MARY EVEREST BOOLE
Collected Works

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MARY EVEREST BOOLE

Collected Works

Vol. II

II

Logic Taught by Love

The Nineties

The Mathematical Psychology of Gratry and Boole

On Education : 1900 and later

LOGIC TAUGHT BY LOVE

RHYTHM IN NATURE AND EDUCATION

This book was privately printed in 1890 *and published in* 1905.

ANY creature will follow a truth as long as he thinks that it will lead to something which he can approve. And what he will approve will depend on the accidents of his evolution.

He alone attains to the true dignity of man who follows reverently in his thought whatever in practice he most disapproves, whenever it seems likely to lead towards Truth. Such an one has risen superior to accident; and is, himself, an Evolver.

DEDICATION

TO A JEWISH REFORMER

DEAR SIR,

When Naaman the Syrian returned to his own people, after his memorable visit to the Land of your forefathers, he felt that Truth would seem to him, in later years, less like an impossible dream if he might make his offerings to the Eternal on an altar constructed of that sacred earth over which had trodden the feet of the Reformers of Israel. The Prophet, true to his function as a messenger from the All-Father, respected an instinct which of course he, personally, could not understand. May I ask you to tolerate a statement which certainly you will not understand? You have been to more than one writer on mathematical Logic the witness that fervent devotion needs no superstition about persons or observances, but may be kindled by reverence for the Creator, Who works by laws of orderly causation. This faith of Science, we are often told, is necessarily loveless and cold; there can be no fervour, it is said, without superstition or illusion. But where your influence reaches, all cherished illusions loosen their hold on the emotions; for their beauty fades in the glow of your impassioned love of Truth.

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PREFACE

THIS book will seem to some a mere medley. Is it a text-book of Logic, a pious exhortation, or a treatise on Mythology? Why cannot the author choose some plan and stick to it?

For this reason (among others): Part of the very object of the work is to call attention to the fact that our life is being disorganized by the monotony of our methods of teaching. To escape this monotony, we are driven to seek the needful variety in multiplicity of subjects of study and in conflict of opinion. Variety we must have; but we could get it more safely by alternation of attitude and variety of treatment.

The most important truths are those which no one disputes; but they are now too much forgotten, precisely because, not being disputed, and being monotonously taught, they are found uninteresting. In old days these truths were impressed on the mind by giving variety to the manner of their exhibition.

An eminent Logician says of his own work: "I am proud of having written a book on Logic, in which it is proved, among other things, that the Logic of the heart has its own validity." I should be proud if I could convince a single teacher that the isolation of any mode of thought is misleading; and that no system of Logic can be valid unless it is able to focus together various rays of Truth.

The substance of this Volume appeared in Articles in the *Inquirer, Journal of Education, Jewish Chronicle* and *Jewish World* of London, the *Occident* of Chicago, and the *American Israelite* of Cincinnati.

My best thanks are due to the owners of the long-lost Wedgwood MSS. (recovered in 1882) for confiding them for a time to me. These MSS. would not, it is thought, appeal to a sufficiently wide circle of readers to make the publication of them desirable; but they supply the missing link between the Pulsation-Logic of Gratry and Boole, and the most advanced medical psychology of our time.

Though I should be sorry to seem to commit any one to my views, I cannot refrain from also expressing my gratitude to those who have kindly helped me in tracing the effects of Jewish discipline in promoting personal and racial longevity; amongst others, the Principals of Jews' College and the Jews' Free School; the Editors of the *Jewish Chronicle* and the *Jewish World;* and, last but not least, my kind and valued friend, Mr. Lazarus, late Beadle of the Berkeley Street Synagogue.

The descriptions of lessons on elementary mathematics which occur on pp. 410, 413, &c., appear also in "The Preparation of the Child for Science."

M. E. B.

CHAPTER I

IN THE BEGINNING WAS THE LOGOS

WHAT creative Energy is, in Its own Nature, we do not know; It is The Ineffable I AM. What we do know about It is the fact that It pulsates. The very life of all that lives consists of some mode or other of Pulsation or alternate action. Without this Pulsating action, nothing grows. As the old writers said, It was in the world, and the world obeyed It by compulsion but knew It not. Then It made man, free to know It. Man, being free, sought out many inventions, all intended to substitute some fixed condition for incessant pulsation in human affairs; and to substitute the worship of some fixed entity for that of the Eternal Pulsator. But to some few the secret Wisdom revealed Itself; and to them It gave power to become Sons of God. And all the History of religion, of morals, and of Philosophy, is a history of conflict between the Seers who would teach the Law of Pulsation and the multitude who would pervert their teaching.

All life is pulsation; and health is always rhythmic pulsation timed in accordance with the proper rhythm of the particular organ. Every baby's lungs learn this at their first contact with the air; the baby-heart has caught the secret long ago by sympathetic contagion from its mother's heart. Nature teaches her mighty secret to the baby heart and lungs; and leaves the "voluntary muscles" and the brain to learn it voluntarily. We have gone but a little way yet towards finding out how to do this; still the gymnast knows that much may be done towards hardening limbs against fatigue and disease, by a regular rhythmic alternation of extension and contraction; and logicians such as Gratry (and much greater men before him) knew that, to a large extent, the same can be

done with the mental faculties. The future possibilities that open out before us as we study the great Logicians of the Pulsation doctrine are overwhelming ; one hardly dares realise all that they imply ; but the fact is that the heart and lungs do actually sing, in their own language, the Eternal Hymn—Holy, Holy, Holy is the Logos, the Hidden Wisdom, the Principle of Rhythmic Pulsation, which was in the beginning, is now and ever shall be, Creator of all that is, Preserver of what has proved itself worthy, Purifier by the destruction of all that is sluggish or disorderly. The goal to which we are tending seems to be to train all our faculties, one after another, to take their parts in the same Chorus. The very antagonism of the masses to the teachers of Pulsation is a suspension which enriches the Harmony, the means by which is created the possibility of the Highest Rhythm. Humanity toys and coquets with its own bliss ; it dares not let itself know what the Logos has prepared for those who love Him.

For no one really doubts the doctrine of Pulsation. Every new birth is a witness to the truth that *conception* (whether physical or mental) is the result of re-uniting at a suitable moment elements that have been suitably differentiated. We all know it ; but we fear to let ourselves believe. History, as the Apocalyptic Seers knew, is the story of the alternate withdrawal of man's mind from the Logos-doctrine and re-union with it.

That perennial Love-Story has been intertwined with another, not less solemn and vital. Far back in the ages a Tribe was differentiated, to be to the other races of the earth what the Unseen Logos is to Humanity as a whole ; the subject of incessant misunderstanding ; and the object of alternate fear, dislike, contempt, and superstitious reverence. We never understand the People of Israel (nor can it be said that they ever rightly understand us) ; but every now and then we are made to feel that some magnetism is coming forth from the incomprehensible Race, which acts as a solvent to our metaphysical perplexities ; which is the witness to and preparation for a Life higher than anything we can conceive.

The complex and variable relation between Jews and Gentiles, so unutterably sweet in some aspects, so bitter often, so unsettled and incomprehensible always, seems to be one chief means by which Humanity is being made fit for the rapture of intelligent comprehension, and able to look into the Face of Love.

The Race of Israel is the hereditary priesthood of that Unity whose action is Pulsation. There is another such priesthood : occasional, unrecognized, consecrated by no hand but that of suffering, marked out by no special observance except that of

being always peculiar everywhere; High Priests for ever of that order to which all official priesthoods are forced, sooner or later, to do homage. Out of the deeps they have called; and Truth has heard. Where steady health sees solid things and enduring systems, the *sick* often perceive, instead, a shimmering palpitation.

The man of whom it is said that he made the greatest advance in Logic since Aristotle, said of himself, that no one could do certain kinds of work unless he would *consent to be ill.* The majority decide, of course, that the perceptions of illness are "abnormal"; in old days these abnormal perceptions were called "miraculous." The name matters little; the important thing for us is to see that we do not waste the gifts that God sends through suffering.

Jesus, the High Priest of Pulsation, offered himself to death rather than support any one-sided rights or any fixed doctrine. And having been slain by one set of idolaters, He was made into the object of sensational worship by another set. And now, as ever, the teachers of the Eternal Logos are alone on the earth; and yet we are not alone, because the Father is with us, and all the Seers who went before us.

If we sorrow overmuch about the idolatry of our brethren, do not we thus prove ourselves to be also idolaters who would arrest the natural Pulsations? For the conflict between Seers of New Truth and the lovers of fixed ideas is the very palpitation of human life, the great witness to the doctrine that progress takes place by pulsation.

In some of the following Chapters an attempt is made to picture past episodes in the conflict between the Logos-Seers and their antagonists; in others, suggestions are offered of means whereby that very conflict might be converted into an orderly and peaceable mental gymnastic.

CHAPTER II

THE NATURAL SYMBOLS OF PULSATION

Heaven and Earth declare the wonder of His Work.

THE History of early religions is very much a history of the successive introductions into public worship of various symbols by means of which the Seers hoped to make the masses realise the perpetual Flux or Pulsation which underlies the phenomena of Nature. The Seer perceives the Law of Pulsation by observing a

certain phenomenon; that phenomenon becomes for him interesting; he tries to make the masses share his interest in it, as a revelation of Nature's fundamental Law; the masses lose sight of the idea of pulsation, and get up an idolatrous (*i.e.* fixed) tension on the symbol itself. To the pure in heart who see the Logos, all things are pure, because all things suggest the ineffable "process of becoming"; and those things are naturally sacred to any man, and an object of religious reverence, which most vividly suggest it to him. But to the masses things are not thus pure; because they see, in each thing, not the Creative Logos, but some special quality which is, or which they suppose to be, the especial characteristic of that object. Each Seer tries to break up the association of special Sanctity which clings round the symbol employed by his predecessor; in all good faith and innocence he tries to teach Flux-doctrine by some new symbol; and so the process begins again. It has in various forms gone on throughout the History, not only of religion, but of all the intellectual and moral life of the world; it is made intelligible by studying those natural objects which at various times have been associated with religious ceremonies.

The movements of the Heavenly Bodies revealed to the Seers some mighty Principle of rhythmic motion; those whom they tried to indoctrinate with this idea worshipped Sun and Moon and Stars. The Seers erected stones to facilitate consecutive observation of the heavenly motions; the people supposed those stones to be possessed of magic virtues. It would seem that at some time in the world's history the process of becoming was taught chiefly by reference to vegetable growth. The people attached fantastic ideas to the grotesque forms of certain vegetable objects. Then the Seers selected for use in teaching certain trees distinguished by the absence of tendency to grow into suggestive shapes, and which exhibit in a severely simple form the main laws of growth.* The idolaters constituted these particular trees or plants sacred. Then the Seers ordered the sacred plants to be burned in homage to the Unseen Cause of growth; the masses made an idolatrous ceremonial out of the very act of destroying a sacred Symbol. The Seers would seem then to have turned from the vegetable, which only grows, and whose growth can only be inferred, not seen, to the animal, in which the life-process reveals itself by visible motion. To the medical priest, who, by dissecting a ram's heart, has caught the secret of the throbbing of his own heart, the ram is henceforward a sacred object. The mass of mankind are,

*Such is the characteristic of all the sacred Trees which I have been able to examine.

however, not easily interested in abstruse and as yet imperfectly developed physiological theories ; to them, a ram is—a beast of certain shape. They see his form, but not the pulsating force which constitutes his life ; and, of all that the enthusiast has told them, they remember nothing, except that when they say their prayers they are to look at a ram. From that to the worship of a ram-god is an easy step for the unthinking multitude.

When the sacred beast dies, Superstition makes of him a mummy, so as to preserve as much of him as can be preserved. The Seer orders him to be burned in honour of The Unseen Giver of Life. The masses attach superstitious ideas to the very fire that consumes the offering. The Seer orders that part of the flesh shall be consumed, not by the fire, but by the very worshippers ; the masses make the meal a superstitious observance. Some Seer tries to show that the important thing in the beast is not his death, but the lessons drawn from the palpitating entrails which reveal the secret of life ; the next generation declares that the Prophet drew auguries from the entrails.

Another Seer tells how mere tension on the lessons of the past is idolatrous and barren, and mere following of one's personal inspirations is dangerous and misleading ; that he alone is a true Prophet by whose head converge the two streams of instruction, inspiration and tradition, as two birds may fly from distant points of the horizon.* Posterity says that the great man of old taught how to gather knowledge from the flight of birds.

And so on, ever round and round the same weary circle, the Seers rolling up the Sisyphus-stone towards true enlightenment ; the masses ever plunging back into idolatry and carnalism.

There was in old times one practical difficulty connected with the conflict, which may well account for the eagerness of ancient Prophets to put an end to idolatrous conceptions. To every genuine philosopher the symbols of certain physical functions are among the most sacred of all objects, as being the perennial witness that the Logos is with man ; and not with man only, but with all Creation. But the masses can see nothing in these objects except the symbols of certain pleasurable sensations ; and if they are taught to think intently of them, they make their religion consist in the stimulation of mere sensation. This has been the cause of numberless disorders, and excuses much Prophetic injustice and bigotry on the subject of Idolatry.

The Founders of Judaism desired that the People should be taught, as far as possible, by symbols possessing in a very marked manner the property of *evanescence*. The Sun and Moon, the

*Odin's birds were "Thought" and "Tradition."

symbols of pure Light, had been degraded to idolatrous purposes ; Moses seems to have tried to make his people feel that some phosphorescent material, which shone only rarely, was more truly sacred than the Sun and moon. In fact, the Mosaic religion may be described as one which abjures, as far as possible, the consecration of colour-and-form manifestations which are either *partial* or *permanent ;* it takes, for its principal symbols, manifestations which are essentially evanescent ; and it keeps permanently enshrined nothing but revealed Laws. The writer of Genesis asserts that the true symbol of God's covenant with Man is the Rainbow ; which no man can capture or embalm or enshrine ; which is made by the occasional breaking-up of the One Light into many colours, to fade before long into the Unity of White Light again ; and which, when it departs, leaves nowhere in the world a trace of its having existed, except on man's heart an impression of spiritual beauty, and in his mind the power of attaining a knowledge of the Laws of Light.

We gain a curious side-light on the early history of religions by the study of Cornish legends. When, in the early ages, savage tribes were converted by strangers of a different religion, the priests who converted them taught them to connect the memorials of their old faith with the idea of *evil magic*. Where, therefore, we find Druidic stones, believed by peasants to be relics of evil magicians, we may guess that some conversionist has been trying to indoctrinate people with his views. In Cornwall there are distinct traces of a stratum of some religion intervening between the old idolatry of fixed stones and the Christian ideas imported from Rome through England. The characteristic of Cornish legends is that monoliths are people who would not pay proper respect to the Sabbath ; and who, as punishment for that crime, were arrested on their way to somewhere where they wanted to go, and were struck into stone to stand on the moor for ever, to show what comes of not keeping Sabbath. Now when we know about any preacher, that he instructs his flock to expect, as the penalty for neglect of religious observances, *arrestation of progress*, and *the falling into a permanently fixed position*, we can form a tolerably clear idea what was the main character of the religion taught by him. We are not here, however, left dependent on mere inference, for the religious teachers who converted the Cornish from their early idolatry left behind them another trace besides the legend of the people who would not keep Sabbath. In contrast with these evil stones, there are others held sacred by the peasants almost to our own day ; the so-called "logan-stones." A logan-stone is one so delicately poised, that a child's touch can make it sway to and

fro ; yet it presently returns to a position of equilibrium by virtue of its natural equipoise. The name "Logan" is derived from a word in use in Cornwall, to "log" *i.e.* to *sway, rock, vibrate.* We need not ask what was the philosophy of teachers who held sacred the logan-stone.

Perhaps the most impressive of all Natural Symbols of progress by Pulsation is the one referred to by Jesus—the Law of the circular Storm, which might be suggested to any true lover of Nature by observing the wheeling dust. The Spirit which guides man is like the whirling wind ; it blows backward in one place while it is blowing forward in another ; so that you cannot tell in what direction it is going as a whole, merely from feeling how it blows on you.

In connection with this subject I may mention a remark that has occurred to me in reading works of piety. All sorts of religious writers agree in describing the troubles of life as "stormy seas." The instinct of some leads them to speak of taking refuge from the storm in an *Ark* (which sways with the heaving sea, and yields to its every motion) ; while others, on the contrary, prefer to think of clinging for safety to a fixed stone or cross, or other immovable object. The writers of "clinging" symbolism are of the properly orthodox type ; if such a man should happen to disagree with the ecclesiastical superior who is in authority over him, it will be owing to the disturbing accident of some other having gained a stronger hold on his mind. But the man who, like Baxter, writes hymns about taking refuge in an Ark, is normally a heretic by the very nature of his mind ; a natural Free-thinker, born to be a reformer and an Apostle of the Hidden Logos. There are, indeed, some who express the sense of trust in God without reference to an intervening Ark ; they find sufficient security in the very Law of the Storm itself. He who is scientific enough to know the rhythmic pulsation which is revealed in the Law of the Storm, feels sure that it will cease when the appointed time has come. Suggestions of this feeling are common in the Hebrew Scriptures.

CHAPTER III

GEOMETRIC SYMBOLS OF PROGRESS BY PULSATION

"When He made a decree for the rain, and a way for the lightning, He saw wisdom; and to man He said, The fear of the Lord is Wisdom."—JOB. xxviii. 26-28.

WHILE such Seers as Moses, Isaiah, and Odin were struggling to make the masses attend to the Genesis of things, or process of becoming, to give them some sort of faith in the very existence of any Laws of moral development by reaction, certain thinkers of less actively social and philanthropic temperament retired into solitude to study those Laws in detail, and to impart their knowledge to a few chosen pupils. Many of them studied the Laws of mental development by the method of mathematical analysis. The vulgar called such students Wizards and other harsh names. The pursuit of mathematical Logic was often forbidden; the books of "Grammarye" were burned; and sometimes the writers and readers of them. At other times Wizards were held in high honour. Is it not possible that the famous breast-plate of Aaron, which was consulted in mental difficulties, may have had inscribed on it a selection of the Natural and Geometric Symbols of orderly mental sequence?

In modern times it has been assumed that the study of mathematical Logic must have been "mystical" or "fanciful." But in the middle of last century the Science was revived by a group of writers, among the foremost of whom may be mentioned Babbage, De Morgan, Gratry, and Boole. These philosophers have reclaimed us from bondage to the ignorant dictatorship of the opponents of "Grammarye," by proving that all the more important thought-processes can be illustrated Algebraically. Whatever can be stated in Algebraic symbols may legitimately be expressed, so far as possible, by mechanical action, or in diagrams. The practical possibilities of Algebraic notation are, it is true, far wider than those of mechanical or pictorial representation; but, when a truth has once been expressed Algebraically, it can no longer be considered fanciful to illustrate, by motion or by diagram, as much of it as is capable of such illustration. We are therefore free to teach the elements of the Higher Logic, to those unacquainted with the notation of Algebra, by the same methods as were used of old in schools of Free-Masonry and of Prophecy. Messrs. Benjamin Betts and Howard Hinton are creating a simple system of repre-

sentation, by the use of which the study of Logic by diagrams will some day be carried much further than has ever yet been possible. In this Chapter I propose to give some idea of the elements of the Science which teaches geometrically the laws of mental Pulsation.

A stone, escaping from a sling, exhibits tangential motion, overcoming the counteracting force of the string. According to modern definition, tangential momentum is not, properly speaking, a Force.

"Let knowledge grow from more to more, yet more of reverence in us dwell"; reverence for the Light vouchsafed to those who had not our advantages in the way of technical knowledge. To the thinker of the far back ages, these were the facts presented as a basis for speculation:

If he dropped a stone from his hand, *something* made it fall at once, straight towards the earth. If he put it in a string and whirled it, *something* prevented its either falling as far as the string would allow, or yielding quite freely to the pull of the string. If it escaped from the string, *something* made it fly, not straight to the earth, but off towards the distant horizon. What were these rival somethings? Were they warring dæmons? And was his string a magic implement which altered the balance of power between these unseen personalities?

If the thinker was a Hebrew Prophet, his doctrine of Unity provided him with an answer. The various phenomena were not the work of rival personalities, but various manifestations of the Dunamis or Power exerted by The Unity Who speaks through diversities. And when his confidence in that Unity had given him skill to conquer an opponent, both more richly endowed by Nature than himself and more amply provided with material and mechanical appliances (of learning?), he went back to his sheepfold and sang under the silent stars: "Oh! how love I Thy Law; all the day long is my study in it." The knowledge of Science possessed by the ancient Hebrew was no doubt very elementary; but perhaps it does his more fortunate European successor no harm to reflect that, so far as it went, it was sound. Nor is it bad for the over-cultured, over-specialized, over-examined little victims of advanced education to have their hearts brought into sympathy with the emotions of the Sacred Past, while their fingers are handling its implements, and their intelligence is brought into contact with its problems. The practice of playing with such toys as the sling and stone, the sucking-valve, the old-fashioned rope-maker's wheel, and the bandalore, may be made a means of accustoming children's nerves to the feeling of Nature's opposing

tendencies, and may prepare the organization for receiving knowledge, later on, into the conscious mind. By training the hand to trace out Nature's action, we train the unconscious brain to act spontaneously in accordance with Natural Law; and the unconscious mind, so trained, is the best teacher of the conscious mind.

Another interesting exercise is that of tracing the Pentagram. Number the angles of a regular Pentagon in order; and draw straight lines from 1 to 3, from 3 to 5, from 5 to 2, from 2 to 4, from 4 to 1. Repeat several times in succession. Choose the size of the Pentagon to suit the size of the hand. After some practice, the Pentragram should be drawn by freehand. The exercise may be varied by tracing the Heptagram, *i.e.* passing from one point to another of a regular Heptagon in this order—1, 4, 7, 3, 6, 2, 5, 1. Childish as the foregoing description may seem, the tracing of these figures gives a curious *feeling* of arriving at completeness, by a series of tentative Pulsations backwards and forwards; and in old days the idea of magic attached itself to the exercise. At a time when the ability to investigate the angles of the Pentagram represented a high degree of mathematical skill, we may imagine that some enthusiast, in a fit of that tender fun which is characteristic of scientific genius, conceived the idea of tracing the figure on his threshold, saying to his pupils, "No lying spirit can enter, nor can science degenerate into sorcery, if study is put under the safe guardianship of accurate mathematics. Very slight inaccuracies," he would add, "leave room for the entrance of any kind of treachery and deception." Later on it came to be believed that drawing a Pentagram on the threshold of a study prevented Satan from entering, provided it were drawn with sufficient accuracy. If at any point the junction were imperfect, the devil entered through the gap! The process by which the Pentagram degenerated from being the symbol of a scientific accuracy which shields from temptation to duplicity, into being a magic weapon of defence against a personal devil, is typical of all such degradations.

We now pass from the Science which teaches Natural Law by training the muscles, to that which addresses itself more directly to the intellect, and through the intellect to the soul.

The reform in the teaching of mathematics, now in agitation, depends essentially on getting teachers to understand that the chalk in the lecturer's hand becomes, at a given moment in the lesson, a Revealer, independent of (and, for the moment, superior to) the man who holds it; a Teacher of Teachers, King of Kings, and Lord of Lords. Yet how easily this essential doctrine of

mathematics slips over into the slavish dogmas which ignorant people connect with the so-called doctrine of Transubstantiation ! And how wisely did the English Church decree that the "transubstantiated" bread shall be eaten at once, not preserved as sacred ! We do not wish the children to attach superstitious ideas to the chalk (or bread) when the demonstration is over ; but if there is to be any vital reform in method we must make young teachers realise that, for a few moments in each lesson, he and the chalk *change* places ; that for those moments the chalk, not he, is the true intermediary (or mediator) between the Unseen Revealer and the class. We cannot continue to boycott in England all vital mathematical teaching, just because stupid people have talked grovelling nonsense about the doctrine which is its vital essence.

The manner in which a problem that baffles us when treated on its own level can often be solved by bringing to bear on the solution truths of a higher order than that contemplated when the question was first propounded, is well illustrated by the famous 47th Proposition of Euclid. The question proposed for solution is this : Is there any constant relation between the length of the hypothenuse of a right-angled triangle and the lengths of the sides ? We are now so familiar with the solution, we have so mechanicalized the process by which the answer is arrived at, that the significance of both escapes us. But let us place ourselves, in imagination, back at the time when the question was as yet unsolved and was being eagerly investigated. In studying the earlier problems of Euclid, questions about lengths of lines are settled by striking circles with compasses (which is virtually a process of measuring) ; and questions of area, etc., by superposition. Everything is referred to certain axioms which act as a hurdle set up for the purpose of giving children the exercise of climbing over it. The formal Logic in the beginning of Euclid exercises a certain mental agility ; but everything which is really found out, is found out by trusting to the evidence of our senses aided by some mechanical process.

But when we attempt to find a relation between the hypothenuse and sides of a right-angled triangle, all modes of measurement fail to show any fixed relation, *and appear even to show that none exists.* Those who were satisfied that nothing was valid except the evidence of the recognized instruments probably asserted that the existence of any fixed relation *was disproved.*

But there were true Free-Masons in those days, or rather there were Free Geometers, the founders of Free-Masonry ; bold, untamable spirits, who dared invoke the All-Seeing Eye of the

Great Unity to enlighten their blindness ; and who well knew that rules limiting the play of the human intellect were made, chiefly, to be defied. They claimed the right to seek Truth outside the limits marked by orthodox compasses ; they knew that, when we find our way stopped in the order of thought to which we have hitherto been confined, such experience is an indication that the time has come to investigate afresh the question of the relation between different orders of thought. By transferring the search for a relation between the hypothenuse and the sides to an order of dimensions *higher* than that involved in the original question, we find that there is a constant relation, one indeed of absolute equality, between the *square* on the hypothenuse and the squares on the sides.

Let us think with sympathy of the orthodox Geometricians. They thought, of course, that they had exhausted all the possibilities and satisfactorily proved that the constant relation sought had no existence. And behold, here come dreamers, who claim the right to overthrow all established boundaries of knowledge ; to evade difficulties by a mere trick ; and to solve the question, declared unsolvable, by reference to some extra-linear order of ideas ! We can well imagine their disgust. Alas for human short-sightedness ! the defenders of orthodox methods are forgotten ; and "the dreamers, the derided, the mad, blind men who saw" Truth, because they persisted in ignoring the cobweb barriers raised by intellectual timidity—these heretics built the Temple dedicated by the Wise Man to The Great Unity ; and they also founded the Geometry of the Future.

The moral of Euclid is this : As long as we are investigating relations with no reference to any higher order of ideas than is obviously involved in those relations, we could make each discovery by some empirical method ; a new order of thought begins at the point where we introduce into our reasoning considerations derived from an order of thought higher than that whose relations we are investigating.

Now the present condition of moral and religious reasoning is about on a level with that of mathematical reasoning at the time when a few bold spirits were proposing to look for an equation between lines in the region of non-linear surface ; and the majority were expressing scepticism and indulging in sneers. The parallel is perhaps all the more accurate, because reasoning about lines as lines is in itself, and necessarily, in a sense illusory. There is no such thing in Nature as a line, except the edge of a surface (nor, indeed, can there be any surface except the boundary of a solid).

Thousands of years before any such definite conception dawned in mathematics as that to which the name "dimensions" attaches itself now, it must have occurred to thoughtful men to study the shadows cast by solid objects. The duration of the shadow, it would be observed, is not coeval with that of the substance from which it is projected ; a passing cloud is sufficient to obliterate it. Nor is its form solely determined by that of the solid object, but partly by the position of the latter relatively to the Source of Light. Pondering on this would lead to experiments in shadow-producing. Of the exact course of the shadow-study carried on by wise men of old we have no accurate record ; but whoever is engaged in prosecuting similar investigations now, is sometimes irresistibly made to feel that he is going over the same ground as has been trodden by some "inspired" writer of the olden time. To avoid controversy, I propose here only to indicate a simple method by which any person of average intellect can commence the shadow-study, and introduce children to it. The points of contact between us and the ancients, I shall (with one important exception) leave the reader to find out for himself. I will observe, however, that the shadow-study was a favourite amusement of George Boole ; and it would appear from the Seventh Book of the Republic, that Socrates was familiar with it.

Those who are only beginning the shadow-study can work most conveniently with a single light overhead. Later on, combined and crossed lights can be used, and in some cases it will be useful to have a movable light. Place on the table a sheet of white paper. Hold between the paper and the light a ring. Call attention to the fact that the same ring casts a *circular* or an *oval* shadow, or a straight line, according to the position in which it is held. Also that the same series of shadows is produced by an elliptical ring as by a circular one. Either can be made to cast a shadow resembling in shape the other. A straight line, however (a knitting-needle for instance), cannot be made to cast a curved shadow on a plane ; its shadow is always a straight line, which becomes shorter as the needle is tilted up, till at last it resembles a mere dot.

If a circular disc of card-board be held horizontaly under the light, it can be made to cast a series of shadows resembling in turn each of the conic sections (circle, ellipse, hyperbola, and parabola), by altering the position of the paper on which the shadow is cast. The same series of forms may be produced by placing a lighted night-light in the bottom of a tall jar, and throwing the shadow of the rim of the jar on surfaces held in different positions.

The best paper to use is that which is ruled in small squares (it can be procured at the shops which furnish educational apparatus).

The paper may with advantage be laid on the table with its lines pointing to the cardinal points of the compass ; so that a line of shadow can be described by stating, *e.g.*, that it crosses so many squares from north to south, and so many from east to west.

Take a corkscrew-wire, with rings sufficiently large to throw a distinct shadow. It is possible to hold it so that its shadow is a mere circle ; in another position it makes a mere wavy line. An ordinary spiral wire is easily procured, and in practice is sufficient ; but we shall gain more instruction about the play of Natural forces if we picture to ourselves what would be the effect of using a spiral whose rings are *elliptical*. I shall assume here that we are using an elliptical spiral. The wire itself will represent the path of a planet in space ; one of its shadows pictures the path of the planet round its sun or suns ; another, the path of the whirling storm-wind, to which Jesus compared that of Inspiration.

Let us now place our (elliptical) spiral in such a position that it casts no shadow except an ellipse, and, for convenience of reference, let us agree that the longer axis points north and south. Let us picture to ourselves a tribe of microscopic creatures, whose true destiny should be to proceed upwards in the direction of the coil as a whole, and who have a blind but irresistible impulse to do so. They have no mode of ascending except along the wire ; and no mode of expressing statements about distance, except on the paper. They have a vague, dawning consciousness of movement in the up and down direction, and of distance from the paper. In some, this consciousness of up and down is very much more developed than in others. In some it is so weak that they believe it to be mere illusion ; in others so strong that they fancy all other modes of movement are illusion. But (we suppose) none can make definite *statements* about motion, except by reference to the lines on the paper. Progress upwards, therefore, is, for all of them, non-statable except in so far as it is connected with motion across the surface of the paper.

A group of them have climbed round a half-coil, beginning at the northern extremity of the longer axis ; and have now arrived at its southern extremity. Their actual progress has been upwards, and amounts to half the distance between two coils ; their expressed and apparent progress is the length of the longer axis of the shadow-ellipse on the paper. Whether any individual will be most conscious of his actual or of his recorded progress will depend on the condition of his individual consciousness. The condition common to them all is this : Such progress as is actual is not recorded ; and that which is recorded and registered is not actual nor permanent.

Every part of the progress which is registered will have to be

unmade soon after it is made. Only that which is not registered is permanent. The particular group of creatures under our consideration first made some progress in a direction partly southward, but partly also eastward, away from the longer axis. Already they have had to unmake their eastward progress and come back to the longer axis. They have still, however, been able to congratulate themselves on a considerable amount of progress southward; and the optimists among them no doubt set up a theory that, after all, true progress is southward, and the eastward motion was only an accidental concomitant of the southward. But when the extremity of the long axis is reached, a terrible conflict sets in; the upward path is beginning to turn towards the *north*-west. The southward progress, therefore, is being lost! A most dramatic novel could be woven of the conflict of opinion and feeling that would arise, as soon as the nature of the situation came to be realised; for all the tragedy of History is summed up in the prosaic fact that "the actual progress is not statable; the recorded progress will all have to be unmade."

Whether the spiral wire was actually used in ancient times to teach the true principle of development, will perhaps never be known. In this connection it may be well to notice that the Spiral of Ascent, the winding pathway, would naturally be represented to the early Geometrician (who lived where snakes were common and corkscrew wires not yet invented) by a snake coiled round a branch and hanging freely. The Geometry of the snake-coil is a more advanced stage of the Logic of the Divining-rod. In the fable of the rods that were shown to Pharaoh, the rods of both parties turned into snakes before that of the good prophet could swallow those of the bad magicians.

The Pentagram and the Magic Squares and other puzzles used by ancient "Wizards" illustrate the same principle, though less clearly. The principle itself was well known to the writer of the narrative of Abraham's calling. Abraham lived at a time when children were recklessly sacrificed to the gods whenever the parent felt prompted to do so. First he saw there was something wrong about that; children were meant for something better than to be killed. Next, it occurred to him to think that he might be wrong after all; ought he not to hold himself ready to give his son to God if God willed? He prepared to obey—if God should will. Then he was led to see that God wills to accept the offering of our children in a different way; we are to offer them to the Unity; but so as to hold them in trust for the establishment of human society. Thus he was led gradually up the spiral of revelation; at each step giving up something which had seemed

(though it had not really been) the essence of some previous revelation.

How Superstition has fastened on that standard narration of spiral progress, of which Abraham is the hero, it is hardly necessary to point out.

The whirling storm-wind forms an accurate diagram for illustrating the relation of the ex-centric to humanity. Having drawn the spiral, with tangents running in various directions, one tells the pupil that the spiral itself represents the methods of the orthodox Ecclesia, the constituted authorities, the recognised teachers. The tangents represent various paths taken by ex-centrics, non-conformists, men who have received the *first* personal inspiration, the first birth into a new world ; who have cared, and dared, to go off on lines of their own, each investigating as he is impelled by his own genius.

That is very well for a time ; the youth of genius should find out for himself what is the direction in which he is impelled to go. But before he offers his gift on the National Altar, before he can really contribute to the general store of Knowledge, he must pull himself into line with general progress. How shall he do this ?

The advice usually given is, to conform to the general custom, submit to the orthodox authorities. But there is a better way. The normal to any tangent leads towards the centre of equipoise, of balance, of calm progress ; the spot where is concentrated the maximum of force with the minimum expenditure of force in mere useless motion.

But how can any man find certainly the true normal to his own tangential direction, the path which will guide his own peculiar genius towards the centre of progress and of power ?

The direction given by the diagram is emphatic and unmistakable. He should look out for the brother ex-centric who most especially "offends" him, who is going on what seems to him to be most obviously and certainly the wrong road, because it leads in the opposite direction to what he is sure is, for him, the path of inspiration. Let him unify with that brother, call out to that brother to meet him and join hands. When these two meet, they will be in the centre of calm force. This conversion into the normal is the second birth of genius, the Regeneration which converts mere inspiration into Revelation ; for inspiration is at best partial ; Revelation comes at the moment of the combination of opposites.

As the spiral shows, all inspirations are inadequate ; and nearly all are, in themselves, actually misleading.

A dim suggestion makes itself felt as we think of the spiral wire.

The whole coil might, if long enough, be treated as if it were a wire, and wrapped in its turn round and round into a larger coil. We leave this consideration to the imagination of any reader who cares to pursue it. For none have more need of patience and reticence than those who are teaching the art of generalizing mathematical method, who are transferring to the analysis of ethics and history that knowledge of the human mind which is gained by mathematical investigation. All the various rays of light shed by our various studies came originally from One Source, and are meant to be re-united ; but *not till the appointed time is come.* The danger of premature synthesis is that it leads to the vicious habit of what is called reasoning by analogy ; jumping to conclusions about outer things and historical events. True analogy is of use as throwing light on *Laws of Thought* ; it teaches, not Truth in itself, but *the nature of the relation of the human consciousness to Truth.* True Logic is not dogmatic about facts ; it clears the ground of false conclusions, and leaves The Eternal Pulsation to speak in silence to the soul.

We now go back for a moment to the Tree-Symbolism. In the Hebrew Scriptures knowledge is spoken of as a Tree. In the Odin religion we are taught that: Its root is the knowledge of earth and its crown is the knowledge of Heaven.

CHAPTER IV

THE SABBATH OF RENEWAL

"The Church bells were ringing,
The Devil sat singing
On the stump of a rotting old tree :
'Oh ! faith it grows cold,
And the creeds they are old,
And the world is nigh ready for me.'

"The bells went on ringing ;
A spirit came singing,
And smiled as he crumbled the tree :
'Yon wood does but perish,
New seedlings to cherish ;
And the world is too live yet for thee.' "

C. KINGSLEY.

EVERY now and then in History it has happened that some isolated Seer has perceived afresh the vital connection between Mosaism (in the original intention of its Founders) and the

scientific doctrine of the renewal of health by rhythmic pulsation. One of the most interesting instances of such perception is the Civil Engineer Boulanger, who in the 18th century wrote a little volume entitled, *L'Origine du Despotisme Oriental.*

The work is so advanced in tone that one can hardly believe it is anything but a very clear summary of all that has been discovered since the great French Revolution, about the respective effects of fixed mental attitude in religion, and of free ventilation of religious problems. It is not, however, an after-summary, but an anticipation of modern investigations. The author believed in a Creative Unity who is perpetually revealing himself to man. Every man who once places his feet firmly on that high vantage-ground becomes (intellectually at least) a *Prophet*; that is to say, he is able to trace accurately the course of lights not yet arisen above the horizon of persons less fortunately placed. It seems to this writer natural and inevitable that whoever believes in the Divine Unity must be in advance of his age; so much so, indeed, that he does not understand why the Jewish Prophets should be considered more inspired than other deep thinkers.

The true Revelation, he considers, was given before the invention of writing. The Bible is an attempt to perpetuate the memory of it by writing; the rituals of savages aimed to do the same thing in a different way. Truth about religion and government will be brought to light whenever Judaism is frankly compared with the forest and cavern rituals. In fact, his mind seems to have been saturated with the idea that the germ of new Truth will always be found by following up two old strains of tradition to the point from which they originally diverged.

The second edition of the work is preceded by a letter of sympathy written by Boulanger to console a brother Philosopher who had been reviled and insulted by fanatics. He said that those who are too far ahead of their time to be understood should not puzzle contemporaries by the immediate publication of their ideas, but leave their work for posterity, who will be better able to appreciate it.

The key-note of the book is the intense conviction that despotism is only made possible by some form or other of idolatry, *i.e.* by the worship of some defined *part* of the great Unity. He has a horror of both tyranny and idolatry not unworthy of a Jewish Prophet. Yet he cultivates a genial sympathy with both tyrants and idolaters. No one, he believes, willingly invents an idolatry or imposes a tyranny. All such evils grow up by the degeneration of what was originally good. This degeneration, he thinks, might be prevented if free access to all knowledge available at any epoch

were given to all persons living at that epoch. The Prophets, he thinks, might have simply annihilated all false religions by explaining how they originated in natural and cosmical appearances. Why then give an apparent reality to the heathen gods by railing against them as if they were real ? The true God would surely have found it as easy to convince idolaters as to punish them.

He who comments thus on the great men of the past, while professing to think that all accessible truth ought to be made available for all men, seems to have been keeping himself cool in his study, writing a treatise for the benefit of a possible posterity, who would need his instructions all the less for being already enlightened, while his contemporaries were, all around him, sunk in the most degrading slavery and superstition. He is criticizing men like Isaiah and Jeremiah, who had courage to enter into serious conflict with the vices of their own age, at all risk of disturbing the perfect balance of their own nervous systems. And here we find the answer to the question, why Isaiah was more truly a *Prophet* than Boulanger. A Prophet is a *plain utterer* ; *i.e.*, he not only sees truths ahead of his age, and thinks that the people ought to know them, but is so filled with the love of truth and right that he cannot lead a life of studious calm while self-interested charlatanism is misleading the masses ; he feels that he must endeavour, at all cost to himself, to make what he knows accessible to whoever desires to learn it. In other words, a man is not, in the fullest sense, a Prophet, unless he is both an inspired Seer, and also an actual Re-former. At all risk of over-balancing himself, such a man holds out a helping hand to whomsoever he sees falling into an abyss. And perhaps few forms of human conceit are more cruel or more blind than the lack of sympathy shown by too many abstractly wise men towards mistakes into which practical reformers may temporarily fall.

Boulanger paid the natural penalty of his somewhat insincere optimism, and his lack of sympathy with the impassioned Prophets. He committed himself to the prediction that tyranny and bigotry, and therefore the need for vehement resistance, were almost among the things of the past ! Thirty years after his death, the French Revolution exploded ; proving that such Prophets as Jeremiah were not yet out of date.

To return to our author. The Sabbath, he says, was originally a festival of renewal, the permanent memorial of a re-created world. The Law of *Moses* means The Law adopted by a People saved from flood. When a great misfortune has overtaken a country and destroyed most of the population, the remnant who escape become, he says, for a time, serious and reverent ; they try to express their

gratitude for their preservation by re-organizing society in accordance with the will of the divine Law-giver as revealed in the laws of Nature. But as the knowledge of Nature is, at any given epoch, incomplete, the compilers of human law supplement their lack of knowledge by framing provisional *working-hypotheses*. These hypothetical assumptions ought of course to be held lightly ; men ought to keep themselves always in readiness to substitute for any one of them any ascertained truth. The tendency, however, of the untutored mind is always towards thinking fancy more sacred than fact, and doubtful episodes more divine than ascertained and eternal laws. An instance of this perversion occurs in the history of the Sabbath. Legislators who had discovered by experience the enormous importance to human welfare of a periodic rest from labour, wishing to enforce its observance, made a fanciful guess at the origin of the need which they perceived. *Once upon a time, the Creator made visible objects on six of the days of the week, and abstained from doing so on Saturday !* Till somebody discovered a more intelligible explanation, it was hoped that this one would impress the Hebrew mind with the idea of keeping Sabbath. The average Hebrew mind fixed itself on the one fragment of fancy lying amid so much solid truth, with the tenacity of a barnacle clinging to a rock ; and alas ! with something of the short-sightedness of a barnacle, which supposes itself safe because it has got tight hold of a scrap of shell! The Creator left off doing things on a certain Saturday long ago ; therefore it is very wicked to do *certain things on Saturday*. (And indeed it is only too true that some Jews have so completely missed the essence of the Sabbath idea as to consider it wrong to carry an umbrella to Synagogue, but not wrong to sit at home thinking of accounts ; wrong to write a letter to an absent friend whom one has not time to correspond with in the week ; but quite permissible to "cram" for examinations at any subject which does not involve holding a pen.) The true object of Sabbath, the prevention of mental stiffening and moral hardening, the re-creation of moral life by change of mental attitude, is too often lost sight of ; and many people know nothing, and care to know nothing, of all the marvellous science of periodicity by which the exceptional vitality of Judaism has been created, except the one obscure and doubtful statement that, on one particular Saturday, long ago, creative activity suspended its beneficent operations !

And this is a fair sample of the manner in which what once were religious truths degenerate into dogmas full of superstition ; the degeneration being in all cases due to neglect of the study of antiquity. On this point our author insists strongly. So far from

the reverent study of antiquity being a cause of superstition and a hindrance to progress, it is the great preservative from the superstitions which grow up by the degeneration of useful customs.

The refrain of the book is like the announcement of a new day, a summons to awake to a richer and fuller life. It is a mistake to suppose that *Sabbath* has any necessary connection with inaction ; the very words *Sabbath* and *Jubilee* (the author insists) originally meant, not *inaction*, but renewal. This message he leaves as a legacy to posterity, who, he trusts, will be able to understand him. Cast thy seed upon the waters, and after many days it shall be found !

Boulanger describes non-idolatrous religion by a series of delicate negative touches, which, so to speak, chip away, one by one, the elements of idolatry ; leaving pure religion to reveal itself.

"Idolatry does not consist, necessarily, in taking a statue, an animal, or a man, as the representative of God ; to define it fully, we must say that every form of worship or code of law is idolatrous which takes as divine that which is not divine. It is not only idolatrous to treat a stone, or beast, or a mortal, as if it were God ; we are also guilty of idolatry if we imagine that the words of that man, or the oracles pronounced through that statue are the very words and decrees of Deity. We are guilty of idolatry when we prefer speculations and mystical chimeras to reason and good sense ; when we treat any legislative code as if it were dictated by the Almighty ; when we endow with a divine character the servant of a theocracy ; when we try to regulate the conduct of men here below by Laws suited only to Celestial beings ; when we confuse heaven with earth ; when we mistake our own position and pretend to be more than mortal ; and when we forsake our own place as citizens of this world and subjects of the Civil Government, either to tyrannize over other men in the Name of God, or to live as recluses, despising or forgetting our fellow-men."

I have dwelt at length on Boulanger's charming little volume, because it affords a good example of the way in which rational views of the Scripture religion have occasionally been held throughout the ages, and have died out owing to the prevailing ignorance about the logical basis of the doctrine of progress by gradual Inspiration.

CHAPTER V

THE RECOVERY OF A LOST INSTRUMENT

"Hilkiah said, I have found the Book of the Law in the House of the Lord."—2 KINGS xxii. 8.

To form any adequate conception of the situation in which the founders of the modern pulsation-Logic found themselves, we must imagine a state of things somewhat of this kind.

Suppose that in some social convulsion, every ophthalmoscope were now to be destroyed, and all the men who use the instrument were to perish, leaving behind a few of those who had been accustomed to see it used, and to clean or otherwise handle it. We must suppose a great many ophthalmoscope-drawings preserved, with notes proving that these purported to be drawings of the retina.

After society had settled down again, the drawings might begin to attract attention. Thereupon would set in fierce discussion in the medical world. There would be a *tradition* that certain medical draughtsmen of the 19th century had a means of knowing what the living retina looks like; a means not accessible to ordinary men. Traditions would be handed down that the condition necessary for seeing how to do the drawings was *induced* by holding to one's eye a certain machine. These traditions would be different in form, according as the servant in whose recorded reminiscences it had originated had been accustomed to see his master use this or that form of handle or frame. It might come to be a point of faith to believe that the drawings were done while the artist was wholly or partially entranced. On the other hand, some sceptics would assert that the pictures were imaginary, or, at most, founded on mere observations made in the dissecting-room. More acute observers would see that *something* more than mere invention had been at work, and would suppose that the drawings had been the result of marvellously careful induction, made by comparing the phenomena observed in the dead eye with the symptoms of living patients. At last, in the new civilization, someone living outside the tempest of rival theories, and studying optics for himself, would re-discover the principle of the ophthalmoscope, make one, and actually *see* living retinas. At once he would perceive that all existing theories alike were provisional working-hypotheses, *i.e.*, mere expressions of ignorance of the essential fact; and that the drawings of the mythical 19th

century artists must have been really made by the use of just such an implement as his own.

Now, our discoverer of the future would probably be an amiable man, willing enough to share the joy of his new discovery with whoever desired to possess it; and equally willing to abstain from worrying with it persons who had no such desire. The mental condition of those who erect working-hypotheses into articles of faith, and who like consecrated theories better than Truth, would be too utterly foreign to his conceptions for him to argue with them. As for those who should desire both to retain their theories about the old drawings, and also to use the new instrument, he would consider them differentiated from ordinary lunatics only by not possessing the sincerity of the latter. He would publish an account of his discovery, for the benefit of whoever wished to read about it; and, having done so, would feel he had fulfilled his duty to society; and would not think himself bound to disturb himself any further.

As some readers may not be acquainted with the nature of the ophthalmoscope, I will tell my parable over again in a simpler form. Suppose there was an island, the inhabitants of which were unacquainted with the principle of numeration, and therefore could only write in numbers singly. They would be able to add and multiply numbers only so far as they could reckon. They would know what such simple numbers as "three times five" make; and very clever and persevering ones might know what twelve times twelve make. But about all large numbers they would have to guess; they would have opinions, and discuss, and generally turn out wrong. If they had a tradition among them that certain ancestors of theirs, called Moses and Isaiah, used to pronounce oracularly as to what numbers "like the trees in a forest for multitude" came to, when multiplied together, and *always turned out right*, they would frame a provisional working-hypothesis that Moses and Isaiah were "inspired," and would argue and jangle as to the precise nature of the "inspiration." Then suppose some islander found out how to "carry," that fortunate individual would know exactly how Moses and Isaiah made sure of their results. And of course the supporters of the rival theories about inspiration would join in calling him hard names; and equally of course he would not mind what they said, but would go on his own way, and wait till events justified his faith in Rational Arithmetic *versus* fanciful guesses.

Now the situation in which the modern discoverers of Mathematical Logic found themselves, was very much like that of our hypothetical new Helmholtz, or the island discoverer of the

process of "carrying." Certain ancient Prophets had discovered a means—not of *communicating with the Unseen* (for every man, and woman, and child, and beast does that, until his faculties have been trampled out by the process called nowadays "Education"), but—of making communication with the Unseen *safe*, by applying a mechanical test to ascertain exactly what is being communicated; to distinguish, that is to say, the Inspiration of Truth from the suggestions of the diseased brain. The difference between old Scriptural and merely poetic inspiration consists precisely in the fact that the inspired men of Palestine possessed such a test. The difference between Prophecy and pseudo-prophecy in old times, consisted in applying the test with utter fidelity, in allowing it to act with mechanical accuracy. Babbage, Gratry, and Boole revived that test. They published their books. Then, finding themselves confronted with dishonest folly, they left the world to come to its senses at its leisure.

CHAPTER VI

BABBAGE ON MIRACLE

"If the children of men are silent, iron and stone shall cry out Hosannah."

CHARLES BABBAGE is chiefly known to the world as the inventor of a machine intended to spare the labour of calculating numerical series. In the course of its construction, he had to make a thorough study of the Laws of natural sequence, so far as these are embodied in processes of successive additions. But the man who would think of undertaking such a task at all was sure to see the importance of saturating himself with a further knowledge of Nature's series. He investigated not only those mathematical series the equations of which are known, and which underlie such natural curves as planet-paths, lines of refraction, &c.; but also those forms of Natural sequence the mathematical expressions of which have not yet been ascertained, such as geologic changes, the development of plants and animals, &c. He had nothing to lose or gain by any conclusion to which he might be led; he had one all-absorbing end in view, the perfecting of his machine; and, for that object, it mattered nothing what the Laws of Nature should turn out to be; the one desideratum was that he, Babbage, should know what they were, and embody them truly in the construction of his cogs and wheels. One of the facts which he discovered was this: For one series (numerical or phenomenal) which goes on uniformly, there

are an almost infinite number which either sooner or later have interruptions or Singular Terms. His arguments cannot be fully entered on here; but the main result is this: Whoever adduces the inflexibility of Law to prove the improbability of Miracle, only proves that he does not understand the connection between Law and Phenomena. No miracle, Mr. Babbage considers, could be, *a priori*, so improbable as it is that man should learn the true law of any sequence by observing an *uninterrupted* series of phenomena. He says:—"It is more probable that any law, at the knowledge of which we have arrived by observation, shall be subject to one of those violations which, according to Hume's definition,* constitute a miracle, than that it should not be so subjected. . . . The class of laws subject to interruption is far more extensive than that of laws which are uninterrupted. It is, in fact, infinitely more numerous. Therefore the probability of any law with which we have become acquainted by observation being part of a much more extensive law, and having, to use mathematical language, *singular points* or *discontinuous functions* contained within it, is very large." "Miracles are not deviations from the laws assigned by the Almighty for the government of matter and of mind. . . . They are the exact fulfilment of much more extensive laws than those we suppose to exist. In fact, if we were endued with acuter senses and higher reasoning faculties, they are the very points we should seek to observe, as the test of any hypothesis we had been led to frame concerning the nature of those laws. Even with our present imperfect faculties we frequently arrive at the highest confirmation of our views of the laws of Nature by tracing their action under *singular* circumstances." "A miracle may be only an exact fulfilment of a general law of Nature, under such singular circumstances that, to those imperfectly acquainted with that law, it appears to be in direct opposition to it." "All miracles are prophecies . . . they are revelations, more or less in advance, of events which, although in real accordance, are apparently in direct contradiction to the laws of Nature."

The work from which the above extracts are taken† forms probably the best introduction in our language to the art of inductive reasoning. It is simple in style, almost entirely free from technicalities, and very reverent in tone. It makes no attacks on the special beliefs of any sect, but confines itself to neutralizing the poisonous doctrines of those who oppose Science to Religion, by showing that all attacks made on Faith in the name of Science

*Hume had "deduced the *a priori* probability against the occurrence of miracle from universal experience."

†Ninth Bridgewater Treatise. Murray.

must necessarily rest on a mistaken apprehension of the bearing of scientific observation. There are, probably, out of the Scriptures, few sublimer conceptions than Mr. Babbage's Vision of future rewards and punishments ; he pictures the cruel man, not tortured by an angry Deity, but mercifully awakened to true self-knowledge, by being endowed with senses fine enough to perceive things as God sees them ; and to hear the reverberations, through the infinite ether-spaces, of the long-silenced cries of his victims. It might have been supposed that the book would immediately take a place among educational text-books, among which it is well suited to rank high. But the education of the country was, in those days, in the hands of ecclesiastical parties ; and, by common consent, the book was ignored.

The study of Mathematics seems to have a wonderful tendency both to induce religious faith and to counteract the influence of dogmatists ; and the instinct of the latter class seems to detect this without their being able to give any rational explanation of their dislike. There is a mysterious link, more easy to perceive than to describe, between mathematical truth and the doctrine of the Fatherhood of God in its old Mosaic sense. Of course, the fact of learning at second-hand, and applying to practical uses results arrived at by the investigations of others, has no relation to any sort of religion ; it leaves the field equally clear for dogma or for atheism. But whoever has truly apprehended the nature of the process of mathematical discovery, knows henceforth that the mind in him which can go through such a process is the child of the Creator. Contact with the Mathesis which underlies human thought constitutes an absolute revelation or unveiling of Deity. For this reason mathematicians are usually disliked by priests ; the true mathematician has (though in a very humble manner and small degree) "seen God" ; and the slightest glimpse of that vision is often sufficient to destroy the possibility of believing in priest-made and partial deities. Mr Babbage says nothing against any particular doctrine ; but under all his statements there resounds perpetually, as a deep harmonic undertone, the implied thought : "Nature is the representation of the action of those mathematical laws which can also be represented by interrupted numerical series ; I have made a machine which is able to represent to the eye the action of some mathematical laws and the existence of certain interrupted series ; therefore my mind is, in its own little way, akin to the Creative Mind. I believe that some such events as those called miraculous must have taken place during some portion of the history of our planet ; but my faith in God rests on no testimony concerning such past wonders ; for I

stand in presence of the perpetual miracle that man is made in the Image of God; a sharer in His power to understand numerical law and impose it on matter; a sharer in His power to apprehend moral law and to be the author of joy and woe: a sharer in His power to trace events to their causes; and therefore a sharer in His own immortality. I am, by natural inheritance, a child of the Living God; and when He has anything to say to me He can say it without the intervention of a priest." The clergy decided that Mr. Babbage was an "unbeliever"; and the then rising generation lost the benefit of his aid, to the great injury of both Religion and Science—"Friends whom we cannot think apart"; but which, thanks to ecclesiastical jealousies, are made to "seem each other's foe." It is impossible not to detect, in the antagonism excited by such work as that of Mr. Babbage, the same feelings which caused some persons in an Irish town to ill-use a sick and inoffensive stranger (who, as it afterwards turned out, was a Jewess); "She says she don't want the parson, nor yet the priest; so she must be *something* queer"—the same spirit which has made Gentiles in all ages taunt Judaism with the question—"Where is thy God?"

The result of introducing Mr. Babbage's book into a school, is a spontaneous development of the feeling expressed in the Pentateuch that properly taught people are a nation of priests and can find God each for himself. The book to which he gave the name "Ninth Bridgewater Treatise" can occasionally be procured at second-hand; and whoever reads it carefully finds it the entrance to a rich mine of religious truth, of a peculiarly elastic and liberal kind. Its teaching leaves the mind free to believe without difficulty in the existence of *any* order of phenomena, however miraculous-seeming, for which there may appear to be sufficient evidence; but destroys the inclination to address actual *worship* to anything except the Divine Unity.

CHAPTER VII

GRATRY ON LOGIC

"Blessed are they that have not seen and yet believe."

MATHEMATICAL Logic used to be expressed in Geometric or quasi-Geometric diagrams. We now write it usually in a terminology borrowed from Algebra.

