Indian Thought and Western Science in the Nineteenth Century

A Letter to Dr. Bose by Mary Everest Boole

This letter was written in 1901; it was published in The Ceylon National Review in June, 1909. In 1911 it was printed as a booklet under the title of "The Psychologic Aspect of Imperialism," but when Mrs. Boole put it, later on, into its final form she restored the original title.

16 LADBROKE ROAD,

LONDON, ENGLAND, 1901.

Dear Dr. Bose,

Nivedita* conveyed to me your request that I would explain what I meant by speaking of the unfitness of the English people to undertake the *education* of such a people as the Hindus. What I said was that the English suffer from a carefully cultivated ignorance of certain essential elements of psychology, and that European science could never have reached its present height had it not been fertilised by successive wafts from the psychic know-ledge stored up in the East.

It is commonly said that the great modern advance in physical science is entirely a product of Europe and America, It is true that most of the work of observing, collecting, and classifying phenomena has been done by Europeans and Americans, but the masses of detail brought to light by Western observers are reduced to order by means of what is called the higher mathematics. Higher mathematics consists mainly of psychologic science evolved in Asia and brought to Europe by individuals who reduced it to a notation which, while facilitating its use as an organiser of phenomena, withdrew it from the cognizance of an ignorant and meddlesome priesthood. You wish me to explain the statement. If I were younger, I should like to make a fresh study of this interesting topic. But, in my seventieth year, my sight and strength are a little failing me; I can no longer enter on fresh studies. The most I can do is to write out my reminiscences of the facts and books which led me to form my opinion.

As my letter must therefore take a personal and what may seem an egotistic form, I must ask you to let me say, at starting, that [948] when I shall speak of my husband's work having been misunderstood, I do not and cannot possibly mean that he was neglected or undervalued. On the contrary, he received recognition, in the shape of medals and honorary degrees, to an extent which he considered far beyond what he either merited or desired. He often spoke warmly to me of the generous assistance given to him in his researches by mathematicians here and abroad; of their overpraise of whatever in his books they were able to understand; and of the more than cordial welcome accorded to him whenever he visited any university. He told me that he went very little into university society, because he had good reason to know that the cordiality of his admirers would in most cases have been diminished if they had had any clear idea what his books really were about. As he knew of no

* Margaret Noble

way in which he could make the academic public understand his real meaning without plunging into controversies repugnant to his tastes, he shrank from receiving homage, as it were, on false pretences.

As to my own family, whatever one's opinion may be of the taste displayed by the English in altering the ancient name of the great mountain, there can be no doubt that the choice of my uncle's name in connection with this queer kind of vandalism was meant as a full recognition of the services rendered by him to engineering science. If, therefore, at your request I tell the people of India some facts which I happen to know in the history of modern European science, I do so not as one appealing to men of another race for recognition denied by her own; but because I venture to hope that for the sake of my uncle and my husband what I say may at least gain a thoughtful hearing. When you have read what I have to say, I ask no more; I do not wish to convince anyone against his instincts; judge for yourselves.

You know that Professor Be Morgan caused a *Treatise on Maxima and Minima*, by Ram Chundra*, to be published in England, in order to prove to English men of science that the Hindu mind masters, without the aid of the differential calculus, problems which among us had hitherto been solved only with the help of the calculus.

The bearing of this fact has not, it seems to me, received sufficient attention. If we heard about a foreign tribe that it could see, without telescopes, celestial phenomena discovered by us only by the use of telescopes, we should at once ask: "Does this mean [949] that they possess some instrument of equal optical power with the telescope, but differently arranged? Or does it mean that they can see, with the naked eye, or by means of some simpler optical assistance, what is invisible to us without a powerful arrangement of lenses?" In the former case we have evidence of a vision equal to our own and of a constructive ingenuity similar to our own, but which accident has directed rather differently. In the latter case we must conclude that the foreign tribe have an organic power of vision such as we have either never developed, or have lost owing to misuse or disuse. Which of these two cases does the Hindu treatment of Maxima and Minima most resemble? Read De Morgan's Preface: I can only give a few extracts.

> "On examining this work I saw in it, not merely merit worthy of encouragement, but merit of a peculiar kind, the encouragement of which, as it appears to me, was likely to PROMOTE NATIVE EFFORT TOWARDS THE RESTORATION OF THE NATIVE MIND IN INDIA.
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> "They" (the English) "forget that at this very moment there still exists among the higher castes of the country — castes which exercise vast influence over the rest — a body of literature and science which might well be the nucleus of a new civilisation, though every trace of Christian and Mohammedan civilisation were blotted out of existence.
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> "Many friends of education have proposed that Hindoos should be fully instructed in English ideas and methods, and made the media through which the mass of their countrymen might receive the results in their own

* A Treatise on Problems of Maxima and Minima, solved by Algebra, by Ram Chundra, late teacher of science, Delhi College, Published in London (Wm, H. Allen & Co., 7 Leadenhall St., 1859) under the superintendence of Augustus De Morgan, from the Calcutta edition (printed by P. S. d'Rosario & Co., Tank Square, 1850)

languages. Some trial has been given to this plan, but the results have not been very encouraging in any of the higher branches of knowledge.

"My conviction is that the Hindoo mind must work out its own problem, and that all we can do is to *set it to work* that is, to promote independent speculation on all subjects.

