and valuable collection of the works of British artists given by him to the trustees for the public benefit." The trustees have also selected Mr. Haghe's large water-colour drawing. We sincerely hope that these acts on their part may but merely prove the prelude to the establishment of a collection of the British school of water-colour paintings in the new gallery—when we get it.

On the various Descriptions of Wood employed for Building and other purposes.

THE OAK.

Assimilated, as it is, with almost every national feeling of an Englishman's mind, and calling up, as it does, the remembrance of past ages, in all their massive splendour, the Oak must ever stand foremost among its brethren of the forest; and for this reason we here assign to it its wonted position.

Being very hard in texture, oak is peculiarly adapted for all purposes where great strength and durability are required; while its colour, which, when new, is a deep red or light brown, and, when old, a dark brown, adapts it for all descriptions of household furniture, panelling, and cabinet work. When applied to the latter purposes, it is generally carved, for which its closeness of grain peculiarly adapts it; but this is often a work of great trouble, on account of the hard knots which run through it.

In building, oak is generally employed for the beams, &c., supporting the roof and flooring; and, in the construction of some edifices, it is still used for the flooring itself, although of late years it has become nearly superseded by Norway fir, or *deal*.

In the selection of oak, a great deal depends on a knowledge of the soil on which it has been grown; for we generally find that, when the produce of a peculiarly rich soil, it is deficient in strength, being full of sap, which necessarily impairs the solidity of the wood. And, again, we have to consider the effects which the atmosphere produces upon it in the situation in which it is grown, as it has been found that even the produce of a few acres may vary in quality according to the position of the trees; thus, those having a northerly aspect have been uniformly better in quality than those exposed to the rays of the noon-day sun.

The best means of discovering the comparative quality of different kinds of oak, consists in immersing several specimens in water, and attentively watching the respective weight of each after having been soaked for a certain time;* the specimen that has imbibed the least quantity of the fluid should always be chosen for use, as that may be depended upon as being closest in grain, and, consequently, least liable to decay.

Those trees which have been cut down in winter should always, where possible, be selected, for in such the sap has become partially dry, and, consequently, they require less seasoning.

Great attention should always be paid to the state of the timber about to be selected, examining well the central parts, as there it is that decay generally first shows itself. It is to a want of proper attention on this point that many disastrous accidents may be ascribed, with regard to the beams employed for supporting roofs, &c., breaking beneath their loads.

There are many processes employed for the purpose of preserving timber, and particularly oak, from decay after it has been felled. The old process consisted merely in immersing the wood, either in logs or cut into planks, in water for a stated period, alternately drying and wetting them; but there have been lately many important discoveries made respecting this subject, amongst which may be mentioned the inventions of Sir W. Burnett and Mr. Treffey, accounts of which will be found in pp. 75 and 77 of the first volume of this work.

* This method may be advantageously employed with regard to every other description of timber.

Ivory.

Ivory is the substance of the tusk of the elephant, and is esteemed for its beautiful cream colour, the fineness of its grain, and the high polish it is capable of receiving. That of India is apt to lose its colour and turn yellow; but the ivory of Achem and Ceylon is not liable to this defect. Ivory is chiefly used as a material for various ornamental articles, and for tablets for miniature painting, &c.

Ivory shavings may be reduced into a jelly, similar to that of hartshorn; or, by burning in a crucible, they may be converted into a black powder, which is used in painting, under the name of *ivory-black*. Ivory may be stained or dyed; a black colour is imparted to it by a solution of iron and a decoction of logwood; a green one by a solution of verdigris; and a red one by being boiled with Brazil-wood, in lime-water.

The use of ivory was well known in very early ages, for we find it employed for arms, girdles, sceptres, harnesses, sword-hilts, &c. The ancients were also acquainted with the art of carving in ivory, and of dyeing and encrusting it. Homer refers to the extreme whiteness and beauty of Ivory. The coffer of Cypselus was doubtless the most ancient monument of this kind in basso-relievo, and we meet with similar instances in the temple of Juno at Olympius, in the time of Pausanias; that is to say, 700 years after it had been built. The ancients possessed numerous ivory statues, particularly in the temples of Jupiter and of Juno, at Olympius. These statues were very frequently inlayed with gold. The most celebrated are stated to have been the Olympian Jupiter and the Minerva of Phidias, the former was covered with a golden drapery, and seated on a throne formed of gold, of ivory, and cedar wood, and enriched with precious stones. In his hand the god held a figure of Victory, also of ivory and gold. The Minerva was erected in the Parthenon at Athens during the first year of the eighty-seventh Olympiad—the same year in which the Peloponnesian war commenced. Pausanias likewise makes mention of an ivory statue of remarkable magnificence, representing Juno on her throne, sculptured by Polycletes, together with numerous others.

METHOD OF REMOVING VARNISH FROM MODERN PAINTINGS.—In removing varnishes of a recent date, pumice stone powder may be employed, and a very soft and fine bottle cork will save the fingers; but nothing will answer so well as the finger on the more delicate tints. For the removal of a strong varnish, as copal, &c., a mixture of spirit of wine and spirit of turpentine will be required. To make these two spirits unite, a small quantity of the salt of tartar (tartrate of potash) is to be added. Every time this is used, the bottle is to be well shaken, very little poured on the picture, and rubbed on with a small piece of flannel; then lay on the part rubbed a few drops of oil of olives to retard the action of the spirits. These operations are to be repeated over the whole picture, frequently changing the pieces of flannel, and as frequently applying the olive oil, in order to see what progress has been made. The picture, lastly, is to be washed with a sponge, soap, and water, afterwards with clean water, and then covered with a fresh varnish. If any stains should be found on the picture so unconquerable as to remain after the above process, a little oil of spike lavender will certainly remove them; but the greatest care must be taken in using this essential oil; it softens old paint so quickly, that there is scarce time to apply it and the olive oil before it has gone too far; it is better to reduce its strength with spirit of turpentine if it should happen to be too genuine. Many use lancets and small scrapers, but this operation has also its risks from scratches, &c.—*Fielding on the Knowledge and Restoration of Old Paintings.*

THE DECORATIVE ART UNION.—Some few weeks since (see p. 30, *ante*) we cursorily noticed a project announced under the above title. At that period, we could not, of course, be expected to enter deeply into the matter, having scarcely any other information at hand respecting it than that afforded by a prospectus. Since then, however, we have regarded its progress and prospects with especial interest, and have, after mature consideration, come to the conclusion that it is eminently deserving of both the patronage and support of every lover of art. The wide sphere of operation which opens itself before such an institution is only equalled in magnitude by the positive benefits its operations within that sphere are calculated to produce to the community at large. By its means a new channel will be opened for those various productions of the head and hand which have hitherto been restricted in their production by the precarious chance which existed of their disposal after being manufactured, while it will afford an opportunity to all for possessing themselves of valuable works of art at an almost insignificant outlay. The idea of establishing the "Decorative Art Union" originated with the Editor of the *Critic*, a journal of respectability and influence, and has by his exertions been carried out up to the present time. We see from the last weekly list published up to the time of our writing this, that 178 members have already joined the association. The subscription is half-a-guinea.

Notices to Correspondents.

NOTICE.

TO HOUSE DECORATORS, GRAINERS, CABINET MAKERS, &c.—Beautifully coloured Specimens of the various Woods and Stones will be presented to our Subscribers monthly. The first Plate is in the hands of our Engraver, and will be shortly ready for delivery. Each Plate will contain four Specimens, while its size will adapt it for binding in the Work.

☞ All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the DECORATOR'S ASSISTANT, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** Part IX. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I. to VIII. still continue on sale. The First Volume, beautifully bound in scarlet cloth, in a style designed expressly for this Work, gilt and lettered, price 5s. For those parties who have taken in the Work in Numbers or Parts, Cases have been prepared for binding it in, price 1s. 3d. each; or the Publisher will undertake to get it bound, including the cases. Early orders are respectfully requested for Back Numbers.

ANSWERS TO QUERIES.

PAINTING MAGIC LANTERN SLIDES, &c.—Sir,—I beg to inform your intelligent correspondent "F. E." that water colours are those used for painting magic lantern slides although very thin oil colours may be employed. There is no peculiar preparation necessary for either when applied for this purpose. All colours may, I believe, be used; at least I have always used whatever colours my fancy dictated with good effect; but the brightest ones are decidedly the best to be employed, black being merely used for giving full relief to the other colours. Your humble servant, PHILOSOPHICUS, Chatham.

J. M.—You may stain holly, pear-tree, and beech black by means of the following preparation; and we think it will answer for deal:—Take a troy pound of logwood, and add a sixth part of its weight of galls; form a stain of these; and apply one coating to the work; then add one part of verdigris to the stain, and give the work another coat; after which add one part of sulphate of iron, and add one or more additional coat, as may be deemed necessary. You may conclude by polishing with linseed oil.

A DECORATOR AND SUBSCRIBER (Manchester).—We never intend to alter the price of this work; its limits will grow with the amount of patronage bestowed on it. The recommendation of our subscribers, as we have before stated, is to us of the utmost importance;—they have already, we flatter ourselves, seen what we can do; for what we will perform under more genial auspices our honour and the ardent desire we possess for the extension of useful information amongst the industrial classes must be our sufficient guarantee. We have had already some thoughts of commencing a series of biographies of painters, and we will, perhaps, do so shortly. For your good wishes we are much obliged, and shall receive with pleasure any extracts &c., suitable to the nature of our work, with which you may feel disposed to favour us.

MARY QUEEN OF SCOTS. By A. Dumas. London: *Geo. Peirce*, 310, Strand.—Mr. Peirce is well known as the publisher of a series of translations of the most approved works of fiction extant in French literature. The fidelity of their rendering and the taste with which they are got up are only equalled by the cheap rate at which they are offered to the public. The present work is a peculiarly interesting story written in Dumas' happiest vein, and we strongly recommend our readers to judge of its merits by a perusal; for although the supposition on which it is founded may be erroneous, it cannot fail of leaving an impression on the mind which romances do not often produce.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 111.)

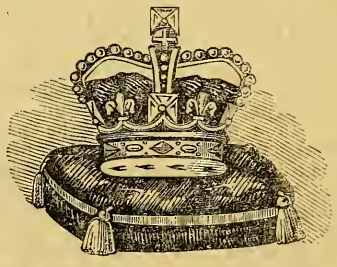
Ceres (in the archæology of the fine arts), the goddess presiding over husbandry. In painting and sculpture she is represented as a young woman of pleasing countenance, surrounded by the usual emblems of a pastoral life, such as corn-sheaves, reaping-hooks, scythes, &c. Ceres was the daughter of Saturn and Cybele, and was supposed to be the first

who cultivated the earth. In antique sculptures, Ceres was represented as a tall, majestic woman, with golden hair, surmounted by ears of corn. Her right hand filled with poppies and wheat, and her left grasping a lighted torch. For an illustration of the figure of this goddess, see the initial letter of the leading article, page 124.

Coat of Arms (in heraldry), the insignia borne by individuals, bearing relation either to their own acts or those of their ancestors. —*Crest*, that portion of a coat of arms which is placed on the wreath in the centre on the top of the shield. This portion is frequently

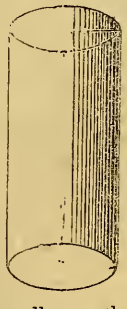
detached and engraved separately on seals, &c.

Cushion, a quantity of some soft material covered over with cloth, &c. The crown of



England is sometimes represented as placed on a cushion, as represented in the above engraving.

Cylinder (in geometry), a solid or cube having two flat sides and one revolving, the



same as a garden roller, or the shaft of an unfluted column. In mechanics, this form is of great value and of extensive application.

(To be continued.)

The Electric Telegraph.

The progress which electricity has now made in effectually establishing an instantaneous means of communication between the most remote portions of this country cannot but be regarded with peculiar interest not merely by scientific individuals but by the community at large. We, therefore, as a pendant to the articles presented in our first volume on the subject of the electric telegraph, now present one, which we extract from a contemporary, on the method employed for transmitting messages, and the general arrangements adopted at the Central Telegraph Office in London.

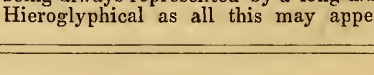
The offices are situated at the extremity of a court leading out of the north side of Lothbury, opposite the Bank of England. The façade has some architectural pretensions; and immediately over the entrance is an ornamented clock, illuminated at night, and moved by electricity. Entering, we pass into a large and lofty hall, with galleries running round supported by pillars. Here the first object that arrests attention is a map of England of colossal dimensions, placed on the wall opposite the entrance, and covered by a net-work of red lines showing the telegraphic communication at present existing between the metropolis and different towns in the kingdom. Under the galleries at each end of the hall are two long counters, over which are the names of the various places to which messages can be sent. Behind the counter are stationed clerks whose business it is to receive the message, enter it in a form which will be presently described, and pass it to another set of clerks, who transmit it by machinery to the galleries above. Adjoining these are a series of rooms containing the electro-magnetic telegraphs of Messrs. Wheatstone and Cooke. They are placed on desks, and before them are seated the clerks whose province it is to work the apparatus. Each apartment is provided with an electrical clock, showing true London railway time, which is observed throughout the departments.

The wires are brought into the underground portion of the building by means of nine tubes, each tube containing nine wires. They are subdivided as follows:—Twenty-seven come from the North-Western Railway, nine from the Eastern Counties, nine from the South-Eastern, nine from the South-Western, nine from the Strand Branch Office and Windsor, nine from the Admiralty, and nine are spare to meet casualties.—The Admiralty have now an uninterrupted communication between their offices in Whitehall and the Dockyards at Portsmouth; for which accommodation they pay £1,200 a-year to the company.—On a level with the rooms in which the wires are received are several long and narrow chambers devoted to the batteries. Of these there are 108—each battery consisting of twenty-four plates. Sand moistened by sulphuric acid and water is used as the exciting medium. The batteries thus charged are found to remain above a month in good working order. They are so numbered and arranged in reference to the wires that any defect can be immediately rectified. Each railway has a division to itself; and thus all risk of confusion is avoided.

We shall probably convey a better idea of the process of transmitting messages and obtaining replies by describing the course which would be pursued in the case of an individual desiring to send a message to, and receive an answer from, Liverpool. Proceeding to the counter above which Liverpool is inscribed, the message is written on a printed form containing blank spaces to be filled up with a description of the subject to be transmitted, the station to which it is to be conveyed, and the bill of charge for the same, receipted by the clerk. This form is sent up by machinery to the apartment containing the Liverpool telegraph, and the clerks in charge of this immediately set the needles to work. As the words of the answer are read off, a clerk writes them on a form somewhat similar to the foregoing, but containing an entry of the time employed in transmitting the message. This is then sent below to the party waiting for the answer.

We were fortunate in being present when two important messages were sent to the office for transmission. One was from Col. Maberly, of the Post Office, desiring the agent at Liverpool to state whether the American mail had been detained—and if so, how long? This was answered in seven minutes. The other was from an eminent mercantile house, anxious to know the description of goods in a vessel just arrived at Southampton. It was answered in eleven minutes.

We were surprised on making inquiry to find that the charges are much more moderate than we were led to expect from statements in the public prints, which set forth that the transmission of a message cost £5. How exaggerated this is will be seen by the following charges, taken from the books of the company:—For a message not exceeding twenty words—to Berwick, 12s.; Birmingham, 6s. 6d.; Bristol, 13s.; Edinburgh, 13s.; Gosport, 6s. 6d.; Liverpool, 8s. 6d.; Manchester, 8s. 6d.; Glasgow, 14s.; Southampton, 5s. 6d.; Yarmouth, 7s. When it is borne in mind that the company have laid down 2,500 miles of wire, and have upwards of 1,000 men in their employ, it cannot be said that the foregoing scale of charges is exorbitant. There are at present fifty-seven clerks employed in the department of transmitting and receiving messages, independently of those occupied in printing communications for the newspapers. This department is exceedingly interesting. It is carried on in a long room communicating with the west gallery. The appearance of the words as printed will be best understood by the annexed fac-simile, it being only necessary to say that the lines form the letters—



The alphabet used is as follows:—A - — B - — - C - - - D - - — E - and so on; finis being always represented by a long dash ——. Hieroglyphical as all this may appear, the

characters are read with the greatest ease by the parties concerned in the operation. It is carried on with wonderful celerity—1,000 letters being printed each minute at stations two hundred or more miles apart.

We shall attempt to describe the process, but strongly recommend our readers to see it in action. A slip of paper about a quarter of an inch broad is punched with holes at distances corresponding to the dash lines shown above—these holes being the letters. Two cylinders—one, for example, in London, the other at Manchester—are connected in the usual manner by electricity. Supposing it to be desired by a party in London to print a message at Manchester, the slip of paper is placed over the cylinder in London, and pressed upon it by means of a spring which plays in the middle. Thus, when those portions of the paper which present no holes appear, the contact is broken; where the holes are presented, contact is made; and, accordingly, the current of electricity will be conveyed or broken to the cylinder at Manchester precisely in the same ratio as it is received from the cylinder in London. Over the cylinder in Manchester is wound a sheet of paper dipped in a solution of prussiate of potash and sulphuric acid, which enables it to receive, and record by dark green lines, the strokes of electricity given out by making and breaking contact with the cylinder at London. There are various ingenious mechanical arrangements connected with the process, which is the invention of Mr. Bain.

It is intended to devote a portion of the building to the use of annual subscribers, who will be accommodated with a room furnished with newspapers and telegraphic despatches of the prices of railway shares, markets, &c. The subscribers will also have the exclusive use of a code of private signals, which will enable them to communicate with their correspondents by a species of short-hand known only to themselves.

Rules for Painting Armour.—It will be of use to note that, for *general purposes*, the body armour during four centuries may be thus simply classified:—

12th century....Scale, ring, and mail, *unmixed* with plate.
13th century....Mixed mail and plate, the mail predominating.
14th century....Mixed mail and plate, the plate prevailing.
15th century....Æra of complete plate.

For the 16th century, or Tudor period, the breastplate will be found a good guide. Its form was at first globose; then a point appeared in front, near the centre; this point or peak gradually fell towards the waist, till at last it extended even beyond the band of the breastplate, and assumed both the form and the name of a "peascod." Under the Stuarts, the peaked waists by degrees disappeared, till at length the breastplate became nearly square at its termination, with an obtuse ridge down the centre.—"*Chart of Ancient Armour*," *by J. Hewitt.*

Scientific Societies, &c.

HULL LITERARY SOCIETY.

Colour in Decoration.—Mr. Lockwood lately read a paper on "the Uses of Colour in Decorating." He alluded to the remarks of Mr. Burge, Q.C., contained in a paper which that gentleman read some time since, on the utility of archæological pursuits, in reference to the restorations in Holy Trinity Church. in which he had stated that the objects of the builders of Gothic architecture were to lead the eye by columns, and lines unbroken by colour, upwards towards heaven, and questioned the use of colours in these restorations. Mr. Lockwood stated that, as the architect employed in these restorations, he had merely followed the traces which he had found existing, although not to the extent in decoration and colour as they had previously existed. He directed attention to the use of gold and colour on the floor, walls, ceilings, and pillars, and mentioned the introduction of ornament and colour by the Saxons, for at the baptism of Edwin, King of the Saxons, in 726, the walls of the temporary building on the site of the present York Minster were decorated with hangings and paintings, brought from France, Gaul, and Italy. He then went on to show that it was the constant practice to decorate the churches of that period with hangings of various colours, with paintings in tablets, and gave instances of presents of such works being made to different churches in England, by Alwin and others of that period. Mr. Lockwood noticed the effects of the Crusades, and the consequent employment of colour in every variety of tint for the purposes of decoration. He then traced the decline of the art to the period of Henry the Eighth, occasioned by the devastation and plundering of the churches and convents during the Reformation.

Improved Chimney-Sweeping Machine.—A patent has recently been taken out for a new mode of facilitating the cleansing and sweeping chimneys and flues, effected by improvements in the machinery or apparatus employed for that purpose. The invention consists of an arrangement of brushes attached to a rod, by rods and levers in such manner that at any enlargement or contraction of the flue or chimney, the brushes are expanded or contracted at pleasure, by which every part of the interior of the chimney is acted upon by the brushes; these brushes being made circular, square, or other shape, to suit and conform to the shape of the sectional area of the chimney or flue. For the application of the apparatus to horizontal flues, it is mounted upon wheels, traversing upon the lower side of the flue, for the purpose of maintaining the rod to which the brushes are attached at or about the centre of the flue, and thereby enabling the brushes to act equally upon all sides of the flue or chimney, which renders the patentee's arrangement of apparatus an improvement in the hitherto imperfect mode of effecting the object in view.

Architecture.

(*Continued from page* 96.)

THE great amount of time, labour, and attention requisite for the production of engravings such as those with which this series of articles is illustrated, necessarily impedes our preserving any exact degree of regularity with regard to their appearance. We, therefore, think that this will serve as a sufficient excuse for our delay in presenting the following illustrations, which bear reference to our last article. In future, we will, however, contrive to make the illustrations accompany the letter-press descriptions.

THE DORIC ORDER.

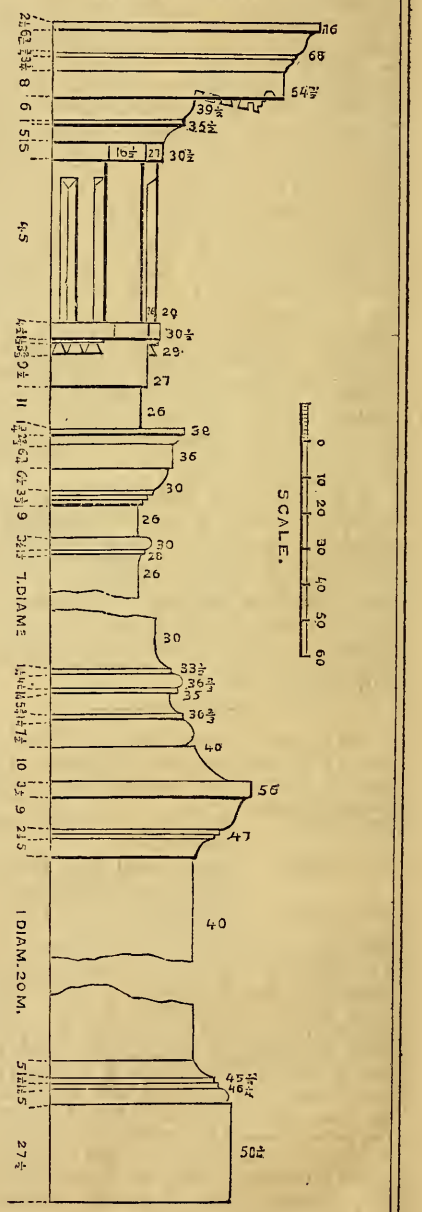


Fig. 1.

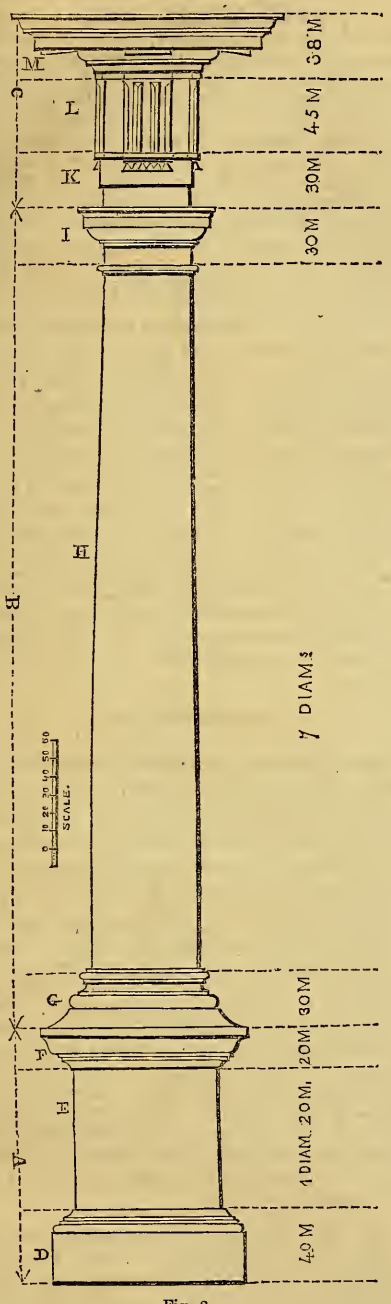
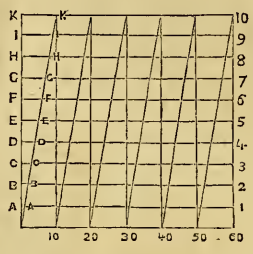


Fig. 2.

Reference to Fig. 2.

A. Pedestal.
B. Column, with base and capital.
C. Entablature.
D. Base.
E. Die.
F. Cornice.
G. Base.
H. Shaft (7 diameters)
I. Capital.
K. Architrave.
L. Frieze.
M. Cornice.
M. Minutes.

The neck of the capital is 50 minutes and the base 60 minutes.



Scale of Minutes.

To form this scale, it is first necessary to ascertain the diameter of the column required, then take the entire width of the diameter and form a square; divide the base into six equal parts, to be called minutes (in order to prevent each minute being divided into ten parts); take ten equal divisions on the side, portions of which will give the parts,—then draw the horizontal and perpendicular lines from side to side; afterwards draw the diagonal lines, as A K, taking care that the lines meet only at the extremities of the perpendicular; then the distance from A to A will give one part, from B to B two parts, from C to C three parts, and so on to K K, which is the width of ten parts. When a given distance is required—for example, say 20 min. 6 parts—take two divisions on the base line for the minutes, and add the width of the space between F F for the parts, it will then produce the width required, and so on for any other dimension.

Rice Glue.—Mix rice flower intimately with cold water, and gently simmer it over the fire, when it readily forms a delicate and durable cement, and only answering the purpose of common paste, but admirably adapted to join together paper, card, &c. When made of the consistence of plastic clay, models, busts, basso relievos, &c., may be formed; and the articles when dry are very like white marble, and will take a high polish, being very durable. In this manner the Chinese and Japanese make many of their domestic idols.

To Inlay Mother-of-Pearl Work.—In Birmingham (to save time), the fragments of pearl are cut into shapes with press-tools. Tortoise-shell is softened by soaking it in hot water—the design arranged, and placed between flat dies, under a heavy press, to remain till the shell is cold and dry. It is thus embedded in the shell. Those vivid colours on paper trays, &c., are fragments of the Aurora shell, pressed in the same way, while the paper is damp, when dry the design is painted, varnished, baked, and polished.

Bronze Casting in France.

In page 87, vol. i., we gave a paragraph detailing the method employed of mixing the different metals used for casting bronze figures, &c., in France, along with some statistics respecting the number of workmen occupied in the profession; we will now enter into a description of the process of casting:—

In the modern bronze foundry, the mould of a statue consists of three parts:—1, the core; 2, the wax, in which every exterior portion of the statue is modelled; and 3, cement for the shell or mask, deriving all its impressions from the wax. The core is a rude representation of the figure intended to be cast, and smaller, in every part, in proportions agreeing with the calculated thickness of metal: if large, or having extended parts, it is strengthened inside by means of pieces of iron. It is composed of a mixture of gypsum and brick-dust diluted to the consistence of clay, and must be raised upon a fixed grate, in order that it may be thoroughly dried, and for another purpose afterwards mentioned. It is next covered over with modelling wax; which should be, in all parts, at least an inch thick; this the artist with his tools fashions exactly to the form which the casting is to exhibit, the perfection of the ultimate design, of course, corresponding to the degree of excellence attained in the model. If, however, the statue is to be a fac-simile of one already executed in marble, or modelled in plaster of Paris, moulds of the latter material are formed upon the pattern figure, and from these moulds castings in wax are obtained of convenient sizes, and these are joined together upon the core; the workman proceeding from the feet upwards, and filling up every cavity inside as he advances, by pouring in a liquid cement. By the former method, it will be perceived, every line of the moulding must be executed by the sculptor himself; in the latter, an artist may, with proper attention to copying merely, produce in metal a masterpiece of statuary. In either case, we have the entire form of the intended bronze composed externally of wax; to this are now to be attached several nearly perpendicular sticks of wax, intended to form conduits for the passage of the molten metal, as well as vents for the escape of the air during casting; bits of bronze are likewise stuck through the wax into the core, so as to keep both parts of the mould in their relative position after the wax has been drawn out. When these are arranged, the formation of the shell or outer covering is proceeded with; it is composed, in the first layers, of a mixture of clay and old white crucibles, very finely powdered, sifted, and moistened to about the consistency of cream; this is carefully spread several times over upon the wax, so as to fill every indentation, and cover every raised part; to this composition, earth and horse-dung are aftsrwards added; and, lastly, a thick coating of these two materials only is laid on. The whole is now firmly fixed to the grate by means of uprights, and bands of iron, embracing the shell at intervals.

Every precaution having been taken to secure the stability of the mould, a fire is kindled under the grate, and the wax melted out, leaving the space which it occupied to be filled with the metal. When, however, the mould is prepared in several parts, from a model first accurately formed in gypsum, and afterwards cut up into sections of convenient size, the pieces may be dried separately. The mould being thoroughly dried, is, whether entire or composed of several pieces, hoisted by means of a crane into the casting pit, and having been put together and properly placed, it is carefully surrounded with sand; if the subject be too big to allow of the mould being thus lifted, then all the preceding operations would have to be carried on in the pit. The mould being thus placed, and gutters made from the furnace to communicate with the different conduits leading to various parts of the statue, the metal is suffered at once to flow into and fill the mould, which it does almost instantly. As it is difficult to obtain very large statues perfectly sound, they are sometimes cast in several pieces, which are afterwards united by pouring metal, in a state of fusion, along the joints. The work, whether cast at once or in sections, is finished by cutting off superfluous portions, and chiseling the different parts: after which the surface is sometimes rendered of uniform appearance by the aid of some composition, according to the taste of the artist.

National Work on Decorative Art.—M. Gruner has, we learn, contracted with the Council of the Government School of Design for the production of a work to be entitled "Louis Gruner's Book of Ornamental Design, for purposes of Decoration and Manufacture." By the artist's agreement with the Council, he is to execute *ten* parts of the work (of which he has submitted two as a specimen); he is to supply the Council with fifty copies of each part,—and to be paid on the delivery of the proofs of each part £130, and £20 additional on the delivery of the said fifty copies. He is authorised to sell parts to the public at a cost not exceeding one guinea each; and he is to defray the entire expense of the work,—but to be allowed to use any designs already the property of the Council. The whole copyright and the entire profit of the work (subject as above) is to be for the benefit of M. Gruner—who undertakes to produce the ten parts within two years.

The Discoverer of Gunpowder.—The discoverer of the power of gunpowder, when confined and set on fire, of propelling heavy bodies, was, according to common report, Berthold Schwartz, a monk, who is said to have lived at Mayence, between 1290 and 1320. He, in some of his experiments in alchemy, had put the mixture into a mortar, and, having accidentally dropped into it a spark of fire, to his astonishment saw the pestle fly off into the air.

Model Lodging-Houses.

THERE is no subject more intimately connected with the moral and social progress of the age we live in than that of the establishment of good, wholesome, and commodious habitations for the poorer classes of the community; and it is one to which we are determined to lend our most strenuous aid and support. We have already adverted to the institution of comfortable and cleanly houses to be let out at a cheap rate either to families or individuals (see pp. 75 and 86, vol. i.), and we will now proceed to regard the measures taken by the "Society for the Improvement of the Labouring Classes" for effecting this desideratum.

In the beginning of the year 1846, the society completed a range of buildings near the Gray's Inn Road, for the accommodation of working men and their families, a portion of the range being devoted to poor widows and single women. Those buildings, the erection of which cost the society several thousand pounds, were opened in the spring of 1846, and, excepting three of the tenements, have been upwards of a year occupied. The gross rental is somewhere about £400 per annum, and at the time of the last meeting, a sum of £7 14s. only remained unpaid by the tenants.

At the last meeting of the society, the committee stated it as their opinion that much good might be done to benefit the poor by taking some of their present dwellings on lease, and effecting a thorough reform and improvement of them. In King-street, Drury-lane, a house, usually occupied as a lodging-house, fell into the possession of Mr. Russel Gurney, an eminent counsel at the English bar, who determined upon a thorough reformation of it. After being entirely repaired, and made clean and wholesome, it was used as a lodging-house at the usual charge of 4d. a night, and has for many months past been fully occupied with lodgers to the number of twenty-four, the whole that it could accommodate. It is now under the charge of the society. In the summer of last year, the society was offered seventeen dilapidated houses in two or three different parts of London, out of which they selected three houses lying together in Charles-street, Drury-lane, a district where lodging-houses for the lowest class of labourers most abound. They took a lease of those three houses, at a rate of £45 per annum for the three, and, from first to last, they have expended nearly £900 in repairing, rebuilding, and furnishing them, and in constructing baths and various other conveniences. They provided eighty beds. The house was opened for lodgers, at 4d. a night, on Monday, the 31st May last—and on that night only eight poor people lodged there. On the 3rd of June there were thirty-five; on the 7th of June, forty-nine; on the 9th, fifty-nine; and on the 10th, sixty-six—being the whole number that the house was then capable of receiving.

The next lodging-house erected under the auspices of the society was the New Model Lodging-House in St. Giles's. The site of this structure, which is in George-street, St. Giles's, and contiguous to the French Protestant church there, cost the society £1,200; the builder's contract was £3,930; and it is destined to accommodate 104 inmates, at a charge of 4d. per night, or 2s. per week, which, assuming it is fully occupied, will yield a return of £540 per annum. The structure is plain and neat in its design, is built of brick, stuccoed in front, and consists of five storeys, besides underground apartments. The basement storey is intended for the residence of the master and matron. The underground apartments are to be fitted up as kitchens and larders, in which the lodgers are to be furnished with fire, and every necessary implement for cooking and keeping their victuals. A hun- and twelve beds in all, each intended for the accommodation of one person, and contained in a distant apartment, will be provided within the walls. Each of the dormitories contains twelve of those separate apartments, divided from the adjacent ones by wooden partitions, with efficient arrangements for warming and ventilating them. Each of the sleeping apartments is also provided with a small wooden chest, having a lock and key, in which the occupant of the room may put and leave anything secure during his absence in the day. To each dormitory is attached a wash-room, lighted with gas at night, and fitted up with a series of leaden wash-hand basins, and towels mounted upon rollers, with an arrangement for supplying and carrying off the water with scarcely any trouble. There are also arrangements for providing the lodgers with warm and cold baths on the premises. Besides all this, there is a large, well-lighted, and well-ventilated apartment set apart as a coffee and reading-room, and fitted up with suitable benches, to which the inmates may repair for innocent and agreeable recreation before retiring to rest. Eventually, a library is intended to be added to the accommodation afforded.

We shall watch with interest the further proceedings of this society, of which we nearly forgot to state that eminent philantrophist, Lord Ashley, is the president.

ARCHITECTURAL MAXIM.—In judging of buildings, the uneducated man speaks from his feelings; and the partially educated man refers to rules. The master, on the other hand, also judges by his feelings; but his feelings are cultivated by study and long-continued observation: the feelings are thus brought to act in unison with the judgment, A person who criticises every fine building which he sees, without vanity or presumption, with a sincere desire to find out whatever is excellent, and to understand and fully enter into the reasons for any admiration which has been generally bestowed upon it by others, yet atthe same time not blindly following authority, but bringing everything to the test of his own feelings and judgment, will form to himself a habit, profitable not only when applied to architecture and the other fine arts, but in every subject on which the human understanding is exercised.—*Wood's "Letters of an Architect."*

The Theory of Painting;

DEDUCED FROM THE "DISCOURSES" OF SIR JOSHUA REYNOLDS.

(*Continued from page* 103.)

With respect to the pictures to be chosen for models, the best rule is to select those of established reputation.

It is not an easy task to point out those various excellences for imitation, which lie distributed amongst the various schools, I will, therefore, at present only recommend a model for style in painting, which is a branch of the art more immediately necessary to the young student. Style in painting is the same as in writing, a power over materials, whether words or colours, by which conceptions or sentiments are conveyed. And in this Ludovico Caracci, in his best works, appears to approach the nearest to perfection. His unaffected breadth of light and shadow, the simplicity of colouring, which, holding its proper rank, does not draw aside the least part of the attention from the subject, and the solemn effect of that twilight which seems diffused over his pictures, appear to correspond with grave and dignified subjects, better than the more artificial brilliancy of sunshine which enlightens the pictures of Titian: though Tintoret thought that Titian's colouring was the model of perfection, and would correspond even with the sublime of Michael Angelo; and that if Angelo had coloured like Titian, or Titian designed like Angelo, the world would once have had a perfect painter.

It is our misfortune, however, that those works of Caracci recommended to the student, are not often found out of Bologna. The St. Francis in the midst of his Friars, the Transfiguration, the Birth of St. John the Baptist, the Calling of St. Matthew, the St. Jerome, the Fresco Paintings in the Zampieri palace, are all worthy the attention of the student; and those who travel would do well to allot a much greater portion of their time to that city, than it has been hitherto the custom to bestow. In this art, as in others, there are many teachers who profess to show the nearest way to excellence; and many expedients have been invented by which the toil of study might be saved. But let no man be seduced to idleness by specious promises. Excellence is never granted to man but as the reward of labour. It argues, indeed, no small strength of mind to persevere in habits of industry, without the pleasure of perceiving those advances, which, like the hand of a clock, whilst they make hourly approaches to their point, yet proceed so slowly as to escape observation. A facility of drawing, like that of playing upon a musical instrument, cannot be acquired but by an infinite number of acts. I need not, therefore, enforce by many words the necessity of continual application, nor tell you that the port-crayon ought to be for ever in your hands. Various methods will occur to you by which this power may be acquired. I would particularly recommend you to endeavour to draw the human figure by memory. I will even venture to add, that by perseverance in this custom, you will become able to draw tolerably correct, with as little effort of the mind as is required to trace with a pen the letters of the alphabet.

But while I mention the port-crayon as the student's constant companion, he must still remember, that the pencil is the instrument by which he must hope to obtain eminence. What, therefore, I wish to impress upon you is, that whenever an opportunity offers, you paint your studies instead of drawing them. This will give you such a facility in using colours, that in time they will arrange themselves under the pencil, even without the attention of the hand that conducts it. If one act excluded the other, this advice could not with any propriety be given. But if painting comprises both drawing and colouring, and if by a short struggle of resolute industry the same expedition is attainable in painting as in drawing on paper, I cannot see what objection can justly be made to the practice, or why that should be done by parts which may be done altogether.

If we turn our eyes to the several schools of painting, and consider their respective excellences, we shall find that those who excel most in colouring pursued this method. The Venetian and Flemish schools, which owe much of their fame to colouring, have enriched the cabinets of the collectors of drawings with very few examples. Those of Titian, Paul Veronese, Tintoret, and the Bassans, are in general slight and undetermined. Their sketches on paper are as rude as their pictures are excellent in regard to harmony of colouring. Correggio and Baroccio have left few, if any, finished drawings behind them. And in the Flemish school, Rubens and Vandyck made their designs for the most part either in colours, or in chiaro-oscuro. It is as common to find studies of the Venetian and Flemish painters on canvas, as of the schools of Rome and Florence on paper. Not but that many finished drawings are sold under the names of those masters. Those, however, are undoubtedly the productions either of engravers or their scholars, who copied their works.

You must have no dependence on your own genius. If you have great talents, industry will improve them; if you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well-directed labour; nothing is to be obtained without it. Not to enter into metaphysical discussions on the nature or essence of genius, I will venture to assert, that assiduity unabated by difficulty, and a disposition eagerly directed to the object of its pursuit, will produce effects similar to those which some call the result of natural powers.

Though a man cannot at all times and in all places paint or draw, yet the mind can prepare itself by laying in proper materials at all times and in all places.

I cannot help imagining that I see a promising young painter equally vigilant, whether at home or abroad, in the streets or in the fields. Every object that presents itself is to him a lesson. He regards all nature with a

view to his profession, and combines her beauties, or corrects her defects. He examines the countenance of men under the influence of passion, and often catches the most pleasing hints from subjects of turbulence or deformity. Even bad pictures themselves supply him with useful documents; and, as Leonardo da Vinci has observed, he improves upon the fanciful images that are sometimes seen in the fire, or are accidentally sketched upon a discoloured wall.

The artist who has his mind thus filled with ideas, and his hand made expert by practice, works with ease and readiness; whilst he who would have you believe that he is waiting for the inspirations of genius, is in reality at a loss how to begin, and is at last delivered of his monsters with difficulty and pain.

The well-grounded painter, on the contrary, has only maturely to consider his subject, and all the mechanical parts of his art follow without his exertion. Conscious of the difficulty of obtaining what he possesses, he makes no pretensions to secrets, except those of closer application. Without conceiving the smallest jealousy against others, he is contented that all shall be as great as himself who have undergone the same fatigue; and as his preëminence depends not upon a trick, he is free from the painful suspicions of a juggler, who lives in perpetual fear lest his trick should be discovered.

(To be continued.)

Mr. Barry's Octagon Court at the New Houses of Parliament.—The visiter to the new Houses of Parliament should make a point of inspecting the roof of the octagon court or central hall of Mr. Barry's great work. The task is rather a dusty one, but masons' dust forgotten, the ascent is by easy enough scaffolding, and the sight is really wonderful. Conceive two hundred and fifty tons of stone fashioned into one roof, and that one roof containing seventy-two bosses, and each boss when uncarved of the size of an ordinary millstone! The roofs of Henry the Seventh's Chapel at Westminster, and King's College Chapel at Cambridge, supply a world of wonder to strangers ignorant of the principles of architecture; but here the wonder must still be greater when they see the enormous mass of masonry which Mr. Barry has built like a heaven over head. These vast bosses will be fashioned into roses and portcullises, and, when seen from the ground, will be at the distance of about ninety feet. This octagon court is as striking an illustration of the magnitude of the works now in progress at Westminster as any we could find about the whole building.

Russian Sledges.—A vessel just arrived from the Russian port of Cronstadt has brought two cases, containing two sledges, with the harness and shafts appertaining to the vehicles, consigned to order. They have arrived at Liverpool.

Painting in Oil.

(*Concluded from page* 118.)

That Vasari should have been the first to give the credit of the discovery to a Fleming is the more singular, seeing that his jealousy as an Italian and a Tuscan is proverbial. It will be readily understood that in compiling such an amount of biographies from such a variety of sources and materials, mistakes would arise; but that in a matter so important in the history of the practice of art—affecting no less than a complete change in the character of its manipulation—he should not have given himself the trouble to investigate more closely, is very remarkable. Vasari obtained his information from Flemish artists—men nationally interested in maintaining the invention for their country. When he tells us that the first inventor was Giovanni da Bruggia (better known as John Van Eyck), he appears (at least in an early edition) even ignorant of the existence of such a person as his brother Hubert; and his whole chapter relating to the process is short and unsatisfactory. Every succeeding Italian writer seems to have followed this statement without investigation; and the error has thus been perpetuated until reference to documents has exploded the idea of the Flemish origin. Mr. Eastlake shows that in the life of Antonello da Messina—where Vasari, speaking of the effort made by the painters to produce a union of tint in tempera without hatching with the point of the brush, says that none had succeeded,—"*Ne con vernice liquida ne con altra sorte di olii mescolati nella tempera*"—he (Vasari) has substituted *colori* (colours) for *olii* (oils) in a later edition, to suit the views of those who attributed the actual invention of oil painting to Van Eyck.

M. Emeric David has supposed that oil painting having been abandoned in the tenth or eleventh century had been invented anew in the fifteenth by Van Eyck. "This," says Mr. Hendrie, "is open to equal objection—as the English authors referred to have shown; and it is singular that some of the materials used for the purpose of painting the chapel of St. Stephen in 1350, were procured from Bruges, Van Eyck's native place. The sum of four shillings and tenpence was paid to Lorvyn de Bruges for six pounds and a half of white varnish at ninepence per pound.'" This was before Cennini or the Van Eycks were born.

"Thus, it appears," remarks Mr. Eastlake, "about the year 1400, the practice of oil-painting, however needlessly troublesome, had been confirmed by the habit of at least two centuries. Its inconveniences were such that tempera was not unreasonably preferred to it for works that required careful design, precision, and completeness. Hence, the Van Eycks and the painters of their school seem to have made it their first object to overcome the stigma that attached to oil-painting as a process fit only for ordinary purposes and mechanical decorations. With an ambition partly explained by the previous unavoidably coarse

applications of the method, they sought to raise the wonder of the beholder by surpassing the finish of tempera with the very material that had long been considered intractable. Mere finish was, however, the least of the excellencies of these reformers. The step was short which sufficed to remove the self-imposed difficulties of the art; but that effort would probably not have been so successful as it was in overcoming long-established prejudices had it not been accompanied by some of the best qualities which oil-painting, as a means of imitating nature, can command."

Hubert Van Eyck, according to strict chronology, was the original improver of the practice of oil-painting; though greatly surpassed by his younger brother John, whose intelligence is celebrated by Bartolommeo Facio.

As pictorial history goes, however, it was accident that led to the discovery of the improved mode of painting in oil. John or Giovanni Van Eyck having finished a picture (on which he had bestowed great pains) on panel, and varnished it, placed it in the sun to dry. The heat, or some other circumstance, caused the panel to split. Grieved at seeing his labour thus lost, the painter sought to avoid the recurrence of the risk by availing himself of such means as the nature of his studies in chemistry might supply. He bethought him if by means of oil boiled with certain ingredients he might make a varnish to dry without the aid of the sun; and trying nut oil and linseed oil, found them more drying than others and better as a varnish. The success of this experiment induced him to try whether colours mixed with oil might work or blend more readily with oil than in tempera,—and the superiority of the oil material was soon established far and near. Some Florentine merchants who traded in Flanders disposed of one of Giovanni's pictures on panel to Alphonso the First, King of Naples; which being seen there by Antonello, a painter of Messina, he repaired to Flanders, and by dint of cultivating a good understanding, presents, and other means, obtained an insight into what was termed the secret. Through Antonello's instrumentality the improved practice was soon known in Italy. Remaining after this but a short time in Messina, he proceeded to Venice,—and died there after practising some years. A certain Maestro Domenico learned from him the secret; and was subsequently murdered by Andrea del Castagno after the latter had induced him to impart it.—Such is the received history of the introduction of oil-painting into Italy.

PHOTOGRAPHY ON GLASS.—Mr. Niepce St. Victor has been making successful experiments in producing the impression of photographic images on glass. Starch, water, and iodide of potassium, boiled in certain proportions, are the ingredients of the mixture, spread equally on the glass. Aceto-nitrate of silver is then applied, and the plate exposed in the camera. Later experiments, however, seem to have shown that albumen was superior to starch.

Notices to Correspondents.

NOTICE.

To HOUSE DECORATORS, GRAINERS, CABINET MAKERS, &c.—Beautifully coloured Specimens of the various Woods and Stones will be presented to our Subscribers monthly, The first Plate is in the hands of our Engraver, and will be shortly ready for delivery. Each Plate will contain four Specimens, while its size will adapt it for binding in the Work.

*** Part IX. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I. to VIII. still continue on sale. The First Volume, beautifully bound in scarlet cloth, in a style designed expressly for this Work, gilt and lettered, price 5s. For those parties who have taken in the Work in Numbers or Parts, Cases have been prepared for binding it in, price 1s. 3d. each; or the Publisher will undertake to get it bound, including the cases, for 2s. Early orders are respectfully requested for Back Numbers.

*** Overseers or Foremen of Factories will much oblige us by recommending our Work to the Workmen employed in the establishments over which they have jurisdiction; while our Readers will confer a similar obligation by bringing it before the notice of their friends and acquaintances.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—Can any of your correspondents inform me how, by having a small portion of the circumference of a circle given, to find the centre? I am, Sir, your obedient servant, BRUNTSFIELD. Edinburgh, Jan. 25, 1848.

ANSWERS TO QUERIES.

WRITING INKS.—Sir,—"Timon" having inquired for receipts for making different coloured writing inks, I forward the following, hoping that they may meet your approbation, and, at the same time, answer his purpose:—*Black Ink*—Take eight ounces of Aleppo galls, in coarse powder; four ounces of logwood, in thin chips; four ounces of sulphate of iron; three ounces of gum arabic, in powder; one ounce of sulphate of copper: and one ounce of sugar candy. Boil the galls and logwood together in twelve pounds of water for one hour, or until half the liquid has evaporated. Strain the decoction through a hair sieve or linen cloth, and then add the other ingredients. Stir the mixture until the whole is dissolved, more especially the gum; after which leave it to subside for twenty-four hours. Then decant the ink, and preserve it in bottles of glass or stone ware, well corked. *Inks of various colours* may be made from a strong decoction of the ingredients used in dyeing, mixed with a little alum and gum arabic. For example, a strong decoction of Brazil wood, with as much alum as it can dissolve, and a little gum, forms a good red ink.—I am, Sir, yours respectfully, ROBERT EDWARDS. Dover, Dec. 31st, 1847.

A YOUNG MECHANIC.—We would never recommend the student either of science or literature to confine himself to the perusal of a particular set of books. In our opinion a miscellaneous study is always productive of the greatest good, in the same manner that the bee, who sips from the greatest variety of flowers, produces the finest honey.

J. F. BRUEN (Bristol).—We will present an article on the subject in about two or three weeks; probably sooner, if we have time.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 121.)

Caligula (Caius),* a Roman emperor, lived

A.R. 776, A.D. 36.

Cammillus, a protector of Rome, lived

A.M. 3690, A.R. 390.

Cataline (Lucius), a Roman emperor,

lived A.M. 3930, A.R. 638.

Cato the Censor, a Roman protector, lived

A.M. 3905, A.R. 605.

* A few words of explanation may be deemed necessary respecting our reason for inserting these portraits. In designing vases, prize cups, &c., subjects are often taken from Roman history, &c., wherewith to decorate them; and in those cases, accurate portraits of the characters are of essential service. It is from this reason that we have adopted the plan which we have this week commenced.—Editor.

Colours (in oil and water painting, &c.) The following is a list of those most commonly in use:—

Yellows.	*Reds.*
Yellow ochre	Indian red
Raw sienna	Lake
Burned sienna	Carmine
Gamboge	Vermillion
Chrome	Venetian red.
Indian yellow.	*Browns.*
Blues.	Madder lake
Indigo	Sepia
Prussian blue	Bistre
Antwerp blue	Lamp-black.
Ultramarine.	

Observations Addressed to Young Painters.—Of the above, all those various tints which are required in painting are formed; but it is advisable to restrict yourself at first as much as possible to the use of the primary colours; and not until increased experience and power have been attained, venture beyond a very limited admixture.—"Colours in the works of art," says Mr. Hay, "are regulated, in their arrangement, by laws founded on natural principles. There are, no doubt, many varieties of tastes in regard to colours, both individually and arranged. Many have fancies for, and antipathies to, particular hues. All have their tastes in regard to particular styles of colouring, some being fond of the gay and lively, some of the rich and powerful, and others of the deep and grave. Some have a partiality for complex arrangements, while others prefer extreme simplicity. It does not signify under what circumstances a variety of colours may be presented to the eye—if they be harmoniously arranged, the effect will be as agreeable to that organ as harmonious music to the ear." The principles upon which this simplicity and harmony are founded must be sought for in all-instructive Nature. It is most strikingly apparent in the colours of the rainbow, and in what may, with no great impropriety, be termed the artificial rainbow, formed by passing light through a glass prism. Correctly speaking, black is not a colour, but the absence of all colour, though there are few blacks which are not more or less tinged with blue, brown, or some other tint. White again is the union of the three primitive colours, in the proportion of three yellow, five red, and eight blue; but in other proportions white, like black, is tinged with various tints. In common language both white and black are called colours. Of the three primary colours, yellow partakes most of the nature of white, being the lightest of all decided colours. Its contrast colour is purple, a compound of the other two primaries. It constitutes, in combination with red, the secondary orange; and when compounded with blue, it produces the secondary green. These two colours are, therefore, its melodising hues; and its most powerful contrast is black. Red, the second of the primaries, is the most positive of all colours, holding the middle station between yellow, which is most allied to light, and blue which is most allied to shade. The hues with which it melodises in series are orange and purple, being its combinations with the two

other primaries. Its contrasting colour is green, a compound of yellow and blue. Blue is the third of the primary colours, and nearest in relation to shade or coolness. Its contrasting colour is the secondary orange, and its melodising colours in series, green and purple. Each of the intermediate compound colours, or secondaries have others, with which they are contrasted or harmonise, through every variety of tint. In order to obtain a knowledge of the harmony of every colour applicable to the practice of painting, the student must assiduously investigate the numerous combinations observable in nature, and perseveringly endeavour to re-produce these artificially. It is, however, satisfactory to know that their most pleasing combinations are strictly regulated by the laws of harmony through the countless varieties of colour, from their brightest or deepest tone to their tenderest tint. While the student, therefore, is investigating effects observed in nature, he ought to make constant reference to these laws to direct his inquiries. The practical part of painting consists in laying colours on the objects of a picture, so as to exhibit them under the peculiar circumstances in which they are placed with respect to the coolness or glow of the atmosphere, or the light, shade, or reflection which may be thrown upon them. The use of colours, accordingly, is the blending and adapting of them so as to impart to every object in a picture a natural appearance, and by a general harmony of the tints to produce a pleasing effect upon the spectator.

(To be continued.)

Gutta Percha.

Although the trees yielding gutta percha abound in the indigenous forests of Australia, it is scarcely five years since it was discovered by Europeans. The first notice taken of it appears to have been by Dr. Wm. Montgomerie, in a letter to the Bengal Medical Board, in the beginning of 1843, wherein he commends the substance as likely to prove useful to some surgical purposes, and supposes it to belong to the fig tribe. In April, 1843, the substance was brought to Europe by Dr. D'Almeida, who presented it to the Royal Society of Arts, London, but it did not at first attract much attention.

The gutta percha tree, or gutta tûbau, as it ought more properly to be called,—the percha producing a spurious article—belongs to the natural family *Sapoteœ*, but differs so much from all described genera, that the naturalists of Australia are inclined to rank it as a new genus. The tree is of large size, from sixty to seventy feet in height, and from two to three feet in diameter.

The mode in which the natives obtain the gutta is by cutting down the trees of full growth, and wringing the bark at distances of about twelve to eighteen inches apart, and placing a coca-nut shell, spathe of a palm, or such like receptacle, under the fallen trunk to receive the milky sap that immediately exudes upon every fresh incision. This sap is collected in bamboos, taken to their houses, and boiled in order to drive off the watery particles and inspissate it to the consistence it finally assumes. Although the process of boiling appears necessary where the gutta is collected in large quantities, if a tree be freshly wounded, a small quantity allowed to ooze out, and it be collected and moulded in the hand, it will consolidate perfectly in a few minutes, and have all the appearance of the prepared article. When it is quite pure, the colour is of a grayish-white; but, as brought to the markets of Australia, it is more ordinarily found of a reddish hue, arising from chips of bark that fall into the sap in the act of making the incisions, and which yield their colour to it. Besides these accidental chips, there is a great deal of intentional adulteration by sawdust and other materials. Some specimens that have been obtained were found to possess very little short of one-fourth of impurities; and even the purest specimens yield, on being cleansed, one ounce of impurities per pound. Fortunately it is neither difficult to detect nor clear the gutta of foreign matter; it being only necessary to boil it in water until well softened, roll out the substance into thin sheets, and pick out all impurities; which is easily done, as the gntta does not adhere to anything; and all foreign matter is merely entangled in its fibres, not incorporated in its substance. Mr. Oxley has calculated that the quantity exported from Singapore to Great Britain and the Continent, from the 1st of January, 1845, to the present date, amounts to about 7,000 piculs; and that to obtain this quantity nearly 70,000 trees have been sacrificed!

When fresh and pure, the gutta is of a greasy feel, with a peculiarly leathery smell. It is not affected by boiling alcohol, but dissolves readily in boiling spirits of turpentine; also in naptha and coal-tar. A good cement for luting bottles and other purposes, is formed by boiling together equal parts of gutta, coal-tar, and resin. When required for use, it can always be made plastic by putting the pot containing it over the fire for a few minutes. The gutta itself is very inflammable,—a strip cut off takes light and burns with a light flame, emitting sparks and dropping a black residuum in the manner of sealing-wax; which, in its combustion, it very much resembles.

But the great peculiarity of this substance, and that which makes it so eminently useful for many purposes, is the effect of boiling-water upon it. When immersed for a few minutes in water above 150 deg. of Fah., it becomes soft and plastic, so as to be capable of being moulded to any required shape or form, which it retains upon cooling. If a strip of it be cut off and plunged into boiling water, it contracts in size both in length and breadth. It is this plasticity, when plunged in boiling water, that has allowed of its being applied to so many useful purposes, and which first induced some Malays to fabricate it into whips, which were taken into some of the towns in Australia, and led to its farther notice. The natives soon extended their manufactures to buckets, basins, and jugs; shoes, traces, vessels for cooling wine, and several other domestic purposes.

Prevention of Damp.

At a period when this subject has assumed such an important aspect, the following extract frem a communication made by J. I. Hawkins, Esq., to the Editor of the "Architectural Magazine," in the year 1834, may not be devoid of interest:—

"Soon after I had taken a lease (ten years since) of the cottage I now occupy, I discovered that the damp ascended the walls to the height of a yard above the ground, and that my furniture began to be injured by mildew. Finding that the foundation was laid upon a subsoil of clay, and knowing that a cure would be effected by interposing a waterproof medium throughout the thickness of the wall, just above the level of the ground, I proceeded in the following manner:—First, I made a hole through the wall, over the ground course, taking out two courses in height and two bricks in length; consequently, the hole was 6 in. high and 18 in. wide. I filled up half this hole, at one end, with two courses of sound bricks, laid in Roman cement. It is clear that the operation could not injure the wall, the width of 18 in. not allowing of any settlement. Two courses more, of 9 in. in width, were next removed, making the hole again 18 inches wide; the half of which was then filled up with bricks and cement as before. The operation was repeated until the whole of the walls of the house were underpinned by two courses of hard bricks and three joints of Roman cement; constituting a waterproof septum, through which the damp cannot rise.

"Local circumstances prevented easy access to two or three spots; and, my bricklayer not taking care that there should be three perfect joints of Roman cement in every part, the moisture still rises, in a few neglected places, in a small degree. But, with these few exceptions, the cottage, generally speaking, has been as free from damp, for nearly ten years, as if built upon a dry subsoil. The cost of 120 ft. run of wall, for the most part 14 in. thick, was about £15.

"In recommending this plan, I would strongly enforce the necessity of performing the operation under every part of the house, partition walls, and chimneys. I yielded to the fears of my bricklayer, and suffered the stacks of my chimneys to remain untouched; the hearths on the ground floors are, therefore, damp, except when a constant fire is kept up. There was, in reality, no danger of any sinking of the stack, as Roman cement, when of good quality, expands in setting, and affords as perfect a support as the bricks and mortar which were taken away; or, rather, a more perfect support than they had afforded.

"In building a house on a moist subsoil, where the expense of a waterproof foundation might be an object, a couple of courses of brick, laid in Roman cement, immediately above the level of the grouud, would prevent the damp rising above those courses. I have seen a single course of slate used for this purpose with good effect; and that is, perhaps, as impervious to water as three joints of Roman cement."