Modern Mathematical Logic may be said to be a tree, whose root is represented by the Newtonian Fluxion-method; and its

trunk by the *Logique* of Gratry* ; while its main branches are such works as those of Babbage, De Morgan, Boole, and Hinton ; and the Sciences of Quaternions and of the so-called Fourth-Dimensional Mathematics. Carrying on the same simile, we might add that the numerous little twigs of special methods thrown off from the main boughs would have all the more chance of being fruitful if they were not so ready to sever their connection with the stock from which they sprang. As a matter of chronology, the treatises of Babbage, De Morgan, and Boole were published before the first appearance of the *Logique*. But then it must be remembered that Science is not created by the printer ; books merely represent, in visible form, a thought-growth which has its actual existence in the Mind of Humanity ; and the chronological order in which the several parts of a new Science are projected on to the surface of Literature is not always identical with the order in which they were evolved. Mathematical Logic will be best understood by those who master the ideas of Gratry before entering upon the study of the more detailed but less philosophically comprehensive treatises of the other writers referred to above. As a matter of fact, neither Babbage nor Boole could have done what he did had he not perceived the truth of some principle analogous to that of Gratry.

And there is no greater hindrance to human progress than lack of piety towards Humanity's best teachers. The statement may be considered a truism ; but unfortunately we are all too prone to neglect truisms. Principles so self-evident that no one disputes them occupy less attention than do theories about which it is possible to get up a controversy ; and the settlement of a fierce dispute is often best effected by insisting on the practical recognition of some principle which everybody concerned is disregarding, precisely because nobody has attempted to deny its truth. I repeat :

There is no greater hindrance to progress than lack of piety towards great teachers ; this is well shown by the whole history of Logic since the publication of Gratry's *Logique* in 1855.

Any Seer of a great comprehensive Truth, such as Gratry, is necessarily ahead of his age. He may be, in a sense, appreciated by his contemporaries ; that is to say, he may be loved for his goodness, and admired because of certain secondary results of the intellectual Vision which has been vouchsafed to him ; but the very essence of such a man's position is that he is seeing truths for which the world around him is not yet ready. When Gratry was writing his Logic, he was looking *through* the intellectual *débâcle* which was then only beginning, and *beyond* it, to the new-created

*Logique, Gratry, 2 vols. Douniol, Paris.

thought-world which might arise from amid the chaos, if the next generation would wisely consider its ways. No reader can properly understand Gratry who does not realise the nature of the cataclysm of which he was watching the beginning ; and few persons in his time had any adequate conception of what was coming on the intellectual world. The condition of confusion which he foresaw in prophetic vision, we know as an indisputable and terrible *fait accompli*. He wrote, therefore, rather for us than for his contemporaries ; to them he brought chiefly a warning, unintelligible to the majority, of stormy weather ahead ; to us he offers practical pilotage through an actual hurricane.

But, alas ! how shall we persuade young men trained in "the newest methods," that an Oratorian monk of fifty years ago was a better logician than they ? "Gratry ? oh ! no doubt he was very clever for his time. But—he had not read any of our modern authorities ; what can he have known of our new methods ? " The young teacher who is preparing pupils for examinations by the help of the last new text-book, and who perhaps hopes to make a name for himself by compiling a still newer one, resents being told of one greater than the author most in repute. So it happens that the writer, who was hardly understood in his own day, because he was so far ahead of the age, is shunted into oblivion when the time comes when he could be understood, because it suits the purposes of interested persons to believe that he is behind their age. The main cause of the chaotic condition into which our thought-life has fallen is the feverish impatience of teachers, each of whom wants to make his own voice heard. But any teacher who is weary of the conflict between Science and Religion, between Knowledge and Faith, between the valuable Lessons of Materialism and the consoling belief in the spiritual world ; any teacher who sincerely desires, not to make a cheap and noisy fame for himself, but to find Truth and Peace for the young souls committed to his care, might do well to devote a quiet vacation to the study of Gratry's *Logique*.

Our author begins by clearly recognizing that mathematics is not so much a department of human thought as the ground-plan of all sane thought ; he treats mathematical Science, not as a special set of truths, but as a map of the country in which Truth is to be found. He of course entirely repudiates the profane notion that mathematical Logic can afford any proof or disproof of religious truths ; but he shows that mathematical reasoning throws light on the nature of valid proof of every kind. The faculties by which the existence of God is revealed to us are hyper-intellectual ; the processes by which we learn spiritual truth are extra-syllogistic ;

and it pleases a certain school of reasoners to deny their validity. Gratry shows that, but for the exercise of similar faculties and the use of similar processes, we could have discovered nothing of the Higher Mathematics. It pleases certain Agnostics to assert that "it is impossible to reason from the finite to the Infinite." The same objection was formerly made against the Integral Calculus, but the Integral Calculus is now an accepted fact; and any one who cares to learn can know exactly how to "integrate a finite expression to Infinity," and can make sure that his results are absolutely correct. No true mathematician depends on testimony for his knowledge of mathematics; each has within himself as absolute a personal conviction of the validity of the processes by which he works out his results as if those processes were purely syllogistic. None the less is that conviction arrived at by a mode of mental action essentially of the same nature as that far more vigorous and sustained mental exercise by which we arrive at a sound and rational faith in God.

"Reasoning is not one process only, it contains two processes, equally valid; but the second is by far the most powerful and most fertile. The syllogistic process *deduces*, passing from like to like. It never leaves its original standpoint; it never rises above that stand-point. It develops what it originally possessed. The other process, the dialectic, rises above its own starting-point; it does not merely develop the material which it originally possessed, it acquires fresh material. . . . This process passes from the finite to the Infinite. . . . This is the process of prayer. . . . Whence it follows that the human mind is capable of a process which, when it is taught as a part of Logic, will give wings to Logic which before had only feet. . . . The Logic of the highest philosophers, both practical and theoretical, has always had wings. But the class of average thinkers exerts itself chiefly in trying to cut those wings, and seems to have succeeded. They must learn to recognize their error, or rather their crime." The author then quotes the following passage from Cournot: "The process by which the mind seizes new truths is often quite distinct from that by which it connects known truths together; and most important truths have been first seen by the help of that *philosophic sense* which precedes rigorous proof." Gratry objects to Cournot speaking as if one process was less *rigorous* than the other. And, in fact, we are quite as sure what is the result of an "integration to Infinity," as of what is the answer to a Rule-of-Three sum.

Suppose that a marble is running round in an elliptical groove under our eyes. Geometry enables us to investigate the relations

between the various portions of the course which we see it pursue. But we know its course by direct inspection. Geometry can but arrange into a convenient form, information which we have gathered by observation ; or, at most, it shortens the processes by which we acquire information. But when an Astronomer has observed a small portion of the orbit of a heavenly body, it disappears from his ken. He has to construct in imagination its future path, guided by knowledge of the hidden law of its motion. In order to do so, he must resort to the method of the Infinitesimal Calculus ; the method thus described by Gratry : "We have analyzed the finite in order to know the infinitesimal. From the knowledge given by the study of the finite, we have eliminated the quality of finiteness ; what remains is true for the infinitesimal ; that is to say, for the analysis and knowledge of the Indivisible and the Infinite. We have analyzed the discontinuous, the divisible, the finite ; and have found therein the law of the Continuous, the Indivisible, the Infinitesimal."

But when we know the theoretical law of the planet's course, how do we know that, when we have lost sight of it, it still continues to obey the Laws of Mathematics ? No Syllogistic Logic can prove that it does not wander, lawlessly, into space. Yet the mathematician ventures to construct, in imagination, its whole course. He is enabled to do so by an act of *Faith*—faith in the Great Unity Who governs Nature ; faith which is the evidence of things not seen. This act of Faith is so elementary and spontaneous, that only a few deep thinkers have recognized it for what it is. But slight as it is, all the delights and powers conferred by the Higher Mathematics are the reward of that simple trust ! See how The Unity keeps His ancient covenant with man ! Eye hath not seen, nor ear heard, nor hath it yet entered into the heart of man to conceive, what He hath in store for those that love Him !

And slight as is the act of faith needed to understand transcendental mathematics, many are unable to perform it. There are so-called mathematicians who confess themselves unable to see the validity of the reasoning on which the Higher Mathematics rests ; they only see that it must be somehow right because predicted eclipses and comets appear in due season ; and they therefore assume the legitimacy of the standpoint whence predictions are made ; but their own mental action goes no deeper than working out the syllogistic consequences of a knowledge which they do not properly possess. They believe because they have seen prediction fulfilled. Blessed are they who believe in The Unity before they see. No possession of any fact which we know only through the intellect or the senses can equal the

intimate and rapturous sense of Union with the Great Unity which is given to him who is enabled by faith to trace in imagination the exact course of a planet out of sight.

Now if persons incapable of understanding transcendental mathematics should presume to claim from true mathematicians a profession of ignorance about all of which they themselves are ignorant, such arrogance would faintly picture that of much (so-called scientific) Agnosticism.

Gratry seems to have foreseen that the Science of Induction would never be developed except by the unselfish co-operation of several men, each of whom should be willing to subordinate his own personal work to the carrying out of a common aim. Mr. Boole's work was, as he gratefully acknowledged, made possible by the generous and self-forgetting aid freely given to him by many contemporary mathematicians; and in particular by Professor De Morgan, who seemed to take a pleasure in effacing himself to bring forward the man whom he might have been expected to feel a rival. And one of my pleasantest recollections of Mr. Boole himself is his studying with loving and almost rapturous delight the pages of the Oratorian Father, who had stated with masterly and exhaustive completeness the fundamental principle which he himself had been vainly endeavouring to express.

CHAPTER VIII

GRATRY ON STUDY

"Seek ye the old paths."

It is not only as showing the true nature of logical evidence that Gratry throws light on the intellectual problems of our day. His treatment of the question—What constitutes valid evidence? contains an answer partial, of course, but certainly sound as far as it goes, to that other question: What constitutes true *Education*?

The special point in debate among teachers just now is, whether Education means teaching children truths, or drawing out the faculties by which man discovers Truth for himself.

One of the most terrible facts with which we have to deal in Education, is that on this point all the real thinkers are on one side, and nearly all the practice* on the other. Among those who are really thinking about Education, the unanimity is so great as

*This was written in the Eighties. It is no longer quite true; but I let it stand.

to be monotonous. We have had unequivocal expressions of opinion at the Education Society. Professor Maurice and James Hinton (who by no means agreed in most respects) were both strong on this point : Education means educing faculty, and does not mean imparting knowledge or instilling opinions. Theorists say —and say very truly—that no amount or kind of practice in remembering and writing out at examinations results arrived at by the investigations made by other people, constitutes any exercise of the faculties by which truth is discovered, or any adequate preparation for solving the practical problems which present themselves in the course of every human life. They maintain that no child is really being educated, except in so far as those faculties are being educed and strengthened, by the use of which Truth is brought to light from amidst a chaos of contradictory-seeming phenomena.

Yet some power mightier than all arguments is preventing these would-be reformers from effecting their purpose. The practical men insist on keeping up a routine of teaching things which can be tested by Examination. It is easy to rail at practical men, but they are the drag on our impetuosity. *Magna est veritas et prevalebit.* A doctrine which does *not* prevail is not, yet, quite true. The resistance of practical men to our efforts is the resistance of the calyx to the premature unveiling of the imperfect corolla. Instead of railing against those who oppose us, would it not be better to mature our ideas and make our method complete, and therefore irresistible ?

The truth is that, in the desperate struggle on behalf of the principle that *Education* means *educing faculty*, the supporters of that principle are too much losing sight of the vital question : What faculties is it most important to educe ? Where the advocates of Education *versus* Examination get their own way, the result often is that too much mental force is absorbed into a minute and monkey-like inquisitiveness about visible phenomena, and often the production of a skill, more wonderful than useful, in the observation of certain classes of facts to the neglect of all other facts ; and in the study of mathematical methods of analysis of principles, to the neglect of vital comprehension of the principles themselves in their bearing on human development.

Gratry is as sure as any Science-teacher of the present day, that Education means educing the faculties by which man discovers Truth for himself. But—what Truth ? And what faculties ? The highest object of intellectual culture, according to Gratry, is to educe and fortify the sense by which we perceive *what the Unseen Teacher is saying to us.*

"Do you know whom you are going to have for your Teacher ? God. The time has come when you will put into practice the command of Christ—'Call no man your master on earth ; for One is your Master, even God.'" . . . You have heard and said that God is Light and enlightens every man. Do you believe this ? If so, then accept all the consequences of that belief. If you believe that you have within you a Master Who wills to teach you, say to this Master, as you would say it to a man standing in front of you : "Master, speak to me ; I am listening."

" But then, after you have said, "I am listening," you must listen. This is simple, but of primary importance.

"In order to listen, we must have silence. Now who, I ask, among men—especially among those who consider themselves thinkers—ever secures for himself silence ?

"All day long the student listens to other men's talk ; or else he talks himself ; when he is supposed to be alone, he is making books talk to him as fast as his eye can move along the lines of print. . . . His solitude is peopled, besieged, cumbered . . . by useless talkers and by books which are a mere hindrance to thought. . . . Believe me, one who studies thus will learn little or nothing ; just because there is only one Teacher, and this Teacher is within us ; because we must listen before we can hear Him ; and to listen we must have silence."

Nevertheless, Gratry insists that no man is really educated unless he knows, and knows well, the essential principles of all the important Sciences. His list of requirements seems at first sight a formidable one. The cultivated man must know enough of the Higher Mathematics to understand the principles of Mathematical Induction ; because "he who can understand the principle of Induction will be for ever preserved from atheism and materialism." (This implies a far deeper acquaintance with mathematical philosophy than is necessary to become a Senior Wrangler.) As for Astronomy, Gratry thinks the ignorance of the public about so grand a Science very strange. He mentions successively, Physics, Physiology, Geology, Geography, History, and Moral Science ; of each of which he requires the cultivated man to know considerably more than a mere smattering. Finally comes Theology. Gratry is tolerant to those who differ from him in opinion ; but he does not understand how it can happen "that every educated man does not know by heart the Articles of the Christian faith.

"If you are Christians these Articles contain the details of your faith. . . . If you are enemies of Christianity, take the trouble to know what are the statements against which you are fighting ; your blows will thus be dealt less at random."

Gratry has here laid bare one of the principal causes of the mental confusion of our time. No man, to whatever denomination he belongs, ought to be considered *educated,* who does not know what are the essential principles both of Mosaic teaching and of the Catholic Faith. What, for instance, does European History mean to one who has no clear conception of the nature of those thoughts and feelings which have moulded our civilization ?

But the question naturally presents itself : If we are to spend a large portion of our time in listening to the Voice of the Unseen, instead of reading, how can such a mass of positive information be acquired ? Gratry's answer is similar in kind to that given later by Hinton, but expressed in a manner both more methodical and more safe than Hinton's. Gratry bids the student keep perpetually by him, for his guidance, the living belief that, as The Creator is One, so must the Science of that which He has created be one also. "Fear neither the magnitude, nor the number, nor the diversity of the Sciences. Study will be simplified, harmonized and fertilized, by comparing one Science with another." We seem to hear Moses of old proclaiming the formula of freedom and of power :—"Hear, O Israel ! The divided gods enslave us ; the Deliverer from bondage is the Unity."

And as we might facilitate our work by unifying the Sciences into One Science, so we should also treat the revelations of all times as One Eternal Truth. This is best done by studying each Science according to the historical method ; letting the culture of to-day flow into our minds in natural sequence from that of yesterday. It is vain that we rise early and late take rest, and anxiously devour many books ; to those who love The Great Unity, He gives knowledge even while they sleep.

If any social phenomenon of our time is more astounding than the ignorance of important facts displayed by many professed scientists, it is the feebleness of mental grasp exhibited by many students of the so-called "mental and moral" Sciences. Their thought-modes suggest nothing so much as the thin rapid pulse generated by exhaustion and over-excitement. This singular psychic condition is clearly traceable to the fatigue caused by the destruction of ancient landmarks. A cultivated mind shrinks indeed from acknowledging as the substance of its *faith* any more of Truth than so much as it has made its own ; but the limit of personal faith is not necessarily that of historical knowledge. Unity of thought is promoted, and the process of self-culture enormously facilitated, by having always at hand in one's memory, in a compact form, the best results of the mental labour of preceding ages. A creed or formulary acts as what Hinton called

"an unconscious constant"; a crystallizing thread round which atoms of knowledge may gradually gather, instead of being swept away by every current of thought, or retained only by vehement effort. Nothing makes study at once so exhausting and so unprofitable as the absence of any frame-work of registered propositions. Nothing, therefore, can be more fatal to intellectual progress than the random destruction of those ancient formulæ which create, as it were, a common language between men; and between the successive epochs of life, both personal and national. The attempt to acquire power and freedom for intellectual pursuits by keeping oneself *ignorant* of ancestral Theology would seem to be about on a level, for practical efficacy, with the attempt to gain facilities for the study of human life by living like a savage. Even those who wish to explore barbarous regions find that they can do so to more purpose if they carry about with them, in a compact form, a judicious selection of civilized appliances. Setting aside all considerations of religion, the European who is not familiar with the various clauses of the Athanasian Creed gives one the same sense of *lack of culture* as does an Englishman unacquainted with Shakespeare, or a Jew who has not read Isaiah.

And the vicious system which is sweeping away the frame-work of association by which we are connected with the past, is only consistent in its folly, in that it provides no substitute whereby the individual child may be connected with its own past. As soon as a child has passed an Examination in a certain "standard," he casts aside that standard, and learns something different. There is no formula which is solemnly repeated every day or every week throughout his school career. Suicidal blindness could no further go.

We may sum up the reflections suggested by the *Logique* of Gratry, by saying that the feverish feebleness of ephemeral Scientism is a part of that grand process of Natural Selection by which irreverence, impiety, and conceit are, in each age, weeded out, to leave room for something more worthy to endure. Excessive specialization is always more or less *idolatrous*. Those who alternate an intelligent interest in the Science of their own day with seasons of pious meditation on the aspirations of the mighty dead, renew their strength like young eagles, and their days shall be long in the land. They shall inherit the possessions of time-serving idolaters. They shall attract peoples that they know not, and nations who knew them not shall seek them; and great shall be the peace of their children; for such is the heritage of the servants of the Lord.

CHAPTER IX

BOOLE AND THE LAWS OF THOUGHT

"Hear, O Israel, the Lord our God is Unity."

SIXTY years ago, logicians had concluded that it would be convenient to express ordinary statements about facts in some sort of Arithmetical or Algebraic notation, so as to be able to work out the logical consequences of premises with the same ease as we work sums. Many attempts were made to create such a notation ; but none of them proved satisfactory. There was in Lincoln a schoolmaster in humble circumstances, who had, when a mere lad, solved for himself a problem of a very different order. It had occurred to him that the Scripture writers must have had some reason for laying so much stress on the command never to think of *The Great All* except as a *Unity*. He had acquired the habit of thinking of each class of things as a fraction of Unity. He found that this habit simplified all study ; and by strict adherence to it he had, in the very small amount of leisure at his disposal, made of himself a fairly good linguist, a learned metaphysician, and a mathematician distinguished for the originality and vigour of his methods of investigation. When, therefore, he realized what was the problem over which logicians were pondering, it naturally occurred to him to try on their behalf the experiment of using the Arithmetical Symbol of *Unity* for *Universe of Thought*. Immediately the notation fell easily into order, and all the difficulties vanished.

As simple obedience to the commands of the Pentateuch had enabled George Boole to solve the questions which the logicians of the 19th century could not solve, it seemed probable that the writers of Scripture knew more than was commonly supposed about the normal action of the human mind. He set himself the task of making a serious study of the Laws of Thought-sequence ; aided by the conversation of a Jewish friend, a teacher of Hebrew at Lincoln. In 1854 he published a book to which he gave the title, *The Laws of Thought*.

A strange result ensued. The author had felt obliged to show that his system was not a mere fanciful outcome of religious fervour ; and, in order to do this, he had interspersed his serious analysis with exhibitions of delicate and skilful modes of extracting the legitimate consequences from masses of premises. Those who were on the look-out for a *rapid method of manipulating syllogisms*, were at first delighted to find their problem solved ; and it is

impossible to speak too highly of the generosity with which several eminent logicians did honour to the man of whom they evidently thought only as a rival in their own line. But it seems never to have occurred to them that any one could care for Logic except as a *method of reasoning*. They proceeded to improve the method of the book called *Laws of Thought*, by leaving out of it all that could throw light on the Laws of Thought-Sequence!

Mr. Stanley Jevons earned a wide-spread fame as the improver of Boole's method. George Boole's own version of the matter was that Mr. Jevons and he were working for totally different objects, and that no intercourse between them could be of the least use to either. His chief anxiety seemed to be to make it impossible that Mr. Jevons should appear as in any way authorized by him. In later years Mr. Jevons was heard to say: "Boole means something that no one has understood yet; the world is not ready to understand him." The solution of Mr. Jevon's perplexity might have been found in the very title of the work on which he was commenting. The symbols which such logicians as he quite rightly discard from Boole's notation, because they are useless and cumbersome and even misleading when employed to work out logical problems, are the necessary implements which those must learn to use who wish to apply mathematical processes to analyze for themselves the Laws of Thought. Had George Boole been chiefly aiming to supply logicians with a ready-made method, his method must be confessed a very bad one; he was aiming to set the example of studying the Laws of Mental Action.

The nature of the change introduced by George Boole into logical analysis may be summed up thus: In working a sum or equation, we seem to ourselves to be only manipulating and transforming the particular statements contained in the so-called "stating" of our question. But these very transformations are effected by means of our knowledge of certain general truths about number, such, for instance, as those registered in the multiplication-table. "Working" a sum means combining its special statements with general statements which are latent in the mind. Working a thought-sum, then, should mean transforming its premises by combining them with our general knowledge of the Laws of Mental Action. And, in fact, the Aristotelian syllogism was, so far as it went, a process of this very kind; it brought a certain thought-law into contact with the special premises of each argument; and, by means of that general law, extracted the conclusion. To make Logic a more powerful instrument than it had hitherto been, what was needed was not, as Gratry seems to suggest, to import into it a new process, the process of faith; but to extend and

make freer and more vigorous our use of that process ; seeing that every syllogism is, so far as it goes, an act of faith in the general Laws of the Creative Logos. The Aristotelian Logic was, in fact, an Arithmetic of reasoning, analogous to such an Arithmetic of number as might be evolved by a race whose general knowledge of the Laws of Number amounted to familiarity with the "twice" column of the multiplication-table.

We may say then that what logicians had been seeking, though without quite knowing what they sought, was a Logic made wide and vigorous by using all attainable knowledge of the Laws of Thought as freely as, in working sums, we use our knowledge of the Laws of Number. Such a Logic, it need hardly be added, is yet to be created ; though George Boole did a little towards laying its foundations. He brought to light three great principles of mental action :

First, that all sound thinking treats the Universe of Thought as a Unity ; and classes of things as fractions of Unity ; and that Unity itself as a fraction of a larger Unity.

Secondly, that we cannot deal logically with any statement except by comparing it impartially with the opposite statement.

Thirdly, that sound Thought is always essentially a free Pulsation between extremes. All selection, whether by an adult for himself, or by a teacher for his pupils, should consist in selection of the question to be studied. When once we have decided what we will think about, we must think with perfect impartiality on both sides. In mathematical language we state this by saying that every sound thought-process which can be carried on with respect to any element (x), depends in some way or other on considering x, first as *Unity* (*i.e.* Universal and absolute throughout the Universe of Thought), and then as *Zero* (*i.e.* non-existent in the Universe of Thought), and then combining the two conceptions. Right conduct (it is often said) is that which keeps the mean between two extremes. Now to know the mean we must know the extremes. Sound thought is related to correct conduct as the pulsation of a Light-ray is related to the onward path of the ray. Whatever hampers the free, side-ways pulsation of the wave from one extreme to the other, interferes with the pure whiteness of the Light ; whatever hampers the free swinging of the mind between extremes of opinion, obstructs man's vision of what is right in moral conduct.

A country watchmaker, being asked why being dirty made a watch go fast instead of slow (as the questioner would have expected), replied : "Well, you see, when the wheels are clogged with dirt, it *don't* go ; not to say *go ;* it only niggles-like." This is

the explanation of the hurry and fever of life. Our minds are clogged with prejudices and trammelled with superstitions ; and they don't really work, they "only niggle-like." We think we are giving our children freedom by presenting to them a mass of novel ideas, the truth of which has not yet been tested, and by indoctrinating them with a mass of prejudices which differ from those of our forefathers chiefly by being expressed in new phraseology ; it would be better to present to them a few subjects of study, selected according to some order which has been tested by long experience ; and, when once a child's attention has been called to any topic, encourage him to think of it with absolute freedom and utter impartiality. This, and not any particular method for manipulating masses of syllogisms, is the main outcome of Boole's mathematical analysis of the Laws of Thought. It is a curious compilation ; over-weighted with too great a mass and variety of material. In its attempt to bring the intellect and heart to work in unison, it fails to make its appeal to either easily intelligible. It needs a far closer study than ordinary readers can be expected to give to an author. Nevertheless, it is a very amusing book, because of its latent satire on those mental processes which religious and ethical writers call "thinking." A few quotations will make clear the author's opinion of ordinary religious controversy.

"I shall examine what are the actual premises involved ; whether those premises be expressed or implied. By the actual premises I mean whatever propositions are assumed in the course of the argument, without being proved, and are employed as parts of the foundation upon which the final conclusion is built. . . . The chief practical difficulty of this inquiry will consist, not in the application of the method to the premises once determined, but in ascertaining what the premises are. In what are regarded as the most rigorous examples of reasoning applied to metaphysical questions, it will occasionally be found that different trains of thought are blended together ; that particular but essential parts of the demonstration are given parenthetically, or out of the main course of the argument ; that the meaning of a premise may be in some degree ambiguous ; and, not unfrequently, that arguments, viewed by the strict laws of formal reasoning, are incorrect or inconclusive. The difficulty of determining and distinctly exhibiting the true premises of a demonstration" (in a book which we are studying and analyzing) "may, in such cases, be very considerable. But it is a difficulty which must be overcome by all who would ascertain whether a particular conclusion is proved or not, whatever form they may be prepared or disposed to give to

the ulterior process of reasoning. It is a difficulty, therefore, which is not peculiar to the method of" mathematical analysis, "though it manifests itself more distinctly in connection with this method than with any other. So intimate, indeed, is this connection, that it is impossible, employing the method of this treatise, to form even a conjecture as to the validity of a conclusion, without a distinct apprehension and exact statement of all the premises upon which it rests. In the more usual course of procedure" (*i.e.* verbal analysis), "nothing is, however, more common than to examine some of the steps of a train of argument, and thence to form a vague general impression of the scope of the whole, without any such preliminary and thorough analysis of the premises which it involves.

"The necessity of a rigorous determination of the real premises of a demonstration ought not to be regarded as an evil ; especially as, when that task is accomplished, every source of doubt or ambiguity is removed. In employing the method of this treatise . . . the process of inference is conducted with a precision which might almost be termed mechanical."—*Laws of Thought,* ch. xiii, §§ 1, 2.

"There are many special departments of science which cannot be completely surveyed from within, but require to be studied also from an external point of view, and to be regarded in connection with other and kindred subjects, in order that their full proportions may be understood." (*Laws of Thought,* ch. viii, § 1). The above passage is in line with George Boole's opinion that no Church can properly be reformed from within. The errors of a Church, he considered, must always be attacked from without. The ideal condition, of course, would be that Reformers within a Church should voluntarily seek the assistance of those who look on from the outside ; but George Boole could not be induced to believe that such liberality was possible.

The following passage is interesting, as bearing on the question of the relation between rival systems of Theology.

"If the general truths of Logic are of such a nature that when presented to the mind they at once command assent, wherein consists the difficulty of constructing the Science of Logic ? Not in collecting the materials of knowledge, but in discriminating their nature, and determining their mutual place and relation. All sciences consist of general truths : but of those truths, some only are primary and fundamental, others are secondary and derived. The laws of elliptic motion, discovered by Kepler, are general truths in Astronomy, but they are not its fundamental truths. And it is so in the purely mathematical sciences. An almost boundless diversity of theorems which are known, and an infinite possibility

of others as yet unknown, rest together upon the foundation of a few simple axioms ; and yet these are all *general* truths. They are truths which, to an intelligence sufficiently refined, would shine forth in their own unborrowed light, without the need of those connecting links of thought, those steps of wearisome and often painful deduction, by which the knowledge of them is actually acquired. Let us define as fundamental those laws and principles from which all other general truths of science may be deduced, and into which they may all be again resolved. Shall we then err in regarding that as the true Science of Logic which, laying down certain elementary laws, confirmed by the very testimony of the mind, permits us thence to deduce, by uniform processes, the entire chain of its secondary consequences, and furnishes, for its practical applications, methods of perfect generality ? Let it be considered whether in any science, viewed either as a system of truth or as the foundation of a practical art, there can properly be any other test of the completeness and the fundamental character of its laws, than the completeness of its system of derived truths, and the generality of the methods which it serves to establish. Other questions may indeed present themselves. Convenience, prescription, individual preference, may urge their claims and deserve attention. But as respects the question of what constitutes Science in its abstract integrity, I apprehend that no other considerations than the above are properly of any value."—*Laws of Thought,* ch. i, § 5.

It is interesting to notice that the life-law of the brain, taught by Gratry, can be illustrated by means of a plain forked stick. But in order to teach geometrically Boole's complicated method of critical analysis, we must also employ the spiral wire or snake-coil. If the writer of the third Chapter of Genesis lived in our prosaic age, he would perhaps formulate his caution thus : "Study Gratry freely. But beware of allowing yourself to be tempted by Boole's subtle and fascinating method ; or it will surely lead you into mischief."

If he were in a specially honest frame of mind, he might add : "Because Boole's method may enable you to grasp ideas quite beyond the comprehension of your Rabbi (Don, Pedagogue, or Pope, as the case may be) ; and therefore necessarily wicked."

CHAPTER X

SINGULAR SOLUTIONS

"I have made out what puts the whole subject of Singular Solutions into a state of Unity."

ALL metaphysicians have known of the existence of a law of antithesis or contradiction in Thought. "We form the conception of man by contrast with that of not-man; we know good by seeing it against a background of evil; the child learns to realise its own personality by coming in contact with things that are not itself." All this is the commonplace of metaphysics. But modern mathematics is leading to the perception that we need something more definite than to see x against a vague background of *not-x*; we need the special and definite antithetic conception to x within the particular "Universe of Thought" to which x properly belongs. And often we have to investigate a class of things as forming a part of more than one Universe of Thought, and contrast it with not-x in each. As, for instance, we may clear up our conception of "black sheep" by contrasting it, first, with "sheep that are not black"; secondly, with "black objects that are not sheep"; and so on. The Differential Calculus, however, shows that the mind is feeling after even a more definite mode of contrast than that indicated above. We cannot truly know the Law which governs an organic group of phenomena unless we allow ourselves to conceive the idea of a Singular Solution of that Law, *i.e.*, an individual which is *constant in some relations as to which the other individuals are variable, and variable in some relations as to which the others are constant.*

Now the so-called Messianic Seers are persons in whom is developed to a high degree the tendency to study ordinary human beings by the method of contrast with an Ideal Man, a sort of Singular Solution of Humanity; of whom they speak as constant in those relations to the Unseen in which we are variable, and fluent in those relations to the visible as to which each of us has his fixed prejudices. This Ideal Man, they assert, is the indispensable Mediator between them and any true knowledge of Humanity. When they have jumped to the conclusion that their need of *conceiving* an Ideal Man is any proof of the actual existence of such an Ideal, visible or Invisible, they err, of course. But, nevertheless, these Messianic Seers are neither dreamers nor maniacs; they are revealing, in the domain of emotion, a Law which

the mathematical doctrine of Singular Solutions reveals to the intellect, viz. that the process of conceiving an antithetical exception is a necessary medium between the mind of man and any very thorough comprehension of the Laws which govern Humanity.

The study of the phenomenon of the Messianic Seerhood became the absorbing interest of George Boole's later years. The chapter on Singular Solutions in his text-book of differential Equations contains much genuine metaphysical truth expressed in mathematical terminology. He made a special study of the sermons of the strange preacher, F. D. Maurice ; and in the last year of his life wrote : "I have made out what puts the whole subject of Singular Solutions into a state of Unity." What strange pulsation of thought must have thrilled from the mind of the great Seer of Messianic Singular Solution, into that of the logician of the Unity, before those words were written, who can guess ? The MS. on which George Boole was engaged at the time lies undeciphered in the archives of the Royal Society ; no mere mathematician can understand it : and no theologian cares to try. Perhaps it may be deciphered yet, when further progress has been made in knowledge of the correspondence between the normal action of the human mind and its automatic expression by means of notations.

CHAPTER XI

ALGEBRAIZERS

"The evidence of Things not seen."

MUCH of the tragedy of religious conflict is due to lack of comprehension of the process of *Algebraization*.

I have pointed out how a question which seemed, on its own level, hopelessly unsolvable, is often solved at once by reference to an order of considerations higher than that involved in the question itself. This is especially the case when a *Law of Thought* is appealed to, to settle a discussion about *things*. Laws of things we cannot be said really to know, except in a fumbling and empirical manner ; when we have true knowledge, it is because we have discovered the Law of Thought which presided at the Genesis of the Things. I wish to speak in all humility and reverence; but I cannot say less than I mean. We get clues, suggestions of Laws of Thought, by studying things ; but whenever we truly *know*, what we know is a Law of Thought, which we have arrived

at by discharging from our observation of particular finite things all that made them finite and particular. The elementary geometrician who first conceived the idea of the circle caught his suggestion from looking at things whose forms were approximately round; but, as soon as he had discovered the law of roundness within his own mind, he was able to express roundness in a new material, to state it generally (by scratching it on the sand) in a manner which afforded no clue to the objects from which the suggestion had come to him. And the law of circularity, thus formulated, was henceforth master within him, and governed his appreciation of things. He did not test his Ideal circle by comparing it with the sun or with an apple; on the contrary, he tested the circularity of a fruit by comparing it with his abstract or Ideal circle. His circle then was an *algebraization* of the round outline of the sun or moon, or of a fruit.

In the same way we discover a law of number, first, by thinking of some particular numbers; but as soon as we know the Law, we can state it *Algebraically, i.e.*, in a manner which conveys no information as to what were the particular numbers of which we happened to be thinking when we discovered it. The particular numbers suggested the law to our consciousness; they do not prove it to our reason. When once it has been suggested, it carries its own evidence, independently of particular numbers. And as soon as we have formulated a Law thus algebraically, it is henceforth master within us. Particular statements about number are referred to it; and our opinion as to the truth of those statements is controlled by it. For instance, the law that one number multiplied by a second always comes to the same result as is obtained by multiplying the second by the first was of course suggested to the consciousness first by the observation of some particular pairs of numbers; but it is not proved by reference to any special numbers; it is general and algebraic. And no student thoroughly understands it as a law of number until he understands it in its algebraic statement: $ab = ba$. As soon as he understands the algebraic statement, it becomes master of his thought.

A similar process has been going on throughout the history of religion. For instance, the idea of God as Father *suggested* itself first in connection with the love of animals or men for their progeny. But the latter contains no *proof* of the former. The idea is suggested to the consciousness by particular facts; but those who understand it at all, accept it on its own evidence; and for them it henceforth governs their ideas of particular facts.

Superstition has always been trying to cumber our ideas about God with the pomposity, or vengefulness, or jealousy, or whatever

vice happened to prevail in the parents of the particular era. Philosophy has always been trying to *algebraize* our conception of Fatherhood; to present the normal or Ideal Father; and to induce human fathers to conform their conduct to this Ideal.

The difference between our imperfect and fumbling knowledge of things, and our absolute and perfect knowledge about Laws of Thought, has been thus described:

"The general Laws of Nature are not, for the most part, immediate objects of perception. They are either inductive inferences from a large body of facts,* the common truth in which they express, or, in their origin at least, physical hypotheses of a causal nature, serving to explain phenomena and to predict new combinations of them. They are in all cases, and in the strictest sense of the term, *probable* conclusions; approaching indeed, ever and ever nearer to certainty, as they receive more and more of the confirmation of experience; but of the character of probability, in the strict and proper sense of that term, they are never wholly divested. On the other hand, the knowledge of the laws of mind does not require as its basis any extensive collection of observations. The general truth is seen in the particular instance, and it is not confirmed by the repetition of instances. That formula of reasoning which is called the *dictum* of Aristotle *de omni et nullo* expresses a general truth in Logic; now that truth is made manifest in all its generality by reflection upon a single instance of its application. And this is both an evidence that the particular principle or formula in question is founded upon some general law or laws of the mind, and an illustration of the doctrine that the perception of such general truths is not derived from an induction from many instances, but is involved in the clear apprehension of a single instance. In connection with this truth is seen the not less important one that our knowledge of the laws upon which the science of the intellectual powers rests, whatever may be its extent or its deficiency, is not probable knowledge. For we not only see in the particular example the general truth, but we see it as a certain truth—a truth our confidence in which will not continue to increase with increasing experience of its verifications. . . . Shall we then err in regarding that as the true science of Logic which, laying down certain elementary laws, confirmed by the very testimony of the mind, permits us then to deduce, by uniform processes, the entire chain of its secondary consequences, and furnishes, for its practical applications, methods of perfect generality?"†

*The author means "our modes of stating them are."
†Boole, *Laws of Thought*, ch. i. §§ 4, 5.

The author has omitted to notice one fact which, from his point of view, probably seemed too self-evident to be worth mentioning, but the ignoring of which causes much confusion in Science ; viz. that whereas he who is teaching a Law of things must illustrate his remarks by reference to actual facts, or his whole argument falls to the ground, a principle of Algebraization can just as well be illustrated by reference to imaginary as to real occurrences. When the law of circularity has once been suggested to the mind, it matters nothing whether the object which suggested it was a real or a painted fruit ; nor does it matter how nearly it approximated to the circular form. In the same way, the spiral law of thought-progress is equally well illustrated by the narrative of Abraham, whether it be a narration of actual facts or an imaginary tale.

The kind of confusion which is caused in literature by this principle not being understood, will be described in a future Chapter.

There was a time when even mathematical algebraization was considered impious and dangerous. We have grown accustomed to it now. But the algebraizers of the moral world are still the objects of the hatred of other classes of men (and that is by no means the worst part of their destiny, as we shall presently see). Ordinarily a tolerably strong antagonism is kept up between three classes : the supporters of convention, who desire to make some sort of practical life possible, and who object to whatever disturbs popular ideas ; the so-called Free-thinkers, who refuse to acknowledge the validity of convention, and who do not believe in the possibility of knowing the true Law of any human relation ; the Idealists, who create an ideal moral code according to some standard agreeable to their feelings. These three classes, in ordinary times, hate each other with very sufficient cordiality. There is a fourth class—honest cautious men who have picked up their notions of Logic from the study of what is called "Natural Science," and who imagine that no Law can be truly known unless it be generalized from a large number of instances. The Algebraizer is a mark for the sneers of all four classes. To the conventional he seems to be defying Law, because he ignores rules made in ignorance of the true Law. To the self-styled Free-thinkers he seems to be attacking freedom, because he asserts that there is a Law which cannot be broken, and which will avenge attempts to ignore it. To Idealists he seems to be extinguishing Light, because their fancy-lamps fade when he dazzles them by opening the shutters and revealing the Sun. And the so-called "scientific" despise him as rash, because he illustrates his meaning by reference to only one or two instances, which (as matters of historical fact)

may be of doubtful authenticity. He can never do right. If he speaks, he is arrogant, in that he professes to know more than other men ; if he keeps silence, he is contemptuous and proud. He longs to give freely that wonder of joy which has been freely given to him. He longs to give freely, but Humanity will not have his gift ; yet it reproaches him for hardness, in that he takes no trouble to slake its thirst for the living Truth. If he be of philosophic temperament, he retires into his study, and confides to his wife, or perhaps to some favourite dog or cat, refined satires about the absurd inconsistency of mankind. But if he be tender-hearted, his heart breaks, and he dies in despair. O ! Jerusalem, that stonest the Prophets !

It may be, however, that he loves the Unseen Revealer more than either abstract Science or concrete Humanity. If so, he is preserved from both cynicism and despair. He possesses his soul in patience until it pleases God to make him understood.

In any case, the worst of his doom is still to come. After his death some follower distorts his meaning, so as to make it palatable to the unthinking masses ; and uses his name to trample out truth revealed to his successors. An algebraizer of our own day used often to say : "One would accept being crucified ; it does not last long ; but to have one's words made into an excuse for trampling down the truth revealed through other Seers, that is a doom to make the stoutest heart quail." Of this awful torture Jesus has had eighteen centuries already ; and Moses thirty-three. O ! Jerusalem, that buildest the tombs of the Prophets, saying : "If we had lived in our father's days, we would not have partaken of their crimes."

CHAPTER XII

DEGENERATIONS TOWARDS LUNACY AND CRIME

"We feel as our ancestors thought, and think as our descendants will feel."—J. JACOBS.

IN former Chapters I pointed out the manner in which idleness and superstition fasten on successive revelations ; how they in each age make a concrete system of opinion out of what was, in its origin, merely the garment worn by the Pulsation-doctrine in the mind of some Seer. But besides such degraded remains of what once were truths as are retained in the conscious memory of men and believed in as doctrines or moral codes, our very nervous systems have their own unconscious memory, and preserve

idolatries and superstitions which have died out of the conscious memory. These are constantly tending to revert into consciousness. A good social system provides for periodic and harmless fits of atavism. Those are wise who, in holidays, throw off the social trammels of their own age and revert to an older mode of existence. If we live too constantly in the one thin stratum of convention which we call "present custom," we grow weary; the energy relaxes in spite of us; and then at last we fall *involuntarily* into some stratum of the past.

Books on Lunacy attribute mental disease to physical causes, which produce weakness of brain-tissue. It is quite true that, given an abnormal strain, the stronger tissues resist it most successfully. But why should we put *continuous* strain upon ourselves, such continuity of strain being contrary to Nature? It is the nature of man to stand on his feet, not crawling; and to exert his mind to live in the present, not yielding to mere instinct. But it is also his nature both to return periodically to the physical position of the earth-worms, and to revert occasionally to the mental position of the savage. We do not wait to lie down till we have fallen from fatigue; we accustom ourselves and our children to relax and revert at regular intervals. Only the exceptionally weak take such indulgences as lying down during the day; but mentally and morally we act as if only the exceptionally weak need lie down at all!

Could I give to each reader the fearful experience which is gained by occasionally residing, for even a week or two, in a madhouse, I need not plead in words; but as that is impossible, I must go on with my appeal to reason and conscience.

Perhaps nothing in the conduct of our life is so irrational as our attitude towards the whole subject of insanity. Because the tendency to yield to certain sensations *in a spasmodic and irregular way* is a proof of mental weakness, it is inferred that those sensations should be discouraged and trampled out by every device in our power; and that, when they occur, they should not be heeded. The consequence is, that when they occur they are often not confessed till too late; and the secret remains an extra burden on the over-taxed mind. It would be as rational to suppose that, because tumbling about in the street is a proof of ill-health, therefore we should neither go to bed at proper times, nor acknowledge ourselves weary, nor thank God for the gift of repose. Those very nervous sensations, the yielding to which in an irregular manner constitutes insanity, are in reality the alphabet of a system of telegraphy by which the past is striving to hold converse with us; they are the solicitations of some lost knowledge urging us to

re-admit it to the mind of the race that was once its earthly Temple. "Behold, I stand at the door and knock," says Truth ; if the visitor is ignored, his importunities may drive us mad indeed ; the best way to quiet them is to admit him quietly, and hear what he has to say. Education should assist us to do this. Many teachers, however, aim at trampling out our power to do it. In so far as they are successful, they only retard progress. Nature, however, always provides a certain minority of neurotic sensitives, in whom latent ancestral instinct is too strong to be driven out ; it reverts in spite of all the attempts of teachers to suppress it, and drives the subject mad. "The majority call the minority mad," said one wise man ; but it would be far truer to say that the majority drive the minority mad by attempting to suppress truth.

Many unexplained freaks of reversion become intelligible when we remember that any sight or sound which was associated in the ancestry with certain emotions tends to revive those emotions in sensitive descendants. To this fact we give the name of "instinct." The cat who has never before seen a dog, and the dog who has never before seen a cat, get what in a man we should call "a fit of homicidal mania" at sight of each other ; an irrational desire to kill each other ; because their ancestors had reasons, founded on knowledge and experience, for desiring each other's death. The young beetle who sees for the first time the petal-veining which is to be his honey-guide, no doubt feels throughout his frame the thrill of prophecy of a joy as yet unknown. He follows the guidance which he cannot understand, till he finds the explanation in a new world of delight. "For beast and bird have seen and heard that which man knoweth not ; " because man considers his own instincts fit for nothing better than to be brutally trampled underfoot. Therefore, where a beetle becomes harmlessly drunk with joy, a man goes mad of suffering.

A dog and cat can be made devoted friends ; not, however, by *ignoring* ancestral instinct, but by studying and guiding it.

Another fruitful source of insanity is the irreverence of teachers for the process of Algebraization. Most children have more or less of that luminous transparency which enables the individual to perceive Laws of Thought reflected in the workings of his own soul. As was pointed out in a former Chapter, he who has thus perceived a Law of Thought may be (and often is) absolutely sure that he has seen a general Truth. Teachers, forgetting to discriminate between Laws of Thought and Laws of Things, assert that the individual is no standard for the community ; and that *no* Law of Nature can be generalized from a single instance.

Many intelligent young people are thus made ashamed of the divinest gift within them, the power of spontaneous perception of thought-laws : and destroy the faculty by not using it. In some, however, the tendency to Algebraization is too strong to be repressed. The lad or girl, being told that "common sense and logic oppose themselves to the practice of generalizing from a single instance," draws the conclusion that his teachers are the opponents of what he feels to be the most sacred portion of his mental life ; therefore he sets up a course of life openly defiant of "common sense" as embodied in the advice of those around him. For some years he is only "eccentric" and perhaps "unmanageable"; but the strain is often too great for the brain to bear ; he has never been taught to distinguish Laws of Thought from Laws of Things ; he carries the practice of *generalizing from one instance* over into the domain of things ; he reasons from analogy, or jumps to conclusions from mere association of ideas ; and falls into a hopeless tangle of delusions—victim to the wilful irreverence of his teachers, and his own fidelity to the great truths which they are trampling underfoot.

The key-note of the Science of Lunacy is struck in certain organizations which a physician once described to me as "the physical temperament of insanity with a brain impossible to overset." To Abraham, for instance, came weird impulses of reversion to savage customs and a nomad life. In a weak man without faith these would have developed into savagery and homicidal mania. A resolute personal will would have trampled them out, and by doing so injured both intellectual and moral development. But Abraham knew them for what they were—*revelations* of the Unity Who is guiding Humanity. He followed them in cautious reverence; and was led by them, not towards uselessness or crime, but into higher truth. No action becomes absolutely sinful except in so far as it is the result of lack of faith in the Unity. Abraham discovered that sympathetic comprehension of the savagery of the past leads, up the spiral of ascent, towards comprehension of the future destinies of Man. He did not kill his son ; he made of him the Founder of a Race.*

In the next Chapter I shall point out how use may be made of nervous disorder (where it unfortunately exists) for the development of Art. But a great deal of insanity and crime might be prevented if the custom prevailed of periodically casting off the conventions of civilization, and reverently reverting to the piety of our savage forefathers, who sought religious Truth direct from Nature, and found it without scholastic and literary appliances.

*See Appendix.

Till we do this, we shall surely find madness an inevitable feature of civilization.

Now a mad individual can be locked up and forgotten. Occasionally, however, an impulse of atavism seizes on a whole mass of people ; too many to be either locked up or ignored. Such a mass, ignorant of ancestral history, and, therefore, not knowing to what their own sensations point, start some weird fantastic movement, related to some portion of ancestral history much as a dream is related to the past experience of the dreamer. Such movements are produced by some stratum of the ancestral past forcing itself into the consciousness of an irreverent and forgetful posterity. A nation lives long in the land which is careful to study its past ; partly because such a Nation reverences the spontaneous Revelations of heredity ; and does not allow priests and school-masters to trample out its instincts ; and, therefore, does not go mad of atavism repressed till it becomes phrensy.

CHAPTER XIII

THE REDEMPTION OF EVIL

"The Bow shall be a token."

A TRIFLING but interesting confirmation of the Pulsation-doctrine is to be found in a singular fact connected with Art-Needlework.

Nervous disorder, at least in its beginnings, has polar or antithetic phases. A fit of excitement is followed by one of depression, etc. These aberrant moods affect, in some degree, the colour-sense. Let any patient, who has a sensitive retina but no knowledge of Art, try the following experiment :

Collect a mass of scraps of silks and ribbon, and a bundle of embroidery-silks or wools, of as many shades as possible. (Any soiled or faded remnants of skeins will answer.) In the excited mood, tack scraps of ribbon, etc., quite at random, on to some soft foundation (such as a bit of soft woollen or cotton stuff). Choose always whatever colour pleases the eye at the moment.

A few days later, when the mood has changed, the patient should look at her work. The colouring will probably appear, even to herself, hideously crude and coarse. Then begin to embroider upon it, choosing whatever colour pleases the eye. Before selecting a needleful, fix the eyes for a few moments on the spot which seems most crude ; then, suddenly, look into the heap of silks and take whatever colour is found most refreshing, embroidering over the

selected spot freely and at random. Before threading the needle again, fix the eyes on whatever spot now seems crudest, and choose a needleful while the eye is annoyed from gazing at that one, and so on. Continue to embroider, in any stitches that suit the hand, in all various moods and in different phases of health, till the whole has been brought to a condition in which it does not offend the eye in any mood.

Experts in needlework, when they see work produced under these conditions, say that it has (however rough in execution) the peculiar stamp of colouring which distinguishes *old* Eastern embroideries from all modern imitations, whether Eastern or European, even the most skilful.

After a time, the worker acquires the power to produce at will this peculiar colouring ; and can produce it in normal health, and apply it to work containing some principle of design. But, so far as I have discovered, no one seems able to acquire it except by working, at first, at random ; and either during illness, or when worried or fatigued. No one can possibly acquire it except by keeping the first few attempts by her for a long time, and working patiently and repeatedly over the same ground. The acquiring of skill is much facilitated by the following method.

During the first crude colouring, think freely and strongly of exciting subjects. (This would be dangerous, but for the correction to be presently indicated.) Think of some exciting topic before choosing a colour ; and, while using that colour, try to register on the memory, in connection with that particular silk, the thoughts present during its selection. When looking at a crude spot for the purpose of correction, recall the thoughts registered on it ; and, before choosing the silk to correct with, try to formulate what some person, who totally disagrees with the worker, would say on the special point associated with that spot.

Of course no silly woman would be capable of this vigorous moral exercise. But any one brave enough to subject herself to it will find health returning and mental vigour increasing at a marvellously rapid rate. Great progress in colour-skill may also be attained by it ; but a few simple rules must be adhered to.

Colour freely by the mere sensuous impulse of the eye, thinking meanwhile of something quite different, and paying no heed to any previously learned theories of Art.

Get the form, as much as possible, by the motion of the hand, not looking at the needle-point. Use the eye only to select colour, and then to keep the work within certain bounds. The practice of following with the needle lines traced on the material with a pen or chalk is fatal to colour *inspiration* (not necessarily to colour

knowledge) ; as the retina, fatigued by unnatural exercise, loses its sensitiveness to immediate colour-impulses.

If any tracing be used, let the design be as simple as possible, and purely Geometric. Trace on the back of the material, and run a thread through to the front. This thread will not need to be absolutely covered, as it can be afterwards removed.

If gold thread be used, wind it first on a reel, till it takes a curved set ; shake it off the reel, and use the natural coils into which it falls, arranging these to please the fancy. Avoid using gold *over a tracing*. Some of the very ancient curves of Indian Art occur naturally when Japanese gold is *shaken* off a reel.

If the hand is stiff, it may be loosened and trained into tune with Nature's formative processes by the practice of drawing the Pentagram and Heptagram. I have the sanction of Dr. Maudsley for the opinion (which is confirmed by my experience) that this exercise is eminently suited to produce, in the muscles of the hand, a kind of automatic skill, a consonance with Nature's growth-processes, such as might well seem to primeval peoples miraculous. The copying of actual forms puts the hand into harmony with certain accidental outcomes of Nature's Laws ; the Pentagram is an Algebraization of Nature's processes of development.

A good test whether the hand is properly in tune with Nature, consists in feather-stitching an irregular spray, in coarse silk, with the eyes shut. The spray so produced should be as natural-looking as anything that could be done with the eyes open.

I speak here of Needlework, that being the Art with which I am familiar ; but similar principles to those above explained have been applied to colour-study with the brush. The fact that it is possible, by utilizing the polarity of nervous disease, to produce the peculiar old-Eastern colouring, and at the same time to facilitate cure by unifying the antithetic phases, throws light, I think, on the attitude of the Pentateuch writers, both towards colour-and-form Art, and towards the question of At-one-ment of error by return to the Unseen Unity. The Third Commandment might, I think, be for some persons paraphrased thus :

When angry, do not indulge in blasphemous exclamations, or in wanton and exaggerated statements ; but learn to curse and swear in colours. This will relieve your feelings as much as bad language could do, and will neither offend your neighbours nor injure yourself. It can be made a means of curing whatever evil tendencies may be latent in your nature, by employing them in the development of Artistic faculty. And be sure that God will bless every attempt to put yourself into line with His Creative energy ; and will, sooner or later, punish every expression of evil which has

no tendency to further its redemption to the service of Good and Unity.

There are those who smile at any serious treatment of so trivial a pursuit as Embroidery. But how can a woman be sure that she has truly grasped philosophic principles, unless she can employ them to improve feminine and domestic occupations ? A wise man once asked : "How many angels stand on the point of a needle ?" It is not recorded of any wise man that he was conceited enough to fancy that question could be lightly answered. The Father of the Calculus cautioned his readers not to despise The Infinitesimal; and a greater teacher even than Newton assured us that The Almighty does not disdain to reckon such trifles as the hairs on our heads. The Lord's People, of old, were encouraged to revel in mingling Gold and Blue and Purple and Scarlet ; because it was felt that the combination of all incongruous colours into one harmonious Rainbow is a token (all the surer for being intangible and evanescent) that the Forces of destruction which threaten to overwhelm man shall be restrained for the salvation of those who trust in the Unity of God. For the Hebrew, the Rainbow was to be a token that God would interpose at last on behalf of His People. But our Father Odin taught that the Rainbow is a bridge, by trusting to which a brave soul can, on its own feet, so to speak, reach the home of the Divine.

CHAPTER XIV

THE SCIENCE OF PROPHECY

"Truth for ever on the scaffold,
Wrong for ever on the throne.
But that scaffold sways the nations ;
And behind the dim Unknown
Sitteth God within the shadow,
Keeping watch over his own."

A GREAT deal has been said and sung about the beauty of Truth, and its perpetual conflict with error. To the popular imagination Truth and Goodness represent themselves as a couple of knights-errant incessantly in the act of slaying certain dragons called errors and vices. It is supposed that whenever any one of these is, anyhow, destroyed, that is always so much gained towards the final triumph of Truth and Goodness over the whole noxious brood. But, alas ! Truth and Morality, so far as man has to do with them, are conditions of brain, of a most exquisitely delicate organization.

And just as it is possible to cure a comparatively harmless physical ailment by the use of remedies which lower vitality and tend to set up a more painful and more obstinate disease than they cure, so it is often possible to combat (and successfully combat) a bad condition of the mind by the use of means which leave it an easy prey to some worse condition. Those who would practice the art of curing physical disease are not allowed to content themselves with studying only the immediate action of remedies, so as to know what drug will neutralize what symptom; they are required to make themselves acquainted also with the structure of the human frame, and the nature of its reactions after certain modes of action, and even of hereditary reactions after stimulation. Those who take upon themselves to cure symptoms without knowledge of reactions are empirics or quacks. They are often wonderfully successful; but the result of trusting to them is a general depression of vital and recuperative power. He only is a true physician who so combats disease as to store up vitality; and he only is a true teacher who so combats evil as to store up brain-vitality. Therefore the Far-Seer, *i.e.* the student of the longer and slower mental reactions, often seems to be opposing something which others think good. The practical result of his peculiar study is that he can rarely throw himself thoroughly into any violent "movement" for the salvation, education, enlightenment, or amusement of mankind. Prophets labour for Humanity in their own way; but their way is seldom one that contemporaries understand. If we wish to realise why such men as H. Spencer, Renan, Maudsley, Hinton, are not noted for what is called Philanthropic Zeal, we must ask ourselves why men of that stamp would not have joined in the popular movements of the past. There was a time when wine was a new discovery. It allayed certain forms of suffering; it ministered to the heightening of certain faculties; clearly, then, wine was the gift of a God; men should drink it in reverent homage to the Divine Giver, and show their gratitude by doing all in their power to induce others to accept the gift. Alas! the Herbert Spencer of that day was only too sure that there must come a reaction; he could not become a Bacchus-worshipper. By and by the bad side of the alcoholism revealed itself; Bacchus-worship was discovered to be vice fostered by pious emotion. The new philanthropists preached a crusade against wine; for what could be more clear than that wine was bad? The Renan of that day could not become an advocate of total abstinence; he told his hearers that Bacchus-worship must have had its good side, or it could not have enlisted so many followers. So it is now. The Prophet knows that much which is called Education means forcing the young brain to give

off, in wasteful and useless display, the latent force stored up by our ancestors ; that much which is called progress in civilization consists in abandoning those processes of recuperation by which scientific men of old taught the masses to store up latent energy for future use. Thus he who sees ahead is a sceptic always ; always a wet blanket on the enthusiasms of those who only see to-morrow or next year.