"That sound judgment which gives men well to know what is best for them, as well as that faculty of invention which leads to the development of resources and to the increase of wealth and comfort, are both materially advanced by, perhaps cannot rapidly be advanced without, a great taste for pure speculation among the general mass of the people, down to the lowest of those who can read and write."

He also quotes from Sir John Herschel's historical article "Mathematics" in *Brewster's Cyclopaedia*:

"The *Brahma Sidd'hanta*, the work of Brahmagupta, an Indian astronomer of the seventh century, contains a general method for the resolution of indeterminate problems of the second degree; an investigation which actually baffled the skill of every modern [950] analyst till the time of Lagrange's solution, not excepting the all-inventive Euler himself."

The destruction of natural faculty which De Morgan deprecated seems to have been going on in other departments besides that of mathematics. A friend of mine who employs himself in founding in Europe little colonies of peasant artists, and who for that purpose has studied good specimens of real old Eastern art, was invited to inspect some weaving done in India in an institution controlled by Englishmen. "Art?" he said to me, "call that Art? True Art always expresses some real feeling, personal or national; that stuff is neither English nor Hindu nor anything else. Some boy from Cambridge or Oxford goes out there and thinks he can tell the Hindus what they ought to do!"

And indeed I fear that the "boy from Cambridge or Oxford," or some other cramming-place here, is the *fons et origo* of all the mischief. "We must keep a hold on India," say our governing classes, "or else what should we do for careers for our sons?" May the words prove prophetic, though spoken in stupid and cruel ignorance! May England long keep a hold on India as a school where "our sons" may learn the secret of true culture! But how can we expect to retain the loyalty of Hindus, if we trample out their normal development and their self-respect? Someone wrote to me lately that Sister Nivedita cares for India, but not for this country. I replied that Nivedita seems to me to be doing more than any other woman whom I know of for the peace and stability of the British Empire. I have gone through all this battle before, on a small scale, and seen the issue. Seventy years ago my father, a parish clergyman, started the (then novel) doctrine that the parish pastor is not a priest, either in religion or in art, but a state-"minister" (i.e., servant), appointed to organise the culture of the parish *in accordance with the desires of the most serious and wise inhabitants*. The neighbouring clergy were alarmed and angry; they said that my father was encouraging disloyalty to the hierarchy of social rank and to the proper authority of the state clergy. But, notwithstanding their disapproval of the methods, they envied the results. There was no parish in the country round where the inhabitants, even the Nonconformists, were so fond of the parish church; no clergyman who had such power as my father to sway the hearts of the people when any feud needed to be healed or any wrong to be righted. Therefore I have no fear of normally developed people; but I do dread human beings who have been mechanicalised and distorted.

My father and De Morgan had drawn wisdom from the same source. What that source was will presently appear. We will now, [951] if you please, go back to the mathematics and the influence of De Morgan.

Of course English youths are now being taught to do problems in Maxima and Minima by means of squared paper and other simple devices similar in essence to Ram Chundra's, and probably superior in efficiency. The power of the English to do this has been, so to speak, thawed out, largely owing to the influence of De Morgan. We have nothing now to learn from India about that particular branch of actual geometry. My point is, as De Morgan's was, that we have still much to learn from India about the psychology of mathematical study generally. And there are many other branches of learning in which our powers are still latent (frozen up, as the power to understand Maxima and Minima directly was frozen till fifty years ago) under certain influences prevalent in Europe, and waiting the touch of India to thaw them into life. It is of these frozen, dormant faculties of ours that I have to write to you.

What I shall say next will seem to you at first connected with Jewish rather than Hindu thought. Have patience a moment: I hope soon to make you understand its relevance to your own affairs.

My husband told me that when he was a lad of seventeen a thought struck him suddenly, which became the foundation of all his future discoveries. It was a flash of psychological insight into the conditions under which a mind most readily accumulates knowledge. Many young people have similar flashes of revelation as to the nature of their own mental powers; those to whom they occur often become distinguished in some branch of learning; but to no one individual does the revelation come with sufficient clearness to enable him to explain to others the true secret of his success. George Boole, poor and with little leisure for study, became known as a learned and original mathematician at an early age. From the first he connected his scrap of psychologic knowledge with sacred literature. For a few years he supposed himself to be convinced of the truth of "the Bible" as a whole, and even intended to take orders as a clergyman of the English Church. But by the help of a learned Jew in Lincoln he found out the true nature of the discovery which had dawned on him. This was that man's mind works by means of some mechanism which "functions normally towards Monism." Besides the information which reaches it from the external world, it receives knowledge direct from The Unseen every time it returns to the thought of Unity between any given elements (of fact or thought), after a period of tension on the contrast or antagonism between those same elements. [952]

At this point all possibility of becoming a priest came to an end. George set to work to write a book (*The Laws of Thought*), in order to give to the world his great discovery. If he had stated it in words, he would have been entangled in an unseemly theological skirmish. He presented the truth to the learned, clothed in a veil so transparent that it is difficult to conceive how any human being could have been blinded by it; he proved that by the mere device of always writing the symbol 1 for whatever is the "Universe of Thought" for the time being, the whole cumbersome mechanism then known as 'Logic' could be dispensed with. If you are thinking of sheep as divided into white and not-white, put x for 'white' and 1 for 'sheep'; if you are thinking of sheep as a portion of the animal kingdom, write z for 'sheep' and 1 for 'animals,' and so on. Using this simple device, he proved that the most complicated examples given in any treatise on logic could be solved easily and mechanically by the ordinary processes of elementary algebra. He said in the book that this law was a law, not of

facts or of essential reason, but of the human mind (*Laws of Thought*, p. 4). He also said he wrote the book for two purposes:

(1) "To investigate the fundamental laws of those operations of the mind by which reasoning is performed" (p. 3), and
(2) "To give expression in this treatise to the fundamental laws of reasoning in the symbolical language of a calculus" (p. 5).