The English Navie.—The English navie has carried a knowledge of his craft into countries where the arts of digging and handling the spade were in their infancy. It may seem ridiculous to talk of there being "an art" in shovelling earth into a barrow; but it is an art, and a very important one. It is quite English. The very spade is English, and so are the pickaxe and wheelbarrow. All over continental Europe, the instrument of digging is a clumsy species of adze; and that for lifting is a long pole with a small shovel at the end of it. The short shovel with a cross handle is English; the French and Germans know nothing of it, except as a new importation. With the short English spade or shovel, a navie will with ease lift, in a given space of time, six times the quantity of earth that a Frenchman will do with his long-poled instrument. He excels in the art of carrying as well as lifting. On several railway workings which we have seen on the Continent, apparently under the charge of native contractors, the earth is filled into small cars or waggons, which are drawn by men or women with ropes across the soft and uneven surface of the ground. The toil and tediousness of this process are excessive; and the spectacle makes one melancholy. "Can it be possible," you say to yourself, "that they don't know of the wheelbarrow?" This little vehicle, homely as it appears, is entitled to be associated with the most stupendous undertakings. Pushed along on a plank—another English invention—by a stout navie, it forms one of our most valuable machines. The great or wholesale carrying engine, however, of the navie, is the waggon on temporary rails. Of this expert mechanism the continentalists likewise knew nothing till they saw it introduced by English contractors; and, after all, the car, dragged with difficulty by ropes, is still chiefly employed by them—a dozen men or women not doing the work of one horse! The English navie, paradoxical as it may seem, is an important agent in the spread of civilisation: he carries the arts abroad, and practically expounds their operation. Now that he has shown the French the use of the pickaxe, the short shovel, the wheelbarrow and plank, and the waggon and temporary rail, we may reasonably expect that the knowledge of these improved instruments of labour will be extended over Europe. How curious! An illiterate peasant from the fens of Lincolnshire tells the learned of France and Germany things which alter the face and condition of kingdoms, and which they never heard of before! Philosophers who can discover planets, not having the ingenuity to invent a wheelbarrow! Countries affecting to stand at the head of science, yoking women in rope-harness to draw mud, and making them draw it too, in the most unscientific manner!

A DESIGN FOR IRON-WORK. (*See also page* 138.)

Architectural Museum.

N this subject, to which we briefly alluded in a late number, we now propose to enter more fully. Since the appearance of our first notice in these pages we are glad to perceive that the matter has become generally agitated both by the press and by private individuals; and a Mr. Benson, of North Shields, has published a plan for effecting the object, in the columns of a professional contemporary.

At the present day there is nothing so necessary for the advancement of knowledge as the advancement of the means for attaining it. It should be remembered that although natural genius may exist in individuals—as it hath ever done, it is still necessary that that genius be properly cultivated, ere it produces anything tending to benefit the nation. The argument will not hold good that, because in a few isolated cases—and they are, indeed, but comparatively few—men have risen into fame, and earned immortality for themselves by their own unaided exertions, we are always to rely on the precarious chance of the existence of such persons in every age. It therefore becomes us immediately to extend the spread of education, whether it be in literature, science, or art, to the utmost; and while we shall, by this means, secure our Byrons, Stanhopes, and Haydons—we shall not, depend upon it, lose our Bloomfields, Watts, and Wilkies.

The British Museum—as it at present exists—is, no doubt, a super-eminently valuable collection;—comprising, as it does, specimens of most of those objects to which history refers as affording indubitable traces of the intellectual and social progress of mankind in every age;—while to all who love to study the wondrous works of Nature, the place affords unrivalled attractions; but still our praise must be limited—the utilitarian spirit of the age requires that our public institutions should be rendered subservient to the public weal, and that the education of their visiters be as much regarded as their pleasure. It is with this view of the matter that we now proceed to treat upon the institution of a museum of architectural antiquaries. There are many, many men whose progress in the architectural profession has been entirely closed by the want of means to visit the Continental countries where the finest specimens of the architecture of every epoch, civil, military, and ecclesiastical are said to exist; and while the means of effectually reviving it lie within the power of government, it is a disgrace to the nation that such a clog should be allowed to exist—a clog that while it remains must retard the proper study of architecture by those who profess it as a profession.

But, to the subject at once. Mr. Benson's letter, above mentioned, contains the following propositions:—

"A museum of architectural models should be established, to consist of—

"The models of cathedrals, collegiate, conventual, and parochial churches, whether perfect or in a ruinous condition.

"The models of all the public and some private buildings.

"These models to be of three separate scales—one scale for the exteriors; another, large one, for the interiors; also a larger, for some integral portion, as may be desirable to show the peculiar characteristics of each building.

"In all cases where desirable, a model to be made, of a scale correspondent, to show the effect to be produced by the completion of the edifice, according to the original design, which may have been frustrated by fortuitous circumstances.

"The scales to be fixed, and, when decided on, not to be deviated from on any account whatever. Thus the comparative sizes will be better understood, and by this means more satisfactory ideas can be obtained."

This plan, it is further stated, could be carried out at an expense of three or four hundred pounds per annum for ten years.

In a short time we will, perhaps, return to this subject.

Our National Defences.—An Ordnance railway, as near as possible to high water mark, round the coast, with moveable batteries thereon capable of being impelled by steam to any point attacked by the enemy, of battering the invading ships, and destroying with grape shot the troops in their attempt to land, is one of the many proposals which are daily being made, in order to secure England's safety from the aggression of her foreign foes.

Improvements in the Manufacture of White Lead.

In page 182 of our first volume we noticed two inventions relating to the above subject, namely, those of M. Gannal* and Mr. R. C. Lotham; but we did not at that time enter very fully into the matter. Several correspondents having since requested further information, we will now give a description translated from the original:—

"A hexagonal or octagonal leaden cylinder is to be prepared, two metres in length, with a diameter of from thirty to forty centimetres. The lead should be from five to eight millimetres in thickness. This cylinder is to be enclosed in a frame made of rod-iron; to one end of which a crank is to be attached. It is to be placed on a stand, so as to receive with ease a rotary movement. At the centre of the cylinder there is to be an opening or bung-hole through which the materials are to be introduced. At the end opposite the crank and in the axis of the cylinder, another opening is to be made, of from three to four centimetres in diameter, through which is to pass, without closing or stopping it up, an elastic tube fitted to a bellows. This tube must reach the bottom of the cylinder. 100 killogrammes of granulated lead and thirty litres of water are to be introduced into the cylinder; the bung-hole is to be closed, and the apparatus turned round at the rate of forty-five or fifty turns per minute, and if this motion is continued for five hours, about two-thirds of the lead will be found reduced to an impalpable powder and still retaining its metallic colour. If the lateral opening remains open, then the lead so divided becomes oxidated, and the product taken out is a protoxide, or massicot, hydrated in part. Lastly, if an elastic tube reaching to the bottom of the cylinder is fitted to the apparatus, the other end of which is attached to the bellows receiving air from a close chamber or enclosure in which there is burning charcoal; the finely divided lead coming in contact with the air and the carbonic acid blown into the apparatus by means of the bellows, is converted into oxide, and finally into carbonate of lead or white lead.

"Acting on this principle, we manufactured a considerable quantity of a product, which was judged to be equal in quality to the best of that met with in commerce.

"When the cylinder has been turned for a sufficient length of time, the bung is to be opened, and the liquid contained suffered to run out; a quantity of water equal to that first introduced, is put in, the cylinder is to be turned for five minutes, the second portion of liquid is to be run off, then the apparatus immediately recharged for a second operation, introducing, however, only seventy-five killogrammes of lead, inasmuch as there remain twenty-five to thirty killogrammes not finely divided. In order to facilitate, and hasten the operation, we have made use of two different processes. The first consisted in pouring into the water, at the moment of charging the apparatus, 500 grammes of nitric acid. The second in substituting for the acid one killogramme of nitrate of lead.

"It is, however, to be remarked, that during the operation a little nitrous acid is disengaged, and that when the operation is completed, scarcely any is to be found in the mixture that remains. It has been observed that the acid or the salt of lead is decomposed. A sub-hyponitrate is doubtless formed, which is afterwards decomposed by the carbonic acid.

"The liquid product, withdrawn from the cylinder, is poured into a vessel containing eight or ten times the proportion of water made use of in the operation. This mixture, violently agitated, becomes considerably whiter, in proportion to the blue tint of the product taken out of the cylinder, which is occasioned by a quantity of lead, finely divided, but not yet oxidated; or yellowish, if formed of oxide not carbonated.

"It is to be observed, that after two days washing, the whole of the product is of the most dazzling whiteness. However, I would here observe, that having dried immediately some white-lead which contained about one-eighth of its weight of divided and non-oxidated lead, at the end of two months the entire mass had a homogeneous tint.

"As in this operation some portions of granulated, and others of imperfectly divided lead, escape from the apparatus, it is necessary to let them deposit in vessels having openings at different heights. In the first place the clear water which floats about the deposit is drawn off, then by an opening somewhat lower down, the pasty deposit, which rests on the imperfectly divided particles of lead.

"The pasty mass is thrown on filters of closely woven cloth, which have been previously fixed on frames. Here a large quantity of water drains off and leaves a plastic residuum. In this state, the filters are taken down, the ends of the cloth are folded over, and the whole is subjected to a violent pressure.

"When this pressure has removed the greatest quantity of water possible, the packets are taken out, the cloths are taken off, the mass is divided into pieces of the desired form, and they are then placed in a hot-air stove.

"As may be seen, the theory of this operation is as simple as its manipulation. In adopting this system of manufacture, we have simplification of labour, a larger product, saving of manual labour, and less chance of loss.

"Until the present period, our manufacturers, followers of blind routine, imitated the form which the Hollanders formerly gave to this article; but now, our workmen, our foremen are too well informed to pay any attention to the particular form or shape that may be given to a product. And when they learn that the adoption of this new form or shape has for its principal object the preservation of the health and life of many thousands of fathers of families, who annually perish in conse-

* By an accident, this gentleman's name was misprinted in the former notice.

quence of the fatal results of the present mode of manufacture, they will doubtless applaud the intention of my publication, and will hasten to call for white lead in a new form.

"To sum up the whole, my process of manufacture consists:—

"1st. In granulating the lead.

"2nd. In reducing it into indefinitely fine particles by friction on itself in a leaden cylinder.

"3rd. In facilitating the oxidation of the lead so divided by the introduction of atmospheric air into the apparatus.

"4th. In carbonating immediately this oxide of lead by making use of air more charged with carbonic acid.

"5th. In hastening the oxidation of the lead, by introducing into the apparatus nitric acid, or the nitrate of lead.

"6th. In washing the product obtained by this process.

"7th. In hastening its desiccation, by subjecting the result to the greatest possible pressure.

"8th. In dividing by square points the pressed mass.

"9th. In drying in a hot-air stove the divided product.

"On the 24th of December, 1839, a room and the closet of an apartment still occupied by M. Mequignon, Jr., rue des Grands Agustus, No. 9, were painted by M. Coulon with white lead manufactured by me by this process: this paint, after seven years, is as beautiful as when it was first applied.

"The publication now made is entirely for the benefit of the workmen. The manufacturers will hasten to adopt it; but I think, moreover, that taking into view public health, the government ought immediately to interdict the method of making it by putting the lead into pots, which is the principal source of the painters', or lead cholic.

"Note.—1 metre=39·37 inches; 1 centimetre=·3937 do.; 1 millimetre=0·397; 1 killogramme=15434 grains; 1 litre=about 1 quart."

Improvements in Springs.—A patent has been taken out by Mr. J. Woods, of Bucklersbury, for springs for supporting heavy bodies, and resisting sudden and continuous pressure; they are formed of flat plates of steel of equal thickness and breadth throughout, except at the two ends, in such manner that the weight shall tend to deflect the plate in its breadth, instead of its thickness, as has been usual. A plate of steel is wound round a cylindrical or square bar, in a spiral or volute form, hardened and tempered. To form the spiral springs a cast-iron mandril of the proper form is employed, furnished with a wrought-iron stem, collar, and cotter, and the plate of steel is hammered or rolled round it while hot, and then tempered. To obtain springs of different strengths, the breadth and thickness of the steel is varied, as also the pitch of the curve, by which means a higher or lower spiral is formed from the same plate.

Oxidation or Corrosion of Iron.

No corrosion, or oxidation of iron, can take place from atmospheric exposure, unless oxygen and carbon are present, and in contact with the iron; nor is this sufficient to effect oxidation, unless the particles of these substances are excited to act upon each other by electricity, which only takes place through the medium of moisture, or dampness—that is to say, moisture is the vehicle of the electric action upon the iron—carbon and oxygen.

Suppose, first, that a surface of pure iron is exposed; then, as the iron contains no carbon itself, the carbon is wholly derived from the atmosphere, as is also the oxygen; and a stratum of the surface is protoxidised by absorption of oxygen from the atmosphere, and carbonated by the absorption of the carbonic acid from the same source, producing a thin pellicle of carbonate of protoxide of iron. But the process does not end here—for the protoxide absorbs an additional dose of oxygen from the carbonic acid with which it is combined, and the carbonate of protoxide becomes gradually the simple peroxide, merely hydrated from the presence of moisture—and this is common rust.

To prove the truth of this statement, take a piece of pure sparry iron ore—viz.: carbonate of protoxide of iron—and, having made a fresh fracture, expose it for some time to the action of the atmosphere, it will be found that the outside has become of a red rusty colour from the proxidation of the surface in contact with the atmosphere.

White cast-iron rusts sooner than gray cast-iron, because its carbon is nearly all combined carbon, and fitted, from its state of chemical divison, to accelerate the corrosion of the iron, by forming carbonic acid with the oxygen of the atmosphere. Gray cast-iron, though it contains a greater aggregate amount of carbon than white cast-iron, yet has it existing, chiefly in mixture, and but little in combination—so that there is only a small portion of carbon in a state fitted for combining with the atmospheric oxygen to form carbonic acid, and thereby to accelerate the corrosion of the iron; and, besides the free carbon existing in the state of keesh, covers and protects every unbroken crystal of iron from the action of the atmosphere. When bar-iron is immersed in common water in the state of filings, a coating of rust will be observed upon the filings, derived from the carbonic acid, which always exists to some extent in common water; but when a second quantity of filings is introduced, no oxidation ensues, because all the carbonic acid was abstracted by the first dose. The carbon, which oxidation leaves upon the surface of iron, is the free carbon, which cannot enter into combination with oxygen, except by direct combustion. I believe the above to be the true explanation of the corrosion of iron in general, but there are many local and accidental causes which may hasten the oxidation—such as gaseous fumes, and direct contact with acidulated matter, or liquids—but these latter causes

are the exceptions from the general rule. I think it will be found that, with all metals, the simple atmospheric corrosion commences with the formation of a carbonate. When iron is the most exposed to the heat of the sun, the protoxide first formed must pass more speedily into peroxide than in those parts where the temperature has been less elevated—and hence the formation of rust will be accelerated upon the sunny side.—*Robert Mushet in the "Mining Journal."*

The Westminster Palace Clock.

We are, it seems, about to have another wonder of the world in the Westminster Palace clock, which is destined to exceed all others in accuracy and dimensions, except, in the latter respect, a skeleton dial at Malines. Truly, we might almost doubt our existence in the economical England of the ninteenth century when we find one of the candidates seriously proposing to jewel the escapement pallet with sapphires! The whole of the arrangements with regard to the new clock are to be approved of by the Astronomer Royal before being put into practice, and it is to him that candidates are referred. Among the conditions drawn up by him are the following:—The frame to be of cast-iron; wheels of hard bell-metal, with steel spindles, working in bell-bearings, and to be separately shipped and unshipped. Accuracy of movement to be insured by dead-beat escapement, compensating pendulum, and going fusee. The first blow of the hammer, when striking the hour, to be within a second of true time. Galvanic communication will probably be established with Greenwich Observatory. The four sets of hands, with the motion wheels, it has been calculated, will weigh 1,200lbs.; the head of the hammer 200lbs.; the weights from 150 to 300lbs.; and the pendulum bob 300lbs. It is to be an eight-day clock. The motion of the minute-hand is not to be constant; it will move once every twenty seconds, when it will go over a space of nearly four inches. Three candidates have already offered themselves for the honour of making the national clock—Mr. Vulliamy, Mr. Dent, and Mr. Whitehurst of Derby. Two estimates have been sent in, one for £1,600—the other, £3,373. "As it is intended," says the Astronomer-Royal, "that this clock should be one of which the nation may be proud, I would propose that the access to it should be a good one, and even slightly ornamented, and that facility should be given to the inspection of the clock by mechanics and by foreigners."

Bridge over the Rhine.—Two French engineers have lately been charged, by the municipality of Cologne, to throw a suspension-bridge over the Rhine in that city, similar to the magnificent one over the Danube at Ofen, in Hungary. The new bridge is to have a pile in the middle of the river, and will cost 150,000 thalers, or 600,000f.

Lessons in Drawing.

METHOD OF DESCRIBING THE FIGURE FOR IRONWORK IN PAGE 134.

First form a square, then find the centre, and from the centre point place the leg of the compass and strike the circle D D. Divide the radius line into three equal parts, and from the point A strike the circle A. Take half the lower division from the point B, and strike the arc B; and then from the point C on the radius line strike the arc C, which will give the form required.

Artistic Societies.

DECORATIVE ART SOCIETY.

Decorations at the Lyceum Theatre.—The subject was introduced by Mr. Laugher, the secretary of the society, with a brief recital of several opinions and suggestions having reference thereto, which originated through various papers on theatres, scenery, stage properties, and heraldry, previously read before the society, and which, it was argued, may have had some share in promoting a meritorious progress in the decorations and scenery of our metropolitan theatres. It did not appear, however, that any particular style of decoration then in existence had been recognised as perfect; but the relievo decorations at the Princess's Theatre had been accredited as excellent, although displaying a treatment too massive and cumbrous for a theatre of its dimensions, whilst those of the Opera House in the Haymarket, and Covent Garden Theatre had been censured mainly for the comparatively tame and ineffective result obtained by a preponderance of flat-surface paintings; and the desideratum, therefore, appeared to resolve itself practically into an amount of light and shadow in the embellishments; and, further, that this is more forcibly derived by projection of surface and relievo ornaments. Mr. Laugher argued, that a freedom in criticism would promote the refinement of our tastes, and, by diffusing a more correct estimation and regard for decorative art, a reform therein must

be hastened. To inculcate such lessons through the medium of a theatre might displease some, but the interior decorations of a mansion do not offer equal scope for fair debate, nor, with persons assuming practical views, does a constant reference to precedents afford equal advantages with a consideration of the living progress and actions of our own times. Our theatres and public buildings, it was contended, therefore, ought to be considered proper vehicles for the education of a nation's taste. The reader then remarked, that in the recent decorations of the Lyceum Theatre, there may be found much of progress in art to watch and carefully study, as they exhibit artistic results very superior to any of a similar character at present in any other metropolitan theatre, and undoubtedly would have an important influence in fostering a demand for that highest class of embellishment, which consists in representing animate forms in relievo. A general description of the ornamental details having been given, he observed, that the embellishments emanated chiefly from the ateliers of the artist-modeller and sculptor, while, with the exception of the fronts to the uppermost tier, pictorial art is only sparingly introduced, and that the contrast in the energy of the respective efforts of sculptured and painted decorations, ought particularly to be noticed. The excellent groups of well-modelled boy-figures clustering amidst the foliage and branches which stretch forth to support chandeliers, arranged at intervals around the theatre, have, it was said, a purport and business-like air, intelligible to all observers: and the expression in the features of the upper groups is especially appropriate to their position. The panels and medallions, containing figures in relievo, were described as works worthy of minute examination; and the foliated scroll-work, birds, beasts, and serpents, introduced upon the boxes and friezes, were said each to possess great artistic merit. The manner in which the birds on the dress-circle are arranged with their natural enemies, such as serpents and wild cats, appearing amidst the lower convolutions of the foliage on which they rest, was alluded to with commendation. It was said, that nine days was the extent of time in which the whole of the relievo decorations had been prepared and fixed by the Messrs. Jackson. The reader, in conclusion, remarked that the style adopted in the decorations of the Lyceum displays many features which have been favourites with the greatest artists in past ages. He referred to the coins, cameos, and bassi-relievi, of ancient Greece and Rome, on which human figures, such as Cupids, Bacchantes, &c., are ordinarily found; also to the examples of beautiful boy-figures in Raphaël's cartoon of "St. Peter healing the Cripple at the Beautiful Gate," as well as the works by Donatello, Ghiberti, Brunnelschi, Titian, Il Flamingo, and others, from the fifteenth to the seventeenth century,—and particularly to Gibbons, whose skill in representing birds, &c., in alto-relievo, for applied decorations, had rendered this class of decorative art popular, down to late in the eighteenth century, evidence of which, it was remarked, might be particularly gleaned from the sculptured tomb-stones to be met with in almost every village churchyard in England.

Method of Bronzing or Browning Gun Barrels, &c.—Take nitric acid two ounces, sweet spirits of nitre two ounces, alcohol one ounce, sulphate of copper (blue vitriol) two ounces, tincture of steel one ounce. These ingredients are to be mixed, the sulphate of copper having been previously dissolved in a sufficient quantity of water to make with the other ingredients one quart of mixture. Before commencing the operation of bronzing a gun barrel, it is necessary that it be well cleansed from all grease and dirt; also that the muzzle and touch-hole be well plugged with wood to prevent the mixture injuring the inside. The composition is then to be applied with a clean sponge or linen rag, taking care that every part of the article be covered with the mixture, it is then to be exposed to the air for twenty-four hours, after which the barrel must be rubbed with a hard brush to remove the oxide from the surface. This must be performed a second or third time if requisite, by which the barrel will be of a perfectly brown colour; it must then be carefully rubbed and wiped, and immersed in boiling water, in which a quantity of alkaline matter has been dissolved, in order that the action of the acid may be destroyed, and the impregnation of the water by the acid be neutralised. The barrel, when taken from the water, must, after being rendered perfectly dry, be rubbed smooth with a burnisher of hardwood, and then heated to about the temperature of boiling water; it then will be ready to receive a varnish made of the following materials:—Alcohol one quart, dragon's blood, pulverised, three drachms, shellac three ounces. The varnish, when perfectly dry on the barrel, must be rubbed with a burnisher to give it a glossy appearance.

Electro-Telegraphic Progress.—It is proposed by Messrs. Brett, of Hanover-square, to establish an international communication, *viâ* Dover and Calais, by their printing telegraph. The English and French Governments have, it is said, conceded grants to the projectors, and the French Minister of the Interior, M. Duchatel, is understood to have expressed an ardent desire for the fulfilment of the undertaking, and promised to give it his cordial support. Experiments made with this telegraph, on land extending 146 miles between the points of communication, have been performed, it is said, with the same rapidity and certainty as at a distance of only a few feet.—A citizen of Edinburgh, surjourning in Manchester, lately received, by telegraph, an incidental call home, wards to Edinburgh, which he reached (a distance of 289 miles each way) in twelve hours, whereas the same feat, only twelve months since, could not have been accomplished in less than three days, and even that, not long since, would have been a "world's wonder" in this age of miracles.

RAILWAY BRIDGE OVER THE FALLS OF NIAGARA.—If anything could be wanting in the attraction of the country about Niagara to turn thither the tour of the multitudes in the pleasure season, this bridge will supply it. Its thousands of tons weight of the strongest iron cord that the ingenuity of the iron-master can desire find a safe support in wrought-iron anchors built in the solid rock 100 feet below the surface; so that before it could yield the very rock-bound earth would forsake its tenacity. A large wooden framework is to be placed so that no undulating motion can be experienced. In full sight of the cataract—the surge of angry waters far beneath—the sullen storm-beaten rocks all around—the quick locomotive will put forth all its quickness to rush beyond the peril of its journey. This glorious work is already begun, the money for its cost paid in and available, the excavations commenced, and the contractor is to cross on horseback by the middle of next June. Its firmness is to be such that with all the burden of a powerful locomotive and a long attendant train of cars it is not to vibrate one inch in the centre. The railway is to occupy the centre,—two carriage-ways on either side, and two footways. What a magnificent spectacle this road in full use will present! A road of this kind over the Menai Straits in Wales is famous for the daring displayed in its construction. That over the Niagara will soon be world-famed. It will be an iron link of civilisation between the two ruling powers of the world, and will never be severed. One of the first thoughts that present themselves in reference to the construction is, as to how the wires are to be thrown across. The steamboat now used below the Falls is to take over two cables, to which strands of iron are affixed. These are to be drawn over till two ropes of iron are drawn over, on which a temporary pathway is to be placed:—and when I inquired where workmen could be found who had nerve enough to work effectually under such circumstances, the answer so characteristic of American strength of action was, "Oh, there are always plenty of Yankees who have both the courage to work there and the ingenuity to work well." The great railway in Canada which is to be connected with this mighty work presents some admirable features. Its grade is over twenty feet, and a very, very large proportion of the distance is on a straight line. On one line, perfectly straight, ninety miles are laid out. All the highways of the country are to pass either over or under the road, by depression or elevation; so that there will be neither obstacle nor hindrance to a flight which will put more life into the provincial dominion of her Britannic Majesty than it has yet seen. "That same" province of Canada West has yet to see great days. "The last link" is completed when this great bridge of the Cataract shall have been completed. From Boston and New York an unbroken line is presented; and the day is coming when some correspondent of yours will delineate the incidents of a thirty hours' journey from the metropolis to Detroit. — *New York Courier and Enquirer.*

Notices to Correspondents.

NOTICE.

TO HOUSE DECORATORS, GRAINERS, CABINET MAKERS' &c.—Beautifully coloured Specimens of the various Woods and Stones will be presented to our Subscribers monthly, The first Plate is in the hands of our Engraver, and will be shortly ready for delivery. Each Plate will contain two Specimens, while its size will adapt it for binding in the Work.

☞ All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the DECORATOR'S ASSISTANT, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** Part IX. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I. to VIII. still continue on sale. The First Volume, beautifully bound in scarlet cloth, in a style designed expressly for this Work, gilt and lettered, price 5s. For those parties who have taken in the Work in Numbers or Parts, Cases have been prepared for binding it in, price 1s. 3d. each; or the Publisher will undertake to get it bound, including the cases, for 2s. Early orders are respectfully requested for Back Numbers.

*** Overseers or Foremen of Factories will much oblige us by recommending our Work to the Workmen employed in the establishments over which they have jurisdiction; while our Readers will confer a similar obligation by bringing it before the notice of their friends and acquaintances.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—Could any of your correspondents inform me, through the medium of your excellent periodical, of the method of engraving door-plates (zinc and brass), together with a description of the tools necessary to inlay brass or copper letters in zinc, or zinc and copper in brass plates.—Yours respectfully, RIX. January 27th, 1848.

ANSWERS TO QUERIES.

MAGIC LANTHORNS.—Sir,—In answer to "Timon" I beg to state that magic lanthorns are made as follows:—A square box is prepared, darkened on all sides except the front, where a tube is inserted to receive a lens, which is placed at its extremity; while at the end nearest the box a slit is made so as to allow of a moveable glass slide, on which is painted the representation of any figure, being worked to and fro. Within the lanthorn is placed a strong light, consisting of an Argand lamp of oil or gas. A mirror behind the lamp serves to reflect and strengthen the light. All magic lanthorns are provided with chimneys, in order to carry off the smoke of the lamp; this is placed upon the roof of the box, and bended in this manner—

which prevents any external light from penetrating into the instrument.—Yours, ever truly, H. S. J. Lincoln, January 1st, 1848.

DECORATICUS (Liverpool).—In Baptiste Fulzosis' "Memorabilibus Collectanea," a quarto work, printed at Paris in 1518, there are numerous fine examples of capital letters; but it is extremely scarce, and only to be met with by chance.

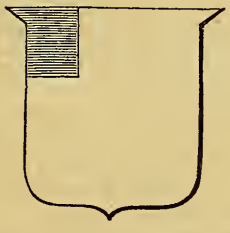
An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 132.)

Cato Porcius, the Younger, a Roman

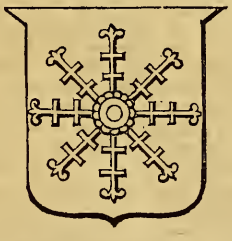
emperor, lived A.M. 3954, A.R. 654.

Canton (in heraldry), is one of the nine honourable ordinaries; being a square portion of the escutcheon parted from the rest. It has



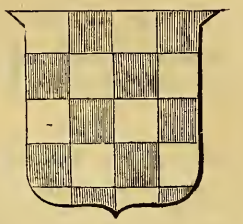
not any fixed proportion, though, by right, it should be less than a quarter. It is often only a ninth part, and used as an addition or difference, frequently to express bastardy.

Carbuncle (in heraldry), a charge or bearing, consisting of eight radii or spokes, four



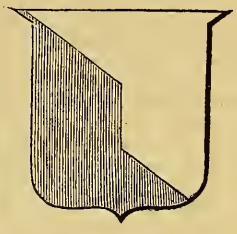
whereof make a common cross and the other four a saltier.

Checky (in heraldry), is where the shield or



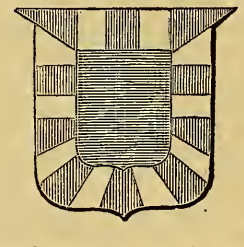
a part thereof, as a bordure, is checquered or divided into checquers or squares.

Cœur (in heraldry), signifies a short line of partition, in pale, in the centre of the escutcheon, which extends but a little way,



much short of top and bottom, being met by other lines which form an irregular partition of the escutcheon.

Compone or Componed (in heraldry), a bordure compone is that formed or composed of a



row of angular parts, or chequers of two colours.

(To be continued.)

The new Professor of Painting will commence his course of lectures at the Royal Academy on Thursday next, and continue it on the three Thursday evenings next following; and the Paofessor of Sculpture, Sir Richard Westmacott, commenced his course on Monday, and will continue it on the five succeeding Mondays. This year, therefore, the courses of lectures will be complete; which, owing to infirmity or some other cause, they have not been for some years past.

The Theory of Painting;

DEDUCED FROM THE "DISCOURSES" OF SIR JOSHUA REYNOLDS.

(*Continued from page* 129.)

The first endeavours of a young painter, as I have before remarked, must be employed in the attainment of mechanical dexterity, and confined to the mere imitation of the object before him. Those who have advanced beyond the rudiments may perhaps find advantage in reflecting on the advice which I have likewise given them, when I recommended the diligent study of the works of our great predecessors; but I at the same time endeavoured to guard them against an implicit submission to the authority of any one master, however excellent; or by a strict imitation of his manner, precluding themselves from the abundance and variety of nature. I will now add that nature herself is not to be too closely copied. There are excellences in the art of painting beyond what is commonly called the imitation of nature, and these excellences I wish to point out. The students who, having passed through the initiatory exercises, are more advanced in the art, and who, sure of their hand, have leisure to exert their understanding, must now be told that a mere copier of nature can never produce anything great; can never raise and enlarge the conceptions, or warm the heart of the spectator.

The wish of the genuine painter must be more extensive: instead of endeavouring to amuse mankind with the minute neatness of his imitations, he must endeavour to improve them by the grandeur of his ideas; instead of seeking praise, by deceiving the superficial sense of the spectator, he must strive for fame by captivating the imagination.

The principle now laid down, that the perfection of this art does not consist in mere imitation, is far from being new or singular. It is, indeed, supported by the general opinion of the enlightened part of mankind. The poets, orators, and rhetoricians of antiquity, are continually enforcing this position—that all the arts receive their perfection from an ideal beauty, superior to what is to be found in individual nature. They are ever referring to the practice of the painters and sculptors of their times, particularly Phidias (the favourite artist of antiquity), to illustrate their assertions. As if they could not sufficiently express their admiration of his genus by what they knew, they have recourse to poetical enthusiasm: they call it inspiration—a gift from heaven. The artist is supposed to have ascended the celestial regions, to furnish his mind with this perfect idea of beauty. "He," says Proclus,* "who takes for his model such forms as nature produces, and confines himself to an exact imitation of them, will never attain to what is perfectly beautiful; for the works of nature are full of disproportion, and fall very short of the true standard of beauty. So that Phidias, when he formed his Jupiter, did not copy any object ever presented to his sight, but contemplated only that image which he had conceived in his mind from Homer's description." And thus Cicero, speaking of the same Phidias: "Neither did this artist," says he, "when he carved the image of Jupiter or Minerva, set before him any one human figure as a pattern, which he was to copy; but having a more perfect idea of beauty fixed in his mind, this he steadily contemplated, and to the imitation of this all his skill and labour were directed."

The moderns are no less convinced than the ancients of this superior power existing in the art, nor less sensible of its effects. Every language has adopted terms expressive of this style. The *gusto grande* of the Italians, the *beau ideal* of the French, and the *great style*, *genius*, and *taste* among the English, are but different appellations of the same thing. It is this intellectual dignity, they say, that ennobles the painter's art; that lays the line between him and the mere mechanic; and produces those great effects in an instant, which eloquence and poetry, by slow and repeated efforts, are scarcely able to attain.

Such is the warmth with which both the ancients and moderns speak of this divine principle of the art; but, as I have formerly observed, enthusiastic admiration seldom promotes knowledge. Though a student by such praise may have his attention roused, and a desire excited of running in this great career, yet it is possible that what has been said to excite may only serve to deter him. He examines his own mind, and perceives there nothing of that divine inspiration with which he is told so many others have been favoured. He never travelled to heaven to gather new ideas, and he finds himself possessed of no other qualifications than what mere common observation and a plain understanding can confer. Thus he becomes gloomy amidst the splendour of figurative declamation, and thinks it hopeless to pursue an object which he supposes out of the reach of human industry.

But on this, as on many other occasions, we ought to distinguish how much is to be given to enthusiasm, and how much to reason. We ought to allow for, and we ought to commend, that strength of vivid expression which is necessary to convey, in its full force, the highest sense of the most complete effect of art; taking care, at the same time, not to lose in terms of vague admiration that solidity and truth of the principle upon which alone we can reason, and may be enabled to practice.

It is not easy to define in what this great style consists, nor to describe by words the proper means of acquiring it, if the mind of the student should be at all capable of such acquisition. Could we teach taste or genius by rules, they would be no longer taste and genius. But though there neither are, nor can be, any precise invariable rules for the exercise or the acquisition of these great qualities, yet

* Lib. 2. in Timæum Platonis, as cited by Junius de Pictura Veterum. R.

we may truly say that they always operate in proportion to our attention in observing the works of nature, to our skill in selecting, and to our skill in digesting, methodising, and comparing our observations. There are many beauties in our art, that seem at first to lie without the reach of precept, and yet may easily be reduced to practical principles. Experience is all in all, but it is not every one who profits by experience; and most people err, not so much from want of capacity to find their object, as from not knowing what object to pursue. This great ideal perfection and beauty are not to be sought in the heavens, but upon the earth. They are about us, and upon every side of us. But the power of discovering what is deformed in nature, or, in other words, what is particular and uncommon, can be acquired only by experience; and the whole beauty and grandeur of the art consists, in my opinion, in being able to get above all singular forms, local customs, particularities, and details of every kind.

All the objects which are exhibited to our view by nature, upon close examination will be found to have their blemishes and defects. The most beautiful forms have something about them like weakness, minuteness, or imperfection. But it is not every eye that perceives these blemishes. It must be an eye long used to the contemplation and comparison of these forms; and which, by a long habit of observing what any set of objects of the same kind have in common, has acquired the power of discerning what each wants in particular. This long laborious comparison should be the first study of the painter who aims at the greatest style. By this means he acquires a just idea of beautiful forms; he corrects nature by herself, her imperfect state by her more perfect. His eye being enabled to distinguish the accidental deficiencies, excrescences, and deformities of things, from their general figures, he makes out an abstract idea of their forms more perfect than any one original; and, what may seem a paradox, he learns to design naturally, by drawing his figures unlike to any one object. This idea of the perfect state of nature, which the artist calls the ideal beauty, is the great leading principle by which works of genius are conducted. By this, Phidias acquired his fame. He wrought upon a sober principle what has so much excited the enthusiasm of the world; and by this method, those, who have courage to tread the same path, may acquire equal reputation.

This is the idea which has acquired, and which seems to have a right to, the epithet of *divine;* as it may be said to preside, like a supreme judge, over all the productions of nature, appearing to be possessed of the will and intention of the Creator, as far as they regard the external form of living beings. When a man once possesses this idea in its perfection, there is no danger but that he will be sufficiently warmed by it himself, and be able to warm and ravish every one else.

Thus it is from a reiterated experience, and a close comparison of the objects in nature, that an artist becomes possessed of the idea of that central form, if I may so express it, from which every deviation is deformity. But the investigation of this form, I grant, is painful; and I know but of one method of shortening the road—this is, by a careful study of the works of the ancient sculptors, who, being indefatigable in the school of nature, have left models of that perfect form behind them, which an artist would prefer as supremely beautiful, who had spent his whole life in that single contemplation. But if industry carried them thus far, may not you also hope for the same reward from the same labour? We have the same school opened to us that was opened to them; for nature denies her instructions to none who desire to become her pupils.

This laborious investigation, I am aware, must appear superfluous to those who think everything is to be done by felicity and the powers of native genius. Even the great Bacon treats with ridicule the idea of confining proportion to rules, or of producing beauty by selection. "A man cannot tell," says he, "whether Apelles or Albert Durer were the more trifler: whereof the one would make a personage by geometrical proportions—the other, by taking the best parts out of divers faces, to make one excellent. The painter," he adds, "must do it by a kind of felicity, and not by rule."*

It is not safe to question any opinion of so great a writer, and so profound a thinker, as undoubtedly Bacon was. But he studies brevity to excess; and, therefore, his meaning is sometimes doubtful. If he means that beauty has nothing to do with rule, he is mistaken. There is a rule, obtained out of general nature, to contradict which is to fall into deformity. Whenever anything is done beyond this rule, it is in virtue of some other rule which is followed along with it, but which does not contradict it. Everything which is wrought with certainty, is wrought upon some principle. If it is not, it cannot be repeated. If by felicity is meant anything of chance or hazard, or something born with a man, and not learned, I cannot agree with this great philosopher. Every object which pleases must give us pleasure upon some certain principles; but as the objects of pleasure are almost infinite, so their principles vary without end; and every man finds them out, not by felicity or successful hazard, but by care and sagacity.

(To be continued.)

Oak Trees for Shipping.—It is asserted, in the "Life of Bishop Watson," that a 74-gun ship requires to build it 200 oak trees of two tons of timber each, and supposing 100 such trees growing on an acre, clears 20 acres of woodland. An acre of oak trees is generally reckoned at 6,760 square yards, or nearly half as much more as the common acre. Mr. Wood observed in the House of Commons lately, that it took 150 men a twelvemonth to build such a ship.

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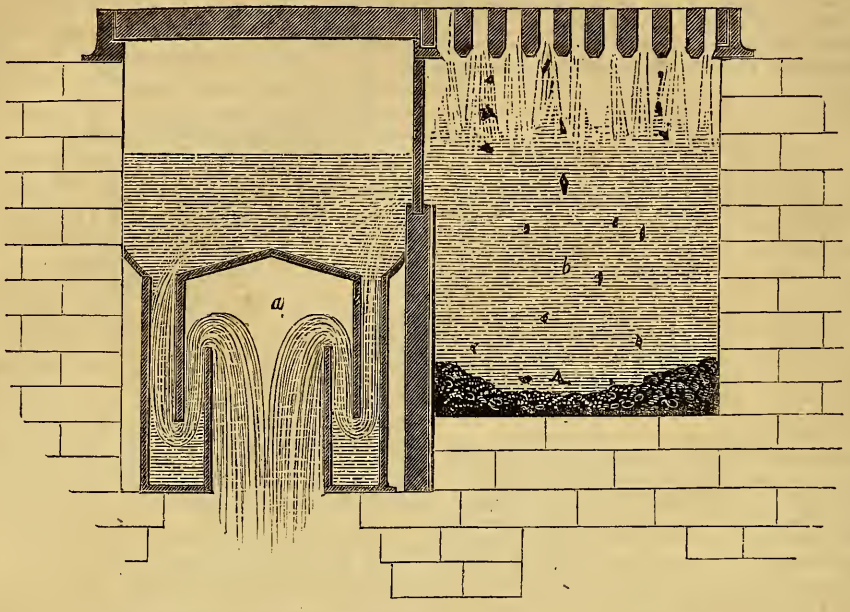
* Essays, p. 252, edit. 1625.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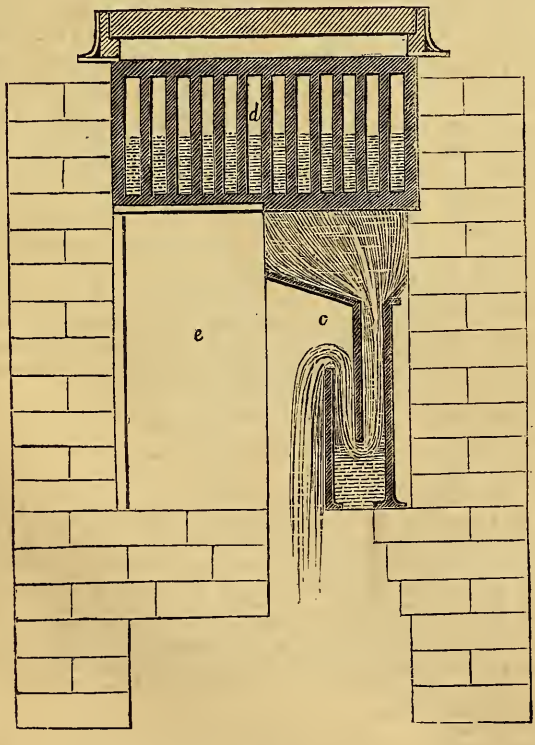
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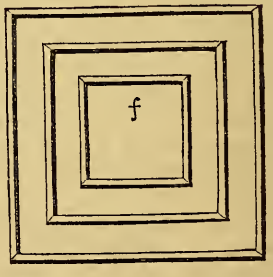
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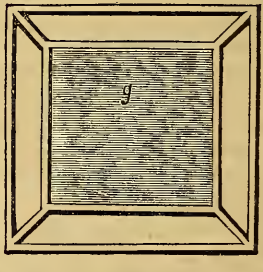
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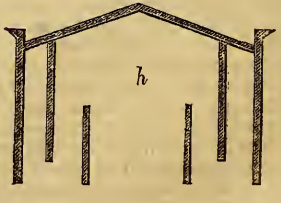
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Correspondence.

DIP EFFLUVIA-TRAP WITH TANK.

To the Editor of the DECORATOR'S ASSISTANT.

SIR,—The accompanying drawing is intended to illustrate the different sections of a dip effluvia-trap with tank. *a* is the dip-trap, and *b* the tank; *c* shows part of the tank, and *d* the grating above the tank. *f* is a vertical section of *a*; *g* is a vertical section of the dip portion of the trap, showing the supports; and *h* is a section of the dip, showing how it is supported by this means. The tank will receive the mud, stones, and rubbish; and the water will rise over *e* and run through the grating *d* into the trap *c*, and so into the sewer. The tank will require emptying sometimes—the trap very seldom. The tank might be made either of iron or bricks, or part stone.

I remain, yours,

ORIGO.

London, Feb. 8th, 1848.

THE PALLADIUM, LATE HALL OF ROME.—Exhibitions, like the one now under notice, can only be regarded as sure signs of our intellectual improvement; for surely it is no unimportant fact to learn that now almost the poorest in the land possess an opportunity of participating in those enjoyments which but a few years since were denied even to the rich. The Palladium, like another exhibition which we noticed some time back, is a place of combined amusement and instruction to all capable of enjoying symmetry and beauty, when presented to the eye and the understanding in their most attractive and fascinating appearance. To the artist, the means of studying the proportions of the human body afforded at this place must be invaluable; and from what we have ourselves seen we cannot but bear testimony to the faultless structure of the living models, and the gracefulness and correctness of the groupings. The exhibition possesses all the attractions which might induce one to linger amongst those ancient sculptures which have been the wonder of ages, with the additional feeling sure to be produced in the spectator's mind by the knowledge that the statues are living men and women. In conclusion, we may remark that the place is very prettily decorated, and we cannot but congratulate Madame Benard on the success of her exertions.

CASINO DE VENISE.—This is one of the most beautifully decorated places of amusement in the metropolis, and we cannot do less than invite the attention of our readers to its manifold attractions. To-night (Wednesday) is fixed for the benefit of Mr. J. W. Sharp and Mr. G. Tedder. To such of our readers as pay a visit, we promise plenty of amusement.

On Zinc White or Oxide of Zinc

AS A SUBSTITUTE FOR WHITE-LEAD IN PAINTING.

BY M. LECLAIRE.

ANY as have been the improvements of late years introduced into the manufacture of white lead, we think that this last improvement will effectually supersede them all. After stating that in practical painting he had found many inconveniences arise from the use of white-lead, which led him to try several other preparations as a substitute for that pigment, none of which except zinc-white answered the purpose, M. Leclaire proceeds to speak thus favourably of the latter; the first application of which for painting purposes, in 1835, he claims for himself. "The zinc-white is much whiter than white-lead when ground in oil, and reflects the light instead of absorbing it; it furnishes finer and more transparent tones; it covers better, and, weight for weight, it much excels it. It is unalterable by sulphureous vapours, which immediately blacken white-lead paint, and lastly, it possesses the desirable quality of not injuring the health of the workmen employed either in its manufacture or its use. Though I had

verified the qualities above mentioned, yet I found myself still very far from a complete and practical solution of the problem. Mixed with oil, to apply readily as a paint, it became necessary to make it dry readily; but the only drying substances known are those which had lead for a base, and which therefore imparted to the zinc-white all the defects of white-lead. Fortunately I finish my researches on this subject by the discovery of a drier which has manganese for its base, and which enables the zinc-white to dry faster than it would if litharge were employed. Several other colours most frequently employed in painting, are composed either of lead or of copper, and owe to those metals the defect of being alterable by sulphurous gas, whilst these same mixed with zinc-white derive from it all the advantages of its unalterability. It follows, then, that in order to give my first invention completeness, and to render it of useful application, we should substitute for the colours susceptible of alteration, those which cannot be rendered so. After several years spent in continued and costly researches, I have arrived at the production, if I may be allowed so to say, of a reform in the art of painting, in completing the scale of unalterable colours, by the substitution of colours uninjurious and unalterable for all those which have copper or lead for their base, insomuch that I may now affirm:—

"1. That the health of a great number of men may be saved, and without any interference with their business.

"2. That the interior and exterior of our habitations can be painted without the disagreeableness of seeing, by the slightest sulphurous exhalation, the painting change colour and blacken.

"3. Lastly, that artists may rejoice in the idea that their *chefs d'œuvre* will not change their aspect nor lose their harmony with the lapse of time, as has happened so often in the pictures of the old masters.

"My profession has permitted me, what in most other cases would be difficult, to introduce these products privately into use; but the advantages which is possessed over painting in white-lead, and especially its freshness and tone, were very soon remarked, and the superiority of zinc-white over white-lead quickly verified. Since that time I have made numerous applications of zinc-white in my business, and always with the same good results.

"The working up of white-lead paint often caused numerous and serious accidents to the workmen. Many suffered from attacks of the lead cholic, some several times in a year, whilst others, who were not absolutely attacked by it, found their constitutions gradually suffering, and were often obliged, for a time at least, to give up their employment, and preserve only a languishing health, or endure incurable disease. I employ constantly 200 workmen throughout different parts of Paris, making use of the white of zinc. Amongst them I have found many whom the lead cholic, and the susceptibility of their constitutions, had obliged to abandon painting; not one accident has shown itself amongst them, so that they themselves well know how to appreciate the employment of zinc-white. Never has one of the workmen employed in the manufacture of the zinc-white, suffered the slightest indisposition which could be attributed to his employment, nor have particular precautions ever been taken. In conclusion, many years of assiduous labour have led me to the discovery and useful application, in the arts and industry, of—

"1. The zinc-white.

"2. The colours with zinc for a base of the same colours as those up to the present time obtained by the aid of lead and copper.

"3. Lastly, a drier for paint, not having lead for its base. These products furnish for all kinds of painting, clearer, finer, fresher, and more transparent tones, than those obtained with colours having lead and copper for their base; and the multiplied experiments made with them have proved that the colours thus made are in every respect superior to those which, up to the present time, have been employed; whilst, at the same time, neither their preparation nor their employment are injurious to health."

Society of Arts.—The tenth ordinary meeting was held on Wednesday night, in the Great Room at the Society's house, John-street, Adelphi. At the conclusion of the usual routine business, Mr. S. Russell read a very interesting paper, written by himself, on some of the principles which govern the invention of polygonar decoration, mosaic patterns, tesselated pavements, and other kinds of geometrical ornament. In commencing, Mr. Russell briefly alluded to the small progress we had made in really high art; this he said might be attributable to the idea which was prevalent amongst us until lately, that the ancients were all possessed of a larger amount of genius than is allotted to mortals usually, and that their works were hardly to be rivalled by us, certainly never excelled. This idea, however, was now being slowly discarded by us, and he hoped ere long that a new æra would open in art, when we should be induced to make new objects of admiration for ourselves. There were certain mathematical rules, which, in peculiar styles of ornament, would cramp the working even of genius itself. As an example of this, he would take the lowest style of art, the ornamenting of a flat surface, such as a floor, a wall, or a ceiling, in order to relieve it of sameness. In doing this, it would be most advisable to choose those ornaments which would present the most beauty, and the most even surface. Of these there only three kinds, the square, triangular, and the hexagonal; all others, such as the pentagon, the heptagon, &c., would not produce the desired results. This fact Mr. Russell proved not only by a series of problems, but also by endeavouring to form perfect ornaments with models of the last-mentioned figures. On the table was a numerous collection of very beautiful ancient vases and cups. The meeting was very fully attended.

Slates, Slaters, and Slating.

Slates, or slate-stones, as they are called in some parts of the country, are now so generally employed as a covering for buildings, that there is hardly a corner of the kingdom where some modern edifice, public or private, does not present to view a slated roof; even where nothing but brick buildings were seen in ancient towns and villages, and where nothing but roofs of tiles or pantiles met the eye, slated buildings are now becoming common, and most of the newly-erected buildings are now slated. Many, also, of the ancient parish churches, with their ponderous leaden roofs, are exchanging their lead for a lighter covering of slate; and although perhaps not quite so durable, it is on the whole cheaper.

Slates for roofing may be divided into three varieties, namely, the Welch or dark-coloured slate, such as is used for writing-slates, the Cumberland and Westmoreland slate, which is of a light blue colour, and the sandstone slate, which varies in colour according to the nature and quality of the stone; but which is generally of a greyish hue. The two former, however, are generally employed in roofing buildings, the grey slate being so think and heavy as to require strong and expensive timbers to support it; though in some situations where it abounds, the farm houses and out offices are covered with this sort because it is found in the neighbourhood. Particular sorts of moss and lichens too are apt to find root upon roofs of this description, which, if not removed, will in time overrun them, and cause them to leak.

Notwithstanding the fineness of some of the Welch and Cumberland slate, which will bear to be split into thin plates or laminæ, some of it considerably less than half an inch in thickness, a covering of it is very durable; and whether viewed at a distance, or near at hand, it has a far more pleasing appearance than the old-fashioned roofs of red pantiles.

From the great demand there is for roofing-slate, a considerable number of hands are constantly employed in the quarries, and in conveying the slate on board vessels bound to various ports of the United Kingdom, and some to foreign ports. The mountainous district of country lying to the north of that æstuary of the Irish Sea called Morecambe Bay, commonly known as "the Lake region," yields the blue or Cumberland slate, large quantities of which are shipped from the port of Ulverston and the villages along that coast. Some of the lakes, particularly Windermere and Coniston lake, serve as channels for the conveyance of slate in boats built for the purpose, the slate being afterwards carted to the nearest port. But even in the vicinity of these lakes the quarries are sometimes so distant that the slates have to be conveyed several miles to the boats along steep and difficult tracks, hardly to be called roads, opened down the sides of mountains for the purpose of getting the slate to market. Some of the quarries are indeed in situations so difficult to approach that it is impossible to employ carts or wheel-carriages of any description, in place of which a rude sort of sledge is made use of. Sometimes these quarries are worked open to the surface, while many are entered by narrow passages or tunnels which lead into the bowels of the mountains, so that they become rather mines than quarries. The rock from which the slates are afterwards formed has to be blasted with gunpowder, and the reports of the explosions among the slate-quarries may be frequently heard reverberating among the hills, and echoed back from mountain to mountain. In Wales, too, the slate-quarries are mostly among the hills or mountains, and the same plan of blasting or blowing the slate-rock is adopted there, and also the same mode of conveying the produce of the quarries to market. For the south and south-western parts of England the introduction of Welch slate is more convenient than the blue or Cumberland kind, and is rather more esteemed as an article for roofing purposes; for, being rather finer in grain, it is somewhat stronger than the blue sort, where the two kinds are of equal thickness.

It was once the custom to employ in roofing only a class of persons known by the appellation of slaters, who invariably belonged to the section of country where the slate-quarries were situated. It is difficult to conceive a reason for this, but so it was, and continued so until within a recent period. While this was the case, many young men from Westmoreland and Cumberland, and some from Wales, would be found slating in most parts of the kingdom. As cold and frosty weather is unfavourable for this work, it is seldom followed during the winter season; these persons usually returned to their native places, and their idled away a few months until the return of spring.

For a long period the slating business was almost exclusively in the hands of a few individuals, who established slate-yards in various parts of the country, employing none but their own slaters to prepare and apply the slate. But the case is much changed, for it is now the custom for stonemasons and bricklayers who are much engaged in building to employ persons connected with their establishments as slaters, and the business, which is by no means a difficult one to learn, is no longer thus monopolised.

The slate when sent from the mines or quarries is not in a condition to be immediately employed on buildings, as, being of a soft texture, were it dressed and squared in the first instance, the edges of many of the slates would get chipped and broken in the carriage, and they would require dressing over again. The slater, therefore, before he commences the operation of slating, proceeds to dress his slates by squaring the sides and bottom end of each slate, so that they may match closely with each other, and form regular lines or courses along the roof, and perforates the upper end with one or more holes for the nails. Sometimes the slates are assorted into variou

sizes, the largest and longest courses being placed along the eaves. The slater commences at the eaves, having first nailed his laths across the rafters at the proper distance from each other, where he places a double row, one over the other, taking care to break the seams, that is, the joinings of the upper and under rows of slates. After this has been done, the next course is then placed at a proper distance from the extreme edge of the roof, the distance that the respective courses overlap each other being called the *band*, and on this depends the strength and perfectness of the roofs; for the greater the band the less likelihood there is of the rain beating in, or of the slate being torn off by the wind.

Use of Plaster of Paris in England.

The stone which is used in England, and brought from the north, is sulphate of lime, and has scarcely any acid qualities in it; it is, in fact, an imperfect alabaster; and the bad quality of this stone, and the high price, prevent its being used in building matters so much as it otherwise might be, and cause little interest to be taken in the improvement of its manufacture. In France, on the contrary—where the stone is in great quantity and of the best quality—the consumption in Paris is more than 1,000 tons per diem, and yet other materials abound and can be had as cheap.

The analysed parts of this stone are, after Mr. Dareet—

Sulphate of lime	78·5
Carbonate	15·7
Water of Chrystalisation	5·8
	100·

A short time ago Mr. J. Delasseux, of Rouen, by his perseverance gained a great step towards its improvement, inasmuch, as by his process he does not alter the nature of the stone nor the chemical qualities: he manufactures at the cheapest rate a material that, though it has the appearance of English plaster, has moreover the qualities of strength and durability, which I shall beg to call your attention to presently. If I were to erect a kiln at Greenwich, I could sell, with a large profit, plaster of the best quality at 30s. to 35s. per ton; and I think that a material of good quality, sold at this price—which permits to build quickly, solidly, and at a cheap rate, and also combines healthiness, elegance, and comfort—cannot fail to meet the most sanguine expectations of the public: in fact, this plaster, which sets in a few hours, may be employed for constructing and cementing a wall of bricks, partitions for apartments solid, iron floors, ceilings, rendering on walls, forming chimney-flues in blocks, bedding stones, and exterior and interior decorations. These statements are not theoretical, as for a long time the plaster has been generally employed in France, and the enormous quantity that the trade exports proves that the material is much appreciated. Professor Hosking, in his new publication, "Guide for the Regulation of Buildings," &c., has sufficiently dwelt upon the value of the material to prove, that in England its introduction should be considered as a useful thing, and would be of great utility in construction. In practice, the following are the quantities of plaster (as used in Paris) requisite for different works, and, calculating that the plaster sold at 30s. per ton, it will be easily seen that my statement is correct, when I say that nothing can oppose its general use.

One ton and a third of plaster to a rod of brickwork, in powder, will cost £2.

	Of plaster per yard super.
Rendering on walls, requires	36lbs.
On ceilings	42lbs.
On quarter partitions	40lbs.
Filling up (or plugging) between joists	60lbs.
Outside decorations (elaborate mouldings, &c.)	70lbs.

The window openings not to be deducted.

Besides this, I must observe, that mixing plaster with sand, in equal parts, makes a good mortar, which sets quickly, and is not dearer than common mortar.

In a country like England, and especially in London, where the ground does not belong to the party building, I have considered it important to introduce a material which embraces economy as well as incombustibility (so important in a city as London), and, moreover, excludes exterior humidity, and preserves interior warmth, and its hardness precludes the possibility of vermin penetrating—a great advantage over the plaster in which hair is mixed. Another advantage is, that, from the rapidity with which the plaster sets, the house may be inhabited immediately, thereby at once receiving interest for the outlay, instead of waiting three or four months, or longer, as is necessary with common mortar.

I have had some objections made as to the difference of climate, but without any cause. At Rouen, the dampest town of France, and where it rains seven months in the year, all the buildings are in plaster, and I am sure that, in using hard stone for making dry plaster in England, it will resist the variations of the atmosphere as well as Roman cement.—*Victor Delassaux in the "Builder."*

To Colour Unsized Prints.—Those who colour engravings, which have been printed on unsized or bibulous paper, make use of the following composition, which is very similar to that employed in paper manufactories. Four ounces of Flanders glue and four ounces of white soap are to be dissolved in three pints of hot water. When the solution is complete, two ounces of pounded alum must be added, and as soon as these ingredients are well mixed the composition is fit for use. It is applied cold, with a sponge, or rather with a flat camel-hair brush.

Review.

TRANSACTIONS OF THE SOCIETY OF ARTS FOR 1846-7. PART I.

NOT long since (see vol. i., p. 156) we had occasion to mention in terms of approbation the past labours of the Society of Arts, and at the same time to mention a new course struck out for its subsequent operations. That course followed even but for a short time has resulted in the happiest effects; and, we doubt not, but that under the genial auspices which at present shine upon the Society's efforts its exertions will ultimately lead to the consumation of that object, to a desire for which it originally owed its birth—namely, our permanent advancement in those departments of art and science, which, while they tend to increase the pecuniary resources of the country, contribute as much to the improvement of the minds of its population.

The "Transactions" which now lie before us present us with a pretty correct datum upon which to form our estimate of the national progress in the arts and sciences. It is beautifully illustrated, and its "getting up" is a credit to all parties concerned.

We select for extract a portion of a paper by Mr. Jordan, on "Carving by Machinery:"—

"The origin of my attention to this subject, in the first instance, was purely accidental, and, had it not been for the chance thought being fostered and encouraged by my kind friend and present partner, Mr. Taylor, it would, in all probability, have died out with its original intention,—that of cutting a few curved grooves in a plate of brass. But the first thought meeting with every possible encouragement, its application to larger purposes was soon perceived and worked out; and the result, after many modifications, is the carving machinery now in use at our works in Belvidere-road, and at the Government workshops at Thames-bank. The machine consists of two parts, each having its own peculiar movement; quite independent of the other; but each capable of acting simultaneously and in unison with the other.

"The first or horizontal part, is the bed-plate and floating-table, on which the work and the pattern are fixed, and all the motions of which are horizontal.

"The second or vertical part, is that which carries the tracing and cutting tools, the only motion of which, excepting the revolution of the cutters, is vertical.