This gives a tone of sadness to the utterances of Prophets. But the sadness is accidental, and due to the fact of the subject not having been understood. For in reality Prophecy is the most joyous and least pessimistic of all Sciences. The Logos visits the follies of the fathers on the children to the third and fourth generation ; but preserves what is good, for thousands of generations ; and all who know him learn to realise that such is the Law of His working.

Even this perception adds to the loneliness of the Prophet ; for as he irritates others by not being able to share in their sanguine expectations of immediate success, so he seems to them hard-hearted because when they are most gloomy he cannot despair. He sees in any misfortune that may occur, only the temporary penalty (long forseen by him) of man's over-confidence. Through all depression the Prophet knows that the Logos punishes for a small moment, but His mercies endure for ever.

Another cause that adds to the loneliness of the Far-Seer is that, sooner or later, he is almost sure to discover a law which the young people about him desire not to believe, viz. the wastefulness of original work published before the complete maturity of the author. The best work is that which combines Genius with Experience ; therefore the way to do the best work is to live to be old. Original work is healthful exercise for the young ; but the work of preparing one's own work for a public wears out the immature brain. Juvenile Genius is impatient, and clothes its own impatience in a disguise of devotion to Truth ; but it would be better if that devotion took the healthy and unexhausting form of studying how to complete and preserve the work of predecessors. The consequence of impatience to be original is that the work of genius is done without experience ; and that those who have genius comparatively seldom live to gain experience. There are, however, always a few who, though aware of their own original power, are willing to bide their time ; and, few though they may be, natural selection always puts the balance of influence into their hands at last. But the feverish and impatient who rush forward to early success despise them for wasting time. And, unfortunately, many of the so-called reforms of modern education are taking the

direction of encouraging young persons to expend their mental energy on original investigation, and discouraging reverent attention to the imperfect work of predecessors and teachers, the completing of which would be excellent preparation for more entirely original investigations. "Honour thy predecessors, *that thy days may be long in the land*," is the true secret of intellectual vigour. It would seem that, in the Eastern Schools of Prophecy, the younger Prophets were employed as messengers and interpreters between their elders and the outside world. This is excellent preparation for becoming, later on, Interpreters of the Unknown Truth to Mankind. The true pulsation of the intellectual life of an individual would appear to be, to utilize the age of passion for the purpose of gaining experience by helping older teachers; then, in fully ripe age, to fertilize the new generation with the best essence of one's own thought. And when a Prophet denounces a "curse" on young men whom impatient ambition makes neglectful of their elders, he is only speaking from the same scientific standpoint as a doctor who predicts future debility as the consequence of any physical sort of premature indulgence.

Several portions of this work were suggested by the conversations of Dr. Alfred Wiltshire, who had spent many years in the study of periodicity and of occasional reversal of attitude, as agents in the development of the human faculties, physical and mental. The foregoing paragraph is the substance of much which he said to me before his disease was apparent to others, but after he knew himself to be a doomed man. He told me that he had made his discovery of the danger of original work done young, too late to save himself; he hoped that his sorrowful experience might be of use in warning others.

The nature of my work precludes the possibility of specifying in detail the precise extent of my obligations to my various teachers. But one motive which spurs me on to complete it is the desire to keep the promise I made when Dr. Wiltshire was dying; that his children should know all I could tell them of the value of their father's life-work.

The most beautiful and powerful of all logical formulæ is also the simplest. It is the great Master Key of Prophecy; used as such, by the mathematician Boulanger; and handed down (for those who have eyes to see) from our pious forefathers in the position of the Mistletoe-berry. No one who has ever used or understood this solemn formula would willingly translate it into common words. But so much misapprehension is caused by the reticence which has been observed about this and other formulæ of Grammarye that I, unwillingly, state it here:

We find the Germ of the Future when we look back to where, in the Past, a branch separated and began to grow into twin-twigs.

The difference between the Far-Seer and ordinary educated men may be summed up thus : Ordinary man thinks of some condition or other as in itself good, and desires to make that condition permanent. If he be so far educated that he consents to severe temperance in such pleasures as those of food, it is because experience has taught us that to make the enjoyment of such pleasures short, periodic, and not too frequent, is the best way to keep the system capable of enjoying what are called "the higher pleasures," such as those afforded by learning, religion, and the social emotions. The ordinary man thinks of physical temperance as a process of sacrificing the lower pleasures to the higher ; he does not understand that the rhythm of temperance should be kept especially in what he calls the highest. The true Prophet, on the contrary, knows that *nothing* is good except rhythmic alternation. He is no more a glutton intellectually than physically ; he no more desires the constant enjoyment of what is called realising the Presence of God than he craves for unlimited brandy ; he no more aspires to a Heaven of constant rapture in the intercourse of Jesus and the Saints, than to a Valhalla of everlasting mead-drinking in the company of ever-lovely Valkyries. He desires, for every fibre of his body, and every convolution of his brain, and for all the faculties which he may hereafter acquire, that each may be the medium of an occasional revelation. And for every revelation he is willing to abide the time fixed beforehand by the Divine Revealer, from Whose Hands we never escape, even if we make our bed in Hell ; and to know Whom is the only Heaven that we need, here or hereafter. And what he knows to be best for himself, that he believes to be best for his friends. He no more desires for his children incessant health or prosperity than he desires for his vines a uniform temperature. Therefore he seems to most people an unfeeling monster. Yet he is not unfeeling. His wife may perhaps desert him,* preferring the society of some man who is less advanced in the Science of Prophecy, and therefore more amusing and more outwardly cheerful (perhaps even, as seen from her point of view, more human and lovable). When this happens his heart breaks. But even when a heart is broken, his own or any one else's, the Prophet never forgets to take an awful joy in the fact that such experience is a Revelation.

Most men confess that they can know "God" only by faith ; that all experience and actual personal knowledge would lead them no further than to know the "Devil," the Destroyer, the

*Hosea.

Avenger, the Tempter, the Accuser. The Prophet, too, knows this Destroyer; he differs from other men in this—that instead of inventing by faith a God *who does not destroy*, he knows the Eternal Destroyer as Eternal Love. Siva the destroyer, he protests, is co-equal and co-eternal with Brahma the Creator and Vishnu the Preserver; and yet they are not three Eternals but One Eternal; not conflicting mysteries but one Ineffable palpitation; not rival powers but One Loving Lord.

There is always about the true Prophet more or less of the feeling expressed by the daughter of the Asa-race in Tegner's immortal poem: "The King's daughter will not condescend to snatch at joy; for she can fling away her whole life's happiness, even as a Queen can cast away her mantle, and still remain just what she was, a Queen."* The masses are jealous of a man to whom personal happiness is but a non-essential, and whose very indifference to his own fate confers on him the power of ruling those hampered with personal desires, by simply waiting till they have exhausted themselves in fruitless struggles after the fleeting joys of earth or the unattainable bliss of an imaginary Millennium. Their instinct tells them that his very existence is a danger to their prosperity. They crucify or burn him; or they lock him up, at one time in a gaol, at another time in a mad-house, under the pretence that he "lacks the normal instincts," and on the assumption that they can know which instincts are "normal" and which are not so.

The Prophet's great danger is the tendency to fall into a mystic acceptance of evil. His faith and patience become exhausted in the struggle against other men's impatience to realise good; he forgets that the true Good is not suffering, nor even the knowledge which suffering brings; but the revelation of orderly Pulsation; and that suffering where there should be joy is as much disorder as enjoyment where abstinence should be.

But underlying all that can be said about the difficulties of Seers in their intercourse with those around them, there is a latent fact of which the best physical expression is perhaps the irritable spring in the plant called *Impatiens: Noli me tangere.* By means of this spring, the seed is scattered, to germinate at a distance from the parent plant. The Prophet's knowledge is the outcome of all the most spiritual thought of his own country and age; he can have no resting-place among his own people, because God means him to take a message to distant countries and to future generations.

Those who devote themselves to a study of the Pulsation doctrine naturally aspire to apply their knowledge to investigate the Laws

*See *A Scandinavian Ideal.*

of the throbbing backwards and forwards of that mighty engine, a mass of men animated by a common emotion.

CHAPTER XV

WHY THE PROPHET SHOULD BE LONELY

"It is good that one man should die for the People."

We have been hitherto tracing the evils caused by the inability or unwillingness of the masses to enter into the thoughts of the Seers. We must now look at the other side, and try to see how dangerous to society is overwillingness to listen to the utterances of inspired Seers. Loneliness tends to save the Seer from becoming a charlatan, and to make of him a true Reformer. It is in fact, one of the most essential aids to true Reform and true Progress ; for this reason : Suppose that a reform is urgently needed in some particular. It is usually impossible to say beforehand in what exact mode it can best be made. Some man of genius tries experiments in his own little corner of the church or of society. If he is left alone to observe in peace the results of his attempts, then, after many years, he and those who have watched his career can say with authority which of his experiments were in the right direction, and which have been proved useless and need not be tried again. But if persons in official positions show favour to him at the beginning, it becomes the *fashion* to imitate him. Numbers do so who have no reason for it except that it is the fashion. The whole thing is made a party-question ; and the thinker and those who are working under him become confused by counter-currents of senseless clamour. No chemist could, under similar conditions, conduct experiments in such simple matters as the purification of water or the improvement of cast-iron ; far less can reforms in religion, in society, in thought, be organized thus. Moses, the great Reformer, after he had conceived his reform, is said to have retired into almost loneliness for forty years, and got no following till he had had time to mature his plans. And, in order that the people of Israel might be the true leaders in all Reform, he made rules which secure to each new Reformer something of the same isolation and silence ; so that his crude attempts and immature conceptions may never be taken up as a mere fashion. Some people think these rules harsh ; but they serve very good ends. They secure that showy, ambitious, self-seeking men* (if Jews)

*This was written 20 years ago.

shall court advancement, either by deserting their church to get on in the Gentile world, or by an affectation of over-strict orthodoxy, by which they hope to win the favour of their own people. Either proceeding is contemptible in itself, but does the church little harm compared to what is done in other churches by showy, vain men playing at Reform. A Jew does not try experiments in Reform unless he is really devoted. The stern Jewish discipline secures for those who are trying social experiments something of the same isolation and quietness as those who are trying experiments in physical science secure for themselves by locking the laboratory door till they have found out what they want to know.

The scientific experiment lasts a few hours ; the moral experiment the best part of a lifetime ; and it seems hard to be ignored and unnoticed till old age. But no man should expect to sacrifice to the Lord that which costs him nothing. God accepts no sacrifice except that of our *best*. Whoever aspires to the honour of righting what has gone wrong in the ways of a whole people must be content to be that of which the scapegoat was a sign ; he must "bear upon him all their iniquities into a land not inhabited," and think and search in solitude as Moses himself did. The true Reformer must always be a man despised and rejected, in whom men see no wisdom ; he must be shipwrecked, like Prospero, on a desert island, till he has perfected his methods. Then he can return, to rule the kingdom which is lawfully his own, the thought-realm of the ideal ; and the experiments of his ignorant days will not have disturbed the practical work of the Church among the masses who have no means of re-creating the past from books in the domain of ideas ; and for whom therefore the destruction of consecrated habits means too often spiritual death.

The sentence which condemns Reformers to comparative isolation acts like Gideon's test, in securing that the work of Reform shall be left in the right hands. He who has *seen* the Law of reaction vibrating down the ages, lives henceforth under a spell ; for him, fate has no terrors, solitude no loneliness, and curses no meaning ; he can go on his way notwithstanding any antagonism ; he knows that, whatever may happen during his life, he will rule posterity from his grave. Those who *can* be stopped had better be stopped ; they have not *seen* God. One who knows so little about the ways of the Creator that he cares what contemporaries think, had better work on lines laid down beforehand ; he should not go wandering off into the Infinite to seek new Truth.

Tegner* (whose conception of the value of ecclesiastical out-

*Frithiof's Saga.

lawry I am here following) represents the young champion of Reform and of Liberty outlawed, not because of any of the things which he wished or intended to do, but for *accidentally* setting fire to an old temple. He is then subjected to a variety of tests, and gives such proofs of fidelity under difficult circumstances that at last he is elected king of a country adjoining the one from which he was banished. But the spirit of his father reveals to him in a dream that he must not venture to exercise even the function for which he has been chosen till he has made Atonement for his involuntary crime by rebuilding the Temple to which, in his rash young days, he set fire ; and the Heathen priest who has heard of the lore of Judæa further instructs him that, if such reparation is to be accepted as true Atonement, the Temple must be dedicated, not to any partial Deity, but to the Unity who speaks through many messengers.

CHAPTER XVI

REFORM, FALSE AND TRUE

"The God *of your fathers* will bring you out of bondage."

THE difference between True Reform and mere fashionable quackery can be illustrated by example. In the beginning of the 19th century comparatively few English people learned foreign languages. At last some sensible people thought that it would be well if we in England knew more of the modes of thinking of our French and German neighbours. They made their children learn French and German, really for a reason—in order that the children should be able to converse with foreigners, and to read good books written abroad. That was a real Reform. Next it began to be the *fashion* to learn French and German. People who had neither the means nor the wish to procure foreign books took to neglecting all sound English education. Many country parents were satisfied with any sort of school in which a girl learned to repeat a few foreign phrases ; they considered that proved she was educated in a superior and advanced manner. If such silly parents had been asked why a girl was to be made to pick up a smattering of French in preference to learning to understand English properly, they could not have told ; "the gentry make their gals learn French " ; they had no better reason. That is false Reform. There are Jews who are dropping that grand old inheritance, the Hebrew language, in order to get their children taught whatever happens to be in

fashion. The Reform they are preparing is that their children will be formed on a lower type than that of their grandfathers ; about that, I think, there can be no sort of question. Re-form should always aim at *rise in type*. And this gives us the clue by which we can distinguish false Reform from true. A monkey will do anything, for no better reason than that some one else has done it *just before* ; it is the privilege of men to study the memorials of the past, and to preserve them for future generations.

When I was a young girl I knew a farmer, who had in his house one of those old oak chests so much prized by lovers of Art, covered with beautiful carvings of scroll-work and flowers. The carving of one of those chests must have taken some man months, perhaps years, to do ; and no one could have done it at all who did not really love his Art. Once done, such a piece of work is a delight to successive generations, and is prized as a family treasure. The farmer's mother became bed-ridden, and was obliged to hire a housekeeper to manage her house. This woman attended diligently to the dairy and all the practical farm-duties which she understood ; but, not being interested in old carvings, she allowed the chest to become clogged with dust, so that the pattern could hardly be seen. One day we called at the farm ; the oak chest was missing. In its place there stood a brand-new white box. We asked for the oak chest. "What oak chest ? " said the housekeeper. "The one that used to stand in that corner ? " "Oh ! *that* old thing ! Why, he wur that old and shabby and dirty, as I were ashamed to see un ; and the worms had got into un ; so when the painters were doing up the front o' the house, I just fetched in a pail o' paint and a brush, and I tuk and I gived un a nice coat o' paint ; and *don't* he look a beauty now ?" That good woman thought she had made a reform in the house, improved her mistress's property. We all know that she was much mistaken. Her idea of improvement was a false one.

We have not all got old carvings in our possession ; but we all have charge of some valuable old things ; an old language, old customs, old traditions, old modes of thought which contain the stored-up mental force of our forefathers, old memories, a race-history, and some form or other of old religious faith. And with all these things we can deal rightly, or we can deal with them wrongly. Changes of some sort we must have. We must not keep every kind of old lumber in our houses, or there would not be room for ourselves. We have to live our own lives ; and we must not so crowd up the world with memorials of the past as to leave no room for the present. We must sometimes make changes or there could be no progress. Which changes are real Reform, and which

are mere foolish fashion ? Then, again, just as an old carving left to itself gathers dust and damp and tends to decay, so everything that is old, if left to itself, tends to become obscure and to moulder. Everything needs care to keep it fresh. Much of our progress consists in refreshing or renewing things that have grown dusty with age ; the question is, How can this best be done ? We have then to study the two questions : What is worth preserving ? and : How to preserve it ? And I think that if we give a few moments' attention to considering how the well-meaning servant above referred to came to make such a mistake as she did, and what exactly was the nature of her mistake, it may help us to find our way to some of the great principles by which false Reform ought to be distinguished from true.

First, how came she to make the mistake ? Well, probably in some such way as this : Either she herself or some neighbour, when she was young, lived in a room the walls of which were becoming dirty and brown and scratched. By and by it occurred to somebody to whitewash the walls. And everybody who came in said : "How you have improved the place ! " And the woman, then perhaps quite a child, got out of the whole affair just this idea : When something is old, and brown and dirty, and has little holes in it, the way to improve it is to put on it whitewash. When she was grown up and had charge of her mistress's furniture, she neglected the oak chest because she took no interest in it ; but all of a sudden it occurred to her that, if any visitors called, it would look discreditable to have the chest so dirty ; she did not care about the carving, but she did not want to be disgraced in the neighbours' eyes. The chest was old, and it was brown, and it had holes and marks in which the dust lodged ; and it was dirty. The old idea cropped up in her mind from mere association, without reflection —"whitewash it, that's the way to improve it." She looked out of the window ; there stood a pail of paint just handy, so she took it and did the deed ; and in half an hour she had hidden from the sight of his posterity the loving, painstaking labour of a man who was dead and could not rise to interfere. Because somebody else improved a dirty wall with whitewash, she thought she could improve a dirty carving in the same way ; because somebody else hid accidental scratches with whitewash, she hid, with paint, marks made by the loving care of a skilled carver.

Now if the woman's own father had carved the chest, if she remembered seeing him, when she was a child, working at it evening after evening, then, after he was dead, when it grew dirty and the dust began to clog the pattern, she would have carefully and lovingly brushed out the dust so as to make the pattern show.

But she had not actually seen any one at work on it ; therefore it never occurred to her to remember that someobdy must have thought it worth while to spend time over the doing of it. It never occurred to her that she was blotting out the memory of the carver by destroying his work.

Here, then, is one clear principle by which to judge when to destroy memorials of the past, and how to refresh such as we decide to preserve. We should cultivate "that power of imagination which forms so large a part of the Divine Charity," by learning to think sometimes of our remote ancestors as if they were our immediate parents, and of the ancestors of others as if they were our own. We reverently consign to the fire many things possessed or made by our own parents, which had only a temporary value, rather than leave them littering about for no purpose except to cause annoyance and excite contempt ; but we preserve and restore that which, by the exercise of a little care, can be made to have a permanent value and do our parents credit. In the same spirit we should deal with all the work of the past. Our old languages, old customs, old modes of religious observance, are often all that remain to tell us about serious, studious, devout men of long ago. It is easy to forsake old customs for the sake of following new fashions ; but the consequence is, that hardly anything then will remain to tell our grandchildren what sort of people their ancestors were. And again, we should try to remember that comparatively little harm is done by the mere mistakes of individuals ; all the most grievous mischief is caused by that massing of error which we call "fashion" ; the unreasoning copying of what somebody else does without reflecting whether it is a suitable thing for us to do. Doing something new because somebody else did it, is not progress. Imitation without reason is the property of monkeys, not of men. Nothing is more dangerous to social order than the habit of imitating at random unselected examples. A thing may be very real progress when some one person does it for a reason ; and the very same thing may be anything but progress if somebody else does it without a reason. We teach little children by imitation, but that is because they *are* children, because their reasoning powers are dormant. So we let a baby crawl on all fours till it can walk. But then a child has parents, who select what example they choose to put before its eyes, and who protect it from crawling into the worst kinds of mud. The privilege of a grown man is to stand up on his feet and not crawl, and to think for himself what he ought to do, and whom he ought to imitate ; and not copy the example of strangers without knowing why.*

*Given as a lecture at the Jewish Working-Men's Club.

CHAPTER XVII

CRITIQUE AND CRITICASTERS

"How beautiful are the feet of them that make Peace."

We have traced some of the harm that is done by prejudiced rejection of new truth; we have also glanced at the far greater harm that may be done by over hasty acceptance of it. We have now to consider the question: What are the steps which might be taken with a view to prepare the masses to receive in an orderly manner whatever new truths about the Pulsation of Life may in future be revealed; so as to secure the greatest amount of good with the least harm? I do not propose to speak of any wholesale measures which need governmental action before they can take effect; but only to suggest possible endeavours for individuals. The present Chapter will relate to the Art of Critique, and address itself chiefly to those who have some experience of the work of teaching elementary mathematics. Any teacher of elementary mathematics might make his class work a real training in the Art of true Critique; and thereby not diminish but increase his success in his own proper subject.

Let us think for a few moments of the whole reading public as a College, which Truth, as Head-Master, is endeavouring to instruct and educate; and of men of Genius, discoverers, reformers, as assistant-masters, to each of whom is committed the task of teaching the subject of which he knows most. The comparison would be an impertinent one, if we illustrated it by reference to classes in such subjects as History or Language; because the school-teacher in such subjects is obliged to require from his pupils a kind of docility which readers are not expected to give to an author. But every mathematical teacher who deserves the name endeavours to accustom his pupils to take nothing for granted till it has been proved to their own personal satisfaction. The mathematician, therefore, is related to his class in much the same way as a writer to his readers. In my imaginary College, the various teachers are in the habit of attending each other's classes whenever they wish to do so; a practice which actually does prevail to a certain extent in some schools, and with the happiest results; for the teacher who takes his place among the pupils of a colleague, can, if he will, set the class an excellent example of courteous and intelligent questioning. But if the various teachers thought of each other's work in the same spirit as the leaders of Literature and

Science do, and if the pupils thought of their teachers as the reading public do of writers and preachers, the result would be not only moral confusion, but intellectual chaos.

The chief reason why courtesy, reverence, and a *certain kind* of docility are needful for those who would learn, is this : Truth is never received into the human mind without an admixture of conventions, of what may be called fictions. These fictions have to be introduced, used, and then withdrawn. It would be impossible to teach even so straightforward a subject as mathematics without the temporary use of statements which are not true to the nature of things. The history of a child who is learning mathematics, like that of human thought, is very much a record of alternate introduction of convenient fictions and subsequent analysis of their true nature. A class, like a public, tends at times to become groovy and mechanical ; to mistake the accidental for the essential; to treat necessary aids to learning as if they were actual truths ; to lose sight of the relative importance of various kinds of information. A class in Botany tends to forget that classification and terminology are not so much part of the life of plants as circulation and fertilization ; a class in Analytical Geometry forgets that the co-ordinates are no part of a curve. Just so, the reading public forgot, till Charles Darwin woke it up, that intermittence is no necessary part of Creative Action ; although it is convenient for man, for purposes of classification, to *imagine* a series of intermittent acts. A student tends to such forgetfulness in proportion as he becomes mechanical in his work ; the genius of a teacher is very much shown by the manner in which he contrives to arouse the interest and correct the errors of a class which is becoming too mechanical.

Theorists in education sometimes imagine that a good teacher should not allow the work of his class to become mechanical at all. A year or two of practical work in a school (especially with Examinations looming ahead) cures one of all such delusions. Education involves, not only teaching, but also training. Training implies that work shall become mechanical ; *teaching* involves preventing mechanicalness from reaching a degree fatal to progress. We must therefore allow much of the actual work to be done in a mechanical manner, without direct consciousness of its meaning ; an intelligent teacher will occasionally rouse his pupils to full consciousness of what they are doing ; and if he can do so without producing confusion, he may be complimented and his class congratulated.

Let us now go into the subject more in detail. We teach laws of curves by reference to certain straight lines—tangents, co-ordinates

radii, etc. These lines bear the same kind of relation to the curves which the framework of sticks fastened into a pot bears to the climbing plant, which is the true object of the gardener's care. The plant itself is living and growing; the justification for the existence of the framework consists in the fact that it would be impossible to get the true enjoyment of the plant without its aid. The co-ordinates form no part of what we want to teach about; but we cannot learn without their help. They enable us to see how the curve came into being, and whither it is tending.

Suppose then that a class, while becoming skilful in working problems seems to have forgotten that the axes are no part of the curve itself. The teacher may wake it up by saying, "You don't imagine, surely, that axes form any necessary portion of a curve. An ellipse, for intance, is the path of a body moving round a focus of attraction. Suppose a planet were endowed with the power of leaving a track in the sky, the track would be an ellipse only, unencumbered with axes. What are the axes, then? Indications of invisible forces? Not so. No line of attraction at any point of the orbit corresponds to the minor axis. The axes are *human devices* to enable us to measure and express the various elements of the orbit." "Well, but," exclaims perhaps some clever pupil, "if the straight lines are unreal, if they mean nothing, why were they invented, and why were we made to study them?" Such reasonable criticism is a great help to the teacher. He proceeds to picture the state of Astronomy in the days when nothing was known of the movement of the planets. He describes the first bewildered effort of the human mind to represent to itself the path of these wanderers. He shows how some man may have at last conceived the brilliant idea of projecting imaginary straight lines across the sky from one fixed constellation to another, thus forming a sort of background of measuring-rods; how the constellations, with these imaginary connecting lines, might be copied on a tablet, and the path of the planet registered thereon from day to day; and how Science might grow up by man inventing modes of measuring and registering curves which the living forces of Nature were describing in Space.

After such a lesson, the class goes on with its work with renewed interest and quickened intelligence. But how would the case be if a group of other teachers were present, who should comment on the lesson in this wise? One says, "All the good books present curves with axes; you think yourself cleverer than our best writers." A second says, "It is perfectly crazy to attempt to teach people to think of curves without axes." A third says, "I really do think there is something in your view; but this much is clear: when

you accepted a post in this College, you undertook to use a standard text-book, and to teach on ordinary lines. If you have theories different from those generally accepted, you were at least bound to give up your post before you began to express them; *then* we could have respected you. To stop here and to suggest doubts to the pupils is dishonest and scandalous; and your conduct makes me doubt the honesty of everything you say." A fourth says, "You are right, and all the books are wrong. It is a shame that children should be taught to believe fictions; away with these stupid books that have misled the world so long." A fifth is indignant that the grand old sages who created Astronomy should be accused of inventing falsehoods to serve their own ends; the sixth, on the contrary, is angry that the time of the class should be wasted on listening to, and trying to follow, the mental History of a set of savages who lived before Analytical Geometry had become a Science. And some clever young lecturer who happens to have heard that our solar system, as a whole, is in motion, and who fancies that such knowledge is his own peculiar property, triumphantly asserts that the earth-path is *not* an ellipse, but an elliptical spiral; and that any statement based on the premise that the ellipse represents a planet-path must be false throughout. Now what chance would any of us have of teaching anything to a class subject to such interruptions of the normal current of thought? In a college where such disorder prevailed, would the pupils be in a frame of mind to receive instruction? Would the teachers themselves be likely to preserve the calmness necessary for the investigation of Truth? That the picture I have drawn is no exaggerated one, that those whose mission is to arouse the public to a perception of the relation between the essential and the accidental have to run the gauntlet of a style of criticism as senseless and frivolous as I have represented, no one can doubt. We are all aware of the absurdity of our present modes of receiving new truth; few, I fear, are sufficiently aware of its evil effects. Therefore it is well for us to reflect what effect it would have on the teaching of so simple a thing as Geometry, if teachers introduced into each other's classes the element which is so rife in our literature.

True Critique is one of the fine Arts; as sacred and beautiful as all true Art. There is no keener pleasure for a good teacher than genuine criticism from a pupil. If a question is asked which shows that the teacher has failed to make intelligible a fact perfectly clear to himself, even that is a source of great enjoyment. But when, as sometimes happens, a remark is made which proves that we have not gone deep enough into our own subject, which opens

up new avenues of thought, and forces us to reconsider a demonstration, to re-investigate a solution ; when, in fact the relation between teacher and pupil is for a time inverted, it is then that that relation becomes fullest of pleasure and profit. (And so of course it is, in a still higher degree, between a writer and the critical reader.) But what chance would a pupil have of making intelligent criticisms, or of asking suggestive questions, if it were the fashion of the class to indulge in a carnival of absurdity wherein senseless accusations were flung about at random ?

Let us return to the subject of Analytical Geometry.

The tangent to an ellipse is an imaginary straight line, representing the path which would be followed by the body tracing the ellipse, if its connection with the attracting focus were suddenly to cease. In its essence, the tangent is a sublime effort of the scientific imagination ; it pictures the result of a sudden cessation of the action of gravity. In practice the tangent is a convenient line for indicating the curvature at any given point. The educational sentimentalists who object to mechanicalness, ought, if consistent, never to use a tangent in working a problem, without stopping to realise the grandeur of the idea involved. As a matter of fact, such incessant strain on the imagination and on the perception of the sublime is unhealthy and deadening. It is far better to use tangents, mechanically, as mere measuring-rods. But a good teacher will take care that no pupil goes through a year's work at Analytical Geometry without having been, once or twice, aroused to perceive the wonderful poetic conceptions represented by the lines he is using.

In our supposed disorderly College, a sentimental poet might take upon himself to reprove the Geometry teacher for allowing so awful a conception as the sudden cessation of gravity to be degraded by being talked of as a mere convenience, without due realisation of its horror ; a scientist holding utilitarian views might retort that the function of the instructor being to impart *truth* no such thing as the cessation of gravity ought ever to be mentioned before a class ; because, as a matter of fact, no instance of any such event is on record.

Let us now pass to the subject of Arithmetic. Instead of fictitious lines, we have here to deal with fictitious statements, *i.e.*, with statements which, if treated as truths, are false, but which, when clearly understood to be mere convenient fictions, do actually convey truth. Such a statement, for instance, is, "Twelve pence equal one shilling." No one is ever really deceived by this particular statement ; but that is because all are familiar with the actual coinage, and know that, as a matter of objective fact, "a shilling"

is not identical with "twelve pennies" (in the sense in which "a dozen apples" is identical with "twelve apples"). But a similar statement, made about unfamiliar objects, or about abstractions, might be misleading, unless the teacher took care to prevent misconceptions. And even in the case of our familiar coinage, it is essential to good mental discipline that the pupils should occasionally be made to define carefully the sense of the word "equal," in the sentence "twelve pence equal one shilling," and have their attention directed to the fact that, if accepted as true, it becomes false; that it contains and conveys truth only while clearly understood to be a fictitious but well-arranged convention. If the teacher forgets to do this, he ought to be grateful to any one who reminds him of his omission.

Now let us suppose that, in our imaginary College, the pupils are unacquainted with the actual coinage, and the teacher not sufficiently awake to the metaphysical necessity for defining, for them, words the real meaning of which is present to his own mind. He simply states: "Twelve pennies are one shilling." A lecturer on physics may afterwards happen to make a statement, the obvious outcome of which is that twelve pennies are (in weight) equal to about twenty-one shillings; and a chemist might prove that silver and copper are not identical, and that no amount of silver can produce the medicinal properties or chemical reactions of a grain of copper. Each teacher will then have made a statement, judged by which his two colleagues will each have spoken falsely. Such a thing is quite conceivable as that a party-spirit should arise in the College; the pupils each taking the side of his favourite professor, and accusing the others of gross ignorance or of wilful perversion of truth. The unlucky mathematician might *then* do what he ought to have done, but forgot to do, at first, *i.e.*, point out that he was using the word "equal" in a conventional sense; a sense perfectly legitimate for his purpose, though legitimate only within the scope of that purpose. But if party-spirit had already been aroused in the matter, and angry or contemptuous accusations flung about, the explanation would only add to the confusion; for the teacher would now be accused by the adverse party of paltering with truth, of using words in a double sense with intention to mislead; his very explanation would be quoted against him in triumph as a confession of guilt. Again I ask, what chance would the teachers in such a College have of discovering truth, or the pupils of learning what had been discovered?

A very prevalent form of criticasterism might be parodied as follows: The teacher states a question thus: "The rate of exchange is $9\frac{1}{2}d$ for a franc; how many francs shall I receive for

so many shillings ? " A colleague interrupts the lesson to ask what evidence there is to show that this is the exact rate. Another asserts that the last rate quoted was 9·875*d* per franc ; and a third insists that the last quotation was 9·876*d*. They engage in a vehement discussion of the point ; but all agree that such gross ignorance of facts as the teacher betrays, proves him to be incompetent ; and that, as the statement on which his procedure rests is proved false, his whole chain of reasoning falls to the ground.

I will close these mathematical illustrations by narrating an incident which actually occurred. An intelligent girl, who had been badly taught arithmetic, joined my class. I set her a sum about some damaged articles worth, originally, £3 15*s*. each, but which were to be sold in a lump at an abatement of one pound and some shillings on the price of each. She was required to find what would be received for the whole. It so happened that the lump sum amounted to so many pounds and *fifteen shillings*. She came to me saying that she could not get her sum right ; the shillings were right, but the pounds were wrong. I worked it for her ; beginning of course, by subtracting the shillings of the abatement from the original fifteen shillings. "But I *had* the shillings right," she cried ; "now you are getting it *all* wrong !" There was something very touching in her dismay at seeing the poor little bit of rightness, which she had secured, put wrong, and I felt like a ruthless destroyer of the last refuge of an innocent soul ; but Arithmetic tolerates no sentimental hesitations ; and I had, of course, to persist. At last, by trusting in blind faith to accurate Logic, we got the whole right, to her great surprise. I asked her to explain her own method. It appeared that she had first set down the original price as given in the book, and then looked at the answer in the end of the book, and, finding that the shillings there corresponded with what stood before her on her paper, she copied them straight into the "Answer" place, thinking that it would be useless (and, I am sure, *feeling* vaguely that it would be irreverent) to meddle with what the book pronounced to be right. She had therefore set to work to manipulate the pounds with a view to get *them* into accordance with the official standard ! Of course she failed. Of course, from our point of view ; but from hers, it seemed that *adhering to the book as long as you could* must be the right thing to do ! I was then able to explain to her a little about the right use of authoritative standards ; to show her that, if used as a check on results, they may often be of use by revealing errors in our reasoning which might otherwise have passed unperceived ; but that, if taken advantage of to spare ourselves the effort of working out our own problems at our own cost, they

are generally found misleading. My pupil profited, I hope, by the lesson, in more ways than one. But what chance should I have had of teaching her either arithmetic or the right use of standards, or anything else, if any other teacher had confused her mind, before I had half finished my explanation, by reproving me for teaching her to rebel against the authority of the text-book, and to work sums as she liked, without reference to the only infallible standard ; and by warning her that I was only pandering to licence and carelessness ?

"Truth for ever on the scaffold ; wrong for ever on the throne." The scaffold on which Truth is murdered, the throne on which wrong sits to rule, are built of careless, irreverent, senseless criticisms. When the account of the good and ill which we have done on earth is summed up, the heaviest item in the account against many of us will perhaps consist in the record of our *idle words*.

The aim of all students should be, so to pass through things temporal that finally they lose not the Eternal ; so to pass through temporary aids to knowledge as not to miss perceiving the Eternal Truths. Only unpractical dreamers suppose that Truth can be grasped without adventitious and fictitious aids ; all true students know that they are dependent on such aids ; and their hope is so to use them as not to abuse them. We are in danger of becoming entangled in these adjuncts of Truth ; of mistaking them for actual truths. Therefore The Unseen Wisdom which guides the destinies of mankind, raises up occasionally what we call "a *Reformer*" ; whose function is to give to Humanity such a lesson as I have described the teacher of Analytical Geometry giving to a class. The Reformer reminds us that our framework of aids to investigation is not, in itself, Truth. As the mathematician teaches us to see the actual path of a planet, in contrast, on one hand, with the tangent conceived by imagining an impossible state of things from which the action of Gravity is suspended, and, on the other hand, with the Axes which are well-arranged measuring-rods, so the Reformer teaches us to look at the actual Life of Humanity, in contrast, on one side, with the Vision of an impossible Idea made simple by the omission of certain elements, and, on the other side, with that convenient mechanism by which the comprehension of our duty is facilitated for us.

How our Heaven-sent Reformers are received, we know : Truth on the scaffold ; and, on the throne, whoever helps us to confuse convenient fiction with fact. The world is surely old enough to behave less like a class of ill-bred school-boys than it has as yet done ; it might prepare itself to give to its future Seers a reception

more worthy than it has given to Seers in the past. All we who are engaged in mathematical teaching may contribute to that end, if we take pains to make our pupils distinguish between Truth and the mere accessories of study. We may also do something to train the rising generation in a comprehension of the difference between true and false criticism ; we may accustom them to combine the fearless loyalty which compels a learner to express frankly his real difficulties and doubts with the respectful courtesy which checks irreverent and thoughtless cavil.

CHAPTER XVIII

THE SABBATH OF FREEDOM

"Let not the son of the stranger that hath joined himself to the Lord say, The Lord hath utterly separated me from His people ; for thus saith the Lord : The sons of the stranger that join themselves to the Lord to serve Him, every one that keepeth the sabbath and taketh hold of My covenant ; even them will I bring to My holy mountain, and make them joyful in My house of prayer."—ISAIAH lvi., 3-7.

IF we visit a well-conducted Gymnasium in a school, we find rhythmic pulsation exhibited in the exercises in more than one form. In some, a limb is sharply thrown out from the body, and immediately and rapidly withdrawn. In others, the pupils assume slowly some extreme and even exaggerated position ; usually one which would be condemned in the class-room as disorderly. Now it does not occur to the Lady Principal to reprove the teacher for thus reversing the orders given by her, nor to bring an accusation of defying her commands and teaching the pupils to set her authority at naught. On the contrary, all parties concerned know that the very object of School-Gymnastic is to undo the cramping effect of class-room discipline. For a young child, or a wild beast, which spends many hours daily in excerise, no gymnastic is so good as the free play of all its limbs ; but as soon as the business of life imposes the necessity for a cramping specialization, mere play, during the short hours allowed for relaxation, is no longer sufficient to give freedom and elasticity to the frame ; the exercise must be specially adapted to counteract whatever forms of specialization may be imposed during the hours devoted to work. Every one knows this, and nobody objects. Every teacher knows that unity among the staff, so far as physical education is concerned, implies, not agreement in opinion as to the best position for girls to place themselves in, but what may be called a "*consensus of reverence*

for the harmony produced by organized antithesis." *Life* means not this position or that, but *alternation* of position. No faculty or organ is properly fitted for its appointed work till it has trained itself, or been trained, into a possibility of rhythmic action ; and education means chiefly the bringing one faculty after another into subjection to this cosmic law.

Long before this principle had been clearly seen to apply to physical education, Philosophers knew that it was the principle of healthy mental action. Laws of Thought are discovered far earlier in the world's history than Laws of things ; for the reason given in Chapter XI., viz., that every man who is capable of thinking can, if he will, state the Laws of Thought with absolute exactness and certainty ; whereas Laws of things are only arrived at after centuries of observation of phenomena ; and even then, as Mr. Boole explains, the statement is, to the last, a hypothetical and probable one (until we have succeeded in Algebraizing the Law of the becoming of the things). It was known that the principle of *contradiction* (or free pulsation) is the life of the mind, many centuries before medical men had discovered that in it consists the life of the muscles. Logic should be to the mind what gymnastic is to the body ; a practice in reversal of attitude. Yet, for some singular reason not yet explained, the mass of teachers and statesmen, while they encourage the application to the physical life of the principle of rhythmic alternation, either deny, or more frequently ignore, that it has any place in the moral life.

The reason appears to be this : Parents, teachers, and governments wish that children should develop *the power to assume at will any physical position.* Teachers and governments are content with such control of the physical as enables them to secure the public safety and order. But few teachers or governors are content with safety and order in moral affairs ; they wish to retain in their own hands a far greater control of mental and moral action than this. The more healthily developed the frame is, the easier it is to preserve a statuesque repose *during certain specified hours ;* but only a cramped and sickly organisation can be kept *continuously* in one position. Healthy mental gymnastic makes children willing law-abiders and docile pupils during the hours of lessons ; but it emancipates them, by making impossible continuous interference with their mental freedom. Now a privileged class can better maintain its power over a sickly and vicious population than over a population of orderly free-thinkers.

A detestable practice prevails in Christian England, and is, I regret to say, on the increase, of teaching in Sunday-school after the same method as is found on week-days to answer the purpose

of preparing children to pass Examinations successfully. The material of the lessons is changed on Sundays, the attitude is not ; for the History of Rome or France is substituted that of Palestine ; for the Logic of Aristotle that of Paul ; for the Poetry of Shakespeare that of Isaiah ; the change is apparent, the monotony is terribly real. The children are subject, throughout their teaching, to the same grinding pressure. Surely religious people of all sorts might join in trying to put a stop to this hideous prostitution of the Blessed Sabbath to the purposes of making children slavish and helpless ; and claim it for the purpose for which it was originally instituted—the cultivation of freedom by *reversal of attitude.*

As for the manner in which reversal of attitude may be induced, that must depend on the subject which is occupying attention during work-hours. If a boy be engaged in weeding, the teacher of his Sabbath-school should point out to him that crops and weeds belong equally to the vegetable kingdom, and have many characterstics in common ; that the Parsnip even belongs to the same class as Hemlock, and the Turnip to the same class as the weed Shepherd's Purse ; that the plants are equally good in the sight of God, and equally interesting from the point of view of Science ; that the fact of some plants being fit for human food, and others useless or harmful to man, is due to an accident of the human organization. The weeder should be exhorted to *make a practice* of preparing for repose by reflecting a moment on these truths as he comes home from work in the evening. He should be told, too, that the amount of blessing which he can thus draw down on himself by meditating on The Unity of plant-life, will be commensurate with the completeness of his attention, during work-hours, to the business of discriminating crop from weeds.

This lesson forms a good preparation for the great climax of all unification. The pupil should be told that the business of our life on earth consists in weeding Good from that which, for man, is Evil ; and that we should prepare for the Sabbath, by which the strain of life is relieved, by thinking of Him of Whom it is written : "I make Peace, and I create evil, saith the Lord."

For a kitchen-maid, a suitable unification would be to reflect on the fact that the potato and its peel, or the cabbage and its outer leaves, grew *as one.*

For a class in History, the unification might consist in reflecting that the Nation whose exploits they have been admiring, and whose triumphs they have been sharing, is but a part of Humanity ; that every victory it has won, in war, has injured some other Nation ; whereas every achievement it has made in Science or

Art has, sooner or later, enriched the whole human race. This act of sympathy with Mankind as a whole will be more productive of vigour, in proportion as the pupils have, during the History lesson itself, thrown themselves more unreservedly into the emotions of the particular people of whom they are reading.

At Queen's College I tried for some years the experiment of holding, on Sunday evenings (the only available time; but the eve of Sabbath would have been more suitable), a true logic-class for the resident pupils. That I made many mistakes I need not say; the whole subject was, at that time, entirely in the condition of pure theory; and I had, as I went on, to find out what were the practical difficulties. Moreover, the College was under clerical management, and of all the staff, including the council and committee, only two members ever had the faintest idea what I was trying to find out, or why I went to the place at all. I had therefore to be very careful not to suggest doubts of the wisdom either of clerical authorities generally, or of our own in particular. The position was difficult, but I tried to find out whatever I could. On week-days the girls had, of course, to attend to one subject at a time, and to look at each from a prescribed point of view. On Sundays I read to them any book, or allowed them to talk of any subject that seemed to interest them, and encouraged the free play of their minds; but I took care to lead the conversation into the channel of finding what light one subject of study throws on another. The characteristics of the week-day lessons being *submission* and *specialization*, I made those of the Sunday lessons *free expansion* and *unification*.

Old pupils assure me that they never discovered any jarring contradiction between my views and those of our clerical heads. The substance of their comments is much as follows: "I didn't know you were teaching us anything on those happy Sunday evenings; I thought we were being amused, not taught. But after I left College I found you had given us a *power*. We can think for ourselves, and find out what we want to know." Now what was Sabbath instituted for, and what was Logic made for, except to create free-thinkers, free men and women, intellectual athletes, Prophets, and, in the best sense of the word, Priests? Moses wished that all the Lord's People should be Priests and Prophets, even as he was.

It is almost needless to remark that the result indicated is due to the observance of a *Sabbath* of Freedom, sharply contrasted with week-day discipline. No such good effects follow the practice of leaving girls to think at random, and to study what they choose (or not study at all), all the week long.

I would never again try to teach under similar circumstances. The logician should not be a servant of a clerical body. If any true mode of teaching Logic became general, it would gradually modify all religious teaching, and make it tend to become a training in order and reverence, not an inculcation of opinions or prejudices. Few clergymen would preach such sermons as they now do, if they knew that their arguments were subjected each week to a careful logical analysis, and all the reasons for the contrary opinion to their own were pointed out before the younger members of their flock. In fact, the same change would pass over religious and moral teaching has as passed over the teaching of physical deportment. A mother or governess now has to be content with forbidding certain attitudes as unsuited to the drawing-room or class-room ; she cannot go through the solemn farce of forcing on the child her prejudices about certain attitudes being in the abstract "unladylike," when she knows that the child will presently be made to assume those attitudes by order of the Gymnast. So a clergyman would, if Logic were properly taught, be obliged to content himself with inducing in Church an attitude of reverence and devotion ; he could not, with a grave countenance, attempt to inculcate his own opinions or prejudices as essential truths.

The command that children should honour their own parents by no means implies that they are not, once a week at least, to be put into an attitude of sympathy with the ideas of other people. This teaching of true Logic in no way tends to interfere with the submission due, in matters of fact, to parents or other lawful authorities. On the contrary, it makes submission seem less harsh. Disobedience in a child is usually the result either of unsatisfied craving for that reversal of physical posture which is the life of the muscles, or of unsatisfied longing for that antithesis of mental position which constitutes the life of the brain. When we attribute naughtiness in a child to the natural depravity of his own heart, we often might more truly attribute it to the unnatural depravity of some adult, who has made him ill by trying to prevent his reversing either the physical or mental attitude in which she placed him.

Religious writers are expected to have something to say on the subject of Incarnation. The present writer mentions it here, only in order to show that she is not afraid of it.

Incarnation is, necessarily, *phenomenalization* ; for it is the manifestation of somewhat. The Incarnation believed in by Christians is necessarily one-sided ; for it is the manifestation of *Good*—of those qualities, in a perfect form, which, in an imperfect condition, constitute what we call human goodness, without any

admixture of the fierceness and lust which God created in brutes, but which, in man, are evil. Neither the existence nor the value of such a crowning of all phenomenalization has been denied by our great mathematical Logicians. Babbage and De Morgan, Gratry and Boole, concurred in thinking the subject of Singular Solution worthy their profoundest study. But its value is as a type-model for us, an intellectual and moral guide for our working-hours. The notion of substituting, on Sabbath, prostrate adoration of a Manifestation of one side of God, for meditation on the Ineffable and Inconceivable Union of polar attributes, is one which Logic cannot take seriously into account, and which Logicians can find no words to characterize.

The earliest Christians kept Sabbath *as Jews*, and consecrated the working-week by a First-day communion with Jesus; which shows that they took a logical and sane view of their relation to their Master. Whatever excuses priests may afterwards have made to the conscience for ignoring altogether the main purpose of Sabbath, the latent motive for it must have been the same which had prompted all similar perversions. As Boulanger says,* no inefficient government can possibly maintain its place, unless the masses can be induced to adopt some form of idolatry; for the worship of The Inconceivable Unity confers such elastic strength that a people accustomed to it would at once shake off any government which no longer represented its own highest Ideals. And every inefficient government instinctively has recourse, if it can, to the device of using as tools for the brutalizing of the masses those very priests whose original function was to vitalize the masses. "Priests were appointed to lead man in the right road; but in all ages they have feared lest he should find it and walk in it. . . . Men have believed that they could, without degradation, behave as the slaves of Him Who set us free; and" (as the true God retires before such unworthy homage) "they have only succeeded in becoming slaves to His hypocritical Ministers." Thus does Boulanger sum up the History of Religion; and thus may be summed up all that Logic can have to say about any teaching of so-called *Religion* which aims at preparing pupils for Examinations, or which adopts methods found useful in preparing for examination in "secular" subjects.

**Origine du Despotisme Oriental.*

CHAPTER XIX

THE ART OF EDUCATION

"The heathen say, Where is your God ? "

METHODS of teaching which, from the point of view of medical psychology, are sound (*i.e.*, those which vitalize and sanitate the brain), are distinguished from vicious methods (*i.e.*, those which exhaust the vital powers and create bad habits of mental sequence) by the fact that the former are conformed to the central or fundamental law of Thought-sequence.

The physiology teacher lays on his table two specimens of the same bone ; one from which all the gelatine has been boiled, and the other from which the phosphates have been discharged by acid, leaving only a gelatine shape. The class are instructed to examine each separately, and then to form a mental picture of a bone in which these two structures mutually interpenetrate each other. The teacher probably supposes himself to be merely illustrating the structure of bone ; but in reality he is illustrating the fundamental law of sound mental action. Would that all teaching was done on the same model ! We should then hear very little about "breaking down from over-work in schools ! "

The bone-lesson above referred to gives the standard model on a very minute scale ; education should copy that model on various scales of size. The rhythmic beats of alternate specialization and synthesis may vary from the five minutes or so occupied by the bone-lesson, to a period of a whole year ; they should be of various degrees of complexity ; from learning to see as one, two aspects of the same bit of bone, to learning to see what light the year's lessons on History, Language, Mathematics, and Physical Science throw on each other's meaning. The most important rhythm would appear to be one whose pulsation occupies about seven days.

Gratry has pointed out how the habit of periodic synthesis of different branches of study strengthens the mind and enables it to do a marvellous quantity of work without exhaustion or injury. He also calls attention to the fact that when this habit of periodic synthesis is once gained, the brain does a good deal of it by some process of unconscious cerebration, and even during sound and refreshing sleep.

The principle on which Gratry's system, and every other vitally healthy one, depends, is that mere cessation of action, or even mere

change of action, is not rest; rest must be prepared for by *antithetic* action. The normal sequence of the lungs is expansion, contraction, repose. If we tried to make our lungs stand still at any point of the cycle except the right one, such inaction would not give true rest, but induce disease. So it is with all our functions; each organ must not only have its period of non-action, but it must be prepared for inaction by completing its cycle of action, or else the inaction is not sufficient rest. The true brain cycle is this:

Forming special conceptions; unifying those conceptions; washing out all conceptions by thinking of The Inconceivable Unity; Repose.

Sabbath and Jubilee mean not *inaction*, but renewal. Sabbath was, in fact, in its origin, the Festival of The Unity; the true key-note was struck in the "Preparation for Sabbath"; recreative rest was to be prepared for by reaction against specialization, by seeking to know The Unity.

If ever parents understood the Art of mental recreation by Unity, the school-teachers must have had reason to feel that their lines had fallen in pleasant places! Teaching, especially for the more conscientious teachers, is made very unsatisfactory by the general lack of recognition of the true Art of recuperation; for this reason:

The exercise of any organ or faculty takes place by converting its latent force into active force, which is then given off in the form of "function" (*i.e.*, the action appropriate to the organ or faculty). That this exercise strengthens instead of weakening our faculties, is due to the fact that the withdrawal of latent force by exercise creates an immediate receptivity for new force, which then becomes latent. And, under all ordinary conditions, the new supply taken in is in excess of that given off. This new supply ought to come from extra-human sources (including, of course, but not exclusively consisting of, food and air). A sound method in Education means, chiefly, a method which secures that the recuperation shall come from these extra-human sources. But a teacher may be brilliantly successful at Examinations without understanding how to effect this, or caring to try. There are several non-legitimate ways by which he may be securing his apparent success. He may be draining either the physical vitality of his pupils, or those intellectual faculties which are not needed for the pursuit of his own subject, or the moral faculties, especially those for the exercise of which school-life affords no great scope, but which will be needed for the conduct of adult life. Now when a faculty is thus passively drained at second hand, it suffers the same loss of force as if it were itself exercised; and it is not

stimulated to healthy recuperation. Therefore the "successful" teacher may, in reality, be either destroying the physical health of his pupils, or *preventing more conscientious and less showy colleagues from attaining the amount of success which they deserve,* or preparing his pupils to be bad men and women, and a source of moral corruption ; or he may be sowing the seeds of what, in later life, will develop into what is even legally actual insanity. He may do any or all of these things without ever uttering a word in the hearing of pupils on any subject except the one he professes to teach.

From all that Gratry and Boole have said, it would appear that the question whether the faculties exercised recuperate themselves from extra-human sources, or by draining away the vitality of other faculties, especially the moral stamina, depends mainly on whether the synthetical work is commensurate in amount and kind with the specialization, and is properly alternated with it.

The process of synthesising the work of the week is by no means difficult, even for the teacher ; and to the pupils it appears like mere amusement. There are two reasons why it is neglected. One is that any unification at all commensurate with the amount of specialization now going on in schools, is looked on at present (in England at least) with dread. Whenever those who understand the process try to call attention to its importance, the subject is almost sure to be treated, by those who do not understand it, as if we were talking of what is technically called "religion," and trenching on ground which is the proper domain of parents and the clergy. The thing which I mean (or rather which such Logicians as Gratry and Boole, have, in all ages, meant) has no more connection with what is called "religious instruction," than it has with Algebra or Grammar. We mean the mental *act* of synthesis, which forms the compensating recoil from the specialization induced by study ; completing the pulsation, of which special studies form one-half ; and causing whatever faculties have been used in special studies to draw their force from the extra-human sources, instead of draining the vitality of other faculties. At present the Sabbath, so far as it is used at all, is appropriated to the teaching of the special study called "religion" (*i.e., the history of the lives and opinions of former synthesizers*) ; and no adequate provision is made for mental *acts* of synthesis on the part of the pupils themselves. Such synthesis as they are taught to do, is left to chance and to individual teachers. Boole's Text-Book of Differential Equations is, in its way, a model of what can be done, within the compass of a particular subject, towards alternating special study with synthesis. But, within that compass, there is no scope

except for time-synthesis (*i.e.*, the study of the History of the subject), which in Boole's book alternates with the study of the subject itself. The book has been superseded ; more modern ones serve more effectually the purpose of preparing for Examinations. Gratry has received little attention from ordinary teachers. His splendid analysis of the effects of synthesis alternating with specialization, in giving vitality, is mixed up with details of the special plan of sequence in study by which he secured the alternation for himself. Now Gratry's sequence could not be accurately followed in any school ; it could not be attempted in any school which prepared pupils for Examination. Therefore commonplace teachers ignore him altogether, and the course of Natural Selection throws all the benefit of Gratry's discoveries into the hands of teachers who have intellect enough to seize his main idea and disentangle it from his special plans.

So with regard to Boole's text-books. The time-synthesis (or so-called historical method), of which he exhibits samples, is a very good thing in its way, failing anything better. But the specialist teacher, even if he knows this method, can only use it within the limits of his own subject ; and it must be, at best, utterly inadequate to compensate the strain of modern education and restore the needed amount of energy. No one was better aware of this than the Author himself. Nothing is really adequate, except a periodic synthesis class, in which a synthesis of all the week's work is made *by the pupils themselves*, under the guidance of a competent Logician. And it is essential to full success that no subject which has been forced on the attention of the pupils *by any specialist teacher whatsoever* shall be forbidden ground at the Logos-class. I use the word "Logos" in preference to *Logic*, because the latter term has been taken to imply a special kind of study. Logos is the old word for the thing of which I am speaking, the Logic of the Logan-stone ; the blessed antithesis to those fixed stones of evil magic and arrested progress which show the consequence of not keeping Sabbath.

The much vilipended Examination-system has the great advantage of preventing the possibility of carrying out the *plan* of any Idealist *as conceived by him.* It forces us, therefore, if we would learn anything from the ideal purists, to understand thoroughly those principles of sanitation from which their plans are projected ; so as to be able to create our plans for ourselves according to circumstances. Strange as it may sound, I venture to prophesy that the Examiner will prove, in the long run, the best friend of Idealism in Education, by making a clean sweep of all second-hand imitators of Idealist thinkers.

The whole notion of leaving the selection of a Logos-teacher to the caprice or ignorance of individual parents would be, of course, absurd. The essence of his function is the re-uniting of strains of thought which have been forcibly separated by the school-work. The first condition of his performing it is that he should know something of the methods employed in the school. Properly speaking, the Logos-Class should be held by the Head-Master or Mistress. If that is impossible the substitute should be thoroughly in the confidence of the Head.

A second reason why synthesis is insufficiently taught, is that it gives to the teacher an *appearance* of mere Nihilism ; he seems to be Socratically neutralizing everything and actually teaching Nothing. This Nihilism is only apparent ; the general and ultimate effect is in the highest degree both conservative and constructive. But that specialist and positive teachers always *feel* the work of the synthesizer to be antagonistic to theirs, there is no denying. Long ago it was said that "the heathen" (by which was then meant the antagonists of Logos-teaching) said to the Prophets of the Formless and Invisible Unity : "Where is your God ?" (or, where is your Good ?) Oken's answer to this question is almost brutal in its cynical audacity :

$$\text{God} = \text{Zero}.$$

Boole puts his statement into a less startling form ; but it comes practically to the same as Oken's : $x(1-x)=0$; which means : When you have selected your integral unity, or Universe of Thought (however large or small), and divided it into any two sections, x and *not-x*, if you then interpenetrate with each other the two conceptions, the result is zero. If any other result presents itself, your brain action has been imperfect.