It was when this book was nearly finished that he came strongly under the influence of what I would venture to call the Everest School of Mathematics: at first indirectly; afterwards by direct contact with Sir George himself. He finished off his book *The Laws of Thought* somewhat hastily; in fact, he afterwards told me that he had given seven years to its preparation but he wished he had given fifteen.

The academic world was enchanted. George visited Cambridge in 1855, a year after the publication, and was astonished, and at first gratified, at the cordiality of his reception. Herbert Spencer said that the book was "the greatest advance in Logic since Aristotle." George Boole said to me that neither Aristotle's Logic nor the Creed of Moses could have been enunciated unless the formula to which the Universities had now given the name of "Boole's Equation" had been, in some form or other, perfectly well known. George afterwards learned, to his great joy, that the same conception of the basis of Logic was held by Leibnitz, the contemporary of Newton. De Morgan, of course, understood the formula in its true sense; he was Boole's collaborator all along. Herbert Spencer, Jowett, and Leslie Ellis understood, I feel sure; and a few others, but nearly all the logicians and mathematicians ignored [953] the statement that the book was meant to throw light *on the nature of the human mind*; and treated the formula entirely as a wonderful new method of reducing to logical order masses of evidence about external fact. Only think of it! The great English religious mind, which considers itself competent to preach *the Truth*, the only saving Truth, to all mankind; the great academic educational mind which is to improve Hindu culture off the face of the earth, fell into a trap which I believe would hardly have deceived a savage. My husband said to me that he believed he could never have made his discoveries if he had received a university education (as he at one time much wished to do, but was, fortunately, prevented by poverty). My after-experiences, among men who had been subjected to that process, incline me to think he was quite right in so believing. He was, as I said, a quiet student, gentle, timid, very conscientious, and averse to controversy; he could not face the theological animus which would be aroused by any attempt to explain himself in open words, nor did he feel it right to unsettle the superstitions of people evidently too stupid to take in reasonable truth; he went on to further researches.

He had proved the essential Tightness, in relation to human progress, of the command to think of the Infinite Unknown as Unity when appealing to Him for light on finite concerns.

The question next arose: What instinct in man, what fact in human psychology, has given rise to the tendency to think of the Divine as a Trinity?

The Jew could give no further help. The Trinitarian tendency was seen by George Boole in connection with the fact that man conceives the physical world in three dimensions. His Sonnet to the Number Three (p. 250) gives a clue to his view of this matter.

But the great delight of all his later years was the study of the psychology of Incarnation Myths; and I incline to think that the record of it, in *Differential Equations* (Chap. viii, "Singular Solutions"), will be considered by posterity the crowning achievement of his

life. Numa Hartog said to me, in a puzzled way, that it did not read like a chapter of an ordinary text-book. A student who heard his lectures while he was engaged on it, said he looked not like a professor before a blackboard, but like an artist painting from a vision.

My uncle, George Everest, was sent to India in 1806 at the age of sixteen. Things were different in those days from what they are now; there were neither competition Wallahs nor Officers trained in England by 'Army Coaches': the boy went out ignorant, un-spoiled and fresh. He made the acquaintance of a learned Brahman [954] who taught him — not the details of his own ritual, as European missionaries do, but — the essential factor in all true religion, the secret of how man may hold communion with the Infinite Unknown. This my uncle told me long afterwards. Some time about 1825, he came to England for two or three years, and made a fast and lifelong friendship with Herschel and with Babbage, who was then quite young. I would ask any fair-minded mathematician to read Babbage's *Ninth Bridgewater Treatise* and compare it with the works of his contemporaries in England; and then ask himself whence came the peculiar conception of the nature of miracle which underlies Babbage's ideas of Singular Points on Curves (Chap, viii) — from European Theology or Hindu Metaphysic? Oh! how the English clergy of that day hated Babbage's book!

My uncle returned from India finally in 1844. He never interfered with anyone's religious beliefs or customs. But no one under his influence could continue to believe in anything in the Bible being specially sacred, except the two elements which it has in common with other Sacred Books: the knowledge of our relation to others, and of man's power to hold direct converse with the Unseen Truth. In 1846 my father, Uncle's younger brother and pupil, published a paper on the names of God in various languages, in which he attempted to show that Odin, God, Theos, etc., were names for *spiritual vitality* imparted to man. When I was preparing for confirmation, I asked him what the church prayers meant by calling Jesus 'God.' "He is an Incarnation of God," said my father. "But I don't know what Incarnation means; and you told me not to use words the meaning of which I don't understand." "Why can't you understand? You are an Incarnation of God yourself," This from a country clergyman in 1849! You can see that India *'avait passé par là*.'

Now you see why "Boole's Equation" seemed to me at the age of eighteen exactly what it was: the mere algebraic expression of natural psychologic truth; why I was never either puzzled or shocked by my husband's conception of Trinity and Incarnation as myths connected with the psychology of the human mind; and why I was able to help him in his work.