"Before describing these elementary portions more in detail, and asking your attention to the mechanical means of effecting these *movements*, I will request you to follow the thought for a few minutes, so that all may fully comprehend why I wish to obtain them, and what must be the result if they are well obtained.

"Let us then suppose that we can have a horizontal table; capable of moving about in every possible direction in its own plane, and that we have a point over that table, capable of moving on a vertical line only.

"If the point remains fixed, and in contact with the table, while moving over various curves and right lines, lines corresponding with these movements will be described on the table, in the same manner as they would have been had the table been fixed and the point moved. But if, while these horizontal movements are going on, we add the vertical movement of the point, we then trace a solid figure, which has for its plane the outline described by the horizontal motion of the table, and for its elevation the outline described by the vertical motion of the point. *This may be better illustrated by taking any simple solid form, and moving it horizontally while it is traced by a point moving vertically.*

"This idea embodies the whole principle of our carving machinery, although other conditions are requisite to make it generally applicable, and capable of producing many copies at one time. These I shall endeavour to show as I proceed with the description of the mechanical arrangements themselves.

"The horizontal part consists of three castings; first, the bed-plate, which is a railway permanently fixed to the floor of the shop, and made strictly horizontal; secondly, a carriage, or frame, mounted on wheels, and running on this railway; and, thirdly, the horizontal plate, or table, which carries the work. I call this the floating-table; it is furnished with four wheels, which run on the frame, so that its motions on the frame is at right angles to that of the frame on the bed. By this arrangement I obtain two straight line movements, in an horizontal plane, which are at right angles to each other; and, by combining these movements, I can cause any point in the table to pass over or describe any required figure. Now as this is accomplished without angular motion or motion about a centre, it follows, that every point in the table must pass over the same figure and, consequently, by using many cutters, I can produce several copies of the same pattern at one time.

"The second or vertical part of the machine consists of a bridge, or fixed support, which carries the vertical slide; to this slide is attached any required number of mandrils carrying cutters, all of which are made to revolve very rapidly, and one tracer holder, which does not revolve.

"The vertical motion of this system of cutters and tracers is managed by the workman's foot, and the horizontal motion of the floating-table with his hands; the pattern is fixed on

the table, under the tracers, and a piece of wood, or other material of sufficient size and form, is fixed under each cutter; the cutters are then made to revolve rapidly by steam power, and the workman carefully moves about the table, so that every part of the pattern shall come under the tracer in succession; and by the time this has been accomplished, with a succession of tools and tracers gradually diminishing until they can reach the smaller recesses of the pattern, there are as many copies of it produced as there have been mandrils used; each cutter, or rather each mandril, having finished its own separate and distinct copy of the original pattern, in nearly the same time that would have been required to obtain one copy by the same means, and in less than one-tenth of the time requisite to produce a single copy by hand.

"If my description has been sufficiently clear, you now understand the principles of action, and mode of operation, of this machinery, so far as plain carving is concerned. By plain carving I mean such as is worked for one view only; it may be in any amount of relief, but it is without undercutting, and can be worked entirely from one side.

"The more elaborate descriptions of carvings, such as figures, fruits, and flowers, in which a large amount of undercutting is requisite, can also be accomplished by the same machinery; but it then requires modifications not yet described. I have, on several occasions, ventured to make this assertion at other places, when I was not so well provided with proof as on the present occasion; and I have been met with something very like flat contridictions. This, however, though annoying at the time, has not altered my opinion or the fact; nor will it prevent me from again stating that it is not only possible, but very easy, to produce undercut carvings by machinery. Our method, of accomplishing this undercutting and carving on the round, I cannot better illustrate or exemplify than by telling you one of the arguments which was very triumphantly used against its possibility, at a scientific meeting at Hampstead, last winter, where I exhibited a few early specimens of our work. Having assured a gentleman present that the undercutting of the specimen he was examining was done on the machine, he smiled and said 'No, that is not possible; we cannot get a gun to shoot round a *hay-mow*.' I replied, '*True!* but if the engineer takes the liberty of turning the *hay-mow* about on a point, will not a fixed gun point to every corner of it in succession?' This is really the method which I adopt when any considerable amount of undercutting is required, or when the subject is to be worked on several sides; both the pattern and the pieces to be worked are fixed between centres, or on chucks, arranged to turn through fixed angles; so that, having worked one side, the pattern of all the pieces is turned through the same angle, at the same time, so as to present a new surface to the cutters; and, this being done, they are again turned as often as may be requisite to get at every part of the work."

Notices to Correspondents.

☞ All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the DECORATOR'S ASSISTANT, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** Part IX. of the DECORATOR'S ASSISTANT, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I. to VIII. still continue on sale. The First Volume, beautifully bound in scarlet cloth, in a style designed expressly for this Work, gilt and lettered, price 5s. For those parties who have taken in the Work in Numbers or Parts, Cases have been prepared for binding it in, price 1s. 3d. each; or the Publisher will undertake to get it bound, including the cases, for 2s. Early orders are respectfully requested for Back Numbers.

*** Overseers or Foremen of Factories will much oblige us by recommending our Work to the Workmen employed in the establishments over which they have jurisdiction; while our Readers will confer a similar obligation by bringing it before the notice of their friends and acquaintances.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—EDITOR DECORATOR'S ASSISTANT.]

SIR,—Would any of your correspondents be so kind as to inform a subscriber how to obtain a strong lustre, such as that on black cotton, used for lining clothes, &c.? The kindness will ever be remembered by CLUMSY.

SIR,—I should feel obliged if any of your correspondents would inform me how to prepare the varnish or composition used by ticket writers in gilding on cards or drawing boards. I have tried several things, none of which answer well for laying the leaf on with.—A FRIEND TO THE "DECORATOR."

SIR,—Will any of your numerous correspondents favour me with information on the method of japanning articles in papier-mache, such as tea-trays, &c.? In the first place, what is the composition for the black? Secondly, how are they dried, and what length of time is requisite in order to dry them? Thirdly, what kind of colours are employed in painting on them—*i.e.*, whether oil colours or body colours in water? Fourthly, what is the method of polishing, and the best varnish for finishing?—I am, Sir, your obedient servant, A CONSTANT READER. London, Feb. 8, 1848.

LEONARD.—We know of no good work on the subject of objects capable of being viewed through a microscope, from the simple fact that the idea of establishing rules in such a case is in itself a fallacy. Perhaps some of the people who write such books would be able to give an equally complete list of objects that *cannot* be viewed through a microscope;—we will endeavour to asssist them, by mentioning a house, a ship, a continent, or the extent of their own ignorance.

TIMON.—Yours is decidedly the most simple. The "Lessons in Drawing" will be continued, and will include all the ornaments you mention. We are much obliged for your recommendations of our work to your friends. We cannot avail ourselves of your suggestion respecting the "Queries."

RECEIVED.—"W. M. Perrand," "Douglas," "Edward Bow."

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

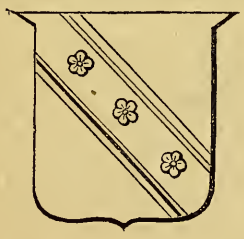
(*Continued from page* 141.)

Caisson (in architecture), a kind of chest or flat-bottomed boat, in which brick or stone-work is builded, and then sunk to the bottom of the river for forming the foundations. Some of the caissons which were used by Labelye for the erection of Westminster-bridge, contained above one hundred and fifty loads of fir timber, of forty cubic feet to the load, and was of more tonnage or capacity than a forty-gun ship of war.—*Hutton's "Principles of Bridges."*

Calathus (in ancient architecture,) a sort of basket, in which women anciently kept their work; and also a sort of cup used in sacrifices. The baskets which are on the heads of canephoræ are also called by this name, as well as the baskets on the heads of Jupiter Serapis, Juno of Lamos, Diana of Ephesus, &c.

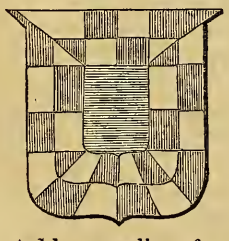
Caliducts (in architecture), pipes or canals disposed in or along the walls of houses for conveying hot air or steam to distant apartments from a common or central furnace, after the manner of the ancients. This method has been adopted in modern buildings with much success and economy. The British Museum and several of the public offices are heated by this means.

Cotice or Cotise (in heraldry), is the fourth part of the bend; which, with us, is seldom, if ever borne but in couples, with a bend between them; whence probably, the name from the



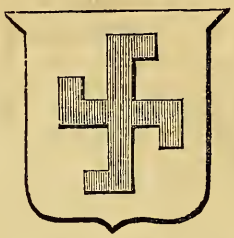
French *cotê*, side, they being borne, as it were, aside of the bend, a bend thus bordered, is said to be cotised, cotice.—He bears sable on a bend (cotised), argent three cinquefoils.

Counter Chevroned, denotes a shield chev-



ronny, or parted by some line of partition.

Cramponee (in heraldry), a *cross cramponee*



is that which has a cramp at each end.

(To be continued.)

Consumption of Smoke.—It is well known to those who have paid attention to the subject, that wherever dense volumes of smoke escape from a chimney a great waste of fuel is taking place, as the necessary consequence of rapid and imperfect combustion. The high price of coal in London, and the southern and eastern districts generally, renders it of considerable importance that this waste should not take place if there are means in existence to prevent it. It is thought there is a patent method of effecting this object which is attended with much expense. The method we are about to explain has this advantage over the patent, it will cost nothing to make the experiment, and it is open to every manufacturer who wishes to save his coal and avoid poisoning his neighbours with smoke. Instead of putting coal on the fires every half-hour or so, as at present, let the mass of cinders, when in a red state, be pushed to the further end of the boiler near the fire, leaving a thin layer of red cinders covering the whole forepart of the fire-hole. Let this layer of fire be completely covered with coal, leaving the fire pushed backwards clear and bright. Let the damper be then half-closed so as to prevent the draught being too strong. The smoke from the burning coal in front will then pass slowly over the bright fire at the back, the carbon or combustible matter being consumed as it passes. The dark portions of smoke are nothing more than small particles of coal which only require to be passed through a strong heat to deprive them of those qualities which render them such a nuisance where steam-engines are numerous. The only instance in which the plan was seen tried was decidedly a successful one, for although the engine was one of 10 or 12 horse power, the smoke emitted from the chimney was not more than is commonly seen issuing from the chimney of a cottage. No doubt many persons consider smoke as an article of little value, but let such persons observe the chimney of a gas-manufactory, and they will soon perceive that gas-makers know to well what smoke is worth to let it go up their chimneys. They take care to extract all the carbon from their smoke before they let it escape. Why should not silk, cotton, and woollen manufacturers do the same? They would find it profitable.—*Patent Journal.*

On Polishing Wood, Ivory, Horn, and Tortoiseshell.

Polishing in the Lathe.—Good work does not require much polishing, for the beauty of it depends more on being executed with tools properly ground, set, and in good order: the work performed by such tools will have its surface much smoother, its mouldings and edges much better finished, and the whole nearly polished; requiring, of course, much less subsequent polishing than work turned with blunt tools. (This is often the case in that done by amateurs and workmen who have not proper conveniences for grinding and setting their tools.)

One of the most necessary things in polishing is cleanliness; therefore, previous to beginning, it is as well to clear the turning-lathe, or work-bench, of all shavings, dust, &c., as also to examine all the powders, lacquers, linen, flannel, brushes, &c., which may be required, to see that they are free from dust, grit, or any foreign matter. For further security, the polishing-powders used are sometimes tied up in a piece of linen, and shaken as through a sieve, so that none but the finest particles can pass.

Although, throughout the following methods, certain polishing-powders are recommended for particular kinds of work, it must be understood, that there are others applicable to the same purposes, the selection from which remains with the operator; only observing this distinction, that when the work is rough, and requires much polishing, the coarser powders are best; but, on the contrary, the smoother the work, the less polishing it requires; consequently, the finer powders, in the latter case, are preferable.

Soft wood, though nearly the most difficult material, may be turned so smooth, as to require no other polishing than that produced by holding against it a few fine turnings or shavings of the same wood whilst revolving, this being often sufficient to give it a finished appearance; but, when the surface of the wood has been left rough, it must be rubbed smooth with polishing paper, constantly varying the position of the hand, otherwise it would occasion rings or grooves (if they may so be called) in the work.

When the work has been polished with the lathe revolving in the usual way, it appears to be smooth; but the roughness is only laid down in one direction, and not entirely removed, which would prove to be the case by turning the lathe the contrary way, and applying the glass-paper; on which account, work is polished best in a pole-lathe, which turns backwards and forwards alternately; and therefore it is well to imitate that motion as nearly as possible.

Mahogany, walnut, and some other woods, of about the same degree of hardness, may be polished by either of the following methods:—Dissolve, by heat, so much bees'-wax, in spirit of turpentine, that the mixture, when cold, shall be of about the thickness of honey. This may be applied either to furniture, or to work running in the lathe, by means of a piece of clean cloth, and as much as possible should then be rubbed off by means of a clean flannel, or other cloth. Bees'-wax alone is often used; upon furniture it must be melted by means of a warm flat-iron; but it may be applied to work in the lathe, by holding the wax against it, until a portion of it adheres; a piece of woollen cloth should then be held upon it, and the lathe turned very quickly, so as to melt the wax; the superfluous portion of which may be removed by means of a small piece of wood or blunt metal, when a light touch with a clean part of the cloth will give it a gloss. A very good polish may be given to mahogany by rubbing it over with linseed oil, and then holding against it a cloth dipped in fine brick-dust. Formerly, nearly all the mahogany furniture made in England was polished in this way.

Hard Woods.—These, from their nature, are readily turned very smooth; fine glass-paper will suffice to give them a very perfect surface; a little linseed oil may then be rubbed on, and a portion of the turnings of the wood to be polished may then be held against the article, whilst it turns rapidly round, which will, in general, give it a fine gloss. Sometimes a portion of shell-lac, or rather of seed-lac, varnish is applied upon a piece of cloth, in the way formerly described.

The polish of all ornamental work wholly depends on the execution of the same, which should be done with tools properly sharpened; and then the work requires no other polishing but with a dry hand-brush, to clean it from shavings or dust, this trifling friction being sufficient to give the required lustre.

Ivory, or bone, admits of being turned very smooth; or, when filed, may afterwards be scraped, so as to present a good surface. They may be polished by rubbing them first with fine glass-paper, and then with a piece of wet linen cloth dipped in powdered pumice-stone; this will give a very fine surface, and the final polish may be produced by washed chalk, or fine whiting, applied by a piece of cloth wetted in soap-suds. Care must be taken in this, and in every instance where articles of different fineness are successfully used, that previously to applying a finer, every particle of the coarser material be removed; and that the rags be clean and free from grittiness.

Ornamental Work must be polished with the same materials as plain work; using brushes instead of linen, and rubbing as little as possible; otherwise, the more prominent parts will be injured. The polishing material should be washed off with clean water, and, when dry, may be rubbed with a clean brush.

Horn and Tortoiseshell are so similar in their nature and texture, that they may be classed together, as regards the general mode of working and polishing them. A very perfect surface is given by scraping; the scraper may be made of a razor-blade, the edge of which should be rubbed upon an oil-stone, holding the blade nearly upright, so as to form an edge like that of a currier's knife; and which, like it, may be sharpened by burnishing. Work

when properly scraped is prepared for polishing; to effect this, it is first to be rubbed with a buff, made of woollen cloth, perfectly free from grease; the cloth may be fixed upon a stick, to be used by hand; but, what the workmen call a *bob*, which is a wheel running in the lathe, and covered with the cloth, is much to be preferred, on account of the rapidity of the operation: the buff is to be covered either with powdered charcoal and water, or fine brick-dust and water; after the work has been made as smooth as possible with this, it is followed by another buff, or bob, on which washed chalk, or dry whiting, is rubbed; the comb, or other article to be polished, is moistened slightly with vinegar, and the buff and whiting will produce a fine gloss, which may be completed by rubbing it with the palm of the hand, and a small portion of dry whiting, or rotten-stone.

Masons' Provident Institution.—The second annual meeting of the above excellent institution was held on Tuesday evening, February 1st, at the City of Westminster Mechanics' Institution, Mr. Wm. Haysom in the chair, for the purpose of receiving the committee and auditors' report for the past year, which left a balance in the hands of the treasurer (Mr. Wm. Freeman) of £209 17s. 5d., including handsome donations from Mr. John Foot, Messrs. H. and J. Lee, Sir De Lacy Evans, M.P., and others. Thanks having been voted to the late direction, a committee of twenty-five was appointed for the ensuing year, with instructions to take into consideration the propriety of announcing an election for one or more candidates for aid from the funds at the next half-yearly meeting.

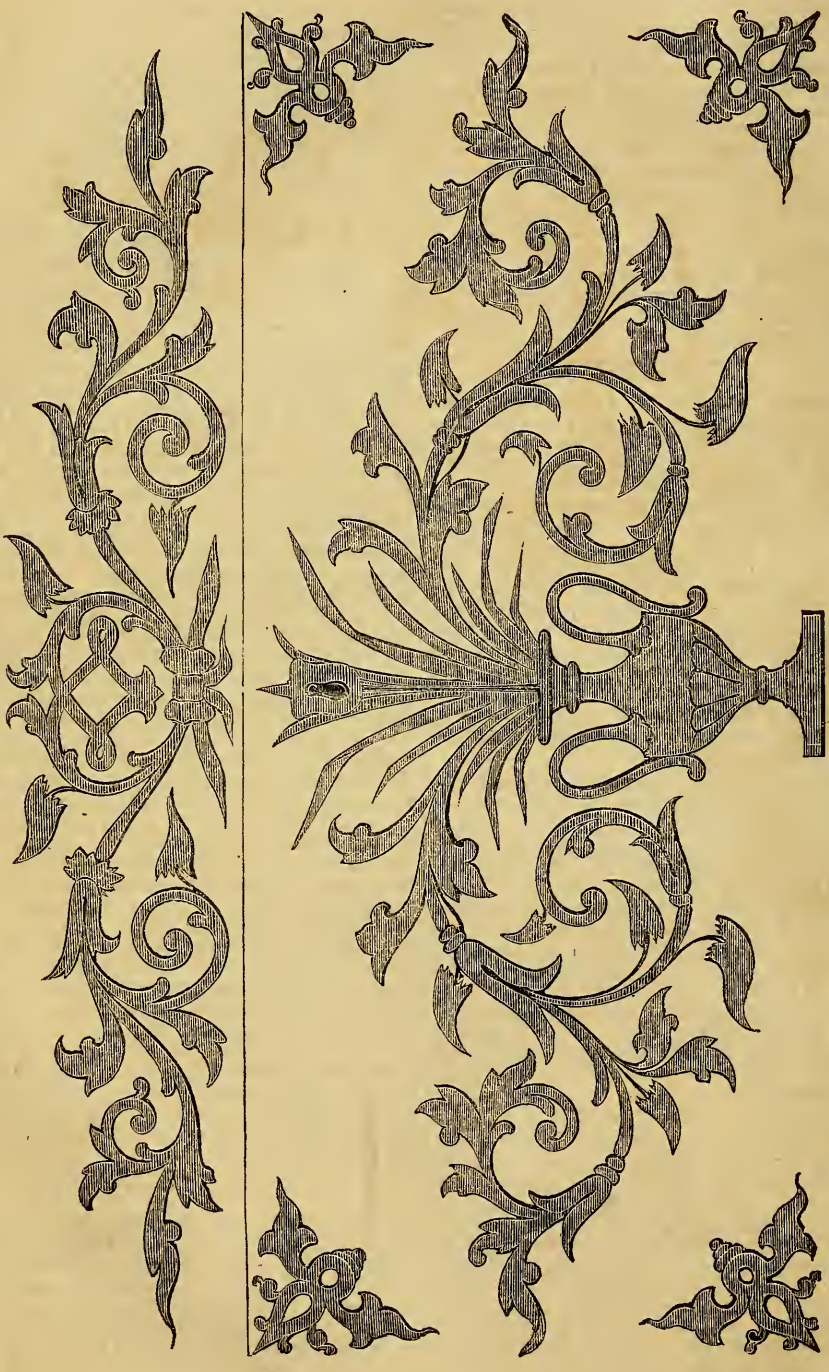
Ancient Carvings.—About twenty little carvings in ivory, which were discovered lying on some of the *bassi-relievi* brought to this country from Nineveh by Mr. Layard, have been added to the national treasures in the British Museum. They are on a small scale—about four inches by two and a half; the greater portion of them resembling strictly Egyptian types rather than Assyrian. Indeed, with scarcely any variation, they correspond with all other Egyptian relics that we know of. The few of Assyrian characters will be a great acquisition—showing, as they do, the state of such Art at that early period. They are well carved, in low relief. A series of drawings is being made from them for publication.

New Gallery.—To facilitate the education of the people in the art of design, "a new gallery" has been opened in Newman-street, Oxford-street, in a house well adapted for the purpose. Mr. Baily, the sculptor, has provided the gallery with its chief ornaments and means of instruction, by a munificent gift of casts and models from the antique; including the "Apollo," "Venus de Milo," and "Gladiator." The institution was open on Wednesday sennight, with a discourse by Mr. James Matthews Leigh, the artist, on the subject of the earliest periods of art, particularly the Grecian schools.

Electric Light.

The electric light in a continuous stream obtained by the new battery of MM. Lemolt and Archereau, forms a new era in artificial lighting. This light, the first trials of which have been recently made at 42, Passage Jouffroy, has been introduced by the managers of the theatre in the Palais Royal, for illuminating the last scene of the *Banc d' Huitres*. The intensity of this light is such, that it quite eclipses by its splendour the footlights and the chandeliers, which actually cast a shadow on the back of the scene. By the help of an ingenious mechanism in connexion with the poles of the battery, the actor Leménil, placed in front of the stage, produced from a binocle two lights, whose glowing brightness illuminated the spectators as with a sunbeam; then one of these same bright lights starting from a point in the second gallery, inundated the scene of the *Field of the Cloth of Gold*, with a blaze of light like the brightest daylight, to the great admiration of the spectators. The important point in the perfecting of this invention, consists in giving to the electric spark a continuity of splendour and duration not hitherto obtained, but which is now destined to applications on a large scale: for example, to lighting large squares and public avenues, theatres, signals, telegraphs, and even to the studio of the painter, for the winter season, since the electric light does not interfere with colours. The electric light of the diameter of a large pea, and thirty times smaller than a gas light, equals more than 300 jets of gas, and, relatively to its volume, is equivalent to a mass of gas 9,000 times more considerable. As to its splendour, it surpasses, whatever be their number, all hydrogen lights, and projects its rays three times the distance. With the aid of an apparatus of only 30 square centimetres, M. Lemolt is engaged in making comparative experiments, so as to replace, with a triple advantage of range and intensity, every species of artificial light, even that obtained by the most powerful lighthouse reflectors. An electric ray emanating from this apparatus, and glancing on one of the terraces of the Passage Jouffroy, at the elongation of the two Rues Viviennes, gave sufficient light to allow of a placard being read placed on the steps at the entrance of the Palais Royal, a distance of 1,100 yards. M. Lemolt has also by concentrating the rays of electric light by means of a lens, inflamed at various distances several combustable substances.

The Chancellor of the Exchequer has acceded to a grant of £4,200 to the Print Department of the British Museum for the purchase of a collection of rare English portraits, &c.—and of an extensive selection from the Aylesford Collection of Rembrandt's Etchings, which will render our national collection of the works of that master equal to any of the kind in Europe.



A DESIGN FOR BUHL-WORK.

Buhl-Work.

AT the present time the art of inlaying has assumed a degree of importance which we would be glad to see continue—as, in our opinion, when properly performed, it cannot fail of refining taste and adding to the growing desire for the beautiful in works of art; but we must, at the same time, most strenuously protest against that incorrect feeling which has so long rendered articles executed in buhl-work merely grotesque objects, without shape or form—apeing, with a bad grace at best, the designs of Eastern nations, who, without any knowledge of the laws of perspective, delineate natural forms in a style which is only tolerated on account of its novelty, or the intrinsic value of the material which, we may truly remark, is spoiled by the presence of such barbarous pictures.

The art itself is very ancient, and may claim some affinity with mosaic work; however, as it merely consists in inlaying with woods, metals, and shells, we shall confine our remarks—reserving for some future occasion a dissertation on its relative. It is said to have been introduced from Asia by the Romans, at the period of their great conquests in that quarter, by means of which they were enabled to attain a knowledge of those refined arts which had for so long a time been chiefly confined to the Eastern world.

In the fifteenth century we find it practised in Italy, where it was introduced by John of Verona, a professional cotemporary of the illustrious Raffaëlle. Improvement succeeded improvement, and what were at first the rude attempts of an introducer, soon led the way to almost perfection in the hands of men who, loving their task, devoted to it all their energies and all their powers of invention.

At first, no doubt, much difficulty was experienced in the selection of wood suitable for the different variations of tint required in objects of extraordinary magnitude; but this was soon overcome by the invention of the art of browning wood by heat, so as to obtain graduating shades of different intensities.

About the year 1650, the art of inlaying was brought to great perfection in France; and many artists signalised themselves by the beauty of their productions—among whom was the celebrated Buhl, who gave his name to the art.

The purposes to which Buhl-work may be legitimately applied, are for the formation of ornamental borders, &c., where it has a very pretty, nay, elegant appearance.

We extract the following practical information from an excellent authority:—

"In this art the part for the ornament, and that for the ground, are glued together, and the design being drawn upon one, both are at once cut through by a very fine species of bow-saw. Thus, there are four parts obtained, which, being put together in two, the one is the ornament designed in its proper ground; and the remainder of the ground, combined with the remainder of the ornament, gives another pattern, called the *reverse*.

"The plates of brass or other metal should be of the usual thickness of a veneer, or as thin as can be conveniently worked, and made rough on both sides with a coarse file, or toothing-plane. The veneers of wood or other

matter to be combined with them should also be toothed; and, both the plates and veneers being warmed, first pass a coat of glue over one of the metal plates and cover it with a thin sheet of paper, then coat the paper with glue, and cover it with the veneer. Place them between two smooth and even boards, and let them be kept together either by a screw-press, or by hand-screws, and remain till dry; they will then be found to adhere together with sufficient firmness for cutting to the pattern.

"The pattern should be drawn on the veneer, or if, from the colour, it should not be sufficiently distinct, a piece of paper may be pasted on the veneer, and after it is dry the design may be drawn upon it. The lines of the pattern should be cut with a bow-saw, having a very thin and narrow blade; such a saw may be made of part of a watch-spring, and the bow, or the stretcher, of the saw, is required to be at such a distance from the blade as will admit the latter to turn and follow the lines of the pattern in any direction. The frame of the saw should be as light as possible. Where the pattern does not in any place approach the edge, a small hole must be made for inserting the saw; and it is usual to saw upwards, that mode of sawing rendering it more easy to follow the lines correctly. When the whole of the pattern is cut out, the veneer or shell may be separated from the metal by exposing them to steam, or to warm water.

"The next object is to join the parts so as to produce two complete ornaments; the one composed of veneer inlaid with metal, the other of metal inlaid with veneer. For this purpose, on a plain surface, place a piece of paper of sufficient size, and the veneer upon it, then with strong glue insert the metal-part in the veneer, and rub it well down with the veneering-hammer and glue; next, cover the whole with another piece of paper, and place it between two plain boards, which had been previously well warmed and rubbed with tallow, and screw or press them together. If this be properly done, the work will separate from the boards when dry; and, the paper being removed, it may be laid in its place as a veneer; but a caul is usually employed in preference to the hammer. The reverse pattern, it is obvious, should be prepared for laying in the same manner.

"The process is the same whether metal and wood, or metal and tortoise-shell, or two woods of different colours be used. When shell is employed, the under side of the shell is sometimes coloured with some bright colour, as red, yellow, &c., mixed with varnish: and not unfrequently it is gilt. When the colour is dry, the veneer is laid with the coloured or gilt side down; and it produces a pretty effect through the transparent substance of the shell.

"The woods used for inlaying should be of a dense, close-grained texture, particularly when inlaid with metal.

"Brass is much employed; and, in selecting it, some attention should be given to obtain that of a good colour; for, by varying the quantity of zinc in its composition, both its colour and quality is much affected.

The brown and yellow-brown coloured woods combine with either white or black; but, when the brown approaches to red, brass does better; and, in some cases, hard, close-grained satin-wood, of a good colour, might be substituted for brass with good effect, though not with equal brilliancy of relief. The parts of ornaments, in black or white, in any ground, should be kept small to avoid dull heaviness in the one, and too strong a glare of light-colour in the other.

"We have no doubt that dyed woods may be used with considerable effect in inlaying, provided the error of introducing unnatural colours be avoided. It is a great mistake to imagine that a variegated patch-work of high coloured parts will ever be esteemed by people of good taste; but it is one equally great to suppose that there is any objection to the use of dye when it is applied under proper restrictions; that the beauty of work is indebted to dye must be concealed, and its use should be merely to imitate or improve the brilliancy of natural tints, so as to render beautiful furniture less expensive."

Mechanical Power of Coals.—It is well known to modern engineers, that *there is virtue* in a bushel of coals properly consumed, to raise seventy millions of pounds weight a foot high. This is actually the average effect of an engine at this moment working in Cornwall. The ascent of Mont Blanc from the valley of Chamouni is considered, and with justice, as the most toilsome feat that a strong man can execute in two days. The combustion of two pounds of coal would place him on the summit. The Menai bridge, one of the most stupendous works of art that has been raised by man in modern ages, consists of a mass of iron not less than four millions of pounds in weight, suspended at a medium height of about 120 feet above the sea. The consumption of seven hanhels of coal would suffice to raise it to the place where it hangs. The great pyramid of Egypt is composed of granite. It is 700 feet in the side of its base, and 500 in perpendicular height, and stands on eleven acres of ground. Its weight is, therefore, 12,760 millions of pounds, at a medium height of 125 feet; consequently it would be raised by the effort of about 630 chaldrons of coal, a quantity consumed in some foundries in a week. The annual consumption of coal in London is estimated at 1,500,000 chaldrons. The effort of this quantity would suffice to raise a cubical block of marble, 2,200 feet in the side through a space equal to its own height, or to pile one such mountain upon another. The Monte Nuovo, near Pozzuoli, (which was erupted in a single night by volcanic fire,) might have been raised by such on effort from a depth of 40,000 feet, or about eight miles.

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Hair Pencils or Brushes.

These are of many sorts, according to the purpose for which they are intended; the larger kinds, such as are used by house-painters, have for their materials the coarser kinds of hair or bristles, such as those of the hog, &c. The finer sorts are more varied in their nature, and these are chiefly the particular objects of our present paper: they are made from the hair (particularly that which covers the tail) of various small animals, and although the more usual sorts are called camel hair pencils, yet the hair of the camel is not used at all; in fact, the camel is but scantily furnished with hair, and what there is, is but little adapted to the purpose proposed. The hair of many of the animals furnishing the furs of commerce answers extremely well. The fitch pencils are celebrated for their firmness, long-wearing properties, and as furnishing a fine point. The black fitch pencils only are produced from the fur so called; the yellow fitch pencils are formed chiefly from the tails of the English squirrel. The manufacture is as follows, for all the kinds, as given by Dr. Ure:—

"We must wash the tails of the animals whose hairs are to be used, by scouring them in a solution of alum till they be quite free from grease, and then steeping them for twenty-four hours in luke-warm water. We next squeeze out the water by pressing them strongly from the root to the tip, in order to lay the hairs as smooth as possible. They are to be dried with pressure in linen cloths, combed in the longitudinal direction, with a very fine toothed comb, finally wrapped up in fine linen, and dried. When perfectly dry, the hairs are seized with pincers, cut across close to the skin, and arranged in separate heaps, according to their respective lengths.

"Each of these little heaps is placed separately, one after the other, in small tin pans with flat bottoms, with the tips of the hair upwards. On striking the bottom of the pan slightly upon a table, the hairs get arranged parallel to each other, and their delicate points rise more or lesss according to their lengths. The longer ones are to be picked out and made into so many separate parcels, whereby each parcel may be composed of equally long hairs. The perfection of the pencil depends upon this equality; the tapering point being produced simply by the attenuation of the tips.

"A pinch of one of these parcels is then taken, of a thickness corresponding to the intended size of the pencil: it is set in a little tin pan, with its tips undermost, and is shaken by striking the pan on the table as before. The root end of the hairs being tied by the fisherman's or seaman's knot, with a fine thread, it is taken out of the pan, and hooped with stronger thread or twine; the knots being drawn very tight by means of two little sticks. The distance from the tips at which these ligatures are placed, is of course relative to the nature of the hair, and the desired length of the pencil. The base of the pencil must be trimmed flat with a pair of scissors.

"Nothing now remains to be done but to mount the pencils in quill or tin-plate tubes, as above described. The quills are those of swans, geese, ducks, lapwings, pigeons, or larks, according to the size of the pencil. They are steeped during 24 hours in water, to swell and soften them, and to prevent the chance of their splitting when the hair brush is pressed into them. The brush of hair is introduced by its tips into the large end of the cut quill, having previously drawn them to a point with the lips, when it is pushed forward with a wire of the same diameter, till it comes out at the other and narrower end of the quill."

Improvements in Bell-hanging.—A patent has been obtained by Mr. W. P. Parker, of Lime-street, for an improved arrangement of bells in hotels, mansions, &c., by which, whatever number of rooms there may be, one bell will suffice; and the particular room is indicated by a corresponding number appearing on the face of the machine. A contemporary gives the following notion of the arrangement. A suitable bed, or foundation plate, is made of a size corresponding to the number of rooms, in which are grooves cut in a horizontal direction; in these grooves, bars, consisting of strips of metal properly secured by studs, slide; they are connected with suitable cranks and levers, in such manner, that when pulled backwards they immediately raise a hammer which strikes the bell; and they are, on the bell-pull being released, drawn back into their places by barrel springs. On the face of the foundation-plate, which is the part exhibited to view, numbers are painted, corresponding with the several rooms, cabins, &c., each covered with a semicircular piece of sheet metal, moving on a pivot in the centre of the cord of the arc in such a manner, that when the circular part is upward, the figure is covered; but when one of the bars is pulled back in the groove, it draws down the semicircular shield, and discloses the figure at the same instant the bell is struck: on being released, the bar is replaced in its original position, and the shield resumes its place over the number.

Franklin's Gift to American Mechanics.—Dr. Franklin left a sum of money to the town of Boston, to be loaned to young married mechanics at a low interest. In December last it had accumulated to the sum of 40,465 dollars; also, 1,000 dollars, the interest on which is invested in silver medals, and distributed, at the annual examination of the schools, among the most deserving boys in the writing and grammer departments.

Preservation of Paintings.—At a meeting of the Polytechnic Society, in the course of a conversation on the qualities of gutta percha, it was suggested that if valuable pictures were backed with a thin coating of gutta percha, it would enable them, in a great measure, to resist the influence of the atmosphere, and render them all but imperishable.

Alcohol, as used in Arts and Trades.

Independent of its consumption as a potable liquor, alcohol is most extensively used in many arts, trades, manufactures, and branches of domestic economy; is more or less indespensable in most of them, but its invaluable proporties might be more generally and advantageously availed of, if it could be obtained at a lower price. At the toilette and tea-table, in the bedchamber—both of the sick and healthy—and in the nursery, in the naturalist's museum, in the artist's workshop, and the chemist's laboratory, it is one of the most necessary and useful agents we possess.

In other countries its consumption in the above, and many other ways, is much greater than in England, conducing in no trifling degree, not only to their national prosperity but also to the health, comfort, convenience, cleanliness, and elegance of those who use it; and it certainly appears desirable to devise some means to reduce its price in this country, if it can be done without danger to public morals, ultimate injury to her Majesty's revenue, or serious damage to the interests of other trades, especially to those already engaged in the spirit trade in its present state.

With the sincerest wishes for my country's welfare, I, therefore, beg to suggest the annexed plan, and shall feel myself most amply repaid, if my humble efforts at all contribute towards the attainment of so desirable an object as the one now in question; and I cannot but allow myself to believe, that by its adoption, with, perhaps, some modifications, not only with all the ends above alluded to, be most fully answered, but also, that a considerable increase of public revenue will ultimately be obtained; a powerful support and stimulus given to some important but now depressed trades; greater facilities afforded to the arts, sciences, and professions; and a very desirable adjunct more easily furnished to the comforts and conveniences of social life. * * * *

The manufacture of white lead is by no means an insignificant branch of our trade; and acetous and pyroligneous acids are also very extensively used in the calico-printing; and we have powerful opponents in Holland and Germany; but let our white-lead manufacturers be allowed to make their goods either from vinegar made from impregnated alcohol, instead of from grain-wash, or else with common vinegar, impregnated so as to prevent its being used for culinary purposes, and this department of our native industry will increase most surprisingly.

It is true that, compared with our stupendous cotton, woollen, linen, iron, and some other manufactures, the above-named, and others affected by the price of alcohol, sink into insignificance; yet in the aggregate they are of considerable importance; and when it is considered how we are opposed on every side by the rival interests of every other trading nation, and how needful it is to open all new channels of trade possible, no advantage ought to appear too trifling to be availed of; and when it is, moreover, borne in mind, how many trades stand or fall together, how the prosperity of one adds to that of another, and how many unemployed hands are set to work by the revival of even one apparently insignificant trade, it will be readily admitted, that the important results which may arise from the adoption of the present plan, by which, I think it may safely be affirmed, some million gallons of alcohol will be consumed in the ways I have here very superficially alluded to, which at present, by reason of the high duty on it, are not so consumed, and that even many new trades may be thereby created which as yet have no existence.

It cannot be denied, however, that the manufactures of naptha, camphine, &c., is becoming every year of more importance, and that these products serve for many purposes as good substitutes for alcohol; yet their properties are so very different from it, and alcohol has a so much wider field of applicability, that these manufactures would not suffer by the adoption of the proposed plan, nor materially interfere with its utility, but, on the contrary, their use, in combination with alcohol, might in many cases be doubly advantageous.

The purposes to which cheap alcohol, impregnated in the way hereafter proposed, might, and would be applied, are too numerous to be here particularly enumerated; but amongst others may be named the following:—as a neat and pleasant combustible, particularly in the summer season, to heat small quantities of liquid where no fires are kept; as the basis, or at least a component part of most articles of perfumery; as a recoverable menstruum in the extraction of colouring and other matter from various substances; and as a universal and indespensable agent in the chemical laboratory—as, for example, in the preparation of the fulminants, now so generally used in her Majesty's service as well as by the public: as a refrigerant in medical and surgical practice, as an agreeable and powerful evaporant and antiseptic in the sick room, hospitals, &c.: as a recoverable menstrum in paper hanging, varnish-making, and in the manufacture of stearine, margarine, and other fine candles: as a vehicle for paint, where the nauseous of linseed oil and turpentine is unbearable: as a detergent for paint work, pictures, plate, wearing apparel, &c.: as the basis of many chemical and pharmaceutical preparations, and in the preservation of objects of natural history and botany, which in many cases are of enormous size and require much spirit.

All articles proposed for impregnating the spirit, ought to possess the following properties:—1st. Volatility, so as to rise, more or less with the spirit in every distillation, however often repeated. 2nd. Solubility in alcohol, so far as all the flavouring matter it contains is concerned, so that the alcohol may be fully impregnated thereby. 3rd. Solubility in diluted alcohol, to the extent that it will be impossible, in consequence of these three properties, to separate the impregnating matter from the

spirit in which it is mixed, by any processes which would not bring the cost of the recovered spirit, higher than that on which the full duty had been paid.

Some of the articles which might perhaps be used for this purpose, are—coal naptha, rectified oil of bones and amber, camphor, oils of lavender, rosemary, origanum, &c.; musk and musk-seed, ambergris, attar of roses, and some of the acids.

The articles which, however strong-scented, are inadmissable, are self-evident, such as turpentines of every kind, and culinary and confitorial aromatics of all descriptions, to protect the gin and liqueur manufactures; and also nitric acid, to prevent the illicit manufacture of sweet spirit of nitre.

It would be indifferent to her Majesty's excise what impregnants were used, provided they answered the single purpose of rendering the spirits with which they were mixed, absolutely unpotable, therefore the parties requiring this impregnated spirit might select those allowed ingredients which best suited their trade. With some, as the painter, varnish-maker, &c., economy would be a greater object than to the perfumers; therefore, for them the impregnants must be cheap, while the latter would avail to use those dear ingredients which they now use, as musk, attar of roses, &c. Sometimes, and to suit his particular views (whether honest or not), a large consumer might propose to the proper authorities, an ingredient not already on the proposed excise list, and it would then devolve on the chemical department of her Majesty's excise, to ascertain (at applicant's expense), whether or not such ingredients could be allowed to be used without danger to the revenue, and if so, let the permission be granted, and that article be added to the list of those already allowed.

There always have been, and ever will be, illicit distillers, so long as any duty on spirits exists, worth evading; therefore let the present proposition be fairly examined, to see if it affords any additional facilities to such offenders. These persons, I believe, generally make their own wash, and distil and rectify it on the same premises, and with the same utensils. Now, what would the gain by purchasing the impregnated spirit at the low duty, with the view of making it potable? Who are their present customers? If any others than those who drink it, they would lose all their sale to them by the present plan, for a suitable spirit might be openly purchased at the lowest price. How, therefore, would they be placed as illicit distillers of drinkable spirits by my proposed plan? Why, just as they are now,—for suppose them to buy spirits impregnated with any of the cheapest (and they must be cheap) ingredients on the excise list, it is assumed that it would have a widely different, and more disagreeable flavour than the coarsest spirit they now make, and such as no processes within their means could render endurable to the taste; and, besides this, how could they prevent the peculiar smell of this spirit when hot, in their imperfect stills, from detecting them, and they would require too much room and too many additional bulky and expensive utensils, ever to make it worth their while to run so much risk, even if, after all, the spirit might possibly be made drinkable. Their chief customers are the poor and vicious, who are nevertheless very nice and fastidious in the flavour of their favourite beverage, and such a spirit would not at all suit their previous tastes; so that it may be assumed, on tolerably good grounds, that the danger to her Majesty's revenue from this source would, instead of being increased, be greatly diminished by the present proposition, inasmuch as the consumers for non-potable uses, who now buy illicit spirit would then use that on which at least some duty had been paid. * * * * *

It would require a knowledge of the sciences, arts, manufactures, professions, and trades, possessed but by very few individuals, to view this subject in all its bearings, and fully to estimate the advantages here proposed; and they may, therefore, appear overstated to a superficial calculator; but a careful consideration will enable such to appreciate them better.

Let us, as a feeble illustration of my views, take Alkanet root as an example of the working of the proposed plan. It is well known what a troublesome, dirty, and very wasteful operation it is to get the colouring matter out of this substance by oil or turpentine; but a chemist, who under this plan, would make such operations his business—would, at a trifling expense, extract the entire colouring matter, at little or no loss of alcohol, and send it into the market, somewhat in the form of powdered dragon's blood; and ask any gunstock-maker, cabinet-maker, or perfumer, if he would not consider this a great advantage. I am aware that an alcoholic solution of the colouring matter of Alkanet root would not answer, but here the alcohol would be entirely driven off, and the dry extract left in its original beauty and purity, a new article in commerce.

It must also be remembered, that the question is not exactly what wonderful advantages do we see the trades, &c., of those countries possess over us where sprit is very cheap? but rather, what advantages might we not reap, taking in view our greater national enterprise, our superior capital and skill, our extensive possessions abroad, and our luxurious and rich consumers at home, were we similarly situated? For example: a French perfumer can far better afford to pay 5s. per gallon for the spirit he uses, than a Russian or German perfumer 3s.; and an English perfumer can still better afford to pay 7s. or 8s., than the two former 3s. or 5s. So, also, a German or Russian family would, perhaps, rather endure for months the odious smell of oil or turpentine in their newly-painted houses, than pay 3s. or 4s. a gallon for alcohol to avoid the evil; whereas in England it would be most gladly paid, to escape from such an evil—but 18s. or 20s. is too much to pay for the immunity.

From these observatioas, it will be seen, that that I only here propose to carry out, in principle, the plan adopted by Government some years ago, with regard to the salt used for agricultural purposes: and although many obstacles may be opposed to the one in ques-

tion, I think it will be admitted, that well-directed and persevering efforts have overcome far greater ones, for the attainment of objects of less importance.—*Correspondent of the "Builder."*

Iron Carriages.—The tendency of the last few years to substitute iron for wood has been shown in ships, ploughs, and other machines. It has even been attempted in houses; but here, we believe, without that success which is shown in extensive use or practice. A gentleman in the north of Scotland is now experimenting, with good ground of hope, on the introduction of iron carriages. He proposes that the bodies of such vehicles should be formed entirely of an iron frame, the panels of plates of galvanised iron, and the axles of iron tubes filled with wood; the wheels to have for spokes double rods pyramidally arranged, or on what is called the suspension principle. The advantages proposed are—first, a lightness as about two to three; second, a saving of cost in about the same proportion. Thus, a pony-carriage, which, of the usual materials, would weigh five hundred-weight, is only about three when constructed of iron; an omnibus, which, of the ordinary construction, would be twenty to twenty-four hundred-weight, can be formed of iron at about eleven. The same in respect of external decorations and internal comforts. A carriage of this kind effects an important saving in the motive power. If successful as an invention, it must be of no small importance to humanity, both in sparing the muscles of individual horses, and allowing of a greater share of the fruits of the earth being turned to the use of human beings. For use in tropical countries, there is a further advantage in the non-liability to cracking and shrinking, and the unsuitableness of an iron frame for becoming a nest of noxious insects. Apart from the mere substitution of one material for another, which is the leading feature of the invention, much is claimed for it on the ground of the superior springs employed in these carriages. They are spiral, and vertically arranged, working in a case, with an apparatus which precludes their falling from the perpendicular. We have seen one of Mr. Aitken's carriages, and taken a drive in another, without being able to detect any point in which they are likely to prove a failure. Their success, however, must be matter for larger experiment, requiring time for a satisfactory issue. —*Chambers' Edinburgh Journal.*

Stain for New Oak.—A correspondent, who objects to the use of lime-water as a stain for oak, on the ground that the colour produced, though good at first, becomes in two years of a foxy red, says—For new work, especially church work, let no oil, no ash come near it, but wash it with *hot beer*, and rub it well; the grain will show admirably, and time will mellow it down to a tone which never could be acquired if it had been previously doctored.—*Builder.*

The British Institution.—The exhibition this year may be regarded as being to all intents and purposes a decided failure. Most of the great names that formerly disposed us to toleration have departed from the catalogue, and among those that remain there seems to be no other spirit existant than a servile desire to follow in the steps of others. There are some good pictures, nevertheless; but we have not room for criticism, even were we so inclined.

An Iron "Horse" of 100 tons weight, reared in a blast furnace at the Plymouth Iron-Works, for the last five-and-forty years, has just been uncovered, preparatory to its removal from the stable, but now inconveniently limited position in which it has so long stood. This sturdy growth of almost half a century has been found far too unmanageable for removal by mere "blasting," the brunt of which it has withstood for the last fortnight, without flinching, so that it has been determined to adopt the scheme whereby our solitary Yankee brethren in the far west often throw such overgrown pebbles clean out of sight, with a single pair of hands, whenever they are found to cumber the ground. In other words, a trench is to be dug for it on the brink of its present position, into which they will pitch it, clear of all further annoyance.

Notices to Correspondents.

☞ All communications relating to the literary department of this publication, must be addressed (post paid) as follows:—"To the *Editor* of the Decorator's Assistant, 17, Holywell-street, Strand, London." No attention will be paid to any addressed otherwise.

*** Part IX. of the Decorator's Assistant, in a beautifully embellished Wrapper, is now ready, price Sevenpence. Parts I. to VIII. still continue on sale. The First Volume, beautifully bound in scarlet cloth, in a style designed expressly for this Work, gilt and lettered, price 5s. For those parties who have taken in the Work in Numbers or Parts, Cases have been prepared for binding it in, price 1s. 3d. each; or the Publisher will undertake to get it bound, including the cases, for 2s. Early orders are respectfully requested for Back Numbers.

*** Overseers or Foremen of Factories will much oblige us by recommending our Work to the Workmen employed in the establishments over which they have jurisdiction; while our Readers will confer a similar obligation by bringing it before the notice of their friends and acquaintances.

Phidias.—Why so? besides, you have given us an incorrect quotation. Sir Joshua Reynolds never spoke such words.

M. J. P. (Gravesend).—Apply by letter to the Secretary of the Society of Arts, Adelphi, and that gentleman will, doubtless, supply you with the required information.

A Young Painter.—Use lamp-black—that will be good enough for the purpose.

Received.—"M.," "Theodore," "A Subscriber."

*** The article on "Gutta Percha," which appeared in these pages a fortnight since, was extracted from the *London Journal*; we must apologise for our delay in thus acknowledging the source from which we obtained it.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 151.)

Caius Marius, a Roman consul, lived

A.M. 3943, A.R. 643.

Cicero, a Roman dictator, lived A.M. 4011,

A.R. 711.

Claudius, a Roman emperor, lived A.R. 781,

A.D. 41.

Clelia, a Roman consul, reigned A.M. 3547,

A.R. 247.

Coriolanus, a Roman dictator, lived A.M.

3557, A.R. 257.

Crassus, a Roman consul, lived A.M. 3994,

A.R. 694.

(To be continued.)

The Value of Evening Hours.—What have evening hours done for the mechanics who had only ten hours' toil? What in the moral, what in the religious, what in the scientific world? Hearken to these facts! One of the best editors the *Westminster Review* could ever boast, and one of the most brilliant writers of the passing hour, was a cooper in Aberdeen. One of the editors of a London daily journal was a baker in Elgin; perhaps the best reporter on the *Times* was a weaver in Edinburgh; the editor of the *Witness* was a stonemason. One of the ablest ministers in London was a blacksmith in Dundee; another was a watchmaker in Banff; the late Dr. Milne, of China, was a herd-boy in Rhynie; the Principal of the London Missionary Society's College at Hong Kong was a saddler at Huntley; and one of the best missionaries that ever went to India was a tailor in Keith. The leading machinist on the London and Birmingham Railway, with £700 a year, was a mechanic in Glasgow; and perhaps the richest ironfounder in England was a workman in Moray. Sir James Clarke, her Majesty's physician, was a druggist in Banff; Joseph Hume was a sailor first, and then a labourer at the pestle and mortar in Montrose; Mr. Macgregor, the member for Glasgow, was a poor boy in Ross-shire; James Wilson, the member for Westbury, was a ploughman in Haddington; Arthur Anderson, the member for Orkney, earned his bread by the sweat of his brow in the Ultima Thule. —*North of Scotland Gazette.*

Engineering Science in Ancient Egypt.

The base of the great pyramid is a sqare of 764 feet. This measurement was taken by Mr. Jomard, on the side to the north, after digging down to the true base; and the total perpendicular height was also found by him to have been 479 feet. Since that period Mr. Perring has given us the following dimensions from accurate measurement:—

	ft.	in.
The former base . . .	764	0
The present do . . .	746	0
Perpendiculur height .	450	9
Former inclined height.	611	0
Present do . . .	568	3
Perpendicular height by casing-stones . . .	480	9

The total area of the base was 13 acres, 1 rood, 22 poles, and at present it covers 12 acres, 3 roods, and 3 poles. And supposing the rock to average 8 feet in height only over the whole extent of base, after deducting the hollow passages and chambers, Mr. Perring calculates that the quantity of stone originally used amounted to 89,028,000 cubic feet, or about 6,848,000 tons!

The present quantity of masonry, supposing it solid, is about 82,111,000 cubic feet, or 6,316,000 tons; the space occupied by the chambers and passages being taken at 56,000 cubic feet. Dr. Clarke observes that the stone used was a gray limestone, and rather more compact than that called "clunch," and that when it was struck with a hammer, it exhaled a fœtid odour. Denon describes this pyramid to have had 208 courses in height.

The outside casing-stones were found at the bottom, in their original position, near the centre; they were quite perfect, and had been hewn to their required angle before they were builded in, and appear to have been afterwards polished down to one uniform surface. They were cut to an angle of 51 deg. 50 min., and were in height 4 ft. 11 in. At the base they measured 8 ft. 3 in., and on the inclined side 6 ft. 3 in. Where they were jointed, the cement which interposed was so remarkably fine a layer, that it was scarcely perceptible.

The outer stones of this pyramid are laid in regular courses, and we find them, as described by Herodotus, very strongly cemented together;—this author also informs us how these immense blocks, some more than 30 feet in length, were raised. He says that after the first course was laid, machines, constructed of short timbers, were placed upon it, which hoisted from step to step the various blocks, as they were brought along the inclined plane. Goguet has given the form of such a machine, which consists of a timber frame containing a fulcrum, to which a long lever could be applied, worked by many men at one time, and capable of raising weights far greater than any we find used here. Each course being so much within that below, it formed a sort of stairs, so that such a machine as is now described could be readily applied, and would serve to raise the blocks from one step to the other.

Such is the manner, probably, adopted by these early engineers to pile one stone upon another; and, by the magnitude of the masses they constructed, they hoped to render their work immortal. They are as solid as they are immense; and all the means that could be found to render them so were adopted. No timber enters into their construction, and the stones used are of great dimensions, and always solidly bedded.

The granite was obtained from Syene, which is a district reaching from the island of Philæ, along the whole line of the cataracts; that of the finest quality is obtained on the banks of the river.

The beautiful pink or rose-coloured granite, the syenite of the ancients, is very hard, and composed of large crystals, which receive an excellent polish. Two-thirds of the mass is rose-coloured feldspath; sparkling mica and glassy quartz fill up the intermediate spaces, mixed with hornblende occasionally. Pliny sometimes designates obelisks made of this granite, as "Thebaicus lapis," because it came from the region between Thebes and Syene.

Another granite, more resembling that of the ordinary kind, is found contiguous to it, with particles occasionally much, coarser or finer. To these may be added the fine-grained granite; the gray with gray-coloured feldspath; black and white granite, which has white feldspath with black flakes of mica, and oriental basalt; and a very dark kind, which is owing to the abundance of mica.

The sandstone quarries of Adjar Selseleh furnished the chief part of the building stone for the temples: they are situated in the sandstone district, and, according to some, the stone resembles the *grès de Fontainbleau*. When first taken from the quarry it is easily worked, and may be obtained in lengths of 30 feet or more.

We find some quarries of great extent on the borders of the valley of the nile. Limestone was generally employed in all the early buildings; and quarries, from whence large quantities were taken, may be seen at Massarah, where there are tablets remaining, cut in the time of Ames or Amasis, the leader of the eighteenth dynasty, who ascended the throne about 1,500 years B.C.; and from these quarries all the compact magnesian limestone used in the construction of the pyramids of Gizeh was taken. There are other quarries at Téhneh, on the point of a hill, where is a thin deposit of crystallised carbonate of lime; numerous nautili are found imbedded in the limestone, some of which are more than 6 inches in diameter.

In examining these excavations, we obtain some knowledge of the early Egyptian practice of detaching masses of stone, and also a valuable lesson on the saving of both material and labour. To the Egyptians the difficulty of constructing a pyramid was scarcely more than the removal of stone from the quarry, and building it up in the manner in which it lay previous to its being detached from the original bed; the only difference was, that the top

stones of the quarry became the foundation stones of the pyramid; they were taken away in layers, all of the same thickness, and built in courses; and as the work proceeded, the quarry might represent as many steps from bottom to top as the pyramid—inverted, of course. The stone was sure to lie the right way of its bed; and it would be scarcely necessary to mark an oblong stone, after it was detached; its depth being uniform with the others, would indicate sufficiently its true position.

The manner in which a quarry was worked is deserving of our attention. It was commenced by levelling the surface of the rock and marking out a square area of sufficient dimensions, to afford the quantity of stone required; around this was cut a deep trench; at parallel distanees, 7 or 8 feet square, according to the size of the stones, other parallel trenches were made, and then similar lines at right angles, dividing the whole into as many squares. After this the blocks were cut to their required thickness; layer after layer was thus removed, according to the depth of the quarry, or as long as it yielded good stone.

At other times, after the square was marked out on the top of the intended quarry, which was usually selected on the side of a hill, or where its face was perpendicular to the plain below, a horizontal trench was driven through the middle of the square, and then the masses of rock were detached on each side of this first groove; and as each layer was removed, new trenches were cut, until the whole assumed the character of a series of steps on each side of the centre, which rose from the bottom to the top of the quarry, resembling the form of a pyramid. The same machinery which lifted the stones from their beds or steps answered to elevate them to their new position.

Limestone continued in use for many years, after which a fine sandstone was employed, which was discovered to be of far greater durability. The quarries of Silsilis are extensive, and situated between Edfoo and Gébel Silsileh. From them most of the sandstone was obtained which was used in the Egyptian temples and other public buildings.

THE ARMS OF THE SEE OF MANCHESTER.—The arms granted to the See of Manchester have just passed the seals of the College of Arms. They are thus technically described:—"Or, on a pale engrailed gules, three mitres of the first; a canton gules, charged with three bendlets enhanced, or." The arms will make a rich and showy blazon; the two colours used being red and gold, those of the old arms of Manchester, or more strictly speaking, of the Grelles, Greslets, or Gresleys, the ancient barons of Manchester. These arms are preserved in the canton (a square shield in the upper right hand corner of the field). The grant of a charge of three mitres of gold on a broad red upright bar in the centre of the shield is a rich one heraldically, and worthy of the extent and importance of the See of Manchester.

Nails of the best quality for shoeing horses are said to be made from old wire ropes.

Strength of Various Substances.

MR. RENNIE found the following weights requisite to crush a cubical inch of the undermentioned substances:—

Elm	1284 lbs.
White Deal	1928
English Oak ..	3860
Portland Stone ..	620
Cragleith Stone ..	8688

Cubes of a quarter of an inch, of different metals, were crushed by the following weights:—

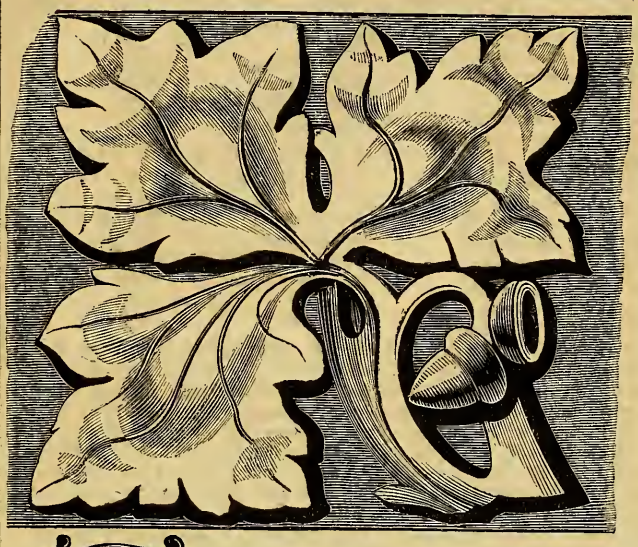
Cast Iron	9775 lbs.
Cast Copper	7320
Fine Yellow Brass ..	10306
Wrought Copper ..	6509
Cast Tin	966
Cast Lead	483

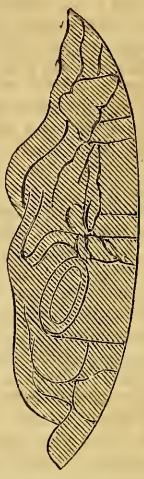
Some curious calculations have been made by Mr. Dodd, the civil engineer, on the comparative tenacity of certain metals, in the pure and alloyed state. He says, "If I take copper, whose tenacity or strength on the square inch is 12 tons, 15 cwt. 1 qr. and 12 lbs., and to six parts of it add one of tin, whose tenacity is 1 ton, 19 cwts. 2 qrs. 16 lbs. finite reason would tell me I should weaken the copper 1 ton, 10 cwt. 3 qrs. and 7 3-7 lbs., instead of which, I add 11 ton, 15 cwt. 3 qrs. and 6 lbs. to its tenacity or strength, as experiment demonstrates; again, if I take three parts of tin, and add to it one of lead, the weakest of all metals, its tenacity or strength, on the square inch, being only able to carry 7 cwt. 2 qrs. and 23 lbs., mere human reason, by mathematical calculation, would tell me the two together would carry only 1 ton, 11 cwt. 2 qrs. and 17 lbs., instead of which they will carry 4 tons, 11 cwt. and 8 lbs., which actual experiments demonstrate. How humiliating this to the knowledge of man, with all his chemical researches! How little does he know or comprehend of the secret workings of nature!"