The old Hindoo sages knew that we can form no idea of Deity except by affirming and then denying every quality in turn A *thing* cannot, at one time, be black and white, except of course in different parts ; yet to formulate aright a statement about God, we must say that He at once possesses every conceivable quality and its opposite, and yet has no parts. In other words

God is No-Thing.

Impatient ignorance asks, of course, " *Cui bono ?*" "Who is better for the whole laborious proceeding of Meditation, if there remains NOTHING to show for it ?" The answer is that neither Oken's Zero, nor Boole's, has any connection with negation or non-existence. That Zero means : "No form, but a living Force ; No-Thing, but a power of understanding, utilizing, and even

creating things." The result of a proper synthesis-lesson is, not the knowledge of any theologic proposition which can be stated in a neat sentence at a Divinity-Examination; but an increased power of understanding the genesis and structure of facts generally, and an improved hygienic condition of brain. The pupil, in fact, gets out of the unification-lesson a supply (commensurate with his week's work) of *Creative Energy*. Idealists such as Gratry and Boole are too prone to wonder what more any man can want, for this world or the next, than just *that*, and then plenty more of the same. Practical teachers, however, know very well that man in general wants *recognition by his fellow-men*. He wants, in fact, *success;* that visible success which can only be attained by the use of some method which is, metaphysically-speaking, imperfect. Beneficient Nature, who implanted this desire in the teacher-mind, is wiser than the Ideal purists; she has made abundant provision for its legitimate gratification. Any clever teacher has a right to use any method he likes, and to become as successful at Examinations as he can. It is the business of the child's "Pastor" (not the preacher of a special religion, but the Shepherd-servant of the Unity) to harmonize all the special aberrations by a suitable periodic synthesis. He will seem to neutralize the work of the teachers. He will especially seem to be neutralizing the work of any teacher who either introduces a new method, becomes rapidly popular, is very successful in preparing for Examinations, or, above all, possesses Genius of a showy order. Genius and originality are dangerous factors in education, unless their action is counteracted by a specially suitable synthesis. But the more dangerous a method of teaching is when not suitably counteracted, the more capable it is of becoming a source of vitality when it is suitably synthesized. The very alternation between a method which is highly vicious (*i.e.*, which rapidly produces showy results), and one which is sound (*i.e.*, produces no results except accession of force), this alternation, when habitual, sets up its own glorious pulsation, and generates by induction a force, perhaps the very highest and most vital which Humanity can command. The danger of modern education does not consist in the imperfectness of imperfect methods; it is that no provision is made in the mental life for alternating their use with that of those perfect methods the result of which is "Nothing"—except force stored up for the specialist teachers to use. In the physical life it is now perfectly understood that it is some teachers' business to produce no result except a neutralization of the harm which is incidentally done by other teachers as a necessary concomitant to the good they are doing. Fifty years ago any one who had ordered young

ladies to put their hands on their hips, then on their toes, and to assume, in fact, every position *condemned by their parents and teachers as disorderly*, would have been supposed to be trying to *undo* all the good work of parents and teachers, and to set children against lawful authority. Now, everybody knows that the very business of the Gymnast is to undo the cramping effect of the positions rendered necessary by the exigencies of study and of society; and nobody objects to its being done. We have all found out that the Gymnasts are the friends, not the enemies, of Order. We have seen the beneficial effects of gymnastic on the pupils; few notice the silent influence for good which it has exerted, through the pupils, on the parents and teachers; but it *has* exerted an influence on us all. What mother could condemn her daughter's desire for reversal of physical position as "unseemly" and "unladylike," in the face of the fact that the girl will presently assume the condemned posture by the orders of the graceful lady who presides in the Gymnasium? We are content, now, to tell little girls that standing with one's hand on one's hip is a proceeding more suited to the play-room than the drawing-room. The Gymnasts only profess to cure the weakness of children's muscles; in reality they are helping to eradicate the irreverent dogmatism of parents. Let Logos-teachers boldly claim the right to do for children's minds what the Gymnast does for their bodies, *i.e.*, renew vital elasticity by periodic *reversal of attitude*, and after a time the public will grow accustomed to the idea that it is some teachers' business to do *nothing*, except vitalize the minds of children by undoing other people's teaching. The conceit of specialist teachers of all sorts will have to give way before the Logical equation of brain-rhythm, as the conceit of would-be-genteel Mammas has had to give way before the Logic of muscular exercise. And we cannot lay too much stress on this point: the Gymnast is an absolute Nihilist; he does *Nothing*—except *reverse the positions of the muscles*; he has no results to show, except increased health and strength. The Logos or Pulsation-doctrine, pure and holy as it is, may, in one sense, be described as the Scavenger of our life. By burning up all that is specious and false, it prevents the development of those abnormal conditions which to the ignorant seem like culture, but which are in reality the product of corruption, the source of disease, and the main cause of insanity.

Those who, of old, attempted to base National Education on the principle of the Logos, or rhythmic pulsation, struck the true key-note at starting. The symbol of the covenant made with man by Infinite Knowledge was the Rainbow; which no man can

capture or embalm or enshrine ; which is made by the breaking up of the One Light into many colours, to fade before long into the Unity of white light again ; and leaves nowhere in all the world a trace of its ever having existed, except in Man's heart an impression of spiritual beauty, and in his mind a suggestion how to discover the Laws of Light. The type of mind which asks *"Cui bono ?"* of every lesson for which there is nothing to show at Examination is the same as the type of mind which sneers because the Sacred Ark of the Hebrew Covenant contains, practically, NOTHING—a few old-world tales illustrative of a state of society long passed away ; a few self-evident laws of morality ; and a mass of rules, very uninteresting, and to a large extent negative in form, tedious to carry out, of no obvious utility, but, on the contrary, in themselves a hindrance to active life. Of positive information, *Nothing*. It is time that teachers at least should be taught to understand that, though man has a right to desire and procure whatever he wants, the inner shrine whence Truth issues to hold converse with man may not be desecrated by the presence of immediately realisable results. If it be so desecrated, the Blessed Guest departs. In that Ark is preserved what the Rainbow leaves behind when it fades into white light : the keys of the Infinite Store-house of Science ; the canons of the Art of Thinking ; the Secret of the Method whereby man may draw down Truth from Heaven, without blighting either his body or his soul. *Life* lives in that empty Ark ; the true life of man's brain. For we are the children of the Creator ; not His mere handiwork, made arbitrarily, unlike Himself ; but the outcome of His very thought-processes ; and sanity, for us, means thinking as He thinks, so far as we think at all. And (if His work reveals His manner of thinking) He thinks in an incessant rhythmic pulsation of alternate "positing and denying," of constructing and sweeping away ; a pulsation which produces the *appearance* of negation and the *reality* of power. It is in vain that we try to fight against, or to ignore, this rhythmic alternation of contrary notions. If we carefully embody it in our daily study, it becomes to us a source of constant power, like the movement of our lungs. If we forget it, it never forgets to sweep our work away. Unless it has helped to build the mind, their labour is but lost that built it. It is vain that we haste to rise early, and late take rest, and devour many carefully compiled text-books ; to those who love the Invisible, Formless, alternate-beating Unity, the knowledge which is power comes even during sleep.*

*"The Creed of Sanity."

CHAPTER XX

TRINITY MYTHS

"Holy, Holy, Holy, Lord God of Hosts."

In very old times, wise men devised a special method for counteracting the dangers of specialization, a standard test by which a student could judge whether his mode of recuperation was suited to the nature of his special dangers. Their method rested on a perception of the fact that man is so organized as to perceive the Divine in three principal modes :

1. By the study of Nature, of the work of Creation, the most interesting part of which, to early peoples, was the observation of the Starry Heavens. God, *as Creator,* was called by Indians *Brahma,* by Semitic peoples *Elohim,* by Christians *God the Father.*

2. God is revealed as a *Race-Preserver* ; in the dividing of the animal Creation by lines across which union is infertile, and by other lines across which union is unhealthy ; and also, and chiefly, in the singular differences introduced into the human body by diversities of culture, of climate, and of circumstance ; and in the danger of too sudden interruptions of ancestral habit. God as *Race-Preserver* was called by the Indians *Vishnu* ; and in each country by some name special to itself. The idea of the *Race-Preserver* is embodied in the name *God of Israel* (and perhaps also in *Jehovah* ; said by some to be the tribal God of the pre-Mosaic Hebrews).

3. Persons of sensitive temperament and introspective habits recognise the fact of an actual contact between their souls and the Divine, of a personal inspiration of truth which comes to them in some manner not explicable by reference either to impressions on the senses or to intellectual conclusions. And, as any deep sorrow or strong affection increases the capacity for receiving this poetic inspiration, and as it is often increased also by severe physical suffering, God, as inspirer, was thought of as *The Purifier by the Fire of Love and Pain* ; called by the Indians *Siva.* This idea is represented by the Jewish word *Adonai,* and by the "Holy Spirit" of our churches.

The Philosophers perceived that terrible dangers were caused by the divided and over-specialized study of Divine action. The worshippers of Brahma, the Creator, lapse into a cold and immoral contemplation of Nature. Nature contains not only beauty, but also what in man would be cruelties and lust ; and those who

think of God *only* as Creator, too often become indifferent to moral order in human life. Moreover, as Nature has many aspects, each branch of Science tends to represent the Creator differently. To the imagination of the mere Geometrician, the infinite means infinite space ; to the student of meteoric phenomena, the infinite is represented by mere force ; to the arithmetician by mere number. To those of old who specially valued physical strength, God was a Bull ; to those who specially valued cunning, a Serpent.

On the other hand, Vishnu, the Race-Preserver, comes to be thought of too much as the preserver of one's own tribe. Each tribe comes to have its own preserver, who fights against the preservers of other tribes. As patriotism degenerates into tyranny over other nations, so religious gratitude for the preservation of one's own race degenerates into contempt for the divine preservers of other races.

But the worst transformation is that which falls on the idea of the *inspirer who teaches by the fire of love. Purification by fire* degenerates into *destruction by fire.* The inspirer by *love and pain* becomes *Siva the Destroyer,* and then *Moloch,* who claims as his offering the burning alive of innocent babies. It is found, too, that pain is not the only condition under which the faculty for receiving poetic inspiration is momentarily increased ; pleasure also heightens it. Inspiration of a certain sort can be got up by wine ; Siva the Inspirer is thought of as Bacchus the wine-god, who is gratified by drunken orgies. The Adonai-idea degenerates into Adonis, the god of beauty of form, and into Aphrodite, the goddess of grace ; finally into Cupid, the god of light love-fancies, and Venus the goddess of vicious indulgence.

And the worst thing about all these horrible fables was that they embodied a certain truth ; and the attempt to disprove them was futile. Gentile philosophers were driven to distraction by the impossibility of making men disbelieve things which though so pernicious, were somehow true to human experience.

Down into all this ghastly tangle of great truths and hideous falsehoods came the mighty reformers who organised the Trinity-doctrine. After an exhaustive and masterly study of the process by which good degenerates into evil, they discovered that falsehood comes by the dividedness of truth, and that the unification of all aspects of deity would infallibly purify each. It is hardly too bold a metaphor, if we say that, by the law of the Trinity, the various aspects of deity are to be prevented from slipping down-hill in various directions, by firmly linking them together at the top. The Hebrew Scriptures contain a record of canons, which, if

observed, would set philosophy free to develop indefinitely, by for ever preventing it from degenerating into debauch or folly.

These canons are binding as long as Judaism or Humanity lasts, being founded on the nature of the human mind. Jesus, when accused of disregarding the law of Moses (because he had taken upon himself to neglect a few minutiæ of the technical rules, which he considered interfered with his usefulness), truly replied that heaven and earth must pass away before one jot or tittle of the law should fail.

By the Law of Israel, each aspect or facet of the God-idea is to be clearly presented in its purity.

1. All Creative energies are summed up in the one word Elohim. There is to be no God of Light distinct from the God of darkness ; no devil who causes evil contrasted with the deity who gives good ; no bull-god or serpent-god, no god of thunder, or god of wind ; all natural science is one, and is the worship of Elohim.

2. Homage is to be paid to the Race-Preserver, not by prejudices against other virtuous and pious tribes, but by abstaining, in His honour, from unnatural mixtures and infertile unions. While He is to be worshipped by Jews as the "God of Israël," they are to remember that He cares equally for all the tribes of the earth. The preservation of law and order is not to be a mere cunning device for securing the supremacy of one's own tribe, but a perpetual worship of Jehovah, the God of all the races.

3. But especially is danger from divided and partial worships to be avoided in the direction of the *search after inspiration*. No devices are to be resorted to, to heighten the *sensation* of inspiration. Jews are to put themselves *en rapport* with the Inspirer, only so far as a holy life will attain that end. Not passion or intoxication, but solemnity and abstinence, are to characterize their attempts to approach personally to Adonai. Sacrifices are to be made to Him by fire, in his character of *Purifier by Fire* ; but none of these exhibit any other connection with pain or death than is shown by learning to kill animals for food in the least hardening and most merciful manner possible. Jews are to inflict no needless suffering, either on themselves or on other creatures, for their own excitement or amusement. Adonai is neither Moloch, the pain-giver, nor Adonis, the lust-exciter ; but the Inspirer who purifies by love.

But pure and holy as are each of these aspects of deity in the Mosaic conception, still no race could be trusted to preserve them in their purity, unless they were seen to be different aspects of one eternal fact. Hear, O Israël, the deliverer from bondage is One. The same idea is expressed in a lovely old lullaby hymn, in which, five times over, the name *Saviour* is given to the grouping of the

three attributes, "Elohim," "Adonai," and "King" (or Orderer, or Organizer). By some Christian theologians, strange to say, not only are the three aspects of the God-idea made into three individuals,* three real personalities, but one of these personalities alone is considered to be the *Saviour* ; and that one was manifested in human shape to avert the wrath of another.

Nothing, however, could be clearer than that each of the three principal facets of the God-idea is distinctly traceable in the Hebrew Scriptures ; and Jewish theologians might gracefully make the admission that, in that respect, Christians have seen something in their sacred books which most of themselves have missed. But, though individual rabbis may have failed to detect the use made in the Pentateuch of the old Trinity-Myth, the Synagogue ritual still enshrines it. Not only is the triple Kadosh a recognition of the threefoldness of religious emotion ; but each aspect of the God-idea receives its special and appropriate greeting. It would be impossible to convey to Jews, accustomed from infancy to their worship, any notion of the impression made on a Christian visitor by the difference in the tone of the three strains interwoven in it : The homage of astronomers to the Creator in the greetings at New Year and new Moon ; the homage to the Race-Preserver, God of Abraham, Isaac, and Jacob ; the homage to the Eternal Reign of Love the Inspirer, in the oft-recurring anthem : "Adonai reigneth, Adonai hath reigned, Adonai shall reign for ever and ever."

That the startling effect of these three elements of Jewish worship, so contrasted and yet so exquisitely blended, should have driven Christian theologians out of their senses, and into mad raptures of delight and wonder, is intelligible. That they should, in consequence, have written much caressing rhapsody, more poetic than accurate, about the Jewish Scriptures, is pardonable ; there are occasions on which it is not to one's credit to be able to keep quite prosaically sane ; and one's first contact with the Hebrew religion is one of those occasions. But the *creed of Israel* is very evidently a caution to avoid the horrible dangers into which the heathen fell by dividing the different facets of divine influence ; and the statement that Moses meant Jews to worship more than one Person, passes the legitimate limits of even poetic license.

The true use of the Trinity-doctrine is as a standard whereby to judge whether we are really getting for our own minds the vitalizing influence of the Unity-doctrine. Whatever facet of the God-idea is presented to us by our studies, we should be careful to

*_Persona_ means a mask, not an individual.

remember the other aspects when we are preparing for repose. We should remember the essential Unity between the three facets ; a Unity such that we cannot keep our minds in a condition to do justice to our own special subject, unless we pay reverence to all three aspects of the Divine when we are preparing ourselves for rest. In this Trinity none is afore or after other, none is greater or less than another ; but the whole three are co-eternal and co-equal ; and he that will be safe must think after this model. So says that marvellous old Credo, in which, in a degenerate age, well-meaning idolaters enshrined the remnants of an older Philosophy which seemed about to die out.

The Law of Moses is holy as of old, and whoever speaks of it should do so with reverence. Those who disregard it, do just as truly lapse into idolatry as men did three thousand years ago. The mere mathematician conceives of a Space or a Number ; his absorption in the contemplation of which deadens his interest in other forms of truth. The man who defies natural science often sinks into a mere vivisectionist, who inflicts torture at random, for the gratification of an idle freak of curiosity.

Adonai has his dangers too. Spiritualism and æstheticism each has its own vicious modes of heightening the sense of inspiration. The Catholic worship of Jesus and Mary, by nuns and monks respectively, often degenerates into the worship of Adonis and Aphrodite, under other names ; and had sometimes all the more distracting effect on the imagination, for being, nowadays, prevented by conventual regulations from exhaling itself in physical scandals; and the Moloch-form of fire-worship still exists in the belief in an *everlasting* and *non-purifying* hell.

As for the second facet or division of the God-idea, Vishnu, how much better would have been the influence of Christian Missionaries had they not sanctioned the heathenish notion that God has given no truth except to European races ! They are as essentially worshippers of a tribal God as the savages whom they would convert.

Nor are Jews guiltless of this form of idolatry. No Bismarck or Stoecker could stir up epidemics of anti-Semitism were the Jews, who fidget over little details of rule, equally true to the essential canons of their faith ! The way in which too many Jews trust to "Jehovah" to protect them from the natural consequence of their own actions is as idolatrous and heathenish as is the trust of a Catholic peasant that his own special saint will keep his family in health, while he neglects common precautions of hygiene and morality. The "God of Israël" which many Jews worship is essentially an eidolon or image of character evolved within the

Jewish mind. Some entirely ignore that Jehovah is race-preserver of other races, and that therefore all knowledge of hygienic rules discovered by Gentiles should form part of the religion of Jews. They neglect to worship God as Elohim or Creator, therefore they despise the marvellous new knowledge which He is pouring out, about the effect of the lower creatures on man, and of human beings on each other. And when trouble comes to them, in consequence of such ignorance, if any preacher speak to them of God as *Adonai, the purifier by suffering, the inspirer by love,* they turn away either in anger or in contempt. Thus they make of themselves what in medical language is called a "foreign body" in the general commonwealth ; and their private virtues, and family piety, and loyalty to the tribal God of Israël are unavailing to prevent their being felt to be a danger to the State.

Idolatry, therefore, is not at an end in Europe, among either Jews or Gentiles. Nor is the need for seeking the cure of social ills in the worship of the great Unity less than it was when Israël came out of Egypt. If we were not idolaters, the educationists who are imposing their cruel laws on all types of children alike, would remember that the Law-maker is also a Race-Preserver, and forbids a too rapid change of ancestral habits ; the Salvation Army would believe that salvation means, not hysteric tension on one aspect of deity, but reverence for all aspects of that divine Creator, whose laws include a law of reaction after violent nervous action, and a law of hereditary recoil of posterity from the exaggerations of a preceding generation ; sensitive and "mediumistic" women would be trained in the knowledge of the orderly Elohim revealed by Science ; our luxurious æsthetes who worship Adonis, the Art-Inspirer, will remember that the true Adonai will sooner or later purify all by the fire of pain ; thus force would be stored up for the solution of our practical problems, which now is being wasted in the struggle to gain that which cannot satisfy. The wisdom Who came out of Egypt with Moses still cries to us, though few hear her voice : "Hear, O Israël, and hear, O Man ; divided Gods make us slaves ; the Deliverer from Bondage is Unity."

And every man, when he is about to prepare for rest by worshiping The Inconceivable Unity, should remember that the true God is not a mere reflection of his own personal predilections, but is equally Holy in each of the three aspects under which he reveals Himself to Humanity.

Another form of the Trinity-doctrine is the *time-division,* past, present, and future. This time-trinity is just touched on in both Hebrew and Christian ritual. Its essence is preserved in the myth of the three Fates, called in the Odin-Legends Urda, Verdendi, and

Skelda ; or *Was, Is-Becoming,* and *Shall-Be.* The student who takes an equal interest in the History of the Past, the development of the Present, and the destinies of the Future, keeps his mind balanced. If any one of them be neglected, the fates become furies who avenge ; or Vampires who suck away the student's life blood and make of him an evil fate to other men. If the balance is duly kept by remembering all three equally in religious meditation, the three Fates become three Graces.

This dual aspect of the three Fates is made more intelligible by reference to the dual form of the Legend of the Birds who feed Seers with wisdom. These birds are now doves, now ravens. They inspire peaceful doctrines, or prompt to deeds of darkness and cruelty, according as the Prophet does, or does not, unify their several inspirations. The true Prophet is *he to whose head both birds come.*

CHAPTER XXI

STUDY OF ANTAGONISTIC THINKERS

"Audi Alteram Partem."

WHENEVER a Law of Nature is ignored, it asserts itself as a destructive agent. The remedy is not to rail at the Law, but to study it and enlist its action into our service. The savage prays his Manitou not to send storms ; the civilized man puts up a lightning-conductor to his house, and he who knows how to do this, knows also how to use electricity for the purpose of advancing civilization still further. Parents are often distressed at facts which mean that the young mind is violently impelled to satisfy the Law of alternate action, by throwing itself under the influence of some teacher whose views are opposed to those of former teachers. What the young mind imperatively needs is not conflict of opinion but alternation of attitude and of emotion ; we should try so to organize life that this relief can be found without actual contradiction. Young people need contact with persons who *feel* differently from their parents ; teachers might give that relief without suggesting that the parents are mistaken or wrong. But at present there is so much tension on questions of opinion that, if parents select teachers whose tendencies are opposite to their own, the children learn from the strangers to think their parents mistaken ; whereas the parent who seeks out for his children influences counter to his own, gives thereby the best possible

proof of being in the right; for he proves that he has more confidence in the Eternal Truth of the Principle of alternation than in his own special opinions.

All who live in the intimacy of great original thinkers, observe how incompetent the families and intimate friends of such men usually are to understand them. The reason, I believe, is that men of Genius attract so much attention as to destroy the mental elasticity of those around them and thus weaken their mental vigour. The son of a great thinker does not acquire true vigour till he throws himself out of his father's sphere of influence. The psychology of the matter not being understood, the thinker thus loses the aid of those who, by their very heredity, should be best able to help him.

Long observations of the families and followers of original thinkers, and some experience as a secretary to several such, have led me to form a plan for myself which I find so useful that I venture to recommend it to the notice of the children, pupils, and secretaries of men of Genius.

When I find my power of understanding my employer coming to an end, and myself growing weary of his peculiar style, I try to find out to whom, among those on his own intellectual level, he personally feels most antagonistic and is most unjust. I give myself a *bath* (so to speak) in the ideas of this rival, and (if opportunity serves) in his actual personal influence. For instance, supposing that I were working under Mr. Spurgeon, the famous preacher, and grew tired, I should seek Mr. Bradlaugh.* I should seek, not conflict of opinion, but variety of attitude and emotion. I should not ask him what he thought of the Millennium, nor talk to him about Mr. Spurgeon; but I should try to get, somehow, a bath in Mr. Bradlaugh's peculiar *magnetism*. I should ask him to go to an Oratorio with me; and try to get him to talk to me about the Future destinies of Man. When the needful relaxation had been produced, this (to judge from all my experience) is what would happen: I should find myself writing, without effort or fatigue, an Article on the Future of Humanity, of which Mr. Spurgeon (and perhaps also Mr. Bradlaugh) would say: "You have expressed my meaning more exactly than I could do it; you have said what I have been trying to say but could not express satisfactorily."

A little tact and a little explanation are needed to induce even a Philosopher to understand why his secretary or follower wants the relief of being counter-magnetized by his bitterest opponent.

*I mention these two gentlemen because, as I have never studied under either of them, nothing I say can be taken as personal.

But the result being that one is better able to help each philosopher, it is to be hoped that learned men will, before long, grow accustomed to the idea; and gradually induce parents and teachers to generate brain-force in young people by a similar unexhausting method.

CHAPTER XXII

OUR RELATION TO THE SACRED TRIBE

"Israel was despised and rejected; when we see him there is no beauty that we should desire him. He is full of sorrows and acquainted with grief. We hid our faces from him; he was despised and we esteemed him not.

"We thought him stricken of God; but he was wounded for our transgressions, and with his stripes we are healed.

"He shall see of the travail of his soul and shall be satisfied: by his knowledge shall he justify many; for he makes intercession for transgressors."

THE Path of intellectual Progress is a Pulsation between the active study of Nature's variety of manifestations and repose in the contemplation of The Unmanifested Unity. Science and Art tend to become, every now and then, entangled in and weakened by the overwhelming multiplicity of sensible facts. But Nature has provided us with a Sacred Tribe, subjected from Time immemorial to a peculiar discipline, which somewhat unfits its members to be great Leaders in the sensuous Arts, because it gives to them a strong tendency to think of The Unseen Unity. The effect of this Tribe on the thought-life of the world is very like what was described in Chapter XIX as the effect of the true Logos-teacher on a School; when Science has exhausted itself and wandered off into too much detail, some Jew like Mendelssohn or Spinoza, or some Gentile who has been saturating his soul in Jewish lore, like Gratry or Boole, prepares for true recuperative repose by striking afresh the key-note of Sabbath, the Name of The Invisible Unity. For reasons which were pointed out in Chapter XIX, he who does this seems to be out of the line of progress, because he ignores and neutralizes much which others have been doing and which seems essential. But when once we have realised that nothing is more essential to progress than strong pulsation we shall lose the feeling that the peculiarly Jewish type of mind is out of tune with true refinement; we shall turn to it for the repose which gives new energy to all forms of culture.

The function of Judaism is perhaps best understood when we

remember that the early Christian asceticism was not an isolated phenomenon, but a typical specimen of a group of facts, the natural outcome of tendencies whose action is essential to our intellectual life, but whose uncontrolled action would destroy society. Of these tendencies, Judaism is the corrective and controller.

In order to avoid entering into disputed questions of theology, let us look at the action of these tendencies as exhibited on a small scale in our own day.

James Hinton wrote a charming little book called *The Mystery of Pain*, wherein he announced that failure and suffering are the greatest boons that life has to offer. This and his other published works were hailed by many as a new Gospel. He next proceeded to state, in conversations and in private lectures, that "Heaven looks down on no sight so cursed as a happy home"; because, he said, in order to keep home happy, men ignore the claims of strangers. Finally, he propounded certain theories of sublime self-abnegation, which have, in one way or another, been the ruin of nearly all who paid any attention to them.

The career of such men becomes more intelligible, when one knows that James Hinton habitually went out in winter insufficiently clad, not in order to give his great-coat to a beggar, but to give himself the pleasure of suffering from cold. James Hinton would have been a useful subordinate in any well-organized school of Philosophy; unfortunately we have in England no well-organized Schools; and a large circle set Hinton up, for a time, as Leader. Now when a community has arrived at such a condition that men can be set up as thought-leaders who are born without the healthy appetite for self-preservation which is the necessary physical basis of all knowledge of the means by which society is preserved, that community needs to be taken in hand and controlled by the influence (one might almost say, by the magnetism) of a morally sane race. In ordinary times, Judaism keeps itself in the background, and leaves Gentile thought to develop in its own way. But when Philosophy has evaporated into the fourth dimension, when it has played with the Eternal till it has shrivelled out of itself the perception alike of locality and of epoch, of possibility and of sequence, of perspective and of proportion, then is a fitting occasion for Judaism to come to the front. It reminds us that He Who gave to us a certain limited power of sympathy with strangers, reserved for Himself the luxury of limitless sympathy, precisely because He is not a stranger but the Father of us all; that this Father in Heaven has placed us on earth; that the particular stratum of the fourth dimension wherein He has located us is that

of three dimensional (*i.e.*, physical) consciousness; that mere vague sensuous sympathy, not safeguarded by Law, may be not virtue but vice; and that the Eternal, acting within the limits of His own Holiness, has imposed on our faculties an order in development and a sequence of action which cannot be safely ignored.

We are prone to think Jews indifferent to religion and careless of our well-being, because they leave us so much to ourselves. Our own restless fussiness causes us to think every one callous who is not incessantly fidgeting about, trying to improve and convert somebody else. The New Testament (to say nothing of the Old) might have taught us that he is the best teacher who most perfectly reflects the Divine patience and willingness to *suspend action.* The Ideal Saviour seems to be asleep, leaving others to manage the ship as they will; till they cry to him in the storm, "Master, we perish."* In another version of the storm-myth,† the teacher, perceiving that men would make him a King by force, retires to commune with his God, and leaves the disciples to go on their way alone. But when it is dark and the tempest arises, they find that, without using their means of transport, he has reached the same spot as themselves. When the need is sorest he is found at hand, saying: "I am here; be not afraid."

James Hinton was well aware of his own lack of stability, and dreaded above all things being set up as an intellectual Pope. His own instinct told him that the true path of progress consists in incessant pulsation between the strong and the mobile types of mind. He often illustrated the relation between the two types by the following Parable. Little boys and girls, he said, play together indiscriminately, regardless of sex; and all copy the eldest or cleverest child. But as soon as that mental difference begins to appear which is to end in a possibility of fuller sympathy, it is often marked by a mutual repulsion, which lasts till the time for mutual understanding has come. The girls call the boys "Horrid, noisy, greedy, vulgar creatures, who don't care for fairy-tales and who destroy the dolls"; and the boys call the girls "Silly, sentimental molly-coddles, who can't understand anything sensible." Each side has a perfect right to its own opinion; and, should the quarrels become too violent, it is not of much use to preach solemnly about the sinfulness of lack of charity; it is better to remind all parties that when they are older they will feel differently; and to encourage them, in the meantine, to assist in each other's education. Nor is it wise to put too much check on the natural repulsion, by forcibly assimilating the lives of boys and

*Luke viii. †John vi.

girls; those young people are found ultimately of most use to each other in whom the differentiation of character has been allowed to develop.

This illustration surely throws light on the whole relation between Jews and Aryans. People who hope to improve the world, either by converting Jews to religions cast in the Trinitarian mould, or by depriving us of the adjuncts to faith which it is natural for us to seek, belong essentially to the same order of reasoners as those who fancy that boys are made more refined by being taught to pose in effeminate attitudes, or girls more logical by being forbidden to do fancy-embroidery. Those turn out best-bred who respect the individuality on each side, and yet are willing to learn from each other. The old fable of Narcissus tells the fate of those who can love nothing but the reflection of themselves.

The stern spiritual discipline which has made Jews indifferent to much which we think essential to religion, the sentimental and somewhat hysterical weakness which characterizes Aryan pietism, are among the means by which the differentiation is being effected; while sufficient proof that it is still incomplete is afforded by the fact that misunderstandings still arise. And perhaps no antagonism could prove ultimately to have been so great a misfortune, as would be the arresting of the differentiation before it is complete. Europe is quarrelling with imperfectly developed Jews; but it long ago lost its heart to the typical Jew, as seen in Vision, though as yet it knows not what it was that it saw. Christ, as he exists in Christian tradition, is not so much the historical Jesus as personified Judaism. The simple manliness of Jewish piety has so dazzled us, that we have invented a whole system of theology to account for its difference from our own more effeminate graces. Underlying all forms of Christian doctrine, there is the deep human truth that Gentile thought, with its Art and its fancy, its sensibility and its weakness, is the "Bride of Christ"—the counterpart and destined helpmeet of the pure strong Hebrew faith. We Christians have got our life into confusion by trying to copy our Ideal "Christ"; we are not enough like him to know how to set about it. Jews do not go into ecstacies about "Jesus," because they are (potentially at least) himself.* When Judaism and Christianity have discovered their true relation to each other; when we Christians, especially, have

*I speak here only of Jewish reformers in religion. Of the Jews who devote themselves to Finance, Commerce and Politics I have nothing to say, except that they are what Europe has made of them. What Europe *has* made of them should be carefully studied by those who are undertaking the task of bringing Chinese and Hindus into contact with Western civilization.

realised that our true function is not so much copying Christ ourselves as organizing social life so as to facilitate the development of Judaism into its natural likeness to him, surely that will be the Millennium prophesied of old, "the Bridal of the Earth and Sky."

This may seem a romantic way of dealing with those epidemics of Jew-hating, which, as a prosaic matter of fact, often originate in trade jealousies and in envy of the special business faculty of Jews. The true Prophet, however, is not he who conjures himself into mystic trances, in order that by shutting his eyes to earth he may see into Heaven ; but he who looks at the facts that God shows on earth by the Light which God sends from Heaven. Such an one can algebraize the slightest indications of progressive tendency in man. He thrills with the joy of future harvests when he sees one plant become more fruitful under human care ; and hears all Handel's music in the tones of Jubal's lyre. And if it be vouchsafed to him to realise something of the true relation between the Aryan and the Jew, he knows henceforth the meaning of Isaiah's golden dreams. Those who are weak and contemptible while severed, become sublime and strong when united. "Il y a au monde une chose sainte et sublime ; c'est l'union de deux êtres imparfaits. On est souvent trompé, souvent blessé, et souvent malheureux ; mais on aime ; et quand on est sur le bord de la tombe, on dit : J'ai aimé ; c'est moi qui ai vécu, et non pas un être factice créé par mon orgueil et mon ennui."

This truth we all know. It lies deep down in all our hearts. We Gentiles know it, but are powerless to carry our knowledge into action ; for impatience clouds our perceptions, and we lose Love by premature unifications. The unregulated indulgence of impulses of Altruism destroys nerve-stamina ; and, as a consequence, we find mere unreasoning dislikes stronger than our faith in the Eternal Principle of Love. Jews have been taught, and will at length teach us, that the Love which is stronger than death and which survives the grave is not to be snatched at by any emotional passion, whether religious or poetic ; it is brought into our lives by in all things awaiting the due time, and by the systematic consecration of natural duty.

CHAPTER XXIII

PROGRESS, FALSE AND TRUE

"The Wind bloweth as it listeth; and thou canst not tell whence it cometh or whither it goeth."

It may seem to some readers anomalous to write the words False Progress. It seems to be often ignored that any such thing can exist. Many suppose that so long as we are moving, we are necessarily moving onwards. Others again suppose that movement is of no use unless it be in the ultimately true direction; they forget that turmoil, which is useless for progress, may be useful in preventing stagnation.

Nothing is more certain than that some Power beyond our ken forces us to go through a great deal of false Progress, *i.e.* of motion, the tendency of which is not in the direction towards which Humanity is really tending. We are constantly deceived in this matter. We think we are making a progressive movement, and all the while we may have been retrograding towards barbarism, or making a rapid rush off on a path which we shall have to retrace before we can rejoin the onward March of Humanity. We have to discount our jubilation about progress; we certainly progress on the whole; but we are, at any given moment, liable to mistake for progress something which is in reality the reverse.

When the Prophets saw, as we see every summer day, how the wind catches up the particles of dust and carries them along, whirling them round and round as it goes, they felt that progress carries mankind on so; not in one straight line, but round and round, yet steadily moving on all the while. The same direction which is really in the march of progress at one moment is a mere flying out of it, off at a tangent, at another. That is why fashion is not progress. Fashion is mere imitation. Now if we watch the wind-storm, we see that to go East to-day may be real progress, but to go East to-morrow because some one else went East yesterday may be not progress but a departure from it. All the outer life of the world, political, educational, social, philosophic, moves onward by incessant change of direction. There is no real misfortune in this; we should miss much that is valuable if we restricted ourselves to going always in one direction. The danger is that if we have no standard of right direction, we may lose our way altogether, and fly off into isolation. Therefore, just in the middle of the whirl, Providence has placed one thing which moves on in a steady

sweep towards the ultimate Truth, and which was never meant to take any part in the whirling movement to which all else is subject. And that one thing is the religion of Israël. It stands always in the centre of the world's march, as a test of the right direction. Nothing is going far wrong which keeps, as it were, well within sight of that standard. And when we have gone a little way wrong, it acts as a test to help us to find our way back to the right path. Judaism helps the world to judge of its own direction. This standard is not so rigid as to make all people alike ; it leaves us all free to differ in detail ; it allows Gentiles to try experiments and to gain the experience that can only be acquired by making mistakes and then correcting them ; but if we take heed to the legacy left us by the old Prophets, it enables us to avoid drifting dangerously far from the right road. If people were discussing which is East and which is West, and one happened to catch sight of the sun rising, he would listen to no further discussion ; he would *know* which was East. And if people are discussing what is true and what is false progress, and one of them discovers that the road he is going is leading to a clearer understanding of the religion of Israël, that man has *seen* the Orient.

Suppose that the thought-life of an age or a Nation has diverged from the march of Humanity, and its philosophers cannot agree among themselves which is the path back towards the line of true progress. One says, "This is the way"; and another says, "No, it is that"; and a third obstinately wants to persevere in the road he is going along. But if one of them catches sight of the old religion of Israël, if he finds himself saying, "*Now* I understand the nature of the Law which the old Psalmists loved ; *now* I know for what the martyrs of Israël gave up their lives, and what gave them courage," that man is troubled with no more doubts. He argues no more. He lets other men go on in their own road, quite certain that he is on the right track at last, and that those who are turning their backs on that beacon are going away from true Progress.

Perhaps the difficulty of distinguishing true progress from false is never so great as in what relates to mental cultivation, to refinement, to Education. It is here that the admission of Jews or other persons of Asiatic origin into European schools becomes most valuable as a test. If I had to select a school for a Christian girl, the first question I should ask would be, not how many pupils passed the Higher Examinations (for no Examination is any security against flashy and unreal modes of thinking) ; I should ask, first, whether the Jewesses who attend the school improve or deteriorate by being there ; whether they are found to be, on the

whole, a good or a bad influence. Every country and every school gets, as some French writer has said, *the Jews which it deserves.* A school or a country where Jews are found to be a deteriorating influence is one where public opinion is judging of progress by a false standard.

So it is on a larger scale. A Nation may seem to be rushing onward in a line which is supposed to be that of culture ; but if it turns out that the Asiatics who take part in that culture drift out of sight of their own religion, if they lose their perception of the meaning of their own past, they are leaving the line of true progress ; and whoever is sharing the same kind of education is leaving it along with them. Whatever culture produces that effect on Asiatics is deadening and stupefying for all parties ; it may look like improvement, but it partakes of the nature of white paint over corruption. It will end by leading all parties towards impiety and vulgarity—the Asiatics first, of course ; but ultimately everybody else as well. But if Asiatics can throw themselves heartily into the culture of a country without losing hold of their own religions, we may be sure that that culture is founded on something approximately like the true laws of human development. If the result of successive changes in an Educational code is that Asiatics can make excursions into the Science, the Literature, the Philosophy of their age, and come easily back, with fresh energy and fresh clearness, to the work of advancing their own religion, then the rest of us may feel assured that we are not being led far wrong ; for whatever movement brought about that result must have been a movement towards the line of true Progress.*

CHAPTER XXIV

THE MESSIANIC KINGDOM

"It is a slight thing that thou shouldest restore Israel ; I will set thee for a Light to the Gentiles."—ISAIAH xli. 6.

THE words "Exodus" and "Reform" have a natural and vital connection ; the founders of the Mosaic system intended to prepare a standing council of *reformers,* a body capable of quietly reforming all the thought-material of the world, by introducing into intellectual life that rhythmic motion which is characteristic of physical life.

*Given as a lecture at the Jewish Working-Men's Club, London.

The true Re-former is distinguished not by any particular opinions or practices, but by a something, impossible to define, the very presence of which makes stagnant thought *uncomfortable.* He possesses faculties which orthodoxy lacks ; he has intuitions the source of which is unknown to it, the purpose and meaning of which it fails to conceive, and about which it only understands, vaguely, that they threaten danger to its stability and peace. When the young Mazzini was thrown, innocent, into prison, officialism gave this account of the motives for his arrest :

"He is a young man of remarkable talent ; very fond of solitary walks by night ; and habitually silent about his meditations. The government does not like young men of talent the subject of whose meditations is unknown to it."

The instinct of the Austrian government had discovered that when Genius goes forth alone to listen to the Voices of Nature, events are likely to occur soon afterwards calculated to disturb the peace of stagnation. And as usual, tyranny forgot to inquire whether imprisoning Genius is likely to cure it of a taste for liberty !

Just so, tyranny has, on many occasions, forgotten to inquire whether trying to cramp the Theistic Seer-hood of Judaism is likely to cure it of the habit of seeing God.

The function of Reform has hitherto been carried on for the Gentile world, episodically and violently, by a succession of such men as Savonarola, Bruno, Luther, Cromwell, Wesley, Mazzini, Maurice, Renan and Hinton. The intention of the founders of Mosaism was to organize a body which should (after some centuries of preliminary discipline) acquire the power of accustoming the whole world to having that function performed for it as regularly, quietly and constantly as the lungs reform the blood.

Judasim, *as a sect,* far from becoming more intelligible and more tolerated because of the progress of liberality and culture, must, on the contrary, become more impossible and more intolerable with every advance in civilization. It has no place in the modern world, unless it is the intellectual heart-and-lungs of Humanity, viz., an organ whose function is to receive all the thought-material gathered by the Gentile world ; purify and aërate it by submitting it to the action of that circulating rhythm which is characteristic of Nature's vital processes and of the Jewish discipline ; and give it back to Gentiles in the form of pure religion. Humanity can become an organic body only when its circulatory apparatus becomes well established.

The possibility of performing the true function of the reformer does not depend on any particular opinion about the Bible, or any

other book. Nor does it depend on either following or abjuring any given mode of conducting ritual, nor on the possession of any special item of knowledge. No persons ever performed that function more efficiently than did the compilers of the Pentateuch (whoever they may have been); in their day there was no Bible, either to believe or to disbelieve. Jesus performed it; and if any fact is known about him, it is that he took the ritual just as he found it; conforming to established custom whenever his doing so did not interfere with honesty or charity, and laying no great stress on any details. Moses Mendelssohn may be said to have been actually the heart and lungs of the Berlin thought-life of his day. Now he was a learned Talmudist, and his co-religionists had no fault to find with his ideas of ritual.

The possibility of being a true world-reformer does not depend on occupying any particular position in the thought-world. The possibility of performing that function at all depends on having ideas about the nature of truth which are *living*, in contradistinction to such as are *dead*. The possibility of performing it properly depends on having ideas which are *rhythmic*, in contradistinction to such as are *jerky* or *lawless*. The nearer a man approaches to the possibility of having ideas which combine the characteristics of being living and of being orderly, the more clearly he sees that the main object of the founders of Mosaism was to prepare a race capable of perennially keeping up those quiet alternations of mental attitude which are the natural purifiers of all scientific and artistic ideas, and the thought-equivalent of the rhythmic movements of the physical heart.

The Pentateuch is the formal ark, which contains, as a *Shekinah*, the essential ideas of Mosaism. But one can never learn any science or art by any amount of study of even the best text-book, without at least attempting to work some examples; least of all can that most glorious of all arts, the art of organizing thought, be so learned. A child's *first* breath is an effort, and perhaps a painful one; but after one full inhalation, the process goes on easily enough! A rhythm is always delightful to those who have once got into the swing of it. A Jew only needs to get one true conception of what *living truth* means; he may then attend to any honest vocation to which he is adapted; he simply *cannot help* purifying the thought-life of every one around him; the hereditary faculty for doing it is so ingrained that it goes on without his consciousness.

Orthodox people never seem to see that their singular dislike to Reformers is of the very same nature as the dislike of the Egyptians to Moses; of the professional scribes to the young

teacher who wanted to throw on old prophecy the light of a living experience gained by the attempt to realise the prophetic ideal. It is the dislike of the Inquisition to Galileo; of the medical profession in Harvey's time to the doctrine of the circulation of the blood; the dislike of the stagnant mind to whatever forces it to recognise throughout creation the existence of that incessant rhythmic pulsation which is the appointed purifier of all that is foul, the liberator of all that is enslaved. Only those who doubt the power given to the Ark to keep its own place as the Centre of the world's march, need fear to see its accessories move round it as the earth moves round the Sun.

The method suggested in the Pentateuch for the cultivation of the rhythmic condition of the brain is marvellous in its naïve beauty, and whenever it has been followed *in its simplicity, according to the spirit of the Founders,* it has produced results of which it is not too much to say that they are properly "miraculous," *i.e.,* they are beyond anything which can be explained in words, even by the person who produces them.

The essence of the rhythmic method consisted in accustoming the consciousness of man to follow, by alternations of thought and emotion, the rhythm of all the discoverable periodicities of Nature; especially those which affect the human organization.

Many Eastern religions embodied this principle to some extent, by reverently following certain of the Nature-rhythms. The founders of Judaism, true to their worship of Unity, seem to have aimed to embody in the education of the people all that were discoverable. The solar and lunar periods were, of course, to be followed. Then, as the Founders knew (what many good hygienists in various ages and countries have discovered) that the human mind requires, for health, a change of occupation and of attitude once in seven days, they did not merely say, as modern doctors do, "Take a rest regularly once a week"; they thought: "The fact that there is a *need* for a seven days' rhythm in the human organization proves that there *is* some seven days' rhythm in the creative agency by which man was brought into being." Therefore they made it a matter not only of hygiene but of religion to mark the seven days' rhythm by arousing, each week, impressive and solemn forms of consciousness, as a counteraction to the mechanical drudgery of the other six days. They also utilized, in a similar manner, the changes in family life and the epochs of National history. They felt that as to a man is the regular pulsation of his heart and lungs, so is, to creative wisdom, the complex rhythm of Nature; and they thought too (and were they not right in so thinking?) that nothing is more likely to put man into *rapport*

with living truth than getting his mind to beat in unison with the heart-beats of the unseen Father.

The effect, in those comparatively rare instances in which the discipline was carried out in the true spirit of the Founders, was something like that which is produced in the wood of a violin by the constant repetition of musical notes, or in iron by lying along a magnetic current. The brain of the best kind of Jew is an instrument which catches the property of rhythmic thought by constant contact with the periodic movements of Nature ; and at last it becomes an instrument which, when a set of facts is presented to it, the special laws of which are as yet unknown, proceeds to deal with them, spontaneously, according to the laws of Nature and of Logic. It repeats, at every slightest touch, the true rhythm of creative truth. Such a real Jew was called, in old days, a "Prophet." Moses wished that all the Lord's people should be Prophets. There was a hope that some day the education of Prophets should be complete ; that absolute incarnation of rhythmic grace and Logic should become possible. But the idea of so tuning feeling and thought into harmony with natural law, that rhythmic laws, hitherto unknown, should re-echo, or reveal themselves, within the brain, was too overwhelming a conception to enter the average Jewish mind ; and unfortunately the rhythmic mode of education is liable to become mechanical. The majority of Jews, in all ages, have supposed that there was some special duty or virtue in observing *this* or *that* festival. And, of course, any idolatrous over-tension of this kind impairs mental elasticity, and does away with much of the good result of Jewish discipline. Therefore Judaism has always hitherto been as a frost-bound landscape, illuminated by a few prophetic stars. But modern Science seems now touching it with her magic wand, and crying : "Arise, Shine, for God hath said : 'Let light be' ; and the *Shekinah* of the Lord shall be revealed."

Messiah's Kingdom cannot mean the rule of any one Incarnation, past, present, or to come ; the possibility of any such autocracy being a source of permanent health or prosperity is precluded by the very form of those equations according to which (whether we are aware of it or not) we must think whenever we think sanely. An embodied perfection, who shall spare other people the trouble of thinking for themselves, by telling them what they are to do and to believe, may be a suitable ideal for cowards ; but no such anomaly can be the Messiah, or will be tolerated by the leaders of living Science.

The vicious habit of trying to make God in the likeness of phenomena, instead of remembering that the human mind was created

in the likeness of God in order that it might *compare* and *organize* and thus *master* phenomena, has led to this among other grotesque and horrible results : That because we happen to live in a planetary system, in which only one focal luminary has succeeded in struggling out of the condition of nebulous potentiality into that of coherent fact, men have jumped to the conclusion that this abortive condition of our own home is a law for the whole possible range of Being. Jews in old times, instead of faithfully proclaiming the doctrine of *Invisible Unity*, with all its logical consequences, invented the idea that all Israël, and indeed all Humanity, is to be ruled by one Messiah ! and Christians, following suit, have improved on the absurdity of their former teachers, by desiring to extend the dominion of their Messiah to the whole Universe, and make of him the equivalent of God Almighty ! Mathematicians, however, who are beginning to spend much of their thought-life in solar systems more complete than our own, the source of whose force is a *polar-relation* between *more than one sun*, are beginning to find that the belief in a phenomenal Almighty is out of line with the most elementary properties of matter and of force, with the first principles of Logic and of Hygiene. The whole idea of *sacred phenomena* is revolting to the fine mathematical instinct. *Love* is sacred ; and whoever can make himself loved is legitimately sacred to those who love him. Not any one human King, but Love the Inspirer, shall reign for ever and ever. The Messianic Kingdom will come, when in every town in the world there is some beloved teacher holding a divine commission to give his blessing *urbi et orbi*, by opening the Ark of the Shemang Israël, and revealing the living Shekinah, the rhythmic pulsation of all life and truth. For from Zion shall the Law go forth, and the word of the Lord from Jerusalem. And there is no superstition in believing that a man is *divinely commissioned* to do that which we find him doing unconsciously ; no progress in Science need make us doubt that a baby's heart has a divine commission to keep up circulation and vital heat. Wherever a man is found, whose own thought-sequences have caught the true rhythm of the Shemang Israël, other men are found clinging lovingly round him. The time comes, at last, when even the orthodox, weary of the cramping fetters of a system of interpretation untrue to the Laws of Nature, are ready to cry to such a teacher : "Master, to whom should we go ? thou hast the words of Eternal Life." And if coming to him is only allowed to mean a temporary rest for the weary and heavy laden, he is as willing to bid them come as the sun is to attract and to enlighten. But his hold on their allegiance will be not static and dead, but living and dynamic. The moment that any idolatrous

tension on his personality or his characteristics is set up, the true teacher gives new impulsion to his pupils, sending them forth on their appointed path: "Why call ye me good? There is none good but One, that is God. Call no man your Master on earth; for One is your Master, even The Unseen Unity. And greater work than mine shall my successors do, when I have gone to the Father."

Let us choose this day whom we will serve. Phenomena, classifications, fixed rules, have proved that they are powerless to unify and heal; if The Unseen Unity be God, let us worship Him, and Him only, with all our hearts. The standards of the creeds have been warring against each other, because they have emancipated themselves from their rightful ruler. The Crescent, the symbol of the fatality of Natural Law; the Torah, the standard of obedience to rule; the Trinity, the Ideal of metaphysical classification; the Cross, the witness to the elevation of the despised; the Crucifix, the sublimization of utter adoration; each has aspired to create man in its own image; but man, who is made in the Image of God, has escaped from the control of them all. But now, as in the days of Moses, Science is raising those Natural Symbols which are the pledge of God's power to reveal the law of continuity, and of man's power to reverse the lines of Separation. The Trumpet has sounded to herald the Festival of Nature, when God shall be sought under no roof made with hands, but under the trees which He hath planted. The Water is being poured forth abundantly from the golden ewer.* The Spirit of Progress and the Church of Truth say come; let whoever understandeth help to spread the Good News. And let him that is athirst come, and whosoever will, let him take the Water of Life freely.

FROM AN ARYAN SEERESS TO A HEBREW PROPHET

"Death a Terror? Your thinking unveiled to my sight
My heart bare before you in Heaven's own Light!
Our vesture of flesh shed off into the grave,
And nothing between us our love to enslave!
My own personal life has but parted us two;
And its death, O! my love! will be union with you.

Death a terror? Yes, surely. For Love is a Fire.
We children of earth know not what we desire.
The Eternal, in passing us, stretched out His Hand
That we might not be lightning-struck, here, as we stand;
And I think, O! my dear one! 'tis only too true
That THAT HAND put a veil between Gentile and Jew.

*This refers to some ceremonies of the Feast of Tabernacles.

Death a Terror ? Ah ! yes ! of all terrors the King.
Are we fit for such bliss as that meeting may bring ?
The dazzle of wonder, the splendour unknown
Of a flash from your soul as it strikes on my own.
Then——nor female nor male, no more Gentile nor Jew,
No more check on my freedom but union with you.

APPENDIX I

For those who wish to understand practically the connection of the method of Gratry and Boole with ancient Philosophies.

INITIATION FOR PSYCHIC MATHEMATICS

LET the aspirant occasionally, when he is in any difficulty, put himself back in imagination into prehistoric times. Let him try to fancy himself an early Geologist, surrounded by savages who ask him to find water.

The Geologist takes the opportunity of showing them how to find the Water of Life. He says :

"Let us seek the Great Father in our spirit ; then perhaps He will show us how to supply our bodily needs.

"The truth is holy and pure ; and may not be taught by any tree that has thorns or the likeness of the horns or tail of any beast ; but only by this, the Sacred Hazel (or Olive, etc.). And let us put out of our minds all imperfect ideas and animal impulses ; and seek to understand in straightforward simplicity.

"Separation seems to us an evil ; but in reality it is not so ; it is a condition of growth. Look at this tree ; the branch that here has one bark-case, higher up is divided into two. It must be so ; without separations nothing can grow into beauty. Therefore if God separates us from our friends, let us remember that separation is not an evil but a means of progress.

"Man is, like the trees, subject to the Law of separation ; but he is not, like the trees, its slave. He is the son of the Law-giver ; and heir of His power. I hold in my hand the instrument of separation ; and can inflict it on anything that grows."

(He raises a knife.)

"Man, the Son of God, is Lord of all created things, and should pay superstitious homage to none. Therefore I fear not to cut this branch, though it grows on the Sacred Hazel."

(He cuts the branch, and takes it by the two prongs, the united end hanging downwards.)

"You call me Healer, Teacher and Counsellor; but my knowledge resides not in me. It comes from The Great Unity; and I acquire it by putting together in my mind things which I see dissevered, and dissevering in my mind things which I see together. In token whereof I reverse this branch; putting Unity where was division, and division where Unity was."

(He reverses the wand).

"If any of you seek help from me, I bid you come while I hold reversed this sacred branch of divination; in order that you may always remember that knowledge comes from putting together things which we find separated, and separating things which we find together.

"This knowledge is not mine, to give or to withhold; it comes down from The Unseen Unity Whose servant and revealer I am; and is given, freely, to all who seek it with a pure heart. In token whereof I raise this branch high over your heads and mine."

(He raises the branch.)

"Now lest any should think that the Hazel has powers of its own, I will cast the branch into the flames, that all may witness how powerless it is to avert its own dissolution. May the Unseen Father accept the offering of ourselves and all that we have; and deign to minister to our bodily needs."

(He burns the branch.)

The awe-struck savages would by this time be polarized into a "circle"; and the Magician (whose Geologic insight would have been already informed by studious observation) would become lucid; and *see* where water was.

The student should, occasionally, go over this little scene in his mind; especially when he finds himself in any intellectual or moral perplexity. If he holds the forked stick in his hands and actually goes through the performance, especially with a freshly-cut stick, so much the better. The magnetism of the fresh Hazel-Wand acts as a slight additional stimulant; much as breathing doubly oxygenated air for a few minutes might do.

The modern Dowser is one in whom fidelity to the Past is a *physical* instinct. When he goes through half this of ceremony, his fingers tingle with the longing to complete it. They and the Hazel mutually magnetize each other, till the fork, of its own accord, completes as much of the ceremony as it can.

The Psychic mathematician is one in whom fidelity to the Past is a *spiritual* instinct. When he meditates on old Ceremonies, secrets connected with the mathematical organization of thought reveal themselves in his brain. To him, what others call Time is as a fourth dimension of Space; and he *sees* it, stretched out like a

line. His Trinity is not three Persons in One God, but three times in One Eternal, Past, Present, and Future. And when he becomes lucid, Time becomes foreshortened, and he sees them as One ; sees them (at his best) with equal distinctness and assurance.

When the aspirant has become impregnated with the ideas suggested by the early and savage ceremony, he may take a further step. Let him picture a band of eager lovers of Liberty using the Ceremony to initiate a new member. The initiator concludes it by holding the rod by its tips and making it slowly revolve ; having the united end alternately above and below his fingers, saying :

"I dedicate you to the cause of orderly Revolution ; and the overthrow of all systems based on the maintenance of any fixed condition of things. Let us pray that the Will of God may be done on earth *as it is in the Heavens* ; that is to say, by incessant, orderly Revolution.

"In the Name of The Invisible Unity, Eternal and Inconceivable, Amen."

Let the aspirant go over this in his mind, when he is puzzled by any political or social problem, and fix his mind's eye on the spiral earth-path or moon-path. After a time, he will think of things as Boole and Gratry did, and understand their terminology easily.