My father used to say to me: "Few crimes which a man can commit are more wicked than trying to convert Jews to any of our forms of Christianity; because the New Testament is their own book; and the best hope of the world is that they (the Jews) should study it in their own way and tell us what it means." I have found the teaching of Jews about the New Testament very helpful in connection with my husband's psychology. Therefore I [955] never care what Europeans say about India; I wish to hear what Hindus themselves can tell us about their old literature.

When my husband died I received an enthusiastic welcome as the widow of the mysterious recluse to whom science owed so much. Scientific men, theologians and publishers alike, invited me to throw light on some passages in my husband's works which they felt to be obscure; but every attempt on my part to interpret "Boole's Equation" as a law of the human mind known in Asia from the earliest recorded ages met with either violent

opposition or blank non-intelligence. My adventures among the learned would fill a volume, and very funny reading it would be, though in some parts very sad. I can now only sum them up in a short parable. There was once a steam-hammer, capable of crushing a big iron bar flat at a single blow. The inventor (Mr. Nasmyth) sometimes amused himself by showing visitors that his control over it was perfect; that he could crack a filbert shell with it without injuring the contents. Now, can you imagine a party of squirrels watching this *tour de force*? "Oh! here is a wonderful man! He has invented a mechanical nut-cracker! We need never use our own teeth again! Let us give him medals, and confer on him honorary titles as a learned squirrel, doctor of the Science of Nut-cracking! But... stop, there are parts of this machine not essential" (to the cracking of nuts); "let us get rid of them; then the apparatus will function more easily. Oh! dear Mrs. Nasmyth! how glad we are that you have come to us! You were in your husband's confidence; you know how his glorious machine was made; help us to improve it!" Imagine Mrs. Nasmyth trying to explain to these amiable beings that the cracking of nuts was an accidental side-issue; that the true purpose of the machine was something entirely different.... There you have my history during the thirty-six years that have elapsed since my husband's death. With regard to my husband's later work, I have found myself since his death caught between the cog-wheels of two opposite kinds of superstition, which seem to me equally childish and unworthy of civilised beings. Men who were pledged to a theologic system based on the conception of three individual gods in One God, were afraid to face the simple statement that Trinity is a limitation, not of the Divine Essence, but of human concrete imagination. On the other hand, many "Free-thinkers," proud of their emancipation from the trammels of idolatrous Trinitarian theology, shrank from all reference to Trinitarian metaphysics, as if it necessarily involved a step back towards the idolatry from which they had escaped. Those who can treat this subject sanely and reasonably are almost invariably persons who have become [956] familiar with the Hindu conception of Trinity. They have been, however, until quite lately, in a very small minority.

A similar fate has befallen Boole's investigation into the nature of the psychologic processes by which the Aryan mind arrives at the conception of special Incarnations. The theologic party, pledged to the theory that one special Incarnation, and one alone, had actually happened in Syria nineteen centuries ago, and that all others are fabulous, were simply scared and shocked at any psychological treatment of the subject; while those who have emancipated themselves from the notion that "salvation" depends on "belief" in the Syrian Incarnation, dread all reference to the subject as "superstition." Only those who have studied the Hindu doctrines can be said to be sane on this topic.

I am sometimes told that my experiences and my husband's are unique. I do not think so. If they were, they would be in no way worth recording. But, from what I saw thirty years ago of the resolute determination of religious people to suppress evidence tending to show the value of other cultures than their own, and of other Sacred Books than the Bible, I am led to suspect that much work similar to my husband's has existed at various times in Europe, and been ruthlessly destroyed, often, however, leaving a fertilising sediment in the shape of Mathematics. Now, however, the great sinners in this respect are not persons who suppose themselves to be religious, but rather those who profess to be scientific, progressive, and above prejudices and superstitions.

I will give you two instances of work somewhat similar to my husband's and mine having been in existence and having been suppressed.

No one doubts the vast influence exerted on French thought, during the last half of the eighteenth century and the first half of the nineteenth, by the group of men called the

Encyclopedists. But one never hears anything of the influence on the Encyclopaedists of Nicolas Antoine Boulanger. I have never met anyone who had ever heard of him. I found on a bookstall a little book signed with initials only, and dated 1760, *L'Origins du Despotisme Oriental*. I asked Mr. Garnett of the British Museum about the author. Mr. Garnett had never heard of him or of his book; but with his kind assistance I managed to find in the British Museum Library a biographical notice of the author and other works by him.

Nicolas Boulanger, when at school, learned very little; which I think goes to show that the teaching he received must have been very bad; for he afterwards became an eminent engineer and was employed by the French Government in making military roads, [957] he did, what was still possible at that day, though, alas! no one could do it now — he procured information about the real old ideas of the Indians of America, He studied Eastern thought-modes with great care and wrote the treatise which I have mentioned on Despotism, and another: *L'Antiquité devoilée par ses Usages*, wherein he propounded this thesis: that, before the invention of writing, man had received a great revelation of the nature of his own mental powers; that some races tried to preserve this by means of ceremonies performed with branches of trees and other natural objects; that other races acquired the art of writing and registered what they knew in sacred books; that the Jewish Festival of Unity (the Sabbath) was originally a festival, not of inaction, but of renewal; that the truth about government and education would reveal itself when men began to compare sacred writings with the rituals of savages; that priests were appointed to lead men into truth, but in all ages they have feared lest men should find the right road and walk in it; and that no tyrannical government could keep itself in existence if it did not keep a staff of priests to trample down natural truth.