The cohesive force of metals is very much increased by hammering or rolling them. To draw asunder a cylindrical bar of iron, of 1½ inch diameter, requires a force of 43 tons; while a bar of only 1 inch diameter, and whose cubic admeasurement is not half as much as the 1½-inch, requires a force of 29 tons to draw it asunder; and if we take a wire of 1-10th of an inch diameter, which has been rolled and drawn so repeatedly, in reducing it to that size, we shall find that it will require a force of 650 lbs. to draw it asunder.

There has just been uncovered in the workroom at the eastern end of the Chamber of Peers, in Paris, a ceiling painted by Henry Scheffer, representing King Charles the Fifth—to whom France owes the foundation of her first library. He stands in his royal robes, receiving the learned and scientific men of his kingdom, and inviting them to come and study there for the benefit of his subjects.

The New Houses of Parliament.





THE slow progress which has been hitherto made in the building of the New Houses of Parliament, has lately been rendered the subject of a debate in the House of Commons, during the course of which many facts were elicited which we cannot but deem sufficient to exculpate the architect from any degree of blame; but as it is not our intention to enter upon these just at present, we will here content ourselves with presenting an extract from Mr. Barry's report, which is dated the 1st of February; reserving for a future occasion an accurate statement of the expenditure of time and money, made up to this time, with whatever remarks of our own upon the subject that may seem necessary:—

"The carcase works of the building, as far as the site is available or free from temporary buildings, are completed, with the following exceptions, namely, the upper portions of the Victoria-tower, the Clock-tower, and the Central-tower, which are upon an average 100 feet above the ground, St. Stephen's porch above the level of about 60 feet from the ground, two bays of the western portion of St. Stephen's-hall, which are within eight feet of their intended height, and the central masses of the building abutting upon the Central-tower, and the towers of the river front, which, together with St. Stephen's-hall, are now being roofed in.

"The scaffolding, stages, and hoisting-tackle of the three towers are nearly completed, and contracts have been made for proceeding with the upper portion of those towers.

"The stone groin over the Octagon-hall, under the Central-tower, is turned, the centreing is struck, and the bosses are now being carved.

"The stone groining to the corridors in communication with the Central-hall, and other groins in various parts of the building, including those over the public staircase, are for the most part completed.

"The fittings and finishings of the Peers' and Commons' libraries, the Peers' refreshment-rooms, and the offices attached thereto, and the offices for the Clerk of the Crown, are so far advanced as to allow of those portions of the building being occupied prior to the Easter recess.

"The fittings and finishings of the committee-rooms, and corridors in the one-pair storey of the river front are far advanced, and might have been completed by next Easter if the rooms had not been required for use at the commencement of the present session.

"The finishings of the Lord Great Chamberlain's apartments, Her Majesty's robing-room, and the wood ceilings, wainscot framings, doors, &c., for numerous apartments, corridors, &c., in various portions of the building, are in hand, and in part fixed.

"There are at present 1,399 men engaged upon the works of the New Palace; of which number 776 are employed at the building, 120 at the quarries, 335 at the Government works at Thames-bank upon the joiners' works and wood-carvings, and 168 upon miscellaneous works both at the buildings and elsewhere."

On Framing Angles.

In practical construction a knowledge of the method of "framing angles," as it is technically called, is of great importance. When the length of a joint at an angle is not very great, merely cutting the joint so that upon joining the parts the plane of the joint shall bisect the angle, will suffice. This operation is denominated *plain mitreing*, and is shown for different angles by fig. 1. But when an angle of

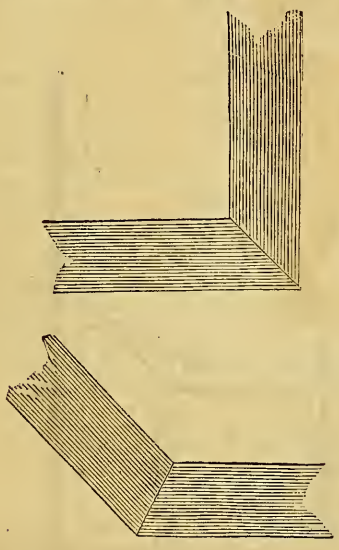


Fig. 1.

greater length has to be joined, and the description of work does not require that the joining should be hid from view, the method exhibited in fig. 2 is often employed. The

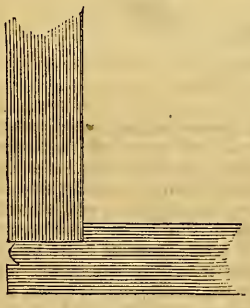


Fig. 2.

small bead renders the appearance of the work less objectionable, because any irregularities produced by shrinking are not seen in the shade of the quirk of the bead. A bead upon an angle, where the nature of the thing does not determine it to be an arris, is fraught with many advantages; it is less obnoxious to injury, and admits of a secure joint without the appearance of one. Fig. 3 exhibits a joint of

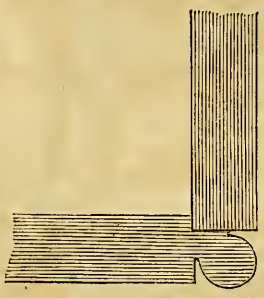


Fig. 3.

this description. It is the method generally adopted for joining linings together at external angles. Fig. 4 shows a very good joint for an

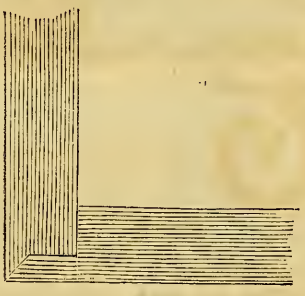


Fig. 4.

exterior angle, whether it be a long or a short joint. It is used for mitreing dado together at external angles. The joint represented by fig. 5 is considered superior to the latter for

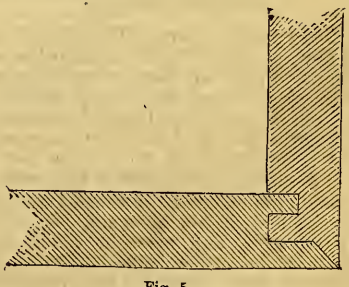


Fig. 5.

long joints in the direction of the grain of the pieces; the parts being drawn together by the from of the joint itself, they can be adjusted with a greater degree of accuracy, and joined with more certainty. The angles of pilasters are often joined in this manner. Interior angles are usually joined in the manner shown

by fig. 6. If the upper or lower edge be

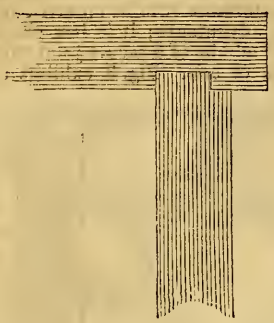


Fig. 6.

visible, the joint is mitred as in fig. 1, at the visible edge only; the other parts of the joint being grooved, as in fig. 6. By this method, the skirting and dado at the interior angles of rooms, the backs and back linings of windows, the jambs of doorways, and various other parts of joiners' work, are put together. Fig. 7

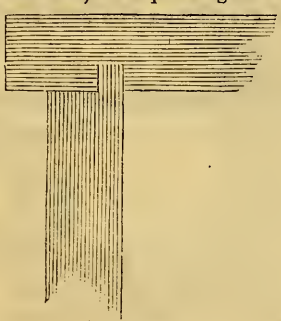


Fig. 7.

shows the variation of this method which is employed in work of a coarser description, such as joining the angles of troughs, &c. It is better adapted for a water-tight joint than one with a smaller groove.

Sir John Soane's Gift.—The 24th of March is the day appointed for the distribution of the dividends which shall have accrued during the preceding year from the sum of £5,000, Reduced Three per Cent Bank Annuities, invested by the late Sir John Soane, among distressed architects, and the widows and children of deceased architects left in destitute or distressed circumstances. Forms of application are to be had at the Museum, No. 13, Lincoln's-inn-fields, and must be filled up and delivered there on or before Thursday, the 16th March, after which day the trustees state no application can be received.

Polytechnic Institution.—The institution is announced to be opened in March for the reception of works for exhibition, and to the general public in April.

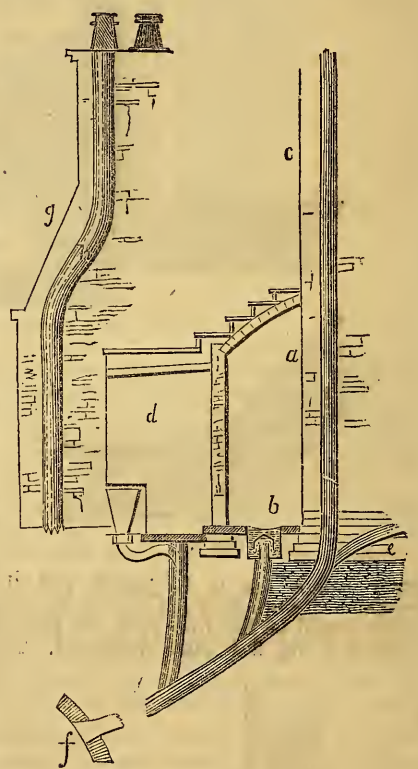
A Lima newspaper states that a substitute for quicksilver, in the extraction of silver from lead and other ores, has been discovered.

Correspondence.

VENTILATION OF SEWERS.

To the Editor of the Decorator's Assistant.

Sir,—The accompanying drawing is intended to exhibit an improved method of ventilating sewers. *a* is a section of the basement storey of a party wall; *b* is the area, showing also the manner in which the drainage is performed; *c* is the ground-floor storey; *d* the vault, showing the water-closet, and the manner in which it is drained; *e* is the house-drain; *f* the sewer; *g* the attic storey, roof, and chimney-stack; and *h* the foul-air shaft.



I would propose that a spare shaft be left in every house, to carry off the effluvia of the drain, in the manner shown in the drawing. The foul air, being considerably lighter than the ordinary atmosphere, will ascend to the top of the edifice and there be liberated. There are a great many houses built at present with spare shafts in the party wall, which might very easily be made use of; and I would suggest that tubes might be fixed up the backs of churches and factory chimneys, where such lie contiguous to main sewers, by which means great good would be effected at a comparatively small outlay.

I remain, yours,

London, Feb. 21, 1848. Origo.

Royal Academy.

PROFESSOR LESLIE'S FIRST LECTURE ON PAINTING.

The professor commenced by remarking upon that power which most painters possess of fairly estimating styles and excellencies that are entirely beyond their reach; and upon this quality he founded his pretensions to the situation he then occupied—the difficulties of which, he said, had been much increased by the abilities of his illustrious predecessors, much of whose learning and elegance still continued to instruct us as part of the permanent literature of the country. He then stated that he should proceed to advance some general observations on education in art.

The road to art was proverbially a long one; and it was often made longer than it need be by our own mistakes. If, therefore, anything he could say should tend to shorten it to his younger brother artists, it would be in a great measure owing to discoveries of some of his own errors, which though made too late to be of much benefit to himself, might possibly be of use to those whose habits were not so formed, but that they might be abandoned if wrong.

Words could but very imperfectly explain what painting was, or what it should be—because it was the business of painting to do what words could not do. Writers on art, therefore, often had recourse to the analogies that existed between painting and poetry; but we were always to remember in making use of analogies that the essential characteristics of every art were not those in which it resembled other arts, but those in which it differed from them. Painting, addressing itself to the mind through the eye, should please at first by form, by colour, by light and shade, or it appealed in vain to the mind. These things were, therefore, the essence of the art—more especially colour and chiaroscuro, for it shared them with no other, and he would say to every young painter, "Address the imagination and the heart if you *can*, but please the eye with these you *must*." He was not, however, to be understood as placing the pleasures of sense before those of the mind, or indeed on anything like an equality with them. He trusted, as he proceeded, to be able to show that he did not underrate the poetry and sentiment of art, though he thought it a fatal mistake to undervalue the means by which *alone* the mind and heart could speak to the eye—a mistake that might often have hindered the development of much poetic feeling.

Genius, as far as it had to do with painting, might be considered as the union of taste with imagination. Now, imagination seemed to be a power to which instruction could scarcely reach; and if in any degree amenable to direction, it could only be so through taste—a faculty that was admitted to be capable of much improvement by cultivation. By taste, in its most perfect condition, he understood not the mere relish of beauty and of truth, but *true judgment;* the power that estimated all things belonging to art relatively as well as singly. It had also as much to do with the heart as with the head; for material beauty would never be fully known but to him who knew also what was moral beauty. Imagination might be considered as the active power of genius—taste as the controlling and directing power. It was the *temperance* which Shakspere recommends to the actors in their bursts of passion; but, as he also told them, it was not *tameness*,—neither was it mere fastidiousness, much less timidity. It would dare all things for a great end,—but it would never seek *merely* to astonish; nor was it ever presumptious. It was not exclusive; it objected not to ugliness or deformity, but it assigned to them their proper places. It excluded only falsehood; and this it detected as readily under the most magnificent disguises as when it affected the most childlike simplicity. It would be easy to expatiate on the attributes of taste until they would tell him that he had proved that no man had ever possessed it; which was, indeed, true of taste in the abstract; for in the most perfect human works there existed flaws from the want of it, and which were, no doubt, always traceable to partial cultivation and the accidents of local position and evil associations. And if taste were the proper director of the imagination, it was also modified in its turn, in every individual, by the particular caste of the latter.

But considering them as distinct faculties, and that either might exist, though in a less perfect condition, without the other, he would endeavour to show the great importance of so much of taste as depended on sound judgment, to the right exercise of the imagination. Few men had had more imagination than the amiable visionary Blake. No mind could have been loftier in its aspirations than his,—no heart more pure. He conversed daily with angels—he wrote poetry that Charles Lamb called "glorious," and Coleridge quoted by heart; and, so far, he had taste as well as imagination. But his pictures, though the subjects were sublime, were too fantastic to be looked at with any seriousness; for, by a singular perversity of judgment, he was led to associate sinfulness with the pleasure of the eye, and he spoke of being haunted by demons in the shapes of Titian, of Correggio, of Rubens, and of Rembrandt, tempting him to commit light and shadow, and to be guilty of colouring. Blake, he should be told, was mad; but this did not affect the argument, for madness was but an unbalanced mind, and the power he (Blake) wanted was, as he had said, judgment—the better part of taste. Blake was but an extreme specimen of what was always more or less the result of the undue predominance of the imagination—and which, as far as it threw off the controul of judgment, produced what might be called the *fanaticism* of art.

Barry might be quoted as another, though a less extreme, instance of an extraordinary man devoting himself to a great object, and wilfully rejecting much assistance of the highest value. He (Barry) spoke of the Dutch and Flemish painters, including Rembrandt

and Rubens, as out of the pale of his church. And what was the result? He (Barry) expended six years of thought and labour in the production of a series of pictures of high moral aim; but so deficient in the attributes of art, that though they might be acknowledged as the productions of genius, no power of reasoning would ever persuade the world to admire them.

To Blake and Barry he would now oppose, by way of contrast, Terbugh, as a painter of the least possible imagination, and whose works exhibited no remarkable degree of purity of mind. We should deduct, therefore, from his taste, all by which imagination and fine feelings might have exalted it. His subject had rarely anything to interest, and we might be thankful when they had nothing in them to disgust; for he (Terbugh) often descended to incidents of the most repulsive kind: a well-dressed woman, for example, tippling by herself, and in the act of draining a long Flemish glass, while she has a stone bottle on her lap. Yet such, and others little better, from his hands, were made gems of art by the exquisite taste of the colour, execution, and light and shade, with which they were recommended to the eye; and Terbugh ranked with great painters, and was of a class from which Reynolds did not disdain to learn, and Raffaëlle would not could he have seen its productions; while the works of Blake could scarcely be said to belong to the art; and those of Barry, from their lamentable deficiency in all that can satisfy the eye, must take a rank far below the productions of the painters he most despised of the Dutch and Flemish schools.

He (the professor) had no hesitation in saying that every artist whose name had lived, owed his immortality more to the excellence of his taste than to any other simple faculty. Not that it was his greatest quality; but that it displayed all the rest to their fullest advantage, and without it his mind would be but dimly and with difficulty seen. The lofty imagination of Raffaëlle, the wonderful fertility of his invention, with all his extraordinary dramatic power, and his deep knowledge of human nature, would never have placed him where he was, nearer to the hearts of men than any other painter that had ever lived, were it not for that pure and true taste which gave such an indescribable natural urbanity to every work of his hand,—from the earliest of his attempts to the grandest of his frescoes. Compare, for instance, his "Galatea," with the same subject by Annibale Caracci, of which the National Gallery had the cartoon. In academic excellence the work of Annibale was not inferior to that of Raffaëlle; but without anything of affected prudery, there was a modesty, a gentleness, in Raffaëlle's picture which by contrast would vulgarise works much less gross than that of the Bolognese. He had selected the "Galatea" of Raffaëlle as a proof of the purity of his taste, because the subject was one in the treatment of which whatever there might be of grossness in the mind of the painter would be sure to appear.

It was taste only that could settle the difficult questions of *finish*. A young painter in the midst of a fine collection of pictures might be puzzled by seeing so wide a separation between great masters in the degree of attention they had given to the details of their works. But he would learn as he became acquainted with the art, that all pictures were finished if the intention of the master was fully conveyed; and that details might be omitted by Velasquez or introduced by Terbugh, and the effect be equally satisfactory, because whatever the one gave or the other left out was given or omitted under the guidance of an exquisite taste. Who, for instance, while standing before the "Boar Hunt," by Velasquez, in the National Gallery, would desire more than he could find in it; or in looking at the "Blue Boddice," by Terbugh, in Her Majesty's collection, would regret that the finish had been carried so far?

In speaking of this faculty hitherto, he had assumed the meaning that always accompanies the word when used by itself—*i. e., good taste.* But good taste might be considered as the exception, and bad, or rather mixed, taste as the rule. In cold or phlegmatic natures taste was a mere negation—hence mediocrity; but ardent temperaments had always strong relishes—and if these were not, by nature or education, directed to truth, they would always turn to falsehood. It would not be necessary for him to say that the best and worst tastes had often been united in the same men; and where great powers of invention and execution were joined to a false but plausible taste, the possession of them was able to corrupt an age. Indeed, as art appeared to have sometimes risen to a great height at the bidding of a single commanding mind of rightly directed powers, it had at other times sunk into corruption by the no less powerful influence of a single mind possessed of the ability to give to falsehood the appearance of truth. Not but that there were always concurring circumstances in the state of society to facilitate either the ready admission of truth or of falsehood, and that these circumstances acted upon leaders as leaders again acted upon the multitude; and this afforded a clue to one cause of the irregular progress of art—a progress marked, ever since painting might be said to have reached its maturity, by alternate periods of great vigour with periods of decay, sometimes verging on dissolution. It was consolatory to know, however, that in most countries in which painting had achieved great triumph, the achievement had not always been for once only; though it was of great importance to notice that different periods of excellence had always been marked by different *characters* of excellence. And this should teach us a lesson we did not seem disposed to learn—namely, that any attempt to remove particular styles of art must always prove futile, since history showed us that art had often revived, but styles never.

Believing, as he had said, that taste was the only faculty obedient to training, and that imagination was beyond our reach, excepting through its influence, he would point out some of the dangers to which he thought taste was exposed in its immaturity. A young painter

at the commencement of his studies, how far soever he might be from the perception of the highest beauties of pictures, would generally see truly their faults. As he became better acquainted with fine works of art the beauties he discovered in them would atone to him for the faults which he still sees. But if, on becoming still more alive to their excellencies, he allowed himself to be persuaded that their faults were necessarily connected with their beauties--or that they were conventional merits, and not only inseparable from, but indispensable to, a particular style,—he would make an opening in his mind for the admission of all the unfounded theories which ingenious critics had at different times broached on the false plan of considering pictures as *the art*, rather than as imperfect manifestations of parts of the art; which was the most that could be said even of the greatest works known to the world. Sir Joshua Reynolds, wise and candid, and above all things loving and seeking the truth, advocated a theory founded on this basis; and which, although he did not allow it to influence his own practice, had certainly a tendency to preclude much that the student might learn from his example. It was, perhaps, chiefly from modesty that Reynolds placed colouring—a quality he so greatly excelled in—lower than he (the professor) thought it should be placed among the attributes of art. It was natural that he (Sir Joshua) should not think the most highly of that which he found so easy; but as he (the professor) had not the same reason for undervaluing this charming power, he would endeavour to show why he ventured to dissent on this point from so deservedly high an authority. Nor was he the first professor in that academy who had differed from Sir Joshua in this matter—for Opie, in his third lecture, in allusion to the theory of Reynolds says, "Though I respect *him* much, I respect *truth* more, which I think will bear me out in maintaining the contrary opinion."

In the first letter which Reynolds addressed to the "Idler," he spoke of "critics who are continually lamenting that Raffaëlle had not the colouring and harmony of Rubens, or the light and shadow of Rembrandt, without considering how much the gay harmony of the former, or the affectation of the latter, would take from the dignity of Raffaëlle." He (the professor) thought that the following reply to this might fairly be suggested on behalf of the critics. The colouring and harmony of Rubens, instead of injuring the dignity of Raffaëlle, would, if applied with the discrimination with which Raffaëlle was sure to have applied it to his works, have greatly improved them. Imagine, for instance, the "Galatea" with the tone and harmony of Rubens, or the "Parnassus"—and the image of a work would be immediately presented to the mind of far greater perfection than either of those pictures in their present state. Then, again, that the colour of Rubens might be accommodated to all that was most dignified and pathetic in the art, we had a striking proof in a picture by his hand that yielded to nothing in the world in sentiment, the "Descent from the Cross." Whatever might be the deficiency of this great work in historical dignity arose from the grossness of form and want of elevation of character in some of the personages. It might be objected also that the dress of the Magdeline was too modern; but the expression of her face—little as we saw of it,—the grief and reverence with which she receives in her arms the feet of the Lord (a beautiful thought, and which he [the professor] did not remember to have occurred to any other painter of the subject), the expression, he repeated, of her face and attitude had rarely been equalled, never surpassed. It was, indeed, perfect, and the colour and chiaroscuro were of the greatest importance in assisting the deep impression this matchless work must make on every human being that had a heart.

Then, again, as to the light and shadow of Rembrandt being incompatible with the dignity of Raffaëlle, he would say the same thing. Unquestionably not, if used with Raffaëlle's judgment; and he (the professor) believed Raffaëlle would have gladly availed himself of Rembrandt's powers in such subjects as the "Incendio del Borgo" and the "Liberation of Saint Peter from Prison." One of the most remarkable features in the character of Raffaëlle was the quickness with which he saw and made himself master of every beauty and excellence in the works of others—of his contemporaries as well as of the painters who had preceded him; and to this it was in part—he could scarcely say how great a part—owing that he so far surpassed all other painters of his time excepting Michael Angelo. To this quality not only his quickness, his taste, and his penetration were necessary, but his natural modesty. He never thought too well of himself; but he strove to the last, "That he might attain, not as although he had already attained," to excellence. Indeed, the example of Raffaëlle's habits of mind was the best of any individual example that could be proposed to the student.

We often heard of the language and the grammar of art; and these words were frequently used where there was no real correspondence between the qualities in painting which they were put for and the words themselves. Sir Joshua Reynolds, in his Fourth Discourse, spoke of Paul Veronese and Tintoretto as possessing merely the language of painters; and adds, "It is but poor eloquence that only shows that the orator can talk." He (the professor) would wish his auditors to consider for a moment what were the qualities thus compared to language—*i.e.*, to a system of mere arbitrary signs of things, which, having no resemblance to the things themselves, varied in every nation under heaven. The powers of art, thus compared to language, presented with the most vivid images of all that nature addressed to our sight; and these images were given to us by Paul Veronese with a greater degree of general truth than any other painter had ever achieved on so large a scale as that of his principal works. He united exquisite harmony and purity with the greatest brilliance and force of colour, and the most unaffected system of light and shade.

He had elegance, grace, dignity; and in some of his compositions a grandeur of style, not unworthy of Michael Angelo; while Tintoretto, possessing many of the highest excellencies of colour, appeared irresistibly to our imagination by the power of his chiaroscuro.

(To be concluded in our next.)

Tempering on Steel.—In the year 1789, Mr. Hartley obtained a patent for a mode of tempering cutting instruments of steel, by immersion in oil, heated to a regulated temperature, measured by a thermometer. This was certainly a great improvement, both in point of precision and despatch, on the common method of heating the instrument over a flame till a certain colour, produced by a film of oxide, appears on its surface. The colours are,

At 430° F. a very faint yellow for lancets.
450 .. a pale straw colour for razors and surgeons' instruments.
470 .. a full yellow for penknives.
490 .. a brown for scissors and chisels for cutting cold iron.
510 .. a brown with purple spots for axes and plane irons.
530 .. a purple for table knives and large shears.
550 .. a bright blue for swords, watch springs, truss springs, and bell springs.
560 .. a full blue for small fine saws, daggers, &c.
600 .. a dark blue, verging on black, is the softest of all the gradations, when the metal becomes fit only for pit and hand saws, which must be soft, that their teeth may bear sharpening by the file, and setting by the hammer or pliers.

Comparative Rate of Speed on Railways.—The principal railway companies have fixed the accelerated speed at which the trains will run during the winter quarter at the following comparative rates:—Express trains on the Great Western travel at the rate of 40 miles an hour; North-Western, 38; South-Eastern, 35; Brighton Coast, 35; Eastern Counties, 29; and South-Western, 39. First and second-class—Great Western, 32; North and South-Western, 26; South-Eastern and Brighton Coast, 23; and Eastern Counties, 24. Third class, or parliamentary trains—Great and North-Western, 16; Brighton Coast and South-Eastern, 18; South-Western, 24; and Eastern Counties, 14. Mail trains travel at the same rate as first and second-class trains.

The days appointed for the reception of pictures and other works of art, intended for exhibition at the Royal Academy, are Monday the 3rd and Tuesday the 4th of April.

Medal Die-Sinkers have been called on by the Art Union for specimens of their dies, with the view of giving commissions for a series of medals.

Artistic Curiosities.—It may not be generally known to the passers through King-street, Covent-garden, that in the smoking-room of the Garrick Club are four pictures painted in distemper, though slight of their kind, rivalling any similar works that have been produced. "The Ruins of Baalbec," by David Roberts, is one of the most elegant productions of his pencil. The architectural details are touched with all the certainty and grace so peculiarly his own; and the train of camels and figures are executed as he only knows how to execute such matters. Stanfield has contributed "The Remains of a Roman Arch, &c."—we believe at Ancona; the sea in the distance. This picture possesses quality of tone and air that exhibits in some respect the superiority of the material over oil. The early practice of both these masters in the scene-room of the theatre has well qualified them for such productions. Nor is Mr. Louis Haghe—so well known for his eminence as a lithographic draughtsman—far behind these artists in his two subjects; one a scene in the Low Countries—the other a view in Italy. Both are with figures, on a large scale. Hitherto unused to the material, these pictures by Mr. Haghe prove that to the experienced and true artist the mere fact of change in the employment of pigments and vehicles is of little import. When the mind can conceive, the hand readily obedient in one medium can easily accommodate itself to another.—*Athenæum.*

Notices to Correspondents.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—I should feel greatly obliged if any of your numerous subscribers would inform me as to the best kind of wax for modelling very fine ornamental work, and the best method of preparing the same.—I am, Sir, yours very respectfully, A Subscriber. Birmingham, Feb. 20, 1848.

Sir,—Could any of your correspondents inform me respecting the process of polishing a cast of rice glue, and the material of which the mould should be formed?—Yours, &c., J. Collings. Pimlico, Feb. 20, 1848.

Sir,—I should feel obliged if any of your correspondents would favour me with the recipe for a good varnish for wood that will take French polish upon it without getting rubbed up.—J. L. Bradford, Yorkshire, Feb. 19, 1848.

A Patron from Number I.—Apply to the Messrs. Ackermann, in the Strand, with regard to your first question. We know of no article that will brighten water-colour paintings without leaving a gloss, nor do we believe that there is such a thing in existence. However, if you apply as above, you may be satisfactorily answered on this point also.

A Bricklayer (Edgeware-road).—We are aware that sewers constructed of pipeclay have been recommended, but we really cannot perceive their utility. The material is at once unsafe and expensive.

T. B.—Indian rubber dissolved is stated to form an excellent vehicle for oil-colours. Try it, and perhaps the difficulty will be overcome.

Received.—"F."—"Marcus."—"A Carpenter."—"A Friend" [your suggestion will be attended to].—"Gothic Architecture" [we will reserve it].—"A Country Subscriber."—"Kenney.'—"F. M. S." [send the article].

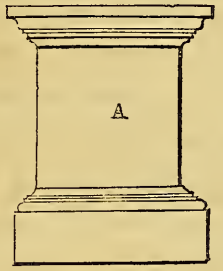
An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 161.)

Corner-Stone (in building), the stone placed at an angle of a building.

Crampoons (in building), pieces of iron hooked at the ends, employed for drawing or pulling up stones, timber, &c.

Dado (in architecture), that part in the middle of the pedestal of a column, marked A, between its base and cornice. It is of a cubic form. The dado employed in the interiors of buildings is a continuous pedestal, with a plinth and base moulding surmounting the die. This continuous pedestal, with its moulding, is constructed of wood, and is usually



about the height of a chair-back. Its present use is to protect the stucco-work or paper of the walls, but originally it was used as an architectural decoration to a room. The construction requires care in joining the deals of the dado, which are ploughed and tongued, keyed transversely at their backs, in order to prevent any joint from appearing in the die or plane surface. Some dados are panelled.

Dancette (in heraldry), is when the outline of a bordure is greatly indented, as fig. 1.

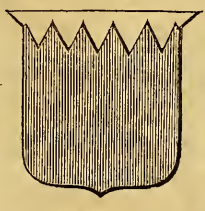


Fig. 1.

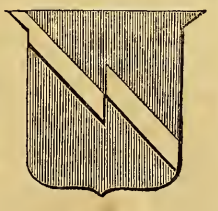
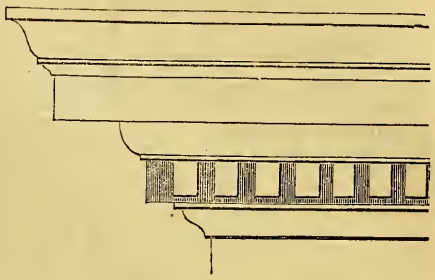


Fig. 2.

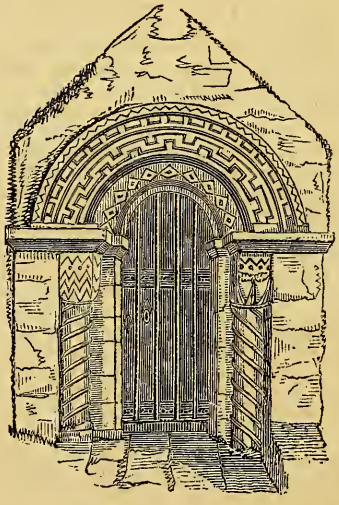
There is also a bearing of a bend called *double dancetté* (fig. 2). Thus, he beareth *azure*, a bend double *dancetté argent*.

Dentel (in architecture), an ornament in cornices bearing some resemblance to teeth; particularly in the Ionic and Corinthian orders. Vitruvius prescribes the breadth of



each dentel, or tooth, to be half its height, and the metopa, or interval between each two, to be two-thirds of the breadth. [We shall shortly give the rule for drawing the dentel.]

Doorway (in architecture), the entrance to a house, distinguished from a *gateway* by being smaller in dimensions. Anciently, doorways



were but mere open spaces without any means of closing the entrance. The accompanying example belongs to the circular style.

Decoration, the art of embellishing by means of painting or sculpture. It is essentially an art of taste, but is modified in its application by various known rules founded upon experience, deductive science, or adaptation. Decoration has been extensively employed from the most remote periods, and has given rise to many elaborate essays upon peculiarity of style. As we have presented many valuable papers on the subject in the body of this work, it would be needless for us to enter upon it in this place.

(To be continued.)

Artistic Societies.

INSTITUTE OF FINE ARTS.

Mr. Wyse's Address to Artists. — At a general meeting of the Institute of Fine Arts, held on February the 19th, Mr. T. Wyse, V.P., in the chair, a paper was read by Mr. Franklin on the "Connection between Art and Manufactures," the object of which was to claim for the decorative art a higher place than is usually assigned to it, and to shew that some of the greatest artists of antiquity had not thought the practice of it derogatory to them. Some ordinary business having been transacted,

Mr. Wyse addressed the meeting at considerable length. He said that a great and beneficial change was taking place in England in respect of the arts; every time he returned here from his own country, he fancied he saw a difference, which to those who were always here was, perhaps, not visible. Most important was the study of the fine arts, and all study that would tend to counteract the hurry and scuffle which characterise our time. To interest the people in art was of the first consequence,—without a sympathising public it was useless to expect progress in the arts. It was not because Greece was free that art reached there so noble an elevation, but because *all* participated in the enjoyment of it and could appreciate its efforts. Some had said that England was too democratic for the arts; this he must regard as a calumny against free institutions, or a calumny against art; he denied it wholly, as he could never believe that free thought, free word, and free action were opposed to the progrees of art. The great obstacle to its progress amongst us was a want of sympathy, which had been produced by the separation of art from the purpose of ordinary life. There could be no lack of power in England; poetry and eloquence were not wanting in England, then why should art be, which was but another form of poetry—the poetry of form? Our insulated position, which drove us to the practical, had, perhaps, something to do with our backwardness in art. In America there was the same tendency; all travellers were struck with the great progress making there in everything but art; but that would necessarily follow. It was desirable our tourists should regard matters of art differently from what they did. Travellers who had seen all Europe (and in too many cases made all Europe see them) often returned little benefitted in this respect. Much of that one-sidedness which once characterised England was, however, fortunately disappearing, and we were more willing than formerly to learn, no matter from what source. A great move was being made, and it was surely worth while to strive to form a truly English school. To raise art, we must elevate the artist. If we looked to the annals of Greece we found the artist the counsellor and friend of the ruler; so also in Rome. In the middle ages, too, when new institutions grew up, we found artists, if not in the state, in the church; in the bosom of the church the greatest artists and preservers of art were nurtured; while all around were war and struggling, there they found peace—the promoter of art. Art never died in England, though it was sick; there was twilight, but never perfect night. As in the Athenian game, where the torch was handed from youth to manhood, and from manhood to old age, without being extinguished, so art was never lost, but still transmitted. As the church became corrupted, another society for the preservation of art arose within it. Those who looked at the noble works left by architecture necessarily asked how it was that, while in other respects society was retrograding, such wonderful buildings were raised. These were the work of a confedracy who had their own laws and powers, preserving inviolate the secrets of their art. There was a story recorded of an architect murdering the son of a bishop because he had communicated the secret to another. Their statutes were preserved in a town in Germany to this day, and showed great coincidence with ancient German architecture as we now see it. Succeeding these, as communicators of art, continued Mr. Wyse, we find the Italian schools, each depending on one master, and following his rules. This accounted for the numbers of what are called "Guido's" and "Caracci's" which are of the school only,—executed by pupils of these masters, and in some cases touched or finished by them. This was not an organisation like the church, but approximated to the philosophic schools of Greece, from each of which proceeded a body of doctrine. During this time artists lost nothing of their importance with the state: Raffaëlle might be seen descending the steps of the Vatican with as noble a band of followers and disciples as any prince; and Brunelleschi might be heard calling boldly on the Florentines to attempt great works. A short time only had elapsed since he (the speaker) had read the noble preamble with which, in the fourteenth century, the Florentines commenced the record of the foundation of their great church. It would be well if our senators, at this moment especially, could here how this small state spoke. The preamble said, that considering it was of the utmost importance for a state to show by its outward works its inward wisdom, they had commanded Arnolpho to commence a church, &c. Only a few nights before Mr. Barry had been accused of occupying ten years in the erection of the intended senate-house. This church in Florence took 230 years in building. But did the Florentines hesitate or fear? No. Every artist who could aid in producing excellence was encouraged to come forward: time was not considered, expense was not considered. They spent more money upon it than they had on all their wars, and food was taxed expressly in aid of the funds for completing this church. The same spirit was apparent all over Italy; they had a stout heart, and full confidence that art would never be

wanting to the state, and would pay back all that was spent upon it.

The speaker went on to trace the progress of schools. Louis XIV., although a mock Augustus, made up of contrivances and shams, led to the recognition of the value of art and the worth of artists in his reign. In the Netherlands, at the same time, we know that artists were commissioned as ambassadors, and stood in the first rank. We come to England, and there we find art merely permitted, not ennobled. The orthodoxy of *whitewash* was deemed of more importance than art; the painter was shut out from the church. Where should such severity end? If painted glass be admitted, why not painted walls? If music, why not sculpture? The artist was driven from the high places; the upholsterer took the place of the architect. Look in the country-houses of the aristocracy, where in truth our aristocracy reign, and what do we find? Little but family portraits, or subjects foreign to our sympathies. Our own noble history is lost sight of, affording as it does countless subjects for illustrations. Look in our courts of law, still no art. A lining of deal painted to look like oak is the utmost we could expect to find. When every now and then an isolated instance of one of our own nobles encouraging art did occur, a great cry was raised of the patronage afforded by our aristocracy. Patronage! why one single cardinal of Rome had done more than all our aristocracy together. And now when the barrier had been broken down, and, in our new chambers of legislature, we were about to afford an asylum to art, murmurs were heard and cries for undue haste. The discussion in the House, however, had shown how few there now were who refused a recognition of the claims of art. Now that artists had an opening afforded them to assist their country, the question of preparation must be considered. They should occupy themselves with their books as well as their pencil. They should get the language, the grammar of their art of course, and then strive to compose. The mechanical art of painting was of itself little. The question to every picture should be, what does this tell me? Whether landscape or figure piece, it should still have a soul, and speak to the soul. An artist must be educated; to produce mere transcripts of nature is not sufficient, and it was to be wished that they should give a short time to the study of books every day.

Cornelius had told him, that when he wanted inspiration, he opened Shakspeare, and there he always found it. They might rely upon it, that such a practice would give elevation of thought, and lead them above works which belonged only to the ephemeral day. These were not the objects of art. They could not all be Shaksperes and Raffaëlles, but all could aid in inspiring a love for such men, and that was much; all could make the men about them better, and that was more. Praise had been given to those who made two blades of grass grow where only one had grown before: he would say, that to make two minds think who had never thought before was a nobler act, and should be more highly lauded.

Veneering.

The art of veneering bears some analogy to that of Buhl-work—the difference being that instead of the thin slips of wood being laid down to a particular pattern, the whole surface of the underneath portion, generally of some coarse material, is covered by the *veneer plate*, the whole thus forming an economical and in many cases equally useful substitute for a more expensive wood. In commencing our subject, it may be as well to explain to the reader the manner in which the veneer plate is formed. A large block of whatever description of wood is to be employed, is secured by means of pins to a sort of frame which traverses a sort of railway, and which being set in motion by means of steam power applied to revolving cogs underneath, presses the wood against the teeth of a circular saw. A workman is employed to guide this operation, which he does by standing at the side of the saw and as it cuts the wood, prevents accidents by placing a long stick between the severed plate and the side of the saw. He has also at his command a powerful break with which he can stop the machinery in an instant.

After the plates have been cut they are rubbed over their surface with sand-paper in order to erase all irregularities on their surface, and pieces of calico are glued on at the extremities in order to prevent the plates from warping. They are then ready for use.

Having both the plate and the article to be veneered ready, the operation is performed as follows:—The ground, or that part which is to be inside, of the plate is first moderately warmed at a fire, and the outside slightly wetted with warm water or thin glue and laid on the ground directly; the workman now takes a veneering hammer, and, beginning at one end, works from the middle to each side until neither air nor glue exudes from the sides or ends. This is one method, but another called *veneering by cauls* is employed, although it must be remembered that its use is only admissible where it is impractible to lay on the veneer by means of a hammer. "A caul is made out of solid wood, shaped to the wood to be veneered, and being well heated, and afterwards oiled and greased, it is screwed down upon the veneer, and by its pressure and its heat sends out the glue, causing the veneer to bed close to the ground. For carved surfaces, sometimes thin wainscoat is used for cauls, and, by heat, made to bend to the crooked surface. In general, cauls of one-inch deal, keyed across to keep them straight with wainscoat, are used for card-table tops."

If a caul be employed, the veneer must necessarily be rendered of a very uniform thickness; or wherever there is a thin place the glue will collect, and consequently the veneer will be imperfectly laid, and liable to blister. In order to heat the cauls regularly and sufficiently, a large hot-plate is employed by some cabinet-makers. A hot-plate consists of a thin plate of cast-iron, with a furnace fire below it. One heated by steam is more safe, and not liable to over heat.

A DESIGN FOR A SPANDREL, LOUIS XIV. STYLE.

The Screw.

HOWEVER much may be our veneration of the ancients for their ingenuity, when we come to regard the screw, that veneration must, most assuredly, be increased to a still greater extent. Few persons, unaware of its exact nature, would be inclined to regard this instrument with any extraordinary degree of interest, yet when they learn that by means of those few rings placed on the surface of a cylinder, the most mighty as well as the most delicate of operations can be achieved—when they learn that the instrument thus formed is equally useful in the lifting of a 74-gun ship of war and the formation of a Geneva watch, they cannot fail in experiencing surprise.

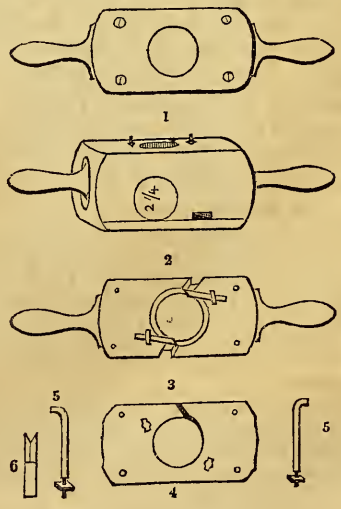
The screw cannot properly be denominated a *simple* instrument, inasmuch as it is never used without the assistance of a lever or winch to help to turn it; but amongst the variety of methods employed for the application of mechanical power, there are none which can take precedence of this instrument. The wedge, the inclined plane, and the lever were merely the natural inventions of untutored minds; but the construction of the screw—more elaborate in principle and more powerful in effect than either of these—required a more advanced knowledge of mechanical art in order to bring it to perfection. The screw is essentially a compound machine—combining, as it does, all the properties of the other powers, without any of that encumbrance which would necessarily attend upon their individual employment.

To such of our readers as have not had had an opportunity of seeing *original* screws made; but have only seen them formed by means of *other* screws—as in the use of taps and dies by smiths, or the screw-plate by clock-makers, bell-hangers, &c., a brief description may not be deemed unacceptable.

Our design is to point out the manner in which a variety of the most useful screws may be obtained, as well as to ennumerate some of the purposes to which particular screws can be applied.

I.—SCREWS IN SOFT WOOD.

Screws in soft wood are cut by means of a tool called a "tap and screw box." Figs. 1 and



2 show one of these boxes as fit for use, while fig. 3 exhibits the box without its top—showing the two V shaped cutters, which are held in their proper position by the bolts shown in fig. 5 passing through the box. Fig. 4 exhibits the top of the box—the side shown to go next to the box—therefore exposing the aperture for the passage of the wood cut out by the first cutting V, which is so placed as to cut only half the depth of the required thread—leaving the second cutter, which is placed on the opposite side of the box, and half a thread lower, to finish the screw. It will be perceived that as soon as the first cutter has cut its share, the thread in the box conducts the wood to form the screw to the next cutter, and the remaining thread in the box conducts the wood so that a perfect screw is formed. The "tap" is generally made of cast-iron, a section of which would appear as shown in fig. 7; and on the screw-box is generally given a circle showing the size of the centre-bit required to bore the hole for the nut. One cutter only is requisite in the box when the size of the screw is under two inches.

7

Beech is the wood generally employed for the purpose of screw-making—especially for joiners' and cabinet-makers' bench-screws, hand-screws, &c.

(To be continued.)

A Word with our Readers.—Last week we commenced the publication of a series of designs in a separate form suitable for binding with this work. The first specimen having met with the unqualified approbation of all who have seen it, and we having been requested to continue them as frequently as possible, we will endeavour to issue them monthly; as this has been the first great step made towards the art education of the people, the proprietors of this work earnestly trust that their exertions may not be unsupported by those who have the power (and who has not?) to do so by their patronage. Recommendations of our work by our readers to their friends and acquaintances is of the utmost importance to us; and we rely upon their kindness and generosity to further our interests where they are so intimately connected with their own. The design given last week was for a panel. Its composition partakes both of the Elizabethian and Arabesque styles.

Chloroform in Manufactures.—The powerful solvent capabilities of chloroform are now by experiment fully established. Caoutchouc, resin, copal, and gum-lac, bromine, iodine, the essential oils, &c., yield to its solvent powers. This property may, it is believed, prove extensively of advantage in many of the fine and useful arts.

In Ipswich, machines are now at work knitting stockings by steam. The work is done with beautiful accuracy. One young person can attend to three machines, and each machine will knit one stocking in three hours.

Correspondence.

IMPROVED EASEL.

To the Editor of the Decorator's Assistant.

Sir,—A great improvement might, I think, be made in easels by the adoption of the following plan:—

The ordinary easel is shaped like a step-ladder, thus—

A

but if the left leg were to be attached in this way, by means of a hinge—

A

and the long leg made in two pieces and joined in front by another hinge, the artist would be enabled to gain more space in his studio, by packing up the whole, when not in use, into a portable compass. When packed, the pieces would fall thus—

III

like the leaves of a book, and occupy no more room than an ordinary frame.

Yours truly,

Pencilensis.

Wilsden, March 4, 1848.

Preserving and Colouring Wood.—M. Renard, of the Rue de Rocher, Paris, has lately taken out a patent in England for improvements in preserving and colouring wood. His process is thus described in the specification:—A strong cylinder is placed in close contact with the large piece of timber intended to be stained by means of leather washers, and held in its place with a screw jack and chains. This cylinder is exhausted by any suitable means, and to the other end of the piece of timber is fixed a bag made of some impermeable cloth. The other end of this bag is tied on to a stop-cock, fixed in a vessel containing the colouring matter. When the cylinder is exhausted, the pressure of the atmosphere on the colouring fluid forces it into the pores of the wood. In this manner wood may be stained of any required colour, or impregnated with any substance intended to preserve it from decay.

New Era in Steam Navigation.—In the *Washington Union* is a report from a board of engineers and others, appointed by the Treasury to test an important improvement in the construction of naval steam-engines, the invention of Captain Ericsson. There appears to be an apparatus called an evaporator, and another a condenser, conveniently arranged amidst the machinery so as to occupy very little space. By this, the steam, after performing its work, is converted into water, and forced back into the boiler—again and again taking the same routine. As some of the steam will always be lost by loose joints, the evaporator supplies the deficiency from the element in which the vessel floats, and from this increased supply of steam the condenser affords any desired amount of fresh water. The whole is said to be complete and perfect.

Royal Academy.

PROFESSOR LESLIE'S FIRST LECTURE ON PAINTING.

(*Concluded from page* 170.)

It was no unfair mode of rating the qualities of art (continued the professor) to estimate them by the difficulty of their attainment, and the rarity with which we found them in any tolerable degree of perfection. A poet might in a word or two convey an idea of the complexion of a beautiful woman, and those words often very vaguely used. In the hands of Shakspeare, "Nature's pure red and white" were sufficient; but the painter to do this, was to be engaged in an actual rivalry with Nature herself—a contest in which a distant approach to her was allowed to constitute success;—and even such success in the colour of flesh, had not, perhaps, been accomplished by twenty artists with whose works we were acquainted—Paul Veronese being one.

It was to be acknowledged, however, that no painter had less of sentiment or strong expression; but, at the same time, he had never anything of affected sentiment, of which there was so much in art, and which was infinitely worse than none at all; and the expression we did find in his works was always true to nature.

In the picture of "Esther before Ahasuerus," in the Louvre, the whole figure and the face of the fainting queen were admirable. The death-like paleness was exquisitely given, the half-open eyes that saw nothing, and the slightly-parted lips. She had not fallen; but remained a lifeless weight in the arms of her attendants. But as Paul Veronese was to be seen to great advantage in the Louvre, he (the professor) was to be allowed to offer a few words on his (Veronese's) two immense works, "The Marriage at Cana," and "The Magdelene washing the feet of our Saviour,"—two of the most impressive pictures he (the professor) had ever seen.

"The Marriage at Cana," it was true, was anything but a relation of the story; but its great merit consisted in its exceeding all other pictures of its size in noon-day splendour of colour and breadth of effect; and he need scarcely remark that it was in such pictures, containing an infinite variety of minute parts, that breadth was most difficult of attainment. But in the opposite picture, though it had suffered much from time and reparation, the same excellencies were united with mueh propriety of treatment and of expression. Paulo had imagined the incident to have taken place, as related by St. Luke, in the house of a Pharisee; and the magnificent architecture might not, therefore, be inappropriate; nor was the violation of the costume so flagrant as in many other of his works. He (Paulo) had given to Judas, who might be known by the purse at his girdle, the meanest head in the picture, but with nothing of the aspect of a downright villian; and this was, perhaps, the truest physiognomy of the character. The Magdalene was well conceived; wholly absorbed, unmindful of all about her, and of what was said—her heart went with her action. The expression and interest with which a young man, probably intended for Saint John, regarded her devotion, was inimitably natural; and the conception of the whole picture had great dramatic truth—the main incident entirely absorbing the attention of all who, from their situation, were aware of it; while the personages near the right and left extremities of the canvas, ignorant of what was going on, were otherwise engaged. He (the professor) had described this picture with no intention whatever of ranking it with, or even near, the conceptions of Raffaëlle; but merely to show that the merits of Paul Veronese were very far beyond the mere verbiage of art.

Some critics had gone farther than Reynolds, and in a sweeping way had denounced all the varied excellencies of the Dutch and Flemish schools as the language, only, of art. To this, however, he would not waste a word in answer; for he could not think that it needed a reply before such an audience as he was addressing. Writers who had no practical knowledge of painting, might thus condemn what they did not understand; but should any artist be disposed to listen to them, he would advise him to try to paint the commonest object as the best Dutch painters would have painted it; and he (the professor) was much mistaken if he (the artist) would not soon acknowledge their transcendent excellence.

But to return to Reynolds: he (the professor) should not omit to say that the same "Discourse" was highly valuable for the judgment with which he (Sir Joshua) pointed out the real deficiencies of the Venetian school, and the praise he awarded to Titian; though he (the professor) was forced again to dissent from him, when he found him considering colour as a merely sensual element of art. It was certainly no more so, in the common and gross meaning of the word, than form, or light, or shade. All these might be equally employed to render subjects that appealed to our lowest passions attractive; and for this end Correggio had availed himself more of light and shade than of colour. Errors of this description arose from confounding the art with the subject; and it was one of the first things necessary; that the student should keep those entirely distinct in his mind. If he (the student) hoped to benefit substantially by the study of art, he should learn to see that qualities had often no necessary connection whatever, which were, nevertheless, inseparably united in particular styles,—as, for instance, the grossness of form in Rubens with his manner of composition or with the hues of his flesh; or the chiaroscuro of Rembrandt, the simplicity and truth of his expression, with the deformity and meanness so often found among his groups.

But colour had been considered sensual, according to another meaning of the word, as addressing itself to the eye only, and not to the mind. This however, like the first objection, applied no more to colour exclusively

than to any other quality of art. Beauty of form or truth of light and shadow addressed themselves as much to the eye and no more to the mind than colour, unless they expressed a sentiment; and colour might appeal to the mind as powerfully as either, particularly in the expressions of gaiety, of sadness, or of solemnity. Sir Joshua Reynolds seemed also to rate colour, too much as a merely ornamental quality; but every part of the art was ornamental—and if colour was more so in some schools than in others, it was only because it was truer in those schools to Nature. We should not confound the materials the Venetian painters introduced into their pictures with the media of their art; the effects of their rich velvets, satins, brocades, &c., with those beauties of Nature, her brightness, splendour, and harmony of tone, which they first gave in perfection, and which might as well adorn the poorest and coarsest materials as the richest. It was not that Paul Veronese was gayer in colour than Raffaëlle; but he was truer, and seemed completely to have attained that which Raffaëlle aimed at in nearly all his objects, namely, the broad light of tranquil mid-day. The most solemn, the most mournful tones, and tones suited to the most sublime subjects, might he found in the works of Titian, of Tintoretto, and even of Paul Veronese, as well as colour the most magnificent; but the distinguishing excellence of the Venetian and of the Dutch and Flemish schools was, that whatever might be the choice of colours—whether the tints were brilliant, rich, or negative; whether the effects were light or dark, the true tone of Nature was spread over the whole. Until a finer tone should be discovered he (the professor) could never think that Venetian or Dutch colour could do otherwise than exalt the highest subjects; and it seemed, therefore, to him a most injurious error for painters to think of colour as a thing that might be either neglected as a minor excellence or deliberately rejected as inconsistent with other qualities. Such might be a convenient mode of thinking—and to none would it be more so than to himself,—but he was convinced it never was the way in which any really great painter ever thought or felt; and it was curious to see in the writings of Reynolds his natural love of colour breaking out in detached passages and confuting his own theory of the incompatibility of the excellencies of the Venetian or Dutch with those of the Roman schools. He (Sir Joshua) admitted in one place that the colour of Titian might assimilate with the grandest subjects, and in another he said, "Jan Steen had a fine manly style of painting that might become even the design of Raffaëlle."

He (the professor) trusted that in the foregoing remarks he should not be thought to undervalue the authority of their illustrious first President as a general writer on art, any more than he (the professor) could be supposed to be indifferent either to his transcendent excellence as a painter or to the benefits he had conferred, far beyond any other man, on the school of which he was the founder. Indeed, it was because he (Sir Joshua) justly ranked amongst the highest authorities in criticism, it was because his writings were given to some of their students who obtained prizes and were accessible in their library to all, that he (the professor) had thought it necessary to point out what appeared to him an injurious tendency in one part of them; and he would accompany what he had said by remarking that all theories, how high soever might be the authority that sanctioned them, if formed solely on the practice of particular schools should be carefully examined before they were implicitly relied on. Indeed, theories deduced from art *merely* were always to be mistrusted—while principles derived from Nature formed the only basis of sound theory. And this was the definition of Reynolds himself—"Theory is the knowledge of what is truly Nature."

In whatever degree the colour of the Florentine and Roman schools was inferior to that of the Venetian and Dutch Schools—and it was often not at all so—he (the professor) believed the fact might be accounted for entirely from accidental causes, of which he should reserve the consideration until another opportunity. Indifferent colouring had never been found to stand in the way of immediate fame; and to their present success, therefore, it was of little moment whether they coloured well or ill. Jarvis was eulogised by Pope, and Richardson and Hudson acquired fortunes—and where were now their works? But if they wished to do that which would outlast them, they were to look beyond present fame, and be able to say, as Nicolo Poussin said of himself—"I have neglected nothing."

If the quantity and excellence of previous art, and facility of commission with it would make great painters of them, they were in a position infinitely more favourable to such a result than the student of any former age. An English painter who had never even been out of his own country, had within his reach means of acquiring a knowledge of art, as far as it could be acquired from pictures and statues, far greater than were possessed by Michael Angelo and Raffaëlle. He had opportunities of seeing and studying many forms of excellence of which they possessed but the germ, but which had been fully perfected by the genius of succeeding painters. And though that which constituted the peculiar supremacy of each of these wonderful men had never been equalled, yet very much had been added to the art of which they had but imperfect glimpses. In this country also, they had not only the best works that they were acquainted with of the antique, but they had in the Elgin marbles, fragments of absolute perfection of which they (the former painters) knew nothing.

Yet with apparently greater advantages than the world ever before presented, the young painter had many more real difficulties to contend with in the commencement of his studies *then* than at any former period. The very wealth of art created one great source of embarrassment:—the student was apt to be so impressed with awe by the works of the great masters then congregated in galleries, that any attempt to rival or combine their excellencies seemed to him (the professor) to be utterly

hopeless. The student wandered through the public collections admiring rather than studying what seemed to him to be the productions of an order of beings that were never again to exist. Reconciled to this belief, he sought rather to imitate than to rival, and settled down into mediocrity. This was the defect of one class of minds. Another class found it easy to imitate superficially—but still in a sufficiently artistic manner to win the approbation of equally superficial critics—omitting all minor details because many great masters had thought proper to do so, without observing that even the ommissions of great painters are full of slight and exquisite indications of knowledge, with which such imitators are not endowed. The trick is flimsy and easily seen through, and it was in reference to it that Richardson observed, "There is *bold* painting, and there is also *impudent* painting."

There was a very pernicious error prevalent consisting in a bigoted admiration of particular schools. The professor reprehended this by observing that he who pinned his faith wholly on any one particular school, was invariably the worst person to observe its peculiar charm. He advocated a cosmopolitan taste in painting by observing that variety of observation was necessary in order to appreciate truly the merits of any of the great masters.

Professor Leslie then entered upon the foolish belief that many persons entertain that all that can be done has been already performed; and contended that it might as well be advanced that Nature herself was exhausted. To the mind of true genius there was always a new path opened to eminence, and he instanced the examples of Rubens, Rembrandt, Hogarth, and Reynolds, each of whom had pursued this path triumphantly, notwithstanding all that had been done by former masters.

The professor concluded this lecture by observing that many young painters were more impressed at the commencement of their studies by the productions of their contemporaries than by the works of the old masters, and although when kept within proper bounds, such an influence was far from injurious, yet, as in the case of the annual exhibitions of paintings, they were too apt to view the performances of others when bad, as inferior to their own, and content themselves with the reflection, without endeavouring to improve upon their own skill. The best advice he (the professor) could give to his younger auditors was to look to the old masters in order to discover the faults of the living painters, and to every style to discover the faults of every other style—and, above all, to look to Nature for the instruction Art could not give.

A New White Paint is said to have been discovered by a Mr. Forrest, who intimates that it is neither based on lead, zinc, nor iron, but that it is nevertheless based on a metal. Probably antimony or bismuth bid fair for the honour to which neither zinc nor iron may aspire. A really good substitute for lead would certainly in many cases be a valuable desideratum.

Scientific Societies, &c.

ROYAL INSTITUTION.