An objection has been made to my presentment of the Branch ritual, because old documents prove that Ritual to have been, at various times, connected with fleshly and sensuous ideas. It certainly was so. Those who consider that fact a disproof of my view must have approached the study of ancient systems from the outside and with minds saturated with European ideas of classification and distinction. The true line of cleavage between good and bad, in religion, lies not between this and that ritual, but between the simple and the perverted use of the same ritual. A Water-Dowser taught me the traditional method of cutting and handling the forked Divining-Rod ; and I have no hesitation in affirming that what I witnessed was the remains of some old and very solemn ceremony. I went through the performances repeatedly with the Hazel as instructed by the Dowser ; the forks were nearly all plain forked sticks. Afterwards I cut forks from all kinds of shrubs and trees growing in the neighbourhood of Greenstreet (Kent). I got a large collection. Some were like the horns of beetles, oxen, or stags ; several would serve for Phallus symbols. One (from a hawthorn) had a thorn out in front and a longer one behind ; and bore the most extraordinary resemblance to the hind quarters of an ape in a very nasty attitude. One, from a Honeysuckle, showed a perfect clean fork, a miniature copy of

the pure Hazel fork, but with a spiral coil winding round and round it—a perfect picture of the Serpent in the Tree of Knowledge.

This instance illustrates how easily the symbols of a pure religion may slip over into being symbols of degrading idolatry; and how unwise it would be to treat any ancient ritual as in itself and necessarily evil, only because priests have perverted it. This is more especially the case, because the Creator Inspirer, Who descends at the moment of contact between differentiated polars, is the object of worship of all inspired Genius. Adonis, the god of vicious wasteful expenditure of force in the pursuit of mere sensuous pleasure, is the same word as Adonai, the Fertilizing Inspirer of the Hebrew; the name too sacred to be written and indicated only by dots. Pan, the horrible Satyr, is "the All," the Unity of Nature; identical with "The I Am, the Unity" Who delivered Israël from bondage.

FORMULA FOR SOCIAL COMBINATION

The maximum of force is got by a coalition between the party rising into predominance and the class most neglected and despised. In France, in the 18th century, Philosophy was the rising power, and the proletariat were almost deprived of Civil rights; when they combined, they swept everything before them. In England, now, Science, especially psychological Science, is the rising power, and the only class denied all right is the class of lunatics.

APPENDIX II

WHATEVER may be the faults of the Jewish people, a question which need not be here discussed, they have brought down to us from some remote civilization a tradition of enormous value:

The vital conviction which, during thousands of years, at all times pressed upon the Israëlites, was that they were a "chosen people" selected out of all the multitudes of the earth to perpetuate the great truth that there was but one God—an illimitable, omnipotent, paternal spirit who rewarded the good and punished the wicked—in contradistinction from the multifarious subordinate animal and bestial demi-gods of the other nations of the earth. This sublime monotheism could only have been the outgrowth of a high civilization, for man's first religion is necessarily a worship of "stocks and stones," and history teaches us that the gods decrease in number as man increases in intelligence. It was

probably in Atlantis that monotheism was first preached. The proverbs of "Ptah-hotep," the oldest book of the Egyptians, show that this most ancient colony from Atlantis received the pure faith from the motherland at the very dawn of history : this book preached the doctrine of *one* God, "the rewarder of the good and the punisher of the wicked." (Reginald S. Poole, *Contemporary Review*, Aug., 1881, p. 38.) "In the early days the Egyptians worshipped one only God, the maker of all things, without beginning and without end. To the last the priests preserved this doctrine and taught it privately to a select few." (*Amer. Ency.*, vol. vi. p. 463.) The Jews took up this great truth where the Egyptians dropped it, and over the heads and over the ruins of Egypt, Chaldea, Phœnicia, Greece, Rome, and India this handful of poor shepherds, ignorant, debased, and despised, have carried down to our times a conception which could only have originated in the highest possible state of human society.

And even scepticism must pause before the miracle of the continued existence of this strange people, wading through the ages, bearing on their shoulders the burden of their great trust, and pressing forward under the force of a perpetual and irresistible impulse. The speech that may be heard to-day in the synagogues of Chicago and Melbourne, resounded two thousand years ago in the streets of Rome ; and at a still earlier period, it could be heard in the palaces of Babylon and the shops of Thebes—in Tyre, in Sidon, in Gades, in Palmyra, in Nineveh. How many nations have perished, how many languages have ceased to exist, how many splendid civilizations have crumbled into ruin, how many temples and towers and towns have gone down into dust since the sublime frenzy of monotheism first seized this extraordinary people ? All their kindred nomadic tribes have gone ; their land of promise is in the hands of strangers ; but Judaism, with its offspring, Christianity, is taking possession of the habitable world ; and the continuous life of one people—one poor, obscure, and wretched people—spans the tremendous gulf between "Ptah-hotep" and this nineteenth century.

If the Spirit of which the universe is but an expression—of whose frame the stars are the infinite molecules—can be supposed ever to interfere with the laws of matter and reach down into the doings of men, would it not be to save from the wreck and waste of time the most sublime fruit of the civilization of the drowned Atlantis—a belief in the one, only, just God, the father of all life, the imposer of all moral obligations ?

THE NINETIES

PART I

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THE WISDOM-RELIGION NOT AN ESOTERIC DOCTRINE

The World's Advance-Thought, 1890

The new school of Theosophy is creating such confusion in the popular mind between the Wisdom-Religion of Ancient Asia and the doctrines of some Indian sect or college that it is high time the truth should be told. For, among those to whom the Wisdom-Religion, if they knew its tenets, would prove an inexhaustible source of delight, some, in the hopes of learning it, join some esoteric body or sect, which they soon leave, disappointed ; while others are deterred from seeking it at all by unwillingness to join such sects. And this is a pity, for the Wisdom-Religion is a perfectly straightforward and simple science ; it is related to esoteric secrets, much in the same way as knowledge of the laws of muscular development is related to the practices by which acrobats and dancing masters induce special kinds of flexibility. The latter (the special practices) may be the secrets of a clique ; the former never can be so, for knowledge of law is the common birthright of all who care to learn.

It is, of course, conceivable that some college may have taught,

at the same time, both the Wisdom-Religion and certain esoteric secrets ; though even that is unlikely, for nothing more effectually deadens interest in esoteric doctrines than does the practice of the Wisdom-Religion. It is far more probable that some college which had lost the Wisdom after possessing it retained the name, and applied it to some secret of more or less value. It would seem, too, that symbols once used for teaching the Wisdom-Religion were afterwards employed for other purposes, some of which may have been of an esoteric nature. However that may be, this much is certain ; the Wisdom-Religion itself is a secret only from that enormous majority of mankind who prefer not to know it. Those who know it are willing enough to explain it to whoever asks them—so much of it as can be explained in words, which is little. It is learned, chiefly, by practice. And what can be said about it is in fact so simple and monotonous as to be found very uninteresting except by those who practise it. It teaches the main laws of action and development of the faculty by means of which man receives new Truth ; and its principal proposition may be stated, in modern terminology, thus : Man is an animal so constructed that he receives an accession of mental force when he returns to the thought of unity after attention to contrast. For instance, if a man, immediately after carefully weeding his field (which of course involves giving his attention to points of contrast between his crop and the weeds), spends a few minutes in meditating on properties common to all plants, he thus performs an act of the Wisdom-Religion ; and does more to fertilise his brain than if he had read many pages of science or philosophy. This kind of alternation is exactly what the common-place man dislikes ; if his livelihood depends on the destruction of weeds, he prefers to nurse a hazy and unphilosophical feeling that they are not worth considering, because "only weeds," and, in fact somehow organically different from and inferior to the plant which he cultivates. The hunter who thanks his Manitou for sending prey into his hands and for delivering him from the paw of the lion and the bear, is merely conforming to the dictates of ordinary religion ; but if, while his soul is still warm with the sense of his own escape, he reflects that the lions hunting for their prey seek their meat from the same Great Power which, on this occasion, has frustrated their desire, he is performing an act of the Wisdom-Religion. This is precisely what the majority of hunters are too lazy, mentally, to do.

It must be observed that no amount of mere abstract philosophic meditation on the unity of plant-life or the similarity of animal needs (or of any other entity which contains within itself

the material for potential contrast) confers the benefits attaching to the practice of the Wisdom-Religion ; these benefits are the reward of such meditation only when it is an act of reunion after a mental act of contrast—of homage to the great principle of contradiction.

It may be asked on which side the Wisdom Religion gives its verdict, in the great controversy between Materialism and Spiritualism. According to the former, the brain is a machine which merely transmutes into intellectual and emotional force those coarser forces derived from food, air, and other physical sources. Spiritualists believe, on the contrary, that the brain receives part, at least, of its force directly from a spiritual source. The Wisdom-Religion makes no statement on that point ; it declares only that alternation of contrast with synthesis is the normal action of the human thinking-machine, and the condition under which it performs its proper function, whatever that may be. But nearly all those who systematically conduct their mental life in accordance with the dictates of the Wisdom-Religion are irresistibly led by experience to the belief that part of their force is derived from some source other than those known as material.

It has been shown that the peculiar mathematical formula in which the Wisdom-Religion has revealed itself in these latter days is not the expression of any abstract or necessary Truth, but a statement about the working of the thinking-machinery, by means of which man comes in contact with Truth. It is possible to conceive that the Law might have been different, that there might be creatures who receive Truth by some other process than that of re-uniting contrasted elements ; but sex-law is there to remind us how much older than the creation of man, how much wider-reaching than the human intelligence, is the sway of that Adonai-Force which incarnates at the contact of contrasted polars. Flowers obey the Adonai-Law ; and even the most elementary leaf-forms are evolved in accordance with it. Creation manifests it everywhere, and he who diligently practises the Wisdom-Religion is brought to feel that his soul is not imprisoned in a mere material brain, the slave of an arbitrary law, but is the child of the Law-Giver ; free to call Him Father on the sole condition of trying to think as that Father thinks ; and, on that condition, heir of his creative power, and able to evolve for its own use a habitation suited to its needs, a brain which works in conformity with His modes of working.

Books written by followers of the Wisdom-Religion are, for the most part, unintelligible to outsiders. The latter, however, not infrequently contrive to misunderstand the books, and gather

from their philosophic calm an impression of moral indifference and of heartless selfishness. We do not care to refute accusations made by such readers. Our religion has always been an object of fear and hatred, and therefore of slander, to idolaters of systems, whether religious, ethical, or spiritualistic. Each such system consecrates some special code as being in itself good, and condemns as impure or diseased whatever impulses are contrary to that code ; whereas in the Wisdom-Religion ethical ideas are treated as valuable chiefly because they create antithesis to natural impulse, and thus set up that action of contradiction in which consists the truest life of man. For instance, an abnormal craving for alcohol is, in the eyes of moralists, a curse ; whereas the true student of the Wisdom-Religion thinks of it as an opportunity for moral struggle and for strenuous acts of Faith ; he knows that, in whatever way the struggle may end, something will have been gained by its taking place. He believes that his abnormal craving is the result of his ancestors having been addicted to the worship of the Wine God, and the practice of (what used to be considered) the "duties" of a cordial hospitality ; and reflects that their mistaken ideas of duty were as sacred and as much a part of the spiritual education of Humanity as are some of the ideas most in favour in our own more sober days. He knows, too, that the practices now insisted on as religious and moral are, in their turn, preparing a legacy of bitter but wholesome struggle for a future generation. In every department of the field of ethics, the Wisdom-Religion is the great iconoclast, the merciless and imperturbable destroyer of settled convictions ; and the idolater of system always supposes that its impartial belief in antithesis necessarily implies moral indifference. As one of our great masters used often to say, an idolatrous multitude can be brought to condone any heresy or to forgive any crime ; the one thing which it never tolerates is Faith. We are not concerned to defend our religion from the attacks of those who prefer superstition to faith and random accusations to careful inquiry. Nothing that is said about it can prevent the fact that the practice of it confers a peculiar and enduring force ; and those for whom it has become a habitual exercise trust far more in the survival of the fittest and the ultimate predominance of the brains most saturated with spiritual energy than in arguments addressed to contemporary opponents. If we tell our priceless secret freely to whosoever asks us, that is surely as much as we can be expected to do ; it is no part of our duty to force it on those who prefer to consider it valueless. But, for the encouragement of any novice who may be really anxious to know towards what moral goal he is being led, we quote the

following extract from the letters of one of our greatest living masters to the present writer :

"The possibility is arising of the apotheosis of Judaism. * * * But where shall we find the counterpart of Judaism, the destroyer of idolatry and the return to Unity ? When will the Jews, sunk as they now are in the lowest mammon-idolatry, realise that the outcast Ishmael is to be their restorer ?"

UNIFICATION

The World's Advance-Thought, 1890

The main law of brain action (proved to be such by my husband and Gratry simultaneously) is *not* "Unity," but *unification*. Angels, possibly, see all things always as a Unity ; we not only are prevented by circumstances from doing so, but are furnished with brains which would be ruined by doing so. Talk as you may about the "Unity of Creation," if you caught a rattlesnake beside the bed of a child you loved, you would forget all about "the equality before God of all His creatures" and "the Unity of all Creation" ; you would—and you ought to—eliminate the snake first, and think afterwards. Now, from the point of view of an abstract and sentimental Unity, this fact involves a mournful contradiction ; but from ours, the snake will have aided in your moral development. For if, immediately after being roused to feel strongly the contrast between the child and the snake (that it is your business to save the one and destroy the other), you reflect that the same Great Power, who made these things your duty, will, Himself, one day recall that child from its earthly body, thus destroying the physical life which you have saved ; and that, till now, he fed and protected that very snake which you have killed ; if you will thus courageously face the principle of contradiction, within your own soul, you will receive the reward promised to the practice of the Hidden Wisdom, *i.e.*, an accession of spiritual force.

There are many, nowadays, who worship an abstract ideal of Unity in a manner as essentially false and idolatrous as is the worship of any savage to his Manitou. There is no more Wisdom in saying "O Unity ! hear us," than in crying "O Baal ! hear us," or praying, as Positivists do, to "Holy Humanity," if we confine our meditations on Unity to the Unity of that portion of Creation with which we, personally, are not in conflict. The vitalising Unity, for each individual, is the Unity between himself and the

forces which injure or oppose him; between the objects of his dearest affections and those of his bitterest hate. We all have enemies; if not men, then snakes, or weeds, or bad weather, or persecuting spirits, or something. Jesus never said: "Have no enemies," but "Love your enemies"; "think of that which you most hate in the light of the fact that it is made by Him whom we love." It is the very struggle, the act of turning loving thoughts towards something we are prompted to revolt from, which vitalises the soul, and Boole's Law shows why. The study of this Law (the Law imprinted on the structure of our frames) makes life very serious; and, in a sense, even sad. But it gives an inner joy and repose, of which nothing can rob us; and a strength which makes us uncrushable. The world will not heed; so much the worse for the world. To as many as will heed is given power to become Sons of God.

I have been asked what I conceive to be woman's true function and position. I can only answer by telling you the position which many women of my acquaintance have reached. They have accepted any sort of duties which have come naturally, and any "rights" which were conceded to them; and have steadily conducted their inner life according to the Law of the Hidden Wisdom. They have always been thought not very learned, and perhaps a little odd; the advocates of "Women's Rights," especially, have been impatient at their apparent slavish contentment with "an inferior position." Till some crisis has arisen in which all the men concerned, and all the "Women's Rights" women, have found themselves at the end of their resources; and then the woman of the Hidden Wisdom has come to the front, naturally and easily, and settled what was to be done. And everybody has done what she settled. And then she has relapsed into her former contented obscurity and gone on with her housekeeping or embroidery or what not, till the next family crisis. My idea of the true outlook for woman is to go on doing that sort of thing *ad infinitum*, till at last men lose faith in brute force (whether physical or merely intellectual) and confess the Wisdom which God has revealed to babes.

FREE LIFE AND THE HIDDEN WISDOM

"Free Life," Nov. 7th, 1890

Those who would lead a free life, in fact as well as name, must desire, before all things, true mental freedom. This consists,

not in the mere absence of certain specified prejudices (religious or otherwise); but in being, as much as possible, *elastic* in all directions; ready to cope with new problems as fast as they arise; free from that kind of stiffness which makes thinking of a fresh subject laborious and painful. Nothing hinders a people so much in throwing off restraints imposed by governments as the clumsiness caused by its own stiffness.

Now the best way of promoting mental elasticity is the practice of what used to be called *The Hidden Wisdom*; which consists in a systematic alternation of *analysis* and *synthesis*. Modern mathematicians have proved that this Law of the Hidden Wisdom is the Law of the special machinery *by which man discovers truths*. In modern scientific language *man is an animal so constructed that his brain performs its proper function by alternate analysis and synthesis*. The more regularly this alternation is kept up the better the brain develops. The test of any educational, ethical, or religious system is this: How far does it secure that every mental act *contrasting* any *x* with its corresponding *not-x* shall be completed by an act of *re-unification* of the contrasted elements? In so far as any system ensures this normal sequence, it is truly ethical and educational; in so far as it prevents this sequence, it tends, in the long run, to produce a diseased or stiffened mental condition, bad mental habits, and powerlessness for self-guidance.

Of those who might be induced to study the priceless lore of the Hidden Wisdom—always a small fraction of the whole population—many are deterred by the grotesque confusion, now prevailing in our literature, between the Hidden Wisdom and certain so-called "Esoteric Secrets." The Hidden Wisdom has never been the property of any clique of initiates. It is hidden only from that large majority of mankind who prefer not to know it because of its tendency to destroy convenient fictions. It can be learned by any person (not an absolute idiot) and under any conditions. All that is needed is to form a habit of seeking for some quality *common* to two persons (or things, or classes), after we have been led by circumstances to dwell on the *contrast* between the two. When this habit is once formed, the Hidden Wisdom reveals itself within the brain as naturally and easily as oxygen reveals itself within the lung which has formed a steady habit of alternate opening and contracting.

ERRADIATION VERSUS CONCRETE SUGGESTION

"Light," Oct. 31st, 1891

Hardly anyone now doubts that thought-transference, or, as it is called, "suggestion," is a possibility. Few doubt that it can be used as a remedial measure. Yet many entirely condemn the practice on grounds which, when analysed, come to mean that (like anything else which has medicinal powers) it can be misused, and, when misused, is dangerous. But we are not to abandon a remedial agent without at least trying to find out how it should be used. Those who are making experiments on this subject would find their study more profitable and less dangerous if they would place clearly before their minds a few of the elementary principles of human psychology.

Man may be roughly described as a bundle of nerve-chains, all united at one end. The free ends are connected with organs of perception or discrimination, whether physical, intellectual, ethical, or spiritual. The united ends are gathered into an organ whose function would seem to be the conceiving of common principles underlying the phenomena perceived by the various free ends. (The basis of this statement is the mathematical analysis of the Laws of Thought, made—simultaneously but independently —by Gratry and George Boole.) Nervous currents should flow "up and down" the chains, and never jump from the outer end of one chain to the outer end of another. "Never" is of course not meant to be absolute for healthy people ; a healthy man can stand a good deal in the way of bad conditions. But when we undertake to treat one who needs help, our first care should be to eliminate, at least from our own action on the patient, elements which are unhygienic ; and it is most distinctly unhygienic to attract a thought current from one chain to another without passing it through the united ends (or reason-ends) of the chains. Now, let us examine, in the light of this principle, the possible ways of treating by suggestion a person who has got one of his nerve-chains over-irritable at its free end. (He may have at the stomach-end of the nerves used in alimentation a restless craving for alcohol ; or he may see, with some outer brain-faculty, a friend's conduct in an irrationally bad light.) We can try one of three plans : Either (1) make a "negative" suggestion to the part actually affected ; try to lull or narcotise (magnetically, of course) the over-irritable part. Or (2) we may try to divert force from the affected organ by stimulating some other (outer) faculty ; suggest-

ing some different interest or emotion or thought, of a definite and concrete kind; suggest to go and hear some music instead of quarrelling with the friend, or to freshen himself up with a country walk instead of drinking brandy. Or (3) we may try to arouse, magnetically, the reasoning organ. The first plan (negative suggestion) is permissible only as opiate-lotions are permissible —with great care, and always with the understanding that we are doing a thing not in itself quite right, because the suffering, or evil, is worse than the remedy. As a habit, such calming processes are bad. The second plan (diverting force by definite concrete suggestion) is temptingly easy, and productive of immediate good-seeming results; and, of course, for the operator, pleasant, in that it gives a great sense of power. But I believe it is always most thoroughly bad. The only really hygienic mode is the third; suggesting some general principle of reason or morality; thus helping the patient's conscience and reason to act, and then leaving the central organ, thus aroused, to act on the outer ends of the nerve-chains in its own way.

Of course, I know that in condemning the practice of concrete "suggestion" I am attacking the very stronghold of cheap and easy Spiritualism. I can only say that the practice seems to me contrary to the clearest indications of mathematical psychology; that the whole experience of a long life (spent largely among occultists) has taught me to think it as perilous as the random use of drugs; and that more than one medium has written (automatically) very serious warnings against it. It will be said that no one objects to audible suggestions of a change of thought; to playing music to a cross child, or inviting a drunkard to go for a walk. But, in the first place, nature has so arranged things that one cannot make audible suggestion of a diversion without more or less stirring the reason-end of some chain. In the next place, the wise and pious always accompany the audible suggestion of an external change with magnetic suggestion at the reason-end; whereas, if the magnetism of the suggester is concentrated on concrete suggestion, he is not in the right state to suggest principle. In the third place, though I do not object to diverting an unreasonable person's thoughts by audible suggestion, I do think that most people trust, far more than they should, to this natural and comparatively harmless method. The name "erradiation" has been given to magnetic suggestion at the reason-end of the chains. On the whole it seems to me a suitable word for the purpose.

ON MODERN LOGIC IN RELATION TO BIOLOGIC STUDY

An address delivered before the Christo-Theosophical Society, April 23rd, 1891.

You have done me the honour of inviting me to address you on a subject which concerns us all : the light which the Modern Higher Logic can throw on problems connected with Biology.

I must ask your forgiveness if I begin by calling your attention to a principle so obvious that the mention of it may seem almost an insult to your understanding. Truths, so self-evident that no one doubts them, are, for that very reason, too much forgotten ; and we can often throw fresh light on a question that has been causing perplexity, by referring to some principle which no one had thought worth mentioning, because it is indisputable.

Let me suggest then that there is an essential difference between a game and exertion undertaken for a real object. The essence of a game is that we voluntarily forego the true and most effectual means of accomplishing our professed object ; depriving ourselves, temporarily, of the use of the faculty which would best lead to our end ; the true purpose of the game being to exercise some other faculties. In any genuine work, we really want to accomplish an end and we use the faculties which will best accomplish it. For instance, in cricket, there is an elaborate pretence, on the one side of wanting to knock the stumps down, on the other of desiring to protect them. The *rule of the game* is that the attackers shall use no bigger weapon than a ball ; the defenders no shield except a narrow bat. If the stumps really were wanted out of the way they would be easily got rid of ; and if any one really wanted to protect them, some effectual shield would be used.

Play is legitimate and useful for us all, provided it be honest. But its legitimacy ceases the moment that we begin to claim anything on the ground that we are seeking to accomplish some end for the public good, while, in reality, we are deliberately setting aside the truest means of accomplishing that end, in order to play a game for our own amusement, exercise, or profit. And even the healthfulness of a game for ourselves ceases when we fall into the error of keeping up, chronically, restrictions and privations imposed originally for the temporary purpose of play. Blind-man's buff is a healthy and useful exercise, but only while recognised *as* a game. If the bandage be kept on habitually, that is bad for the eye-sight ; and if any individual claims either exemption

from duties, or authority over other men, or the right to injure any living creature, on the pretence that he is seeking something which it is important to find, while that individual is in reality playing a game of groping for the thing with a bandage over his eyes, we pronounce him either dishonest or mad.

Now, a good deal of modern biologic study is in reality play giving itself out as work ; biologists claim the right to inflict pain on animals and moral torture on humane persons, on the ground that they are seeking truth for the benefit of the sick ; while the fact is that the sick are being ruthlessly injured for the sake of keeping up an artificial ignorance of the very things which Biologists profess to wish to know. Medical men also claim the right to grant certificates of lunacy ; which, of course, must be a monstrous notion, unless they know better than the rest of us what is and what is not sane mental action ; whereas the logic used by them about many subjects, *and especially when they are defending the practice of vivisection,* proves that the medical profession (as a whole, and with certain honourable exceptions) is very much more ignorant of the laws of brain-action than any intelligent set of men possibly could be at the present day, were their ignorance not artificially and carefully preserved.

I should be sorry to accuse any particular individual of bad faith ; but it is only too certain that biologists, as a body, are carrying on a course of action of which no honest individual would be capable.

If we have a tangled tassel to get straight, it is absurd to pull at a thread here and a thread there while the handle into which all the threads are fixed is lying hidden in the heap. That may be good as *play,* as an exercise of skill and patience ; whoever really is anxious to get the tassel straight for practical purposes *begins* by finding the handle and holding it uppermost ; then the threads fall naturally into their place. I accuse modern biologists, *en masse,* of pulling at their tassel thread by thread, while neglecting to put its handle uppermost.

The handle of the whole Biologic Tassel is the human brain. I am not here speaking from the spiritual or religious standpoint. I say nothing about any Oversoul, which may be supposed to use the brain as its vehicle. Biologists wish to investigate material man ; now material man *is* a brain which *has* an appendage of muscles and nerves ; and nothing but confusion can come of treating him as a bundle of muscles and nerves, which *has* a brain somewhere in the tangle.

It is true that some biologists profess to be seeking, by the

process of vivisecting monkeys, to ascertain the laws of brain-action ; the excuse being that, if those laws were known, we could deal more wisely than we do with nervous disease. But the laws of brain-action—those at least most important for the treatment of nervous disease—were perfectly well known at least 4,000 years ago ; probably much longer, certainly so long. George Boole has proved that they can be known, at any time, to any person who cares to learn them ; and Charles Babbage has shown that no other laws of nature ever have been known with *absolute* certainty. That is why I call them the handle of the tassel—we can find them and know them ; and when we know them they help us to disentangle phenomena. Comparatively few persons in any age know them ; most people seem to prefer being ignorant of them. I have no quarrel with any one's preferences; only it does seem nonsensical to pretend that those truly aspire to disentangle the intricacies of biology who deliberately prefer not to get hold of the handle of the whole science.

There are hundreds, nay thousands, of persons in England at this time, whose history might be briefly summed up thus :

The individual, owing to some hereditary cause, was born with a brain peculiarly sensitive, and therefore unable to endure action contrary to the true nature of brain. Some law of brain-action therefore revealed itself to the child, by means of the discomfort consequent on the violation of it. Parents, teachers, and society insist on perpetual violation of true brain-law ; and the sensitive specimens become inflamed or injured in some way that cannot be ignored. The patient then is handed over to a medical practitioner, who treats as the surest proof of disease the self-protecting instinct of the brain to act according to its true law, and who thus cuts off every possibility of recovery. Many patients in lunatic asylums are perfectly well aware that they are diseased ; but I have heard such patients say : "We are sent here not to be cured of a disease, but to be taught to lie" ; and the most intelligent and honest medical psychologists acknowledge, sorrowfully, that such is indeed the case.

The knowledge of the laws of brain-action was anciently placed, along with certain other hygienic and sanitary knowledge, under the sanction of religion, and was communicated dogmatically and empirically by priests. All knowledge so communicated tends to degenerate and be distorted ; and in the last century a great cry arose for exact scientific Truth ; for the emancipation of man from dogma ; for some proof of what he is required to believe satisfactory to the scientifically-trained intelligence. The cry, then, was for *mathematical proof*. Bigots denounced and cursed

those who made this audacious claim. But Providence is always more gracious than bigots ; and, in the middle of this century, what the philosophers and scientific men had been clamouring for was sent to the world. First, Charles Babbage invented a sort of artificial thinking machine, the primary purpose of which was to take off from living mathematicians the trouble of calculating complicated series of numbers. This steel brain was found to obey and illustrate some of those very principles which, hitherto, pious persons had supposed to be exclusively articles of religious faith, and which the quasi-scientific were already discarding as exploded superstitions. Whoever wishes to see the subjects of miracle, and of that continued educative retribution called by Hindus "Karma," expounded from the standpoint of European exact science, should consult the book called by Mr. Babbage "IXth Bridgewater Treatise," in which he describes the new vista opened before his eyes by the working of his machine. It was published in 1837.

In 1854, it was proved, by means of the Differential Calculus, that the great Unity-law, which had been in all ages taught by the best class of Theologians as the fundamental dogma of Theology is, in reality, the fundamental working-law of the machinery by which man perceives Truth of any kind. It was proved that man's thinking machinery is of such a nature that whenever it acts rightly its *Universe of thought* can be treated as a Unity.

Please observe that mathematics does not profess either to prove or to disprove anything about the nature of the Divine. The old command of theology had been : Thou shalt think of the Creator as a Unity. One doctrine of Theosophy had been : Creation is a Unity. You will perhaps be able to judge whether modern mathematical logic has any side-light to throw on theology and theosophy. But our business to-day is with what it has to say about biology ; in this matter it gives us the most positive and absolute information : Man's brain is a machine which functions properly only when it can treat its whole Universe of thought, whatever that may be, as a Unity. That is a biologic statement pure and simple, and is the central principle of any possible science which has the human brain and nerves for its subject. Yet, so far as I can make out, biologists are, at this very day, groping and poking and playing blind-man's buff, in a childish pretence of longing to find the main laws of brain-action, while keeping themselves as ignorant of the great central law of their subject as are the unfortunate monkeys on whom they experiment.

The first law of brain (Universe of thought must be treated as Unity) was proved by two mathematicians about the same time

—my late husband and a monk in France. They had worked independently, and arrived at the same result by different methods. The book written by the monk, Gratry, and called by him "Logique," is in many respects the better of the two, and I would especially recommend it to the notice of Theosophists. Gratry stated plainly (what the English writer only hinted at) the connection between health, both of body and mind, and the steady, habitual observance of the great Unity law. But Boole's proof was, as a bit of mere mathematics, more original-seeming and more striking, though not, in my humble opinion, at all sounder or more complete than Gratry's. However that may be, Boole's proof of the main laws of thought (or, as it should have been called, laws of the human thinking-machine) has never, I believe, been challenged. There has been a certain amount of discussion over details ; whether some symbols used by him are necessary, whether some applications of his theory are of much use, and so on. But the principle itself is unquestioned, and, I believe, considered unquestionable. The University of Oxford gave him the honorary degree of D.C.L. ; and Herbert Spencer speaks of his book as the greatest advance in logic since Aristotle.* His method has been applied to solve problems in statistics and economics, and even, I have been told, to guide chemical investigations. But let me repeat once more ; the feats by which Charles Babbage and George Boole earned their chief fame did not consist in discovering laws previously unknown ; they gave to the world of physical science mathematical proof that certain laws, which pious people had supposed to be laws merely of religion, and which atheistic people had supposed to be merely inventions of superstition, were in reality laws of a certain *machine*—the machine through which Truth reaches man. The laws themselves were quite as well known to Newton as to Gratry ; they were known 4,000 years ago to whoever cared to learn them ; they are known, now, to many persons who have never read one line of that mathematical calculus whence are drawn the specially mathematical proofs.

Having now cleared my ground by calling your attention to a few undisputed and, as I believe, unchallengeable facts, which everyone seems to forget when biology is on the *tapis*, I will enter on my subject—the relation of the Laws of Thought to Biologic Studies.

One of the strangest features of the vivisection controversy seems to me to be this : that even Zoophilists and Anti-Vivisectionists allow themselves to be deluded into speaking of vivisection as the expression of a desire for intellectual Truth ; their mode of

*Study of Sociology. Chap. IX. The Bias of Patriotism.

attack is to the effect that "moral and spiritual rightness is of more importance than intellectual progress." Such an argument as that is of little use when the persons argued against doubt the existence of spirit, and disagree with their opponents as to what is and what is not moral. The typical science men claim that their first *duty* is to seek, and their second is to teach, intellectual Truth. The logical answer to that is, that if it has really been borne in on them that their first duty is to seek for intellectual Truth, it would be desirable that they should set about doing that duty. And, as a means to that end, it would be desirable that they should learn the tests by which to distinguish true from false intellectual action. For, so far from vivisection being the expression of anybody's desire to know Truth, it would seem to me, judging from the arguments used by its advocates in defending it, that it is rather the expression of the resistance of the whole community to any serious search after intellectual Truth; of its resolve to play a game of pretence Truth-seeking. Vivisection is, I think, analogous to the eruption in scarlatina. It is the characteristic eruption, or specific visible token, of a disease which is infecting all the intellectual and educational life of the world—a disease, one symptom of which is a dislike to using the brain in accordance with its first law, the test law of all its action; another is a shrinking from hearing that law even stated; a third is the tendency to mistake vivid brain-impressions for intellectual convictions, and thus to become the victim of hallucinations; a fourth symptom consists in confusion between love of truth and lust for the mere *sensation* of personal discovery; a frantic craving for such modes of investigation as can be completed within the lifetime of the individual, and contempt for those methods by which a great truth is given to the public, after having been discovered by the unselfish co-operation of several students, no one of whom can exactly be named as the discoverer. Many a professedly "scientific" man will accept any absurdity as the explanation of some phenomena he has been observing, rather than let himself think that the true explanation may lie in some principle to be discovered after he is dead. This is, of course, simply a symptom of brain aberration.

Another symptom, which appears only in spots here and there (so to speak), but which seems the specific eruption of the same disease, consists in a hideously anomalous state of the brain, in which the act of destroying or distorting sentient material imparts some ghastly kind of lucidity, totally dissevered from any power to distinguish truth from glamour. Practices which heighten lucidity, while diminishing the power of the brain to balance itself

by the Unity-test, used to be called, in Palestine, by names which we translate : "witchcraft," or "sorcery." And it does not follow, because we have left off calling those practices by ecclesiastical hard names, that they are no longer dangerous and bad ; it would be just as rational to assume that leprosy is not disease because we no longer sprinkle the patients with Holy Water; or that cleanliness is useless because we are now trusted to perform our own ablutions instead of being watched by an official hired to mutter prayers while we bathe.

Nothing could be more illogical or more unwise than to treat vivisection as the vice of biologists specially ; nothing could be more futile than to hope to stop it while we treat it so ; it would be on a level with trying to suppress the eruption of scarlatina, treating the spots as the sole seat of the disease. Vivisection, as I said, is the outcome of an intellectual disease, which is vitiating the whole scientific and educational life of the nation ; and that disease is, resistance to Truth ; unwillingness to know the Laws of Thought ; laziness in following such of them as we cannot help knowing ; jealousy of the intellectual power acquired by those who adhere to them better than we do ourselves ; terror at the blaze of light which those laws throw on the whole of our life on earth. Every Schoolmaster and Bishop in this country does something to promote a state of things of which vivisection is the natural and inevitable outcome. We are guilty, too, in our own degree ; you, and I, and everybody. Everyone of us can do something to improve that state of things, and to create a condition in which vivisection would become manifestly useless and therefore contemptible.

What we have to do for that purpose is to cultivate steadily a habit of treating our own Universe of Thought, whatever that may be, as a Unity, and thus to promote sanity in ourselves and those around us.

The laws of thought are connected with the discovery of biologic truth, not in one important manner only, but in two. In the first place, if the brain does not act according to its proper laws, it becomes unfitted for its purpose as a truth-revealer ; in this respect, every possible or conceivable sort of knowledge must ultimately be dependent for its correctness on the habit of conducting the thought-life according to the Laws of Thought. But in the second place, it would seem that the Laws of Thought —the Laws of the machine called brain—are in some special sense the key to the Laws of all vital forces. Newton, for instance, discovered the Law of gravity, not by observing stars more than many others were doing, but by studying and keeping the

Laws of Thought ; and especially that central one : Universe of Thought equals Unity. Having trained his brain in the habit of acting sanely in accordance with its Laws, he compared what was known about the movement of the stars which he could not reach, with the motions of objects within his grasp ; and thus was led to perceive the action, throughout creation, of that Law of gravitation which is to a planetary system what its Life-Law is to an animal or plant. Newton, as it happens, has been accepted by the public ; chiefly, I think, owing to the impossibility of evading the necessity for doing so. If it had been possible to reach the planets and make a brilliant experiment by distorting their orbits, some man would have made a hypothesis founded on his own distortion ; the public would have been dazzled and distracted by him, and would have ignored Newton ; and we should be, to this day, as ignorant of the laws of motion as we are of the laws of Biology.

For how has it been in regard to other sciences ?

Dr. Charles Winslow was studying the Laws of Thought-sequence ; and at the same time employing persons all over the tropical world to collect information about earthquakes. After thirty years of study he published a book showing how the Laws of Human Thought really give the key to the phenomena of cosmic disturbance and enable us to organise and explain them. He was strongly advised to leave out of his book all reference to the Laws of Thought, and simply to tell the public what he knew about earthquakes. He steadily refused to do so ; what he wanted to tell the public was not how earthquakes happen, but how the Laws of Human Thought throw light on natural phenomena. The book failed to interest readers. Mr. Norman Lockyer said to me, years afterwards, that there is a splendid bit of work on earthquakes locked up in Winslow's book, but useless, because he insisted on mixing the subject up with metaphysics. But it was not Dr. Winslow who mixed earthquakes up with Thought-Laws. Nature did that. Dr. Winslow simply declined to put asunder what Truth had joined together ; and, in consequence of that refusal, the public refused to read his book.

About the time that Dr. Winslow printed his book, there came to England from New Zealand the drawings which lie before me, and which I will ask anyone who is interested to inspect presently, for I should scarcely dare say what I am going to say about them if I could not give ocular evidence of it—it would sound too like a fairy tale.

Mr. Benjamin Betts was studying the laws of Thought, and as he knew nothing about that Calculus in the terminology of which

mathematical logic is usually expressed, he set to work, all by himself, to invent some simple mode of expressing the laws of mental development and of Thought-sequence. He found out how to do this geometrically; and having organised his method, he began to draw diagrams illustrating Thought-sequences. He drew on a purely geometric plan, following only the course of Thought-sequence. He found he was drawing—planet-paths, leaves, and flowers. He also observed that if the planets of any system could leave a track in the sky, the result would be a corolla-form. I dare not comment on these facts; I will read Mr. Betts' own comment:

"The laws . . . of infinite solar systems throughout the universe are telegraphed to us by these flowers at our feet. Does this effort of imagination appear to you very difficult or very far-fetched? These laws of the corolla-form we have educed as laws of Thought; therefore also must the laws of the solar corolla be laws of a Thinking; Some One is thinking there; thinking in potential activity as you and I are thinking this moment! In the beginning of history man was defined as made in the image of God; and now we have to feel after Him and find Him by the similitude of His thinking to our human thinking! Next time you look up into the starry vault, try if you can bring this truth home to you in that visible thinking before you—In Him we live and move."

When first Mr. Betts' description of his method reached my hands, I mentioned it to Mr. Lockyer (I had not then seen the drawings, except a few of the simplest). Mr. Lockyer did not deny, even then, that he thought it quite possible Mr. Betts had really solved a problem on plant-growth with which the best intelligence of Europe had been struggling in vain for many years. He advised me to request Mr. Betts to write out what he had to say about plant-growth, omitting its connection with the laws of Thought. Mr. Lockyer added: "If Mr. Betts will consent, give him every encouragement; if he will not consent, my advice to you is, have nothing more to say to him."

I am not blaming Mr. Lockyer; he knew his public only too well; and, as he reminded me, we had the experience of Dr. Winslow to warn us of the uselessness of expecting any public to care to see Nature interpreted by reference to metaphysical Law. Mr. Betts of course refused, as Dr. Winslow had done, to buy popularity by betraying the message with which he felt himself entrusted. I did not take Mr. Lockyer's kindly-meant (and I suppose I must say, judicious) advice; I have done every thing in my power to call attention to Mr. Betts' marvellous discovery, and

Louisa Cook spent the last energy of her earth-life in the attempt to translate his phraseology into a popular form. No scientific man or artist who has seen these drawings, doubts that Mr. Betts really does know something about plant-growth which is unknown to the rest of the scientific world ; but hardly any one cares to learn what it is. Why so ? Mr. Betts' method did not involve the destruction of a single leaf or flower ; it did involve a life of unambitious study, and a great deal of stern self-discipline. And botanists are much like the rest of us : they like cutting flowers to pieces, better than disciplining their own minds according to the true Laws of Thought. Now the outcome of that preference, when it touches the subject of biology, is, of course, vivisection.

Botanical specialists encourage pupils to begin the study of plants by pulling something to pieces ; whereas those who wish to bring the study of nature into harmony with the business of training the mind in accordance with the Laws of Thought, discourage a child from making destructive investigation on any plant, until after he has found out all he can about it by patient observation of Natural Sequence. Michelet has shown how the whole mind and character, especially of a girl, may be twisted askew, by being taught to take a wrong attitude towards plants and flowers. I lately heard a lady-doctor, who is making a study of the Laws of Thought, say : "We sow the seeds of brutality, in our treatment of flowers." If we encourage children to compete for prizes in Botany, by methods which involve the glorification of monkey-destructiveness elevated to the level of a Fine-Art, and which fail to give any training in sustained observation or any true insight into the Laws of Natural Sequence, we have no right, then, to rail at them, if, a few years later, they scramble into precocious notoriety, by impudently ignoring the Creative Unity, and by ill-using His sentient creatures. Especially as it is made very manifest to them that men who learn to know Nature by observing the Thought-sequences which underlie Natural growth are allowed to die, as they have lived, neglected and unheeded.

I feel all the more bound to lay stress on this point, because, owing to a singular accident, my own husband was not ignored during his life-time. On the contrary, he was belauded to an extent which saddened all his later years ; for he felt that his popularity was due, first, to an accident, then to the misconception of ordinary science-teachers as to what it was that he had discovered.

Dr. Hickman some years ago gave a lecture to medical men, in which he recommended a method of study calculated, he says, to lead to the discovery of most of the things which are now being investigated by means of vivisection. His method

would seem to me (judging from the Gratry point of view) admirable ; and Dr. Hickman considers that the results obtained by it would be far more reliable than any corresponding results of vivisection. It is in line with the main laws of Thought ; it involves a very sound combination of patient observation and philosophic study ; and it would have, so far as I can judge, no tendency to produce hallucination. It has one great advantage from the point of view of the genuine seer (disadvantage from the point of view of feverish and ambitious charlatanism)—the individual who had the labour of making a long series of observations would not always be the one to present its results to the world. Therefore no one could succeed, by Dr. Hickman's method, except those who are willing to work for the truth irrespective of personal fame.

Dr. Hickman's scheme could not be properly carried out without the co-operation of an intelligent lay public ; and I have tried hard to arouse interest in it and secure the assistance needed. So far, I have entirely failed ; and I am bound to say that I have found non-medical persons far more obstructionist, in this matter, than any set of medical men or women I have come across. The fact is, the public are interested in anything which is one-sided, mischievous, monkey-like, showy, and quackish, even if they profess to think it wicked or shocking. Average man cares little for that kind of study which is unambitious and consonant to the laws of Thought.

I have mentioned just one or two discoveries in Physical Science, made by the study of the Laws of human Thought : those the history of which has come within my own personal knowledge. This kind of discovery and suppression of what has been discovered, is going on incessantly, all around us ; with the ultimate result that biologists are able to throw dust in the eyes of the public, by pretending that cruelty is necessary for the discovery of truth. There is a very special connection between pain-causing experimentation and disregard of the laws of logic. A botanist, for instance, can say, frankly, of such work as that of Betts : "I daresay he has found out some truths ; but I do not care for finding out truths by such methods, I like my own way better." But the general public, and even the biologists themselves, have a hazy idea that the dissecting of living animals *would* be *wicked* if it were not *necessary* ; and those who want to justify it, are obliged to begin by asserting that certain truths, useful in medical practice, *cannot be discovered without it.* Could anything be conceived much more likely to injure the proper working of a thinking-machine, than to find itself committed to maintain

such an illogical absurdity as that ? Who can know that such methods as Dr. Hickman recommends might not reveal, as he says they would, more than all the vivisection that could be performed ? The same men who assert that vivisection is necessary, would have asserted, long ago, that unless we can climb up, and see, and handle and twist about the planets, we can never learn the Laws of their life-motion. The answer to that is, that if you are a charlatan you cannot ; but if you are Kepler or Newton you can. For true genius does not mean recklessly seeking to multiply visible phenomena at all costs to other lives ; but, as Newton said, it means *infinite patience* in dealing with the phenomena you do see. In fact it would seem that astronomy is science precisely because it affords so little scope for brilliant charlatans ; they are obliged to stand aside and be silent, and let the man who can truly interpret Nature, because he has learned to think like Nature's Creator, be listened to when he speaks. The reason why biology is not yet science is because it is always possible for noisy charlatans to drown the voice of men of Newton's type ; and to bewilder the public with hypotheses, framed by minds which do not think as God thinks.

Few people realise how systematically all our schools and colleges discourage adherence to the laws of Thought, and impose on pupils a continuous and stupefying observance of false rules, which are, in reality, only the rules of a certain educational game. Pupils leave the so-called "educational" establishments with brains mutilated like the feet of Chinese ladies. This hampers them in all original investigation, and causes them to resort to many really unscientific expedients. But if their special study be Biology, their brains are still further distorted by the necessity for justifying their proceedings, before their own conscience and the public, by asserting that vivisection is absolutely *necessary*, till some of them make themselves really believe it.

Then there is another reason for the peculiar and deadly antithesis between causing suffering to helpless creatures, and study according to the laws of Thought. Brain-sanity depends essentially on treating the whole of one's universe of Thought as a Unity. Every kind of study or of action involves making some kind of severance or contrast in the mind ; we cannot study people or things without thinking of them as contrasted with some other things ; but the way to prevent this contrast-action from injuring the brain-machine, is to carefully counteract it by reversing it. For instance, when I began to study the relation between logic and Biology, I had to make in my mind a crisp picture of the attitude towards Nature of ordinary biologists (judging that attitude,

of course, from *their own* statements and arguments). I had to make a mental contrast between their attitude and that of Newton or of Mr. Betts. In the first rough draft of my views, I wrote, of course, nothing that I did not believe to be true ; indeed, I still believe that every word which I then wrote is true. Nevertheless, if I had uttered that as I wrote it, it would have left on my brain a slight trace of prejudice, of bias ; if I had done so frequently I should have set up at last some real hallucination of believing biologists as a class to be much more callous, much more careless about truth than the rest of us ; much more so than any individual among them really is ; I should have injured the flexibility of my thinking machine. In order to avoid doing my brain and its future work this great injury, I was bound to restore its elasticity by setting it to work according to that true law of its nature : "Universe of Thought equals Unity." I had to make a meditation ; picturing what Pasteur or Klein might have done, had they been able, thirty years ago, to read Gratry's Logique with George Boole (much better, probably, than I have done in many things) ; and what illogical conduct Mr. Betts and I might have fallen into had we been exposed early to the temptations of a medical school ; I had to think what errors we have committed analogous to those I attribute to Dr. Ferrier ; and so on. The consequence was, that when I re-read what I had written, I felt I could not utter it. If I could have done so, my address to-day would have been more one-sided and definite, and less dull and prosy than, I fear, you have found it ; but it would have purchased whatever interest it might thus have acquired at the expense of my future sanity. I do not mean that I need have become *what is ordinarily called* "insane" ; but the flexibility of my thinking-machine, its power of response to truth, to fact, would have been more or less injured ; and frequent repetitions of such small injury would at last produce a hallucination, *i.e.*, a serious deadness to the touch of truth in some direction.

Well, now, let us picture a student doing for the first time a pain-causing experiment on some helpless creature, not for its benefit, but for his own instruction. He dislikes the business at first ; but, if he be not a student of the laws of thought, he may become "used to it" (as it is called) ; which means, of course, that the flexibility of his thinking-machine is injured. But if he be a habitual observer of those laws, he will not sleep, or at least will not pass a week, without mentally reversing the actions of his working day, going over the scene again and putting himself, in imagination, into the animal's place. I think we might safely give any man leave to do as much vivisection as he cared to do, on

condition of thus reversing his mental action at the close of each day or week ; because, on that condition, he would remain a sane agent, and not become the prey of those illogical hallucinations which come of distorting mental powers by exercising them in violation of the law of their action.

Great confusion on this matter prevails even among honest-minded persons. All science depends, essentially on synthesis ; and every scientific student works by comparing (or unifying) diverse-seeming phenomena, *within the range of his own special subject.* This local synthetic action is mistakenly supposed to be sufficient for mental health. It might, indeed, be so if the man could make himself a mere machine for doing Botany or Physiology ; he would then become what is called "narrow," but, within his narrow limits, would be sane. But every man lives some kind of life outside his one special study. And in the process of passing from study to the outer-life, some action of the brain is set up, which, unless consonant to the test-law—(Universe of Thought equals Unity)—is false to the true nature of brain. The man who habitually passes from the laboratory to a joyous family circle, and back again, without placing himself and his children, in imagination, in the place of his "subjects," must be fast growing, in the proper logical sense, *insane* ; and no reliance can be placed on his judgment in either sphere of action.

The history of ancient religions abundantly proves the tremendous antithesis which has always existed between reverence for the Logical Unity and the tendency to inflict torture, whether on men or beasts. Religions which encouraged torture were always idolatrous ; which always meant (as the engineer Boulanger showed) that, in some form or other, they destroyed mental elasticity, by discouraging the return of Thought to meditations on the absolute unity of the Universe. Those Prophets and teachers who practised and taught the great religion of the Laws of Thought, the simple reverence for the Logical Unity : these teachers always had an utter horror of all attempts to draw down inspiration, knowledge, truth, by inflincting torture on any creature.

One of the great old Masters of the art of brain sanitation by periodic recurrence to the thought of Unity was seized, we are told, with a longing to *see* that creative Power, whose thoughts (if we may venture to use such an expression) are telegraphed to man by the laws of human thought. It was only a momentary aberration : Moses soon remembered that eyes of flesh cannot actually see God. But the narrative goes on to say that a Voice rang in the thinker's ears, proclaiming an awful Name.

The Lord ; the Lord God ; merciful and gracious ; long-suffering ; abundant in goodness and in truth.

Eyes of flesh are fitted to see phenomenal diversity and the order of time-sequence ; only within himself can man behold The Creative, Life-giving Unity, The Eternal, Our Father. And the revelation of Him can come only to the individual ; what man can prove for his brother man is the working law of the instrument through which the revelation comes.

Those members of the medical profession whose hearts are wrung with anguish, because certain biologists persist in disgracing medical science with cruel and prurient freaks, might, I think, get some consolation from the history of mathematical science. At one time (I fear we must admit) a good deal of irreverent nonsense was talked in the name of mathematics ; on which nonsense religious people conferred a fictitious halo of dignity, by answering it with denunciations as foolish as its own pretensions. The more the clergy denounced mathematics, the more rampant grew the mathematicians ; till all of a sudden, the machine invented to work their sums for them brought to a *reductio ad absurdum* the supposed axioms on which all the atheistic reasoning had been based. It was long ago prophesied that, if human Hosannas should cease, the very stones would next take up the cry ; and certainly the Modern Higher Logic may be said to date, as an exact Science, from the time when Babbage's metallic calculator sent forth its wondrous message ; though the key-note of it was very clearly struck, nearly a century earlier, by Boulanger (the engineer).

Possibly the vivisection controversy is destined to collapse, before long, at the touch of some unconscious agent. Possibly the inoculated bacteria may become such an agent, by bringing to a *reductio ad absurdum* the monstrous results of all biologic study which ignores the laws of Thought.

No sparrow falls, we are told, without Our Father's knowledge. The blood of martyrs is the seed of Church-Reform ; we, who believe in God, can hardly admit that any evil is permitted to exist without some reason. The victims of vivisection seem to be a vicarious sacrifice for sins which are common to us all ; may their blood become the seed of a Reformed Biology, which shall bear the Fruits of the Spirit, Love, Joy, and Peace.

MEDICAL EXPERTS AS ETHICAL GUIDES

An address given to the Bond of Union amongst workers for the Common Good, November 2nd, 1893

In a recent number of some Magazine it is said that the inartistic condition of England now is shown, not by any lack of pains taken in decorating the streets, for which much care has been taken of late, but by the fact that public opinion tolerates decorated buildings being hidden from view by big flaring ugly advertisements and counter-advertisements of individual achievement (real or pretended, though mostly the latter) ; to which one may add that the most beautiful woods are similarly disfigured.

It would be absurd to blame the advertisers for this blot on our civilisation ; the fault is our own, for whatever the public insist on having, somebody is sure to supply. When we take the trouble to seek out and encourage modest tradesmen who spend their capital on honest material ; when we make it clear that we value such workers more than those who spoil natural and artistic beauty by using them as a back-ground for self-advertisement, the advertising nuisance will die out.

But while we shrink from the trouble of seeking out and encouraging unobtrusive merit, what right have we to complain if obtrusive *de*merit rules the roost ? The public like to be cheated with false hopes of getting something without paying the full price of it, and advertisers give us the delusion for which we crave. There is no lack of medical and biologic science—ethical beyond the dreams of any preacher in any religion ; but public opinion allows this glorious wealth of Biologic Ethic to be hidden from view by any inventor of a quack doctrine who wishes to advertise himself, or out-advertise somebody else. No man invents a really vicious method while he is thinking of Truth as a Unity, and of himself as an anonymous servant of Truth. Bad methods crop up in proportion as men think of knowledge as a collection of isolated statements, each one of which is a convenient opportunity for exhibiting some individual's name, or for making somebody's fortune. For instance, Science, in the person of some humble practitioner, says to a sick man, "You are over-feeding, over-drinking, over-exciting yourself ; lead a more moderate, reasonable life." "Oh, dear no !" says an advertiser, "Take my pick-me-up and you will feel all right." Silly people take the patent pick-me-up, and do feel "all right" for a time ; but presently the digestion gives way. "If you will do wrong, you must pay the

penalty," says Science. "Oh, no !" says another advertiser, "only take my pills, or wear my electropathic belt, and you will be all right. "The remedy is just as likely to injure the health as to improve it ; but the public like the temporary false hope, and are always willing to pay for it. The true science of hygienic sequence—of cause and effect—cannot advertise itself ; but quack remedies can and do, to the disfigurement of nature and art.

What biologic Science has to say on the Sex question is easy to find out, if the public really wished to know. Take, for instance, the little 3s. 6d. book on "Evolution of Sex" in the Contemporary Science Series. It starts from no specially spiritual standpoint, and treats the whole sex question in the ordinary materialistic way, as one of changes in Protoplasm. In all that relates to general direction and ultimate tendency, the teaching is as sternly moral as St. Augustine's ; and I have heard one of its authors say that, in his opinion, the problem for Biology is to find out how to absorb and convert into spiritual and intellectual energy all the sex-force, over and above the amount necessary to continue the race. The subject is summed up by the statement that the remedy for sex-difficulties is to be found in "a new Ethic of the Sexes, and in the increasing education and civism of Women." There is a wide gap between that sort of physical science and the arrangements we have heard of in Indian barracks ! It is hardly necessary to say here that of all the ways of preventing certain contagions, compulsory examination is the *least* efficacious. The cure of the social evil must be, rather, sought by "education and civism," by making all classes feel it disgraceful to carry contagion ; imparting the ideas of restraint, of duty, and of care for mutual welfare. In Russia, where the "Acts" are universally and rigidly enforced, and their normal results vividly appear, a "Medical Expert" has been heard to say—"Those cursed decrees are responsible for more contagion than all the vice in the country ! " Medical science is emphatic as to the kind of mental training which diminishes sex-passion—viz., free individuation, variety of interests, the free direction of one's own life in all that does not interfere with one's neighbours, a total absence of all the habits which make the men the mere passive slaves, and tools of a ruler. The kind of drill and exercise, and mode of thought, which would make citizens willing and capable defenders of their own country in case of attack from without, also keeps sex-passion at bay. Cromwell's army were eminently chaste ; but they would have been of no use for purposes of mere military-ism; they could not have been ordered abroad, at the bidding of any man who happened to be in command, to shoot down innocent strangers without knowing why.