Boulanger never allowed his treatises to be printed during his lifetime; they were circulated in MS. among the Encyclopaedists: if they were the fathers of modern French science, Boulanger may well be called its grandfather. He died in 1759, and in the following year his pupils began to pour edition after edition of his works through the press: in Paris, Amsterdam, London and Geneva. Why, then, are the books so unknown in Europe now?

The great beauty and clearness of French mathematics, which set in about the time of the Encyclopaedic, culminated in 1855, in a work on Logic* and on the inspired Intellectual Faculties, by Gratry, in which he proved that the calculus of Newton and Leibnitz was a supra-logical procedure, and that geometric induction is essentially a *process of prayer*; by which he evidently means an appeal from the finite mind to the Infinite for light on finite concerns. He said that Logic (as ordinarily conceived in his day) had only feet, whereas, treated as he suggested, it would acquire wings. My husband in the previous year called attention (*Laws of Thought*, p. 4) to the distinction between mathematical induction and the kind of induction known to observers of physical fact. My husband did not use the words "inspiration" and "prayer" about the former, as Gratry did; as I said, he avoided calling the attention of the unlearned to his work by words familiar to them in connection with "religion"; but he described the process of mathematical induction in terms which should have shown to any educated person [958] what he meant. He revelled in Gratry's book. I have never met with any other Englishman who had seen the mathematical portion till it was pointed out to him by me; though as a religious writer Gratry is well known. What has become of Gratry's influence on science? I have heard that he was threatened with excommunication. The sentence was not carried out: it would have called attention to his work. The Church did a cleverer thing. Gratry's psychological deductions from his theory of mathematical induction were of the highest order; they were republished in a separate form,

* Logique, 2 vols., Douniol, Paris,

without any mention of the mathematical root whence they sprang. Thus it was possible to make them appear as the outcome of specially Catholic theology, and to hide their connection with the great psychologic truth which underlies all religions alike.

At this point our reasoning must leave the earth and rise for a moment on its wings. Those who can understand nothing which does not refer either to the hoarding of minerals or the cracking of nuts will not be able to follow us. Shut your eyes for a moment and turn your gaze within. Think what must have been the effect of the intense Hinduizing of three such men as Babbage, De Morgan, and George Boole on the mathematical atmosphere of 1830-1865. What share had it in generating the Vector Analysis and the mathematics by which investigations in physical science are now conducted?

Ask Mr. Sinnett to think of this, and then to assert again, if he can, that *Hindu thought has had no influence in developing European physical science.*

I have one more point to notice, the significance of which I think you will easily perceive.

After reading Boulanger, it occurred to me to follow up the clues as to early spiritual thought given by ceremonies connected with natural objects, such as trees, branches, etc.

Surely physical and intellectual fertilisation run parallel in the history of the minds of all naive peoples, and the one is to them a symbol of the other.

I published a few papers on "Sacred Branches," and received more than one warning — one in especial from a well-known leader of religious reform — that I must be mistaken in supposing that ceremonies connected with branches had ever any reference to spiritual or intellectual fertilisation; because — guess why — because there is evidence that they *had* been at various times connected with physical generation!

These be thy intellectual leaders, 0 England! These be the wise men who are going to show Hindu women how superstitious [959] it is to offer rice to the Sacred Egg. You would probably still find more than a few ladies in Hindustan capable of pointing out to these prosaic gentlemen that the person that does see the connection between physical and spiritual fertilisation is more likely to be a true interpreter of any ancient religion than the person who cannot see it. God defend India from having its women 'educated' under the auspices of such men!

Now, dear sir, I have told you the special facts to which I alluded in our short conversation. Will you allow me the privilege of indulging in a few promiscuous suggestions born of my various experiences in the English thought-world? They cannot harm you; they may, perchance, afford you a little help some time or other. Take them at least as an old woman's blessing on your aims and on Nivedita's undertaking.

The class of literature called Sacred Scriptures, such for instance as the Scandinavian 'Eddas,' the Sanscrit 'Vedas,' and that collection of Hebrew and Greek writings known in England as 'the Bible,' is made of two strands closely interwoven.

One strand consists of the traditions, myths, legends, laws, ethical notions, rituals and customs which constitute the 'religion' of some particular race or nation.

The other strand consists of allusions to and hints of the great, world-wide, world-old secret, of the means by which man can maintain and increase his capacity for directly

receiving into himself fresh force from cosmic sources, and fresh knowledge direct from that storehouse of the As-Yet-Unknown which remains always infinite, however much we may learn. I call this latter strand 'secret,' not because those who most truly know it are unwilling to communicate it to anyone who wishes to know it, but because of the unwillingness of men agglomerated in groups either to know it or to let it be known. The majority both dislike for themselves the stern self-discipline which the knowledge of it imposes, and dread the mental power given to others by its possession.