Curiosities of Glass Manufacture.—On February 18th, Mr. A. Pellatt read a paper on the "Curiosities of Glass Manufacture." This communication would have been made on the Friday before, but for an alarm of fire in the Theatre of the Institution. On the present evening, as it was not considered prudent to re-erect the furnace which had caused the apprehension, Mr. Pallet explained the various processes by diagrams, models, and working instruments. Of these processes we can give but a brief outline. It was noticed that in ancient, as in modern glass, sand was the base, and alkali the solvent, and the injury occasioned to the glass by an excess of the latter ingredient was pointed out. That opacity of glass, called *devitrification*, was explained as consisting in the formation of a multitude of minute crystals in close contact with each other on the surface of the glass. The process of annealing was then described; and it was shown that a glass tube 40 inches in length contracts if annealed one quarter of an inch, while an unannealed tube of the same length contracts but one-eighth of an inch. The most interesting part of Mr. Pellatt's discourse referred to the mode of making *Vitro di Trino*, and of impressing heraldic devices, &c. on glass.—In the case of Vitro di Trino, the gathered glass, after being expanded into a bulb or cylinder of the required size, has rods of other glass or enamel attached to it in a vertical position, at equal distances all round, and then, the bottom being held, the top part is more or less turned, so as to give an equally inclined twist to the vessel and the rods. A similar but larger vessel is made, but which is also turned inside out, and then the former is put into the lathe; and, being expanded by blowing, the two come together and adhere by the rods and their intersections, but inclose small portions of air which, being regular in size, form and disposition, give the character of the glass. When heraldic devices, &c. are to be impressed, a mould of the design is made in a fit earthy material (being puzzolana or one of the volcanic deposits), and this is placed within, and forms part of the larger iron mould in which the decanter is blown—when the larger mould is removed, the earthen portion still adheres to the glass, and continues in its place until the bottle is finished. After the annealing, the mould is moistened with water, and immediately separates, and the impression is found really perfect. At the close of Mr. Pellatt's communication, Mr. Faraday called the attention of the members to two circumstances of philosophical interest which had happened during the momentary apprehension of fire to which we have alluded.—1. At three different time the water poured on the cinders of the temporary furnace, when, on the fire being drawn, they fell on the hearth, became decomposed by the ignited carbon; and the

hydrogen, driven by the sudden expansion of steam, &c., having penetrated the hot and porous hearth-stone, found its way to the heated beams and space which were immediately beneath.—2. This gas, though not in the state of flame as it passed through the hearth-stone and pugging, was after being mixed with the air below sufficiently hot to enter into combustion,—producing three gushes of flame downwards from beneath the hearth:—and it was experimentally shown that a temperature so low as barely to scorch paper, and in which the hand may be held for some seconds without inconvenience, is yet able to ignite a jet of coal or hydrogen gas in air.

To Determine the Strength of Boilers.

The iron of boilers, like the iron of machines or structures, is capable of withstanding a tensile strain of from 50,000lbs. to 60,000lbs. upon every square inch of section, but it will only bear a third of this strain without permanent derangement of structure, and it does not appear expedient in any boiler to let the strain exceed 4,000lbs. upon the square inch of sectional area of metal, and 3,000lbs. on the square inch of section is a preferable proportion. The question of the strength of boilers was investigated very elaborately a few years ago by a committee of the Franklin Institute, in America, and it was found that the tenacity of boiler plate increased with the temperature up to 550 degrees, at which point the tenacity began to diminish. At 32 degrees the cohesive force of a square inch of section was 56,000lbs.; at 570 degrees it was 66,500lbs.; at 720 degrees, 55,000lbs.; at 1,050 degrees, 32,000lbs.; at 1,240 degrees, 22,000lbs.; and at 1,317 degrees, 9,000lbs. Copper follows a different law, and appears to be diminished in strength by every addition to the temperature. At 32 degrees the cohesion of copper was found to be 32,800lb. per square inch of section, which exceeds the cohesive force at any higher temperature, and the square of the diminution of strength seems to keep pace with the cube of the increased temperature. Strips of iron cut in the direction of the fibre were found to be about six per cent. stronger than when cut across the grain. Repeated piling and welding was found to increase the tenacity of the iron, but the result of welding together different kinds of iron was not found to be favourable. The accidental over-heating of a boiler was found to reduce the ultimate or maximum strength of the plates from 65,000lbs. to 45,000lbs. per square inch of section, and riveting the plates was found to occasion a diminution in their strength to the extent of one-third. In some locomotive boilers which are worked with a pressure of 80lbs. upon the square inch, the thickness of the plates is only 5-16ths of an inch, while the barrel of the boiler is 39 inches in diameter. It will require a length of 3·2 inches of the boiler when the plates are 5-16ths thick to make up a sectional area of one square inch, and the separating force will be 39 times 3·2 multiplied by 80, which makes the separating force 9,984lbs. sustained by two square inches of sectional area—one on each side; or the strain is 4,992lbs. per square inch of sectional area, which is a greater strain than is advisable. The accession of strength derived from the boiler ends is not here taken into account, but neither is the weakening effect counted that is caused by the rivets, which certainly would not be less in amount. The proper thickness for cylindrical boilers or other cylindrical vessels, whether of cast or wrought iron, exposed to an internal pressure, may be found by the following rule:—multiply 2·54 times the internal diameter of the cylinder in inches by the greatest pressure within the cylinder per circular inch, and divide by the tensile force that the metal will bear without permanent derangement of structure, which, for malleable iron is 17,800lbs., and for cast iron 15,300lbs. per square inch of section, the result is the thickness in inches. Where the sides of the boiler are flat instead of being cylindrical, a sufficient number of stays must be introduced to withstand the pressure, and it is expedient not to let the strain upon these stays be more than 3,000lbs. per square inch of section, as the strength of internal stays in boilers is generally soon diminished by corrosion. It is expedient also that the stays should be small and numerous rather than large and few in number, as, when large stays are employed, it is difficult to keep them tight at the ends, and oxidation of the shell follows from leakage at the ends of the stays. A strain at all approaching that upon locomotive boilers would be very unsafe in the case of marine boilers, on account of the corrosion, both internal and external, to which marine boilers are subject. All boilers should be proved when new to three or four times the pressure they are intended to bear, and they should be proved occasionally by the hand-pump when in use, to detect any weakness which corrosion may have occasioned.—*Bourne's "Catechism on the Steam-Engine."*

Notices to Correspondents.

Mr. B****** is informed that this work is not at present sufficiently remunerative to allow of our engaging contributors at a pecuniary outlay to ourselves; otherwise we should be happy to avail ourselves of his offer. We will, however, preserve his address.

A. W. (Bristol).—You cannot be an attentive reader, or else you would have perceived that we have long since commenced the very illustrations you inquire about.

S. A. P. Park.—You will find the information you require, with regard to the camera obscura, in page 169 of the first volume of this work. The best plate looking-glass is that required for the mirror—it must be perfectly *true*, or it is useless.

Tau.—The inscription is perfectly right. The name *Edward*, itself, is Saxon; and, in order to Latinise it, it is only necessary to give it a Latin termination. Thanks for your kindness in recommending our periodical.

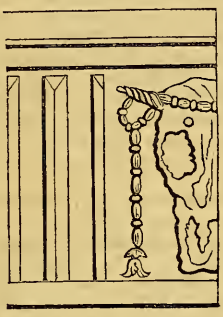
Architect.—A very clever epigram was circulated respecting Buckingham Palace at the period of its first alteration; as near as we can remember it ran as follows:—

"'Twixt Florence and London the difference is this,
Nor think that I speak it in malice:—
The first has the palace that *Pitti* is call'd,
The second—the *Pitt*ui Palace."

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 171.)

DEMI-METOPE, the half of a metope, which



is found at the retiring or projecting angles of a Doric frieze.

DIAPRE or DIAPERED (in heraldry), a dividing of a field into planes or compart-

ments, in the manner of network, and filling the same with a variety of figures.

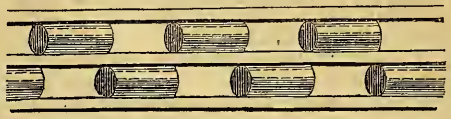
DOOR-FRAME or CASE, the wooden frame enclosing a door, which is joined together,

wrought and beaded, or formed of architraves and linings, and called a door-case.

DOUBLE LEAF MOULDING, a moulding used

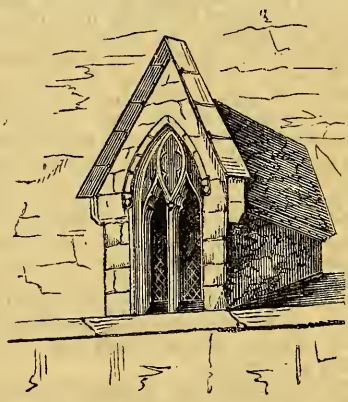
in Saxon architecture.

DOUBLE BILLET MOULDING, a moulding used



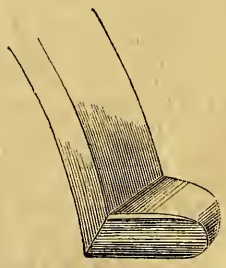
in Saxon architecture.

DORMER or DORMANT (in architecture) a win-



dow formed in the roof of a house, or above the entablature.

DRIP, the projecting moulding over an arch, answering to the "corona" in classic archi-



tecture. The hood moulding over doorways and windows is often called the "drip-stone.

(To be continued.)

Mr. Leslie, by his patent burners, has already saved £1,000 per annum in the gas expenses of the Post-office. He offers to make a pure gas at 3s. per 1,000 feet.

On Chalk.

BY W. E. HALL, ESQ.

Chalk, the mineral most widely spread throughout Great Britain, is composed of forty-four parts of carbonic acid, and fifty-six of lime, and contains an inconsiderable quantity of silex and iron. It has an earthy fracture, is meagre to the touch, and adheres to the tongue; it is dull, opaque, soft, and light,—it specific gravity being about 2.3

General Pasley, in his work on limes, &c., states that "one cubic foot of chalk lime, burned in pieces not exceeding the size of a man's fist, weighs, on an average, 35lbs, and is, consequently, the produce of about 63lbs of dry chalk.* When gradually slaked with the proper quantity of water, which occupies about two hours and a-half, it will fill the space of one cubic foot, and five sixth parts of a foot; and, by the solidification of the water during this process, its weight will have increased from 35lbs to about 50lbs. But when one cubic foot of pure quicklime is pounded dry without slacking, it will only occupy about two-thirds of a cubic foot in the state of powder. Thus pure quicklime powder does not occupy more than one-third of the space of the slaked lime powder procured from the same quantity of chalk, their respective bulks being as 4 to 11." It has been found, that one cubic foot of burned chalk lime, fresh from the kiln, (weighing 35lbs), when well mixed with 3½ cubic feet of good river sand, and about 1 1-5th cubic foot of water, produced about 3¼ cubic feet of as good mortar as this kind of lime is capable of forming.

Organic remains are abundantly found in chalk. They are mostly marine plants, lamelliferous, and celluliferous corals and sponges, asteriadoe, crinoidea, and echinida, mesomyonous, and brachiopodai, conchifera, phytiphagous and cephalopudons mollusca, crustacea, fishes, mososaurus, chelonia. Mr. De la Beche observes—"Organic remains are, in general, beautifully preserved in the chalk; substances of no greater solidity than common sponges retain their forms, delicate shells remain unbroken, fish even are frequently not flattened; and altogether we have appearances which justify us in concluding, that since these organic exuviæ were entombed, they have been protected from the effects of pressure by the consolidation of rock around them, and that they have been very tranquilly enveloped in exceedingly fine matter, such as we should consider would result from a chemical precipitate.† The wood is often marked with the perforations of boring shells, such as the *teredo* and *fistulana*."

The chalk at Brighton, Gravesend, and near Cambridge, has been found to contain microscopic shells. Thousands may be extracted from a small lump of chalk by scrubbing it with a nail-brush in water.

Chalk is found in Denmark, and the south of Sweden, and even in Poland and part of Russia. In France it surrounds and underlines the strata of the "Paris Basin," from which it stretches northward into Belgium and the north of Germany. In Iceland, the chalk acquires a degree of hardness equal to that of compact limestone. In its geological position, and in the nature of its fossils, it corresponds, however, with that of England, with which it is considered to be entirely identified. The white limestone on the Antrim coast, Ireland, is of the same geological composition and formation as the chalk strata in England; but it possesses a characteristic difference, in beiug of much greater induration than, in general, the English chalk strata. The white limestone lies under a basaltic rock, and in contact with it.

As soft chalk as any in England may be found in the pits of either side of the river Thames.‡ A similar chalk is found in Herts, Bucks, and Beds. The chalk at Dover, Norwich, Lewes, Brighton, and the Isle of Wight, is harder; and a still harder chalk is found on Hand-fast Point, and under Ballard Downs, in the Isle of Purbeck. The Yorkshire chalk is much harder than the chalk in the south. There is no chalk in Scotland or Wales.‖

About a mile to the southward of the town of Dover is the celebrated chalk cliff, which is supposed to have been described by Shakspere in "King Lear"—

> Gloster—Dost thou know Dover?
> Edgar—Ay, master.
> Gloster—There is a cliff, whose high and bending head
> Looks fearfully in the confined deep;
> Bring me to the very brim of it.

French Patents.—We are enabled to state that business is resumed as usual at the Patent Office in Paris. Patents granted by the exking will be continued in force, and those applied for, but not issued previous to the revolution, will be granted in due course, "in the name of the people." Advantage will be taken, in all probability, of the new state of things, to effect several changes in the patent system; for the French, like ourselves, are far from being pleased with many of the laws relating to patents. In particular, the French object to the rule which obliges every patentee to place on his patent articles, and even in his advertisements, the word, "*Sans garantie du gouvernement.*" This they regard as an insult, and, as it were, an invitation to infringement. The requirement of the specification at the time of demanding the patent is considered to be objectionable, although in what respect it really is so, we cannot see. So far from there being any grave evils in the French system, it is heartily to be wished (so think we) that the patent laws of England were based on as rational a plan.—*Patent Journal.*

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* One cubic foot of solid chalk, perfectly dry, weighs 95lbs; but, on breaking it into small pieces for burning, a cubic foot measure will only contain 63lbs of the same chalk of fair level measure.

† Researches in Theoretical Geology, p. 349.

‡ There is a fine pit of this description on the Middlesex side of Waterloo-bridge.—Ed.

‖ Mr. Lyell, in the company of Mr. Conrad, examined the chalky strata of New Jersey. He found they bore a striking analogy to those of Europe.

Black Lead.

This substance, which is also called plumbago and graphite, must be considered as one of the forms of carbon. It is well known in the manufacture of pencils, for which purpose it is almost exclusively obtained from the mine of Borrowdale, at the west end of Derwent Lake, in Cumberland, where it was first wrought in the reign of Elizabeth. The precautions taken, about a century ago, to protect this valuable mineral, are curious. It is said that many persons living in the neighbourhood derived their subsistence by plundering the mine. A guard was always watching; but their efforts were often set at nought: indeed, so great was the power of the inhabitants in that district, most of whom were miners, that at one time a body of them broke into the mine by main force, and held possession of it for some time. Even now the nicest precautions are taken to protect the valuable property against the pilfering propensities of the Cumberland mountaineers. A strong building, consisting of four rooms upon the ground-floor, is erected to protect it; immediately under one of these rooms is the opening, through which alone the workmen can enter into the interior of the mountain: this opening is secured by a trap-door. This apartment they call the dressing-room: here, as the miners arrive, they change their clothes and put on their workman's dress; and after they have finished their work, they again change their clothes—this is done under the superintendence of the steward. Two men are seated at a large table in the innermost of the four rooms, employed sorting and dressing the plumbago: they are locked in, and all the time they are at work they are overlooked from an adjoining apartment by the steward, who, by way of additional security, is armed with two loaded blunderbusses.

The cleansed black lead, as it is usually called, is packed up into strong casks, containing 1 cwt. each, sent to London, and there sold monthly by auction at a price varying from 35s. to 50s. per pound. In the reign of Elizabeth, the substance sold for about a farthing a pound, and was solely used for marking sheep.

Plumbago is not pure carbon; it contains other substances, chiefly oxide of iron; these foreign matters vary in different specimens. Vanuxen gives the following analysis of three specimens—the first and second from Borrowdale, and the other a pure specimen from Buistletown, Pennsylvania:—

	1	2	3
Carbon	88·37	61·27	95·4
Water	1·23	5·33	0·6
Silica	5·10	10·10	2·6
Alumina	1·00	3·20	0·0
Oxides of iron and manganese ..	3·60	20·00	1·4
	99·30	99·90	100·0

In these analyses there is most likely an error in the quantity of water, for now that the analyses are generally performed in a more perfect manner than formerly, titanic acid (a substance not mentioned in the above analysis) is invariably found; and, in all probability, part of that weighed by Vanuxen as water, was, most likely, this acid.—*Professor Holmes in "Patent Journal."*

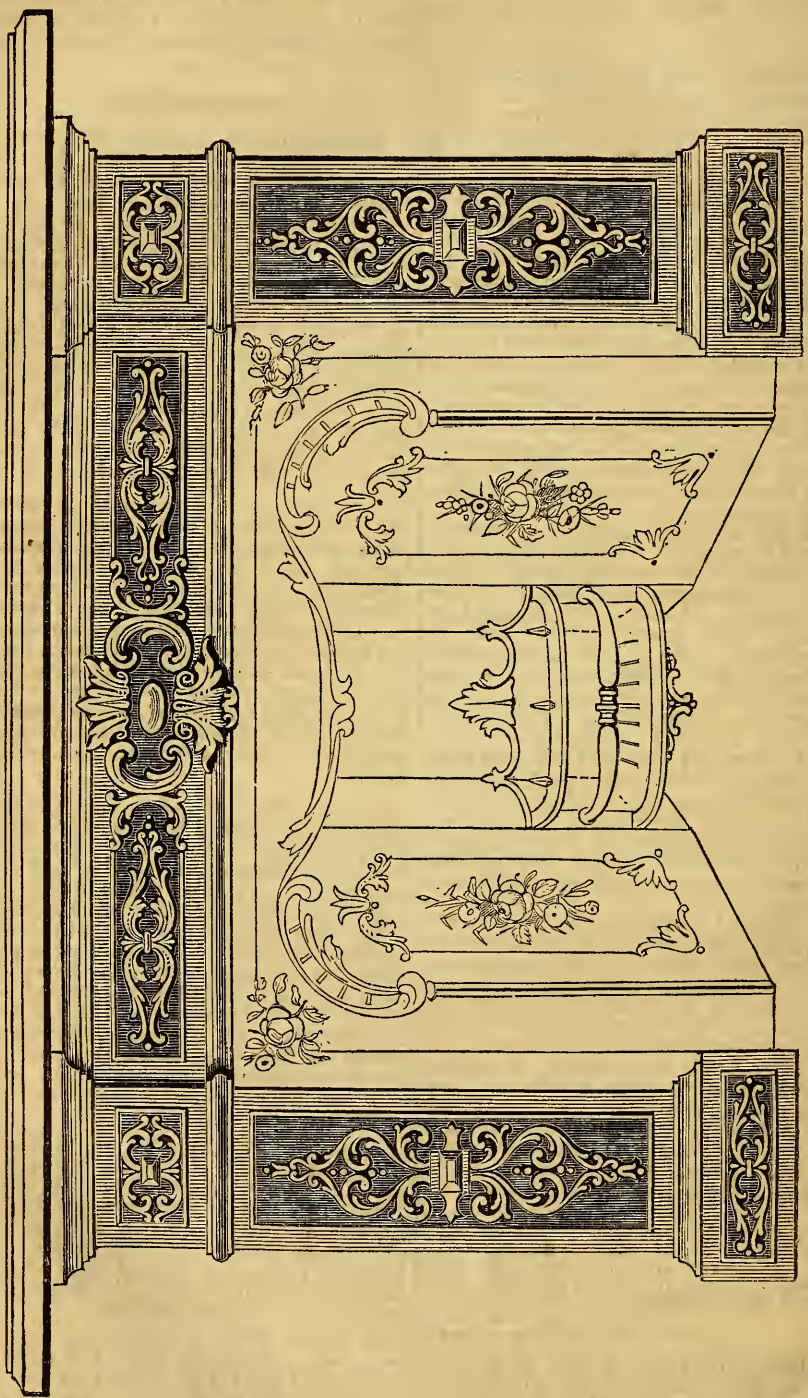
Nail-Making in America.—The first attempt to manufacture cut nails in New England was made in the southern part of Massachusetts, in the revolutionary war, with old iron hoops for the material, and a pair of shears for the machine. Since that period, besides supplying the consumption of the United States, estimated at from 10,000,000 to 100,000,000 pounds, and at a price not exceeding the duty, machines of American invention, for the manufacture of nails, have been introduced into England; and immense quantities of nails have been exported from the United States to foreign countries during the past year.—[The machines here alluded to manufacture all those varieties of cut brads, nails, &c., now in such general demand here.—Ed.]

Sound Visible.—In this age of wonders, what will the world think when we assure it that a method has been discovered and matured by which sound will be made visible to the human eye, its various forms and waves demonstrated to sight, and the power to discriminate between the tones of one musical instrument and another, be as complete as to observe the action of water when disturbed by any material cause. The experiments, we believe, are likely to be ere long repeated in the Royal Society. The exhibition of effects on fine sand has probably led to this astonishing issue.—*Patent Journal.*

Book of Eternity.—In Signior Castagnetta's account of the asbestos we find a scheme for the making of a book, which, from its imperishable nature, he is for calling the book of eternity. The leaves of this book were to be the asbestos paper, the cover of a thicker sort of the same material, and the whole sewed together with thread spun from the same substance. The things to be commemorated in this book were to be written in letters of gold, so that the whole matter of the book being incombustible, and everlastingly permanent against the force of all the elements, and subject to no changes from fire, water, or air, must remain for ever, and always preserve the writing committed to it.

Conducting Powers of Metals to Heat.—Hold in the flame of a candle, at the same time, a piece of silver wire and a piece of platinum wire, when the silver wire will become too hot to hold much sooner than the platina. Or cut equal pieces of each wire, tip them with wax, and place them upright upon a heated plate (as a fire-shovel) when the wax will be seen to melt at different periods.

To Stain Wood a Mahogany Colour, [see also p. 125, vol. i.]—Take half a pint of nitric acid, a piece of alum about the size of a Spanish nut, and as much logwood as will give the desired colour.—*From a Correspondent.*



A DESIGN FOR A CHIMNEY-PIECE.

Schools of Practical Mechanics.

(A SUGGESTION.)

THE intelligence and ingenuity of the English mechanic have ever been celebrated by historians and contemporaneous writers; and, in our own age, we have had good practical evidence of the genius which too often lies neglected within the brain of the working-man—only requiring education to loosen it from its bondage, and to bring its resources to bear on the improvement of our arts and manufactures. Of late years, the establishment of mechanics' institutions in various parts of the country, and more particularly in the metropolis, has, doubtless, effected much in the right direction; but these, too often, from their limited resources, although invaluable as places where the working-man may obtain really sound miscellaneous knowledge, are inadequate to the purpose of leading him, by means of a systematic course of study, through the broad field of mechanical science, and of implanting in his mind not merely rudimental but practical knowledge of processes and their results—of causes and their effects. It has been justly observed that the man who is merely acquainted with but one department of art or science is incapable of appreciating the enjoyments arising from a mastership of many—and, we may truly add, is also incapable of adding to the resources of his own profession by a comparison with others.

It is only necessary to observe the number of trades and professions which radiate, as it were, from one particular operation, and to bear in mind, the step by step progress which almost every manufactured article, from a pin to a pistol, or a tea-kettle to a steam-engine has to make ere it is finally disposed of, to be at once impressed with the conviction that universal knowledge ought to be the great desideratum of the age—a knowledge that would tend more to open the eyes, hearts, and minds of men, than any project that has been set on foot since the world began.

But how is this to be obtained? inquires the reader. We answer, let him look at the various schools of design now dispersed about the country—let him review in his own mind the vast amount of good these have been the means of effecting, and then ask of himself whether the principle cannot be extended in its application? Whether, in fact, schools could not be established to teach the mechanic the true practice of his own and its analogous professions?

The schools of design are superintended by masters of ability—the schools we propose could also be superintended in a like manner. At all events, we are certain that the principle, if adopted by government, would be as much to the national advantage as it most assuredly would be to its credit.

THE "PERIL INDICATOR."—There is now in Portsmouth dockyard a working model of a "peril indicator," to denote the approach of ground to ships and steamers, the invention of Lieutenant Westbrook, R.N. (1826), of the Stag revenue cruiser, on the Ryde district. The apparatus is positively too simple to describe: it is fitted to the keel of the vessel, and consists of a projection therefrom of two bars, ten feet below the keel of the vessel; immediately these bars, which are fitted forward as well as aft, touch ground, they spring up level with the keel and ring a large bell in the engine-room, which is the signal for the engineer to instantly reverse the engines and send the ship astern. The invention has met with the approval of some of the members of the Admiralty, and every scientific naval or other person who has seen it. A trial would fully demonstrate its usefulness and applicabilty; its expense is too trivial to be an obstacle.

NEW MOTIVE POWER.—On the 20th of last month, M. Lafond took out a patent for the application of *chloroform*, as a motive power in place of steam.

Royal Academy.

PROFESSOR LESLIE'S SECOND LECTURE ON PAINTING.

The learned professor commenced his second lecture to the students of the Academy by remarking that he was about to give several examples of the powers of invention and expression, taken from different schools and from different walks of art, and he observed that he had adopted this course because the method of classifying the various branches of art, according to difference of style or subject, had never in his opinion been successfully carried out.

Originality in painting depended entirely on the painter's powers of observation, and it constituted the difference between the greater or lesser artist, that the one was thinking of art at all times, while the latter only reflected upon it in the studio. Too much time could never be devoted by a painter to filling his sketch-book with whatever interesting objects he happened to come across—they were always of utility.

The professor remarked that the importance of the constant observation of Nature to the painter of real life would be readily admitted, but such habits were of no less value to the painter of the most imaginative class of subjects. The *supernatural* was not the *unnatural;* —the centaur, the sphynx, the satyr, &c., were but combinations of Nature, and there was true taste exhibited in making these ideal beings act naturally—an example of which might be taken from the Phygalian marbles, where a centaur was made to bite his antagonist, &c.

Ghosts and witches required some considerable degree of attention in their treatment by the painter—materiality should be avoided as much as possible, and the imagination taxed to concoct that well which it is impossible to bring before the eye. In this department of painting the great Fuseli stood pre-eminent, and yet he never painted anything that might seem unnatural to the most scrupulous critic; while Sir Thomas Lawrence, in his picture of "Satan," gave so much materialism to the form of the evil one as to be utterly unnatural with reference to the subject.

Symbols, personification, and allegory next came under notice, and the professor remarked upon a beautiful instance by the late president (Mr. Howard) of graceful personification which adorned a ceiling in the princely mansion of the Duke of Sutherland. It was a circular composition in which he (Mr. Howard) had most successfully availed himself of the mythologic names of the sun and the planets. Apollo sat in the centre, and the composition was so contrived that the earth, represented by a graceful figure of a female attired in a green mantle, was nearest to the eye. Her head was crowned with towers, and she seemed to do reverence to the god as she passed him, holding forward an urn to receive his rays. A lesser and younger figure, with a crescent on her brow, and with white drapery, half encircled her with one arm, while she extended the other towards the sun, with an urn also. Mercury, Venus, Mars, &c., all revolved in their proper places; and the entire composition was managed with great skill and taste.

After adverting to the rage for Grecian costume which was prevalent some years back, and which he happily denominated the "Greek mania," the professor stated that he was not insensible to the sincerity of expression, the grace, and the happy inventions that chracterised the works of the early Italian masters, or the many exquisite traits of Nature by which their immature art was adorned. They were the worthy precursors of Michael Angelo and Raffaëlle; but he could not agree with a recent critic, who stated that Michael Angelo's picture of the "Last Judgment" stood far below the dignified grandeur of Orcagna in the treatment of the same subject in the Campo Santa, at Pisa. That Michael Angelo borrowed his figure of Christ from the latter, he (the professor) would admit; but he thought that if Angelo had trusted to his own judgment and invention, he would have succeeded better.

The professor then remarked upon the degree of fame which had been gathered both by Raffaëlle and Michael Angelo, and, after critically examining the grounds which these artists founded their reputation, stated that the former had painted the least number of pictures, with the exception of one (Leonarda di Vinci), of any man, and the latter, taking his early demise into account, comparatively the most.

He then entered into some remarks upon Hogarth—a master who was wholly unequalled in invention and expression, excepting by Raffaëlle alone. No painter whatever, and but few writers, had laid bare the evil dispositions of human nature, and their inevitable consequences, with such a mastery of illustration. Hogarth was a painter of nature in the highest sense, as distinguished from a painter of matter-of-fact. He failed, however, in religious subjects, although there were touches in his pictures taken from scripture subjects which distinguished them from the productions of commonplace minds. Hogarth, it was true, was often gross, but the age in which he lived was much less fastidious than ours, and his great object was to expose vice in all its deformity. Debauchery he always made detestable—never attractive. He was not—it was to be owned—a ladies' painter,—for ladies, fortunately for themselves, knew nothing of the life which he chiefly satirised. But it was no sign of a healthy masculine taste to object to what Charles Lamb denominated his "strong meat for men."

Gutta Percha Medals.—We have lately inspected some specimens of castings in gutta percha; but we consider that it is not entirely suitable for the purpose: the outlines are generally badly preserved, and the whole in many cases indistinct.

Gold and Gold-Beating.

Gold is the most precious metal employed in commerce. It is exceedingly soft and flexible, but its tenacity is sufficiently great to sustain, in a wire one-tenth of an inch in diameter, 500 lbs. weight without breaking. In hardness it is superior to lead and tin, but inferior to iron, copper, plantinum, and silver. Its lustre does not equal that of steel, platinum, or silver, but it surpasses the other metals in this respect. It may be exposed for any length of time to the atmosphere, without suffering the least change. It is also unalterable in the common fire; but on being exposed to powerful burning mirrors, or to the heat of the oxy-hydrogen blow-pipe, it not only melts, but even rises in vapour.

Gold is not readily oxidised or dissolved by any of the pure acids. Its best solvents are chlorine and nitro-muriatic acid; and, according to Sir Humphrey Davy, the chlorine is the agent in both cases, since the nitro-muriatic acid does not dissolve gold, except when it gives rise to the formation of chlorine. It is to be inferred, therefore, that the chlorine unites directly with the gold and that the compound formed is a chloride of gold. There is no inconvenience, however, in regarding it as a muriate, since re-agents act upon it as if it were such. The gold is precipitated from its solvent by a great number of substances. Lime and magnesia precipitate it in the form of a yellowish powder. Alkalies exhibit the same appearance; but an excess of alkali redissolves the precipitate. The precipitate of gold obtained by a fixed alkali appears to be a true oxide, and is soluble in the sulphuric, nitric, and muriatic acids; from which, however, it separates by standing. Gallic acid precipitates gold of a reddish, colour, and very soluble in nitric acid, to which it communicates a fixed blue colour. Ammonia precipitates a fine solution of gold much more readily than the alkalies. This precipitate, which is of a brown, yellow, or orange colour, possesses the property of detonating with a very considerable noise, when greatly heated. It is known by the name of *fulminating gold.*

Most metallic substances precipitate gold from its solution in nitro-muriatic acid. Lead, iron, and silver precipitate it of a deep and dull purple colour; copper and iron throw it down in its metallic state. A plate of tin, immersed in a solution of gold, affords a purple powder, called the *purple powder of Cassius*, which is used to paint in enamel. Ether, naphtha, and essential oils take gold from its solvent, and form liquors, which have been called *potable gold.* The gold which is precipitated on the evaporation of these fluids, or by the addition of sulphate of iron to the solution of gold, is of the utmost purity. The principal use of gold, as is well known, is in coinage. It has been with mankind, from time immemorial, the representative sign of every species of property. Even before the art of coining was invented, it passed for money in the condition in which it was found in the earth; and in this form it still enjoys a currency in many parts of Africa. It is rarely employed in a state of perfect purity, but is almost universally alloyed with copper, or with silver, in order to increase its hardness. The alloy of gold and silver is found already formed in nature, and is that most generally known. It is distinguishable from that of copper, by possessing a paler yellow than pure gold, while the copper alloy has a colour bordering upon reddish yellow. A variety of means are employed to judge of the quality of alloys, supposed to consist in part, or principally, of gold, without resorting to a regular analysis.

The art of gilding metals (see p. 52, vol. ii.) depends upon the double property which mercury possesses, of amalgamating with gold, and of becoming volatile by heat, and thus quitting the gold, which adheres strongly to the metal upon which the mercurial amalgam has been spread. The composition of the amalgam generally used is eight parts of mercury to one of gold. The malleability and extreme divisibility of gold are the foundation of the art of *gold beating;* and these two properties are so remarkable in this art, that natural philosophers are in the habit of quoting the results it furnishes, as examples of the divisibility of matter. Boyle has observed that a grain of gold, reduced to leaves, will cover a surface of 50 square inches; that each one of these square inches may be divided into 46,656 other little squares, and that, of course, the entire amount of surface derived from one grain of gold is capable of being divided into 2,322,800 parts, each of which is visible to the naked eye.

In consequence of the wonderful extension which the gold-beater is enabled to give to this precious metal, it is employed for ornamental purposes to an extent which, from its comparative scarcity, would otherwise be impossible. Thus it is estimated that an equestrian statue, of the natural size, may be coated with a piece of gold not exceeding ten shillings and sixpence in value. The gilding of the dome of the *Hôtel des Invalids*, at Paris, cost about £5,000, and in India, where it is common to gild towers, bridges, gates, and colossal idols, it is known to be attended with still less expense.

The following is a short account of the ingenious art of *gold-beating.* The gold used is as pure as possible, and the operation is commenced with masses weighing about two ounces. These are beaten into plates six or eight inches long, by three-quarters of an inch wide. They are then passed between steel rollers, till they become long ribands, as thin as paper. Each one of these is now cut into 150 pieces, each of which is forged on an anvil, until it is about an inch square, after which they are well annealed. Each of the squares in this state weighs 6 4-10 grains, and in thickness is equal to 1-766th of an inch. The 150 plates of gold thus produced from one mass are interlaid with pieces of very fine vellum, about four inches square, and about twenty vellum leaves

are placed on the outsides; the whole is then put into a case of parchment, over which is drawn another similiar case, so that the packet is kept close and tight on all sides. It is now laid on a smooth block of marble, or metal, of great weight, and the workman begins the beating with a round-faced hammer, weighing sixteen pounds; the packet is turned, occasionally, upside down, and beaten with strong but not acute strokes; till the gold is extended nearly to an equality with the vellum leaves. The packet is then taken to pieces, and each leaf of gold is divided into four with a steel knife. The 600 pieces thus produced are interlaid with pieces of animal membrane, from the intestines of the ox, of the same dimension and in the same manner as the vellum. The beating is continued, but with a lighter hammer, which weighs about twelve pounds, until the gold is brought to the same dimensions as the interposed membrane. It is now again divided into four, by means of a piece of cane, cut to an edge, the leaves being by this time so light that any accidental moisture, condensing on an iron blade, would cause them to adhere to it. The 2,400 leaves hence resulting are parted into three packets, with interposed membrane as before, and beaten with the *finishing* or *gold hammer*, weighing about ten pounds, until they acquire an extent equal to the former. The packets are now taken to pieces, and the gold leaves, by means of a cane instrument and the breath, are laid flat on a cushion of leather, and cut, one by one, to an even square, by a cane frame; they are lastly laid in books of twenty-five leaves each, the paper of which is previously smoothed, and rubbed with red bole, to prevent them from adhering.

Gold wire, as it is called, is, in fact, only silver wire gilt, and is prepared in the following manner. A solid cylinder of fine silver, weighing about 20lbs., is covered with thick leaves of gold, which are made to adhere inseparably to it by means of the burnisher: successive layers are thus applied, until the quantity of gold amounts to 100 grains for every pound troy of silver. This gilt silver rod is then drawn successively through holes made in a strong steel plate, until it is reduced to the size of a thick quill, care being taken to anneal it accurately after each operation. The succeeding process is similar to the former, except that a mixed metal, somewhat softer than steel, is employed for the drawing plates, in order to prevent the gilding from being stripped off; and no farther annealing is requisite after it is brought to be as slender as a crow-quill. When the wire is drawn as thin as is necessary, it is wound on a hollow copper bobbin, and carefully annealed by a very gentle heat: finally, it is passed through a flatting-mill, and the process is complete. According to Dr. Halley, six feet in length of the finest gilt-wire, before flatting, will counterpoise no more than a grain; and as the gold is not quite 1-57th of the whole, a single grain of gold, thus extended, will be 345.6 feet long, and only the millionth part of an inch in thickness.

Civil Engineering.

If there is one profession more than another which can be considered the favourite professsion of the day, it is civil engineering, and, perhaps, more from its comparative novelty to the public than any other cause. Novel though it may be in its present standing, the practice of a civil engineer, in its various departments, boasts of great antiquity. The Egyptians seem to have had a distinct corps, similar to the French *Ponts et Chaussées*, or the Dutch *Waterstaat*, charged with the care of the canals and irrigation. Hydraulic engineering also attained a great height of proficiency among the Persians, and was doubtless cultivated as a distinct art. Many of the engineering operations of the Persians were, however, conducted by the Phœnicians, who were evidently well practised. In cutting the canal of Mount Athos, during Xerxes' invasion of Greece, the Phœnicians were the first to show the proper way of executing the work, by making the banks of their portion with a slope; while, as Herodotus relates, the other nations dug them upright, and they consequently fell in. The Greeks, from the nature of their country and from political causes, had little call for engineering science; their mining works were chiefly superficial, and their military operations and sieges afforded little scope for great exertions. The Rhodians acted as their military engineers, and enjoyed considerable fame. Mechanical engineering also had not any great call for display among the Greeks, whose machinery either for mining or hydraulic purposes was not on a large scale.

The Romans were the great engineering people of antiquity, and have left us many noble monuments: their roads, tunnels, sewers, canals, embankments, aqueducts, bridges, and moles, were executed with great skill and foresight, and are of such durability as to have resisted the injuries of time and the ravages of barbarians. Thus, although the Roman power is annihilated, and their nation ceases to exist, they have left an invaluable legacy to Europe in their works and the profitable examples they afford. Had the literature of antiquity perished, these noble relics would still have contributed to the maintenance of civilisation and its restoration. How the architects and engineers of the middle ages profited by these studies is well known to the antiquary. Even in this country the roads, bridges, canals, and embankments left by them were well copied. The monks of the marshlands copied the Fossdyke and other Roman precedents in their drainage of the fens, and they showed themselves apt scholars in many other works. Neither were the mining-works of the Romans conducted with less enterprise and less skill. Their joint-stock undertakings for working the Spanish silver mines would have been distinguished in modern days, both on account of the extent of their workings and of their power of drainage by the Egyptian spiral. Their melting furnaces were also of respect-

able magnitude. The account of these operations in Strabo may be perused with deep interest, particularly as showing how little real advance the art of mining has made in so many centuries. The Romans, from their practice in erecting gigantic monuments and raising heavy weights, were able to cultivate mechanical engineering with success, and they derived great assistance from the skill of their workmen, whose ability in iron and brass work may be seen in many specimens in the British Museum. The Roman works were generally under the supreme direction of the civil and military authorities, as they might be under a board of works here, but the subordinates were professional men. In "Dionysius of Halicarnasus" (b. 3, ch. 20,) we find an instance of the early period at which contractors were employed at Rome, and the extent of their business. It relates that the sewers having been for some time so neglected that they were blocked up, the censors concluded a bargain with a contractor to clean and repair them for a thousand talents. In fine, such was the flourishing state of engineering among the Romans, that Polybius makes special and honourable mention of it as a great trait in the Roman character, in his comparison of the Romans and the Greeks.

We have already alluded to the example set by the Romans in this country. They were the first to embank the Thames and attempt the recovery of the Lincolnshire fens. Of Saxon engineering but very few specimens or records remain. That the art was not neglected is proved by the example of St. Ethelwold, who made a cut from the river Isis to Abingdon Abbey, to supply that establishment with water, and to work a mill which he built. He also executed a canal at Winchester, the benefit of which is still enjoyed by the inhabitants. By his exertions the whole city was supplied with water. Instances of such works are also to be found in the middle ages; but the modern school of engineering, like most other arts, dates from the age of Elizabeth. The enterprising spirit of that day was in particular directed to the mineral wealth of the country, which was made more available, and placed greater resources at the command of the community and the man of intelligence. The completion of the New River by Sir Hugh Myddleton, was valuable from its influence on hydraulic engineering. Then we come to the fens again, where Colonel Vermuydens exertions were effectually exerted for the reclamation of those regions from the dominion of the sea. The age of Charles the Second, whatever were its other defects, was most favourable to mechanical genius, and a bright constellation of men, distinguished by their useful inventions, marks that period. The utilisation of the principle of the steam-engine by Savary and Newcomen comes next; but it is not until the middle of the last century that engineering really became sufficiently important to form a distinct profession. Three men mainly effected this change—Smeaton, whose Eddystone lighthouse is only one of a multitude of hydraulic works executed by him; Brindley, who executed the Bridgewater canal, and founded our system of water communication; and Watt, who, by improving the steam-engine, increased the power of the engineer. This forms the old school of engineering, when the engineer was something of a surveyor and something of a mechanic; and the superintendence of mines, canals, and harbours, met with considerable employment, but had scarcely acquired scientific standing or popular importance.

Great as these several enterprises may appear, they are, however, nothing to those of the present century, in which several remarkable circumstances have contributed to the rapid progress of engineering science: these are the introduction of docks, of gas, of railways, and steam-navigation, the application of machinery on a large scale for manufacturing purposes, and as a substitute for manual labour. The dock system of London is equalled by that of Liverpool, and has been followed at Bristol, Hull, and in all our leading seaports, while it called for the employment of more powerful means than the engineer had previously been accustomed to; the establishment of gas-works and water-works was no less favourable for the exertion of his talents, and in the last dozen years he has been called upon to preside over works, to which even his previous experience was inadequate. The mere superintendence of works so gigantic as those in railways demanded the application of great powers of mind, and often baffled the experienced engineer, while the requirements of a new system have called for the constant exercise of mechanical ingenuity. The railway system, with its machinery, is of itself sufficient to constitute an age of invention, and does the greatest credit to the talent of this country, which has been mainly exercised upon it. Steam navigation has contributed its quota to this progress, and we must not omit the suspension bridge as one instrument in its advancement. The demand for machinery in our great establishments and our factories, has created a large branch of business, which is daily increasing. The use of iron, for a multitude of purposes, equally contributes to the employment of the engineer, whose material it is. Cables, rigging, the hulls and michinery of shipping, the suspension bridge, and the viaduct, can now be made of this native material, and its appliances daily become more varied.

Thus a new school of engineering has been formed, the earlier period of which includes Trevithick, the inventor of the high-pressure engine and the locomotive, one of the most remarkable men of the age; Woolf, Rennie, Telford, and Huddart, the inventor of the block-rope machinery. The altered position of engineering is now producing a great change among its professors, for as employments become more numerous, a subdivision of labour is the natural result. The great classes may now be distinguished into civil engineers, employed on railways and public works; mechanical or practical engineers, employed in the construction of steam-engines and other machinery, and the superintendence of factories and mining engineers, employed in the

management of mines of various kinds. Engineering is still an open profession, something like the bar, that is, a man of any training, or of no training, may attach himself to it, but of course it depends on his qualifications whether he gets employment.

An Exhibition of Book-Finishers' Designs was held by a committee of the London Book-Finishers Association, on Monday evening, the 6th inst., at the Plough Tavern, Museum-street, where there was a good display of rubbings from ancient and modern specimens of the art, and of new deeigns, both original or modern, and also imitative of those elaborate decorations with which the learned monks of old delighted themselves, to illuminate and adorn their biblical treasures. Where variety and taste, as well as ingenuity, were so generally displayed, it might be invidious to distinguish any one of the modern specimens which most struck our fancy; but amongst the ancient, there is less occasion for reserve, and we may therefore remark, that the one specimen amongst all of these which we most admired, was a rubbing from the boards of an Irish book nearly eight hundred years older than any in the room. In this preference we believe we shall be borne out by many of the practical men present, as well as in our next selection of a geometrical design, with a quiver in the centre, from amongst the "Diana" patterns. A member of the committee delivered an able and interesting address on the history, the capabilities, and the prospects of their art, as a high and elaborate branch of decorative art in general, and in the course of his observations on the *esprit du corps*, the taste, and the pride, which animate some, and ought to animate all, of his fellow-workmen in the execution of their more elaborate and original designs. This exhibition, as the first of its order, promises fairly for the future advancement of a tasteful branch of decorative art.—*Builder*.

Notices to Correspondents.

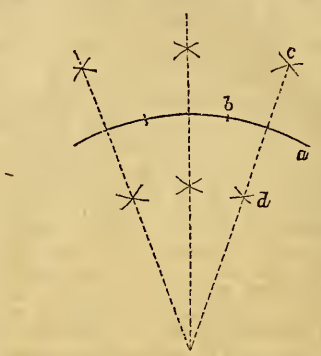
QUERIES.

In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

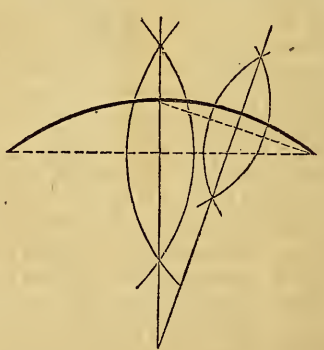
Sir,—Finding, by your insertion of the plan for an effluvia trap, that matters conducive to the health of towns are allowed in your pages, will you allow me to ask the following question through the medium of your periodical? Can any of your readers inform me where to procure a *smoke-consuming stove*, adapted for common fire-places, upon the following, or any improved, principle?—An iron box is constructed under the fire, which will hold sufficient coals for a day's use; the bottom is made to wind up and replenish the fire from the bottom instead of at the top, consequently, the smoke is consumed by passing through the fire.—E. Bow.—P.S. I saw one of the stoves in question in use in London about 25 years since; how the ashes are disposed of I am not aware—they might pass through a grate, perhaps, at the back of the fire where practicable. Of course, the bottom has to be let down in the morning, the box filled, and the fire lighted with wood on the top of the coals.—Maidstone, Feb. 22nd, 1848.

ANSWERS TO QUERIES.

Method of Finding the Centre of a Circle upon a small portion of its Circumferance being given.—We will suppose the inquirer to have a portion of a circle—say, part of a stone arch:—first transfer it to a board or paper, and then divide it into three or more parts.



From *a* and *b* strike *c* and *d*;—this may be done with any radius above the half the division. Then with a straight edge through *c* and *d* strike a line, and where these straight lines intersect at the bottom is the centre required. Another method is as follows:—from the other point described, with the same radius an arc to intersect with one of the other arcs; from the intersections draw straight lines, the junction of which will be the centre required.—



Douglas, Edward Bow (Manchester), W. M. Perarm.

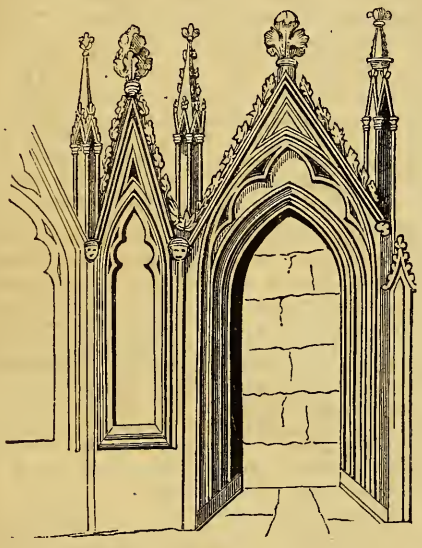
Lessons for Lovers. London: E. Dipple, 42, Holywell-street, Strand. This is one of the most pleasant books of poems that we have met with for many a day. Unlike the generality of works of its class, it has a purpose, and every line advances some new fact, couched in graceful rythm, which none of us would be the worse for knowing. We cannot say more in favour of this book than to state that we perused it from beginning to end without once laying it down, and that then our only wish was for more of it. With regard to externals, it is got up in a very creditable manner, and cannot fail of securing extensive patronage, not merely amongst love-stricken youths and maidens, but also the public at large.

J. L. (Bradford, Yorkshire).—You will perceive that we have used one of your receipts. We have already given a receipt for French polish (see p. 107, *ante*) which we consider more preferable than the one you have sent; but your suggestion respecting the substitution of naptha for the spirit of wine, we consider to be of service. It is, as you remark, much cheaper, and might be advantageously employed for work of a coarse description. We shall always be glad to hear from you.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

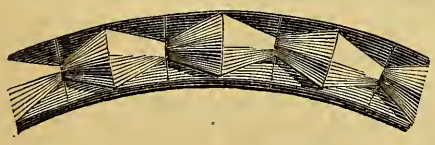
(*Continued from page* 181.)

Decorated Architecture, a name given



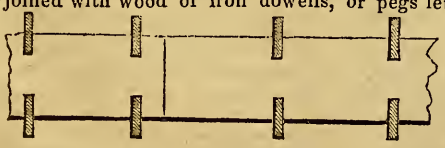
to the second style of Gothic architecture, from 1240 to 1380.

Double Cone Moulding, a moulding used



in Norman architecture.

Dowelled Floors (in carpentry), floors are so called when the boards are laid straight, joined with wood or iron dowells, or pegs let



into the edges to confine them down, instead of nails from the face of floors, having them only on the edges of the boards.

Decius.

Domitian.

(To be continued.)

Banding.—Banding is a term applied to a narrow strip of veneer used as a border, or part of a border, either to a large veneer (see art. on "Veneering," page 173, *ante*), or to solid wood; in the latter case, a rebate is sunk for the banding. Banding is of three kinds: it is called *straight-banding* when the wood is cut lengthwise of grain; *cross-banding* when the wood is cut across the grain; and *feather-banding* when cut at an angle between the two. The latter kind is not often used, nor does it produce a good effect.—Between the binding and the central part, one or more lines are generally inserted, and sometimes a narrow band. The chief object of banding is to increase the beauty of a plane surface by forming a species of border to it; and it requires considerable skill to give the desired effect.—The joints of banding should be as well matched as possible, both in respect to colour and grain; and, excepting the mitre joints, it is an advantage to make the joints at the veins of the wood.—*Nicholson's "Practical Carpentry," &c.*

Basaltes.—A black kind of earthenware, formed of basalt ground, mixed with a little borax, or soda, moulded and baked. Its use is well known in black tea pots, milk-jugs, &c. It is very hard and durable; resists acids; is capable oftaking a high polish; and will bear, without injury, a great degree of heat.

Biography.

SIR JOSHUA REYNOLDS.

Joshua Reynolds was born at Plympton in Devonshire, on the 16th of July, 1723. He was the seventh of the eleven children of the Rev. Samuel Reynolds, master of the grammar-school at Plympton. During his boyhood, he was not distinguished by assiduity or success in his studies, being chiefly diverted from them by an incipient passion for the art in which he subsequently gained such celebrity. He himself stated in after life, that when a mere child he could not refrain from copying every print that came in his way; and various specimens of these juvenile essays still exist. One of them presents a perspective view of a book-case, executed on the back of a Latin exercise, and below the sketch are these words, in his father's handwriting, "Done by Joshua out of pure idleness;" a comment which satisfactorily proves that Mr. Reynolds conceived his son's painting propensities to be somewhat detrimental to his progress in his studies.

Observing every day more and more decided indications of the particular bent of the lad's genius, Mr. Reynolds at length thought proper to gratify his son's inclinations, and placed him, at the age of seventeen, under the care of Mr. Thomas Hudson, then one of the leading portrait-painters of the British metropolis. At this period (1741), art was at a low ebb in the country. The success of the Vandyckes, Lelys, and Knellers, who had brought to Britain all the skill and finish of continental art, appears to have exercised a depressing influence upon native genius, by rendering the artists of the land hopeless of competition. And now, though the day of the foreigners had passed away, native art had not as yet had time to raise itself above its former mean estate, and the country possessed no great painters. Under Hudson, Reynolds perhaps received as good instructions in portrait-painting as any school of the day could have afforded. But after studying only two years out of the four agreed upon between him and his master, Reynolds left the house of the latter in consequence of a quarrel. The old painter, it is said, became jealous of his pupil, who had displayed an unpleasing degree of promise in the execution of various portraits. Hudson accordingly seized a flimsy pretext for dismissing him. The young man wrote an account of the circumstances to his father, who directed him to come down to Devonshire. Partly in that county, and partly in London, Reynolds spent the next six years of his life, engaged in study and in practice. He had the good fortune to obtain the patronage of Lord Edgecumbe and Lord Keppel, and for these employers, as well as others to whom they recommended him, he executed many of his earliest essays in art.

On the appointment of Lord Keppel to a small squadron in the Mediterranean, Reynolds found an opportunity of visiting Italy. In December of the year 1749, he arrived in Rome. "By his well-directed studies at this time (says his pupil Northcote), he acquired that grace of thinking to which he was principally indebted for his subsequent excellence as a portrait-painter." In the autumn of 1752, he returned to England.

Reynolds now hired a respectable house in Newport-street, and launched himself on the metropolitan world as a portrait-painter. His first productions were severely criticised by his brethren. He commenced by resolutely throwing off the trammels of custom, and guided himself solely by his own elegant taste and well-weighed principles. The artists of the day had a set of attitudes and draperies, which they bestowed indiscriminately on all sitters. If they merely effected a likeness, they attained their wish, and sought no more. Reynolds was the first British artist who gave to portraits a poetic and historic cast. Not content with executing a simple fac-simile of the features, he endeavoured to seize on the characteristic air, attitude, or actions of the sitter, to catch him at the most graceful moment, and to relieve and ennoble the portrait in every way compatible with the preservation of its verisimilitude. Notwithstanding the jealous condemnation of other artists, Reynolds persisted in the style of art which mature consideration had led him to adopt, and soon obtained his reward. Before he had been ten years in practice he had set up his carriage, and was in the enjoyment of an income of not less than £6,000 a year. In 1761, he removed to Leicester-square, where he spent the greater part of his after life, and where he received and entertained as familiar friends many of the most noted men of the day.

Among the distinguished persons whose portraits Reynolds painted about this time, reciprocally giving and gaining fame by so doing, were Garrick, Johnson, Burke, Goldsmith, Lord Camden, Mason, Foote, Gibbon, Sterne, Lord Mansfield. Lord Thurlow, Windham, and many others. By means of engravings, these productions were made familiar, to a certain extent, to the country; but, in 1760, an Exhibition of Paintings was opened in London, which gave the public a view of the paintings themselves, and which was followed by consequences most important to the future career of the subject of our memoir. He sent his well-known likeness of Sterne, and his magnificent portrait of Lord Ligonier on horseback, to the exhibition of 1761, and continued afterwards to adorn it with numerous productions of the like merit. Finding the scheme to succeed, the associated artists sought and obtained a charter of incorporation in 1765; but divisions took place among them, to compose which the recently incorporated body was abolished, and a new institution established in 1768, under the title of the Royal Academy of Painting, Sculpture, and Architecture. Professorships were attached to it, and, among others, Oliver Goldsmith received the chair of ancient history. But these appointments were nominal and unproductive; and Goldsmith humorously observed, that such an honour to one in his situation was "something like ruffles

to a man that wanted a shirt." Reynolds, now admittedly at the head of British art, was appointed president of the academy. From this nomination, so well merited, sprang those admirable Discourses, fifteen in number, which Sir Thomas Lawrence has described as "golden precepts, now acknowledged as canons of universal taste." It was not officially incumbent upon the president to deliver such prelections, but he voluntarily imposed the task upon himself, in his enthusiasm for the art. Impelled by the same spirit, he sent not less than 244 pictures to the academical exhibitions, from their commencement in 1760, up till 1790 inclusive. About the same time with his presidency he received the honour of knighthood, and soon afterwards the University of Oxford honoured him with the degree of D.C.L.

Hitherto we have only alluded to Sir Joshua as a portait-painter. Indeed, he did not step out of this comparatively inferior line of art until his powers were felt by him to be fully matured by practice. "Garrick between the Muses of Comedy and Tragedy" (painted in 1762), and "A Lady Sacrificing to the Graces" (1765), were among the first great works of fancy which he produced. In 1773, he exhibited one of his most famous historical pictures, The "Ugolino," representing the Italian Count of that name starving with his children in a dungeon, in accordance with the description of Dante. Critics differ much in their estimation of this picture, excepting as regards the execution, which all admit to be splendid. It is unneccessary to point out the particular dates of the other great productions of Sir Joshua's pencil, or even to name more than a few. In the course of his presidency he graced the exhibitions with such pieces as "The Nativity" (valued at 1,200 guineas), "The Death of Cardinal Beaufort," "The Infant Jupiter," "The Death of Dido," "The Gipsy Fortune-Teller," "Robin Goodfellow," "The Infant Academy," "Virgin and Child," "Venus and Cupid," "Cupid and Psyche," "Witches in Macbeth," "Hope nursing Love," "Holy Family," "Infant Samuel," "The Gleaners," "Sleeping Child," "Scipio," "Sleeping Girl," "Infant Hercules," &c., almost all of which are familiarised to the country by the numerous engravings of them which have been published from time to time. Mr. Malone enumerates 110 pictures, of an historical and miscellaneous order, as being merely the most considerable of the pieces which Sir Joshua executed, exclusive of his numberless portraits. In several instances he received upwards of £1,000 for single pictures. The Empress of Russia gave £1,500 for the picture of "Hercules Strangling the Serpents," and, moreover, sent to the artist a magnificent gold box, studded with diamonds, as a testimony of the satisfaction which she had received from the perusal of his Discourses. It may be interesting to some readers to know that his price for a *head*, as it is called, in 1755, was twelve guineas; in 1758, twenty; in 1760, twenty-five; in 1770, thirty-five; and, finally, in 1781, rose to the fixed amount of fifty guineas. When at the height of his fame, the painter charged 100 guineas for a half length, for a whole length 200 guineas.

Sir Joshua Reynolds, though ever practising his art with activity, and retaining all his early enthusiasm for its advancement and welfare, spent much of his middle life in the society of his many distinguished friends. He was not less admired as a man than as an artist. Mr. Malone, describing his person and manners, says, "He was in stature rather under the middle size; of a florid complexion, and a lively and pleasing aspect; well made, and extremely active. His appearance at first sight impressed the spectator with the idea of a well-born and well-bred English gentleman. He appeared to me the happiest man I have ever known. His mind was never torpid, but always at work on some topic or other. He had a strong turn and relish for humour, in all its various forms, and very quickly saw the weak sides of things. He had an ardent love of truth, and was perfectly free from all artifice and affectation." He was "a firm and faithful friend; and in mixed life an honourable and benevolent man."

After holding the presidency with universal honour and esteem for twenty years, Sir Joshua felt, when painting, a sudden affection in the left eye. "He laid down the pencil, sat awhile in mute consideration, and never lifted it more." His eyesight continued to fail, and in 1791 he resigned the presidency. On the 23rd of February of the following year, he paid the great debt of nature, at the age of sixty-nine. A public funeral testified the regret not only of the followers of art in Britain, but of the noble and the great—of all, in short, who loved the arts, and honoured virtue. Sir Joshua Reynolds left the bulk of his fortune, which was very considerable, to his favourite niece, Miss Palmer, afterwards Marchioness of Thomond. He was never married.

THE ELECTRIC TELEGRAPH.—In working the instruments employed at the various stations throughout the country, it has been found that the occasional deflection of the index needles has been very considerable, and although the variations of electric currents have been common to every part of the island where stations are established, yet local circumstances appear to prevent entire uniformity, and hence some risk had been incurred of inaccuracy. To obviate this, two circular discs, with a rack-wheel and key, have been added to the inner side of the dial of the machines, in which a semicircular parallel opening has been made under the space traversed by the needles, and by means of two small projecting pins on each disc, the exact extent of the deflection is ascertained, and the needles are confined to the precise portion of the circle within which they ought to move. The laws which regulate these variations have hitherto baffled the engineers of the company; but neither the changes of temperature, nor the moisture or dryness of the atmosphere, appear to exercise any influence on the currents, and the subject remains open for the investigation of the philosophically curious.