Military tactics require a very different sort of men from Cromwell's chaste soldiers, men, in fact, who have been subject to a discipline the very reverse of what true medical science enjoins for cultivating the power of continence. Barrack monotony and slavery are necessary to forge the tools which the general, who wishes to get fame as a conqueror, must have at his disposal. Pseudo science suggests that "a staff of women set aside on purpose" will do all that is wanted, and then—very delusively—that "forcible examination" will prevent any contagion resulting. The public like to be cheated into fancying they can have a military system without paying the natural price, and can always find quacks to tell them they can suppress the consequences by Act of Parliament. So long as we allow ourselves to purchase at all costs the momentary luxury of false glory and false ease, we have no right to rail at those who provide such commodities by ways that are vicious and cruel. *Of course,* such quacks get honours and fortunes, which the Prince of the power of this world naturally gives to his own allies ; but he cannot make *us* take such at their own valuation of themselves. An Eastern potentate fully thought that "Morrison of the Pills and Holloway of the Ointment" were the leading lights of British medical science ; "because," said he, "their names are heard of everywhere, and they have the personal approval of your Queen ; for I saw her own patent stamp on their boxes ! "

We in England can see the causes of this Oriental's mistake—ignorance of the true relations of things, and that degrading kind of toadyism which makes the ignorant mistake official recognition for a true stamp of merit, and noisy notoriety for true fame. The same causes make the so-called educated imagine that if a man has a great name in science, or is president of some association, he must therefore be a typical specimen of the advanced science of his time. This blunder is with some mere silly, vulgar flunkeyism, but with others something much worse, as it proves they are falling into that sin which used to be called by the significant name of "devil-worship," whose essence consists in giving power to what they believe to be evil, by magnifying it and spreading exaggerated reports of its dominance, by ascribing to it that universality and dominion which belong of right to God alone ; by ignoring the Good and assisting evil to overshadow Good. The men of whom we disapprove are very indifferent to what we think of them ; they rather enjoy being abused, provided they are acknowledged as types and leaders of medical science, are allowed to overshadow the whole subject, and concentrate attention on themselves and their remedies. Every time we mention them

as types and authorities, we do something to foster their influence.

The public has as yet no idea of its duty towards true medical science. If it had this, the right kind of doctors would have more scope, more possibility of organising, according to their more enlightened and merciful ideas ; while those to whom we object would lose the prestige which makes their example contagious.

A surgeon, when lately arguing to prove the necessity of vivisection, made this remarkable admission—"If what the public wanted was an *organic* science of biology and hygiene, there would probably be no need for vivisection ; but they wish to lead unhygienic lives, and then have a doctor come in to avert some of the consequences ; so in order to know how to do this, we *must* vivisect !" In other words, vivisection is useful, *not* in order that man may know how he was intended to live, but because the public claims at the hands of science that temporary false peace which science *cannot* give, but which quackery and cruelty can ; and there are always persons willing to advertise themselves by giving it. But behind these, and hidden from view by them, there are plenty of "Medical Experts" of a very different sort ; a crowd of modest workers, whose lives we are wasting, whose faith we are weakening, and whom we are daily leading into temptation, by giving them no encouragement.

I lived for about 21 years in a School of Therapeutics whose first canon was that no experiments were to be tried upon any sentient creature, expect such as were also tried upon the experimenters themselves and their families. This was understood to be the normal check on those delusions into which ambition and conceit betray the random experimenter. The methods were ethical in the highest degree ; the subjects—children, cattle, and all, throve on the system of experiment. So far from any assistance being given by Government, every possible obstacle of a legal kind was placed in the way of the school getting pupils. I learn from doctors now, that this school enriched the pharmacopœia, and brought to light some valuable principles of therapeutics ; one told me the other day she had been looking into some of its old forgotten records of experiment, and that the amount of suggestive information was actually "thrilling." But the public knows or cares nothing about all this, and the school died out for lack of encouragement !

Then there was Dr. Hickman's proposal for superseding what he believed to be misleading vivisectional experiments by a system of combined clinical observations, which could only have been carried out by the co-operation of an educated public. The

scheme was calculated to give a great preponderance of influence to the more modest, patient, and reverent order of medical investigators, and to put the showy and ambitious ones at a discount. But it was impossible to rouse the public to take any interest in investigations that were slow and not showy. The persons applied to were for the most part so indifferent, or even antagonistic, that one wondered what they *meant* by professing any desire for vivisection to cease. When the public is so apathetic to the needs and claims of true science, what can a Government do but drift at the mercy of whoever makes the most noise ?

I have mentioned two methods for superseding Vivisection with which I have been in special contact, but there are thousands of practitioners in England now, who know just what the originators of these methods knew, and would like to investigate in ways ethically equivalent to theirs, but who are hindered at every turn ; thousands who do their best to give an ethical tendency to medical advice, not because they wish to set up as specially spiritual, or lack respect for their career as physicists, but because they know there is nothing, on the whole, better for the health of individuals than to take a reverent and ethical interest in the well-being of humanity. Such men die off year by year, disappointed and heart-sick, because the public does not understand what they are aiming at, and cares little for anything but noisy and glaring catch-words.

Though we cannot now do what we might have done to encourage and help the dead, we might at least take pains to know what is going on among medical and biologic "Experts" now living. I happened to hear lectures by three biologists last summer ; one of them said : "Whatever Huxley may be, a biologist he certainly is not ; he teaches not Biology, the Science of *Life*, but Necrology, the Science of *Death* !" At a discussion over which he presided, I mentioned the "Leigh-Browne Trust Fund" for "assisting investigations useful to biology, which do not cause pain to animals." The Chairman said : "If I were required to mention investigations, useful to *Biology*, which *do* cause pain to animals, I should be puzzled !" The second lecturer whom I heard, mentioned some recent experiment on cutting off the tales of mice for several generations, to test some principle in Heredity, and pointed out first, that there was a false step in logic between the experiments and the principle they were supposed to illustrate ; and secondly, that farmers have cut off the tales of certain breeds of sheep for countless generations ; so that, if anything could be learned in that way, it might have been done by observing the lambs born of such sheep ; and he added—"All that one can say

about experimentation of that kind is that it is a pity men waste so much time. . . . The artificial creation of monsters is mostly useless to Science."

The third lecturer analysed certain physical theories of evolution and heredity, to which well-known names are attached—of those supposed to have proved them—and pointed out that no one of them is really proved at all, for under each lies some gratuitous assumption, dragged in to supplement the supposed evidence. He said of one such theory, not very long ago preached as a new gospel—"I don't believe it, and don't know a single one of the younger biologists who does!" implying that the researches by which it had been professedly so triumphantly proved had only made a temporary show, but had not added anything to the real store of scientific acquirement.

He wound up one lecture by quoting Tennyson's line—"Knowledge is of things we *see*," and added, "I don't believe knowledge is of things we *see*, but emphatically of things we do *not* see! We *know* that gentleness and honour are better than falseness and cruelty, but as to *how* our physical bodies are evolved we know nothing yet, we only guess." Here we see the materialistic biologist reproving the professedly religious poet, and convicting him of lack of faith in the unseen Good; by no means so rare a case as many people think! Whenever a student of science does his work thoroughly, he is being led to an interpretation of Nature more spiritual than any poet and theologian reaches; more so, *i.e.*, in the proportion that the Creator's facts are more holy than human fancies about those facts! When the Biologist is not ethical in his teaching, it is because his work is not thorough; because he has stopped short in his investigations, to appeal prematurely to an ignorant public, and throw out partial doctrines as traps to catch applause.

When medical advice does not tend on the whole in an ethical direction, it is because the doctor tells the patient the readiest way out of an immediate difficulty, but not the possible, or probable after-consequences of the remedy he is suggesting.

"The pure in heart shall see God," whether they *call* themselves materialists, or atheists, or anything else. Biologists, who, after starting from a standpoint of mere physical investigation, arrive, by sheer force of simple candour, at an ethical onsight worthy of Moses and the Prophets, are common enough, thank God! Only they don't, as a rule, become President of the British Association; but that is no reason why we should leave them out in the cold, and ignore their existence. If you know of any biologists likely to ethicalise medical science, by all means give to such any help

you can, remembering that to speak of the opposite School as if they represented *all* "Biologic and Medical Experts" is really to extend their influence.

It would be a good suggestion to join the Summer meeting of students in Edinburgh and attend the biologic and social Science courses for an instructive and enjoyable holiday; and if you think the lecturers are likely to exert beneficial influence on future medical science, to ask ere leaving, if you can do anything to help them. I think that several workers are beginning to see that assisting those who work on honest lines, is more useful than the excessive discussing of any set of people who have mistaken rampant curiosity for love of Truth, noisy self-advertising and mutual advertising for genuine fame—and have mistaken for philanthropy, a habit of applying immediate remedies to uncomfortable facts, without respect for past experience, or regard for future consequences.

THE INTELLECTUAL ASPECTS OF VIVISECTION

An address delivered at the Somerville Club

When a non-medical person comes forward to speak about vivisection it is perhaps natural for the audience to assume that the speaker has been led towards the subject by sympathy for suffering animals, unbalanced by adequate realisation of what medical science might do to alleviate the probably far intenser suffering which man feels if his health be mismanaged owing to lack of knowledge in medical practitioners. The assumption would, however, be erroneous in the present case. I have not harrowed up my soul by reading details of what is done in physiological laboratories. Perhaps I ought; but I have not. I know nothing about the vivisection question except the intellectual aspect of the Logic used in defending it. All my experience leads me to think that what is intellectually right *is* right, to desire that the whole moral and spiritual development of man should be regulated by scientific investigation of Laws of development, and to feel that the worst selfishness of which a truly scientific man is capable is likely to be less cruel than the tender mercies of the ignorant. So far, I entirely endorse the arguments of vivisectionists.

But when we claim that life shall be guided by scientific men, we intend that three stipulations shall be understood. First, those who are to guide life should be scientific; secondly, they should be sane; or, if that be too much to expect, one would claim that

their studies should be so directed as to tend, on the whole, towards sanity. Thirdly, they should be human ; if not *humane*, morally, yet at least human in the mode of their intelligence. My objections to vivisection are : First, that it seems to ally itself to the special tendency which, in any other subject than Biology, is supposed to stamp a school as essentially unscientific. Secondly, study assisted by vivisection seems to set the mind acting in precisely the way which I should recommend if the object proposed were to induce incurable hallucinations. Thirdly, it seems to be giving enormous development to those faculties which we have in common with the ape, at the cost of injuring that special intellectual faculty by which man differs from the ape.

Now in proportion as we desire the influence of scientific men, we must dread that of men who are manipulating their own brains in a manner which scientific psychology shows to be the best for making hallucinates, and for inducing reversion to the ape type.

The mind of man has to work at acquiring knowledge by means of a machine, made up of brain, nerves, and senses. I say nothing about who uses that machine—whether the man by his own will pumps in knowledge for himself, or whether any Higher Being uses the machinery as a telegraph to communicate knowledge. In either case the machine has to be used as the vehicle. And if the machinery is working contrary to its true nature, it communicates wrongly, and induces, not knowledge but hallucination. Like every other machine, its normal action follows Laws ; its main laws are as absolute and mathematical as those of an electric battery or a steam engine, though fortunately far easier to understand. Every medical man that ever I met, who knew the mathematical Laws of the mental machinery, owned that those Laws are the key-note of Biology and the centre of all medical science.

Yet the mathematical laws of the human thinking organ are not taught in any medical school (in this kingdom, certainly ; I believe the same rule holds elsewhere). Now there are many good practical engine-drivers and electricians who know nothing of the mathematics of their subject ; but their practical training is of course directed, ultimately, by men who do know the mathematics of it. A school of mechanics which should ignore the Parallelogram of Forces, would take a very low stand in the profession ; and if there were any country in which the acknowledged standard Colleges granted diplomas to persons ignorant of the most elementary mathematical laws of its subject, we should know that the whole subject was, in that country, in a condition of quackery, and that nothing worth calling science was being done there. Now a man may take the highest honours in any medical school

in England without knowing anything about the mathematical laws of the machine whose action dominates all human function. He cannot, it is true, even enter a medical school without passing an examination in the mathematical laws of form and weight, and number and space ; but he may leave it, laden with all its highest honours, without having once heard the main equations of the human thinking-organ even stated—much less having been taught to understand them. And while remaining as ignorant as any savage of the equations which are related to his business exactly as the parallelogram of forces is related to the business of the engineer, the M.D. may proceed to grant certificates of lunacy, or undertake the irresponsible control of persons mentally unhinged, and tinker away at them at his pleasure.

Now it does seem a grotesque anomaly that a consultant engineer must know the mathematics of his business, and a consultant physician need not know the mathematics of *his* business.

But what has all that to do with the vivisection question ? It has much to do with it.

The laws of the machine called brain may be approximately arrived at in other ways than the mathematical way ; and some medical men have found them out, with so near an approach to accuracy as to recognise the main equations on hearing them stated. It is not a very rare experience to hear a middle-aged doctor, on being shown the brain equations for the first time, say, that he never heard the laws stated algebraically before, but they are only a short and explicit statement of truths which all his experience has convinced him of, and on which, for years past, he has based all his teaching and all his practice. On the other hand, there are many medical men who cannot understand the brain equations, and who seem worried by any statement of them, or any suggestion that medical science should recognise them. In my experience, these latter are those who consider vivisection necessary.

The medical men who recognise the equations of the thinking organ as a mere algebraic statement of something they have been trying to express in words, are those who either publicly denounce vivisection as useless and misleading ; or, more commonly, speak of it privately in such terms as these : "I cannot join a society of laymen in denouncing my professional brethren ; but, between you and me, what is said in favour of vivisection is humbug." So that we outsiders find ourselves in presence of a profession divided by a sharp line of difference of opinion about vivisection ; and we are not (at least I am not) capable of directly judging the actual question at issue ; but we find one side willing to test professional

dicta by reference to the mathematical laws of the machinery with which the profession deals ; and the other side objects to the test. What can we do but suppose that those who rejoice in the prospect of their ideas being subjected to mathematical test are on the scientific side, and those who object to it are charlatans ? They may not be exactly dishonest ; I am bound to own that the manner in which advocates of vivisection wriggle out of the way of knowing anything about mathematical tests, resembles far more the instinctive terror of inferior intelligence before mysterious and unknown weapons, than the shuffling of conscious dishonesty. But, whatever be its motive, the fact of shrinking from mathematical tests is always a proof of an unscientific attitude of mind.

If biologists would only learn the algebra of their business, they could do as all good chemists now do, *i.e.*, cut short an immense deal of mere empirical experiment, by working equations out first, to prepare the ground. This would supersede some of the experimentation at once, and would gradually raise the biologist's mind to a higher intellectual level; and possibly—I only say possibly—the dead subject would then supply enough material, without experimenting on living animals. Some medical men say that this would be so; I see no reason to disbelieve their assertion. In the case of chemistry, it is, I know, good for schoolboys in vacation, to mess and muddle at random, and try their own experiments unguided by equations ; but a grown-up man who should pose as a contributor to the world's knowledge, while wasting time in such a way, would simply be laughed at. Yet, the chemist, by refusing the aid of algebra, would waste only his own time and a little non-sentient material. What to think of a man who deliberately prefers tormenting animals, to working equations first, so as to minimise the need for experiment, I really do not know; I cannot conceive his motives, or form any opinion about the abstract lawfulness of his acts.

I am too unlike such a creature, intellectually, to be able to judge him morally. But then, I contend, he is also too unlike me to be able to judge me, or my state of health, especially my health of mind. What is being claimed now is no less than this :

A is so unlike B that A *cannot* judge what is moral for B. But B is so like A that he *can* judge whether A ought to be condemned to incarceration in an asylum for using his brain in an abnormal manner. That seems very one-sided logic ! If I thought of vivisectionists as *creatures of my species*, I should say that they are wicked and disgusting, and that it is an insult to me to ask me to tolerate them. The only reason why I refrain from judging them morally is, that they do not seem to me to be, intellectually,

creatures of my own species; I should have as much right to judge, morally, the acts of gorillas.

What I have to say about the gorilla and the vivisectionist alike is, that neither creature is capable of understanding how I do use my brain, or of judging how I ought to use it.

So far as I understand, the opponents of vivisection wish that the instruction of pupils should proceed on lines of this kind. The pupil is to gain the mere material of his knowledge by inspection of dead material; he is to know the separate nerves, bones, muscles, &c., by dissection, microscopic investigation, and chemical analysis. Then he is to form his conception of their action on each other, in the living subject, by successive efforts of the interior synthetic faculty, aided, of course, by constant, slow, long-sustained comparison with natural living subjects. How much could be learned in this way no outsider can know; advocates of this mode tell us that all which is known at all about biology could be thus taught; but of that I am of course no judge. What we can judge of by means of the brain equations is that this process would not tend to induce false brain-action, for it is consonant to the normal mode of working of the human thinking-machine. Therefore, results so arrived at would be, so far as they went, knowledge, not delusion.

Those who teach by means of vivisection relieve the strain on the interior synthetic faculty by doubling the amount of work thrown on the directly perceiving faculties. Now that is exactly what I should do to a pupil if I desired to induce a hallucination—*i.e.*, a fixed delusion of supposing he knows something he does not know—of supposing something to constitute proof which does not constitute proof.

For the equations of thought are, properly, the equations of a machine whose normal working consists in a regular alternation between outer perception and internal synthesis, these two actions being commensurate in intensity and both applied to the same field of contemplation. As long as these rules of balance be observed, there seems no known limit to the amount of work the machine can do, and do without injury. But whenever either one of the modes of action much preponderates over the other, as also when the two modes of mental action are brought to bear on diverse fields of study, the machine is working contrary to its true nature, and is an unfit instrument for revealing truth. A long-continued habit of misusing the machine induces actual disorder of its powers.

The excuse for superseding by vivisectional demonstration part of the normal work of the internal synthetic faculty, in schools of physiology, is that only a small proportion of the lads

who enter possess the synthetic faculty in sufficient strength to do all the needful work. Supposing this to be true, it forms an argument, not for throwing on the observing faculties of all the lads more work than would be thrown on them by the non-vivisectional plan, but for diminishing it in the case of those particular lads. For, according to the equation, the two modes of action should be commensurate ; and any work done by one in excess of the other must tend in the direction of inducing a false feeling of knowing. In other words, if a lad cannot do the necessary synthetic work, he ought to be set to some mode of earning his living which does not require so much observation as is necessary for a doctor or biologist ; because he had better become a goldsmith or tinker who understands the material he works in, and knows the limits of his own powers, than a biologist who fancies he knows when he doesn't know. And also, if a lad cannot learn by synthesis, from some facts—if he must see *all* the facts with bodily eyes, how can he diagnose in the case of a living patient ? It does not seem to me proved that medical professors might not train the synthetic faculty into efficiency in a larger number of cases than they suppose. But it does seem to me proved that a course of instruction calculated to induce delusions has been introduced into medical schools and imposed on pupils who might otherwise have been truly scientific doctors, simply for the purpose of making bad doctors out of those inferior pupils who might have become good artizans, but who are spoiled for everything useful by a false appearance of knowing what they do not know, which enables them to take a medical degree.

Of course, all this applies, so far, only to the introducing of vivisection into schools, as a means of teaching to the pupils what the professors know already.

We now come to the question of vivisection as a means of original research.

When I was a girl—and that is a long time ago, now—I used to be told never to let any consumptive patient kiss me ; because my own lungs not being strong, I might catch the germs of the disease. I was told that most diseases are due to the growth of microscopic organisms ; that the germs of these organisms, falling on any human tissues, ought, theoretically to be destroyed by the superior vitality of human tissue ; but that in practice the human tissue may be weakened, or lowered in tone, either generally or at some point, and that, if this is the case, the germs may grow and propogate and produce disease. I was told that medical men in general were disgracefully ignorant of this true philosophy of disease, and that they remained so because they were occupied with

misleading vivisectional experiments, which prevented their understanding truth (that was before vivisectionists had pounced down on the germ theory and distorted it). One of the great errors ascribed by my early teachers to medical science, so-called, was that when it does get hold of a truth, it gets hold of it in some distorted way, and often in connection with some horrible hallucination about injecting virus into people's blood. Well, of late years, I have been hearing again some feeble little scraps of what I was told forty years ago about germs, brought forward as a new discovery, which could not have been made unless Koch and Pasteur had experimented on living animals. Whether any hallucination about injecting virus, etc., has accompanied the modern vivisectionist revival of the old germ-science, let those say who know the history of the famous stampede of consumptives to Berlin.

Those who taught me forty years ago made no pretence of having been the first to discover these things. They spoke of very old Hebrew books which, they said, gave the clues. A few years ago, some interesting Articles on diseases in meat, by Dr. Behrend, were published in the "Nineteenth Century" and elsewhere,* in one of which he says it is a great pity the anti-vivisectionists want to interfere with physiological experiment; but he says this, not on the ground that the followers of the Koch methods of investigation have found out anything new, but precisely on the ground that they have recalled public attention to truths known to Hebrews a thousand years or more ago, about the precautions necessary to prevent infection by diseased meat. In fact, the whole object for which Dr. Behrend writes is to try to make English Members of Parliament and medical men as anxious for cleanliness as Jew butchers have been ever since before the Christian era; and though he speaks with cautious courtesy of the British public, the point of his argument seems to be that, as English people are too stupid and unscientific to understand any argument for cleanliness unconnected with nasty experiments, it would be better to do the experiments than to let a stupid nation be weakened by consumption and fever. I have nothing to say about the relative morality of encouraging stupid people to breed disease germs in themselves and of encouraging them to breed disease germs in guinea pigs. We have to do with the intellectual aspect of the question. Dr. Behrend tells us that Koch says it is wonderful how those who drew up the Hebrew butchers' code anticipated his (Koch's) discoveries. What seems wonderful to me is that there

**Nineteenth Century*, Sept., 1889, and October, 1890. See also several Articles published at different times in *Jewish Chronicle*.

should be any tribe still left on earth so superstitious and ignorant that its medicine-men can hope to get any customers at all, while they do not learn to use that grand simple Algebra of the distinctive and dominant human function, which was used by many ancient biologists, and which gives the clue to many medical problems.

The Circassian preventatives for consumption and other diseases made by the traditional methods of treating milk, and known as "Kefeer," depend for their efficacy on the same principle as Kochine—viz., that certain vegetables of low order, when growing in animal fluids give off chemical products which fortify the human body against the growth of disease germs. Kefeer differs from the vivisectionist lymph-arrangements, by being cleanly, decent, and not cruel. It appears safer and more reliable than lymph. Whoever wishes to know the exact difference between white magic and black, between science and sorcery, and especially between *dignity* and *impudence*, should learn all he can about Kefeer and the lymph treatments : the difference is that between the sun which illumines successive generations and that meteor which Jesus saw falling into darkness and making as it fell a momentary flash of light.*

Please observe, I have not taken upon myself to deny that vivisection *ever* reveals any truths unknown before ; I cannot in all cases understand the nature of the evidence. But it is quite legitimate to point out that, in those cases where we can understand the evidence, we find that what has been lauded to the skies as new and valuable discovery which could not have been made except by vivisection, has turned out to be a mere distortion of some grand truth, known long before the supposed discoverers were born, and discovered by methods the nature of which is unknown to them. It is also fair to point out that such arguments in favour of vivisection as are intelligible to the non-medical public, evidently ally themselves with, and depend on, a peculiar mode of distorting the mind, which we consider very paralysing in connection with other sciences than biology. Whoever is trying to make himself believe that *his way of proving a thing is the only way*, is distorting within himself the distinctively human or logical faculty, and inducing the tendency to mistake for proof what is not proof.

In other sciences than biology, teachers have no direct bias towards inducing this paralysing form of mental disease ; they have no motive for it, except carelessness, hurry and stupidity. But wherever vivisection is in question, it seems bound to justify its own existence to its students and to the public ; and the way

*Luke x. 18.

it justifies itself is by ignoring the past history of science; by denying that any other mode of investigation ever has discovered, or ever could prove, the same truths. So that the same kind of brain mischief which teachers of other sciences do to their pupils only negatively and by neglect, is done in biology positively, actively, for the purpose of excusing vivisection. Look at it in this way: a man who does not care to study trigonometry, who prefers to measure the height of a tower by climbing to the top and letting down a plumb-line, may seem to me a clumsy creature; he can have but a limited range of discovery; but I should not dream of denying that his measurements may be accurate—probably they would coincide exactly with those made by a surveyor with a theodolite, though the latter could survey many mountains which the former could not measure at all. But suppose that any school of mechanics taught its pupils to deny that any person could possibly measure the height of a tower without climbing up it or pulling it down, what a set of ignorant, insolent, deluded men, mad of conceit, that school would turn out. This seems to me a parallel case. If, indeed, there existed any set of men who could honestly take about vivisection the same frank tone that I supposed my plumb-line man to take—suppose there were men who said to themselves and to the world: "We choose to study by means of vivisection, because that is the method which is *congenial to us*, because among the many ways in which investigation can be made we prefer that way"—suppose such men existed, I should really expect them to find out something true. I should not like them, but I should believe that truth might come to them. But no such men exist. No civilised country would allow them to exist and be at large. We have by common consent decided that men who profess to like inflicting pain are not wanted on this planet. Those who choose to do their investigations by inflicting pain are obliged, perforce, to try to make the world believe, so far as they can, that *no method but one* could possibly reveal certain kinds of truths.

The whole argument in support of vivisection rests not on the right of each man to be as nature made him and exert the faculties he happens to have—no one dares adduce that argument in this matter—but on the unscientific falsehood that certain truths, useful to humanity, could not be discovered by other men and other methods, if the men to whom those methods are congenial happened to be out of the way.

To return to the Koch germs, here is a specimen of the kind of logic which those who defend vivisection are accustoming the public to rest satisfied with. Consumption, we are told, is such a

curse that it is more than permissible, it is duty, to follow up any clue which presents even the slightest chance of diminishing the number of its victims. For, of course, only idealists like Dr. Blackwell dream of cure by sanitation ; a few wealthy people may live abroad ; average man must earn his living where he can, and die whenever the conditions under which he has to earn it prove fatal. The excuse for following up certain investigations consists in the hope of finding some remedy which can be used without any great cost, and which may avert the worst results of a generally unhygienic mode of life. If we could enable people hereditarily susceptible of consumption, to live in ordinary towns and do ordinary work, that, it is said, would justify almost any means that would conduce to such an end.

Now there exists a remedy for threatened consumption, known as lung-gymnastic or deep inhalation. Of course, like every other remedy, its good effect is increased by good hygienic conditions, but it can be resorted to under any conditions, and minimises the bad effects of wrong conditions. It costs nothing ; it can be used anywhere, and in the intervals of any kind of work, physical or mental. When once the habit has been learned, it can be applied either in bed, or even during work hours, and with no interruption to work. It consists, essentially, in deliberately practising the deep, slow, quiet breathing of a wild animal instead of the superficial and lazy mode of breathing into which civilised man falls. It introduces no drug or poison into the system. No one who has tried it for a month can have, I feel sure, a doubt of its strengthening effect on the nervous system and the brain. It would suggest itself naturally to almost any person accustomed to use the thought-organ according to its equations ; because it is related to lazy, superficial breathing in just the same kind of way that thinking, guided by the equations, is related to the scrambling process commonly called thinking. Medical men, both here and abroad, who have tried deep-inhalation, say that it has an actually curative effect in the early stages of consumption. But of course we have only their word for that ; its actually curative powers may be as great a delusion as those of Kochine ; but no one doubts its tendency to prevent consumption from beginning, in cases where it is as yet only threatened. If we ask why so few medical men in each generation insist on delicate boys and girls learining this heavenly means of strengthening the nerves and lungs to bear the strain of unhygienic conditions, the only explanation offered is that the learning of it would give trouble to both the patient and the doctor. So that we are driven up into this corner : The most speculative chance

of preventing people with diseased lungs from dying of consumption is worth keeping thousands of animals in misery for ; but the certainty of making many weak lungs strong, of eradicating the consumptive tendency from numberless families, of enabling many delicate children to grow up fit to bear ordinary conditions and do ordinary work, is *not* worth taking a little trouble about.

If that is the mode of reasoning developed by going through the long and costly process of getting a medical education, all I can say is, there is plenty of the same sort to be heard in any madhouse ; some lunatics can argue, in favour of cruelty and against taking reasonable trouble for normal ends, as glibly as any vivisectionist ; and, so far as I can see, the logic of the two sets is just about on a level.

I said that study by vivisection allies itself with, and fosters, a tendency to revert from the human to the Simian or apeish type. The equations of the human thinking-organ indicate a machine whose norm is kept by a delicate balance between two modes of action ; on one side all that belongs to the perceptional, investigational, analytic mode of mental action, on the other, synthetic action. We do not know the actual equations of ape-thought, but it is clear from external observation that, in the ape mind, analysis enormously preponderates over synthesis.

Now I do not mean that the discoveries made by vivisectionists —such as they are—could have been made without considerable synthetic faculty. Every induction from any group of observations requires synthetic faculty, and I should be sorry to deny that some leaders of bacteriologist and other vivisectionist schools inherited brains originally human, and even powerful—for true human action—from ancestors who used their brains in a human manner. But that is no proof that such men do not gravitate towards the ape type as they grow older ; such gravitation is very marked in many students of biology and other branches of so-called natural science, who, in youth, were capable of human logic. That is, of course, their own affair. As I said before, I cannot enter into the working of minds so unlike my own, or conceive the nature of the motives by which they are swayed ; I have no right to judge the morality of their self-induced degeneration. But when we find that methods of study invented by such men are adopted in biologic and medical schools to which parents send their boys and girls, and from which students come forth to act as medical advisers or teachers of natural science, to other human boys and girls, we see that it must be right to warn the public of what is going on. A leader in any branch of science must, as I said, have had synthetic

faculty to begin with, and must use it to make the synthetic inductions necessary for creating any sort of method, even a bad one ; but those who merely imitate his method do not balance the overwhelming quantity of analytic investigation which the use of the method envolves, by any of the synthesis which goes to the creation of method. Their work consists almost exclusively of imitation, and analytic or destructive investigation. What the creatures are whose mental activity is a combination of imitation with destructive investigation, unbalanced by the use of the synthetic faculty, anyone can find out who will hand his watch or spectacle case into a monkey cage in the Zoo, and study the subsequent proceedings.

Scientific method always involves first putting aside certain elements of a subject in order to give exclusive attention to others *and then recalling the excluded elements.* Obviously this recalling must be done before exclusion has lasted long enough to destroy mental elasticity. The true surgeon, when once he has decided on cutting off a limb, must of course, during the operation, think of nothing but performing it successfully. But between his operations, he must keep up the habit of thinking of his patients as wholes, as human beings, and not as mere subjects for operation ; otherwise he would lose mental elasticity and power of scientific grasp. Now a certain amount of vivisection is no doubt done under similar mental conditions ; the operator believing that it is good on the whole to put out of his mind *for a short time* all considerations of every thing but the question he is investigating. But to be *brilliantly successful* in physiological investigation, it is necessary, we are told, to cultivate "a habit" of thinking of the subjects as mere material for science, to avoid letting the "excluded elements" (the creature's personality, etc.) come back into consciousness after the operation is over. Such destruction of mental elasticity involves reversion to the brute type, and injury to the most essentially human factor in mental action, the synthetic re-assembling of successively excluded elements.

I think this opens up one hopeful prospect for the future of science ; and I must beg those who approach this subject too much from the moral and emotional side, and have not given enough heed to the claims of science, to bear with me while I point out to them one contribution which the vivisectionist school seems likely to make to the intellectual life of the world—a contribution so valuable that I doubt the right of moralists to interfere to prevent it on mere grounds of sentiment.

The dog and horse, however intelligent, are useless as servants to man, except for rough work, by reason of their lack of fingers.

The ape has keen analytic fingers, but he cannot—I mean the furry ape evolved by nature cannot—use tools; because, to invent tools or to start using them requires synthetic faculty. But when once creatures possess the power to use tools, it might be kept up in the race by exercise and judicious selection, while the synthetic faculty itself might die out. So that if we could induce a few families to spend their lives as imitators of bad methods in biology, for several generations, we might produce a race possessed of human vocal organs and human skill in mere analytic investigation and the use of destructive tools, but utterly lacking that synthetic faculty which makes human servants troublesome at times, because they feel themselves the equals of their masters. No creature quite wanting in synthetic power imagines himself the fellow-creature of one who possesses it; these new human-descended apes would no more dream of thinking for themselves than their furry mental congeners in the Zoo do. Besides, they would be kept docile by selection; cruel and rebellious specimens could be weeded out. There could be no public interference, for the biologists are saturating the public mind with the notion that *all* inferior creatures, however sensitive, are to be used without scruple or mercy, in the interests of any fad that happens to be called science, and at the irresponsible pleasure of whoever chooses to call himself scientific. So you see there would be nothing to hinder our descendants from killing off inconvenient developments in the new breed of apes as they pleased. Only think of the delight in store for the scientific men who should be privileged to watch the gradual development of this interesting induced degeneration! To me, indeed, there is something repulsive in seeing, as we so often do see, the thin, rapid, superficial monkey-type of inquisitiveness gradually superseding the truly human and logical mode of inducing knowledge. But, of course, the foolish prejudices which make me feel the spectacle of mental degeneration painful to witness will have given way, in a few centuries, before increasing light and the general spread of knowledge.

And then think how useful it would be to have slaves, mere chattels, gifted with keen observing power and the inherited habit of making minute dissections!

I often picture to myself a scientific observer of perhaps a thousand years hence, and follow him in the course of his day's study. I see him in fancy, as he goes first to his menagerie and hears reports of the conduct and progress of the junior members of his human-descended stud. Such as have been found persistently insubordinate he sends first to the lethal chamber and then to the

dissecting-room, to be cut up and investigated by their more intelligent relatives. (Not even in a day-dream can I conceive that they would be vivisected ; for wherever the *Art of Thinking* is cultivated, even in our more clumsy days, we find the rule in force, that pain-causing experiment is to be tried, first on the leader or teacher ; and then the most intelligent and docile pupils are rewarded by being allowed to share the Master's cross. This limits experimentation to—*what willing and intelligent disciples are willing to undergo.*)

The biologist of my dream sends such of his slaves as he approves of to their several duties, to collect observations in various departments ; while he makes up a synthesis of some reports of previous investigations. When he has finished, while waiting for fresh reports to come in, I picture him sitting down to refresh himself by reading in some history of biology, a chapter on the Vivisection controversy in the nineenth century. As he finishes the chapter he closes the book, and looks up towards the setting sun, and in fancy I hear him soliloquising thus :

"Truly the Almighty Disposer of events is more far-seeing than we ! Had I been one of the few scientific men, in those benighted days of empiric absurdity, I too should have lifted up my voice in protest, as my precursors did in those days. I should have shrunk from the spectacle of any creatures of human descent degrading themselves by using their brain in a manner flagrantly contradictory of the human equations. Had I been master then, our present most valuable cattle would never have come into existence. But since the stupidity of their ancestors, over-ruled by the Wisdom of the All Wise, has provided science with the help of creatures which no scientific man could have dared to desire to see evolved—creatures enough like ourselves to be of use to us, but too hopelessly inferior to us in the quality of their intellect to be able to defend themselves against us, let me use the gift with reverent caution, remembering that to whom much is given, from him shall much be required. Let me rejoice but with trembling, knowing that if I am false to the great Unity-Law which presided over the evolution of my own superior intelligence, I may be punished in my turn by the loss of that synthetic faculty which alone differentiates me from my cattle, the scalpel-using apes. Let me never be tempted to forget that the whirligig of time is sure to bring round his revenges ; because the One Great Pulsating Avenger is always and everywhere King ; and verily the earth may be glad thereof !"

PART II

THE UNITY-LAW
(*Read before the Christo-Theosophical Society.*)
THE NEGATION OF IDOLATRY
(*Read before the Christo-Theosophical Society.*)
THE RELATION BETWEEN INTELLECT AND INTUITION
(*Read before the Christo-Theosophical Society.*)
A RIFT IN MODERN THOUGHT
(*Read before the Christo-Theosophical Society.*)
A SCANDINAVIAN IDEAL
(*This was read before the Christo-Theosophical Society. The substance of it appeared in "East and West" (Bombay), Oct.* 1909.)
OUR INTELLECTUAL RELATION TO THE UNSEEN
(*"The Unknown World," Dec.* 1894 *and Jan.*, 1895.)

THE UNITY-LAW

Read at a meeting of the Christo-Theosophical Society

THE subject on which I am to address you to-day is not a speculative or theoretical one; it is the ascertained and mathematically-proved working-law of the machinery by means of which man has to do such thinking as he does: Universe of thought equals Unity. I do not propose to enter on the mathematical evidence; it is to be found in works to which I shall be happy to refer any one who wishes it.

The mathematical discovery was not made till the world was nearly ready to perceive the Law itself independently of mathematics; the mere statement of it evokes a cry of welcome from many persons now; and especially such persons as are mostly to be found in this room; and probably none of my present hearers fail to feel that there is something attractive and half familiar already, in the statement that the Equation, "Universe of Thought equals Unity" expresses the working-law of the machine wherein man's mind is imprisoned. Or rather, I should have said, not "imprisoned" but "enshrined." A thinking-organ whose working-law is Universe of thought equals Unity, is, so far as that goes, not a prison but a fitting home and shrine for the soul which is the child and heir of The Creative Unity. If our human personality ever becomes a prison to our minds, it is

because we have made it so by ignoring the true Law of its action. I feel sure that your assent goes with me as I speak, so far. And indeed I almost wonder why I am here to speak to you at all. What can I tell you, which you could not find out for yourselves ? —Nothing.

Nevertheless, the mere *habit* of consciously referring to any Law of Nature, even if it does not increase one's conviction of its truth, does alter, to some extent, one's perception of its meaning and of its bearing on life. If, forty years ago, when I first read the mathematical evidence for the great Unity-Law of Thought, anyone had said to me what I am going to say to you presently, I think it would have saved me the trouble of trying certain wasteful experiments and of making certain mistakes. Forty years ago there existed no one who could have said it ; because no one, then, had had a life's experience of referring to the Unity-Law, in small things as in great ones, as the one all-sufficient criterion of sane thought. In that forty years, the Unity-Law has passed, for some of us, from the condition of a wonderful revelation to that of the unconscious constant underlying all conscious reasoning ; the axiomatic underground basis on which conscious thought is built.

I must beg the indulgence of those who are not interested in technical Logic, while I say just a very few sentences about the change introduced by mathematicians into logical process.

Logic was formerly supposed to be an instrument for finding out truth ; mathematicians called attention to the fact that it is nothing of the kind, but a revelation of the working-laws of the machinery inside of us. All that we can know about other things, we find out by the use of that machinery; Logic enables us to test, at each step, whether our seeing-organs are in a fit state for seeing truly. Logic is neither a telescope nor a microscope, but an ophthalmoscope, it in no way extends or intensifies our natural vision, but only tests its power and sanity ; if our seeing machinery is not working rightly, Logic shows us in what direction and to what extent we must discount our perceptions.

The old Logicians seem to have assumed that man, by direct perceptions, will arrive at correct premises ; and then, given the premises, Logic was supposed to get out of them their legitimate conclusion. But in the first place the conclusion, if valid, must necessarily have been in the premises to start with ; and therefore the mere fact of getting it is useless. For instance, take the syllogism : "All dogs have tails ; Carlo is a dog ; therefore Carlo has a tail," we could not know accurately and absolutely that *all* dogs have tails, unless we had inspected all dogs, Carlo included.

In the next place, the chief reason why we need Logic at all is because man is so very likely to get his premises wrong to begin with. It is quite possible for even a very learned man to believe as solemn truths premises which are mutually contradictory. And what we want with a system of Logic is, not that it shall spare us the trouble of looking to see whether Carlo has a tail, by encouraging us to jump to an unwarranted conclusion about Carlo from a hastily formed opinion about "all dogs," but that it shall shew us when we are believing incompatible premises to be true. And that is what the Calculus of Logic does far more effectually than the old *Barbara, Celarent* formulæ did.

The working of the Calculus of Logic is very simple: Suppose we are making observations on a flock of sheep: whichever Logic we use, we may classify them by mere external observation into, say, white and not-white; into, horned and not-horned; into woolly and shorn; into male and female, and so on. If we are using the old Logic we write down just the data we have observed. We then make successive syllogisms between these data. If our observations were right, our conclusions come right, but if they are wrong the conclusions are fatally, helplessly wrong too. But when we use the mathematical formulæ, we first write down all the observed data; and then another set, viz: White + not white = 1, Horned + hornless = 1, Woolly + shorn = 1. Then we try to combine the two sets of statements.

If they will combine, we work all the results out by one process—a process as easy and mechanical as a child's sum—and the answer comes out, with all the conclusions in a row; and beside them a neat and compact indication of all the points where the data are *incomplete*. But if the observation-data and the Unity-data *won't* combine according to the rule, then we know that our observation data must have been *wrongly observed* somehow.

Perhaps this is a needless precaution, in the case of the sheep; no system of Logic is needed to find out whether a particular woolly sheep has horns or not: (though people do occasionally form wrong impressions even about such simple matters as that). But when we come to deal with great masses of data in commerce, political economy and finance; and still more with such subjects as theosophy and religion, sociology and ethics, we do emphatically need some correcting-system; not in order to get the result from the premises, but in order to show where our apprehension of the data has been inadequate or self-contradictory, to start with. Mathematicians have proved that if we mingle with our observation-data that other set of data which I have described: x + not-x = 1, y + not-y = 1, etc.,—statements, each of

which simply treats as a Unity the whole field we have been classifying, the mere presence of these Unity-data acts as a test, and automatically shows where our observation-data are inadequate or contradictory or imperfectly stated.

Whoever wishes for the mathematical proof of this, must, as I said, read mathematical books. But the working of the principle is simple. That indeed is the reason why the new Logic is not taught in schools ; a very few lessons from one teacher who uses it, would enable children to detect fallacies in the statements of other teachers ; and the schools would be (as Heads call it) "knocked to pieces" by sheer force of the children's power to detect sham-knowledge. In any family where the parents wish it, children can be taught, without the consent of school-masters, in the vacations, in play ; without feeling that they are doing any "holiday lessons" at all ; but most parents are afraid to develop insight thus ; lest the children should not be popular at school, at college and in society ; because they *must* give their children such advantages as are to be got from being "like other people." For of course the two most important things to aim at, in organizing a child's life, are, first that his pedagogue shall not be made to feel small ; and secondly that the pupil himself shall be "conformed to this world," and prepared to play a part in that vulgar Comedy of Errors called Society. If, in the process, he loses the insight which Nature gave him, he can, in later life, fill up the gap by adulterating something, or cheating somebody, or torturing something or persecuting somebody ; so of course he is just as well off as if he hadn't had his mental eyes put out.

There are, however, a few branches of business, such as chemistry and actuaries' work, in which a man's success in life depends not on his persuading himself and the public that he knows a great deal, but on his being able to ascertain the precise point where his knowledge ceases, and his ignorance begins. A few men engaged in such kinds of business have taken up the new Logic and given to it a wonderful development. I have heard one of these gentlemen speak of arranging in a few minutes, and with complete accuracy, a mass of data about International Trade over which one would have to fumble for some hours, on the old plans ; and not be quite sure at the end what one had arrived at.

Now we have done our duty by the question of technical Logic, and may pass on to that aspect of the subject which may be called biologic, psychologic or ethical.

Men like Babbage, de Morgan, Gratry, and Boole were not satisfied with merely inventing an intellectual method ; they asked themselves—What did this thing which they had done, mean ?

Why does one's Logic come right when one treats white sheep + black ones as a Unity ?

There is nothing in the nature of *arithmetic* to make some black things + some white ones = one thing ; as a statement of Arithmetic it is simply not true. There is nothing in the nature of *sheep* to cause any special union or unity between those which have too much wool and those which are shivering with cold because they have just been shorn. No sort of fence we can construct possesses the power to make such animals as we may please to enclose within it fuse into one organism.

The formula x + *not-x* = 1 is not the equation of any set of facts which man has discovered outside of himself ; when we add it to our observation-data, we are adding to them the equation of our own thinking-machinery ; which is always operating untruly to its nature and therefore going wrong, unless its operations satisfy the test-equation ; Universe of Thought equals Unity. That was what De Morgan and George Boole found out between them, and what Gratry found out independently : that the general equation x + *not-x* = 1 is the ultimate test of Truth for man, because it constitutes the arithmetic of the human thinking-organ and the key to human psychology.

In short, this, so far as I understand, is what the four great Prophets of Mathematical Logic have to say to us :

Syllogism can reveal nothing ; because any conclusion, if valid, must have been known before the premises were stated. *Observation* does not reveal Truth ; because man is so very liable to perceive facts erroneously. Observation is not the *source* of truth but merely one of the stimuli or springs which start man's truth-perceiving machinery into action. Truth comes to man *from* some region inaccessible to our observation ; it comes *through* some organ, the working Law of which is Universe of Thought = Unity ; and Logic is the test by which we can judge whether the machinery, as a whole, is functioning properly, whether the observations are being correctly made ; and whether the observing-faculty and the revealing-faculty are acting harmoniously on each other.

Every sense organ is used in acts of discrimination ; the eye is constantly occupied in distinguishing one colour from another ; the ear distinguishes mere noise from true musical note ; the palate selects food from other substances, so also the organs of nutrition are constantly employed in processes of selection and rejection ; choosing out from what we have swallowed the elements we need, and dismissing others.

Then there are even some portions of our mental organization, such for instance as the *attention*—perhaps there are in truth some

portions of the brain—devoted to the work of discrimination; and there are faculties of spiritual perception, and faculties of moral discrimination.

But in the midst of all, sits the faculty which should be Master of all, the faculty of reasoning, of *Thought*; and this faculty is subject to one working-law: Universe of Thought equals Unity; and it has one special function: seeing as Unity the contrasted elements provided by the other faculties for its contemplation.

Man may be described as a bundle of lines or chains. One end of each chain ends in some discriminating organ, and all the chains are gathered together by their other ends in an organ whose function is the re-unifying of discriminated elements. The vital action of thought consists in re-unifying contrasted perceptions. It is the business of the nervous system, somehow to keep these two sets of actions going and to keep them in their true relation to each other. The best way that I know of for forming a conception of educational method, is to draw a picture or a diagram of the working of mind, thus: From a central organ (O) lines proceed, leading to sense organs (A. B. C. etc.) and to mental perceiving, discriminating, classifying organs (a, b, c,). The function of O is to conceive Unity among elements perceived by a, b, c, A. B. C., as contrasted. The action of A. B. C., a, b, c, etc., seems to expend brain force. O seems to be connected with some organ, which is set to work by action at O, and whose function is to pump in force to the brain.

A thought current which has to pass from A to B, or from a to b, if it passes directly seems to act somewhat as an electric spark does when it jumps from one conductor to another; whereas when thought takes the normal direction A, O, B, or a, O, b, its course seems to resemble that of an electric current passing up and down along the proper channel. In an animal, or a child left entirely to itself, action at *a* would probably, as a rule, cease in some harmless way before action at *b* begins; only in case of accidental interruption would any jump occur. But education applies artificial stimulus to the outer faculties; and, moreover, takes the pupil from one lesson or occupation straight to another. It is therefore of great importance that, till good habits have been formed, in the pupil's mind, the teacher should be careful to close each lesson and prepare for the next, by a few words which point to some common quality between the persons or things which the lesson has been contrasting.

To illustrate this I must fall back on the same kind of agricultural illustration which I used here once before. A man who has to till a field must carefully discriminate crop from weeds; he

must do this work with his fingers and also with his external attention ; but in order to prevent his work from stiffening and degrading his mind, he should often meditate on the Unity of Plant-life. If he allows the unifying tendency to govern his fingers, if he mechanically gathers into his basket Spurge-weed along with his Spinach, and cooks both together, he gets poisoned. If he fails to attend to the difference between them, his outer mental faculties are injured as well as his stomach. But if on the other hand he allows the contrast to dominate his reason, if he neglects ever to meditate on the general principles of Vegetable growth, if he never reflects that the weed is as much an exhibition of Creative Wisdom as the crop, he becomes the kind of stupid degraded agriculturalist for whom Nature has no other beauty or value than what his pigs can perceive as well as he.

And if he really desires to make of his brain as good an instrument as it can be made, he should habitually think of the Unity of Plant-life for a few moments on his way home from work (whenever he has spent the day in weeding) before he proceeds to any domestic duty or evening study which will fix his mind on any fresh contrast between any set of things.

The trained logician performs this recuperative gymnastic instinctively, from that habit which is second nature. On closing a one-sided History book, in the very act of finding and opening the text-book of his next hour's study, he wonders whether there was not, after all, in the men on both sides, a good deal of those mixed motives which constitute what is called human nature ; and so on. But with untrained children, as soon as we begin putting on them pressure which prevents natural recuperative sequence, we should never be satisfied without providing some efficient substitute adequate, not only to provide for natural demand, but also to meet the extra strain which we are putting on the discriminating faculties.

It seems to me that most discussions about Education are vitiated by one great flaw ; Educationalists seldom recognise the proper inter-play of the two actions. They know that a child must be taught to see clearly the difference between some things ; and they know that he must be taught to see the Unity between some other things ; but they do not, in fact they dare not, realise that the process of sound thinking consists, emphatically, in seeing Unity where one has already perceived contrast. It is simply a farce—now that we know the law of man's reasoning organ—to dignify anything with the name of Education which does not provide constant opportunities for the human *reason* to say "x plus not-x form a Unity" : and that about some x which

the mere human perception has seen sharply contrasted with the not-x.

There is not the least practical difficulty in doing this. There is no reason why any intelligent man or woman should not learn, in a week, enough to make the test-equation of the thinking organ the norm of his or her business: as a teacher, or as a sick-nurse in cases where the nerves are disturbed; or for the judging of the precise amount and kind of delusion a patient may be suffering from. The only difficulty now in the way of its quite general use, consists in the fact that it leads to consequences startling to good people who claim the right to form judgments about things they haven't studied and don't understand. Many a teacher has begun to get a glimpse of what the Law really is; and shrunk back not daring to look any longer, knowing that, if he does, he must soon find himself doing things that will put him in conflict, not only with the Examiner, but, what is much worse, with that rampant Philistinism which goes about clutching to its breast a bundle of mutually contradictory opinions, which it persists in considering as sacred axioms apparently under the impression that cut-and-dried falsehoods become a living moral sense, if one only hugs them close enough to one's heart. The Examiner is made the excuse for much dishonesty in teachers, for which he is in no way responsible.

The average parent, and therefore of course the average teacher, says pompously: "We must impress children with the essential, eternal difference between *good* and *evil*, else they will not care to be virtuous." Such teachers only repeat the blunder of the farmer who tries to give to his apprentice blind, stupid prejudices against "weeds" as things which have nothing in common with the crop and are unworthy of being interested in. The boy who takes an intelligent interest in weeds as parts of the great Vegetable Kingdom, is not at all more likely than the prejudiced one to grow spurge instead of spinach, and if the lads find themselves in later life in an unknown and wild country, which of the two is least likely to poison himself then? which will make the best farmer there? The man who is accustomed to think all plants equally good, abstractly, in the sight of God, is not more likely but less so, to take into his own stomach or to be a party to any fellow-man putting into his stomach, the plants that are out of place just there. So it is, I feel sure, with moral poisons and weeds.

I do not believe we shall ever rid our neighbours or ourselves of the danger of poisoning human life with what are called vicious *practices*, that is to say with acts unfit for man to do, till we have learned to cultivate profound reverence for the impulses under-

lying those practices, as an organic part of the method employed by the Creator. What we need to take this great leap, is only moral courage; for intellectually all thinking persons know the law. Male and female are complementary polars and capable of fertile union, and in that one fact we have a picture of the general Law of Thought.

Working-men and masters used to be divided by an absolute barrier of Caste; but for the last 1800 years we have allowed preachers to tell us that rich and poor are "One in Christ." And nowadays we are beginning to see that even the Christian and Heathen mind can fertilize each other; yes, and even that there are links between man and the non-human Creation. But that what a man thinks good should ever join hands within his mind with what he thinks evil—no, no, no—never, never, never! say the moralists. But the truth however startling, will have to be faced, sooner or later; and perhaps it will seem less terrifying to us if we calmly reflect what it is that we are being asked to accept. Mathematical Logic does not ask us either to eat poisons or to commit crimes; it neither confuses virtue with vice nor classifies spurge as a species of spinach; it no more implies good and evil to be morally indifferent than it asserts 6 plus 10 to be arithmetically 1. But it does repeat and emphasize the warning given by all History: that there is no reliance to be placed on the mere dicta of *any* of our faculties of perception, classification, or discrimination, whether these be physical, intellectual, ethical or spiritual; that each of these faculties is liable to form impressions contrary to facts and irreconcilable with each other; that they are all linked within us to some higher faculty, the nature of which escapes our observation and comprehension—about which higher faculty no man as yet knows anything, except that it has for its function the incessant correction of the dicta of the perceiving and classifying faculties, and for its one sole correcting method, the unification of the elements which the classifying faculties have contrasted.

Mathematical Logic repeats the solemn warning of religion that *whatever* is not faith in the Unity is morally sin and intellectually blunder; that using the unifying faculty regularly, in response to, and check upon, every mental act of contrast, is the best way to form true judgments, in commerce and finance, in arithmetic and agriculture, in botany and theology, in medicine and in ethics alike; and that refusing to use it at any point can lead a human thinker no whither, except to some compartment or other of that limbo of error for which preachers have invented the name "hell" but which in scientific parlance is called "hallucination."

Dr. Elizabeth Blackwell said lately: "Everybody has gone mad about healing, and nobody cares about *health*." And it reminded me of what was said by James Hinton: that most of what he read about Ethics and Philanthropy seemed to be written by people who would keep up diseases rather than deprive mankind of the pleasure often experienced from the mere relief afforded by palliation.

The normal action of the human reason being to conceive Unity where the external attention and superficial sensations have been perceiving contrast, the healthy condition for man must be one in which the mere fact of one end of a nerve chain perceiving: "This is x; that is not x" starts, at the other end, the instinctive reflection. "This X and that not X form two parts of a Unity." This condition then is the ultimate goal of all efforts for the good of mankind. Moral sedatives and intellectual stimulants may be necessary because of moral illness; but we are on a wrong road whenever we lose sight of the ideal of health, and become content with any condition which affords an excuse for palliatives, and make-shifts by rendering them necessary, and I fear that among people who care about moral questions at all, there are very few who are not sometimes guilty of doing something to discourage man's return to health, in sheer terror at the threatened abolition of some form of make-shift which has been rendered necessary because of man's disease, but which must be discarded as he recovers health. Breathing or digestion may become difficult and painful and may require artificial assistance but we recognise any such condition as a proof of disease; and we should think of it as a proof of disease when we do not find it easy and pleasant to conceive of any pair of contrasted polars as forming a Unity.

This normal action of the brain should be, and often is, even physically health-giving and pleasurable. But to be so it must have become to some extent habitual; have fallen into the category of the sub-conscious activities. An infant's first breath is a spasm; so is, in some cases, a man's first perception of the Unity-Law. The first few attempts to use vigorously a long-bandaged muscle are horribly fatiguing; so are often the first few attempts of a long-prejudiced brain to conceive Unity among contrasted perceptions. But the natural play of well developed lungs and of regularly exercised limbs makes mere existence a physical delight; and so does the natural play of a well trained unifying-faculty. It is amazing, too, what a quantity of work those can get through who have learned so to correlate unifying work to discriminating work that the former takes the place relatively to the latter of re-creation.

Now I am going to suggest something about which I have no right to speak positively, not being a doctor. I believe that what are called *vices*, such as the gambling fever, the abuse of alcohol and other drugs, and also the abnormally excessive craving for some physical sensations, in themselves natural, are the results, at the outer end of a nerve chain, of the whole chain being defrauded of the proper share of force which should have come to it from the Reason end. The formation of a vicious habit means, I think, that the nerve, always underfed with vitality, chronically cheated of its fair due in the shape of force which should have been transmitted from the Unifying Organ, has clutched at the foreign irritant which seemed (though falsely) to promise the supply of its chronic needs. I think that if a man has *a habit* of pumping life into all his nerves by the steady use of his Unifying Organ, he not only needs less of any drug to produce any desired effect, but he can on emergency take just as much alcohol, morphia or chloral as is of immediate use, and will leave off taking it as soon as it is no longer of use.

I offer this suggestion to the consideration of any student who may think it worth investigating.

But there are sinful acts which are not vices ; that is to say they are violations rather of our complicated relations to society, than of any laws of our physical nature. The habit of invariably uniting contrasted polars certainly diminishes the temptation to these acts. The ethicalizing tendency of any religion consists indeed mainly in such unifying tendency as it may possess. I don't like a man, therefore, quâ animal, I incline either to avoid or to injure him. But my *religion* orders me to think of him as a member of the same Church or as a "brother in Christ" it "creates a bond" in spite of the first sensation of antithesis, which is so far good. But it may be as well to point out that, in most religions, the unification depends in some way on the emotional end of the chain. It seems to be more in accordance with the true nature of man to leave the emotions antithetic where it is natural to them to be so ; and to aim at making unification within that Holy Place which is accessible only to pure reason ; leaving this rational unity to control the emotions at its own pace and mould them gradually into its own likeness. I do assure you that, when one has formed a steady habit of unifying all contrasted polars, the mere fact of feeling a strong *dislike* to a person may create quite as strong a tie as that of family or of affection, a tie so strong that there is no necessity for strengthening it by any local emotional considerations whatsoever.

And supposing one has fallen in love (as it is called) with a person

when it is impossible or inadvisable to marry. The grandly vivid contrast in which the object of personal affection stands out from all the world beside, creates, in one's mind, a gorgeous vision of the unity between him (or her) and the rest of the world, in the glow and delight of which the minor question whether one is or is not to have familiar personal intercourse with that individual, becomes comparatively insignificant.