Europe for the last fifteen centuries has been subject to an influence peculiarly favourable to trampling out the true secret of power to draw knowledge direct from the Infinite Unknown. As long as a race is familiar with its own sacred literature, the more earnest and thoughtful of each generation will understand the literature in spite of the dislike of the majority to their doing so. No opposition can prevent an intelligent Hindu from catching the secret from the Vedas, or a spiritually minded Hebrew from knowing how Moses, Isaiah and Jesus held converse with the Inconceivable Unity. But we in North Europe were robbed of our [960] Eddas and our Druidic lore by Roman priests mad of that lust for religious uniformity which is a spiritual perversion of the brute lust for conquest and self-assertion. These Southern invaders did (what missionaries still try to do in Asia): they robbed us of our legends and old customs, which, however perverted by the masses, would always have been transparent and shown the Great Secret of culture to all who wished to see; and they imposed on us a "religion" and a sacred literature, doubly unintelligible to us Western Aryans, as being Eastern and as being of Semitic origin. Had they left North Europe its native legends, and given us the Bible in addition, as interpreter and purifier of our own rituals and customs, they would have bestowed on us a boon indeed! But they insisted on our accepting their ritual and legends instead of our own. Thus in Europe even the intelligent lost for the most part the knowledge of the organic psychologic method of communion with Unseen Truth, and accepted instead a 'religion,' the one commonly miscalled Christianity. It seems hardly credible, but it is a historic and indisputable fact, that for fifteen centuries not only the ignorant and thoughtless, but the large majority of intelligent and spiritual Europeans, believed it to be their duty to allow themselves to be robbed of their natural birthright of spontaneous communion with Unseen Truth, and to accept instead the special doctrines of an alien 'Bible,1 the allusions in which they could by no possibility understand aright. Every now and then, of course, some man in Europe caught a glimpse of the laws of man's natural relation to the Unknown. This has happened sometimes spontaneously, often by contact with the Hindu Sacred Writings AS INTERPRETED BY THE LIVING HINDU MIND. Those who received such illumination, if they spoke in words, were in the Middle Ages burned or tortured to death. In modern times they have only been worried or starved to death. But many of them — my husband, for one, and many another besides — have found the way to state the laws of human approach to and acquisition of the Unknown in a convenient notation, which, as I said, both withdraws what they have to say from the notice of the so-called "religious" world, and facilitates its use in organising physical science by making its application compact and rapid. This science of the laws according to which "finite man can appeal to the Infinite for light on finite concerns," reduced to a compact notation, is what is known in Europe as THE HIGHER MATHEMATICS or CALCULUS OF (mental) OPERATIONS.

Ram Chundra could do without the calculus what Europeans at that time did only by the aid of the calculus, because the calculus was a mechanical invention intended for the purpose of [961] bringing within the reach of the deadened European mind certain things which the Hindu mind saw spontaneously.

When we Europeans boast of our science, one point remains almost always ignored; it is this: no amount of mere observation and experiment can prove a Law of Nature, in any sense which makes it available for purposes of real science. Babbage (*Ninth Bridgewater Treatise*, 1837, 1st edition, ch. ii., and 2nd edition, 1838) showed that however long or carefully men may have observed a sequence of events, if they try to state the law which governs the sequence, the chances are still as infinity to one that they have misstated it, that events predicted by them will fail to happen as observation had led them to expect. Wherever we find the element of prophetic certainty, i.e. of such certain knowledge of a law as shall enable us to say beforehand what consequences will flow from given causes, there must have come in a touch of that other kind of induction — the one called in the West "mathematical." Now the notation, the manipulation of mathematical induction, is entirely European; but the mathematical induction itself *comes from the East*. The majority of Englishmen, when they speak on this topic, speak in what I have called elsewhere a condition of "serene omniescience" of the whole subject.* No amount of skill in using a mathematical notation throws any light on the conditions under which it was generated. A man may use a scientific notation with consummate skill and yet know no more of the mode in which it was generated than the boy who turns the handle of a machine need know of the nature of the investigations which presided over its construction. Many so-called mathematicians are so unawake to the true nature of the machine which they are manipulating that they are hardly aware that there is anything to learn. I, who lived nine years with George Boole while he was collaborating with De Morgan, know — that I do not know. I do as George Boole and De Morgan did: I bow my head in reverent thankfulness to that mysterious East, whence come to us wafts of some transcendent power the nature of which we ourselves can hardly state in words. When materialists on one side, and theosophists on the other, agree in assuring the public that the great structure of European science has been created *without reference to psychic lore*, I feel that I owe it to the cause of truth to say that I differ from these persons, not as to the truth or value or originality of this or that idea or statement, but as to the contents of books which they have apparently never read, about the genesis of notations which they can only use mechanically (if they can even do that much), whereas [962] I have discussed the details of some of them with the originator, before their form was finally fixed.

This question surely goes to the root of all ethics and all the well-being of people in every country and every class.

The "improvement" made by Jevons in my husband's method increased its utility for dealing with mere finance at the cost of all other uses. One proof of the utter ignorance of the English on questions of psychology is, that when one speaks of a *mathematical* treatment of a subject, they almost always suppose one means something like statistics, something which deals with the *numbers* of things, not with mental operations. Mr. John Hobson told me, not long ago, that he always believed mathematics could have nothing to do with the *quality* of anything, that it must always refer to quantity only. He had no conception that the true function of mathematics is to test the *quality of our thinking*; that it is a Calculus of Mental Operation. Mr. Hobson had got his ideas of the meaning of mathematics mainly from Jevons; and, being a true thinker, had refused to acknowledge such mathematics as a guide. The difference between mathematics and statistics is shown in this: the statistician deals only with averages; he rejects all that seems to him unusual as outside of his problem. Boole's notation enables us to deal with ultimate types of fact and to bring out their significance. This is the genesis and meaning of the Science of Incarnations or Singular Solutions. The true test of the validity of any theory, in biology, psychology, or social science, is: How does it answer when

* Saturday Talks, Colchester, 1900, p. 35.

applied to *ultimate types*? Impatience of those apparent "exceptions," which in reality "test the rule," is a sign of a feeble thought-mode whose apparent strength is due to the delirium of fever.