A DESIGN FOR A BOSS.

FREE EXHIBITION OF THE PRODUCTS OF NATIVE TALENT.—The second annual exposition of British Manufactures, consisting of 700 specimens of Decorative Art, has been lately opened at the house of the Society of Arts, John-street, Adelphi. The exhibition is open every day (Saturday excepted) from 10 a.m. to 4 p.m. Tickets may, we learn, be had gratis upon application to any members of the society as well as to the following printsellers, &c.:—Messrs. Ackermann, Strand; J. Cundall, 12, Old Bond-street; D. Colnaghi, 18, Pall Mall East; Dean and Co., King William-street, London-bridge; J. Hetley, Soho-square; J. Mortlock, 250, Oxford-street; J. Tennant, 149, Strand; Phillips, 358 and 359, Oxford-street; R. Henson, 70, Strand; and W. Mortlock, 18, Regent-street. We hope that our metropolitan readers will avail themselves of this opportunity for inspecting the results of British ingenuity.

On Shrove Tuesday a small Roman Catholic church, called the Church of St. John the Baptist, at Hackney, was opened for Divine worship. It consists of a nave, north aisle, chancel, and sacristy, with a bell-cot and spire of Caen stone, 90 feet in height, at the west end, and has withinside more decoration than is usually found in Protestant churches. The altar is richly carved in Caen stone; and there is a sepulchre, piscina, and sedile, in the chancel. The rood-screen is of carved oak, with the rood, and figures of the Virgin Mary and St. John. It has a stained-glass window, by Messrs. Ward and Nixon. The roof of the nave is open, and the ceiling of the chancel is emblazoned in colours and gold; the panels are powdered with stars, and contain monograms of the Holy Name, the Virgin, the Four Evangelists, &c. The church is built of Kentish rag and hassock, and in style is of the decorated period.

Art and Manufactures.

IN these days it is an important object for the advancement of taste in decoration to impress upon the minds of manufacturers—particularly those of ornamental goods—the necessity for their departing from the old beaten track which never leads to novelty or improvement, and entering upon the new route which is destined to effect more for the cultivation of a love of the pure and beautiful in this country, than any other principle which has heretofore been adopted.

At a late meeting of the Decorative Art Society, Mr. Dwyer, in the course of a discussion upon the respective position of British and Foreign Manufactures, in relation to their artistic merits, remarked that the distinguishing difference between them, would be found to arise from the greatly diffused appreciation of superior designs among foreign manufacturers, together with the well-sustained mode of teaching drawing to all in every town of importance on the Continent; while, in England, these things are, as yet, but too slightly cared for by the million. He referred to a recent visit to an extensive iron-foundry in Leicester, where, in reply to such questions as, "How do you obtain designs—do you employ a modeller?" it was said, "No; when we want anything new, we either set up a different arrangement and combination of parts from our own numerous moulds, or we get newer specimens from a papier-mâché manufacturer." Thus, there was not one person engaged in this factory, where design is very important, nor who felt this element of success worth caring for. It was satisfactory, however, to see some instances springing up around us where education of a character suitable to the employment is provided for the youth by the employer, on the most attractive terms. Messrs. Cubitt's establishment was mentioned as one, where a drawing-school and an architectural library are provided, as well as the teaching of arithmetic, and other matters, free of charge to those, young and old, employed by them.

It was said that the paper-stainers, who employ many boys, would find an advantageous result in providing the means for teaching them drawing and the principles of colouring. It was also said (by others) that the number of designers employed by the English manufacturers has greatly increased within the last few years, and that, although we have a profusion of mediocrity in talent shown in the transfer and copying of patterns, from one material or fabric to be applied to another, a great and general improvement is taking place. Mr. Donatty urged that drawing should be taught in our national schools. He wished that the walls of the school-rooms could be decorated with a few good prints having a useful tendency.

It was remarked that the capitalist or master manufacturer too often know nothing about artistic merits, and rely on their own intuitive taste in the matter of design, considering, in their speculations, that if some persons don't like them others will. Mr. Cowtan then stated

that, with reference to paper-hangings, the system of manufacture in this country is different from that of the French, who often employ a chemist, and always an artist, to mix and distribute the colours, which are applied chiefly by women and youths under such superintendence; whilst in England the colours are prepared and laid on by the uneducated but dexterous workmen. At the present time the best kind of "flock and gold" English papers are equal in every respect to the same kind produced in France; but in the manufacture of flowered and many-coloured patterns we do not obtain the perfect gradation of tints which is peculiar to the French manufactures. He was also of opinion that, since the admission of French papers under a reduced duty, the English manufacturers have had more regard to a reduction of the cost than to the production of better designs; and he thought that teaching boys, as alluded to, is exceedingly necessary, especially as the application and mixing of colours are, in this country, left in the hands of such persons when they have acquired a mechanical proficiency in printing.

Bleaching Ivory.—Antique works in ivory that have become discoloured may be brought to a pure whiteness by exposing them to the sun under glasses. It is the particular property of ivory to resist the action of the sun's rays, when it is under glass; but when deprived of this protection, to become covered with a multitude of minute cracks. Many antique pieces of sculpture in ivory may be seen, which, although tolerably white, are, at the same time defaced by numerous cracks; this defect cannot be remedied; but, in order to conceal it, the dust may be removed which has insinuated itself into the fissures, by brushing the work with warm water and soap, and afterwards placing it under glass. Antique works in ivory that have become discoloured, may be brushed with pumice stone, calcined and diluted, and while yet wet, placed under glasses. They should be daily exposed to the action of the sun, and be turned from time to time, that they may become equally bleached; if the brown colour be deeper on one side than the other, that side will, of course, be for the longest time exposed to the sun. The bleaching may be accelerated by frequently repeating the operation just described.—*Repertory of Arts.*

Fossil Woods to Prepare Sections for the Microscope.—A thin slice is first cut from the fossil wood by the usual process of the lapidary. One surface is ground perfectly flat and polished, and then cemented to a piece of plate glass by means of Canada balsam. The slice thus firmly attached to the glass is now ground down to the requisite degree of tenacity, so as to permit its structure to be seen by the aid of the microscope. It is by this ingenious process that the intricate structure of any fossil plant can now be investigated, and the nature of the original determined, with as much accuracy as if it were now living.—*Mantell's Geology.*

Royal Academy.

PROFESSOR LESLIE'S THIRD LECTURE ON PAINTING.

The professor in this lecture entered upon the consideration of form and composition; and proceeded in a masterly manner to point out the real significancy of the term *ideal* as employed to distinguish that best condition to which Nature always tends, and from which in her individual productions she is only intercepted by accident. He took for illustration the human body, and pointed out in a perspicuous manner the accidents to which the human flesh is prone in an artificial mode of life, and the malformations produced by even the most trivial circumstances—such as wearing clothes, &c., and ending by referring the students to the study of Grecian art as presenting the best proportions of the human body; at the same time recommending where possible to refer to Nature, as he observed that although we were rich in fragments of antiquity, many of these were, no doubt, but merely indifferently executed copies of the originals, and originals but imperfectly restored; besides the practice of constantly referring to these could not but lead to mannerism,—as in the case of Raffaëlle himself, who always drew his horses from the mediocrital performances of the masters who had preceded him.

The professor then entered upon relative beauty, pointing out the difference which exists between manly, womanly, and infantile beauty—the most perfect proportions of the woman bore but in few cases any analogy to those of the man, and the long body and short legs of the child would almost amount to positive deformity in the adult.

The taste which many painters, including Rembrandt, Ostade, and several of the Dutch and Flemish schools, had for painting ugly features, required some remark, and the professor explained that the correct portraiture of the human face required that character should always be imparted to the physiognomy, for otherwise the portrait was blank and lacked expression; but still there were points which should not be overreached—in nature the extremes either of beauty or ugliness were seldom visible—Raffaëlle had often surpassed the ordinary limits of beauty, but they were not on than account to select him as their model, for the pictures in which this was exhibited had often many faults which even the good nature of the critic should not allow to be passed over. Rembrandt's taste for excessive ugliness was generally exhibited more in the form than the countenance—and an instance of this might be met with in an etching by him of Adam and Eve, in which the form of the woman was the perfect ideality of ugliness.

The subject of drapery next engaged his attention, and after stating that on this point they derived much valuable suggestion from antique art, he proceed to point out the difference which should exist between the peculiar

disposition of drapery in sculpture and painting. In sculpture, the close adherence of the drapery to the limbs, showing clearly the outline of the body, might form a beauty in sculpture, whereas in painting, unless accounted for by rapid action, or the effect of the wind, it would be a defect—a mistake, he observed, which they found more frequently in Michael Angelo than in Raffaëlle. He referred to Raffaëlle, in this respect, as a master beyond most others worthy of study. He neither overloaded his pictures, nor were his lines ever poor or meagre. Action was always aided by the streaming or fluttering, or slighter movement of the dress, and grace was made more graceful.

In action Rubens was a great painter, as many of his works testified, and one in particular, a small and slight work of his masterly hand, exhibited in the Louvre, and which contained not less than one hundred figures, scarcely one or two of which were not in motion, dancing, romping, and rolling on the ground; while even of those who sat on benches or on tables, not one appeared to be able to sit still. It was a wonderful display of the most difficult attitudes, mastered with consummate ease; but the whole together was too far removed from the probabilities of Nature—and any picture of the younger Teniers of a similar subject placed beside it would show at once how much the truth was to be preferred to such splendid falsehood.

Repetitions of particular attitudes which were often to be observed in crowded assemblages, were not to be rejected because they were not presented in what was called the picturesque style, as in the best works of many great masters, such as Raffaëlle, Poussin, and Peter de Hooge, they constituted their chief excellencies, and the best points with enlightened critics, as must be the case with everything that is true to Nature.

All improvements in composition from the infancy of art to its full maturity, were owing to the successive discoveries made in the broad and varied field of Nature, and the study of the principles by which she made her assemblages pleasing to the eye. Linear perspective was the basis of linear grouping, and until its laws were first well understood composition remained imperfect. The professor adduced several examples of paintings executed both before and after the discovery of this art, and critically analysed each specimen.

Balance of lines and masses was the great principle of general composition; and whether this was obtained by exact symmetry of parts, as in the school of Athens, or by the many other more irregular plans of arrangement, depended much on the subject:—for one form was not more legitimate than another. Nature delighted them in so many different ways that art might, and, indeed, should, follow her variety if it would avoid the stagnation of mediocrity—the invariable result of too exclusive an attachment to any one system.

The first thing taught by perspective was that they saw the form of no object whatever exactly as it was; and though the lines of buildings which were in reality perpendicular were all made by perspective to terminate in one point above the horizon; they were to continue as heretofore to draw all lines perpendicularly that they knew to be really perpendicular to the horizon, because the plane of the picture being itself subject to the laws of perspective, became altered by those laws according to the point from which they viewed it, and carried with it all lines that were parallel to itself. This rule obviously applied equally to lines parallel to the horizon if they were also parallel to the plane of the picture.

But in the application of the laws of perspective there was as much room for choice as in the application of any of the other principles of Nature to art. The beauty of a composition depended greatly on the placing of the horizontal line, and its apparent truth on the choice of the point of distance. The professor adduced the remark of Stothard that great grandeur might be obtained either by a very high or a very low horizon; but when the horizon was placed in or near the middle of the picture, grandeur of composition was to be sought from some other principle, and cited several instances to prove the justice of this remark.

After some very able and judicious remarks on Hogarth's style of perspective and composition; and his style of painting costume, the professor announced that he should defer the consideration of several admirable styles of composition until his next lecture.

Hardening of Steel Dies.—Mr. Adam Eckfeldt is stated to be the first who employed the following successful mode of hardening steel dies. He caused a vessel, holding 200 gallons of water, to be placed in the upper part of the building, at the height of forty feet above the room in which the dies were to be hardened; from this vessel the water was conducted through a pipe of one inch and a quarter in diameter, with a cock at the bottom, and nozzles of different sizes, to regulate the diameter of the jet of water. Under one of these was placed the heated dies, the water being directed on to the centre of the upper surface. The first experiment was tried in the year 1795, and the same mode has been ever since pursued at the Mint without a single instance of failure. By this process the die is hardened in a way as best to sustain the pressure to which it is to be subjected; and the middle of the face, which, by the former process, was apt to remain soft, now becomes the hardest part. The hardened part of the dies so managed, were it to be separated, would be found to be in the segment of a sphere, resting in the lower softer part as in a dish, the hardness of course gradually decreasing as you descend towards the foot. Dies thus hardened preserve their form till fairly worn out.—*Franklin's Journal.*

Badigeon.—A preparation for colouring houses. It is prepared with saw-dust, slaked lime, the powder of the stone with which the house is built, and a pound of alum, dissolved in a bucket of water. A little yellow ochre is sometimes added to it.

Architectural Mouldings.

The regular mouldings are eight in number, and are thus named :—The *fillet* or *band*, the *torus*, the *astragal* or *bead*, the *ovolo*, the *cavetto*, the *cyma recta*, the *cyma reversa* or *talon*, and the *scotia*.

Fig. 1 represents the fillet. It is the smallest rectangular member in any composition of

Fig. 1.

mouldings. When it stands upon a flat surface its projection from the surface is generally made equal to its height.

Fig. 2 represents the torus and astragal. They are both shaped like ropes, but the torus is of larger proportions. In form the torus is a semi-circle, which projects from a vertical

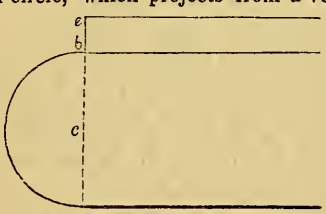


Fig. 2.

diameter. Its profile, as above shown, is the segment of a circle, described from the centre *c*, which is on a line representing the vertical diameter from which the moulding projects. The torus in the above example is surmounted by a fillet, as *b e*.

The Roman ovolo is a moulding generally of the shape of a quadrant, and is described as in fig. 3, the height and projection being given.

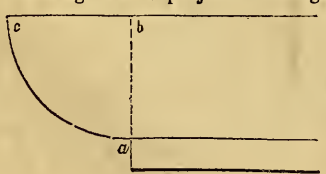


Fig. 3.

And first, let the height be equal to the projection as in fig. 3—draw the right angle described by *a b c* and then the quadrant *a c ;* but if the projection be required to be less than the height, as in fig. 4, draw *a b* and *b c*, as before, at right angles. From the point *a* draw the arc of a circle *b d* with the radius *a d*, and from

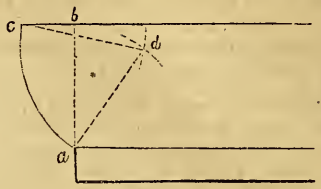


Fig. 4.

the point *c*, with the same radius, describe another arc cutting the former arc at *d ;* the point *a* is the centre from which the ovolo is to be described, with the radius *d a* or *d c ;* this being done, the curve *a c* is the contour of the ovolo.

The Roman cavetto is struck in much the same manner as the Roman ovolo (fig. 5),

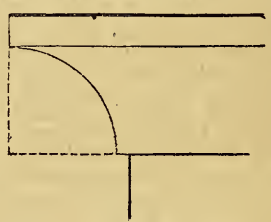


Fig. 5.

where the indentation of the moulding is of the form of a perfect quadrant, only that the point of the compass must be placed on the point of the meeting of the two straight lines (fig. 5). Where, however, the indentation is less than the quadrant, the lines must be formed

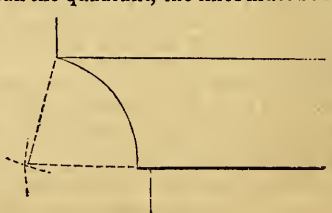


Fig. 6.

as shown in fig. 6, and the figure struck from the point where both meet.

(To be concluded.)

Door-springs, of new invention, have been patented by Mr. Cotterill, of Birmingham, the principle of which consists simply of a spiral spring, inclosed in a cylinder acting on a piston-rod, to which the opening of the door gives the momentum, and it does double duty by the additon of a joint at the point where the spring is at its utmost depression, by means of which the backward action of the piston is checked, and the door kept open at pleasure.

A single piece of china, before it is finished, employs forty hands, from the man who pounds flint to the designer and colourer.

Silvering.

There are various methods of giving a covering of silver or a silvery aspect to the surfaces of bodies. The application of silver leaf is made in the same way as that of gold [see art. "Gilding," page 52, *ante*].

Copper may be silvered over by rubbing it with the following powder:—

Tartar	.. ..	2 drms.
Common salt	..	2 ,,
Alum	.. ..	½ ,,

Mix with 15 or 20 grains of silver precipitated from nitric acid by copper.

The surface of the copper becomes white when rubbed with this powder, which may afterwards be brushed off, and polished with leather.

Saddlers and harness makers cover thin wares with tin for ordinary purposes; but a cheap silvering is used for this purpose as follows:—

Silver that has been precipitated from aqua-fortis by the addition of copper, common salt, and muriate of ammonia, of each two ounces	½ oz.
Corrosive muriate of mercury	1 drm.

Triturate together, and make into a paste with water.

With the above, copper utensils of every description, that have been previously boiled with tartar and alum, are rubbed, after which they are made red hot, and then polished. The intention of this process appears to be little more than to apply the silver in a state of minute division to the clean surface of the copper, and afterwards to fix it there by fusion; and, accordingly, this silvering may be effected by using the argentine precipitate above mentioned with borax or mercury, and causing it to adhere by fusion.

The dial plates of clocks, the scales of barometers, and other similar articles, are silvered by rubbing upon them a mixture of muriate of silver, sea-salt, and tartar, and afterwards carefully washing the saline matter off with water. In this operation, the silver is precipitated from the muriatic acid, which unites with part of the coppery surface. It is not durable, but may be improved by heating the article, and repeating the operation until the covering seems sufficiently thick.

The silvering of pins is effected by boiling them with tin filings and tartar.

Hollow mirrors or globes are silvered by an amalgam consisting of one part, by weight, of bismuth, half a part of lead, the same quantity of pure tin, and two parts of mercury. The solid metals are to be fused first together, and the mercury added when the mixture is almost cold. Very gentle heat is sufficient to fuse this amalgam. In this state it is poured into a clean glass globe intended to be silvered, by means of a paper funnel which reaches to the bottom. At a certain temperature it will stick to the glass, which by a proper motion may thus be silvered completely, and the superfluous amalgam poured out. The appearance of these toys is varied by using glass of different colours, such as yellow, blue, or green.

The following is the method of silvering cast-iron, pursued at St. Petersburgh, described by Major Jewreinoff:—

"The liquid for silvering is prepared in the following manner:—Cyanide of potassium, prepared according to Liebig's method, is introduced into a stoppered vessel, and freshly-prepared pure chloride of silver, still in a moist state, added; the whole being covered with water and shaken violently for some time at the ordinary temperature. An excess of chloride of silver is taken, and should a small quantity of it remain undissolved, a few pieces more of the cyanide are added after some time, taking care, however, to avoid having an excess of the latter salt, but always a small quantity of undissolved chloride at the bottom of the vessel. This last circumstance is important, because when the liquor contains too much free cyanide of potassium it is easily decomposed, and moreover does not silver so well; before employing it, it is filtered, and is thus rendered perfectly clear, iron and a little chloride of silver remaining on the filter. The plating is effected by means of a galvanic pair of plates, consisting of zinc and a coke cylinder, which are separated from each other by means of an earthen diaphragm. The pair are placed in a glass vessel containing dilute sulphuric acid, and dilute nitric acid is conveyed into the earthen diaphragm. The best mixture for the coke cylinders consists of five parts by weight of finely pulverised coke, eight parts pulverised coal, and two parts common rye flower. When the cylinders are dry they are placed in earthen crucibles, in the lids of which there is an aperture for the escape of the gases, and are then heated to redness.

"Those cast-iron objects may be most easily silvered which have not been painted, as the removal of the paint from the surface of the metal is somewhat difficult. The cleansed object is immersed in the silver solution, and connected with the zinc pole by means of a conducting wire, and a platinum plate immersed in the liquid at some distance from the object to be silvered, and connected with the coke cylinder. A plate of cast-iron, of four square inches surface, is generally completely plated in thirty minutes."

Model of the First English Steam Vessel.—The following notice appeared in the *Oracle*, daily newspaper, December, 1789:—There has lately been laid before the Admiralty Board the model of a ship, worked by steam, which is so constructed as to sail against wind and tide. This ingenuity is to be rewarded by a patent."

Small Air Balloons.

For experiments in courses of natural philosophy, mechanics, and chemistry; as also for determining the currents existing in the upper regions of the air, there are required little balloons of hydrogen gas, whose small weight and ascensional power may enable them to rise to a sufficient height. The baudruche or blind gut of the ox, prepared for the use of the gold beater, is the best substance that has hitherto been used for this purpose.

For the purpose of making the small air balloons, a mould is necessary, made either of wood, or, which is at once cheaper and better, of plaster of Paris. This mould is generally a hemisphere of 24, 30, or 36 inches in diameter, and is placed upon a stand or table, so that a person may walk round it. When used, it is to be carefully greased all over.

The baudruche, or prepared skin, when bought of the bladder-dealers, is in the form of very dry and very hard slips. In order to cover the mould, the skin is soaked in warm water for 12 or 15 hours; it is then spread out with great care, and applied to the mould, beginning at the top. The ragged edges, or any accidental inequalities, are to be removed with a deal of caution by a pair of cutting pincers. A second baudruche is then applied, so as to cover one-half of that applied to the mould; and then a third, also covering one-half of the second, and so on, in such manner that every part of the mould may be covered with two thicknesses of skin. Care must also be taken that the skin already on the mould be kept moist until the next layer is applied, as otherwise the baudruches would not adhere together; for this reason, a wet cloth must be kept on the skins until the whole is finished.

When the whole of the hemispherical mould is finished, a tape, well greased, is tied round the base of the hemisphere; and those pieces of skin which are left at the lower edge are rolled up and kept moist, while the hemispherical part is left to dry for a few hours: when dry, the part already made is greased, to prevent the adhesion of the skin, and is used as a mould, beginning at the bottom with the loose flaps remaining from the former hemisphere, and adding fresh skins up to the top of the hemisphere, where a short cylinder, about an inch in diameter, is placed, and the skins brought round it. To strengthen this intended opening into the balloon, the skin is here trebled, or even fourfold.

A few hours are sufficient to dry this second hemisphere, when it is to be taken off the mould, from which it parts with ease, in consequence of the grease; and in like manner the tape is withdrawn from the internal part. The nozzle of a pair of hand-bellows being then applied to the cylindrical mouth, it is blown up, and being tied, a very thin coat of varnish is rubbed over the surface by means of a sponge. This being done, the balloon is turned inside out, and again blown up and varnished; after which it will hold hydrogen gas perfectly well.

A balloon of this kind, 3 feet in diameter, when well made, ought not to weigh more than 2 ounces and a half; so that, when filled with pure hydrogen gas, it ought to rise in the air with the force of between six and seven ounces.

Anointment and Induration of Plaster, Stone, Cement, and Pasteboard.—A patent has been granted to Mr. William Hutchison, of Barnsbury-park, Middlesex, marble merchant, for a foreign method of redering plaster, pasteboard, porous stone, and other substance, impervious to wet, frost, vermin, or other destructive agencies, and for mashing paper, rags, hemp, ropes, and even hay and straw, and preparing them into substances useful for sheet-roofing, pipes, tiles, &c. The plaster, porous stone, mashed hay, &c., are first shaped as may be desired, then perfectly dried, so as to be highly absorbent; then boiled in a mixture of rosin and oil, grease, &c., or pitch and coal tar, for a time, varying according to their thickness or bulk, and then dried again, and finished off by polishing, &c., according to the nature and purpose of the article. The absorbent mixture may be tinged with various mineral or vegetable colours, or the substance be prepared of a black or other dark colour, as with the pitch, &c. Chalk, alabaster, busts, and even soft and porous wood, may be also treated in the same way, but all must first be dried, so as to ring like metal, and be afterwards boiled in the unguent till it is thoroughly absorbed.

Notices to Correspondents.

QUERIES.

[In order to collect as much useful information as possible we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—Will you, through the medium of your valuable publication, permit me to ask a solution to the following problem? Given the length of a line, say 10 inches, it is required, by geometrical construction, and also by calculation, to cut or divide the line, so that one part of the line shall form the side of a square that shall contain just twice the area that the other would contain whose side is the remaining part of the line so cut. By inserting the above, you will greatly oblige. Yours, &c., John Whitaker.—Stockport, March. 1848.

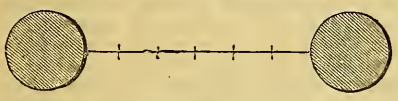
Errata.—In consequence of one of those mistakes which sometimes occur in the best regulated printing establishments, several errors were allowed to go uncorrected in the answer to a query respecting the method of finding the circumference of a circle given in our last number. The second rule ought to read thus:—"From two of the given points, as in the above example, describe arcs to intersect; from the other point describe, with the same radius, an arc to intersect with one of the other arcs; from the intersections draw straight lines, the junction of which will be the centre required." The name of one of our correspondents was also spelled wrong; it ought to have been "Perram" instead of "Perarm."

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 191.)

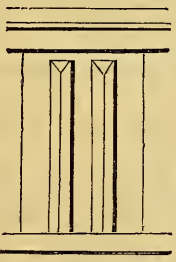
Damaskeening, or Damasking, the art of inlaying iron or steel with other metals, especially gold and silver, is of great antiquity. It is principally used for sword-blades, guards, cocks of pistols, &c. Herodotus mentions a saucer so ornamented: so, also, were the shields of some of the forces of the Samnites which fought against Rome. It was a favourite manufacture with the ancients. We know not at what time it so flourished at Damascus as to have derived its name from that city.

Diastyle (in architecture), one of the five manners of intercolumniations used by ancient architects, having three diameters between



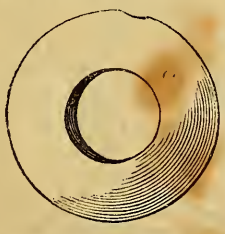
the columns. According to Vitruvius it was the third species, and comes between the systyle and aræostyle.

Diglyph (in architecture), a species of ornament which has two channels sunk in, while



tryglyphs have three. Vignola claims the honour of the important invention.

Disc or Disk (in antique sculpture), a broad circular piece of iron or other metal, or of stone, used in the ancient sports. There is an



ancient disk of granite in the cabinet of antiquities of the Royal Library at Paris, described by Millin, in which are holes, one for the thumb and four for the fingers.

Ditriglyph (in architecture), a space comprehended between two triglyphs.

(To be concluded.)

Jones's Friction Hammer.—We have been favoured, says the *British Mirror*, with a sight of a novel machine which has just been completed, and s now at work at the Great Western Works, the invention of Mr. John Jones, manager of the works, who also invented the "Cambrian Engine." The machine is called a "Friction Hammer," and consists of frames of cast-iron, in which are vertical slides acting as guides to the hammer, and also supporting the machinery necessary for putting the hammer in motion. The hammer consists of a plane bar of flat wrought iron, so arranged as to work in the slides, and is raised by means of two vertical rollers turning in opposite directions, which are made to bear upon the bar by an exceedingly simple arrangement of levers. A slight pressure upon the handle of one lever raises the hammer to any height not exceeding seven feet; the pressure being removed it falls by its own gravity; this lever is also arranged so as to stop the hammer in any part of its descent, should circumstances render it necessary. The friction rollers are put in motion by means of straps and pulleys, fly-wheels being also fitted on each strap. A double punching and shearing machine of great power, by the same inventor, has also just been completed at these works.

Improvements in Galvanisation of Metals.—Messrs. Morehead and Rogers have patented the use of alloys of zinc and tin, or zinc and lead, or all three combined in certain cases with antimony (an electro-thermal antithesis to zinc, or a negative pole to it as the positive), in coating iron, whereby the protective power of the zinc is combined with certain other advantages, such as the obviation of its brittleness by aid of the tin, which is well known to coat iron without that tendency to scale off which zinc has manifested. The patentees have also protected various other improvements, such as the use of vapour of muriatic acid to dissolve the oxide generated on the iron surface, and the use of rollers plunged in a soft and not quite fluid bath of alloy, while the iron plates to be coated are pressed by the rollers during the process of coating.

Salt-Cellars.—A correspondent, speaking in reference to the Art Manufacture, suggests that the designers employed therein should set the first example of adding a cover to the salt-cellar. Certainly we cannot see any reason that that receptacle should go without any more than its old companions—the mustard-pot and the pepper-box.

Arsenites.—Compounds of arsenious acid and various bases. The chief arsenite used in the arts is Scheele's green, which is an arsenite of copper, procured by precipitation from the sulphate of copper.

Artificial Marble.

We have lately been much interested by an examination of specimens of artificial marble, sandstone, conglomerate, and other mineral productions made by Mrs. Marshall, formerly of Manchester, now of Edinburgh.

So far back as 1840, Mrs. Marshall was struck with the odd idea, that the animal and vegetable remains so universally found in the secondary and tertiary strata might, by a chemical or electric influence exerted upon the disintegrated particles of these rocks, have been the cause of their aggregation.

Between the first rude outline of this idea and the realisation of Mrs. Marshall's wishes, five years, and upwards of ten thousand experiments, intervened. Many of these were forbidden in their detail, and others requiring truly scientific patience to complete; but the whole result has been a satisfactory demonstration that if the constituents of any mineral body of which lime forms a part be mixed in their true proportions (the lime used being free from carbon in any form), and these mixed with animal and vegetable remains, under circumstances of due moisture and heat, aggregation of their particles will take place at periods varying with the substances under experiment, from a few minutes, to hours, weeks, and months; and these artificial aggregations (allowing for absence of time, and incalculable amount of superincumbent pressure present in natural phenomena) come so undeniably near, in appearance and qualities, to the products of nature, as to throw a totally interesting light on some of her hitherto most mysterious operations.

There are two problems which have justly been considered by geologists as among the most difficult in their science: The one is, that the nodules in strata containing fossils, particularly crustaceous relics, contain more lime—taking size for size—than the intervening space in the beds. The natural conclusion at first sight is, that the surplus lime accrues from the osseous fabric of the organism. But investigation proves that there is more lime contained in the whole nodule than this will account for. Mrs. Marshall's experiments and specimens shown that bone or recent shell has, more than any other portion of the animal frame, a power of attracting or of *condensing* lime, while a counter power is exerted by the lime of hardening or solidifying the bone. This, of course, acts more powerfully and obviously when the bone and the lime come in immediate contact, as in the nodules of the crustaceous fossils, than in the case of the vertebrata, where the integuments interpose like a screen. Thus if portions of bone, or recent shells, be placed in a heap of sulphate of lime, or of magnesia thoroughly free from carbonic acid, with a very small proportion of vegetable matter added, and the heap so prepared be kept in circumstances of moisture, the parts in contact with the bone will first begin to harden or condense, and this action will gradually radiate to an extent corresponding to the size and form of the osseous matter, while at the same time the bone, even the soft cellular portion, becomes hard and stone-like. The very same effect is produced by and on *coral*; for not only does the lime harden in an extraordinary degree round the coral, but in the same ratio the latter loses its dull opaque, and becomes semi-translucent. Whether "countless ages" would bring these to a perfect resemblance of natural fossils, it is hard to say; but a year and a half has sufficed to render them extremely curious, and worthy of attention. The experiments conducted with the constituents of sandstone and lias lead to the very same results, but much more slowly than in the pure lime.

The other problem to which we allude is this: From what cause has it arisen that many mineral substances, and even whole strata, are found identical in the nature and proportions of their constituents, yet totally different in their lithological structure? Such is the stratum frequently above coal and lime, and both above and mingled with sandstone. Mrs. Marshall's experiments show that if a mass of imitation of such mineral bodies be prepared, and one part of it left at perfect rest, while the other is agitated or disturbed, the one will harden in a few hours or days into a substance not distinguishable by the eye from the natural stone, and capable of resisting water and weather; while the latter will take as many weeks to harden, and then present a mass which readily degrades by exposure to either. The experiment may be varied thus: Such masses always *set* or harden from the centre outwards; allow the mass to set till within half an inch of the surface; disturb what remains, and the result will be, that on making a section, the centre will be found hard enough to take a fine polish, while the outer crust will be a mere crumbling mass of chalk or sand.

Mr. Hugh Miller, in his "Old Red Sandstone," conjectures that the curious outstriking of colours which here and there occurs in that and some other formations, may have arisen from the action of decaying animal matter. Not only is this completely proved by this lady's experiment, but what Mr, Miller seems not to have once suspected, that decaying *vegetable* matter has the same effect; and doubtless to this, rather than animal, are owing the more curious and grotesque forms in which these white and grey stains appear.

We were particularly interested by one specimen, in which, with the view of solving two problems by one experiment, there had been laid down upon the surface, while yet fluid, a few of the delicately-rounded leaf-stalks of the *Fucus vesiculosus:* of these some had sunk only half, and others wholly, under the surface. In course of time the vegetable matter shrinks to a film that can be blown out with the breath, and there then remains in the mimic stratum perforations which are lined with white, presenting the most perfect resemblance to those mysterious worm-like borings which occur in the face of compact limestone, and having given rise to so much discussion.

The specimens are divided into two classes—the one terrestrial, and the other marine. We are inclined to consider the latter decidedly the more interesting and curious. Patents for Britain and foreign countries have been taken for the use of this discovery. But we confess that, as devoted utilitarians, we feel a far deeper interest in the *economic* than in the merely scientific results of this discovery, curious and important though they be. Upon the principle developed, two most valuable and entirely new architectural cements have been compounded—the one pure white, the other of a greenish-gray or sage colour.

The first, after the trial of years, has proved itself a certain cure for all damp arising from porosity, or presence of sea-salt in building stone, *or from want of honesty in building even with good materials*—a cause for damp, we regret to say, fully more common than the two former.

It is not easy, on any known or alleged theory, to account for this quality in the cement; but the *fact* is incontrovertible. We have seen walls in sunk flats (done with it more than two years ago) which had been streaming with damp, noxious and offensive in its effluvia, so as to be quite uninhabitable, rendered perfectly dry, and the apartments offering a peculiarly comfortable sensation to the feelings on entering, as if a fire had recently been in them. This arises from the intonuca* being such a remarkably slow conductor of heat, that the atmosphere in all apartments plastered with it is kept at an even temperature—warm in winter and cool in summer; whereas common lime, being a very rapid conductor of heat, speedily robs the air of all warmth in winter, and throws in great heat in summer—effects which we but partially obviate by covering it with paint or paper.

This cement also resists fire to a very high degree. Half an inch depth of it has been known to protect lath from intense fire for two hours; and even when it reaches the wood, neither flame nor spark is ever emitted—it smoulders slowly into a light white ash. The cement does not, even under a red heat, crack or fly off from the wall; but if water be thrown upon it at this time, its substance and cohesion are destroyed, and it requires removal.

Dissatisfied with this result, the indefatigable experimentalist applied herself to making new combinations, and a few months since succeeded in perfecting a cement combining all the good qualities of the white, with the additional advantage (a grand desideratum indeed!) of remaining perfectly uninjured by water thrown upon it, even when at a full red heat. If a common brick, covered with one-eighth inch of it, be thrown into the heart of a large fire, and brought to a red heat, and from the fire be thrown into a bucket of water, it will neither crack nor fly from the surface, and when dried, will bear no mark of injury, smoke and dirt excepted. Care must be taken, in laying on the cement, that no opening to the brick be left, otherwise the brick itself will rend on meeting the water.

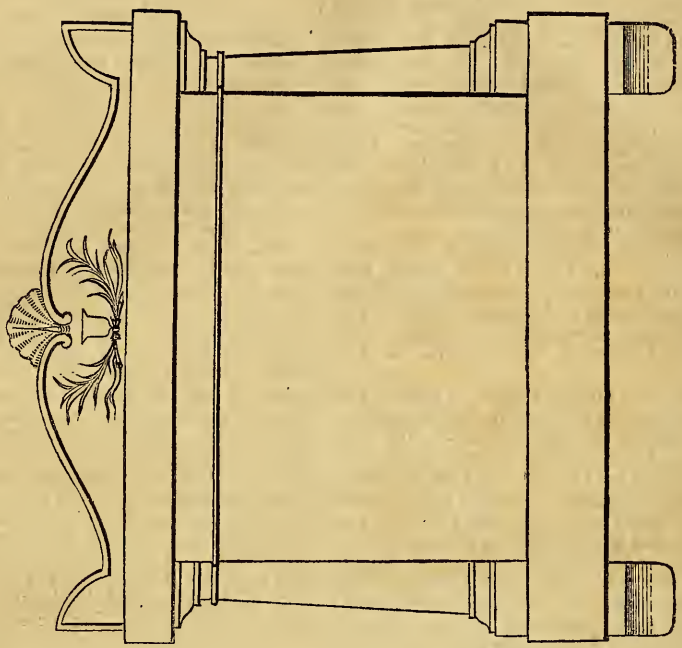
The advantages of a cement like this, both in domestic and trade architecture, are too obvious to require argument or demonstration. If floors and ceilings be formed of it, fire may be confined to the apartment in which it originates, instead of penetrating, as in so many deplorable cases it has recently done, with the rapidity of lightning, from one story to another, upwards, and downwards, through whole ranges of building. And when extinguished, no repair will be required but that occasioned by the removal of smoke and wet ashes.

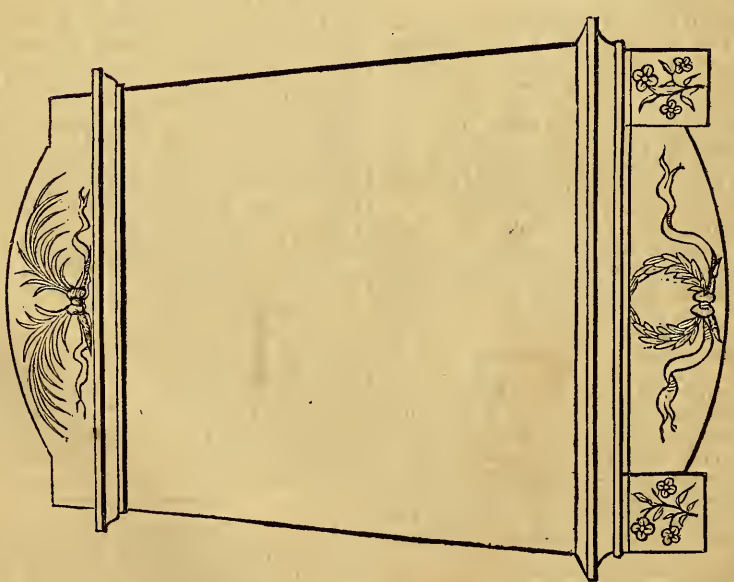
Both these cements harden and dry in so short a time, that houses or apartments done with them may be inhabited in a fortnight after the plasterers are finished. No noxious exhalation—as from common plaster—or lurking damp remains in them, to injure health or property; and this alone is an immense benefit in cases of alterations, particularly in shops. They both take paint or paper the moment they are dry. But for all unpretending apartments, or for lobbies and staircases, no colour more beautiful or appropriate than that of the gray cement itself could be desired. It is considerably cheaper than the white: but this matter we refer to the manufacturer. It is, however, one of deep importance to the public, that anything preventing the scourge of fire and of damp should be brought within the reach of those building or *repairing* for the masses, at such a price as to remove all excuse for not using it; and here we would remark that the rapid and thorough drying of these cements throws a large amount of saved rent to the credit side, which should be considered as reducing the expense of it. We have included damp, along with fire, as *a scourge*; indeed we consider it very decidedly the severer of the two; nay, we are prepared to hold that in towns it is more the promoter of death than all other causes united—not to name the misery and discomfort it entails on life. We speak of the *dirt* of the habitations of the poor; but damp and dirt are indissoluble in ther companionship: and how often, by the cruel Pandemonium-like window-tax, is the evil deepened and (without a pun) *darkened* to the industrious poor, whose very *means of existence* is often connected with a free access of the blessed light of heaven to the scene of daily toil!

We have already exceeded our space, or we would refer at length to the boundless variety and importance of the uses to which these cements may be applied. On our table, at this moment, are most delicately-beautiful medallions, executed in white on coloured grounds; specimens of marble, splendid in colouring and polish; and pieces of granite and other stones, rugged from the quarry, united by it with most extraordinary firmness.—*Chambers' Edinburgh Journal.*

* Mrs. Marshall has given this name to her cement—it is simply the Italian word for wall-plaster.

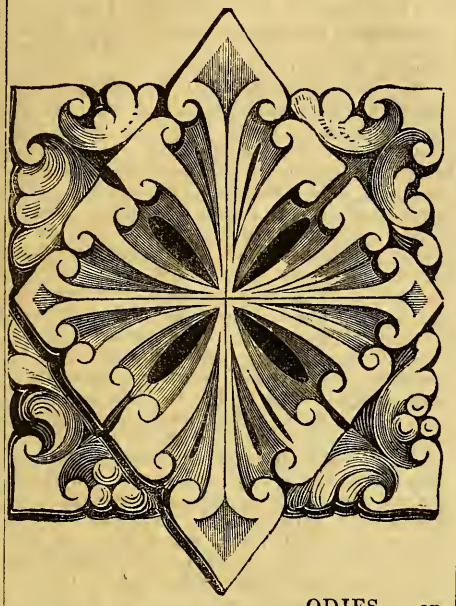
PETITIONS AGAINST THE PATENT LAWS.—We understand that petitions, praying for a reformation of the great abuses which at present exist in the patent laws, are in course of signature. Reformation is greatly needed.





DESIGNS FOR TABLETS.

Light.



BODIES appearing to us coloured only in proportion as they are struck by the light, the light ought consequently to be regarded as the cause of colour. It results hence that the object which is entirely thrown into shade must necessarily appear black whatever may be its colour at other times when it is struck by rays of light. A plain globe of whatever colour, when illuminated by the sun, will display all possible shades on that side which is exposed to the sun's rays. The point to which the strongest light is directed, will exhibit the strongest tinge of colour, and those points which are altogether in shade will appear quite black. Between these two extremes the natural colour of the globe will exhibit different shades according to its position. The painter must therefore carefully observe the action which the light, as it is more or less strong, produces upon each colour: he should reflect that the force or intensity of the light is produced by two causes: first by its absolute quantity; as for instance, the sun is less brilliant when the atmosphere is loaded with mists and vapours, than when the sky is clear and serene. Another principal point, which ought to occupy the attention of the artist, is the nature or *colour* of light, because it has a great influence on the colour of bodies. He ought also to take equal care to observe the influence of light on the *chiaroscuro*. A landscape appears altogether different when the light is sensibly changed, and the different objects are seen more or less distinctly. Each scene of inanimate as well as of *animated* nature should be examined by the artist with the greatest attention, under different aspects of the sky, whether the sun is shining, or the sky charged with lowering clouds and vapours. He will thus discover that a very strong light, when the shadows are not relieved by a strong *reflected light*, is against the harmony of the picture, because the bright and shaded spots then seem at a distance to be blots upon it. Certain methods of disposing the objects will prove to him that a weak light renders the picture dull and heavy, and that a light too violent produces little dispersed clear and sombre masses. The best advice to be given to artists on this subject is to follow the example of Leonardo da Vinci, to write down his observations, and to fix them (if one may so speak) by sketches taken whenever he sees a fine effect of light.

Light is sometimes spread uniformly over all the objects, and at other times the principal and strongest light comes only from one side, while the other is radiated by a much weaker and reflected light. Sometimes the best effect is produced by the light uniformly spread over all the surface of objects: at other times a borrowed light is preferable. There are some subjects for which the latter, or to speak more properly, a dead light, is almost absolutely necessary, such as portraits.

An accurate observer will perceive that generally a light from above produces the best effect, not only because it throws into greatest clearness the plan on which the objects are traced, and because the shadows are more shortened, but also because their shapes are more elegant than when the light strikes them in an oblique direction. He will have the same occasion to observe this, when any group which forms by itself a complete picture is illuminated in a manner the most advantageous by a light which strikes the principal figure through a narrow opening, in that manner that the other objects are only radiated by a reflected light.

Sometimes a picture receives light in two different ways, which generally produces a bad effect; and this method should therefore be carefully shunned by the artist. In that case nly, where a side-light should be too brilliant, another weaker might be advantageously introduced from the opposite side.

To these observations on natural effects of light, the artist should add those which are furnished to him by study of the works of the

great masters. He will perceive in those of the elder Venetian school all the advantages and admirable harmony of colours produced by a judiciously modified distribution of light and shade. Various effects of light are likewise, in particular, very splendidly exemplified in the masterly productions of Rembrandt.

Review.

Sanitary Reform and Agricultural Improvement; or, How to Promote Health and Abundance. By C. F. Ellerman, Esq. In three Letters. (Letter I.) 2nd Edit. London: *Peirce and Hyde*, 310, Strand.

This pamphlet, addressed to Viscount Morpeth, in his official capacity of Chief Commissioner of Her Majesty's Woods and Forests, is an ably-written treatise, by Mr. Ellerman, late Hanoverian Consul at Antwerp, and whose name is, no doubt, well known to our readers in connection with that of the Deodorising Fluid, patenteed by him, and which has entirely beaten all competitors out of the field. We have perused the pamphlet with much interest, and laid it down with satisfaction. The arguments adduced are clear and conspicuous, and cannot, we are assured, fail of convincing any right-thinking person of the vast superiority of the author's plan over any that have as yet been laid before the public. We will endeavour, in a future number, to present an article embodying Mr. Ellerman's principle of "Sanitary Reform and Agricultural Improvement;" but for the present advise our readers to resort to the fountain-head itself.

Flint.—Flint is a mineral which occurs of all colours, but generally yellowish and dark gray, commonly in a compact amorphous body, rarely crystallised. It is widely spread throughout the earth, in primitive, secondary and alluvial formations, but especially in limestone. Its principal use is for gun-flints, and it is also reduced to a powder and used in the manufacture of porcelain and glass. The manufacture of gun-flints is exceedingly simple, and a good workman will make 1,000 flints a day. The whole art consists in striking the stone repeatedly with a kind of mallet, and bringing off, at each stroke, a splinter sharp at one end and thicker at the other. The splinters are afterwards shaped at pleasure, by laying the line at which it is wished they should break upon a sharp instrument, and then giving it small blows with a mallet. Large manufacturies of gun-flints exist at Muesnes in Berry, in Galicia, and at Avio in the Tyrol.

On the Manufacture of Gas.

Mr. N. Defries, the inventor of the Patent Dry Gas Meter, delivered a highly interesting lecture upon the above subject, at the White Swan Tavern, Deptford, on Wednesday evening, the 16th of February.

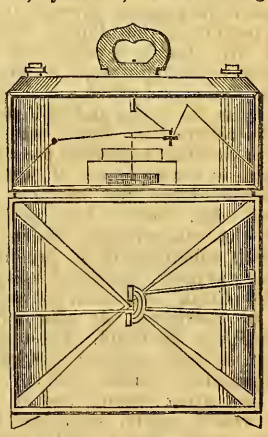
Mr. Defries stated, that in bringing the subject before the meeting, which was one of great importance to the public at large, he would, in the outset, make a few observations relative to the manufacture of gas for illuminative purposes. There were gases of a quality much superior to others; and he was happy to say, that in some of the companies in London, a great improvement had within the last two months taken place, as regarded the quality of the gas manufactured by them. Previous to the period he had stated, the gas generated by most of the London companies was so charged with sulphur and ammonia that it could not be introduced into private dwellings, without injury both to health and furniture, and, in fact, those companies seemed to generate it, not so much for the gas itself as for the sake of the coke—but now he believed there were only two companies in London who generated gas and sent it to their customers charged with sulphur and ammonia. As examples of the improvement which had taken place in the quality of gas, he could not do better than refer to the South Metropolitan and the Greenwich Gas Companies—they being in neighbouring towns—both of which, as well most of the London companies, with the exceptions he had named, made excellent gas for illuminative purposes. The obvious reason why gas was not more used in private houses than it was, arose from the fact of that hitherto generated, by so many companies, being so much impregnated with sulphur.

He would mention as an instance a private gentleman, who, as many others did, usually dined at his club, and seeing the brilliancy and beautiful quality of the gas used there, he resolved upon introducing it into his own residence. He accordingly did so—was supplied first by one company, whose gas was bad, his family not being able to tolerate the sulphur it emitted. He tried another company, and that company supplied him with so excellent a gas, that he not only had it taken into his dining-room, but to every room in his house, including bed-rooms. Now such would be done in almost every case were a good gas manufactured; and he felt justified in saying, that it was the cheapest, the safest, and the clearest light that could be used—cheapest, because it did not cost one-fourth of oil, wax, or tallow—safest, because, while insurance companies rated an extra stove as hazardous, they never did so in the case of gas—and cleanest, because it would not soil the finest linen. It was only, then, necessary that companies should send out pure and good gas to have it generally used. And how was the public to be insured of this good gas? How was it to be divested of the sulphur and ammonia which in many cases so much

impregnated it? Certainly not by the system pursued by some companies, of having superintendents and workmen who understood nothing about the nature of gas, and who, instead of testing it (as they would require to do) almost every half-hour, did not perhaps do so in twenty.

The reason why companies manufacture gas of so bad a description was to save expense, and he was confident that none of the London companies could send out good gas, from the heavy expenses to which they were subjected, at a cheaper rate than 6s. per 1,000 feet. Small country companies could give it considerably cheaper, being subjected to a comparatively small expense; and in Deptford he had not the least hesitation in in saying, that a good article could be manufactured for 5s. 6d. per 1,000 feet. Then their expenses were comparatively trifling to what the London companies were subjected to. In Deptford gas-works could be erected and put in operation for some £6,000 or £7,000, while in London such could not be done under £300,000 or £400,000. And let them think of the expenses of management attending the London gas companies, combining the inspectors, managers, clerks, collectors, and so forth; while their other expenses of an incidental character were very heavy. One company was rated at the enormous sum of £4,000. Great loss was sustained through consumers surreptitiously burning; and the leakages in the mains produced a constant and heavy loss. As a proof of the utter impossibility of preventing loss of gas in the mains, the lecturer stated that he himself had put down a main of 200 yards; and, although every joint was well tested, and no escape discovered, a great deal of gas was lost in its passage through the tube. All the large companies are subject to this evil—therefore, he advised that the best article should be procured; and he trusted that the London companies would not be asked to lower their prices, as the maintenance of a fair rate of payment formed the only chance of obtaining a good article; but be it how it might, he pledged himself to the public to be their watchman, and, to the best in his power, to look after and and support their interests. He, himself, would undertake to erect works in Deptford, and serve the community with good gas at 5s. 6d. per 1,000 feet, provided that community pledged themselves to support him.

Then, with regard to the meter question. He was the inventor of what was termed the dry meter. He had disposed of from 18,000 to 20,090 of these within the last eight years. The dockyard authorities of Woolwich had given him great support, and burned their gas night and day—while, at the Thames Tunnel, his meter had been in use night and day for four years—equal to about 30 years of ordinary use. Their registration was recorded daily, and found to be inflexibly correct. In the Queen's Palace, the Government offices, the large club-houses, churches, chapels, the theatres, &c., his meters would be found working with universal satisfaction. They had also been used in Deptford; but he was told by the superintendent of the Deptford Gas Company that they did not answer, and that many of those used there had stopped. But what was the reason of their doing so? Certainly, if they had given so much satisfaction in all the places he had mentioned where they were used, and while they were, at the same time, so extensively patronised by the London companies, there must be some reason of an extraordinary nature why they were not suited for the temperature of Deptford, and the reason was very plain. It was the bad gas that was manufactured there that was the cause. He had examined several of those meters which had failed, and he found the works of them completely stuffed up with sulphur—so that it was not the fault of the meter or gas-fittings, but the fault of the gas. The original sort of meter that he constructed was, generally speaking, working satisfactorily; but it contained no protection against the gas corroding the machinery; and wherever bad gas was found, corrosion was likely to ensue. It was this cause, and this alone, that had produced the results of which the superintendent of the Deptford works complained. It was to remedy the great evil of the gas affecting the machinery, and stopping the action of the meter, that he invented his new protective rotary valve, by which, as the meeting could see



VERTICAL SECTION OF DEFRIES' PATENT DRY GAS METER.

in the model before them, the machinery was secure from the action of the gas, and which offered the most efficient protection against the greatest impurity. The lecturer having then stated that his meter was the best yet found out for detecting fraud on the part of the gas consumers, as the companies who used them could not possibly be cheated, proceeded to illustrated the mode of manufacturing pure and brilliant gas by means of working machinery, which he had provided for the purpose. Gas generated in a retort at one end of the platform passed from the hydraulic main into what is termed a condenser, formed of zig-zag plates, and filled with water, which cooled it. From thence it passed to the washer, and thence to the purifier—an in-

vention of Mr. Leslie's—which was composed of a series of perforated plates, upon which a composition was laid, which absorbed the ammonia.

The Scotch gas companies, he mentioned, in passing, only used a dry-lime purifier, and they manufactured the best gas he had ever seen, and he did not see why they could not manufacture as good gas as the Scotch did, unless it was that the Scotch were not coke-dealers. But notwithstanding that, whatever might be the merits of Mr. Leslie's purifier—and its merits were, no doubt, great—he thought it might be dispensed with; for if pure gas was generated throughout England, no purifiers would be needed; but as matters stood, it would be of essential service to the inhabitants of such a town as Deptford to be able to purify their own gas. From that purifier, then, it went into the gas-holders, from thence it was carried into one of Mr. Defries' patent meters, which had a plate affixed, and which was capable of registering the 600th part of a foot. He then showed the light of the gas proceeding through the meter, which was of a beautiful appearance, considering the quantity of foul air which, on its first appearance, it had to displace.

By way of illustrating the fact that dry meters are superior to wet meters, inasmuch as that gas, in its passage through any liquid, absorbs a portion of that liquid, Mr. Defries exhibited Mr. Low's napthalising light, in which the gas passes through a sponge, saturated with naptha, and which was shown to add very greatly to the purity and brilliancy of the light. The reverse, he stated, was the case with water; and that gas which passed through water must, in consequence of its absorption of that liquid, have its luminous qualities diminished. Mr. Defries here proceeded to speak of the water-meter, which, besides being so well calculated to be practiced upon by designing persons, possessed many defects, which Mr. Clegg had said, it would be impossible to overcome. It also offered the greatest facilities for fraud. He thought that the companies had suffered enough already from this practice. Suffice it to say, such was the case, to a great extent; and an instance, which he would quote, contained the most conclusive proof. Some little time ago, a person brought him a meter to be repaired, in consequence of its having stopped registering; and he not only discovered to what company the meter belonged, but he found that a hole had been made through the bottom and the partition, by which the gas passed without registering. He also showed the effects produced on one of Mr. Leslie's burners, in which, by the introduction of what is termed a "combustion chamber," a light, which consumes not more than 3½ft. of gas per hour, is made to yield an intensely brilliant light, far exceeding in brilliancy that produced by the universal burner, which consumes about 7ft. of gas per hour. These illustrations created much interest, and elicited much applause. The lecturer, after stating that gas should not be less than 400 specific gravity, then went on to dilate on the importance of good gas, and good meters, to the community. They were matters of general public utility; and he was determined, wherever his meters were found fault with, to go to that place, and investigate into the cause, as he was satisfied that, did they, in any instance, fail, such failure would be caused by the gas, and not from any defect in the meter. He concluded by stating that, should the people of Deptford decide on establishing a new gas company, he would give them all the aid in his power, free of expense; and having been a gas engineer for 23 years, he ought, by this time, to know something of the subject.

On the conclusion of the lecture, Mr. Defries was loudly applauded. A vote of thanks was passed, in acknowledging which Mr. D. regretted that Deptford did not possess a Literary Institution, where they could have met; should, however, such a project be carried out, he would subscribe £5 towards it, and should be happy to deliver the first lecture in it.

Emery is chiefly found in shapeless masses, and mixed with other minerals. It contains about 80 parts in 100 of alumine, and a small portion of iron, is usually opaque, and about four times as heavy as water. The best emery is brought from the Levant, and chiefly from Naxos, and other islands of the Grecian archipelago. It is also found in some parts of Spain, and is obtained from a few of the iron mines in Great Britain. In hardness, it is nearly equal to adamantine spar, and this property has rendered it an object of great request in various arts. It is employed by lapidaries in the cutting and polishing of precious stones; by opticians, in smoothing the surface of the finer kinds of glass, preparatory to their being polished; by cutlers and other manufacturers of iron and steel instruments; by masons in polishing of marble; and, in their respective businesses, by locksmiths, glaziers, and numerous other artisans. For all these purposes, it is pulverised in large iron mortars, or in steel mills; and the powder, which is rough and sharp, is carefully washed, and sorted into five or six different degrees of fineness, according to the description of work in which it is to be employed.

Plugging Avoided.—The evils resulting from plugging in flues for skirting grounds, &c., have led a correspondent, who signs himself "James Ivison," to suggest the manufacture of a brick with a dove-tail mortice in it to receive a plug formed in three pieces,—an ingenious notion deserving of consideration. He says,—"I need not tell you how strongly plugging in green work is to be deprecated, more especially in work no thicker than nine inches; and as to wood bricks, they seldom or ever remain tight. The plug-brick could be made of coarse pottery or hard brick material, or when it did not interfere with the bonding of the work, stone could be used of any size, as in the north of England it is extensively used and worked cheap. The plugs could be fixed in with marine glue, and built in the wall as the work proceeds."—*Builder.*

Architectural Mouldings.

(*Continued from page* 198.)

The Greek ovolo (fig. 7), unlike the Roman ovolo, cannot be described by means of circular arcs, but by finding a number of points in it. For this purpose draw the tangent *a c* from the lower extremity *a*, indicating the inclination of the curve at that point; draw also the vertical line *a b c* through the extreme point *b*, or projection of the curve. Draw *b e* parallel to *c a*, and *a c f* parallel to *c b*; make *e f* equal to *a e*; divide the lines *e b* and *b c* into the same convenient number of equal parts; draw straight lines from the point *a* to the points of division in *b c*, and, similarly, draw straight lines from the point *f* through the points of division in *b e*, meeting successively the lines drawn from *a* to *b c*. The points of intersection of

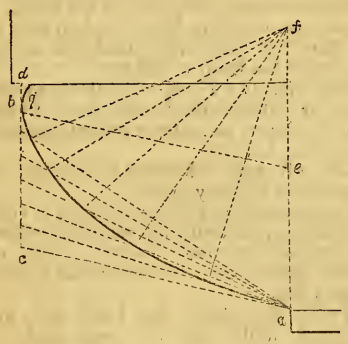


Fig. 7.

the pairs of lines thus drawn will be as many points in the contour of the moulding, and a curve line traced so as to embrace these points will be the greater part of the contour. The remaining part *b g*, if required to be determined in the same manner, may be found by drawing lines from *a* instead of *f*, through the points in *b e*, and from *f* to *b d*, instead of from *a* to *b c*. Of course, this will give a good deal more of the curve than is necessary. The curve drawn in this manner is a portion of an ellipse, somewhat greater than a fourth of the whole circumference. The recess of the moulding, *b g d*, at its projecting point, is denominated a *quirck*.

The Greek cavetto (fig. 8) is somewhat elliptical, and may be described by a combination of two circular arcs, thus:—let *a b* be the projection of the moulding, and *a c* the vertical line, from the point *a* draw *b d* vertically from *b* and make it equal to *b e*, which is two-thirds of *b a*; from the centre *d* describe the arc *b i*; draw *i n* perpendicular to *e d*, make *n o* equal to *n i*, draw *o p* perpendicular to *a c*, and meeting *e d* produced in *p*, and from the centre

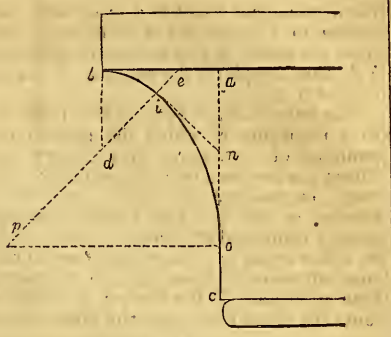


Fig. 8.

p thus found, describe the arc *i o*. The contour *b i o c* will represent the Greek cavetto.