In saying this, I am not merely speculating ; I speak of what I do know and testify of what I have seen. The great Legislator who formulated the code called the Ten Commandments, forbidding us to kill the person we don't like, to make love to the person we do like if doing so would disturb the harmony of our own or someone else's family arrangements, or dishonestly to covet our neighbour's honestly-earned possessions, prefaced all these prohibitions with the solemn command, given in the Name of the Eternal Unity : Thou shalt have no other Gods before Me ; by which He meant, I think, not to exalt the special Eidolon or fetich of his own little tribe, Israel, above the fetiches of other tribes, nor to inculcate nor to prohibit any special mode of theological belief or of pious aspiration ; but rather to give to his tribe perennial vitality by enjoining that among them, no form of conception shall be so dwelt on, no sort of emotion so indulged, as to interfere with the frequent and complete return of the mind to that Eternal Unity, from Whom all our conceptions and emotions come, each produced by some limitation and accompanied by some error ; and in Whom they must all merge, if we are to preserve ourselves free from distracting and insane desires. Later Moralists, who, while professing to follow Moses, have dissevered the so-called practical Commandments from that true biological source of moral force, reposeful meditation on Creative Unity have always found themselves struggling desperately to produce, in some artificial and not quite healthy way, a few of the outer symptoms of Unity : as any one may notice who watches the societies which have for their object the suppression of the various vices. We see the same abnormal tension on mere *symptoms* of virtue, in what are called well-regulated homes and schools. See how much is sacrificed to prevent friction among the individuals who have to live together, and to avoid the sense of mutual divergence arising. That is what is called making the household, or the school, a Unity. This is no doubt pleasant and convenient ; it sheds, as the Psalmist said, a perfumed ointment over life. But, the *first* necessity of life is not scented hair-oil ; but internal vitality. " 'Tis *life* of which our veins are scant ; more life and fuller, that we want." And the vital action, for man, is to conceive Unity

where he has been perceiving antithesis. That is a very different thing from preventing antithesis from being perceived.

It is hardly too much to say that in many homes all moral honesty is sacrificed to the business of procuring the titillation of agreeable contact at the outer ends of the emotional chains ; and at school, all vigorous intellectual action is subordinated to the business of securing what is called *esprit de corps*, which means chiefly the pleasant contact at the outer ends of the *intellectual* chains. For that higher relation, the only truly and specifically human one, which is made at the *inner* end of the nerve chains, teachers as a rule seem to care very little.

The strange inability of average man to conceive the true nature of the Unity-Law becomes more manifest when a society is started for the express purpose of illustrating that law. The world seems disappointed when it finds that such a society does not "tell us what we are to believe," nor "stir us up to attack any evil in particular." But any society which possesses a form of belief is necessarily selective, and to some extent therefore narrowing, and any society which combats a special evil is necessarily aggressive and to some extent hardening ; or in other words, all such societies fix one's mind on certain data, and give comparatively little encouragement to the great vital process of incessantly correcting the premises by the Unity-Law. The use of a society for unification should be to act as counterweight to, or re-creation from, all societies for doing or believing; to restore the *vis viva* or moral energy which these societies, however valuable, must tend to exhaust ; it should therefore make no appeal to the selective ends of our nerve-chains, it should not aim to alter existing lines of cleavage, by substituting others ; it should place one in contact with persons with whom one has hardly an idea or purpose in common ; and say : "You X, and you not-X, the duty which binds you to each other is of higher obligation than any bond which depends on common beliefs or feelings or preferences." But so utterly at sea is the public as to the meaning or use of this, that one always finds a Unity-society driven, by the sheer pressure of its nominal adherents, into setting up a specialist line of its own, and becoming an imitator and rival of the "doing" and "believing" societies, instead of a counterpoise to them. It is a pity when a society, intended for Unification, fritters away, in an idle chase after artificial agreement in opinion, the valuable opportunity it has to offer for practice in the Art of Unification of complementary polars. For I do think mankind is throwing on the selective, affectional, sensational, and other perceiving faculties, far more than they can well bear of the strain of keeping us morally in

order ; strain which the non-affectional Unifying-organ could, if well trained, bear far better.

But not only so, we are throwing on the perceiving and emotional faculties far too large a share of the business of providing amusement for us and keeping life pleasant and happy.

If we are getting our mind to act habitually in accordance with the Unity-Law, life—mere life—grows more interesting as it goes on. Sources of enjoyment dry up, of course, one after another, as one grows old ; but if one's brain is accustomed to obey its normal law, these are replaced successively, by other sources of keener enjoyment. New avenues of amusement, of delight, open as the former ones close. And a good deal of the astonishing generosity of certain Unitary Philosophers, generosity, not only in dealing with pecuniary matters, but with possessions to them far more valuable, has really been the easy liberality of men so surrounded by sources of delight that allowing one or two to be closed was not an appreciable sacrifice.

I once nursed through his last illness a man who had devoted his life to the study and practice of the Unity-Law. His outer mental faculties had been for many months decaying, so that he had been unable to carry on much of his ordinary external work ; and the machinery broke up at last with physical symptoms, usually accompanied, the medical men said, by violent and painful delirium. They were much puzzled to find their patient calm and rational to the last ; certain mental faculties were totally disorganized, but he knew how to suspend the action of those which were so, and the exercise of the Unifying faculty kept him, to the end, in a trance of child-like enjoyment. By watching that case—the quiet enjoyment of the patient at seeing distinctions deliquesce, and the bewilderment of the medical men at *not* seeing the suffering they expected—I could not help feeling that death is in reality the great crisis of Unification, the Festival of the Unity, celebrated by the destructive sacrifice of all the faculties of perception ; and that what doctors call delirium, in such cases, is due to the fact that the whole strain of existence is being thrown, suddenly, on a unifying faculty, which ought to have been prepared for the crisis by a lifelong practice, but which has, instead, to take up its work suddenly, in a kind of convulsion.

But to prevent mistakes, let me say here, emphatically, that the destruction of the time-sense, and of the faculty of discrimination should take place *only* at death. The vice of all mystics is that, instead of encouraging healthy interplay between the contrasting and the unifying faculties, they try to weaken our *sense* of antagonism, to produce, prematurely, the quiescence of death.

The more I visit the insane, the more convinced I become that physical disease of the brain is *not* a cause of insanity, but only the permitting condition, which makes manifest the virtual insanity previously existing, by preventing it from concealing itself in a quasi-orderly mode of conversational life and talk. Insanity itself is due, I feel sure, to habits of wrong relations between the unifying and the discriminating ends of the nerve chains. If once the right relations were established, disease might produce many forms of external, mental impotence; but there could be no insanity, because the well-trained unifying faculty would always be able to order any diseased faculty to cease from acting.

The enormous overweight of work which we are throwing on our discriminating faculties by not daring to trust to the unifying faculty, strikes one about every kind of discussion. See the amount of tension there has been over the question whether it is of most consequence to man to keep his physical machinery functioning freely and regularly according to its true nature, *or* to store up for himself intellectual powers and pleasures! The question has no meaning, except at the low level of that kind of study which alone *can* interfere with health. The highest of all intellectual delights, the greatest culture of the intellectual powers, those given by the habit of unifying contrasted impressions, are compatible with the fullest attention to physical health; and the pursuit of them tends, of itself, to regulate and harmonize, not to disturb, nervous action. Gratry says very truly that when the habit is once well formed, it goes on, thoroughly and profitably, during sound and refreshing sleep.

Then again, see the amount of passion that has been expended over the distracting subject of "Altruism." Many popular tales written for edification seem to point to the moral, not only that if a thing is good to do, it is better to do it for someone else than for oneself, but even that if a thing is bad to do, it is made good by being done for somebody else. It does seem a curious notion of altruism: to keep oneself so rushed and busy doing things at random for one's brother man that one has no time to know whether the things are good or bad to do; or to know what are the tests by which the question should be decided; or to keep in order the faculties by means of which one might be able to judge it; or to know what is the right condition for those faculties to be in! The best of all gifts that any man can receive, the habit of union with the Unity—how can I give *that* to my brother? There is only one way; I must acquire it myself; if I do so, I shall be sure to erradiate it somehow, sooner or later.

If we could only get a true idea of the relative importance to us of *Truth*, and of our personal emotions, prejudices, sentiments and opinions—if we could only learn to realise that The Unity is in very fact Our Father, the Model whose characteristic is imprinted on us before our birth and the perennial Source of our *Life!* If we could but trust that when we have hold of His Hand we can afford to cast away any sort of crutch which has become inconvenient or cramping, how many unsolvable problems would quietly solve themselves!

People seem afraid of touching a level of thought at which antithesis can be at once strongly felt and also seen to be temporal and shadowy. The level where altruism and egoism coincide; where the question whether you like a man or dislike him becomes, comparatively, insignificant, where the great interest of your relation to him is seen to turn on the fact that because he stands out strongly as an X against a contrasted background of other men who are not X's you have an opportunity of making an intense Unity between him and the rest of mankind—that level seems to most people mystical and cloudy; they imagine that those who have reached it can have done so only by leaving the solid ground and trusting to some gas-inflated balloon. But what more solid ground can we stand on than the laws of the machinery provided for us to think and feel with? People ask what we find up there meaning apparently, what there is to buy and sell, or appropriate, or discuss about or dogmatize on. There is *nothing at all* up there, except the living waters, which any one who will can take without money and without price, in full assurance that the supply is infinite, and that the more he draws out for himself the more freely the stream will flow for the next who comes to draw.

This Philosophy of Unity—

> "Shall lead thee to those fountains
> Whose streams run never dry;
> To those holy heights of Being
> Where all resentments die."

I have now said what I have to say of the Unity-Law in itself. But if you are not tired, it would be a great pleasure to me to tell you a little about the fact in the background which gave to the subject of Mathematical Logic its peculiar fascination for some English students. About fifty years ago, just when the true Law of the Thought-organ was dawning on the intellectual consciousness of mathematicians, a few Jews in England were struck with what would seem to have been the religious half of the same afflatus. They started a movement, the object of which was to give the

Hebrew mind something higher to busy itself about than the characteristics which distinguish the Jew from the Non-Jew; by reviving interest in what they called The Essentials of Mosaism: devotion to Unity, as the Source of all that is true in religion and the spring of all that is valuable in morals.

This movement and the mathematical one were conducted independently of each other. The Reform Jews knew little of mathematics, and the Reform Logicians even less of the technicalities of Jewish Life. The two sets of men could do nothing for each other in any external way. Yet—I can speak for our own side—it would be difficult to over-estimate what Mathematical Logic owes to the fact that, while it was developing, its fosterers were watching the new-old Mosaism arising in its grand simplicity from amid the tangle of orthodox Talmudism. And perhaps the Jewish Reform, too, owed something of the cheerfulness with which it met its difficulties to the respectful sympathy of our pioneers, Charles Babbage and Augustus de Morgan. For the Talmudists, the official Hebrew Scribes and Pharisees, declared the Reform unlawful, and pronounced against the Mosaists that terrible sentence of Excommunication, under which culprits are, as it were, turned out, like the scape-goat, from the shelter of the community of Israel, and left to find such justice and sympathy as they can in the outer Gentile world. In the hurry of the moment, technical reasons were alleged for the sentence; but I believe it was soon perceived that these reasons were not strictly valid; the Mosaists had said nothing against the Jewish Law. At any rate, no one now disputes that the Synagogue still presided over by some of the old excommunicated Reformers is one of the most important and influential in London. But even after it was admitted that the attempt to exclude the Mosaist teachers from the fold of Israel had been a mistake, many pious Jews expressed a very great dread of their growing influence. The reason was not anything like prejudice or Pharisaism, in the sense we Gentiles give to those words; on the contrary, it was as pathetic and sorrowful as the wail of a sick child. This was what was said:

The little customs which give to old-fashioned Judaism its peculiar local-colouring, these customs "make a warm atmosphere, draw out the affections and emotions, and make a bond between Jews." The reformed teaching attacks indeed no point of Jewish orthodoxy; but it lays comparatively little stress on anything except the doctrines, true for all races and epochs, that man is a child of the Creative Unity; and that if he habitually remembers that fact he will naturally feel impelled to do as he would be done by, even to persons to whom he is tied by no special bond. Such

unaccidented, indefined, non-sectarian teaching might, it was feared, prove the death of the Church of Israel, because—guess why, if you can? Why, my friends, because non-specialized teaching is—*cold!* Our leaders felt this so-called "cold" doctrine to be simply quivering with white-hot sunlight. But then you see, they hadn't had the benefit of any rabbinical tuition; and had no standard by which to judge, except their untutored instincts and their knowledge of the Laws of Thought. The rest of the story may be summed up, so far as our side is concerned, in one sentence. Augustus de Morgan had read the history of Pontius Pilate, and profited by it. Whoever wants to know more about the movement, should read the collections of prayers and sermons published by the West London Synagogue.

The whole episode is profoundly interesting both as throwing light on past History, and as a warning against yielding to mere habits of pious association. But one loses the whole point of it, if one supposes Talmudist teachers to be selfish or hypocritical or ambitious. Of course there are among them varieties of character and degrees of excellence; but I have been told and have every reason to believe that ever since they began to exist, over two thousand years ago, they have always been, in the main, philanthropic, venerable, learned and pious. They are logical, given the data. They care very little for ordinary worldly honours; they thrust themselves forward so little that most Christians hardly know that any such persons exist out of the New Testament. I had occasion to meet several of them during some years of connection with the Jewish Press; and I cannot say I ever saw one who seemed anything worse than a dear old gentleman, compounded of two very nice sorts of Christian old gentleman: the benevolent country Rector and the cultured University Don. Their one vice is rather intellectual than moral in the ordinary sense of the word; but it is peculiarly contrary to the spirit of Moses, the nominal Founder of the religion of Israel. They cannot get hold of the idea that the Creative Unity, Our Father, revealed Himself "before Abraham was," to people who had no books at all, and can reveal Himself now to people who don't understand Sacred Books; they do not realise that the action of Creative Unity on man consists in incessant *correction of premises*; and they allow themselves to become helpless slaves of mere habits of emotional association.

I am sure that when they were trying to snuff out the Reform movement they honestly believed they were doing God service; but they failed to understand the inspirations of their age; and, out of all that was going on round them, they only succeeded in grasping the one alarming notion that *somebody was proposing to*

open a window, and forthwith lost their heads in a panic of terror lest their beloved and carefully coddled Church should catch its death of cold! And indeed it is quite possible to catch cold in a properly ventilated house, however warm, if one has become enfeebled and devitalized by a long habit of living in close rooms!

This deadly shrinking from spiritual pure air, with its almost inevitable concomitant, the fidgety craving for constant doses of some special local stimulant, should be recognised as illness; it should be treated not with contempt, but with the utmost tenderness, short of setting its requirements up as a standard; but tenderness to illness must always stop short of sacrificing the true Ideal of health, the keeping up of a supply of genuine vital power. If we only have within us abundant latent vitality, we shall convert it into warmth or colour, into assimilative or recuperative power, into motion or working energy, according to the requirements of the special occasion.

Whatever palliatives sick souls may crave, whatever precautions grandmotherly old nurses may think needful, whatever remedies may be suggested by physicians or by priests, let us never forget that the *first* necessity for health is abundant vitality; and the source of life for thinking man is always the same: Hear O Israel, the Lord our God, the Lord is UNITY.

THE NEGATION OF IDOLATRY

Read before the Christo-Theosophical Society

THE history of religious conflict may, in one aspect, be described as the history of man's search for some form of idolatry which shall not be open to the objection of being idolatrous. Every generation finds out that its predecessors were led into disaster by their worship of this, that, or the other fixed conception of Truth; and every generation imagines that fixed conceptions of predecessors were idolatrous, and hopes to find the one special fixed concept which shall not be so.

The existence of definite outlines, limited mental concepts, is essential to the religious life, as to every sort of mental activity in man. The only process by which man can arrive at truth consists in the formation of concepts and subsequent destruction of them by merging each in the Unity which embraces it and its opposite. This alternation—the formation and destruction of mental concepts—is the special function of the machinery given to man to learn with, or rather it is the process by which that machinery

performs all its many and varied functions. The harm of idolatry consists in its tendency to arrest this normal process, to prevent that proper completing of normal cycle which is fulfilled by the negation of the eidolon when its time has come. In fact, *idolatry* consists, as its name implies, in *serving* images or concepts instead of making them serve us, in treating them as more sacred than the relation between the Infinite Unknown and the human soul.

Our President* often asserts that, if we profess to believe in the Unity of Creative Energy, we are thereby committed to the belief that there can be no ultimate evil; that evil exists only in the *imagination*. Our *imagination*—our image-forming, or concept-forming machinery—is certainly the source and seat of much evil, and if we kept it in order, we should then be better able to judge of, and deal with, facts of all kinds.

Persons of artistic temperament can assist themselves in the process of forming conceptions, by projecting them in shapes or outlines,† and Isaiah has taken advantage of this fact to show clearly the precise point at which genuine enthusiasm and healthy mental activity cease and the deadening process of idolatry begins.

The artist takes, for instance, a block of wood, and concentrates his whole attention on the business of evolving out of it his ideal. Or, in the modern phraseology of Logic, he makes of the block his "Universe of Thought" for the time being. He evolves his concept by a process of successive rejections, eliminations, or limitations; he chips away every bit of wood that will not fit in to his Ideal. The chips, of course, are, for him, worthless compared to his image, or realised ideal; he gathers them up and uses them as mere fuel for his fire. Then he admires his precious eidolon: quite legitimately; for probably it has been to him a revelation, both of beauty in itself, and of the power residing in man to conceive and create beauty. He shows it to his tribe, who also admire it for similar reasons. Here we have Art, Order, Economy, and the evolution of a common æsthetic sense and a common sense of Revelation of the Unknown. So far all is innocent and useful. Yet many men of old tortured themselves and each other in honour of wooden images. When, and how, begins that process of degeneration which converts artistic enthusiasm into degrading idolatry? What is the first step downhill? Isaiah has marked the turning-point downwards with a precision to which the latest researches in mathematical psychology have added nothing except entire sanction. Mischief,

*The Rev. G. W. Allen; see *Things to Come* and other publications of the Christo-Theosophical Society.

†Isaiah XLIV, XLV.

he tells us, begins at the point where the Artist (or his followers) find it difficult or unpleasant to realise that the waste chips, together with what is now the image, formed originally a Unity.

It would be childish to suppose that what Isaiah objected to was the Art of Statue-making; for he himself takes pains to explain that he applies his principle to test both the Persian dual Gods, and all our ideas of good and evil. We have a right to like light and dislike darkness, provided we remember that the same Creative Energy produces both phenomena. We have a right to hate evil and love good, provided we remember "I make peace and create evil," saith the One Creator, "I the Lord do all these things."

Our apprehension of any concept, as essentially disunited from the antithetic concept which forms its background in our consciousness, is an effect of some *limitation* of our faculty. The test—the only test known in mathematical Logic—of whether our mode of apprehension is a symptom of *disordered* as well as limited faculties, is the one given by Isaiah to the wood-carver; Does our mode of apprehending our concept make any obstacle to our fitting the antithetic elements back into their place as integral parts of the Unity of Thought? If it does, then our mode of apprehending is somehow distorted, false, and our next business is, not to rail at the antithetic elements for being inconvenient, but to find out what is the matter with our mental machinery, what misleading idolatry we have been indulging in.

The practice of frequently testing our own attitude towards any concept, by trying whether it interferes with fitting its opposite back as an integral portion of Unity, has two advantages. The alternation between tension on contrast and unifying the contrasted elements forms a gymnastic which agrees with the Laws of Thought indicated by the Equations of the human thinking organ. It is found, in practice to increase mental elasticity and power. And then again, if, during the normal life of the concept which we have made for ourselves or been taught to love, we make a frequent practice of *remembering* that it, and what was discarded in making it, form by right an essential Unity, then whenever the time comes that it should be absorbed into, or superseded by, a conception of higher order, we are ready for the sacrifice and can make it at once, in a sane and reasonable spirit. But if we cherish our conception *without* testing our own attitude towards it by that only Logical Criterion of Sanity, the Unity-Law, the mind is apt, so to speak, to stiffen round the concept, and when the time comes for it to be superseded, we find great difficulty in letting go; so much so that it may seem at last easier to commit any cruelty or

crime, than to tear from ourselves that eidolon which has become embedded in our mental fibres.

Provided we stop short of letting ourselves get into a condition in which we cannot fit antithetic ideas back into Unity, each man has, of course, an inherent right to frame for himself whatever conceptions of The Unknown are suited to his degree of progress. The Founders of the Jewish and Christian Churches never undertook the impossible task of finally fixing what is the true conception of The Inconceivable. They have indeed left certain indications of their own conceptions of the divine ; but that is an incidental and almost accidental concomitant of their true task : which was to provide a standard, by referring to which we can test when our own conceptions are becoming inadequate to the situation in which we find ourselves and the duties which we are being called on to perform, a canon by which we may know when the eidola which we have been cherishing are becoming for us the objects of idolatry. When Moses in his personal quality, as a struggling, over-worked, over-anxious man, implored for himself a revelation of the Name of God, a revelation was indeed granted to him*—but with the distinct caution that it was but a partial one, suited to his own condition : "The Lord, the Lord God, Merciful and Gracious." But when Moses asked by what name he, in his capacity as a Leader, should reveal God to a whole People, he was forbidden, we are told, to declare any Name of God. Say : "I am, sent thee."† He that Is ; the Nameless, Formless Truth. Say : "Hear O Israel, the Lord our God is Unity."‡ Say : "I am He that brought thee out of bondage ; have no other Gods before me."§ Have no other Gods before that Unity which delivers from the land of bondage and the degrading practice of idolatry.

So with the Founder of Christianity. Though he was wont, in conversation with friends, to pour out his conceptions of his Father—the truest no doubt which can be stated in human words —yet when he is summoned to declare what he thinks the commandment most binding on the religious man, he does not *then* express his personal ideas and spiritual conceptions ; no, he falls back on the standard proclaimed by the ancient Liberator of his Race : Hear O Israel, the Lord is *Unity* ; thou shalt love Him (that is Unity) with all thy heart and soul ; and thy neighbour as thyself.‖

Idolatries are, usually, dual and antithetic. Probably if we knew enough of the history of religions, we might find, in every case, alongside of the sect that stultified and degraded itself by slavish

*Exodus xxxiii, xxxiv. †Ex. iii. ‡Deut. vi.
§Exodus xx. ‖Mark xii.

idolatry of one Ideal, another sect stultifying and degrading itself by slavish idolatry of the condition of mind which consists in not admiring that Ideal. Beside the savage who thought it pious to arrest his own mental growth by making a final and absolute Deity of his wooden image, there was probably some other savage, who, if he could get hold of that image, would think it pious to throw *that*, instead of the chips, into the fire, and who arrested *his* mental growth by thinking this iconoclasm the be-all and end-all of piety.

Look at the history of Judaism. The ideal of the Founder (or Founders ?) was originally a grand one. A race was to be set evolving itself, which, as long as certain forms of heathenism should last, was to remain a standing protest against image-worship, and on behalf of allegiance to the Divine Unity. Israel was to be a miniature unit : the standard model for a future United Humanity. To evolve such a Race, under the conditions of ancient society, certain elements of ordinary culture (sculpture for instance) had to be discouraged among the early Hebrews. They were to be a peculiar people, but only till the knowledge of Divine Unity should cover the earth. The chipping away of certain forms of culture, the prohibitions of certain articles of diet or dress, were purely incidental to the essential purpose, evolving the concept of a United People, worshippers of Divine Unity. But how has the divine Idea, Unity, been sacrificed to the mere form of the human concept Juda*ism* ! Fifty years ago there were Rabbis in Europe, who declared that it was less evil for a Jew to rob (even to rob a brother Jew), than to eat of the accursed *Trifa* (Gentile food).

Here in London, in our own day, there have been learned, cultivated and pious Jews, not a few, who would feel less grief at a son or daughter marrying the most careless and worthless specimen of their own race than the most pious and intelligent monotheist of any other race. The law against mixed marriages "*is Eternal like the God who gave it,*" was the formula. (Here again the instance of the sculptor throws a flood of light on the situation. Every genuine artist is as sure as Moses was, that the impulse to evolve a particular ideal by successive exclusions came down upon him from a Divine Source ; but the true artist knows in what inspiration consists, and how its cycle should be completed ; Second-hand followers imagine that the actual material in which the work has been done, and the portions excluded in the process of doing it, are divided by a distinction, "eternal like the God Who gave it.") The antithetic form of idolatrous possession exists also ; whole districts of Europe are saturated with what is

nothing less than a specific disorder of the nervous system, *anti-semitic hysteria*, which often passes into an acute and highly contagious form, creating such epidemics of insane terror that governments have often found it impossible to manage a country with Jews in it, as is the case in Russia now.

The history of Israel repeats itself in a minor degree in all Churches. Each Church, in the process of evolving its Ideal, is obliged to impose certain restrictions, to eliminate certain elements. Each Church in turn becomes idolatrous by allowing its members to forget that the elements sacrificed to a human Ideal were integral portions of the Unity of Creative Energy.

And how seldom does it fail to happen that the idolatry of forgetting the essential divinity of the discarded elements creates a counter-idolatry which denies the human value of the evolved Ideal.

We, in Western Europe, have long outgrown that barbarous stage when men degrade themselves and torture others in honour of wooden or stone images ; and most educated persons have also outgrown that further stage when men mistake the words of a Creed for divine Revelation and stunt themselves and worry their friends in honour of a religious formula.

It by no means follows that we have outgrown all temptations to idolatry, and we are doubly liable to fall into the temptations which beset our own path if we try to atone for idolatries we are inclined to by despising those we have no mind to. Perhaps there never was a time when idolatry was more rampant than now, or its consequences more wasteful, misleading, and cruel. We are not any the less vicious idolators, mischievous lunatics, because we happen to be born in an age which has forgotten Moloch and Woden. The question is, how do we use our own brains in relation to those concepts which we have *not* forgotten ? Do we remember the organic Unity between each concept and its polar ? Do we thus neutralize often enough, and fully enough, whatever concept we personally delight in ?

The School of medicine founded by Hahnemann relied for its observations on the willing help of an intelligent non-medical public. The vivisection controversy offers an excellent instance of the manner in which Isaiah's test might have presented a pair of harmless and admirable eidola from degenerating into objects of idolatry and occasions of cruelty. The Inconceivable Absolute, as perceived by the human mind, is split by the mental machinery into two polar modes of apprehension, two antithetic eidola, or mental concepts, neither of which has any actual existence apart

from the other. We call these respectively "matter" and "spirit," but these are mere names of two modes in which we perceive the one organic fact, *Life*.

The distinction between these is as truly made by our perceptions as the distinction between sacred image and worthless chips is made by the carver's tool. In the same way, we divide the evolution of Humanity into "This Life," and "Future Life," so we divide the idea of sequence into the two conceptions "Moral" and "Fatal" (or "Necessary"). So we counteract the idea of "Personal God" with that of "Mechanical Force." Now there are many persons who think themselves far too advanced to resent any sort of opinion *about* the spiritual, many so far educated that they would expect to get more or less instruction from any seriously written book which treats of the concepts: "God," "spirit," "moral," and "Future-Life"; but who would think there was no religious truth to be learned from any work in which those terms ("God, spirit," etc.) should be replaced by such words as "Force," "matter," "Laws of Nature," and "Improving the conditions of this life." And then again, there are others who exactly reverse this queer idolatry; they fancy that any serious student can find out and teach something about the Truth, provided only that he chooses out of each pair of antithetic concepts: "Force" instead of "God"; "Matter" instead of "Spirit"; "This life" instead of "Future"; and "Necessary" instead of "Ethical" or "Moral." The idol and the chips again! Why, the whole question which out of each pair of antithetic concepts we prefer to dwell on, is determined by personal idiosyncrasy, taste, habit; the only action we can take which has any claim to be called either logical, pious, or scientific, is the action which, *after* we have formed or selected our own eidolon, *after* we have projected our personality into a concept, completes the cycle by remembering that the chips we flung into the fire were cut by ourselves away from an organic Unity, in the process of evolving our concept.

One of our medical members* has described for us in words to the force of which I could add nothing, the grotesque, miserable, pitiful, and ghastly condition of impotent muddle into which the treatment of sick minds and bodies has been got, owing to our folly in supposing that the distinction between "spiritual" and "material" is an actual one. No cruelty ever perpetrated in honour of Moloch and Woden can have inflicted more suffering than is inflicted now, owing to the ignorance which is maintained, the delusions which are induced by our worship of our antithetic idols.

There are persons so constituted that they take the keenest

*Lessons of the Hygienic Congress, Dr. E. Blackwell.

delight in analyzing and investigating what we call the physical world. Some very good people declare that they take much more living interest in ascertaining the boiling-point of a chemical than in knowing the opinions of any ancient saint, or the present condition of any spirit who has passed into the unseen world. They are made so, they cannot help themselves. Some of these people revel in the work of the dissecting room, tracing up the physical machinery by means of which some corpse used, when it was a living person, to do its physical work ; they become quite poetic and rapturous over the beauty of this study. If I had to take the boiling-point of chemicals, I should think it wearisome drudgery, and if I had to follow the course of nerves and muscles in a dissecting-room, I should feel it repulsive drudgery. On the other hand, we, the Christo-Theosophical Society, take delight in finding, let us say, the boiling-point of ideas, in dissecting deceased religions, and discovering the mental machinery by means of which beliefs, now long dead, evolved and expressed themselves. But there are persons to whom any dissection of religion, any allusion to what we call the spiritual world, any conscious dwelling on religious ideas, gives the same sense of combined boredom and repulsion as dissecting-room talk gives to some of us. Of course it is cheap and easy to say that we who enjoy investigating religions are on a higher level than those who enjoy cutting up bodies. It is very easy, but it is very, very false. The fact that I should dislike the sight of cut-up bodies is a proof of the limitation of my faculties; the fact that somebody else dislikes the associations connected with such words as, "Spirit," "Religion," "Faith," is a proof of the limitation of his faculties. We are all limited creatures. We cannot help that, but we can, if we choose, help being idolatrous creatures. Man is the son of creative Unity ; and, if he pleases to take up his birthright, he is heir of the divine power to see Unity. No man hath seen God with any of his perceptional faculties ; we, spiritualists as we call ourselves, can no more see God by the exercise of our order of faculties than a biologist can find the indwelling deity incarnate in man by poking in a brain with a scalpel. The one is as futile a notion as the other. God is not any man's hobby ; no man hath seen God by the mere use of those faculties wherewith he evolves his own special Ideal. But every man can see God, the Unity, by the help of that brother in whose special Ideal are utilized the very chips which he has discarded.

Just see what we have been doing by our sustained and uncorrected tension on the (supposed essential) contrast between spiritual investigations and physical biology. Spiritualism is producing quantities of lunacy, simply because spiritualitss choose

to experiment in wilful ignorance of certain laws of recoil and reflex-action long known to all "materialistic" biologists. Meantime biology itself remains, as to main principles, very much a blank; no effort has yet enabled, or seems likely to enable biologists to seize the main law of action of that great nervous centre whose action, in man, dominates all other nervous action and pitches the key of human recuperative power. The main law of brain-action was discovered (simultaneously here and in France) by men who were trying to understand by means of transcendental mathematics, the history of the product called *Thought*. They accidentally stumbled (without recognizing what they had found) upon the working-law of the *special machinery by means of which man thinks*. Biologists hitherto have not allowed themselves to be helped by this discovery. Their own eidolon or concept was: to *seek the Law of the physical*, therefore they decline to take cognizance of any revelation made to that alien tribe whose eidolon of study was: *to investigate the metaphysical*! But Eternal Truth entirely declines to acquiesce in our classifications or endorse our idolatries. Often the only condition on which *A* can receive the solution of the question which is pressing on his heart and perplexing his intellect, is that he shall consent to accept the missing clue from the hand of *B*, the individual who seems to him to be going most absolutely on the wrong road.

Many of us are lamenting that young people in whom we are interested, are led astray by bad teachers, either of the showy and ambitious order, or coarsely materialistic, sensual and cruel, or frivolously and dangerously reckless in preaching doctrines about the Unseen and the Future: led astray, that is to say, by the representatives of the world, the flesh, or the devil. My friends, is it not just possible that we, who fancy ourselves serious and moral teachers, have lost our grasp on the young generation owing to our own tension on our own hobbies, which, after all, are partial, and which, if too much stress is laid on them, become necessarily idolatrous?

Do we not too often forget that in forming our concept, of education, of religion, of a life worth living, we have necessarily omitted some elements, as vital after all as those on which we laid stress? And may not our children be frantically groping (in the mire perhaps, and vainly) for something good of which *we* have deprived them?

Neither petty selfish ambition, nor cruel curiosity about the physical, nor impious curiosity about the spiritual, have much attraction for young persons who have come under the powerful spell of any genuine Leader of men. But how terribly often does it

happen that young people, whose own instinct would have led them to follow some grand simple true leader, have been prevented from doing so by the interference of their parents or official teachers.

The leader is objected to for some reason which, when analyzed, resolves itself into the fact that he has blurred or effaced the outlines marked by some former leader; has worked up into his concept some of the elements which some former leader omitted or eliminated. Is *that* any reason why parents should become scared, and lose the favourable moment, and condemn children to be starved on some side of their natures, till the children, driven frantic of mad longing for some missing element of good, snatch at garbage hardly fit to feed swine? We should remember that a true leader always feels himself to be the Son and Heir of Creative Energy; he always dares to cast away the ideals of the past, and carve his own concepts afresh from out of the living Unity.

We moderns are tempted to think ourselves not idolatrous, because mere growth is now so rapid that half a life-time, or less, suffices to set us laughing at the very idols to which, so lately, we sacrificed the best interests of those dearest to us. But mere growth is not necessarily rise in type. Those alone can hope to rise in type who have courage not to miss the favourable moment. The question always is, not: What do we think of the idols of the past? but: Can we rise, above our own hobbies, to Faith in the Unity which embraces each concept and its polar-opposite? Can we do this, while our hobbies are still fresh, and, to ourselves, living and delightful, or shall we nurse and coddle them, and clutch them, and be slaves to them, till they and we incur the derision and contempt of those who are to succeed us on this planet?

When our children were little, we taught them to kneel down in Church and say to the Divine Unity "Our Father"; if when they are grown up they elect to leave off using the phraseology which we taught them, surely it is then our turn to remember that "a father has a right to speak to his children without our permission, and is likely to do so in ways which we cannot comprehend."

Believe me, my friends, when I denounce idolatry I am by no means "damning sins I have no mind to." I have lately been led to reflect on my own shortcomings in this respect owing to the naive manner in which the *words* "spirit," "religion," "faith," and "Future life" seem to be ignored in the Community of Russian Exiles now settled in London. I have no intention to speak of politics. Some of the exiles, it is true, are understood to have begun their career, as Moses is said to have begun his, by some

extra-legal and violent attempt to redress wrongs in their native country. Like Moses, they found that would not answer; and they then escaped into Exile. Like Moses, they have now turned their attention to the business of organizing communities drafted from their own country, on what they consider rational and liberal principles. Here the similarity seems to stop. Far from upsetting the arrangements of the Canaan they have chosen, they desire to abide by its laws and to make themselves as useful and as little inconvenient as possible. But there is no denying that some of them are, mentally, almost overpoweringly big and strong. The cheerful and unconscious manner in which the Exile community ignores our distinctions, the way in which they, so to speak, march past the idols we have been quarrelling over, without seeming aware of their very existence, is in truth startling, and can hardly fail to set anyone thinking seriously who has come into contact with the practical results of the movement. It has made me realise with quite new clearness how our vision of the Divine has been clouded, by mere habits of verbal association, by intellectual laziness, by lack of mental agility, and by allowing those loving emotions, the true function of which is to facilitate and sweeten relations with our fellow-men, to waste their force in clinging round ideals and concepts which we ourselves have created. The pious phraseology which these Russians ignore is, for many eager young people, of all countries and races, saturated with distasteful associations, owing to the foolish tension kept up by their elders on conflicting and unimportant hobbies. The salvation of many young people now may depend (humanly speaking) on their finding someone simpler than ourselves, who shall give them the experience of Divine Unity, unspoiled by the association with the words in which we have been trying to teach them Divinity. What right have we, who, by our own idolatrous tension on words, have created the difficulty, to claim that our children shall be wise enough to let themselves be helped out of it without falling temporarily into the antithetic idolatry of objecting to our favourite words? By entertaining strangers, some have entertained messengers of peace unawares. It would be very easy to set up a lament that these strangers, with their powerful intellects and their fascinating tales of escape from Siberia, are tempting our children to ignore God and the spiritual life; but certainly if we do that we shall be thus doing our best to give the next generation an impression that "spiritual life" and "faith in God" mean, chiefly, not knowing how to appreciate better men than ourselves. If we find the situation a little puzzling to pious parents, that is chiefly because we ourselves have neglected to keep our minds

elastic. I wonder what the Egyptian parents said, whose sons wished to join that mighty Leader of emancipated slaves, who ignored alike the holy statues and the sacred cats, the precautions necessary to preserve cherished bodies from decay and the spiritual Book of the Dead; who maintained discreet silence as to any opinion he might hold about a Future Life; who concentrated the attention of his people on questions of social organization and mental and physical hygiene; and who in the name of the Inconceivable *I Am* forbade the mention of any God at all, except *the Unity who delivers from bondage.*

Whatever the Russian Exiles may see fit to leave un*said*, some of the things they are *doing* concern us very deeply. They are making it practically possible for members of many hostile races, educated in the most violently antithetic religious prejudices, to live together in a condition of organic social Unity, each individual earning his living by some honest calling, but none considering his earnings his own if help is needed by a sick member, or by a member newly arrived from Russia and not yet settled into work. They are confronting that Jewish difficulty, which the Czar considers unmanageable, by educating Russian Jew and non-Jew children as playmates. In Russian exile circles it is considered "bad form" to show that you are aware whether the person you are addressing is a Jew. But then of course it is equally "bad form" in the Jew to revive unpleasant associations by doing anything to remind his friends of his Race. Jews of the Exile Community are bringing up their children quite outside the pale of Israel, and in ignorance of ancestral customs. Now the ordinary "lapsed Jew," who has simply "sold his birthright for a mess of pottage," backed out of his own personal difficulties by denying his descent, is a character for whom few persons have much respect, but it is quite a different thing when the dogged perseverance developed in the Hebrew race by so long clinging to the specially Jewish customs in the face of persecution, is being utilized, in a free country, not for mere personal aggrandizement, but in evolving schemes for the annihilation of "the Jewish difficulty" all over the world. The difference is just that between mere irreverent sacrilege, and the serious negation of one ideal because the time has come to rise to a higher one.

The Muscovite government have for several generations tried to close many avenues to knowledge. Consequently restless young Russia, male and female, has long devoted itself to the pursuit of such permitted sciences as Chemistry, Botany, Biology, and Medicine. Many of the Exiles have gone through very great suffering, bodily and mental, and all whom I know of are tender-

hearted and compassionate in the extreme towards both man and beast. And their many and eager enthusiasms leave little room for the development of gross sensuality. Their leaders are intellectually powerful enough to throw into the shade the scientists of whom we hear so many complaints, and morally grand enough, by their devotion to humanity and their heroically borne sufferings, to shame out of countenance mean ambitions and petty fussiness about trifles. They are therefore well suited to neutralize the influence of teachers to whom we have real reason to object. By the superior force of their dominating moral energy, they may succeed in shaming out of existence a host of conflicting prejudices and crotchets, and thus facilitate that union among ourselves which seems to us now so far off and unattainable. They may find themselves obliged to do some things which we, brought up so differently and accustomed from infancy to political freedom, cannot conceive of as being necessary or useful. They have their faults; everyone has. But on the whole there is no mode of education now open to young people in England which seems to me quite so vitalizing or, in the best sense of the words, so moral and religious, as that which may be gained by trying to serve the Leaders of the Russian Exiles. In the work they are trying to do, I personally wish them, respectfully and cordially, God-speed. But whatever conclusion we may come to about any special movement, at least let us never forget that the Sun will continue to shine without our aid, and that when we need Light, our care should be to open the shutters which we ourselves closed. Our Ideals, our classifications are but temporary exclusions; True Light is Unity, The Eternal.

The venerable Leader of the West London Synagogue, Rev. David Marks, kindly permits me to say that, in my references to passages quoted from the Old and New Testaments, I follow interpretations given in his sermons.

THE RELATION BETWEEN INTELLECT AND INTUITION

Read at the Christo-Theosophical Society

If we attempted to deal with the subject of intuition generally, that would involve a preliminary analysis of such topics as hereditary tendency, ante-natal and infantile impressions and spiritualistic inspiration. All of these no doubt are factors in producing that kind of spontaneous effortless perception of Truth which we call intuition. But in order to narrow our discussion this evening down to something like manageable dimensions, I propose

to confine it to the relation between intuition and intellect, to the effect of conscious intellectual action of minds still in the flesh, in evoking whether intentionally or otherwise intuitional action in other minds.

That all modes by which intuition is generated interact mutually, we cannot doubt ; and it would be impossible to decide, in any given case, how far the intellectual action of one person in the flesh has been assisted in producing intuition in another, by the agency of invisible beings ; or how far both have been aided by hereditary or infantile impressions dormant in the brain of the subject. But I am to deal with intuition only in so far as it is related to, and caused by, the intellectual action of men and women in the flesh.

All of what we hear of under the names Thought-reading, Thought-transference, Mesmeric direction, or Hypnotic suggestion, are mere accidental manifestations of a process which is going on more or less everywhere and always. This process can be indicated by saying that, when an idea has been generated in one mind by some process, it tends to transfer itself to other minds which have not gone through that process ; and this transference may take place without the knowledge or intention of either of the persons concerned ; though it is facilitated by either or both desiring the transference, and may be hindered by either or both desiring to resist it. The amount of capacity for absorbing other people's ideas by magnetic contact varies ; in very young children it seems to be generally great ; after infancy, it is found in all degrees ; from the ordinary person who feels just a little more impressed by hearing an earnest lecturer than by reading the lecture, to that extreme condition of thought receptivity, which both makes personal intellectual action well-nigh impossible, and which also often simulates the most brilliant results of intellect.

I intend to use chiefly the masculine pronoun for the intellect and the feminine for the recipient of impressions ; this is chiefly for the convenience of making a distinction, and is in line with the distinction drawn by Mr. Maitland and Anna Kingsford. In reality either party may be physically of either sex, though I do think that extreme conditions of thought-receptivity are more frequent among girls than among boys.

Education can not become Science till the power of intellect in the teacher to evoke intuition in the pupil has been acknowledged and studied ; for in the first place those who retain the power of absorption to a degree which almost arrests the development of intellect proper have to be educated as well as others, and must be dealt with somehow ; and no scheme which implies that the

personal action of these pupils is to be to any great extent of an intellectual kind suits them. And then again, phenomena are constantly occurring in schools, the true explanation of which is that the pupil is thought-reading the teacher; and as long as these phenomena are attributed to the independent mental action of the pupil they, so to speak, vitiate the evidence and confuse the whole field of Psychology.

Intuition has many ways of mirroring the intellectual acts of another person. Some children can translate almost any sentence just while the teacher has his attention concentrated on that sentence; and therefore seem clever at languages because they translate well at class without preparing the lesson.

Sometimes a young person has spasmodic fits of original creative power in some Art; each such fit being distinctly traceable to contact with an original Artist.

Many children begin thinking, on waking in the morning, about something which persons with whom they are *en rapport* talked after the children were asleep the night before.

Of course all the "folded lambs" and "gathered flowers" whose pious utterances and early deaths are recorded in the small literature of the various religious sects, are thought-absorbers, hyper-saturated with magnetism, owing to the one sided tension of the enthusiasts among whom they live.

If the intuitional absorber always mirrored exactly the results of intellectual action, thought-readers would be more easily detected as such. But the reflection often differs from the original in ways which deceive superficial observers. The intuitional reflection is apt to take a more picturesque and concrete form than that of the original, for instance: A philosopher thinking out an abstract question overnight may set some child in another room or another house, into such a condition that next morning she feels prompted to write a weird and fanciful allegory, which illustrates the principle he was thinking of. It is a mistake to attribute these productions to genius or inspiration in the juvenile writer; it would be more to the purpose if the parent would treat them as danger-signals, indications that the child is in too close contact with some thinker, probably one whose own brain is dangerously active, who is losing normal continence of magnetic force, and unduly magnetising the intuitionists who happen to be *en rapport* with him.

For intellectual action produces much more showy and brilliant intuitional action, when the brain in which the intellectual action is going on is itself disturbed, over-excited, and fast shedding force,

and especially when it is in fever, or going through that other crisis of change, to which we mortals give the name of *Death.*

What we call a Poem is sometimes the crystallization in verse, in one brain, of ideas which are being thought out in prose by another. Swinburne for instance is a sort of human flute, through whom whatever strong magnet happens to be next to hand can blow at pleasure. Mazzini wrote through Swinburne the "Songs Before Sunrise." Other influences wrote quite different things through him. The sweetness of tone belongs to the flute ; some other person fashions the melody. I say this in no disparagement of human flutes ; they do no harm by expressing musically ideas not their own. Many people read a song who will not read a sermon.

If Swinburne or any other poet consciously attempted to paraphrase or versify Prose Essays the result would be impoetic and pedantic ; whereas poetry poured through a mere versifier by the magnetism of a thinker has a peculiar freshness and charm. But when a lad writes original-seeming verses expressive of lofty ideas, it is a mistake to treat him thereafter on the supposition that he necessarily believes what he has written, or even knows what it is all about.

Many years ago, a girl of sixteen acquired quite a reputation among some of our foremost literary men by her marvellous comprehension of ideas beyond her age (their own ideas of course).

A few years later a well-known writer said to me, of this lady, that being in the room with her was like being with one's own ghost, for she always said exactly what he was just going to say. About the same time she herself described to me the condition of parasitism into which she had fallen. She said she was incapable of spontaneous mental action, her mental existence was a mere aching void except when in contact with some thinker.

But this sickly parasitism is not necessarily the doom of the thought-absorber.

There is nothing in itself bad in the second-hand mode of acquiring knowledge or artistic development ; it is the intuitionist's normal mode of learning. But the laws and safeguards of the process of intuitional absorption are quite different from the laws and safeguards of intellectual action proper.

It is amazing what slight and inaccurate traces of knowledge acquired by thought-reading will often remain on the absorber's memory unless it has been fixed by processes suited to complete that particular mode of first acquisition.

Therefore, when a pupil *seems* to possess either great general

intelligence or marked capacity for some particular subject, the teacher ought to be able to test how far she is really possessed of the supposed faculty, or how far she is merely a passive mirror reflecting the mental action of himself or of some other person.

Many who are in reality victims of over-magnetism are supposed to be victims of "over-work," and proofs that women "cannot stand so much education," when it would be truer to say that they are wrecked by the trampling out of normal faculties, by the lack of any work or any education, which could be, in any sense, real for them. All subjects which are good for boys to learn are good for girls too; and extraordinary intuitionists should always be familiar with the same topics as are occupying the more intellectual minds of their age. But the *mode* of learning should be different. For one who has gone through the process of seizing a principle by *intellectual* action, the normal completion of cycle, and a good correction for his dangers, consists in learning masses of facts and formulæ, and therefore great knowledge of such formulæ is rightly imposed on all who wish to earn the rewards of intellectual work proper. But one who has soaked in a truth by thought-reading a thinker, has started a different kind of cycle, which needs to be completed in a different way, and to forcibly prevent such a one from the normal completion of her own cycles, by straining her to do acts which are the proper completion of cycles of a different kind, is simply the inculcating of vicious sequence.

I repeat then, that every teacher, whether parent, school teacher, or professor, and more especially every person engaged in religious teaching should provide himself with tests by which he can judge whether he is arousing true personal mental action in his hearers, or is only evoking from them a reflection of some thought process or some emotional state, the true seat of which is in his own mind. The tests are many and various; it is easy to find one suited to any special case when once the teacher has become convinced of the importance of the point. What ails us in this matter is not doubt or error as to what is the *best* test, but cruel carelessness about the whole subject, which causes incessant confusion as well as many and terrible tragedies in educational life.

I will mention one such tragedy. The late Professor Kingdon Clifford was a magnet of extraordinarily high power. He had cast off the Bible, and was understood to have become too *scientific* to believe in witchcraft, or to waste time over the quarrels between rival schools of Prophets in Asia.

He had a girl-pupil, who did wonderful things in mathematics. She took a special scholarship over the heads of all the male candidates, and Professor Clifford said on that occasion that if a

few men as clever as she could come to University College, it would soon rival Cambridge as a Mathematical School. The simple fact was that she was a girl through whom any thinker could blow any order of truth. She seemed so unlike the stuff of which mathematicians are made, that I one day said to her, "I cannot think mathematics is your true function."

"Oh, no!" she replied, "my *function* is to understand *whatever Professor Clifford wants to get understood.*" Of course every occultist will know what fatal magnetic interlocking must have been going on before such a thing could be said. To non-occultists I must explain that it was not at all the utterance of sentimental gush; the girl was, in the most straightforward manner, expressing her honest, though too limited, knowledge of the nature of her own mental activities. Professor Clifford, however, attributed the wonderful work done by his pupil to a personal vocation of her own for mathematics. The result was that her health broke down: then she took a fit of Evangelical piety—(i.e. found out too late that her function in life was to understand things which Professor Clifford did *not* particularly care to have understood), and died in the odour of sanctity—one of the countless victims of the cruel delusion of teachers who mistake the reflection of their own mental processes on the brain of an intuitional pupil for personal mental action in the pupil. In this case, as in many others, Nature seems to have avenged the wrong. From my own observation of Professor Clifford at classes of his which I attended, I venture to think that his premature decay, as well as much of his over-brilliant success, was due to a habit of recklessly over-magnetizing his pupils.

The Prophets of Palestine may not have known everything, but some of them did know that it is inadvisable to undermine one's own health and other people's for the sake of spreading one's special views and increasing one's influence, by random indulgence in the wonderful and awful delight of contact between intellect and intuition.

We are not called on to pass moral judgment on creatures so innocent of all psychic knowledge as university professors mostly are; and I should be sorry to use harsh words about Kingdon Clifford. But there is no breach of charity in saying that if we occultists, who know better, let ourselves be tempted to gain followers for ourselves, by playing murderous tricks with the intuitional faculties of other people, we are on a level with heathen magicians and priests; and this is equally the case whether we call the views we wish to spread, "scientific" or "religious," "theosophical" or "spiritual."

Those in whom the faculty of thought-absorption is distorted for

the purpose of making it look like intellectual power are not always fortunate enough to burst a blood-vessel and die while young. Some go mad shortly after leaving College ; some have an illness which leaves them physically and intellectually wrecks for life ; some recover physical strength and part of the mental faculties, but with the whole moral region permanently destroyed ; some avert sudden break-down by relieving the unnatural strain with alcohol or other drugs, and thus contract permanently habits of vicious toxication.

As James Hinton said, those whom the Lord adopted for the special function of the intuitionist, are to be found, mostly, in early graves, or else in madhouses, or jails, or places worse than either.

The Jesuits, wiser than either Protestant religious teachers or our modern Secular-educationalists, have long made a serious study of the relation between intellect and the more mobile intuitional faculty ; with the practical result that they are able to keep alive, sane, and fairly decent in conduct, many whom our ignorant carelessness would kill or make wrecks of. Mrs. Besant and others have lately shown what advantage for the advancement of their cause the Jesuits derive from study of this subject. I am sure no one here supposes that when God created such women as I have described, or such sweet singers as Algernon Swinburne, He meant them to become the mere tools of priests, who are themselves slaves of a despotic order. *That* need not surely be—though many in despair have supposed that it is—the *only* mode of safety, open to the specially absorbent temperament, from the dangers which beset it on all sides ; nor surely need the intuitionist do, as many are doing—leave unused her peculiar gifts, never allowing herself to get into close rapport with any strong intellectual magnet, for fear of not getting back into her own personality in time to avert disaster. We intuitionists can use our powers fully, and yet be as free as any one else, both from spiritual bondage and from spiritual vices, if we study the laws of our own organization, and are content to do work for which we are fitted.

We come then to the question : What is the true function of the thought-soaking intuitionist ? What is her true relation to the intellects whose results she appropriates by absorption ? What is the work which she can do, in fair quantity and quality, year after year through a long life, without, on one hand, the risk of precipitating serious fiasco by over-magnetism, or on the other side, the degradation of becoming the mere tool and slave of an organized system of direction ?

We must consider, first, what are the special safeguards of the

intuitionist in her relations with intellectual magnets. The main condition of safety is that we should carefully cultivate, and keep awake and keen, that instinct of spiritual chastity, which warns us when magnetic contact is becoming too close or too continuous, when it is time, so to speak, to shut the door between our own aura and that of the intellectual magnet whose ideas we have been absorbing. We should therefore, as much as possible, avoid putting ourselves into positions in which we cannot obey that instinct without violating engagements, expressed or implied.

A thought-absorber therefore should not marry a strong intellectual magnet, until the magnet has acquired sufficient Psychic knowledge to be aware that certain conventional rules of bourgeois domestic happiness are inappropriate to that particular case.

As to occupation. The work which suits us best is that which gives scope for the faculty of the interpreter between different classes of persons. Translating is good work for us thought-absorbers, and the holding of revision classes between lectures to make the topic clear to the more backward members of the audience, for we can generally see far better than an intellectual teacher can at which point a particular pupil has failed to grasp his meaning.

So far as bread-winning is concerned, it seems to me that a thought-absorber would do indeed well to resist all temptations to gain a living by any occupation specially interesting to herself. The more interesting the occupation, the more it stimulates the aura to open towards employers and coadjutors in the same work; and this facilitates special magnetic contact with those persons. All this makes the work at first delightful, but presently the time comes when the aura should be closed to those particular persons for the sake of bodily and mental health. Now one cannot retire from the work for which one is paid at the bidding of the magnetic instinct. Not only should the paid work be but moderately interesting, it is well also to prevent oneself becoming too much interested in the persons among whom we do it. The protecting circle can thus be kept constantly closed between us and those persons. In that case, enough thought-transference still takes place by a sort of percolation, to cause a mild intuition which has a certain modest commercial value; one's employers and coadjutors are not startled into admiration of one's genius, but they do find that one understands enough not to give trouble, and one can plod away without hurting oneself, and give general satisfaction without gaining any great notoriety.

But of course work done under these conditions of negative precaution is not the main work of the intuitionist's life, nor any

satisfaction of her aspirations. What is the *use* of the faculty of seizing, at second-hand and by magnetic absorption, the truths which the intellect of other people has laboriously evolved by hard study? What use to the world is our possession of this faculty? And how can we actually use it fully for the benefit of the world, without ruin to ourselves and danger to others?

The use of the faculty is that it can always transcend the limitations of the intellect of its own time.

However large may be the grasp of the intellect, still it always perceives what it holds as truth, as against a background of statement which seems to it valueless frivolity and to some other intellect valuable truth; while that other polar intellect perceives the first one's truth as trifling or absurd.

The laborious processes by which an intellect acquires knowledge, do to some extent fasten it to the special kind of knowledge which it has thus laboriously acquired, and give to that kind of knowledge a fictitious value in its eyes, which throws into the shade facts which go to prove that that particular kind of knowledge is, after all, partial. Intuition, having absorbed the knowledge without the labour, is less hampered, freer to perceive the lacunæ of that order of Truth, and better able to deal fairly with truths of an opposite order.

He thus can do, about the problems of our own day, what intellect itself can never do till a new generation has arisen which can look back on those problems from the impartial standpoint of the later historian.

It is the privilege of the thought-absorbing mind to transcend the perceptions of the greatest intellect with which it is at the time in contact, by always seeing with equal force the main dicta of the *two* greatest intellects with which it is in contact. And it can, if it trains itself for that purpose, learn to seize the principle underlying the polar assertions of any two conflicting and mutually contemptuous intellectual forces. The intuitionist can therefore be always one step ahead of the leading intellects of her age—ahead of their difficulties, simply by combining their results.

This answer as to the utility of the absorbing intuition is the answer also as to the conditions of its safety. The special danger is that whenever one is doing interesting work with a powerful intellect, such magnetic interlocking may be set up, that, when one's instinct points out the desirability of closing the protecting circle, one is powerless to detach oneself. As for the intellectual person himself, he nearly always supposes himself fully competent to tell us what we ought to do, but we usually find that he neither knows how to manage magnetic relations, nor believes in the danger of mis-

managing them ; and if the intuitionist cannot look after herself, her chances of safety are small !

There is however always someone to be found, able to help the over-magnetized intuitionist to recover her proper personality. The intellect which is polar to the one under which she is at the time working, can always do this. His touch can bring to the intuitionist not only safety and freedom, but also the supreme flash of inspiration. Mere vague variety, lawless promiscuity is not at all what is wanted ; the touch which sets us free from over-entanglement in the aura of x is not that of y and z and all the rest of the alphabet ; but *not-x*, the polar antithesis of x.