When a man finds that he has made a mistake, he often likes to get out of the matter without being obliged to own that he made it.

An editor will tell one in the coolest manner that one's ideas 'are highly original, interesting, and valuable, but one must manage to express them without showing that one heard them in a synagogue, or readers will take offence.' (They would do the same if one said one had heard them from a Brahman.) This same edifying system is carried on in detail, at the expense of whatever individual discoverers, ancient or modern, happen to be out of favour with the special clique for whom one is writing.

Women who have cultivated the art of 'making lenses of them-selves' (*i.e.* bringing to a common focus thought-rays of different orders) are always made tools of in this way, unless they are very careful to prevent it. Many women, under inducements similar to those which have been brought to bear on me, succumb morally, [963] and allow themselves to be set up as *illuminate*, and traded on for dishonestly pious purposes. And many a woman who would not consent to be false to her own instincts of fidelity has gone mad under the horrible pressure.

A great alienist told me about 1885 that the present condition of the atmosphere of religious and educational circles in England was bad for the health of patients who had any tendency to *delicacy of conscience*.

I then said: "English thought is now so rotten that it gives way under any firm grasp. It lacks cohesion, because the members of one group are afraid to own their obligations to some other group."

My experience is that Jews, whatever their faults may be, have at least some perception of the meaning of *fidelity to ancestry* (racial and intellectual), and they never attempt to make one disloyal in the way that Gentiles do. Therefore Jewish thought is more coherent, vitalised and pure than ours.

Instead of trampling out the Hindu methods of culture, we had better improve on our own. Medical men have often expressed to me their regret that their preliminary education had been so one-sided and futile as to put needless difficulties in the way of their understanding the Laws of Thought as algebraically expressed.

Assistant teachers in schools, after a short period of study of "Boole's Law" (*i.e.* the law of mental unity), usually come to the conclusion that many of the methods taught to them in the training-schools are radically bad, destructive of nerve-health and of intellectual power; they are puzzled and pained at the impossibility of carrying out what they see to be the dicta of sound psychology in connection with any school system at present in existence. Children are often brought to me with the request that I will "try to find why they cannot get on with mathematics," and what is wrong with the methods in use at their school. Usually I find that the mathematical text-books in use in the school are very good in their way; but the whole system and discipline of the school are contrary to the most elementary principles of mathematical psychology; the children have acquired radically bad mental habits, and have no idea how such a thing as a mind ought to be used.

India, no doubt, sorely needs the vitalising touch of Europe; she needs both our physical science for practical use and our mathematical notation to interpret to her consciousness the treasure of her own subconscious experience. But do we not also need her touch perpetually? Those who think that the little [964] scraps of Indian lore already in our possession comprise all that there is to know are, I fear, leading us sadly astray. Mr. Sinnett having brought home from India one or two golden eggs, is now telling us that it never sent us any before his time and never will again; he is trying to persuade you to kill the bird that laid them. I hope for all our sakes that you will not be persuaded to do anything so foolish.

A woman once spoke to me about "the art of sheathing the mind to prevent the shedding of force," and added: "My mother was an American Indian; we are taught those things in our cradles; we are born knowing them." What would it be to England and America, in these feverish, neurotic days, to have in every school a competent teacher of "the art of sheathing the mind to prevent the shedding of force"? Alas! what has become of those with whom it was a hereditary tradition? As for the ART itself, we have here mean, foolish, degenerated scraps of it. Something similar has happened in the matter of at least one valuable American food-plant. Having got the potato under cultivation, the Anglo-Saxon race were foolish enough to allow the wild stock to be killed off as a "weed." Now, we would give a good deal to renew our degenerated, over-cultivated Europeanised stock by fresh importation of the true native growth; but, alas! the native tuber is now hard to find. Let us all pray that a similar fate may not overtake the mental foodstuff which we have imported from India. Your country may be, if dealt with wisely, a practically exhaustless store of psychologic knowledge.

The battle which you have to fight has been fought out already on a smaller scale, in the matter of Hebrew culture and faculties. For centuries Europe has been trying to unjudaise Jews: the religious party wished to missionize and "convert" them to Christianity; the secularising party of late has wished to prove that the Jew could do nothing better than accept bodily our own materialistic, unphilosophical, anti-psychological modes of learning. This pressure produced what was known as "the Jewish Difficulty." Surely that ought to be a sufficient warning of the consequences of trying to prevent gigantic psychologic forces, of whose nature we are ignorant, from developing along the paths that are normal and safe for them. There have, fortunately, been always a certain proportion of Jews too wise to be caught* in the mischievous man-traps set by us for the destruction of their higher faculties. This [965] select minority has accepted our science for what it might be worth, but refused to let us flat-iron out their own old methods of domestic discipline. Now, a quiet but strong current of religio-philosophic influence has set in which, originating among such Jews as Claude Montefiore, Israel Abrahams, and Lily Montagu,† is sweeping many harmful delusions from our Gentile homes. What such Jews are doing, I hope you Hindus will also do in your turn, and on a larger scale.