The conge, or scape (figs. 9 and 10), is a species of cavetto, and is not recognised as a distinct moulding. In section it is partly concave and partly straight, the latter part being vertical. To describe it, let *a b* be the projec-

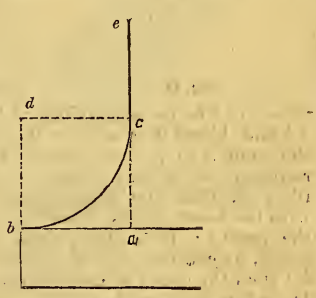


Fig. 9.

tion of the moulding from the vertical line *a e*, which it is required to touch; and first, if the projection *a b* is equal to the height of the curve, make *a c* (fig. 9) equal to *a b*; and from the points *b* and *c* as centres, with *a b* or *a c* as a radius, describe the arcs intersecting at *d*; from *d*, with the same radius, describe the arc

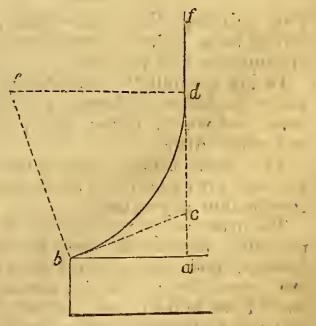


Fig. 10.

b c; this completes the contour of the conge. If the conge contains less than a quarter of a circle, as in fig. 10, let *b e* be the tangent to the curve at the point *b*; on the vertical *a f* set off

the distance *c d* equal to *c b;* draw *b e* at right angles to *b c*, and *d e* at right angles to *c d;* from the point *e*, as a centre, describe the arc *b d;* this completes the contour of the moulding *b d f*.

The cymatium, or ogee, is the term applied to a moulding of which the section is compounded of a concave and convex surface. There are two species of cymatium: the cyma recta, or, simply the cyma, and the cyma reversa or talon. The Roman cymatium is usually composed of circular arcs, which may be either equal to or less than one-fourth of a circumference. Thus, in the accompanying figures, 11 and 12, the former of which represents the cyma recta, and the latter the talon,

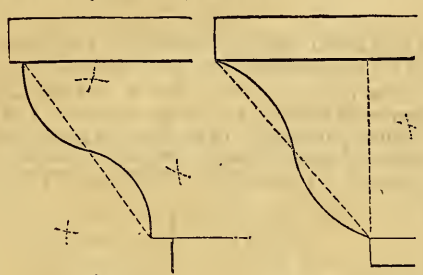


Fig. 11. Fig. 12.

let *a* and *b* be the extremities of the curve, join *a b* and bisect it equally at the point *c;* from the point *a* and *c*, as centres, with the same radius, describe arcs cutting at the point *e d:* likewise, from the points *b* and *c* as centres, with the same radius, describe arcs cutting at the point *e;* from the points *d* and *e*, thus found, as centres, describe the arcs *a c* and *c b;* then the curve of double flexure, *a c b*, fig. 11, is the cyma recta, and the curve *a c b*, fig. 12, is the cyma reversa or talon. In the former, it will be observed, the concave portion of the surface is uppermost, whereas in the latter it is undermost.

(To be continued.)

General Rules for the Painter.

For painting the flesh—black, blue black, white, lake, carmine, *orpiment*, yellow ochre, ultramarine and varnish.

To lay the pallette:—first, lay carmine and white in different degrees; second, lay *orpiment* and white, ditto: third, lay blue black and white ditto.

The first sitting, make a mixture on the pallette for expedition, as near as the sitter's complexion as you can.

To preserve the colours fresh and clean in painting; it must be done by laying on fresh colours, and not rubbing them in when they are once laid; and if it can be done, they should be laid in their proper places at first, and not be touched again, because the freshness of the colours is tarnished and lost, by mixing and jumbling them together; for there are certain colours which destroy each other by the motion of the pencil when mixed to excess; for it may be observed, that not only is the brilliancy, as well as freshness of the tints considerably impaired, by indiscriminate mixing and softening; but if colours be too much worked about with the brush, the oil will always rise to the surface, and the performance will turn comparatively yellow in consequence.

Never give the least touch with your pencil until you have present in your mind a perfect idea of your future work.

Paint at the greatest possible distance from your sitter, and place the picture occasionally near your sitter or sometimes under him, so as to see both together.

In beautiful faces, keep the whole circumference about the eye in a mezzotinto, as seen in the works of Guido, and the best of Carlo Maratti.

Endeavour to look at the subject, or sitter before you, as if it was a picture; this will in some degree render it more easy to be copied.

In painting, consider the object before you, whatever it may be, as made out more by light and shadow, than lines.

A student should begin his career, by a careful finishing and making out of the parts, as practise will give him freedom and facility of hand; a bold and unfinished manner is generally the habit of old age.

On Painting a Head.—Let those parts which turn or retire from the eye, be of broken or mixed colours, as being less distinguished, and nearer the borders.

Let all your shadows be of one colour; glaze them till they are so.

Use red colours in the shadows of the most delicate complexions, but with discretion.

Contrive to have a screen, with red or yellow colours on it, to reflect the light on the sitter's face.

Avoid the chalk, the brick-dust, and the charcoal, and think of a pearl, and or ripe peach.

Avoid long continued lines in the eyes, and too many sharp ones.

Take care to give your figures a sweep or sway, the outlines in waves, soft and almost imperceptibly against the background.

Never make the coutour too coarse.

Avoid all those outlines and lines which are equal, which make parallels, triangles,&c.

The parts which are nearest to the eye appear most enlightened, deeper and shadowed, and better seen.

Keep broad lights and shadows, and also principal lights and shadows.

Where there is the deepest shadows, it is accompanied by the brightest light.

Let nothing start out, or be too strong for its place.

Squareness has grandeur; it gives firmness to the forms: a serpentine line, in comparison, appears feeble and tottering.

The young pupils are better taught by those who are in a small degree advanced in knowledge above themselves; *and from that cause proceeds the peculiar advantage* of studying in academies.

The painter who knows his profession from principles, may apply them alike to any branch of the art, and succeed in it.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

(*Continued from page* 201.)

DADDOCK (in carpentry), wood thoroughly rotten.

DEBRUISED (in heraldry), a *pale*, &c., borne upon any beast in an escutcheon; expressed the beast is *debruised* of the *pale*.

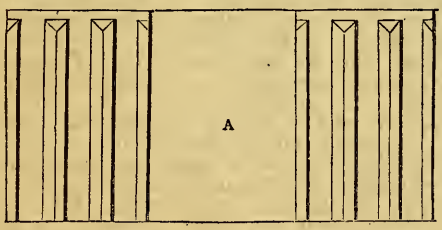
DEMI-BASTION (in fortification), a half bastion, or a description of fortification which has only one face and one flank.

DEVOURING (in heraldry), when fishes are borne in an escutcheon, in a feeding posture, the heralds term it *devouring*.

DEXTER POINT (in heraldry), the right side or point in an escutcheon.

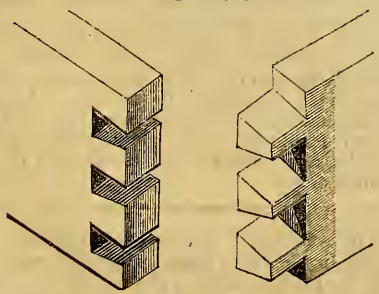
DIALLEL LINES (in geometry), lines that run across or cut one another.

DITRIGLYPH (in architecture), a space com-



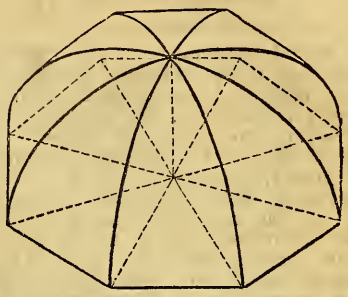
prehended between two triglyphs (marked A in the engraving).

DOVETAIL (in carpentry), a method by



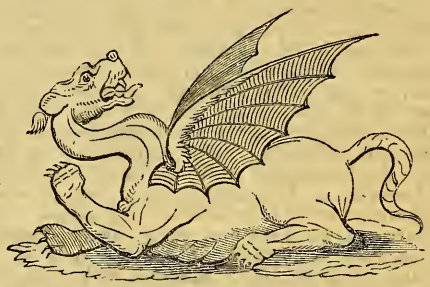
means of which two pieces of wood are joined together, as shown in the engraving.

DOME (in architecture), a kind of vaulted roof or covering, in the shape of some portion



of a sphere, ellipsoid, &c., and frequently constructed of masonry.

DRAGON (in the mythology of the arts), a fabulous animal or reptile, supposed to be a



species of winged serpent, that was held in divine estimation by some of the earliest nations of antiquity.

DRAPERY (in painting and sculpture), the

dress of a figure in a picture or a statue.

(To be concluded.)

DEATH OF SERAPHIN VLIEGER.—This celebrated Flemish Artist has been carried off by typhus fever at the age of forty-one. As early as the year 1824, he was recognised as the first painter of the Flemish school: in 1826, the city of Brussels awarded him the gold medal, and in 1829, the Netherlands presented him with 500 florins; he likewise received the gold medal of Groningen. M. Vlieger was first professor of the Academy of Alost.

Society of Arts.

The second exhibition of this meritorious society, to which we briefly adverted in a former number, shows a marked improvement on the preceding one. In number, variety, and beauty, the specimens exposed surpass those of 1847. The first manufacturers in the country, especially in those elegant departments where decorative manufacture rises into fine art, have contributed to the show, which does honour to the taste and inventive genius of Great Britain. It is a reproach sometimes addressed to us by foreigners, that in our desire for solidity we neglect grace, and aim at usefulness almost to the exclusion of ornament. The superior durability of our manufactures, and their great aptitude for the end proposed, are on all hands admitted; but these very qualities are sometimes assumed, by critics from beyond the channel, to be pursued until the gratification of the eye is lost sight of. We would have any who entertain such opinions, and who now favour our shores with their presence, to pay a visit to John-street, Adelphi, and admire the combination of the useful and the graceful they there will find. Our columns are too full for that lengthened notice the exhibition really deserves, or for more than a very cursory glance at a few of its most striking points. On entrance we were first struck by a gigantic specimen of *papier mâché*, in the form of a large sofa, profusely adorned with flowers, birds, and butterflies in mother-o'pearl. The effect is rich in the extreme, almost to gorgeous, perhaps, for general adoption; a room thus furnished would be dazzling. A cheval-screen of the same material, and by the same manufacturer, is exceedingly graceful and less gaudy. A more sober style of adornment, also applicable to various kinds of furniture, is the wood carving by Jordan's machinery. A panel of game suspended over the chimney piece in the chief room is charmingly sculptured, and it is difficult for persons unacquainted with the process to understand how any machine can impart such correctness of form, such delicacy of finish. There is a softness in the fur, a flutter in the feathers, which stand out in strong relief, and lack but colour exactly to assimilate nature. In wood manufactures the modern *marquetérie* is admirable, Holland's loo table tops especially attracting many gazers. They have dangerous rivals for public favour in their immediate vicinity, but in a different style of art. The Mintons have a host of elegant specimens of their various productions in earthenware, encaustics, tesseræ. Their garden pot and stand and garden seat are capital imitations of old wood twined with ivy; their hearth, to one of Sylvester's beautiful grates, is deserving of high praise, but their painted chimney slabs are most generally attractive. Those painted in flowers are very exquisite, and surpass those of Copeland, on the same side of the room. The latter manufacturer, however deserves all credit for some very pretty slabs of Etruscan and Mosaic designs, and for a charming view of Cochem castle, of picturesque and artistical effect. In painted china these chimney slabs are numerous and good; with their exception, the class of earthenware is generally poor. In Mosaics, Russell's new form of tesseræ is worthy of notice. By the adopting the triangle of Plato, he obtains a great increase in the number of combinations. But of this class the most remarkable and novel specimens are on the opposite side of the large room, Nos. 602 and 603. These are two tesselated slabs by a new process, possessing for chief advantages over all previous ones, great diminution in the cost of production, important increase of durability, and the facility of employing tesseræ of the minutest dimensions at small proportionate augumentation of expense. The hardness of the material is extraordinary. We saw a strong knife struck violently across one of the slabs, sparks followed, but not a scratch remained. The tesseræ, which may be made as small as those employed in mosaic brooches, are placed by machinery in every variety of design and colour. The invention has not yet been brought into general use, and when it is, we anticipate its application to very many purposes, for which mosaics, especially of the finer sort, have hitherto been too expensive. Next to these curious specimens are Magnus's printed slates, the first attempt of the kind, and a highly successful one. Another new art by the same hand, issued from the Pimlico slate works, is the enameling on slate, an excellent superficial imitation of the Florentine mosaics, produced at comparatively trifling cost. Then we have Pratt's Anglo-Etruscan vase, the largest specimen of English earthenware ever produced, bought by Prince Albert, who has ordered a companion vase.

The north wall of the large room is occupied by a large number of specimens of statuary, porcelain, and art manufactures, comprising much beauty and some novelty, but concerning which our space commands us to abstain from detail. Hetley and Co. have some brilliant specimens of stained glass, whose bright colours attract much attention; and the daguerreotypists are in great force. To show the rapidity of the process, these ingenious gentlemen have actually caught a sunbeam, and transferred it to their metal. A bank of cloud, drifting in a high wind, is also rendered clearly, and without the slurred appearance which rapid motion might have been expected to impart. Another plate, showing the peculiarities of positive and negative colours in the photographic action, will be appreciated by connoisseurs in this branch of art.

The Royal Academy Exhibition.—A writer in the *Times* suggests that the council of the Royal Academy should issue season tickets, at 5s. each, as a boon to those who would really enjoy the contemplation of the works of art exhibited there.

Metallisaton of Plaster-Casts.

By M. A. Brandely.

The plaster-casts are first immersed in melted wax, either white or yellow, for the purpose of rendering the plaster incapable of absorbing moisture, and giving an appearance of softness. Any excess of wax may be removed, and the cast allowed to cool.

Then take—

Sulphuret of carbon	1,000 parts
Good clear phosphorus	250 parts

A few minutes after having shaken the phosphorus in the sulphuret it is entirely dissolved.

Then take—

Silver in fine grains	100 parts
Pure nitric acid	250 parts

Dissolve the silver, evaporate the excess of acid, and dilute the solution with 1,000 parts of distilled water. When the nitrate of silver is dissolved, take two basins, each capable of containing two quarts; in one place the solution of phosphorus, and in the other the nitrate of silver solution. The quantities above given are the result of a great number of trials, and they are those which have been found to answer the best. The plaster-casts fixed to a copper wire are dipped in the solution of phosphorus, and after having been allowed to drain, are placed flat on a plate of sheet-iron or zinc, with the engraved side uppermost.

When all the sulphuret of carbon has evaporated, the casts will commence to give off phosphoric vapours; it is then ready to be dipped in the solution of nitrate of silver. The bottom as well as the side should be completely dry before this immersion. Care must be taken that every part of the cast should be covered with the solution, and to ensure this it may be touched over with a badger's-hair brush after it is taken out of the silver solution, otherwise a hole would appear in the point not touched with the solution. The cast is then allowed to drain, and is afterwards suspended by the wire to dry.

The presence of phosphorus produces the reduction of the silver, which soon takes its natural colour. The moment this has taken place, plunge it into the phosphorus solution, where it may remain for from eight to fifteen days; instead of remaining white it assumes a dark colour by the evaporation of the phosphoric acid, which re-acts on the silver and the oxide. In this state the casts receive an equal coating of metal, but less freely, because the oxides are not so good conductors as the metals themselves.

The process finished, carefully pour the solution of phosphorus into a stoppered bottle, which should be placed in the cellar, or in a large vessel of water. If it should happen that during the operation any of the solution has fallen on the fingers, they should be immediately dipped in nitrate of silver solution, to prevent the action of the phosphorus on the skin.

The process should be performed on a marble slab, or, what is better, on a plate of zinc, to avoid the accidents which might arise from the action of the phosphorus on wood.

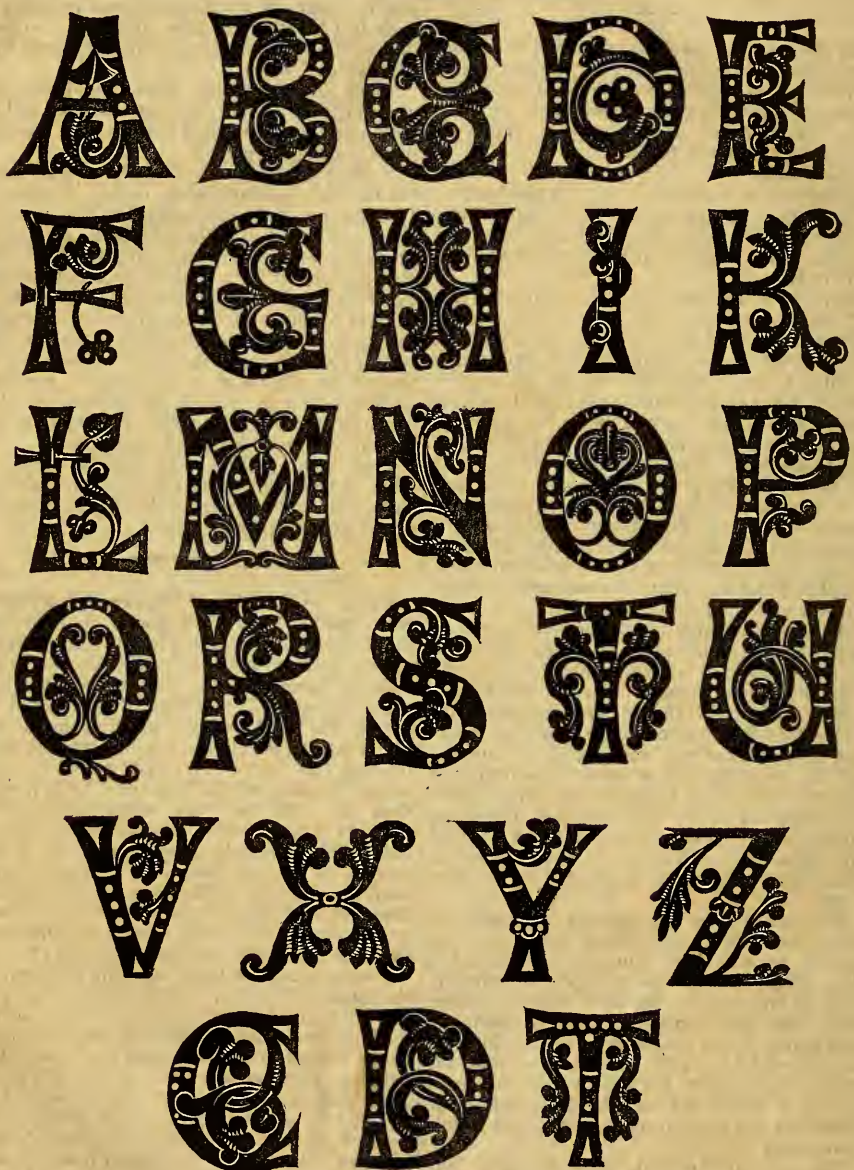
If the casts requiring to be metallised are of a large surface, lay them over a sheet of cast-iron by means of a triangle of iron reaching to their full length, and pass over their surface the solution of phosphorus, and afterwards that of nitrate of silver.

When the casts have been metallised, and are dry, they should be brushed over lightly with a soft hat-brush and the metal on the back parts may be scraped off.

Neither plumbago nor metallic powders, nor the method recommended by Mr. Walker, of London, are to be compared to this process. However soiled it might have been, a cast thus prepared becomes certain in the effect produced, whether it be wished to obtain reproductions from it by the electrotype process, or to have a simple covering of metal to protect the casts. Another advantage is that the metallic deposit is more agreeable to the eye than that of the plumbago, or the metallic powders. Unfortunately it cannot be applied to casts taken in stearine, with which we must for the present continue the use of plumbago.

Casts taken in D'Areet's fusible metal require no other preparation than the plaster-casts, viz., to be dipped in the melted wax, and a wire connected with them.

Casts of Leaves of Plants.—Very accurate casts of leaves of plants may be prepared by a very simple process. A quantity of fine grained sand, in rather a moist state, must be provided, on the surface of which a leaf selected for casting from should be laid, in the most natural position the taste of the artist can effect, by banking up the sand beneath its more elevated parts by the lateral pressure of the blade of a knife; when thus the leaf has been supported in every part, its surface should, by means of a broad camel-hair pencil, be covered over by a thin coating of wax and Burgundy pitch, rendered fluid by heat: the leaf being now removed from the sand, and dipped into cold water, the wax becomes hard, and at the same time sufficiently tough to allow the leaf being ripped off from the wax mould, without altering the form of the latter. The wax mould is now placed on the sand, and banked up in every part, as the leaf at first was; and then an edge or border being raised or sand around the leaf, at a sufficient distance, very thin plaster of Paris is then poured over the leaf, and a camel-hair pencil is used to brush the fluid plaster into every hollow on the surface, and exclude air-bubbles. As soon as the plaster is set, it will be found, on taking it up from the sand, that the heat generated during the setting of the plaster, will have softened the wax, and that the same may be dexterously rolled up from the impression thereof on the plaster: and thus the most beautiful and perfect moulds may be obtained for making any number of plaster casts in relievo, of the leaf which has been selected.



GERMAN ALPHABET—ELEVENTH CENTURY.

The Royal Institute of British Architects.

THE Royal Institute of British Architects has lately published its lists of prizes for architectural designs, &c., for the present year. We present our readers with the following extract from the resolutions:—

"Royal Medal.

"Her Majesty having been pleased to grant her gracious permission for the Royal Medal to be conferred on such distinguished Architect or Man of Science, of any Country, as may have designed or executed any building of high merit, or produced a work tending to promote or facilitate the knowledge of Architecture, or the various branches of Science connected therewith,

"Resolved,—That the Royal Gold Medal be awarded this year to the Author of some Literary Publication connected with Architecture.

"N.B.—The Council will, in January, 1849, proceed to take into consideration the appropriation of the Royal Medal accordingly.

"Institute Medal.

"Resolved,—That the Silver Medals of the Institute be awarded to the Authors of the best Essays on the following subjects:—

"1. On the peculiar characteristics of the Palladian School of Architecture, and a comparison and contrast of its elementary principles and details with those of ancient Roman Art.

"2. On the best manner of covering the Roofs, and forming the Flats and Gutters of Buildings,—the nature of the several materials used in various parts

of the country for these purposes,—their most effectual and economical application,—the inclination to be given to the different parts, and the other practical precautions to be adopted, to prevent snow and rain penetrating into the building.

"N.B.—Each Essay to be written in a clear and distinct hand, on alternate pages, and to be distinguished by a Mark, or Motto, without any name attached thereto.

"Soane Medallion.

"Resolved,—That the Soane Medallion be awarded to the best Design for a Building to serve as a National Repository and Museum for the illustration and exhibition of the productions of the Industrial Arts, with all suitable accessories, and accommodation for the delivery of Lectures, and for the purposes of chemical and other experiments.

"The successful Competitor, if he go abroad, will be entitled to the sum of £50 at the end of one year's absence, on sending a satisfactory evidence of his progress and his studies.

"N.B.—The competition for the Soane Medallion is open to all Members of the Profession under the age of twenty-five years.

"Each Essay and set of Drawings is to be delivered at the Rooms of the Institute, on or before the 31st of December, 1848, by Twelve o'clock at noon."

On the Use of Oxide of Zinc, or Zinc White, in Painting.—M. V. Dumas, President of the Academy of Arts and Sciences, of Dijon, claims for M. de Guyton Morveau, the discovery of the application of oxide of zinc to painting, as far back as the year 1782. The Royal Academy of Architecture, of Paris, appointed a commission in 1786 who made a favourable report on its employment. "We are indebted," said the commission, "to the zeal and enlightened views of M. de Guyton Morveau, for the numerous and repeated experiments which have been made on the zinc white. From these experiments it is evident that the zinc white possesses two most important advantages over white lead; the first is, that its use is not at all injurious to health; the second is, that it retains its freshness and whiteness without being, like white lead, affected by sulphurous vapours, and covers at least one-third more of surface." "The only thing," says M. Dumas, "which astonishes me is, that its application to the painting of apartments has not been continued and extended. This, in my opinion, has been owing to the high price of the metal, which has prevented the zinc white from entering into mercantile competition with white lead." As much attention has of late been called to this subject, the Academy of Dijon is prosecuting some experiments, the results of which is promised to be shortly communicated to the Academy.

Free Exhibition of Art Manufactures.—This exhibition will remain open until the 29th of this month (April).

The Theory of Painting;

deduced from the "discourses" of sir joshua reynolds.

(*Continued from page* 143.)

To the principle I have laid down, that the idea of beauty in each species of beings is an invariable one, it may be objected, that in every particular species there are various central forms, which are separate and distinct from each other, and yet are undeniably beautiful—that in the human figure, for instance, the beauty of Hercules is one, of the Gladiator another, of the Apollo another, which makes so many different ideas of beauty.

It is true, indeed, that these figures are each perfect in their kind, though of different characters and proportions; but still none of them is the representation of an individual, but of a class. And as there is one general form, which, as I have said, belongs to the human kind at large, so in each of these classes there is one common ideal and central form, which is the abstract of the various individual forms belonging to that class. Thus, though the forms of childhood and age differ exceedingly, there is a common form in childhood, and a common form in age, which is the more perfect, as it is more remote from all peculiarities. But I must add further, that though the most perfect forms of each of the general divisions of the human figure are ideal, and superior to any individual form of that class, yet the highest perfection of the human figure is not to be found in any one of them. It is not in the Hercules, nor in the Gladiator, nor in the Apollo, but in that form which is taken from all, and which partakes equally of the activity of the Gladiator, of the delicacy of the Apollo, and of the muscular strength of the Hercules. For perfect beauty in any species must combine all the characters which are beautiful in that species. It cannot consist in any one to the exclusion of the rest: no one, therefore, must be predominant, that no one may be deficient.

The knowledge of these different characters, and the power of separating and distinguishing them, is undoubtedly necessary to the painter who is to vary his compositions with figures of various forms and proportions, though he is never to lose sight of the general idea of perfection in each kind.

There is, likewise, a kind of symmetry, or proportion, which may properly be said to belong to deformity. A figure lean or corpulent, tall or short, though deviating from beauty, may still have a certain union of the various parts, which may contribute to make them on the whole not unpleasing.

When the artist has by diligent attention acquired a clear and distinct idea of beauty and symmetry—when he has reduced the variety of nature to the abstract idea, his next task will be to become acquainted with the genuine habits of nature, as distinguished

from those of fashion. For in the same manner, and on the same principles, as he has acquired the knowledge of the real forms of nature, distinct from accidental deformity, he must endeavour to separate simple chaste nature from those adventitious, those affected and forced airs or actions, with which she is loaded by modern education.

Perhaps I cannot better explain what I mean, than reminding you of what was taught us by the Professor of Anatomy, in respect to the natural position and movement of the feet. He observed, that the fashion of turning them outwards was contrary to the intent of nature, as may be seen from the structure of the bones, and from the weakness that proceeded from that manner of standing. To this we may add the erect position of the head, the projection of the chest, the walking with straight knees, and many such actions, which we know to be merely the result of fashion, and what nature never warranted, as are sure that we have been taught them from children.

I have mentioned but a few of those instances in which vanity or caprice has contrived to distort and disfigure the human form; your own recollection will add to these a thousand more of ill-understood methods, which have been practised to disguise nature among our dancing-masters, hair-dressers, and tailors, in their various schools of deformity.*

However the mechanical and ornamental arts may sacrifice to fashion, she must be entirely excluded from the art of painting; the painter must never mistake this capricious changeling for the genuine offspring of nature; he must divest himself of all prejudices in favour of his age or country; he must disregard all local and temporary ornaments, and look only on those general habits which are everywhere and always the same; he addresses his works to the people of every country and every age, he calls upon posterity to be his spectators, and says with Zeuxis, *in æternitatem pingo.*

The neglect of separating modern fashions from the habits of nature, leads to that ridiculous style which has been practised by some painters, who have given to Grecian heroes the airs and graces practised in the court of Louis the Fourteenth; an absurdity almost as great as it would have been to have dressed them after the fashion of that court.

To avoid this error, however, and to retain the true simplicity of nature, is a task more difficult than at first sight it may appear. The prejudices in favour of the fashions and customs that we have been used to, and which are justly called a second nature, make it too often difficult to distinguish that which is natural from that which is the result of education; they frequently even give a predilection in favour of the artificial mode; and almost every one is apt to be guided by those local prejudices, who has not chastised his mind and regulated the instability of his affections by the eternal invariable idea of nature.

Here, then, as before, we must have recourse to the ancients as instructors. It is from a careful study of their works that you will be enabled to attain to the real simplicity of nature; they will suggest many observations which would probably escape you, if your study were confined to nature alone. And, indeed, I cannot help suspecting, that in this instance the ancients had an easier task than the moderns. They had, probably, little or nothing to unlearn, as their manners were nearly approaching to this desirable simplicity; while the modern artist, before he can see the truth of things, is obliged to remove a veil, with which the fashion of the times has thought proper to cover her.

Having gone thus far in our investigation of the great style in painting—if we now should suppose that the artist has found the true idea of beauty, which enables him to give his works a correct and perfect design—if we should suppose, also, that he has acquired a knowledge of the unadulterated habits of nature, which gives him simplicity—the rest of his task is perhaps less than is generally imagined. Beauty and simplicity have so great a share in the composition of a great style, that he who has acquired them has little else to learn. It must not, indeed, be forgotten, that there is a nobleness of conception, which goes beyond anything in the mere exhibition even of perfect form; there is an art of animating and dignifying the figures with intellectual grandeur, of impressing the appearance of philosophic wisdom or heroic virtue. This can only be acquired by him who enlarges the sphere of his understanding by a variety of knowledge, and warms his imagination with the best productions of ancient and modern poetry.

A hand thus exercised, and a mind thus instructed, will bring the art to a higher degree of excellence than perhaps it has hitherto attained in this country. Such a student will disdain the humbler walks of painting, which, however profitable, can never assure him a permanent reputation. He will leave the meaner artist servilely to suppose that those are the best pictures which are most likely to deceive the spectator. He will permit the lower painter, like the florist or collector of shells, to exhibit the minute discriminations which distinguish one object of the same species from another; while he, like the philosopher, will consider nature in the abstract, and represent in every one of his figures the character of its species.

(To be continued.)

To Clean Marble, Jasper, Porphyry, &c.—Mix up a quantity of the strongest soap-lees with quick lime, to the consistence of milk, and lay it on the stone, &c., for twenty-four hours, clean it afterwards, and it will appear as new.—This may be improved by rubbing or polishing it afterwards with fine putty powder and olive oil.

* "Those," says Quintilian, "who are taken with the outward show of things, think that there is more beauty in persons who are trimmed, curled, and painted, than uncorrupt nature can give; as if beauty were merely the effect of the corruption of manners." R.

Biography.

GEORGE BIRKBECK, M.D.

George Birkbeck was born on the 10th of January, 1776, at Settle, in Yorkshire, where his father was an eminent banker and merchant. At an early age, he discovered a decided predeliction for mechanical pursuits, as well as those of a scientific and philosophical description, which latter, no doubt, led to his selection of the medical profession for his future career. Passing over some extraordinary exhibitions of talent on his part, when but a mere student, we turn to that glorious epoch in his life, when, prompted by the purest spirit of philantrophy, he conceived the idea of communicating the light of science to the untutored mind of the humble and laborious artisan by the establishment of *Mechanics' Institutions.*

There is something peculiarly interesting to the reflective mind in the circumstances which gave rise to the formation and accomplishment of a plan so obviously calculated to confer upon society advantages, of which the extent and importance cannot even as yet be adequately appreciated. Having been appointed Professor of Natural Philosophy to the Andersonian Institution at Glasgow, he required, in order to illustrate a course of lectures, many pieces of apparatus to be prepared which the institution did not possess;—and as no philosophical instrument maker competent to the task, was at that time resident in Glasgow, the lecturer was himself obliged to have recourse to such workshops as appeared best adapted to his wishes, and to superintend in person the manufacture of the requisite apparatus. By this means he was brought into immediate communication with the operative artisans of Glasgow, and during this intercourse, his acute penetration discovered such evident indications of latent genius in the minds of the workmen, accompanied by a kind of intuitive anxiety for the acquisition of knowledge, that the spontaneous feeling of regret, excited by their want of scientific information, was instantly succeeded by a benevolent wish that the means of obtaining this information could be placed within their reach.

Among the various pieces of apparatus thus constructed under the personal direction of the Doctor, was a *model* of the *centrifugal pump*, and it was in the cellar of the tinman's shop, where this model was completed,—when surrounded by the workmen who had constructed it unconscious of its use, or the principle upon which it acted;—when contemplating the powerful expression of intelligent curiosity depicted in their looks, and replying to the numerous inquiries suggested by the novel construction of the apparatus;—it was in this place, and at this moment, that the thought first darted across his mind, of delivering a course of gratuitous lectures for the scientific instruction of the humble and unenlightened operative mechanics of Glasgow.

The plan which resulted from the Doctor's reflections on this interesting subject was soon matured, and in the month of March, 1800, he communicated his benevolent scheme to the trustees of the Andersonian Institution, in the hope of obtaining their concurrence; but here he was doomed to disappointment—his plan being considered—as are generally most plans promulgated for the benefit of our fellow creatures—visionary and impracticable. Nothing daunted, however, by the cold reception of his project in this quarter, upon his return to his native place, at the close of the session, he issued a prospectus of the different courses of lectures to be delivered during the ensuing session; and his favourite plan of establishing a "Mechanics' Class" still predominating in his mind, he added an able explanation of the means by which this could be effected.

A printed invitation was circulated among the Glasgow manufactories as soon as the usual business of the next session was commenced, containing an offer of tickets for the admission of the most intelligent operatives in each manufactory into the mechanics' class. In reply to this, a few lists of applicants for admission were received, and the promised tickets having been issued, Dr. Birkbeck delivered the first lecture of his course on the mechanical affections of solid and fluid bodies to a class of 75 pupils. So powerful was the impression made upon this limited audience by the lecturer's instructions, and so rapidly was this impression communicated to other workmen, that the next lecture was attended by 200; at the third, the number was augmented to upwards of 300; and at the fourth, at least 500 were present.

Dr. Birkbeck continued these lectures during the two succeeding sessions; the mechanics evincing throughout the same unmixed feelings of approbation and gratitude; and in the summer of the year 1804, circumstances induced him to relinquish the office of Professor in the Andersonian Institution, in which situation he was succeeded by Dr. Ure.

In the May of the following year, the Doctor was married to Miss Catherine Lloyd, youngest daughter of Sampson Lloyd, Esq., of Farm, near Birmingham. He afterwards passed a few weeks in travelling, and, according to his original intention, he then came to London, where he established himself as a physician; and from his extensive connections, and the unlimited confidence reposed in his medical skill, his practice rapidly increased, and his prospects of an honourable independence, as the merited reward of his labours, were in the highest degree flattering; when, however, the untimely decease of his domestic partner plunged him into the greatest mental distress; but by a persevering attention to the important duties of his profession, his mind gradually resumed its serenity, and for several years afterwards, he continued to advance rapidly towards the highest degree of eminence as a physician.

Dr. Birkbeck entered a second time into the married state in July, 1817, when he was united to Miss Anna Margaret Gardner, youngest daughter of Henry Gardner, Esq., of Liverpool.

In the midst of his successful professional career, Dr. Birkbeck still retained his attach-

ment to those scientific pursuits in which he had formerly attained so much eminence, and the premises of the London Institution in Moorfields, of which he was one of the original projectors, being now completed, he offered to deliver a gratuitous course of Lectures on Natural and Experimental Philosophy, and this handsome offer being gratefully accepted by the managers, he delivered, during the spring of 1820, seventeen lectures to crowded and delighted audiences. He also delivered other courses of leetures at the same place in the years 1823 and 1824.

Many years had elapsed since the early object of his ambition, the formation of a "Mechanics' Class" at Glasgow, had been carried into effect, and having had, during this long interval, but little communication with that city, he had not received much information of the progress of the class. In the supplement to the "Encyclopædia Brittanica," Mr. Dugald Bannatyne had spoken of Dr. Birkbeck's plan in the highest terms of eulogy, and had expressed an anxious wish that it should be acted upon in all the principal manufacturing towns; this, added to various other circumstances, particularly a suggestion which appeared in a periodical publication, in the shape of a letter addressed to the mechanics of London, to establish a Mechanics' Institution in the metropolis, induced Dr. Birkbeck to co-operate in the undertaking, and the result was the foundation of the Mechanics' Institution in Southampton-buildings, Chancery-lane, the first stone of which was laid on the 2nd of December, 1824, by the Doctor himself.

This was the first great step made towards the improvement of the working classes. Other institutions rapidly sprang up in all parts of the country, on the principle of the original one; and Dr. Birkbeck before his decease had the glorious satisfaction of hearing his name pronounced by thousands of mechanics, with esteem and gratitude, as that of their best benefactor.

He died on the 1st of December, 1841, of a severe internal disease which occasioned great suffering. He left a son by his first wife, and two sons and two daughters by his second wife. His funeral was attended by a large procession of the working classes, and members of the Mechanics' Institute and other societies, the Committee of the Polish Refugees and a number of Poles; and among the private carriages was that of the Turkish Ambassador. Altogether, about 1,000 persons were present.

Dr. Spurgin's Patent Pen.—Dr. Spurgin, the inventor of the endless ladder figured in the article "Crane" in our "Glossary," has lately taken out a patent for a new pen, involving the principles of capillary attraction and galvanism. The means employed are extremely simple:—Within a common iron pen, a small plate of zinc, bended to follow the line of the pen, is secured by points of solder at a short distance from the former, by means of which the ink is securely retained, and a galvanic current kept up.

Tracing Papers, &c.

1. *a.—Common Transparent Paper.*—Mix together equal parts of olive oil and turpentine, to which add a little sugar of lead, and rub this mixture upon tissue paper. This is very tedious in drying, and remains for a long period.

b.—Lay over the tissue paper a thin coat of copal varnish, or mastic varnish. This makes a clear, good paper, but it will not bear ink or water colour. In the latter respect paper washed over with spirit varnish is superior.

2. *Best Transparent Paper*—Mix together by a gentle heat, one ounce of Canada balsam, and a quarter of a pint of spirits of turpentine; wash it as before, over one side of tissue paper. This dries quickly, is perfectly transparent, and is not greasy, therefore does not stain the object upon which it may be placed.

3. *Transparent Guide Paper for Oriental Tinting.*—Use the mixture of Canada balsam and turpentine, as above, on both sides of a sheet of thick drawing paper; it will become beautifully transparent. It takes some days in drying, and, when new, sticks somewhat to the fingers.

[Ink and water-colours, when to be used upon any kind of transparent oiled paper, must have a very small quantity of *gall* mixed with them, which will flow readily upon the greasy surface. Transparent papers are sold at extravagant prices, notwithstanding the vast consumption there is for them. The architect draws chiefly upon them the numerous designs requisite in his profession. The engraver is by their use enabled to transfer to the wood-block or to the metallic plate an accurate design, and at once to reverse it by merely turning over the paper; the artist, with this transparent copy, can make any number of objects similar in attitude, in size, and in detail, and all can procure facsimiles of patterns, of prints, of autographs, and every object of artistical decoration and interest, by merely laying the tracing paper above the subject to be copied, and drawing with a pencil whatever is seen beneath. It is sometimes requisite to transfer a delineation from transparent paper on to another and less flimsy material, for example, an elaborate architectural plan, when first formed, must of necessity have upon it numerous false lines, marks of the points of the dividers, &c., which, in the finished plan, would be unsightly; to remedy this it is drawn first on common paper, and then transferred to a thicker and cleaner sheet. This process involves the use of the opaque tracing papers; these are of such a nature that when the prepared side is placed downwards, and anything is written with a point upon the back, a part of the composition comes off, and leaves a black mark on a piece of paper placed beneath, exactly similar to what may have been written above. Upon this principle the *manifold writers* are made; first is laid a sheet of common paper, upon this a sheet of prepared paper, face downwards, then another piece of common paper, then prepared paper again. This may be repeated three or

four times, if the papers be thin, and upon drawing or writing anything upon the upper sheet, you will have several exactly-similar copies below. Plans and patterns are often drawn in this manner.]

4. *Black Lead Paper.*—Nothing more is necessary than to paint over, with a brush, a sheet of thin writing paper, with black lead powder, mixed with water. When dry it will be fit for use. It gives lines sufficiently distinct for most purposes, and has the advantage that it may be rubbed out afterwards with Indian rubber when desirable.

5. *Soap Paper.*—Rub over one side of a piece of thin paper (using a piece of rag), a mixture of soap, lamp black, and a little water: when dry, wipe off as much as possible with a cloth, to prevent the paper staining the sheet to be placed beneath. It will be quite black, and the mark made by it cannot be obliterated by Indian rubber.

Taste Pays.—Artistic improvement in manufactures has created an entirely new school of architecture in London. Assuredly there are few whose memory cannot carry them back to the old shop-fronts of the metropolis. They remember the small dingy panels, the heavy frame-work, like the gratings of a prison, and the miserable attempts at display of wares, more calculated to repel than to invite purchasers. Now that shopkeepers have got something worth showing, they have become eager to display them. Does any man imagine that the plate glass, rich mouldings, and splendid pillars, in the shops in Regent-street, the new Strand, and Ludgate-hill, would ever have been erected but for the confident belief, that repayment would be derived from the gratification afforded to the improved and improving taste of the people? We may be assured, that if the shopkeeper found his association with the architect a losing concern, the march of plate glass and gilt mouldings would long since have been arrested. Its continued progress is a conclusive proof that *taste pays;* no one indeed can doubt the fact who walks through the streets of London with his eyes open.—*Art-Union Journal.*

Sims's Steam-Engine: A Novelty.—The economisation of steam and fuel appears to be about to reach its maximum, or rather its minimum, in a recent patent taken out by Mr. James Sims, of Redruth, the well-known steam-engine builder, the essential principle of which consists in the use of steam merely to shift the main sources of the motive power,—viz., two heavy weight-blocks to each of one, two, or more wheels—alternately from and to the centre of motion. The principle is said to be applicable either to rotary or reciprocating engines, and to engines working either on the expansive or the condensing principle, but particularly to expansive and high-pressure engines. The wheel or wheels, too, may be made to revolve either way, and the power may be transmitted either from the shaft or the periphery, and may be converted, as the special purpose of the engine may require, into rectilineal motion by any of the known methods.

Notices to Correspondents.

QUERIES.

[In order to collect as much useful information as possible, we have determined on devoting a portion of our space to the insertion of Queries which may be interesting to many of our Readers; at the same time we must intimate that the replies should be as brief as possible, without incroaching on their completeness.—Editor Decorator's Assistant.]

Sir,—Will any of your correspondents inform me what sort of fish skin it is that is sometimes used as a substitute for glass or sand-paper, and how the same is prepared? Yours, &c., John Leach, Bradford, Yorkshire, March 26th, 1848.

Sir,—I should feel much obliged if any of your correspondents would inform me how to get over a rather difficult job for a young carpenter; that is, to hang a 1¼ door with common butt hinges, and cap 10 inches on the top of it, making 4⅜ in. projection on each side. The difficulty is the joint—how to do it without projecting hinges. I remain, a well-wisher of the Decorator's Assistant, C. J. M., London, March 13th, 1848.

H. B.—You will find every convenience at Bishop's Coffee-house, 20, Berwick-street, Soho, which has recently been re-embellished, and decorated with busts, statuettes, and paintings. There is also another attraction—an excellent and increasing library, including works on art. The refreshments are excellent in quality, and the charges exceedingly moderate. It is situated very near the free picture galleries and conservatory at the Pantheon Bazaar, Great Marlborough-street, which are well worth a visit.

T. R. Lawson (Romford).—The fundamental principle of all phonographic systems consists in spelling words exactly as they are pronounced. There have been several plans proposed, but we think that Mr. Isaac Pitman's is that most calculated to effect the desired end, namely, that of facilitating the study of languages.

An Inquirer (North Britain).—If you have good employment, do not attempt to come to London in quest of better; remember the adage, "a bird in the hand is worth two in the bush;" and rest contented with what you have got.

A Yorkshire Subscriber.—You will find a complete treatise on fresco painting in our first volume. We cannot answer your second inquiry just at present.

Architectus.—The price of the plate which was issued with the Decorator's Assistant is one penny; any increased charge made by a newsvender is unjustifiable and fraudulent.

E. T.—The *only* way to paint the slides is to use transparent colours; opaque ones will not admit the light through them, and are, therefore, of no service. Thanks for your recommendations of our work.

J. B. (Woodbridge).—We will make inquiry and furnish you shortly with the desired information.

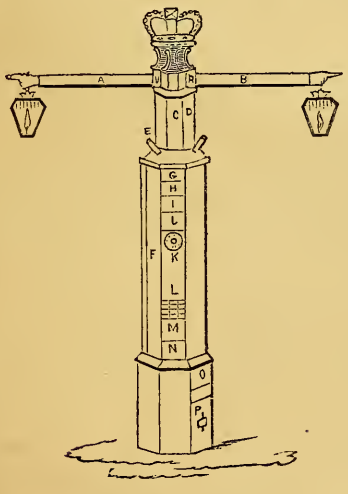
"Old Blucher" Again (Oxford).—The mechanical difficulty of "bringing up" engravings, as it is technically called, on that side of the paper which takes its impression from the "inner form," has alone prevented our giving greater weekly instalments of the "Glossary." You will perceive by laying out an uncut copy of any of the illustrated newspapers that *all* the engravings are on one side of the paper. Arrangements are, however, being made, which will shortly enable us to comply with your wishes. You are a bit of a wag, we see; but as it is impossible for man to make "young friends' tongues which keep going from morning till night," we are afraid that perpetual motion will not yet surprise the world by its appearance in any other shape than that of the human form divine.

Busby (Cheltenham).—We have it in contemplation to give complete alphabets of the various styles of letters employed for decorative purposes. With regard to your suggestion respecting the intermingling of styles in the initial letters, as well as in the design lately issued with this work, we entertain a different opinion to yours. The letters can be easily separated from the surrounding ornament if necessary, while the latter serves a purpose which it will be needless for us to explain; as to the confusion of the amateur, "Busby" will perceive that we devote plenty of space already to the mere *elements* of the art of drawing.

An Illustrated Glossary of Technical Terms used in Architectural and Interior Decoration.

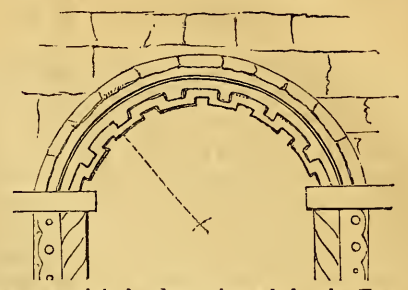
(*Continued from page* 211.)

Direction Post, a land-mark generally placed at the junction of cross-roads, &c. The following is an ingenious improvement upon the ordinary posts made by Messrs. Nash and Ross:—Supposing the column as it stands to occupy some central position in the metropolis, the spaces A and B will represent the leading thoroughfares, the names of which are to be inscribed thereon, with the hands pointing in the precise direction. On the space C are to be marked the names and numbers of the various public offices and institutions in the district, and on D the neighbouring outlets, squares, courts, and places. The orifices marked E are tubes for the rocket conductors communicating with an interior apparatus for the purpose of telegraphing information of fire to the various engine-houses. The sides



of the shaft marked F F are to contain the names of the tradesmen in the principal thoroughfares, with the number of the shops—the names to be cast on a separate metal plate, to be altered or removed at pleasure. G represents the rocket signals. H the number of the fire-engine house. I the turncock's residence. J the fire-escapes and alarum—the latter being sprung by means of a key confided to the care of the police. K denotes in what quarter the local post-offices are to be found. L the compartment for registering returned letters in the district. M descriptions of articles found, and N for those which have been lost. At the base are fire-escapes and fire-mains, with references to the nearest police-stations, and other matters of local information. At the top the Bude light is proposed to be placed, or, in lieu of the crown, a clock and weather-vane.

Diminished Arch, an arch less, or lower,



than a semicircle, denominated, by the French architects, *voute surbasse*.

Dining or Dinner Room, is generally one of the largest rooms in a dwelling house; in stately mansions extending to 40 feet in length, and even 50, and the breadth from half to three-fourths of the length. The dining rooms in middle-sized houses are from 18 to 24 feet in length, 16 to 18 feet wide, and 13 feet high; in smaller houses the largest room ought to be appropriated to this purpose.

Draught or Drawing. Architectural composition or design is understood to be a necessary mode of conveying instructions to the practical builder and the workman, by exhibiting a comprehensive view of a projected building; drawings for this purpose must be executed with clearness and precision, conformable to a regular scale of proportions. Plans, elevations, and sections are to represent the internal features of the apartments, halls, passages, and various arrangements for ornament or convenience, and the external façades, porticos, domes, and other outward appendages. Drawings of the smaller parts of an edifice will be required, numerous in proportion to their extent and variety of form. Where the façades of a building differ considerably, elevations of each of them will be required; and more than one general view of the projected building will be necessary, to give complete satisfaction to the proprietor.

Drops, ornaments of a conical form, hanging, drop-like, in the cornice of the Doric order, below the mutules, and on the architrave under the triglyphs, six under each. Drops of a conical form are peculiar to the Roman Doric; those of the pure Doric being

more or less inclined to the cylindric form. The drops in the cornice of the Doric portico at Athens are not much more than one-fourth of their diameter in height; but those of the epi-style are more than half their diameter in height.

(*To be continued.*)

Biography.

RAFFAELLE SAZIO DA URBINO.

This artist, more generally known in our own times by the simple name of Raffaëlle, or Raphael, was born at Urbino, on the 7th of April, 1483. He was the son of a painter, who himself never displayed any particular merit, but at an early period of his son's life he was led to observe the taste that he evinced for his art, and gladly taught him its rudiments; he then placed him under Pietro Perugino, whose style Raffaëlle quickly imitated to such perfection that their works could scarcely be distinguished. His genius soon taught him to soar far beyond his instructor. He studied with ardour the sculptures of the ancient masters; he minutely examined the works of Leonardo da Vinci, and of Michael Angelo; he availed himself of all that could be collected from the artists of his age, and at last struck out a manner which has been acknowledged as perfect.

His fame spreading throughout Italy, he finally received a summons from Pope Julius II. to repair to Rome, to which place he removed in the year 1508 to execute those works which will convey his name to the remotest generation. Raffaëlle's first work in the Vatican at St. Peter's was the embellishment of the Stanza della Segnatura, a portion of which he had no sooner finished than the Pope, highly delighted with the execution of it, entered upon an extensive engagement with him, by virtue of which he was to receive 1,200 ducats in gold for painting each chamber. The Parnassus was the second composition which was executed in the Leguatura; and this was followed by the "School of Athens," "Judgment of Solomon," "Fall of Man," &c.

In 1513, Raffaëlle's patron, Julius II., died, and was succeeded in the papal chair by Leo X., who in the indulgence of his excessive love of splendour, and unbounded liberality, so squandered his means as to leave him incapable of meeting emergencies. His natural taste made him a lover of the glories of art, of which he is at all hands admitted to have been an enthusiastic patron. This pope, no less than his predecessor, had a perfect apprehension of the talents of Raffaëlle, as he fully understood the merits of those works which were executed for him. Among Raffaëlle's friends were most of the princes of the Roman Church, and all contemporary genius and scholarship, even from the grave poet Erasmus of the North, to the imaginative Ariosto, of the South. Through his extraordinary works, especially in the Vatican, the fame of the Urbinian painter had extended throughout Italy, from every quarter of which he received commissions, which, increasing his wealth and considerations, it became desirable, in many respects, that he should possess a house of his own, which was accordingly built, on a site of ground near the Vatican; he, with the assistance of Bramante, projecting the plan of his residence.

Raffaëlle executed very few paintings from 1513 to 1516, with the exception of the cartoons which have for many years been the glory of England and the envy of all other polite nations. The following brief account of these celebrated cartoons may not be uninteresting to the reader:—

The cartoons were executed with the assistance of Francesco Puni and Giovanni da Udine. When perfected they were sent to Arras, for the purpose of being wrought in coloured wools, silk, and gold thread, which being executed, the tapestries were called in Rome "Arassi." For these works Raffaëlle received 434 golden ducats, but the value of the tapestries themselves have been variously stated, some authorities mentioning that in the time of Vasari they were reckoned to be worth 70,000 scudi, or crowns. Rome has been twice deprived of them, but, by a powerful fatality, they yet belong to the Holy See. When Rome, in 1527, was plundered by the troops of Charles V., they were removed as a portion of the booty; but they were, in the year 1553, restored to Julius III. as a portion of papal property. They were a second time removed from Rome, with a second series of tapestries, in the year 1798, and fell, it is said, into the hands of Jews, who proposed to burn them for the sake of the gold with which they were enriched. One was subjected to this trial, but as it did not yield the expected harvest, the others were sold at Genoa, and, in the year 1808, they were again in the possession of the Roman government, in whose keeping they have since remained.

The cartoons were not removed from Arras after the execution of the series of tapestries; but whether they were left from negligence, or with the intention of working a second series, does not appear. In the year 1521, it is believed that one of the cartoons was in the possession of Cardinal Grimani, of Venice. This was the "Conversion of St. Paul," and, if so, it is not improbable that, even thus early, the original series of ten was reduced to seven; for it is well known that Rubens found only this number, and they were by him, on the occasion of his visit to England, in 1630, recommended to Charles I., who purchased them and placed them in Whitehall. On the death of Charles, the whole of his pictures were sold, and the cartoons were purchased by the Republican Government. After the Restoration, that *model* of a king, Charles II., negotiated the sale of these works with an emissary of Louis XIV.; but, by the firmness and persuasion of Lord Danby, the sale was set aside: therefore to this nobleman is England indebted for the possession of the cartoons, which unquestionably take their rank among the most wonderful works of their author.

They were at this time in the state in which they were left by the tapestry workers, by whom they had been divided into strips for convenience in working, having the outlines still traced with the needle. They were sent to Mortlake by Charles II., to be copied in tapestry by an artist named Cleen, who superintended a manufactory of arras at that place, originally established by James I. William III. commissioned William Cooke to mount

and repair them, after which they were removed to Hampton Court, where they were hung in a part of the palace built expressly for them by Sir Christopher Wren, and it would have been well had they been suffered to remain there; for it cannot be denied that they must have suffered materially from their frequent change of location. In 1764 they were transported to Buckingham House, and thence, in 1787, to Windsor, from which place they were afterwards removed to Frogmore, whence they were again sent to Windsor, where they underwent various removals from room to room. In 1814 they were again sent to Hampton Court, where they have generally since remained.

The original number of the cartoons executed by Raffaëlle was five-and-twenty; but, with the exception of the seven in Hampton Court, and two said to be in the possession of the King of Sardinia, are now all lost. The designs, however, are still visible in the tapestries at Rome.

The following is the list of the seven in England—viz., "The Miraculous Draught of Fishes," "Paul Preaching at Athens," "The Death of Ananias," "Elymas Struck Blind," "The Sacrifice at Lystra," "The Apostles Healing in the Temple," and "Christ Delivering the Keys to St. Peter."

If we consider the subject matter of these works, we cannot withhold our surprise at their arrangement, and at the profound skill in the varied relations of expression by which their execution is so eminently distinguished. Raffaëlle has in them divested his figures of all portrait-like formality; they derive their life from their distinctness and prominency of character. Never has any master penetrated more deeply the secret working of the mind, or attained a higher tone of moral emphasis, or a more impressive dramatic development, than Raffaëlle in these works from Sacred History. With such a combination of the highest pretensions in art, these compositions are justly considered as unexcelled by anything that has ever yet been effected in historical illustration.

An altar piece, the well-known "Transfiguration," was the last work which the divine Raffaëlle executed before his death. He seems to have had a foreboding of his approaching dissolution, for some time previous to his decease, he arranged his worldly affairs, making his will in favour of a relation dwelling at Urbino and his two pupils, Giulia Pippi and Giovanni Penni whom he regarded with all a parent's fondness. On his birthday, the Good Friday of the yenr 1520, this great artist breathed his last, at the comparatively early age of thirty-seven. His funeral was conducted with the utmost pomp and magnificence; his body was laid out in state before his immortal work the "Transfiguration." Rome thronged around his bier to pay the last tribute of respect, and his remains were then consigned to the church of Santa Maria Sopra, formerly the Pantheon. Over his tomb is placed a bust, and the epitaph of Cardinal Bembo—

"Ille hic est Raphael, timuit quo sopite vinci
Magna rerum parens et moriente mori."

The Polytechnic Institution.

This institution, which has been closed for some time, in order to undergo various repairs and alterations, rendered necessary by the constantly-increasing objects of scientific and general interest therein displayed, as well as for the greater accommodation of the audiences attending the lectures delivered by Drs. Bachoffner and Ryan, will be re-opened on Thursday, the 20th of April. Among the most important of the alterations effected, we may mention the construction of a new theatre, nearly 120 feet in length by 20 feet in breadth, and in height 50 feet. The architect, Mr. James Thomson, has paid great attention to its requirements as a lecture-hall, and has succeeded admirably. The means provided for the comfort of the audience in the shape of apparatus for warming, ventilating, &c., are complete, and reflect great credit upon the erectors, Messrs. Benham and Son. With regard to the exterior, a new façade, 86 feet in length, and nearly 60 feet in height, has been constructed. The style of architecture is Italian, but the details are Greek. The total cost of these improvements will, it is stated, amount to between £10,000 and £12,000. In our next volume we shall, probably, present our readers with some articles on the contents of this grand depository of art and science.

Expense of Using Hard Water.—Mr. Wrightson, after pointing out the extreme hardness of the waters used in Birmingham, has been showing the good people of that important town how much this costs them. He says—"Taking twelve of Professor Clarke's degrees of hardness to be the average of the entire quantity of water consumed in Birmingham, and taking 100,000 gallons as the average daily consumption in washing the person alone—which must certainly be below the mark, not being four pints for each person (I believe the population is over 200,000)—as 100,000 gallons at sixteen degrees would require 32,000 gallons, 24,000 gallons of soap solution (or its equivalent in soap) would be required for the same quantity at twelve degrees, in order to remove the lime it contains before the detergent property of the soap can have any effect. Now this soap solution contains, as nearly as possible, about $1\frac{1}{8}$oz. of soap in each gallon, therefore, 24,000 gallons are equal to 27,000 oz., or 1,687lbs. This for one days waste is 615,755lbs, for the year, which, at 4d. per pound, is £10,262, no trifling sum to be wasted among the inhabitants of a town in washing the person alone. The further waste in washing linen, &c., must of course be proportionably great, to say nothing of the extra wear and tear, for it is well known how destructive hard water is to linen, notwithstanding the copious use of soap and soda. These facts sufficiently show how important it is for a manufacturing town like Birmingham to be abundantly supplied with water *the softest it is possible to obtain.*

A DESIGN FOR A BORDER (ALHAMBRA).

Paper-Hangings.

PAPER-HANGINGS of an ornamental description are daily coming more and more into requisition; and as the subject is interesting, we now present an historico-technical description from Bohn's admirable edition of Bechstein's "History of Inventions:"—

"Three kinds of paper-hangings have for some time past been much used on account of their beautiful appearance and their moderate price. The first and plainest is that which has on it figures printed or drawn either with one or more colours. The second sort contains figures covered with some woolly stuff pasted over them; and the third, instead of woolly stuff, is ornamented with a substance that has the glittering brightness of gold and silver. tI appears that the idea of covering walls with parti-coloured paper might have readily occurred, but the fear of such hangings being liable to speedy decay may have prevented the experiment from being made. In my opinion the simplest kind was invented after the more ingenious, that is to say, when the woolly or velvet kind was already in use. The preparation of them has a great affinity to the printing of cotton. Wooden blocks of the like kind are employed for both; plates of copper are also used; and sometimes they are painted after patterns. Artists possess the talent of giving them such a resemblance to striped and flowered silks and cottons, that one is apt to be deceived by them on the first view. Among the most elegant hangings of this kind, may be reckoned those which imitate so exactly every variety of marble, porphyry, and other species of stones, that when the walls of an apartment are neatly covered with them, the best connoisseur may not without close examination be able to discover the deception. That the resemblance may be still greater, a hall may be divided by an architect into different compartments by pillars, so as to have the appearance of a grand piece of regular architecture. Whether M. Breitkopf, at Leipsic, was the inventor of this kind of hangings, I do not know, but it is certain that he brought it to great perfection.

"The second kind, or, as it is called, velvet-paper (now called flock-paper), is first printed like the former, but the figures are afterwards wholly, or in part, covered with a kind of glue, over which is strewed some woolly substance, reduced almost to dust, so that by these means they acquire the appearance of velvet or plush. The ground and the rest of the figures are left plain; but the whole process is so complex that it is impossible to convey a proper idea of it by a short description. The shearings of fine white cloth, which the artist procures from a cloth manufactory, and dyes to suit his work, are employed for this purpose. If they are not fine enough, he renders them more delicate by making them pass through a close hair-sieve. This, as well as the third kind, was formerly made much more than at present upon canvas; and, in my opinion, the earliest attempts towards this art were tried, not upon paper, but on linen cloth. The paper procured at first for these experiments was probably too weak; and it was not till a later period that means were found out to strengthen and stiffen it by size and paste.

"The invention of velvet-paper is by several French writers ascribed to the English; and, if they are not mistaken, it was first made known in the reign of Charles I. On the 1st of May, 1634, an artist, named Jerome Lanyer, received a patent for this art, in which it is said he had found out a method of affixing wool, silk, and other materials of various colours upon linen cloth, silk, cotton, leather, and different substances with oil, size, and cements, so that they could be employed for hangings as well as for other purposes. The inventor wished to give to this new article the name of Londrindiana, which appears, however, not to have continued in use. It is worthy of remark, that this artist first made attempts to affix silk upon some ground; but that method, as far as I know, was not brought to perfection; that he employed for the ground, linen and cotton cloth, or leather; and that no mention is made of his having used paper, though he seems not to have confined himself entirely to leather or cloth.

"Tierce, a Frenchman, has, however, disputed this invention with the English; for he asserts that one of his countrymen at Rouen, named François, made such kinds of printed paper-

hangings so early as the year 1620 and 1630, and supports his assertion by the patterns and wooden blocks which are still preserved with the above-mentioned years inscribed on them. He is also of opinion, that some Frenchmen, who fled to England when persecuted for their religion, carried this art along with them. The inventor's son followed this business to a great extent for more than fifty years at Rouen, and died in 1748. Some of his workmen went privately to the Netherlands and Germany, where they sold their art; and the French, therefore, with great confidence maintain, without knowing our artists and their works, that foreigners in this branch of manufacture are still far behind them. In most works of the kind my countrymen, indeed, are only imitators, not through want of talents to invent or to improve, but because our great people, for whom they must labour, consider nothing as fashionable or beautiful, except what has been first made by the French or the English.

"I shall here observe, that Nemeitz ascribes the invention of wax-cloth-hangings, with wool chopped and beat very fine (these are his own words), to a Frenchman named Audran, who in the beginning of the last century was an excellent painter in arabesque and grotesque figures, and inspector of the palace of Luxemburg at Paris, in which he had a manufactory for hangings of that kind. What particular service he rendered to the art of making paper-hangings, I have not, however, been able to learn. Equally uncertain and defective is the information of Von Heinecken, that one Eccard invented the art of imprinting on paper-hangings gold and silver figures, and carried on a manufactory for such works.

"In regard to the time when these hangings began to be made in Germany, I can only say that the oldest information I know respecting them is to be found in a work by Andrew Glorez von Mahren, printed for the first time in 1670. It shows that the art was then very imperfect as well as little known, and that it was practised only by women upon linen for making various small articles.*

"One of the most ingenious new improvements in the art of manufacturing these hangings, consists in bestrewing them here and there with a glittering metallic dust or sand, by which they acquire a resemblance to rich gold and silver brocade. From the above-quoted work it appears that artists began very early to cover some parts of paper-hangings with silver-dross or gold foil; but as real gold was too dear to be used for that purpose, and as imitations of it soon decayed, this method seems not to have been long continued. Instead of these, Nuremberg metallic dust as well as silver-coloured foil are employed. Metallic dust is the invention of an artist at Nuremberg named John Hautsch, who constructed also a carriage which could be moved by the person who sat in it. He was born in the year 1595, and died in 1670. His descendants have continued to the present time the preparation of the metallic dust, which is exported in large quantities from Nuremberg, and is used in shell-work, lackered-ware, and for various other purposes. It is prepared by sifting the filings of different metals, washing them in a strong lye, and then placing them on a plate of iron or copper over a strong fire, where they are continually stirred till their colour is altered. Those of tin acquire by this process every shade of gold colour, with a metallic lustre; those of copper the different shades of red and flame colour; those of iron and steel become of a blue or violet; and those of tin and bismuth appear of a white or bluish-white colour. The dust, tinged in this manner, is afterwards put through a flatting-mill, which consists of two rollers of the hardest steel, like those used by gold and silver wire-drawers, but for the greater convenience a funnel is placed over them. I have in my possession samples of all the above kinds, which have an exceedingly beautiful appearance. This metallic dust is affixed so strongly to paper by means of a cement, that it is almost impossible to detach it without tearing the paper, as is the case with the paper-hangings procured from Aachen. In French, such paper is called *papier avec paillettes*. The lustre of it is so durable that it continues unaltered even on the walls of sitting apartments. The metallic dust, however, has a considerable weight which may undoubtedly injure the paper.

This inconvenience may have induced artists to employ, instead of metallic dust, that silver-coloured mica, which has been long used in the like manner. So early as the seventeenth century the miners at Reichenstein in Silesia collected and sold for that purpose various kinds of mica, even the black, which acquires a gold colour by being exposed to a strong heat. The nuns of Reichenstein ornamented with it the images which they made, as the nuns in France and other Catholic countries ornamented their *agni Dei*, by strewing over them a shining kind of talc. The silver-coloured mica, however, has not such a bright metallic lustre as metallic dust, but it nevertheless has a pleasing effect when strewed upon a white-painted ground, and its light thin spangles or scales retain their brightness and adhere to the paper as long as it lasts. At present I am acquainted with no printed information respecting the method of laying on metallic dust and mica, nor do I know where artists procure the latter, which in many countries is indeed not scarce. I shall here observe, that I once saw at Petersburg a kind of Chinese paper, which appeared all over to have a silver-coloured lustre, without being covered with any metallic substance, and which was exceedingly soft and pliable. It bore a great resemblance to paper which has been rubbed over with dry

* "The author says, 'I shall give an account of a beautiful art, by which one may cover chairs, screens, and other articles of the like kind, with a substance of various colours made of wool, cut or chopped very fine, and cleaned by being made to pass through a hair-sieve. * * I remember that two Swabian women travelled about through some countries, and taught people this art, by which means they gained a good deal of money.' Of the author I have been able to procure no information. His book is a compilation selected without any taste, and according to the ideas of the seventeenth century, from different writers, almost always without mentioning the sources from which the articles are taken; but it deserves a place in public libraries, because it contains here and there some things which may help to illustrate the history of agriculture and the arts.

acid of borax. I conjecture that its surface was covered with a soft kind of talc, pounded extremely fine; but as I have none of it in my possession at present, I can give no further account of it.

["The manufacture of this important and elegant substitute for the ancient "hangings" of tapestry has undergone a gradual succession of improvements, and has now reached a high state of beauty and perfection. The patterns on these papers are sometimes produced by stencil plates, but more commonly by blocks, each colour being laid on by a separate block cut in wood or metal upon a plain or tinted ground. The patterns are sometimes printed in varnish or size, and gilt or copper-leaf applied; or bisulphuret ot tin is dusted over so as to adhere to the pattern; and in what are called *flock-papers*, dyed wools mixed into powder are similarly applied. Powdered steatite or French chalk is used to produce the peculiar gloss known under the name of *satin*. Striped papers are sometimes made by passing the paper rapidly under a trough, which has parallel slits in its bottom through which the colour is delivered; and a number of other very ingenious and beautiful contrivances have lately been applied in this important branch of art.

"The invention of the paper-machine, by which any length of paper may be obtained, effected a great change in paper-hangings, which could formerly only be printed upon separate sheets, and were much more inconvenient to print as well as to apply to the walls.*]—Much improvement might still be made."

File-making by Machinery.—In the town of Birmingham, Connecticut, an invention has been perfected for cutting files by machinery, which, it is said, if not brought to England, will make files an article of import. In England files are cut with a hammer and chisel, producing from one to a dozen files per day. A contemporary thus describes the new machine:—It is about 5 feet long, 2 feet wide, and 3 feet high, and can be worked as easily as the turning of a common grindstone. The blank intended to be made a file is placed in a central position, the chisel strikes both sides of the blank at the same time, making, in common speed, between 200 and 300 cuts per minute. The gearing is so adjusted that the chisels accommodate themselves to the thickness of the file, so that the cut is equal in depth throughout; and the regular progression of the file ensures perfect regularity in the distance of the cuts. A 10-inch file, of medium fineness, is cut on both sides in three minutes; in three minutes more the traverse cuts are made, and it is again passed through to cut the sides. Thus, three machines, which will not cost more than 300 dollars each, and can be tended by one man, can complete twenty common files in an hour, or 200 in a day. A steam-engine of five-horse power can put fifty of these machines in operation.

* Brande's "Dictionary of Science."

The Suffolk-street Gallery.

On Monday, the 3rd inst., the 26th exhibition of this gallery, reckoning from the foundation, and the 2nd from its incorporation by charter, was opened to the public. It consists of 800 articles, by upwards of 300 exhibitors; 32 of these, or something approaching a tenth, being members and proprietors of the gallery. Out of the 800 articles, 100 may be said to possess considerable merit, and at least 200 to manifest a decided quality which entitles them to rank as works of art. As for the rest, "though in the catalogue" they are classed all by the name of "pictures," the valued file in this case does not distinguish "the swift, the slow," nor do they range

> "every one
> According to the gift, which bountcous Nature
> Hath in him clos'd."

To encourage mediocrity is very doubtful policy or kindness; but to encourage, by exhibiting the drivelling efforts of conceit and ignorance, is fostering a kind of insanity. There are too many pictures in this exhibition that will justify our remarks. We refer any reader to Nos. 157, 158, 162, 164, 172, 174, 181—and, indeed, we have so many marked of the same kind, that we have only selected these as instances of what we mean. Nor are these absurdities confined to those who are admitted by courtesy to the gallery. We regret to see the canvasses of members of the society that ought on no account to have been admitted, and yet are not only allowed that privilege, but are actually paraded into prominent places, No. 142, "The Death of Socrates," is a a collection of grotesque figures, not only without an idea of the grandeur of the subject, but is positively ludicrous in its abortive efforts to be effective. Yet this is a large picture in a most obtrusive position. No. 338, a portrait, is painted in a style designedly, as we should imagine, to evade the literal interpretation of the second commandment; and yet this on the line, being also by an M.S.B.A.; a fact paraded with capitals in a very imprudent manner. It were an endless task to attempt to particularise the crudities that fringe and deform the upper and lower part of the rooms; and which it would be mercy to the perpetrators, as well as to the visitors, to have left in their original obscurity. We will leave this unpleasant portion of the subject, and endeavour to point out the relative merits of those who have every claim to be considered as artists in the full comprehension of the term. The landscape painters are undoubtedly the *élite* of this gallery, and they form a band highly creditable to native English art. The members thus distinguished are H. M. Anthony, J. W. Allen, H. J. Boddington, A. Clint, J. Holland, A. Montague, J. B. Pyne, J. Tennant, the Wilsons, father and son. To this number we add of those not proprietors, J. V. De Fleury, S. R. Percy, A. Vickers, and E. Willis. Mr. Anthony has given great promise of excellence in former exhibitions, but he has not realised it in this. His large picture is a great effort, or rather a

series of efforts. He has evidently intended to produce some very powerful effect, but has not been successful in realising it to the spectator. It is a decided failure as to colour, a sickly green predominating everywhere, intended probably to produce an harmonious effect. The figures are numerous, but partake of the same exaggerated manner. No. 222, "On the Coast of Galway," is powerful and true—a happy piece of effect. Here the power and superiority of the colour triumphs over some errors of composition that are apparent. It is, however, a noble picture. Mr. J. W. Allen has always the merit of adhering to nature, and his increasing reputation shows his good sense in thus directing his genius. He has several pictures of merit, but No. 288, "Helvellin," is one of extraordinary merit, being a pure piece of painting, without the slightest aid from any accessories of story. It is a scene of mountains reposing in their sublimity, and gives the solemnity without the gloom of solitary nature. The atmosphere of this picture is perfect, and the grandeur of the mountains is nobly pourtrayed, for the eye traverses the infinity of ravine and glen that separates them. It is undoubtedly the purest and finest piece of painting in the gallery. The harmony of the picture is perfect, and is produced by its admirable truth in form, sky, and air.—J. Holland has his usual number of street scenes, and one beautiful piece of "Flowers." We do not think him remarkably strong this year.—J. Tennant has eight landscapes. No. 11, his principal, "English River Scene," is a large and meritorious picture, and in a much softer and more natural style than this artist generally displays. "The purple light" may have its charms for the multitude, but nature is fonder of the greys and browns. —The Wilsons are excellent. The father as great as ever in his pure, calm, and admirable harmony. No. 82, "Orgueil Castle, Isle of Jersey," is his largest picture. It has all the freshness and power of colour for which he has been long distinguished.—J. Wilson, jun., has somewhat changed his style, giving proof of the versatility of his talents. No. 438, "Fishing Boat Returning to Port," is a fine marine view, clear, bright, and original. No. 64, "Salmon Trap and an old Water Mill," is in his usual style, and is a very pleasing picture. It strikes us that the reflection of the white cattle in the shallow water is not true in fact. Our space will not permit us to individualise any more of the landscape painters, of which Mr. Hassell may be esteemed one this year: he having hitherto devoted himself to architecture. No. 167, "The Old Tile Kilns at Aldershot" is a large and effective picture, pourtraying a striking effect in the furnace light. In some of his other pictures Mr. Hassell has succeeded in giving some literalities he has observed in nature. To the more ambitious portion of the gallery, the figure painters, we can devote but little space. Mr. Hurlstone has some excellent pieces of colour. He is, we think, deficient in passion, and not very successful in telling his story; but he has force and power in composition, and a great sense of the beautiful. No. 244, "Mazeppa," is a misnomer, but it is a fine picture, broad and effective.—Mr. Gilbert has a very characteristic picture, well drawn and painted, No. 306, without a name, but with some not very appropriate lines from Cowper.—Mr. Huggins, a name new to this exhibition, has a picture of mark and likelihood; and if somewhat exaggerated in tone and manner, No. 160 bespeaks powers both of conception and execution.—Mr. Dicksee has some figures not without effect, though there is a harshness of style that is not pleasant.—Mr. J. Stewart, in No. 184, "The Prodigal's Return," has produced a very pleasing composition: the perfect abasement of the prodigal, and the parental feeling of the old man are affecting; the accessories are well thrown in, and altogether it is a superior and effective work.

OBITUARY.

Artists, especially such as are interested in the subject of costume—and who is not, be he painter, sculptor, or draughtsman?—will learn with regret the demise of Sir Samuel Rush Meyrick, who lately departed this life at his seat, Goodrich Court, Herefordshire. During an existence "too short for friendship not for fame," the deceased knight devoted his earnest attention to the subject of costume and armour; and it was by his labours that the valuable and exquisite collection deposited in the Tower of London was chronologically arranged and rendered serviceable to the artist.

Reproducing Engravings.—Mr. Calvert, in a lecture on chemistry, thus describes an easy means of reproducing printing, engravings, writing, &c., which has been recently discovered. Take a piece of paper, dip it in a weak solution of starch, leave it to dry, and then moisten it with weak sulphuric acid. Afterwards take an engraving, put it over the vapour of iodine, and leave it there for the space of about five minutes, by which time the iodine will have fixed itself on every part that is black. Then take this engraving, apply it to the sheet of paper, press it for a minute or two, and the engraving is transferred. If this was the whole of the discovery, it would not be very important; but, if the thing can be done on paper, it can be done on steel, copper, and silver: and here is a ready means of engraving. If you want to engrave on copper or silver, put your engraving over iodine fumes, and then place it on the plate. If it is copper, put it over the fumes of hartshorn or ammonia, wash it, and the engraving is produced. If it is silver, proceed as if for daguerreotype, holding it over the vapour of mercury, and the engraving is produced. There is a more simple means still. Put the engraving over the fumes of orpiment for a few seconds, place it on a plate of copper, press it, and the engraving sinks into it.

Arseniurets.—Combinations of arsenic with metallic and other bases.

Curious Aqueduct.

If a plentiful supply of water is indispensable in our nothern climates, it is, certainly, a matter of absolute necessity under the tropics. Thus, most large cities have been built on the banks of rivers or brooks, or, like Mexico, on those of an extensive lake. The capital of the Brazils does not enjoy that advantage, but the wreath of mountains which surrounds her, all covered with luxuriant vegetation, pour forth (from its granite cliffs) an abundance of springs, to which, in and near the city, the negro water-carrier is resorting. In many houses, moreover, cisterns and wells are to be met with. All this, however, would not suffice for an increasing population; and it was in the middle of the last century that one of the the viceroys, Count Laoradio thought of providing it with that splended aqueduct, which even now deserves the admiration of the traveller. Few towns also possess such splendid material for architectural purposes as Rio de Janeiro,—the granite alluded to being a very even-grained, ornamental, yet easily cut rock, of a bluish-grey colour. The imperial palace, most of the churches—nay, even most of the private houses, are built of it, which impart to them a certain aspect of solidity and sterling-ness. The facing of some of the churches, however has been brought here (as is the case in Bahia and Mexico) from the quarries of the mother country. The plan of M. Laoradio required great skill and perseverance in the surveyor, as most of these springs are not very plentiful (still constant the whole year round), and had to be traced and combined with much labour. Of tunnels, or even costly canals, there was no idea in these times in South America, and perhaps there was no scope for it. Sources and springs were, however, to be brought to the city from all points of the compass, and some from a considerable distance—of six or eight miles. Thus, while perambulating the primæval brush-wood and forests of the Serras about Rio, the traveller perceives the long line of the aqueduct, runing along hill and dale—consisting of an open, square canal of six or eight inches breadth, by even less depth, and merely constructed of substantially-burnt bricks, well bound by cement, and equally well embanked. Thus, it runs on for miles and miles—over spots rarely trodden but by the feet of the distant traveller. In many places these narrow canals are combined into larger reservoirs—and in approaching the city, the water had to be carried over the opening between two granite hills, which has been done by a very showy piece of architecture. It consists of a double row of arches, one built above the other,—the inferior very lofty and of narrow span—through whose arcades the traffic of the Rua de Laoradio is carried on. Thus it proceeds to the very centre of the city, where, from a huge granite reservoir, the water is distributed.—*Brazilian Reise.*

Bronzing Electrotype Casts.

Chemical Bronze.—There are many modes of bronzing employed in the arts, the intent of each is, to bring out the workmanship of the object. The selection is entirely a matter of taste. To prevent too great a sameness of appearance in a cabinet, it is perhaps better not to confine oneself to a solitary method.—A chemical bronze may be made by boiling two ounces of carbonate of ammonia with one ounce of acetate of copper, in half a pint of vinegar, till the vinegar is nearly evaporated. Into this, pour a solution consisting of sixty-two grains of muriate of ammonia, and fifteen grains and a half of oxalic acid, in half a pint of vinegar. Replace the vessel on the fire till the contents boil; when cold, strain through filtering paper; preserve the liquor for use. The remaining sediment may be again treated with another half pint of the solution. This preparation must only be applied to medals perfectly bright and clean.

Dirty specimens may be polished by an article used in domestic economy, consisting of rotten-stone, soft soap, and water; the medal is to be well rubbed with a hard brush dipped in this. Care must be taken not to scratch the medal. It must afterwards be washed in water and placed to dry; when dry, the application of the leather and plate-brush will produce the required polish. Medals may also be cleaned by dipping them in nitric acid, either concentrated or diluted; wax and grease may be removed by boiling in pearl-ash and water, or by pouring the boiling ley on the medals.

In applying the bronze, first warm the medal, then dip a camel's hair pencil into the liquor, and brush the surface for half a minute; immediately after, pour boiling water over it; directly the medal is dry, rub its surface lightly with soft cotton very slightly moistened in linseed oil; gentle friction with a piece of dry cotton will finish the operation. The colour produced by this means, is red; its tints varies according to circumstances. Medals bronzed thus, must be examined occasionally, before they are consigned to the cabinet; for if perchance the vinegar has not been perfectly washed away, they will be disfigured by the formation of a green powder,—the acetate of copper. Should this occur, it may be removed by means of the moist and dry cotton.

Black Lead Bronze.—A very beautiful bronze is obtained by the simple application of plumbago; it is obtained in a few minutes, and with very little trouble. The tint obtained seems very much to depend on the condition of the surface of the original medal; copies of some medals "take" the black lead better than those of others. To produce the tint in the greatest perfection, the operation should be performed immediately after the medal is separated from the mould. Bright specimens from fusible moulds are best, but all others

may be thus treated; those taken from wax should be cleaned with pearl-ash or soda.

The bronze is obtained by brushing the surface of the medal with plumbago; then placing it on a clear fire, till it is made too hot to be touched, and applying a plate-brush, so soon as it ceases to be hot enough to burn the brush. A few strokes of the brush will produce a dark brown polish, approaching black, but entirely distinct from the well-known appearance of black lead. If the same operation is performed on a medal that has been kept some days, or upon one that has been polished, a different, but very brilliant tint is produced. The colour is between red and brown. The richness of colour thus produced, is by many preferred to the true dark brown.

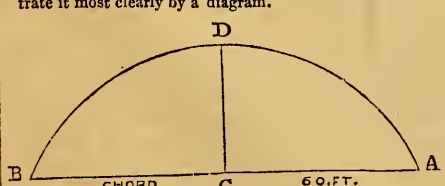
Carbonate of Iron Bronze.—Very beautiful tints are produced by using the substance commonly known as plate-powder, or rouge: after moistening it with water it is applied and treated precisely in the same manner as the plumbago. Some care and practice are required in its use, lest it should stain instead of bronze the medal. Should the experiment fail, the several bronzes may, in many cases, be removed, and the attempt may be repeated.

PATRIARCHAL PLANE TREE.—In the grounds of Kippenross, near Stirling, close by the Scottish Central Railway, there is a magnificent old plane tree, of the following dimensions:—girth of smallest part of trunk, 19 feet; girth close to the ground, 42 feet; extreme width of branches from point to point, 114 feet; height, 100 feet. The cubic contents are 875 feet, and the supposed age upwards of 400 years.

Notices to Correspondents.

ANSWERS TO QUERIES.

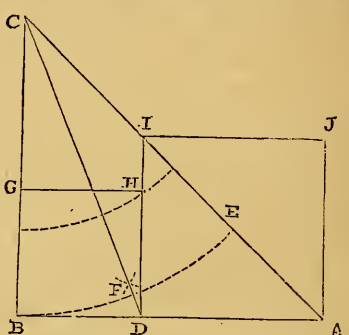
SIR,—I think it was I who first inquired about finding the centre of a circle by having a portion of the circumference. I saw it answered in a different way from what I wished in No. 45 of your work. I have, however, recalled the mode of finding it which I sought, I have always found it correct, and it has been used without failing by a friend of mine engaged in the centering of bridges and such like requiring long radii for the circles. I may, perhaps, illustrate it most clearly by a diagram.



$$\frac{\frac{1}{2}\text{ chord}^2}{\text{height}} + \text{height} = \text{diameter.}$$

Or, more plainly, take the half of the chord of 60 feet, and square it the half, which gives 900, which divided by the height 20, gives 45, to which add the height, which makes 65, which divided or halved by 2, gives 32½, the centre required of the circle. Or, in the shape of an arithmetical rule:—Multiply half the chord by half the chord, and divide the product by the height; then add the height, which gives the diameter, which halved, gives the radius. I think, from this hurried notice, you will glean what is meant. In large circles, when compasses and the like cannot be used, it is valuable, and may, by algebra, be made out to a fraction of an inch, so that you have only to insert your gimlet at the spot at once without any uncertainty; it might, perhaps, be useful to many of your readers.—Your most obedient servant, BRUNTSFIELD. Edinburgh, March 28, 1848.

TO CUT A GIVEN LINE SO THAT A SQUARE FORMED ON THE GREATER PART SHALL HAVE TWICE THE AREA OF THE SQUARE FORMED ON THE LESSER.—Construction: Let the given line be A B; construct the right angle A B C; make B C equal in height to the length of A B; bisect the angle A C B from C; through the point of intersection F



draw the line C F D, and it will cut the line in the point required. Another construction: With C as centre, and radius C B, describe the arc B E; then will A E be the side of the smaller square; hence the arithmetieal demonstration which is as follows—let the given line A B=10 and B C also=10, then will $A C = \sqrt{(A B^2 + B C^2)}$, or 14,1421356, then 14,1421356—10=4,1421356, or the side of lesser square, and 10—4,1421356=5,8578644 side of larger square. JOHN WHITAKER. Heaton Norris, near Stockport, March 31st, 1848.

A PAINTER (Islington).—We do not profess to give medical advice—you had better at once apply to a physician.

M. S. (Liverpool).—The simple mechanical powers are the *lever*, the *wedge*, and the *inclined plane*. Consult M'Culloch's "Dictionary of Commerce"—he is the best authority on such matters as those to which the latter portion of your letter relates.

A SUBSCRIBER.—Apply to the Secretary of the London Mechanics' Institution, Southampton-buildings, Chancery-lane.

FLEUR-DE-LIS.—We have not the remotest idea as to when the Nelson Monument in Trafalgar-square will be completed—probably synonymously with the discovery of perpetual motion.

LIBRA (Greenwich).—We cannot afford to pay for contributions.

MARTIN DOYLE (Sheffield).—Dr. Ure's "Dictionary of Arts and Sciences" is, in our opinion, the best work that you could make yourself master of; but the price is very high, and much more than many working men, who might be benefited by the information contained therein, can afford to pay.

GEO. PECK (Hull).—We accidentally mislaid your letter or else it would have been answered sooner. To your first question, the *Art Union*. The acanthus is chiefly to be found in the south of Europe; but we cannot point out any particular district in England where it is to be met with. Probably some of our readers may be able to enlighten you on this point.

The Theory of Painting;

DEDUCED FROM THE "DISCOURSES" OF SIR JOSHUA REYNOLDS.

(*Continued from page* 217.)

If deceiving the eye were the only business of the art, there is no doubt, indeed, but the minute painter would be more apt to succeed; but it is not the eye, it is the mind, which the painter of genius desires to address; nor will he waste a moment upon those smaller objects which only serve to catch the sense, to divide the attention, and to counteract his great design of speaking to the heart.

This is the ambition which I wish to excite in your minds; and the object I have had in view, throughout this discourse, is that one great idea which gives to painting its true dignity, which entitles it to the name of a liberal art, and ranks it as a sister of poetry.

It may possibly have happened to many young students, whose application was sufficient to overcome all difficulties, and whose minds were capable of embracing the most extensive views, that they have, by a wrong direction originally given, spent their lives in the meaner walks of painting, without ever knowing there was a nobler to pursue. Albert Durer, as Vasari has justly remarked, would probably have been one of the first painters of his age (and he lived in an era of great artists), had he been initiated into those great principles of the art which were so well understood and practised by his contemporaries in Italy. But unluckily, having never seen or heard of any other manner, he without doubt considered his own as perfect.

As for the various departments of painting which do not presume to make such high pretensions, they are many. None of them are without their merit, though none enter into competition with this universal presiding idea of the art. The painters who have applied themselves more particularly to low vulgar characters, and who express with precision the various shades of passion, as they are exhibited by vulgar minds (such as we see in the works of Hogarth), deserve great praise; but as their genius has been employed on low and confined subjects, the praise which we give must be as limited as its objects. The merry-making or quarrelling of the boors of Teniers, the same sort of productions of Brouwer or Ostade, are excellent in their kind; and the excellence and its praise will be in proportion, as in those limited subjects and peculiar forms, they introduce more or less of the expression of those passions, as they appear in general and more enlarged nature. This principle may be applied to the battle-pieces of Bourgognone, the French gallantries of Watteau, and even beyond the exhibition of animal life, to the landscapes of Claude Lorraine and the sea-views of Vandervelde. All these painters have in general the same right, in different degrees, to the name of a painter, which a satirist, an epigrammatist, a sonnetteer, a writer of pastorals or descriptive poetry, has to that of a poet.

In the same rank, and perhaps of not so great merit, is the cold painter of portraits. But his correct and just imitation of his object has its merit. Even the painter of still life, whose highest ambition is to give a minute representation of every part of those low objects which he sets before him, deserves praise in proportion to his attainment; because no part of this excellent art, so much the ornament of polished life, is destitute of value and use. These, however, are by no means the views to which the mind of the student ought to be *primarily* directed. Having begun by aiming at better things if from particular inclination, or from the taste of the time and place he lives in, or from necessity, or from failure in the highest attempts, he is obliged to descend lower, he will bring into the lower sphere of art a grandeur of composition and character that will raise and ennoble his works far above their natural rank.

A man is not weak, though he may not be able to wield the club of Hercules; nor does a man always practise that which he esteems the best, but does that which he can best do. In moderate attempts there are many walks open to the artist. But as the idea of beauty is of necessity but one, so there can be but one great mode of painting, the leading principle of which I have endeavoured to explain.

I should be sorry if what is here recommended should be at all understood to countenance a careless or indetermined manner of painting; for though the painter is to overlook the accidental discriminations of nature, he is to exhibit distinctly and with precision the general forms of things. A firm and determined outline is one of the characteristics of the great style in painting; and let me add, that he who possesses the knowledge of the exact form which every part of nature ought to have, will be fond of expressing that knowledge with correctness and precision in all his works.

The value and rank of every art is in proportion to the mental labour employed in it, or the mental pleasure produced by it. As this principle is observed or neglected, our profession becomes either a liberal art or a mechanical trade. In the hands of one man it makes the highest pretensions, as it is addressed to the noblest faculties; in those of another it is reduced to a mere matter of ornament, and the painter has but the humble province of furnishing our apartments with elegance.

This exertion of mind, which is the only circumstance that truly ennobles our art, makes the great distinction between the Roman and Venetian schools. I have formerly observed, that perfect form is produced by leaving out particularities, and retaining only general ideas. I shall now endeavour to show that this principle, which I have proved to be methaphysically just, extends itself to every part of the art; that it gives what is called the *grand style* to Invention, to Com-

position, to Expression, and even to Colouring and Drapery.

Invention in painting does not imply the invention of the subject, for that is commonly supplied by the poet or historian. With respect to the choice, no subject can be proper that is not generally interesting. It ought to be either some eminent instance of heroic action or heroic suffering. There must be something universally concerned, and which powerfully strikes upon the public sympathy.

Strictly speaking, indeed, no subject can be of universal, hardly can it be of general concern; but there are events and characters so popularly known in those countries where our art is in request, that they may be considered as sufficiently general for all our purposes. Such are the great events of Greek and Roman fable and history, which early education and the usual course of reading have made familiar and interesting to all Europe, without being degraded by the vulgarism of ordinary life in any country. Such, too, are the capital subjects of Scripture history, which, beside their general notoriety, become venerable by their connection with our religion.

As it is required that the subject selected should be a general one, it is no less necessary that it should be kept unembarrassed with whatever may any way serve to divide the attention of the spectator. Whenever a story is related, every man forms a picture in his mind of the action and expression of the persons employed. The power of representing this mental picture on canvass is what we call invention in a painter. And as in the conception of this ideal picture the mind does not enter into the minute peculiarities of the dress, furniture, or scene of action, so when the painter comes to represent it, he contrives those little necessary concomitant circumstances in such a manner that they shall strike the spectator no more than they did himself in his first conception of the story.

I am very ready to allow, that some circstances of minuteness and particularity frequently tend to give an air of truth to a piece, and to interest the spectator in an extraordinary manner. Such circumstances, therefore, cannot wholly be rejected: but if there be anything in the art which requires peculiar nicety of discernment, it is the disposition of these minute circumstantial parts; which, according to the judgment employed in the choice, becomes so useful to truth, or so injurious to grandeur.

However, the usual and most dangerous error is on the side of minuteness; and therefore I think caution most necessary where most have failed. The general idea constitutes real excellence. All small things, however perfect in their way, are to be sacrificed without mercy to the greater. The painter will not inquire what things may be admitted without much censure; he will not think it enough to show that they may be there; he will show that they must be there; that their absence would render his picture maimed and defective.

(To be continued.)

Important American Inventions.

The town of Birmingham, in Connecticut, possesses some extensive works, where copper is melted from the pig into ingots, rolled into bars and sheets, and drawn into wire of all sorts and sizes. It has cut-nail and shoe-tack factories, a broadcloth manufactory (from American wool), a manufactory of patent machinery for the adjustment, extension, &c., of fractured limbs, whereby difficulty in dressing is avoided, pain obviated, and all danger of after-lameness from contraction precluded—a signal triumph of Yankee inventive skill, though not more ingenious than a brass chain fabricator, in the wire-drawing shops, which does its work with wonderful accuracy. At every turn of the driving-wheel, the wire unwinding from the reel, or cylinder, is pulled forward to the proper position, the end running through the last formed link, exactly the length for two links cut off, first one end turned over into a link, then the other—the former dropping down through the machine, leaving the latter projecting above—so that the wire can be instantly pushed through it, when it is cut off, two more links formed, and so on, until a large roll of wire is transformed into a perfectly formed chain, by the unaided operation of machinery, hardly a finger having been lifted during the process. When the principle is applied to iron and steel wire, it will ensure a fortune to the patentee. The great feature of Birmingham, however, is its pin-making. The works of the Howe Company here employ 200 persons. A dozen years ago all the pins used in this country were imported: now none are, except a few German pins, for the German population of Pennsylvania.—One more invention, on the importance of which much stress is laid, I will attempt to describe; it is an invention for cutting files by machinery. In England it is done with a hammer and chisel, producing from one to a dozen files per day. This bids fair to produce a new era in the manufacture of files; and if not introduced nto Europe, will make files an article of exiport from that country. The machine is about 5ft long, 2ft wide, and 3ft high, and can be worked as easily as the turning of a common grindstone. The blank intended to be made a file is placed in a central position, the chisel strikes both sides of the blank at the same time, making, in common speed, between 200 and 300 cuts per minute. The gearing is so adjusted that the chisels accommodate themselves to the thickness of the file, so that the cut is equal in depth throughout; and the regular progression of the file ensures perfect regularity in the distance of the cuts. A 10-in. file of medium fineness, is cut on both sides in 3 min.; in three minutes more the traverse cuts are made, and it is again passed through to cut the sides. Thus, three machines, will not cost more than 300 dollars each, and can be tended by one man, can complete twenty common files in an hour, or 200 in a day. A steam engine of five horse power can put fifty of these machines in operation.

Scottish Architecture.

At a meeting of the Institute of British Architects on the 20th of March a paper of considerable interest was read by Mr. R. W. Billings, "On the Ancient Architecture of Scotland." After stating the earliest remains of construction in Scotland to consist of one or two Romans bridges and earthworks of stations, some Druidical remains of considerable extent, and the Picts' houses resembling beehives in form, Mr. Billings mentioned that the first recognizable style of importance in that country was the Norman; and he pointed out the similarity of style in the architecture of that period in Scotland to that of the north of England. The transition to "early English" and "early decorated" took place in the two countries almost simultaneously; but during the latter part of what may be called the decorated period, at the end of the thirteenth century—when the dispute for the Scotch crown caused the severance of the two kingdoms—a striking difference became visible between their styles of architecture. This became the more marked as the alliance which had then sprung up between Scotland and France grew stronger. From that time forward the architecture of Scotland has borne the impress of her ally; and the ancient and modern houses and hotels of Edinburgh of the present day resemble very much those of the French capital. It is also to be remarked, that during the period last alluded to (the latter end of the decorated period), there existed a considerable affinity between the ecclesiastical and domestic architecture in Scotland:—for instance, the hanging tracery of Roslyn Chapel is found also in the court-yard of Linlithgow Palace, and at Stirling. The "four-centred" arch is not to be found in Scotland,—the circular arch being used at all periods; and from these circumstances the form of the arch, so important an element with us in ascertaining dates, is in that country no guide for the purpose.—Mr. Billings alluded to the immense strength of the fortresses previously to the introduction of powder; and said that when experience proved that no lengthened resistance could be opposed to that terrific power, the picturesque semi-castellated architecture was introduced,—a style as peculiar to Scotland as the perpendicular or the Elizabethan is to England. The system of having a small circular loop-hole under each window in the private dwelling-houses was particularly alluded to. The Reformation and the zeal of the followers of John Knox swept away a large portion of interesting buildings of Scotland; but the real spoliators, Mr. Billings remarked, were the town authorities. Their example was followed by the lower classes,—who in their turn regarded the ruins as "quarries" for obtaining materials; and in the present day railway works are equally destructive to many of the most interesting ruins in the kingdom. Mr. Billings expressed a strong opinion that some official means should be taken to prevent this destruction. In the time of Charles the First the revival of Italian architecture and its mixture with the Gothic produced the picturesque effect so remarkable in the buildings of that period. Heriot's Hospital, Wintown House, and Glasgow College, were especially instanced.

Etching Ivory.—For etching ivory, a ground made by the following receipt is to be applied to the polished surface:—Take of pure white wax, and transparent tears of mastic, each an ounce; asphalt, half an ounce. The mastic and asphalt having been separately reduced to fine powder, and the wax being melted in an earthenware vessel over the fire, the mastic is to be first slowly strewed in and dissolved by stirring; and then the asphalt in like manner. This compound is to be poured out into lukewarm water, well kneaded, as it cools, by the hand, into rolls or balls about one inch in diameter. These should be kept wrapped round with taffety. If white rosin be substituted for the mastic, a cheaper composition will be obtained, which answers nearly as well; 2 oz. asphalt, 1 oz. rosin, ½ oz. white wax; being good proportions. Callot's etching ground for copper plates, is made by dissolving with heat 4 oz. of mastic in 4 oz. of very fine linseed oil; filtering the varnish through a rag, and bottling it for use. Either of the two first grounds being applied to the ivory, the figured design is to be traced through it in the usual way, a ledge of wax is to be applied, and the surface is to be then covered with strong sulphuric acid. The effect comes better out with the aid of a little heat; and, by replacing the acid, as it becomes dilute by absorption of moisture, with concentrated oil of vitriol. Simple wax may be employed instead of the copper-plate engravers' ground; and strong muriatic acid instead of sulphuric. If an acid solution of silver or gold be used for etching, the design will become purple or black, on exposure to sunshine. The wax may be washed away with oil of turpentine. Acid nitrate of silver affords the easiest means of tracing permanent black lines upon ivory.

How the Diamond Cuts Glass.—Dr. Wollaston ascertained that the parts of the glass to which the diamond is applied are forced asunder, as by a wedge, to a most minute distance, without being removed; so that a superficial and continuous crack is made from one end of the intended cut to the other. After this, any small force applied to one extremity is sufficient to extend this crack through the whole substance, and across the glass; for, since the strain at each instant in the progress of the crack is confined nearly to a mathematical point at the bottom of the fissure, the effort necessary for carrying it through is proportionally small. Dr. Wollaston found by trial that the cut caused by the mere passage of the diamond need not penetrate so much as the two-hundredth part of an inch, He found also that other mineral bodies recently ground into the same form are also capable of cutting glass; but they cannot long retain that power from want of the requisite hardness.

Architectural Mouldings.

(*Concluded from page* 210.)

Fig. 13 represents the hyperbolical ovolo, as employed in Doric capitals. To describe it: having given the projection of the curve and the lower extremity *a*, draw the line *a c* in the direction of the lower end of the curve, and *b c* vertically through the point *b*; draw *a g* vertically from *a*, and *b e* and *c d* horizontally to *a g*; set off *e f* equal to *a d*, and *e g* equal to

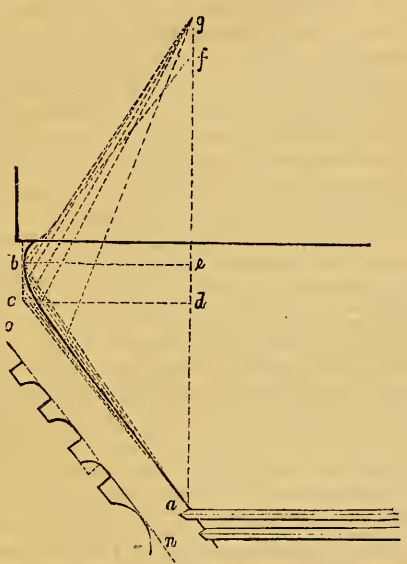


Fig. 13.

a e; join *b f*, and divide *b f* and *b c* into the same convenient number of equal parts; draw straight lines from *a* to the points of division in *b c*, and also straight from *g* through the points in *f b*; the successive intersections of these lines, as in the case of the Greek ovolo [see fig. 7, page 209, *ante*], are the positions of as many points in the contour.

Fig. 14 represents the Greek cyma recta, which may be described similarly to the Roman by means of circular arcs, described with radii of greater length than *a c* or *c b*. The following method was first introduced by Mr. A. M.

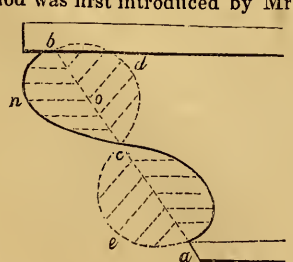


Fig. 14.

Nicholson:—join the points *a b*, the extremities of the curve; bisect *a b* at the point *c*; upon *b c*, as a diameter, describe the semicircle *c d b*, and on *a e* describe the semicircle *a e c*; draw perpendiculars *d o* and *c*, from any number of points in *b c* and *c a*, meeting the circumferences of the semicircles; from the same points draw a series of horizontal lines, as represented in the figure, equal in length to the corresponding perpendiculars—*o n* equal to *o d*, for example. The curve line *b n e a*, traced through the extremities of the lines, will be the contour of the moulding.

To describe the scotia (fig. 15), the extremities *a* and *b* of the moulding being given: draw the perpendicular *a c*, then *b c* is the projection of the moulding; draw the perpendicular *b e*; add one-half of *a c* and two-thirds of *b c* into one length, which set off from *b* to *d*; from

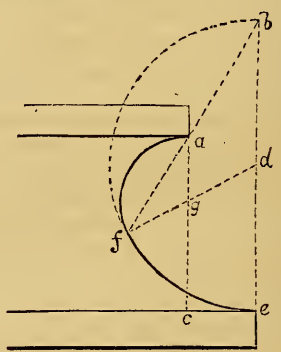


Fig. 15.

the centre *d*, with the radius *b d*, describe the semicircle *b f e*; join *e a* and produce it to *f*; then join *d f*, cutting *a c* in *g*; from *g* as a centre describe the arc *a f*; this arc, in conjunction with *b f*, completes the contour *a f b* of the scotia.

Another mode of describing this moulding is shown in fig. 16. Join the extremities *a* and *b*, and bisect *a b* in *c*; draw *e c d* horizontally, and make *c d* equal to the required recess of the curve, and *c e* equal to *c d*; draw *f d g* parallel to *a b*; divide *a f* and *a c* into the same convenient number of equal parts, and to the

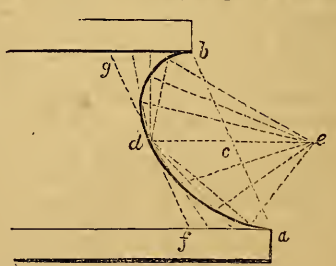


Fig. 16.

points of division in *a f* draw straight lines from *d*; draw also straight lines from *e* through the points in *a c*, till they meet successively the lines drawn to *a f*. Having performed the

same operation on the upper side, the series of intersections thus found are points in the curve, and by tracing a line through them the contour will be completed.

In fig. 17 a method is given in some respects similar to the preceding. Having joined *a b*, describe upon it the semicircle *a d b*; from the centre *c* draw a series of lines perpendicularly from *a b*, meeting the circumference *a d b*; draw also a series of horizontal lines from the same points in *a b*, as shown in the figure, making these lines equal to the corresponding lines

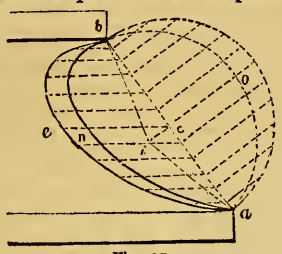


Fig. 17.

to the semicircle—*c e* equal to *c d*, for example; the extremities of these lines will be as many points in the curve. If the recess of the curve is required to be less than *e* c, as for instance, *c n*, then set off *c o* equal to *c n*, and describe an arc *a o b* from the centre *i*, which will be found after one or two trials; performing the same operation, as in the other case, we find the contour *a n b*.

Marble Cutting, &c., in Germany.—On the way back Salzburg, we visited a manufactory of articles in marble—pedestals for statues, columns, and other objects, which are transported hence to different parts of Germany. The machinery for sawing and polishing the blocks is moved by a stream which dashes from an adjoining height. At a little distance, higher up the hill, within the recesses of a most picturesque ravine, we were shown a more novel and curious operation: this was the making of boys' marbles; and a more simple process can hardly be conceived. Small pieces of marble being put into a peculiarly-shaped stone trough or dish, a top of the same material, fitting into certain grooves, is made to whirl about by little streamlets led from the main torrent, and the marbles are soon ground into a spherical form. There were about twenty of these little sputtering mills, one above another on the stream, so that the scene was busy and amusing. At a glance, we were let into the secret of cheap pebble-grinding in Germany. No expense whatever had been incurred in constructing the mills; the apparatus was of the homeliest kind; the sluices on the impetuous streamlets were each nothing more than a turf; the raw material came out of the hill-side; and the superintendent of works was a female, who probably considered herself well paid at a remuneration of twopence a-day. And from this primitive manufactory boys' marbles are sent in vast numbers all over the world.—*Chambers' Journal.*

The Chronotypist.

At the recent sale of the Duke of Buckingham's pictures, the full-length portrait of the Hon. George Grenville, by Sir Joshua Reynolds, sold for eighty-three guineas; and "The Destruction of Pompeii," by John Martin, for one hundred guineas.——Mr. Catlin—whose exhibitions, at the Egyptian Hall and elsewhere, of his picturesque studies of North American character and scenery are well remembered—is about, it is said, to set up his easel in the metropolis with a view to some more formal and comprehensive embodiments of his views and experiences of such aboriginal life.——The French papers state that the Minister of Agriculture and Commerce has formed a commission of painters, architects, &c., to propose reforms and improvements, both industrial and artistic, in the national manufactures of the Gobelins, Beauvais, and Sèvres.——The Sketch-book by Salvator Rosa, exhibited on 1st April at the Marquis of Northampton's third Soirée for the season—the property of Mr. Auldjo—was more remarkable for the notes on the margins and backs of the several studies than for any intrinsic merits of the sketches themselves. They are chiefly transcripts of the neighbourhoods of Spoleto and Foligno; and deficient in that savage character which is the painter's expressive style. On the tables near this book was an extensive collection of initial letters and other illuminations cut out of choral and service books of the middle ages,—and some examples of similar Venetian Art in ducal and other volumes. Of the initial letters one or two were of as remote a date as the thirteenth century. They have been collected by, and are the property of, Major Macdonald. Among the other objects of art exhibited was paper-hanging from Redgrave's trial fresco of "Catherine Douglas barring the door with her arm:"—the fit application of which as a subject for internal decoration seems to us at least questionable. Some specimens of impressions, by a new process, on card-board, in gold and silver leaf, from ancient and modern coins excited much attention.——If the present exhibition of the modern arts in the French capital has had its character affected by the revolutionary movement, our own approaching exhibition will, it is understood, display some effect of the same influences—acting probably in a more wholesome direction. Many artists of distinction—amongst them Ary Scheffer and the celebrated animal painter Le Dreux—have been driven to our shores by the continental tempest, and will seek our alien arena for the display of their art. It is said that the contribution of the French school to the pictures on the walls of the academy amounts to a large number.——The King of the Belgians has commanded the restoration of the palace at Antwerp, and that as many workmen as possible shall be employed on it. Several other public works are also to be commenced immediately, among which is the Quay of St. Michael.——Mr.

Beverley has produced two excellent scenes for "The Happy Family," now playing at the Lyceum; "A Dilapidated Inn-yard," and a "Waterside Villa."——The *Stamford Mercury* states that the powerful steam-engine on Morton Carr, erected about three years ago, for the drainage of the land, is answering every expectation. The 4,000 acres to be drained, notwithstanding the excessive quantity of rain which had fallen, were free from inundation. ——Of volunteering hints and suggestions for the public good there is no end. One points out as an eligible site for a new National Gallery the east side of Wellington-street, Waterloo-bridge—that is, from the line of the river front of Somerset House to the Strand; at present, little better than a mere unsightly gap for nearly its whole extent. Another situation for the gallery has been recommended, namely, the inclosed area of Leicester-square; which, it is reported, is otherwise intended to be covered with houses.——The "Artists' Married Life" being that of Albert Durer, for "Devout Disciples of the Arts," is the title of a new book translated by Mrs. J. R. Stodart from the German of Leopold Scheffer.——A collection of water-colour drawings and miniatures made by Mr. G. P. Harding from celebrated English historical portraits was sold on Friday the 31st of March by Messrs. Sotheby and Wilkinson. The collection in point of finish and interest was not by any means equal to the series by the same artist sold by Messrs. Christie and Manson a few years back; but still there were some good copies, done with all Mr. Harding's usual care and attention to detail,—that Vertue-like fidelity without which these things are worth so very little. The prices were not large—considering the value of the series and the small chance of finding another artist with the same skill and the same inclination whose collection is likely to pass under the hammer of the auctioner. A good water-colour copy of every English historical portrait of interest should, says a contemporary, be made at the expense of Government and deposited in the Print Room of the British Museum. It is easy to conceive the value in many ways of even a coloured copy of Lodge's Portraits.——A handsome garrison-chapel, just completed, in the Royal Barracks at Dublin, is said to be so ingeniously arranged that, except the band (in a gallery opposite the pulpit), not a soul can hear one word of the sermon, but the chapel is bomb-proof.——The *Allgemeine Preussische Zeitung* of the 26th ult., mentions public works of great extent which are being undertaken to occupy the poorer classes in Berlin. Canals, churches, and schools, are in the course of construction. ——Mr. Digby Wyatt announces an illustrated work on the geometrical mosaic of the middle ages: the specimens to be set forth in chromolithography, to give the exact appearance of the originals.——A correspondent of the *Athenæum* points out that the door-keeper of the House of Commons receives £874 per annum, while the Astronomer-Royal is paid £74 a year less; the Parliament messengers receive £300 a year each, more by £60 than the senior assistant of the MS. department, British Museum——The Western Literary Institution, under the new management, is going on very spiritedly. The appropriation of one evening in the week to the consideration of scientific subjects of the day is a good arrangement.——The correspondence between the Art Union Committee and the Board of Trade is now published, and may be had free, we understand, by subscribers and artists, on application at the office in Trafalgar-square.—— The loop-line of the Great Northern Railway will soon be completed, at least that part of it lying between Lincoln and Boston. The station at Lincoln has been commenced.——An electric telegraph has been fitted up in an inn in Birmingham, by means of which the guests can give their orders immediately to the bar. ——The *Stamford Mercury* states that a short time since the workmen on the railway cutting at Greetwell-hill, discovered upwards of 200 pieces of ancient silver coins, also a couple of antique silver rings. The coins comprise a few of William the Conqueror, a large number of Henry II., and a still larger number of those of Stephen.——A rumour is afloat, says the *Bombay Telegraph*, that an electro-telegraphic communication between Calcutta and the sea is contemplated by Government.——At a recent meeting of the Smithsonian Institute, America, Professor Henry gave some account of the founder, a natural son of a late Duke of Northumberland. He was a great chemist, and on one occasion caught a lady's tear on a piece of glass, lost one half, and characteristically analysed the other, and discovered a microscopic salt.——The *Cork Examiner* reports that two lighthouses, one at Ballymacart Head, and the other on Ballycotton Island, would, if no objection were discovered by the Harbour Board, be commenced as soon as all necessary arrangements could be made.——An importation to Liverpool of nearly 400 tons of railway iron has taken place from New York—one of the several importations of the kind which have recently taken place from the United States of America.——The Chinese junk, respecting which so much curiosity has naturally been excited, has arrived in the river Thames. Preparations are making for submitting it to public inspection.——Instead of "the palace at Brighton being again fitted up for the royal habitation," as suggested by a paragraph in the *Brighton Herald*, the stripping of the building goes forward, and workmen are engaged in taking down the chimney-pieces, with a view to their removal to Osborne House.—— The medals ordered by her Majesty for distribution amongst the soldiers, &c., of her Majesty and the Company's service, who took part in the late campaign in the Punjaub, have been completed under the superintendence of Mr. Wyon, R.A., of her Majesty's Mint. The design is an appropriate one. The obverse represents a bust of the Queen, with the ordinary motto, and the reverse a figure of Victory, holding out a wreath to the army of the Sutlej in the right hand, while the left bears a palm branch. The word "Sobraon," or the name of the battle in which the particular wearer took part, is inscribed upon it.——On the Edinburgh and Glasgow Railway, on the 24th ult., the

new iron rope, for taking the trains up the tunnel, came into operation, and is found a great improvement. It takes the trains up in about half the time, and there is now no smoke or steam to pollute the air. The locomotive that drags the train goes up at the same time; but it does not use its power till at the head of the incline.——Lieutenant Gilmore has lately patented an invention for effectively ventilating ships. The means which the gallant inventor adopts to effect the intended purpose, are exceedingly simple, yet, withal, effective. As a proof of the merit of the plan, it may be stated that the Admiralty have ordered all transport and convict vessels to be fitted with the apparatus, and, in a short time, it is believed that all her Majesty's vessels will be ventilated on Lieut. Gilmore's system. Experience in its practical utility has demonstrated its extreme value as affording a perfect downward and upward current—supplying a stream of fresh, and taking off the vitiated air.——The *Mining Journal* quotes a letter from Rotterdam, dated 7th ultimo, which states that "M. F. L. de Ruijter has invented an æronautic machine, which, instead of requiring the power of the balloon, rises into the air from the impetus of its own working, with a weight of 200,000 Netherland lbs., with immense rapidity, and can be steered at will." [Fudge.]——M. Scharenberg, of Strelitz (Mecklenburg), states that, after a course of experiments extending over fifty years, he has succeeded in obtaining a beautiful rose colour from madder. He states he has obtained it in forty shades, varying from a clear rose to the brightest crimson.——The *Inverness Courier* states that the patent obtained by Mr. Aitken, Aberdeen, for the construction of carriages, is likely to lead to a revolution in coach-building. The form of wheels, or springs, of materials for the bodies of carriages, &c., is all entirely new. Mr. A. is exhibiting, as specimens, a car, an omnibus, and a spring-cart. The car holds four persons and is only 4 cwt.; the omnibus can take forty persons, and is about 12 cwt. The cart is about seven hundred-weight and a quarter; it has been loaded to two tons' weight, and been dragged through the street at a trot by a single horse. The extreme lightness of the vehicles is (according to the *Aberdeen Journal*) obtained by the use of what Mr. Aitken calls his *felloe* iron, and the adoption of the iron suspension-wheel.——We understand, says the *Brighton Gazette*, that the reduction already made in the working expenses of the two items, in the locomotive and carriage departments, of the Brighton railway, will this half-year be some £16,000. In the year, it is highly probable that the reductions altogether will reach £35,000, or more.——From a paragraph going the round of the press we learn that it is now seriously intended to bring that long expected stupendous object, Cleopatra's Needle, to England. It has been described as being 70 feet in height, 190 tons weight, 7 feet square at the base, and the whole richly adorned with hieroglyphics upwards of an inch in depth. The pedestal is nine feet square and seven in height. Should such a precious piece of antiquity be transported to the British capital, and erected in a commanding situation, it cannot fail to form a most striking object, not exceeded by any one column in the globe.——The Genoa crucifix, exhibiting in Regent-street, is a fine specimen of carving in ivory. It is said to be the work of a poor monk, uninstructed, and working thus for the first time. Depositions to this effect are in the room, but will probably not carry conviction to all minds.——Government, it is said, has taken possession of the electric telegraph for the present, even to the exclusion of the press, and of everything but the state of the markets.

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POSTSCRIPT.

The ensuing number of this work will form the first of a new volume; and with that number will be commenced a variety of improvements which cannot fail of giving satisfaction to our readers. Among these we may particularly mention the abolishment of the advertisements hitherto printed on the two first pages—the space thus gained it being intended to devote to the general purposes of the publication. The designs presented will hereafter be placed on the front page of the weekly numbers; and, in order to inhance their appearance, no type will be printed on the back. We may here announce that we have a series of articles on each of the following important subjects in active preparation :—

1. Perspective.
2. Design.
3. Costume.
4. Ornament.
5. Heraldry.
6. Drawing.
7. Manufactures.
8. Chemistry.
9. Carpentry.
10. Joinery.
11. Cabinet-Making.
12. Upholstery.
13. Bricklaying.

We also intend presenting elaborate series of articles on the contents of the British Museum, the National Gallery, the Dulwich Gallery, the Armoury of the Tower of London, and the Hall of the Royal Polytechnic Institution, in addition to others of general interest; Editorial Notices, Reports of Artistic and Scientific Meetings, History, Sculpture, and Reviews of New Books, with copious Extracts.

The articles on Architecture will be rapidly followed up, and will embrace all the orders, styles, and varieties from the earliest period to the present day.

Scarce and valuable Essays on Art and Science will appear in our pages in an abridged form.

Most of the above will be illustrated by first-rate engravings.

Having secured the services of several eminent artists, we shall be enabled to lay before our readers weekly an elaborate design of a high order of merit.

Notwithstanding the heavy pecuniary outlay which these improvements will necessarily entail upon us, no advance upon the usual price of this publication will be made; all that we desire of our readers being, that they strive to introduce our work to the notice of their friends. If every one of our present subscribers were but to obtain two extra purchasers, we should be enabled to perform even more than we have promised—and there are, we believe, none that have it not in their power to do so.

In taking leave at the conclusion of this volume, we again have to return our sincere thanks to those who have supported us in our past labours, and cheered us on, by encouragement and suggestion, towards the great end we have in view—the cultivation and improvement of the minds, the feelings, and the tastes of the multitude—the correction of abuse—the furtherance of art—and the dissemination of its principles widely and freely—conceiving it to be, in these days, a noble and a creditable labour, and one deserving of more patronage than we have hitherto received at the hands of the public.

17, Holywell Street, Strand, London.
April 19th, 1848.