The treasures which these people have to guard are different from yours. No Jew that ever I met seemed to have the slightest conception of the nature of the special faculties which

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* See an able article, signed G. K. C, in Speaker, 2nd March. 1901, on this subject. The writer refers to the habit of Gentiles of bestowing honours on precisely those lines of conduct in Jews which the Jewish community would have been too wise to reward.

† I. Abrahams, Jewish Quarterly Review. C. G. Montefiore, The Bible for Home Reading: Macmillan, L. H. Montagu, Naomi's Exodus: T. Fisher Unwin, 1901.

you Hindus inherit, and can help to develop in us European Aryans. But the struggle which you have before you is essentially the same as that which such Jews as those to whom I refer have successfully carried through. Subjects of the English government who wish to revive and give full development to their own racial potentialities (whatever those may be), while sharing to the full in the opportunities for European culture, and who wish also to avoid entangling themselves and their race in political turmoil, would do well to study, as a model, the movement which is now represented by Montefiore, Abrahams, and Lily Montagu. It is a marvel of tact, good taste, concentrated power, and effective management.

A propos of this Hebrew revival, let me tell you a story which you may find it useful to narrate to any missionaries with whom you may be troubled. Somewhere about fifty years ago, two philosophic and ethical reforms, somewhat similar in kind, were started in London; one in the English Church, the other among the Jews. De Morgan and my husband watched both these movements with keen interest. On personal investigation I found the whole subject of modern Judaism treated by the Christian reformer and his followers with patronising carelessness, whereas the Jew reform leader had been shrewd enough to make himself well acquainted with all the writings of the leader in the English Church. I worked under both leaders at different times. Both were perfectly sincere, and, as human beings, worthy of respect. But I noticed one curious difference, which, for me, completely settled the question which was the greater as a leader. The Christian had been himself a "convert" from the Unitarian Church. He cordially welcomed converts who came to him to be received into that which he had joined. The Jew, David Woolf Marks, had all his life been a student of the Christian philosophy; but had [966] remained in the Church of his fathers. And when Gentiles came to him (as many did) to be received into the Jewish Church, he spoke in this wise: "Why do you wish to be received? You want to join us in prayer? The doors of our place of worship are open; come in whenever you like. You wish to read our Scriptures? No one hinders you. You wish to keep our moral laws? Do so by all means; you will be all the better citizen. You want to conform to our ritual? What good will that do you? It is the traditional discipline of a race, unsuited to you and a useless burden for you. You wish to be descended from Abraham? Ah! I cannot give you that. You say that I have taught you what is good? Well, if I have done so, go away and practise it and teach it in your own Church; and do not come here flattering me." I heard this long ago. Last week I went to the old Hebrew reformer, now nearly ninety years old, and asked him if the above is a correct account of his mode of treating would-be "converts." He gave his emphatic assent and his cordial blessing on my present attempt to encourage your aspirations. (He was a friend and colleague of De Morgan and Kingdon Clifford.)

I wish you Hindus would tell yourselves that European civilisation is, compared with yours, a very young child. He is a nice child, but noisy and troublesome, as are all healthy children.

A wise teacher once explained to an old race which was being dominated by a young one, the principles on which the relationship should be adjusted: "Render unto Caesar the things which are Caesar's, and unto God the things which are God's." Leave the child his material "activities"; they suit his stage of development. Never strike him, never grow angry. If he attempts to meddle with sacred things, such as your reverence for your Sacred Past, you can surely make him ashamed of his childish impertinence by a few judicious words.

You invited me to send a message of encouragement and hope to the learned men of India. Better for that purpose than any words of mine are some that were spoken to me long ago by a medical friend (Dr. Wiltshire) who was dying in early manhood of the results of an

over-brilliant career in youth. He said to me: "The way to do good work is to live to be old; if you have genius, keep it fresh till you have also experience." This applies, I think, to nations as well as to individuals.

What we need is not that English visitors to India should tell us little scraps that they happened to learn there, but that Hindus should learn to speak our language, and teach us what they know. And by "our language" I do not mean the English of the market and the mission church, the law court and cramming school; I [967] do not mean any of the dialects in which people who cannot think for themselves repeat like parrots what they suppose other people to have thought. I mean the language in which the real thinking is done here by real thinkers. Tell learned Hindus that Boole's notation was invented by De Morgan and himself for the purpose of expressing *psychological* truth; that it is an extension and development of that international shorthand in which Moses and Odin and the Brahmans of old talk across time and space to such men as Leibnitz and Newton, Boulanger, Gratry and De Morgan, over the heads of politicians and plutocrats, of pedagogues and priests. If Hindus will study the notation of Boole's calculus, so as to know how to express themselves in it freely, they may then help Europeans to found something like a truly human civilization, a truly intelligent education.

I end as I began. Tell Hindus to read De Morgan's Preface to Ram Chundra. Tell them that it is the voice of Mount Everest calling to India to awake and arise, and recover the treasures of its past.

With heartfelt gratitude to the memory of the Brahman who taught my dear uncle (not his special religion, but) the underlying principles of true progress,

I remain, dear Dr. Bose,

Yours truly,

MARY EVEREST BOOLE.