When the student of whom I have spoken began to find that her personality was weakening under Clifford's intellectual possession, she ought to have at once put herself under some powerful religious or spiritualist teacher. It would have mattered little what Sect he happened to belong to ; whatever erroneous doctrines he might hold, Clifford's influence would have saved her from believing them ; the conditions most essential to secure would be that he should be about on Clifford's level in magnetic power, and anti-thetic to him in attitude and general feeling. Of course if she had done this, Professor Clifford and his friends would have been horribly puzzled and annoyed, and would have considered her fickle and disappointing, and probably her progress in mathematics would have been less rapid and brilliant than before. Certainly the religious teacher himself would have found her a much less satisfactory and edifying convert than did that pious person—who-ever he or she was—under whose influence she "accepted the Gospel" when Clifford's hold on her had waned. But I believe that she would have lived to be a moral and intellectual leader among us now ; and possibly Professor Clifford might in that case have learned, from his disappointing pupil, truths about the mathematic laws of psychology which he could never have found out for himself.

I do not see how there can exist any thing which deserves the name either of Educational Science, or of *Science-Healing*, till we know more than we now do about magnetic contact between intellect and intuition, and the Laws of safety of such contact, and especially until the inspiring and strengthening effect, on the thought-absorber, of magnetization by two antithetic intellects, is generally studied by all who are concerned in the mental and spiritual guidance of others. That any knowledge of this subject would utterly put an end to existing practices in many departments of human activity, is very clear. A public exhibitor of clairvoyantes once said to me that he knew nothing about the uses of counter-

magnetization in keeping up the subject's health of body or of mind, but he would not allow it to be done to his subjects, because he had found by experience that it *spoils them for purposes of exhibition.*

This shrewd and candid charlatan had discovered the truth which a subtler kind of charlatanism hides from the so-called educated classes. In every field in which intellect acts on intuition, whether in religion, education, or the training for mediumship, or for clairvoyance, the first effect of polar counter-magnetization is to spoil the intuitionist *for purposes of exhibition.*

It is sad that priests, schoolmasters, and writers on Psychic Science know so little about its value both as a hygienic safeguard and an educative agent.

I wish to take this opportunity of recording a deep conviction which has come to me from a good deal of study of other intuitionsts and from half a century's experience of my own as a sort of clairvoyant assistant to a succession of highly intellectual men. When a thought-absorber allows herself to be over-entangled in the magnetism of any one order of intelligence, the result is not *mere* limitation, mere negative one-sidedness, such as that which befalls the one-sided intellectual student himself. She acquires a kind of abnormal lucidity which at first quickens and then injures her other powers, her health of body and of mind, and which often at last sets up illusions as to the very subject on which she is lucid. No language used in the Hebrew Scripture against witchcraft is in my opinion too strong to characterize this unholy and ultimately misleading kind of lucidity. But in the effort to reconcile the discords of her age, the intuitionist not only recovers normal balance, she rises at once from being a mere magical tool in the hands of clever men to being an inspired Prophet of The Eternal God.

Adonai, the Deliverer from bondage, the Healer and Saviour, the true transcendental Inspirer, descends at the contact of polar influences ; and at His touch all magnetic entanglements, all evil magic and confusing witchcraft vanish into nothingness.

It may be thought that in speaking as I have done of the faculty of thought-absorption I have unduly magnified mine office. Believe me, whatever clever men may be generous enough to say, I know well enough that magnetic intuition is a negative rather than a positive quality ; it comes, as James Hinton said, by a minus. Our much talked-of superiority to mere intellect is very like that of the wren in the old song, which was made King of the Birds. Because of its very lightness, the Eagle easily carried it in its feathers as high as he could go, and then a few flaps of its own

little wings took it just a little bit higher, and the wren may thus catch, sooner than the eagle, a glimpse of the as yet unrisen sun.

We who have received in any marked degree the power of absorbing thought by magnetic contact with thinkers, cannot safely either indulge any earthly ambition of our own, or allow ourselves to become the tools of any one order of human intellect. Our function is to be servants of that Unseen Truth, Whose vesture of many-coloured truths the intellects of the earth rend between them, and humble Prophets of that Eternal Unity, fidelity to Whom is, for us, health and life and light.

A RIFT IN MODERN THOUGHT

Read at the Christo-Theosophical Society

IT is impossible to understand the mental history of this age in which we live unless we take into consideration the fact that alongside of the writers known as representatives of certain ideas, and constantly exerting pressure on those writers, there has been for the last two centuries a continuous succession of men whose lives have been devoted to studying the Science of economy of thought-force. These latter and their pupils puzzle many, who would otherwise be disposed to think well of them, by refusing to enter into movements that are going on round them ; by refusing for instance to express any opinion on some burning questions of their day, or to join societies for propagandizing some doctrine. Enthusiasts are disappointed, and make all sorts of guesses as to why we will not join in so-and-so ; often the true reason is that we perceive, or think we perceive, that what is going on is not being done in accordance with the Laws of economy of thought-force. The mere fact of explaining this, ought, it seems to me, to go far towards healing feelings of soreness and disappointment ; especially as the economists do not assert anything which anyone disputes ; they have only discovered that we can apply, more thoroughly and more extensively than used to be supposed possible, some principles the truth of which no one doubts, and which everybody acts on in certain special cases.

Man's desires are, in many directions, in excess of his own unaided powers of attainment ; but by throwing the actual labour on to specially adapted instruments, he can economize his own force and thus accomplish much which would baffle his unaided powers.

No amount of training in swimming would enable man to cross

the Ocean ; he has conquered that difficulty by means of ships. The invention of lenses to supplement the limited range of focussing power possessed by our eyes has enabled us to gratify curiosity about the heavenly bodies, and also about things too small for us to see.

So far, the instruments are physical ; but thought-instruments act in a similar manner. A little child may wish to know how many days his Aunt has lived, when he is keeping the 27th anniversary of her birth ; but I doubt if any of us could tell him, if we had no way of expressing numbers except a separate name for each number, and no machinery for multiplying except our own unaided faculties. Our ancestors invented the idea of splitting up large numbers into tens, tens of tens, and tens of tens of tens ; so that we can multiply bit by bit and add the results together. This is the principle of our present number-words, and also of the so-called Roman notation. By means of it any adult could have answered the child's question, though if we only used that notation, we should be puzzled if we came to deal with such numbers as are involved in modern financial or astronomic calculations. But by means of the Arabic notations which makes the place of a digit register its value, and which we now commonly use, a little child can find out for himself how many days there are in twenty-seven years ; and we adults can multiply and divide quite gigantic numbers without the least effort. As he who has a steam engine need not carry the weight of his body and baggage, he has only the exertion of lifting them once on to the engine, and then is rid of the weight; so, in multiplying, we do not continuously carry in our imagination the load of big numbers ; we lift them, once for all, into their places, and then are rid of them ; we deal with 300 exactly as if it was only 3, and we throw on the machinery of the notation the burden of carrying on our result, "$2 \times 3 = 6$," and making it mean 6,000.

The notation called Algebraic is an extension of the principle which underlies ordinary Arithmetic.

Many people have a hazy idea that such economy of mental force is possible only when we are dealing with a certain special range of subjects, such as number, form and quantity, to which has been given the name mathematical ; but mathematical processes are founded on Laws, most of which are not the Laws of any special Subject outside of man, but Laws of economy of thought-force. A little reflection will convince us that this is so. There is no reason in the nature of things why we should parcel out into groups the revolutions the earth makes on its axis while going once round the Sun ; we do so because our direct intellectual powers

are feeble, and we cannot grasp the idea of a big number. We have chosen ten as the Standard of size not because of any property of number, but because it suited elementary man to count on ten fingers. The same principle runs throughout. As we relieve the strain of attention to numbers by dividing numbers among digit-places, so we relieve it in dealing with curves, by dividing curved motion into rectilinear directions. Planets, for instance, do not really travel in any straight line ; but we facilitate the study of the elliptical spirals in which they do travel, by imagining three straight lines running respectively North and South, East and West, and Up and Down. This is the basis of Analytical Geometry, of Newton's Fluxion Method and of the Diffl. Calculus. It embodies no actual law of motion itself, but the Laws of Human thought about motion.

It is instructive to reflect that up to a few hundred years ago it was supposed that mental labour cannot be lightened by Mechanical Notations unless its subject is actually number. Questions of form and motion were still treated in the laborious round-about manner of which Euclid's Geometry is the type. Descartes, Newton, Leibnitz and others perceived that the principle by which our arabic notation diminishes labour is a principle not of number but of human thought ; that economy of thought-force by diminishing strain on attention could be applied in dealing with form and motion. Babbage mentions a problem which the best older Geometers left obscure after four columns folio of verbal explanation ; but which is made perfectly clear in four lines by Descartes' notation.

For a little while there was a rift in the Geometer world ! It staggered the Geometers to see problems, over which they had spent years of labour, solved as if in play, in a few minutes ; to hear of Newton coolly professing to answer off-hand questions that had been supposed too complex for man to grasp.

Algebraic notation had been supposed to be only applicable to number ; to see it applied to form, puzzled people, and no doubt seemed unnatural and uncanny. But it is all settled now ; every-one has accepted the idea that Algebra can be applied to form as well as number.

In this century, notation-thinking has invaded Chemistry, which before had been investigated only by empiric experiments and roundabout speculation, and taught by verbal explanations. And now people imagine that Algebra has something specially to do with number and form and chemistry, and that it can have nothing to do with other subjects. It would be just as true to suppose that a steam-engine can do no sort of work except the

kinds it was first applied to. The steam engine is not an appendage of this or that kind of work, but an invention to supplement the weakness of human muscle. Algebraic notation is not an appendage of number or form, but an appliance intended to supplement man's limited power of attention. The original steam-engine can only do its own work ; but once the principle was understood, it could be adapted to any kind of physical labour, by suitable adjustments ; so with thought-instruments ; the orginal Algebraic notation was, so to speak, entangled with the special Laws of Numbers ; but when we understand its principle, we can omit from it the few actual numerical laws and apply it to any kind of investigation. Newton, Leibnitz, Descartes, were all investigating Laws of Thought ; Degerando calls his book on Notations : "L'Art de Penser" ; the newest chemical notation has been founded on that used in a book written by a non-chemist and entitled "Laws of Thought" ; General Babbage has kindly allowed me to copy an unpublished paper in which his father describes the course of his investigations ; one sentence in it is this : "I pursued with ardour the attempt to discover some of those laws of *human thought* which have led to our knowledge of the physical Sciences."

I have here Mr. Babbage's description of the qualities which go to make a good mathematical notation. It may be summed up thus : Notation must present to the eye the fewest possible strokes ; therefore a letter must do duty for a word, or for many words. It must express each kind of relation by some definite and uniform change in the letter ; for instance, suppose we call a cause A and its effect A′, we must call the effect of that effect A″ ; and if we have to deal with any other chains of cause and effect, we must call them respectively B, B′, B″ ; C, C′, C″, etc. All this is to relieve the attention. The notation must break up the work to be done into small and definite fragments ; it must relieve the attention at each step from every association and consideration except the one element which that step of the work involves ; and it must so register successive and partial results as that each may at last fit automatically into its right place in the general result and show at a glance its exact relation to the general result. It must of course so present the answer as that the operator shall not have his force wasted by mistaking for a moment a partial result for an answer to the question at issue.

The answer to a complex calculation is an organic crystallization of a multitude of partial answers, of which each has been so got as not to overstrain attention in the process of getting it, and so put aside the moment it was got that no force has been wasted by any attention to it beyond the amount necessary for getting ; and the

whole is found so arranged at last that no part obtrudes itself to distract attention from the main result.

It is easy to see that these are general conditions of economy of thought-force; not special conditions of number or form or quantity or chemical action or of any special subject.

In complicated calculations the different portions may be worked out by different clerks; and the final result is obtained by combining the results of the labour of them all.

The point to which I specially invite attention is that, in Arithmetic, no person wastes force by proclaiming or propaganding any of the partial answers. We do not expend a particle of energy on acting as if the sum of seven times a number was any answer at all to a question which was set about twenty-seven times. We boldly discarded from consciousness all reference to the twenty, in order to multiply by seven; but the very moment we have finished that, we do nothing more till we have recalled our discarded twenty, and found out what answer *it* gives; and then we do nothing more till we have fused the two answers into one. In complicated calculations performed by the labour of many clerks, no one of them wastes a particle of his own or anyone else's force, or distracts anybody's attention for a moment, by mistaking his partial solution for a real one. Each clerk, from the moment he has got his answer, gives it up, to be dealt with as *not* a solution but an element in a solution.

All this again is perfectly general principle; it has nothing to do with number in particular. As an instance of the possibility of applying systematic economy of thought-force to other subjects besides number and quantity, I will just mention that persons who use my husband's notation write down a set of data such as Aristotle, Clarke, Spinoza, or Whately would have spent pages or whole volumes on showing the result of, then do something as mechanical and easy as a common rule of three, and the answer comes out without trouble, arranged in four places. As in a money sum, a figure in one place means pounds, in another shillings, and in another pence; so, in a logic-sum, a statement in the first place means: According to the premises so-and-so must be; in the second place, it means so-and-so cannot be; in the third: To determine so-and-so we want further information. In the fourth place, if it is not blank, as it should be, we find: "About so-and-so you have supplied incorrect data."

When a book appears which treats of the general principles of thought-economy, this is more or less what happens: The general public perceive that, in this book, dots and dashes do duty for verbs, and letters for names or statements; they jump to the con-

clusion that the subject is what they vaguely call "mathematics," and that the book concerns only Mathematical Specialists. (The very persons of course who don't need it.) Mathematical Specialists feel it due to themselves to read the new book. If they approve of it, they recommend some learned body to confer on the author a gold medal or an Honorary Degree : which is accordingly done. And that is the last that the public hears of the matter. Only a few persons here and there actually learn to use Method for economizing thought. He who does so, finds himself separated from even the most intelligent of his friends by an intellectual gulf, which, unless he is careful to keep up the habit of translating the results of notation into ordinary speech, may grow deeper and wider as the years go on. For it is so much easier for any two persons who use thought-notation to understand each other than for either of them to understand or be understood by anyone who does not, that from sheer *vis inertiæ* the ties made by common use of it are apt to become closer than any other ties, of blood or of character, of common aspiration or of personal affection. Being accustomed to use a rapid notation for thinking, one naturally finds it easiest to converse with those who can talk in the same ; and one is apt to drift away from one's nearest and dearest, in sheer desperation of making oneself intelligible. It seems to me that Herbert Spencer's and James Hinton's persistent, though not always successful, efforts to make understood in words ideas worked out by them in Algebraic notation, implies a more vital recognition on their part of the bonds which unite men than if they had spent a fortune on propagandizing doctrines *about* the Fatherhood of God and the brotherhood of man.

My object, you will perceive, is not to induce anyone to use thought-notation, who does not feel prompted to do so ; still less to show anyone, in half an hour, how to use it ; but, as I said, to try to clear up a cause of misunderstanding and mistrust by telling those who do not use it what is happening to those who do.

It has been discovered that all the processes to which used to be given the name of *reasoning*, all processes of extracting from a given set of premises their logical consequences, whether immediate or remote, can be better performed by suitably prepared machinery than by the conscious mind of man. Given any set of facts or observations, or data of any kind, astronomical, physical, psychical, biological, numerical or any other, then we find out how much they, taken by themselves, prove faster by putting them into a suitably adapted instrument, turning a handle and looking at the indicator than by thinking about them. Moreover, suppose any statements were offered to a machine incompatible with each

other or with the nature of the case, there would be no long investigation needed to discover the error; the machine would ring a bell and put up a signal: "Wrong premise." Or, in the event of the premises being inadequate to supply an answer to the question asked, the iron Calculator could ring the warning bell and put up the signal: "More information wanted." The function of the human operator in all this is to state the premises he wishes attended to and indicate the question he wishes to have answered; his iron servant does all the rest, and registers the answer. Indeed, as Mr. Babbage quaintly puts it: "The engine is capable, under certain circumstances, of *feeling about* to discover which of two or more possible contingencies has occurred, and of then shaping its future course accordingly." It is possible to start the first few terms of an indefinite series; then go away and attend to something different, leaving an irresponsible child or a steam-engine to turn the handle, and come back by-and-bye to find the ten millionth term of the series confronting one on the indicator.

The first known machine for getting consequences from premises was that made, I believe, by Leibnitz, a contemporary of Newton. Reasoning Machines are still costly to make and cumbersome to carry about; they are in constant use for Actuarial and other special purposes, involving a great deal of reasoning on some one special class of facts, but are otherwise not very much used yet; but potentially the statement is a perfectly general and absolute one: Discovering the logical consequences of any given set of premises can be better done by machinery than by conscious thought.

Now we can see at once that the mere existence of any such thing as an iron reasoner must have had immense influence on the whole question of doctrinal propaganda. Before the time of Leibnitz, every one who had deduced a logical consequence from a given set of premises, flattered himself he had been using human reason. People suppose it now, in circles where the influence of iron reasoners has not come. A propagandist often says: "I do not ask you to believe on my authority; attend to such-and-such facts, and judge for yourselves what they prove." Usually his selected facts, taken alone, do seem to prove the doctrine he professes; and the hearers think they have been treated like men, and invited to exercise their human reason! But where the influence of Leibnitz and Babbage has come, we are prone to reflect that if we could put the data on which we are invited to reason into a machine, it might possibly detect fallacies in the propagandist's reasoning which have escaped us; and it

certainly would come to whatever is the logical outcome of his data much faster than we could. The only act in the whole business which a machine couldn't have done, is the selection of the premises to reason on ; and that act the propagandist has taken care to keep in his own hands. It occurs to us that if we would be, not tools in his hands but human thinkers, our next step, after attending to whatever premises he put before us, must be, not to register assent to the conclusion to which those premises lead—that is what a machine would do—but to ask ourselves : "What data did he reject from consciousness in order to fix attention on those he laid before us ? The notation-thinker calls back discarded data, as in our supposed sum we called back the discarded twenty ; and he finds out what *they* would prove ; and not till he can fit together the two results, does he think he ought to act on what he feels he has found out.

Even then of course action is only tentative ; for we know that, besides the data which he discarded and which we can recall by an effort of will, there are other data which we were never conscious of and which our generation cannot anyhow get hold of. But at least a large economy of force is secured by not acting on, or attending to, partial results till after we have called back as many ignored data as we can.

Sometimes a clever, earnest person tells us solemnly, that, after being induced to make profession, in turn, of Methodism, Unitarianism, Atheism and Spiritualism, he has at length found rest in the bosom of the Catholic Church, or that he has come through Storm to Peace by listening to somebody's talk about reincarnation. Notation-thinkers are inclined to reflect that such an individual has been for years past wasting stores of mental energy over a kind of thinking which was fitter for iron cog-wheels than for brain-tissue, and which even a brain might have done by a method far more economical of force than that individual used ; that his mental elasticity has been weakened by an unnatural kind of effort ; that he has mistaken for conviction the symptoms of exhausted reasoning-power, and that because he can no longer go on thinking, he imagines he has come to a "Conclusion," that is to say, a legitimate stopping-place.

I do not wish to imply that doctrines or propaganda have no place in social economy. Notation-thinkers, great and growing as is their influence in disintegrating the authority of other teachers, have little power to directly guide or control large masses of ignorant people ; and probably it is well that these masses should have some one to guide them somehow. But at least it is well that propagandists should understand what they are confronting when

they try to gain adherents or supporters among persons accustomed to the use of thought-notations.

Notation-thinkers often seem to zealous partizans cold-blooded and half-hearted. It may help us to form a conception of their relation to the intellectual life of these last two centuries if we picture the relation of the inventors of gunpowder to the military life of their age. Disputants were busy, with bows and arrows and battle-axes, settling differences between nations; and no doubt many reproached the quiet students for being absorbed in abstract studies and apparently useless investigations, and for taking no part in the struggles that convulsed their compatriots. Presently the students presented the military with an instrument which has—for good or ill—revolutionized warfare and consigned the bows and arrows of all parties to the toy-shop. The like may happen again perhaps.

If there were none but notation-thinkers, there could exist no societies for the propagation of any doctrine; for the notation-thinker, as such, is always seeking for discarded elements; or in other words, for facts which do *not* go to prove his present belief: and even when he can find none, the utmost conviction he can arrive at is: "Providence, by keeping me, in spite of my efforts, ignorant of the facts which do not fit in with this belief, compels me to act, for the present, as if it were true." This kind of conviction may be intensely strong as to what the individual has to do and say next; it has often been strong enough to give courage for martyrdom; but it does not even tend in the direction of supposing that others ought to act on one's conviction. It is obvious, then, that notation-thinkers can seldom endorse either one of the contrary opinions on any religious or social topic arrived at by parties who, however they may otherwise differ, agree in supposing that, if some selected group of data "prove" a doctrine, i.e. force us to see it as true, we ought therefore to think and act as if it were true.

When we apply the principle of economy of force to questions which are not arithmetical, but ethical or religious or social, many estimable people are distressed and puzzled, and wonder that we will not take up some definite position and stick fast there. We do not adhere to any fixed opinion because we have realised that, premises being doled out to us, by experience, gradually, fixity of conclusion is contrary to the Laws of Thought and therefore a waste of thought-energy. One does not mean to claim that notation-thinkers are personally less prejudiced or more liberal on the whole than anyone else, but they have deliberately shifted the whole possibility of holding definite opinions, about anything in

this world or the other, out of the category of religious and moral virtues, and into that of the passions and prejudices which we are aiming to subdue—which we must use sometimes, as we must use other animal faculties, but which we must not permit to use us, or run away with us, or control us.

The questions of psychology too have been much changed by the invention of the Thought Calculus and the reasoning machines. The main question used to be : "What must be the nature of that internal machinery by means of which the creature man is capable of reasoning ? Wherever mechanical reasoning has penetrated, that question has now been replaced by this other : "What is the nature of that internal machinery by means of which man can create an iron machine and depute to it the task of reasoning for him ? The latter question sounds as if it should be more complicated than the former, but the change has introduced into the whole subject of psychology an unexpected and startling simplification. On careful examination of the notations and machinery by means of which we can get our reasoning as it were, done for us vicariously, we are able to assert this principle : Whenever any man has risen to the condition in which his intellectual operations are performed with unerring accuracy, to that condition in which he is master of matter and can endow mechanism with the power to perform logical operations, he has had his analytic and synthetic faculties in a condition of exact balance or equation. The mental act, by means of which man raises himself above illusion and becomes able to make a truth emerge with automatic certainty is the act of conceiving Unity where he has been perceiving divergence. This is the verdict of everyone, so far as I know, who has turned his attention to the psychological aspect of logical notations. The Mathematical proof of the equation between analysis and synthesis cannot be gone into without the actual use of the higher notations ; but the principle is well illustrated by reference to our child's question about Auntie's length of days. Because we are limited and feeble creatures, we cannot multiply directly the number of days in a year by the number of years in a young woman's life. Because we are ingenious creatures, who share with monkeys the tendency to bring things we don't understand down to our own level by breaking them into bits, we break up big numbers into bits. Because we are physical creatures, we don't even choose the size of our bits with any reference to the abstract properties of number, we must needs divide everything according to the number of our own fingers.

But because we have a synthetic power which monkeys lack, we are able to make the very place of the pieces on our paper

conquer for us the difficulty caused by the vastness of the numbers. Because we do not—where Arithmetic is concerned—choose to allow our limitations and our physicalness to subject us to delusions, because we have discovered how important it is, in Arithmetic, to pull ourselves into line with truth, we take care to compensate exactly our monkey-like analysis of our big numbers, by a corresponding act of synthesis ; that is, we put together at the end *all* the results of our partial multiplications. And because—when we are doing Arithmetic—we do not wish to waste our force and muddle our affairs, we perform this putting together at the very earliest possible moment ; we don't bewilder ourselves and others by capering about, each brandishing aloft, and making a noise over the broken scrap of result which he individually has succeeded in getting hold of, out of the common Unit of Thought. So far as Arithmetic is concerned, we all resemble Newton and Babbage in the point in which they most differed from monkeys. Our non-human precursers possess in a high degree faculties of many kinds adapted to the observation of facts, the destruction of unities, and the perception of differences and of contrasts ; whether we apply such faculties to the phenomena of the physical or the psychical, they are essentially animal faculties in their origin and essence ; and perhaps it is even true that "beast and bird have seen and heard that which man knoweth not" ; but the brute has no faculty of synthesis at all commensurate with its power of analysis. Surely then, the evolution of man must go on in the direction of ultimately making continuous and universal that condition of equation or balance between the analytic and synthetic faculties which is the condition under which we all work when we wish accurately to investigate number ; and under which such a man as Newton creates a notation of miraculous power, or such a man as Babbage plans a machine capable of reasoning for him while he sleeps, or prays, or does kindnesses. Appliances for automatic ratiocination not only set free for the deliberate cultivation of synthetic power all the force otherwise spent on conscious and effortful reasoning, but also bring to light the great truth that such cultivation of power to conceive Unity where the brute faculties within us have enabled us to perceive divergence is the only intellectual occupation which stamps us as distinctly *human* ; for all other kinds of mental operations belong to one of two categories ; the perceptive, which we perform by hereditary transmission from brutes, or the syllogistic, which we can entrust to iron machines. The difference between Newton or Babbage and the rest of us is that most of us perform adequate synthesis only about special things, such as arithmetic, where we

have been taught to do so ; whereas the great notationists have a grasp of the principle, and therefore can push it on into new directions. Newton said he was at best only a child picking up pebbles on the shore of the infinite Ocean of Truth, but at least he had efficient tools for picking them up, and an efficient and orderly method of classifying and using them when he had got them. When we all have a grasp of his instrument, we can all be Newtons ; indeed, if everybody grasped it, we could be Newtons all the time ; whereas, the original Newton was always being pulled back by prejudices of education and the friction of environment. What is to happen next after we are all Newtons ? I don't profess to know, but it does seem to me that that step lies very obviously ahead of our race : to get a good practical grasp of its thinking-tools. And if that seems too sanguine a view to take, we must remember that already, if we saw London shopboys groping over sums in the laborious roundabout way that Plato and Aristotle must have done, we should blame the School-Board for tolerating, in a civilized country, such a wasteful condition of impotent muddle !

I repeat, I am not advocating the use of mechanical notations by all people, for all purposes. At the present time, some feel irresistibly attracted to them, and others intensely dislike them. Not all need use them ; but all have a right to share in the great truth brought into prominence by them : that progress in the conquest of mind over matter must go on mainly in the direction of bringing synthetic power up to such a level as that it shall entirely compensate each act of analytic perception.

Owing to the enormous mass of detail discovered by modern Science, all students must economize force somehow. Specialists are fond of assuming that the economy must take place by allowing the synthetic faculty to etiolate, or, at best, to play a secondary part. They say that any man must go mad of over-work if he had to stand the strain of both knowing his own special business thoroughly, and also seeing it in its due relation of subordination to the Unity of Truth. It is right that the public, and especially parents, should be warned that this doctrine is a pure assumption. There is another possibility of economizing force besides withdrawing it from the synthetic faculties ; i.e. relieving attention and memory. And when Scientists assert that man can actually know only phenomena, that Nature or Providence fixed limits to our power of knowing the spiritual substance which underlies phenomena, we may remind them that Providence or Nature also fixed limits, and terribly narrow ones, to man's power of crossing the sea ; that these limits remained fixed, as long as man trusted

to his muscles to support his weight in the water, but vanished at the invention of ships ; and that there does not appear at present any reason for supposing that there need ever be any limits at all to men's future power of relieving attention and memory by suitable notations or of shifting the burden of reasoning on to iron machines.

I would beg any friends who may have been pained at the persistent refusal of some of us to join in propaganda of religious or ethical doctrines, not to suppose that the refusal is necessarily due to indifference about religion or ethics. A serious experiment is being tried ; namely, to apply to those subjects the same careful economy of thought-force which has led to such satisfactory results in the study of number, form and chemistry, and which no one of us would be conceited enough to try to do without, when we wish not to make mistakes in our weekly accounts. Providence, or whatever we call the power which guides mankind, is very obviously using human attention, on the whole, according to some huge notation ; a bit of a problem at a time is given to man ; and he is forced to think out that bit, and ignore the remainder till that bit has been solved. But some of us are resolved that we will, *so far as we can*, avoid expending force on asserting anything which seems contradictory of what our neighbours think they have discovered ; that we will go on at once, without needless loss of time, to pick up whatever data we have been ignoring.

There is an impression in some quarters that the use of mechanical appliances or notations to facilitate thought must tend to make the mind mechanical and the conscience callous and indifferent, and to fix attention on the things of earth, to the exclusion of the spiritual and the Eternal. This notion seems to me to be about as reasonable as if we supposed that a man is the less likely to be able to stand up and contemplate the sky for having a spade to dig out his root crops, instead of going down on all fours to grub them out with his hands. The more the attention is relieved from the necessity of expending itself on mere reasoning, the freer it is to fix itself on eternal principles.

A SCANDINAVIAN IDEAL

This was read to the Christo-Theosophical Society. The substance of it appeared in "East and West," Oct. 1909

IF we are trying to think out what we mean by an Ideal of Humanity, it is not advisable to omit from our consideration

important elements of character evolved in any quarter of the world.

We have been studying various trains of thought: from the South and East, Palestine, India, or Burmah, but we have had as yet hardly any breath from the North. Yet we English are of a race far more nearly allied to the ancient Scandinavians than to either Hindus, South Europeans or Jews; the ideas and legends of the Odin religion are beating about in our unconscious minds, even while our conscious attention is fixed on the utterances of the South or East. We should be all the clearer as to what we mean ourselves if we could bring our own ancestral ideals into consciousness.

The specific characteristic of the religion of Odin as contrasted with those with which we have been made more familiar in classic and theological books, is summed up in its special treatment of the Rainbow-legend. In Greece the Rainbow betokened the advent of a messenger from the gods; in Palestine the Rainbow was held to be the token of a covenant made with man by God. According to the Odin religion, the Rainbow was a bridge across which the souls of the brave walk to the abode of the divine on their own feet, or ride there on horse-back.

A fashion prevails in England of talking as if direct communion with the Unseen existed in Asia long ago, was re-invented in America fifty years ago; and was imported into England a little later by the Spiritualist Alliance or the Society for Psychical Research.

As a matter of fact, there has never been a country or time when there were not Schools of the Prophets: that is to say, groups of persons who devoted their lives to a serious study of the best methods for cultivating the inspirational faculties. The study goes on steadily throughout the ages, though in the outer world it is often the fashion to ignore the fact; such fashions seem never to have gained much hold in Sweden and Norway. There it seems to have been far more taken for granted that the possibility of receiving inspiration exists in man; and that some people lay themselves out to cultivate that possibility to its highest pitch.

I propose to take, as our guide back to the North, Bishop Tegner of Upsala in Sweden, who was born in 1782. One of his poems, "The Children of the Lord's Supper," is known to us all in Longfellow's translation. His chief work, however, was a romance in verse called, "Frithiof's Saga," the scene of which is laid in old Norway. Tegner puts before us a variety of strongly-marked types, and at the end of his book he introduces one early convert to Christianity. This Christian's refusal to do just one thing

which the Odinists expect of him brings sharply out what Tegner evidently considers the specific message of the Christian religion. The Christian appears to have read the Gospels but not the Epistles. By this device Tegner gets behind what the early followers of Jesus thought Christianity should mean to Romans, Greeks or Hebrews; it enables him to state, in good plain Swedish, something which he supposes that Jesus of Nazareth might have to say to Scandinavians.

The book was translated into many languages and was for a short time much in vogue, especially in England. It was spoken of by some as the finest epic since Virgil; by others as the finest Poem ever written. It seized on the world by its vivid dramatic power, the fresh charm of its hero and heroine and the wonderful beauty of its verse. Then I suppose English people found out a little what ideas they were imbibing from it; it was dropped, so to speak, like a hot coal. The scientific world was not yet ready to be shown whither it was tending, by a Poet-Prophet who wore the garb of a Bishop. Theologians, on the other hand, were not yet ready for the Bishop who told them that the whole evolution and education of the world is governed by the same spiritual life-laws which Jesus Christ simply recognised and accepted, because they existed; indeed, even as lately as thirty years ago, when a portion of Tegner doctrine was restored by a certain school of psychologists; religious people raised a protest against what they confused with materialism.

But the influence of such work as Tegner's is never lost; if it finds no public ready for its reception, it starts a fermentation which ultimately generates one.

Many of us are quite different persons from what we should have been had our fathers or grandfathers not read Tegner. His own thoughts, as well as those of his ancestors, are beating about in our subconscious minds, and we shall understand what we ourselves are feeling all the better if we bring back into consciousness what Tegner said to our fathers.

The tale opens with a picture of two young lovers, Frithiof, the son of a wealthy land-owner, and Ingebjorg, daughter of the king of the province in which Frithiof lives. This king is descended from the Asa-race, the race of Odin; and his family are very proudly conscious of the fact. But Frithiof has gone alone and unarmed into the forest, engaged in a wrestling match with a bear, and throttled the bear.

Whoever can accomplish this feat has, it seems, the right to consider himself descended from Thor. The young people are not

yet formally betrothed, but both the fathers give tacit consent to the attachment.

Besides his daughter, the king has two sons. Helge, the eldest is a religious fanatic. He has dark, lurid moods; delights in seeing animals killed for sacrifice; consults Augurs; and is horribly superstitious.

Halfdan, the younger, is a youth who has no particularly evil intentions nor, on the other hand, any sense of responsibility; he has no serious purposes of any kind except to make the best for himself of circumstances as they arise. He is jealous of Frithiof's superior height, strength, courage and beauty; he has no hesitation about using other people's passions and religious prejudices as pawns with which to play the game of life in the interests of his own ambition and for the gratification of his own envy. He is the type which, in any society where religion is in fashion, developes into the ambitious, virtuous, clever, correct, pious *cad*. Wherever any Pharisaic caste exists, a few such men as Halfdan are sure to be found its real backbone and mainstay. The really pious and honest of the orthodox party do not quite like them, but find them too useful to quarrel with; the intelligent among heretics dislike them far more than they dislike real bigots. One feels that Tegner drew the type from some man of his own day whom he loathed; and that the book is a sermon preached by the good Bishop to himself, about his own intolerance of time-serving cant.

The two old fathers are beginning to feel too stiff and feeble to go to battle any more. In the North, at that time, it was not comfortable for a warrior to outlive his fighting days; the old men wish to go to Valhalla; and, according to their religion, there was no objection to their doing so. They send for the three young men; give each of them a warning about the dangers of his special temperament, and much good advice which one sees at once will not be followed; and then they "cut runes to Odin"—that is to say, cut their own throats—with the utmost decorum and self-satisfaction; first making an appointment to meet on moonlight nights, each sitting on his own tumulus, and discuss current events as time goes on.

Then trouble begins. The two young kings think they can improve their own position and that of their kingdom by marrying their sister to the King of some neighbouring province. They summon Frithiof to help them in a war as their vassal; he however ignores the claim which his country has on him, and makes his help conditional on their agreeing to his suit. They put Ingebjorg in an island sacred to Baldur, the Sun-god, the special deity of

their family, thinking, or professing to think, that Frithiof will not dare to go near her in that sanctuary. Frithiof is not troubled with sanctimonious prejudices ; he goes to see his lady love as before. He asks her to marry him and go abroad to live. Why should she not ? She had her father's consent to the marriage. Whose else need she trouble herself about ? Ingebjorg refuses, on the ground that a king's daughter, a child of the gods, may not snatch at bliss ; her life belongs to her people ; "she can cast away a whole life's happiness, just as a Queen can cast away her mantle, and still be what she was before." Frithiof's breach of ecclesiastical etiquette, in visiting the Baldur Island without permission, affords a convenient excuse for turning away from him the popular favour in which he has hitherto been held, by representing him as sacrilegious. To get rid of him more effectually, Ingebjorg's brothers impose on him, as penalty for the sacrilege, that he shall go on a dangerous errand to the Earl of the Orkneys. They try to increase the danger by magical incantations.

Frithiof combats all the dangers by free, fearless faith, and having accomplished his errand, comes back ; to find his homestead burned down, his lands devastated, and his lady given in marriage to a very old man, the king of a large province. She had worn to her wedding a sacred bracelet which had been inherited by Frithiof from his ancestors and which he had given to her. One of her brothers had taken it from her and hung it on the arm of his family's special idol, an image of Baldur the Sun-god. Ingebjorg has left a broken-hearted message for Frithiof that she leaves it to the Allfather to judge between her and her tyrannical brothers. On receiving this message Frithiof says that he knows the Allfather will judge ; but he, Frithiof, would prefer to have a hand in the judging. Tegner does not suggest that there is anything reprehensible in this desire for personal vengeance ; from first to last, there is no suggestion that any desire of the human heart is evil or impure in itself, or even that any desire is in itself lower or higher than any other. This absolute recognition of the equal sacredness of every impulse and desire of man seems to me to be the most characteristic feature of Tegner's psychology ; the one which distinguishes him most from other interpreters of Christian doctrine. When he includes what we should call the thirst for vengeance, the express desire to be the personal instrument of God's judgment on those who wrong us, among permissible and sacred and educative aspirations, he touches, it seems to me, the sublimest heights of audacity. That he does so include it seems quite clear.

For the present Frithiof's desire to help God Almighty in

judging sinners is at a crude stage. At midsummer, he goes to the midnight bon-fire in honour of Baldur, where the kings were sure to be present, with the intention of giving them a piece of his mind ; and he does give them a piece of his, Frithiof's, mind; he has not thought much, as yet, about the Almighty's view of the situation ; he is rather inclined to speak his own mind to gods as well as kings. He turns to the Baldur-Image, and, telling it that the bracelet is stolen property, makes a snatch to recover the jewel. The Image falls into the fire and sets the whole shrine alight. For this accidental crime, Frithiof is declared outlawed and excommunicate. He betakes himself to his ship ; and, for the next few years, leads the life of a Viking, a sort of Robin Hood of the sea, and earns a wide reputation for prowess and courage. After a few years he grows home-sick and lands in the country of King Ring, Ingebjorg's husband, and goes in disguise to Ring's house. The king at once sees through Frithiof's disguise because of his great height.

Now King Ring, in his turn, is beginning to fear he may die of disease or old age ; he is looking out for someone to whom to entrust his kingdom during the minority of his son. But he is not going to be satisfied with merely giving good advice ; he waits till he can find a guardian able and willing to act on sound principles. It occurs to him that if Frithiof is really an honourable man he will be a good guardian, for he has all the other necessary qualifications. He subjects Frithiof to many careful tests ; and being quite satisfied appoints him Regent ; and then cuts his runes to Odin in approved fashion. And everybody thinks that of course Frithiof will now marry his old love, and live happy.

But Frithiof takes a very serious view of his duties. He is not going to do as Helge's father did : govern a kingdom and bring up the heir in the intervals of a warrior's life ; he must give up the personal joys of seafaring and fighting. And the sense of being excommunicate now weighs on him terribly. He feels he cannot marry till he has become reconciled to Baldur the Sun-god. He decides to pay a visit to his own country, to revive old memories, pull himself together and consult the spirit of his father as to what he should do. Sitting on his father's grave, he thinks he sees what to do ; he burned down a wooden shrine of Baldur ; he must build a stone Temple of Baldur ; that will make reparation and atonement. He stays in the neighbourhood till he has seen the temple built and selects a good old man to perform the ceremony of atonement for him, Frithiof, and to dedicate the shrine to the Sun-god.

The old man whom he selects is the one convert to Christianity

in the story. The two principal figures in the scene of the dedication therefore, are these : on one side, Frithiof, the ideal Scandinavian, the Sir Galahad of the Odin religion, tried, purified and perfected by all the wisdom handed down from the past, and by all his own experiences ; he has shrunk from no danger ; nor is there any joy which he has refused to set aside at the call of duty. On the other is a simple exponent of the teaching of Jesus Christ. Therefore what the old priest says, and what he refuses to do, contain whatever Tegner considers the essence of what Christianity should mean as a contribution to the ideals of heathen Scandinavia. Now what does this man refuse to do on the score of being a Christian ? Does he refuse to conduct a heathen ritual ? Not at all ; he is by profession a priest of the National Church, and has no more notion than Jesus seems to have had of objecting to the established order of public worship of his country. He does not suggest dedicating the new temple to Christ, nor does he protest against the roystering, fighting life which many of the congregation are openly living and which Frithiof has only abandoned, because his new duties are incompatible with it. What then is the protest which he makes in the name of Jesus Christ ? He will not perform a ceremony which implies reconciliation with a god, on behalf of a client who is at enmity with any man. He will not accept a present for the Sun-god from a man who has not first made to the Sun-god the offering of his own hatred. According to Tegner's philosophy, there is no need to be reconciled to God if you are not ready for it ; we shall all be reconciled to God in time, if we wait long enough ; around the world the reconciler goes ; and we men call him Death. But if there has awakened in you the desire to be consciously atoned, At-one-d, reconciled to God, before your death, then fulfil the conditions ; be reconciled to whomever you most hate. For God is the All-Father, and the Sun shines on all alike. Frithiof wished to make an offering. As for that, we all make offerings, sacrifices ; life and fate are so arranged that we make sacrifices all along ; our lives *are* sacrifice. But if we wish for the conscious joy of making voluntary offering, let us do it honestly, fulfilling the true conditions. Nothing is ours to give except our hatreds ; our separateness. Separation constitutes the "I" ; let us give that—or give nothing ; and at least have the honesty not to play at giving.

The priest then sends for Halfdan ; and the former foes shake hands ; the sentence of outlawry is formally revoked ; and the Temple is consecrated by the marriage of Frithiof and Ingebjorg.

In order to bring out more emphatically what he really means, Tegner has made Helge die before the end of the tale and Halfdan

reigns alone. It is about him therefore that Frithiof has to decide. Now most of us could have forgiven Helge, the honest and half-crazy fanatic. One can conceive his becoming really converted, as Saul of Tarsus was converted, i.e. coming to the conclusion that his former notions about what the gods had wished had been a mistake; and honestly trying a new way of carrying out their purposes. But Halfdan's form of religious orthodoxy is a desire to get the good things of the world for himself. If he is now converted, it can only be, one is inclined to say, by finding out that Frithiof is more desirable as a friend and more formidable as a foe than he used to suppose. I fear some of us would think that if, after all that has passed, Halfdan is willing to make friends with Frithiof, now that he has become prosperous and powerful, that only proves Halfdan a more unmitigated cad, more unfit for a gentleman to shake hands with, than we thought him before. On this point the priest preaches a special little sermon. Where did Frithiof get his courage, his strength, and the generous, pure, cleanly gentlemanhood which make him look down on Halfdan's snobbish ambition and mean self-seeking? From the gods. Yet he resents Halfdan's being proud of his descent from a royal lineage which dates back to the gods. When all is said, what is there to choose between the two sorts of boastfulness? Halfdan's meanest vices are, after all, only an inverted image of the qualities on which Frithiof most prides himself. When Frithiof can see that, he will no longer be excommunicate. Till he does see it, he is, *de facto*, excommunicate; the mere taking off the formal sentence of Excommunication will alter nothing; he had better remain openly and avowedly excommunicate. What harm does that do him? The Church makes no claim on us to be in communion if we do not care for it; but, if we do, the way is to be reconciled with whomsoever we most hate and despise.

As the Saga is not a text-book of theology but an artistic creation, its moral apex is not touched in words, but indicated by a sort of mental parallax; the various events of the tale pointing to it in silence but with unmistakably converging fingers.

Frithiof had wished to have a hand in dealing out God's judgments. God's judgments, God's justice, are going on always, they take care of themselves, in a region out of our ken. But man, when he feels wronged, gets a longing for what we call Revenge, which means a longing to *see* God's judgment and to be consciously a factor in carrying it out. He has a right to wish this. He is a child of God, and has a right to ask for a share of anything that is his Father's which seems to him desirable. The wish itself must have been an inspiration from the Father; how else could it

occur ? But if Frithiof is to share the Father's function of Judge, he must fulfil the conditions. If he is to be a conscious instrument of God's judgment, he must judge as God judges ; he must begin by knowing his enemy as God knows him ; seeing him as God sees him. God made Halfdan and his disposition and qualities, such as they are ; made them presumably for something. Frithiof must give himself the chance of knowing what such qualities are good for. While he was away doing brave deeds at sea, leaving Halfdan to do mean ones on land, he had small chance of finding out the national uses of Halfdan's politic snobbishness ; if he stops on land and enters into treaty with Halfdan, he will find out. And he will be able to help God to keep Halfdan's ambition in proper bounds. In Tegner's ethical scheme, there are, as I said, no evil passions, no desires low or base in themselves. All desires are means of evolution and education. At-one-ment is not a cure made necessary by something specially wrong in man ; it is, Tegner expressly states, the *key-note of Creation.* All life is a pulsation of alternate separation and re-union ; our personal desires are the means of separations, normal and healthy at their time, but when the desire arises for *reconciliation with God,* that indicates that the time is approaching when it will be normal to return to the brother from whom we parted.

If we allow ourselves to look at life from Tegner's point of view, we see that our own moral sense has become confused because we think of our desires primarily from the point of view of whether they shall or shall not be gratified. Of course, if we insist on doing that, society is driven to classify them as good or bad in themselves, because there are some the immediate gratification of which would be too inconvenient for society to tolerate ; and it must, in self-defence, stigmatize as bad those which are so. But what has our gratification got to do in the matter, anyway ? The king's child can throw all that aside, as a queen can cast off her mantle. A stage queen loses her royalty when she lays aside her trappings ; not so a real one. For a child of God the question should be what his Father has to say to him ; not his own gratification.

All desire is prophetic ; each is the means of some special revelation. The arising of the desire is the first half of the Revelation ; the second part is the discovery under what conditions it would be normal to gratify the desire. As soon as we have made that discovery, the desire itself loses its imperative character ; it becomes a manageable factor. Fighting against a desire *before* we have fulfilled its purpose as a revealing agent is fighting against God, the Revealer, and trying to arrest revelation half-way.

Tegner represents his heathen heroes as finding out for themselves through the experience of life and their own instincts of purity, on what principles the so-called earthly passions should be dealt with; he shows the best of his heathens as finding out the conditions under which it is legitimate to gratify the desire for food, for the excitement of battle, for earthly ambition, for sex-love; for suicide in order to escape a dreary old age. All these desires are equally legitimate, equally pure, if normal conditions are secured, equally evil if gratification is snatched at without consideration of normal conditious. But the heathens were at loose ends, so to speak, about their spiritual desires; they had not realised what were the normal conditions for the repose of feeling reconciled to God, for the supreme joy of sacrifice, for the supreme honour of helping God to judge our brother man. Jesus Christ put these spiritual longings under the very same law as the pure-hearted Norse Vikings evolved for themselves about their earthly wishes. Whatever you wish for, take the wish as a token that the time is come for you to learn what are the conditions under which gratification would be legitimate and pure. The important thing is not the gratification of your wishes, but securing the revelation which each contains. Longfellow, a great student of Tegner, sums up his whole doctrine thus:

"Not enjoyment and not sorrow
Is our destined end or way;
But to act that each to-morrow
Find us further than to-day.
Let us then be up and doing
With a heart for any fate;
Still achieving, still pursuing,
Learn to labour and to *wait*."

Wait, as you wait to expose the lens of a camera till whatever you do not wish to fix on the sensitive plate has been removed from the field of view. Wait, because communion with the Unseen is moral sunshine and has a photographing power on the brain; every emotion which is present synchronously with spiritual joy becomes fixed as a portion of the mental structure, and the impression once thus fixed is difficult to efface.

Much mystic literature seems to imply that special purity involves abstaining from marriage, and seeking spiritual ties and joys instead. This can at best be a partial solution; humanity would come to an end if all men practised it; and if the best practice it, the best leave no posterity; according to Tegner, the ideally pure man will not seek to unite himself with the woman whom he loves nor with the God who is his life while he is in a state of

personal tension against any section of humanity. This is a general solution ; for the more it is carried out, the better it will be both for present society and for posterity. According to this conception, an Ideal Church Reformer would neither marry nor give up his life to his God till he had found out that even the worst type of Pharisee is not uselessly bad and wholly good-for-nothing.

Much religious literature is saturated with the notion that the duty of a Christian minister, as such, is to tell people how they are to think *about* Jesus Christ, who is represented as desirous above all things that men should believe in Him, admire Him, love Him, do things for His sake.

According to Bishop Tegner's breezy Scandinavian view of the matter, it is not the duty of Christian ministers to decide to whom or to what we should give the devotion of our hearts ; the duty of a Christian minister, as such, is to teach the art, which Jesus taught, of keeping the spiritual life pure and manly by perpetual self-excommunication from indulgence in cheap and easy spiritual consolations. Whoever or whatever is our Sun-god, the light of our eyes, the warmth of our life, the joy of our heart, when we wish to give ourselves the luxury of making to it any offering, if we then remember that there is any brother to whom we are doing the injustice of thinking of him as worthless by comparison with ourselves, let us leave our gift before the altar, depriving ourselves of the joy of the sacrifice, till we have been reconciled to that brother by finding out for what purpose God made him as he is, and how we can help him to be what he was meant to be.

There is in Tegner's work an element of dauntless spiritual purity, which reminds one of Una with her lion, of a snow-peak in sunlight, or of a baby splashing in its bath ; a sense of being a child of God, at home in the Father's house and free to use His tools and His toys, His methods and His forces, subject to no restrictions but those which He has laid down. It is unlike almost anything that I know of in religious literature except the recorded words of Jesus Christ.

We in England much need the influence of that pure touch. Our fever and unrest, the languor and uncertainty from which we are suffering, seem to me to be symptoms of home-sickness. We have had about as much as we can stand of Southern religious machinery ; of Incarnations and Ideals ; of covenants with God and messengers from God ; we are, as Tegner said, home-sick for our natural Valhalla. We need to be braced up by an excursion across the bridge of brave souls which leads straight to the great

White Throne of the All-Father. The path looks fantastic, but it is perfectly reliable if only we fulfil the conditions. There is always one hand which can lead us steadily across: the hand of the brother whom we have hated and despised and whom we wished to help to condemn.

This great key-note of the inspirational life was formulated first, so far as I know, by Jesus Christ. It has been, as yet, used very little in any systematic way. It seems to me to be the great scientific discovery of the world, summing up, as it does, the laws of spiritual evolution in terms of physical meteorology. What is the meaning of calling Christ "Lord," if we dare not even try to make use of the great psychologic truth which He taught?

OUR INTELLECTUAL RELATION TO THE UNSEEN

I.—INTRODUCTORY

In my attempts to bring to the consciousness of non-mathematical readers some portions of the spiritual treasures gathered by Babbage, Gratry, and my husband from the region of High Mathematics, I am constantly baffled by the fact that many among the audience not only lack actual knowledge of the Higher Calculus (though my addresses are always intended chiefly for those not familiar with it), but are also imbued with certain mistaken opinions as to the facts of the case—opinions which seem to be prevalent even in the most cultured class of non-mathematicians; which have originated, no one seems able to tell how; and are tenaciously held, though no one can explain why. In order therefore to clear the ground for practical applications of the Babbage-Gratry-Boole revelation, I will begin by a short statement of facts; acquaintance with which I will henceforth venture to assume on the part of such readers of *The Unknown World* as do me the honour of reading my addresses to the Christo-Theosophical Society.

Among educated persons who are not mathematicians, two modes of inference are accepted as valid: (1) The Syllogistic, which is that of Formal Logic; and (2) that used by Naturalists and leaders of Physical Science, in the formulation of Laws of Nature from large numbers of observations. Of syllogistic method, Euclid is the great master and model. He takes as data certain selected axioms; and by successive combinations and re-combinations of these data, erects a wonderful structure of accurate geometric knowledge, which is unassailable on its own ground, and for its

purposes invaluable. No syllogistic structure deserves to stand, unless the data on which it is founded are unimpeachable, as well as the syllogistic superstructure. Why do we believe Euclid's axioms ? They are neither built up syllogistically upon earlier data, nor are they inferred (as the so-called Laws of nature are) from long series of observations. The question—"What is the nature of the process by which we recognise Euclid's axioms as truths ?"—has, in one form or another, occupied much attention : we shall return to it presently.

The other process of inference ordinarily recognised, that from *repeated observation,* is legitimate so long as we only allow it to lead us to form *provisional working-hypotheses,* and hold ourselves ready to correct them on the first appearance of inadequacy. Those who, on first hearing of the duck-billed Platypus, said off-hand—"There cannot be such a creature ; all animals with birds' bills have wings," were making a non-legitimate use of the method of inference from experience ; no possible amount of previous experience can legitimately give the right to feel absolute certainty, that kind of certainty which we feel about the Laws of Algebra. When we say "twice three are equal to three times two," we do not infer this, modestly and tentatively, after long observation, and only as a provisional working-hypothesis, about which we keep ourselves ready and open-minded for the possible discovery of some new kind of creatures of which twice three shall not equal three times two ; we know directly we begin to think about the matter, that twice three are always equal to three times two, and must continue to be so, all appearances to the contrary notwithstanding. How can we be so sure ? Moreover there exists no syllogistic connection between the truths about small numbers shown to children with an abacus or a box of beads, and those larger numbers whose properties they are expected to infer, successively, in the course of their arithmetical experience. How is a boy to know things about millions of miles and years, simply from what he has seen of beans or shells in little boxes ? He does know ; he knows about the millions of years much more certainly than any of us know what is going on under our own eyes. But how ? The Laws of Arithmetic used to be loosely spoken of as "Laws of Number." That most of them are not so, is clear. An Archangel, or other finite creature possessed of intellectual powers very much larger than our own, would probably multiply the number of days in a year by any moderately small number of years, directly, as we cognise twice four ; it is not any law of number, but the narrow limits of our own faculty of direct cognition, which force us to break up the number of days in a year into three groups ;

and the exact size of the groups is even determined by the number of our fingers. Many Laws of Arithmetic are Laws, not of number, but of human psychology. Yet for a long time this was not clearly seen. At last Newton and Leibnitz formulated a process for investigating curves and motions, a method patently and glaringly unsanctioned by the Laws of the subject under investigation. And a strange thing happened (strange, when we consider that the purpose purported to be, and indeed was, mathematical), some persons were sure that Newton's process was valid ; sure with the same kind of instinctive, unreasoning conviction which animates a prophet who has seen God ; while others, on the contrary, could find no ground for supposing it valid at all. It had no *syllogistic* connection with Euclid, or with anything hitherto considered adequate proof. Reasons for supposing it valid were however soon supplied in the shape of results ; the new process enormously increased facilities for accurate culculation. In my youth I was introduced to the Newton-Leibnitz Calculus by a Cambridge graduate, with the announcement (to my mind very unsatisfactory), "No one can prove that the Calculus is true ; logically it is wrong ; but if you stick to it in the dark, the results come out right."

More than half a century ago, Babbage called attention to the fact that if ordinary induction, such as that used by Naturalists to frame their working-hypotheses, were applied to form guesses as to the Laws of Numerical series, the guess would, in an overwhelming majority of cases, prove wrong. Thirteen years later my husband called attention, more specifically than had yet been done, to the entire difference between the mode of induction known in physical science and that by which we infer or induce belief in an axiom of Geometry or a Law of Algebra, or of the Higher Calculus. Evidently the mathematical world was trembling on the verge of some mighty revelation. Then rose up and spoke the brave monk Gratry ; and he said that the process by which those who do see the validity of the Newton-Leibnitz Calculus are brought to see it, is a process identical with that by which the great religious seers arrive at the certainty of the Unity of Creative Energy. Had Gratry been less learned and sound than he was in mathematical philosophy, less eminent than he was, both as logician and as spiritual teacher, he might have provoked a laugh of derision. As it was, while those who were capable of understanding him read his book in awestruck wonder, there was nothing left for the frivolous and flippant to do but to ignore its existence. This they have therefore done. Gratry predicted that when the identity of mathematical induction with Revelation of

the Divine Unity is perceived, *Logic, which hitherto has had only feet, will begin to acquire Wings.* His prediction was fulfilled as soon as uttered, and in a more emphatic and concrete form than he probably expected. For my husband showed that even syllogistic logic becomes enormously more rapid and powerful in its action, if we add to the data constituting the specific premisses of any special syllogisms, certain other data, expressive of faith in the Unity of each pair of contrasted polars. *E.g.*, to any set of premisses concerning sheep, horned-beasts, and white beasts, etc., we may add these others :

"Sheep, plus other creatures, equal Unity.
Horned animals, plus not horned ones, equal Unity.
White animals, plus those that are not white, equal Unity."

It is not of my husband's work, however, that I wish now to speak ; it has met with abundant recognition from the outer scientific world. The result which I most of all desire is to draw the attention of students of *The Unknown World* to the Logique of the monk, Gratry.

II.—SOME SAFEGUARDS OF THE TRUTH-SEEKER

WHEN we look back at the history of *almost* any branch of human knowledge, Physical Astronomy, Biology, Sociology, Theology, Psychology, we perceive a long series of opinions which has each in turn been accepted as a truth, and many of which have been subsequently discarded as exploded errors. Many errors have been believed in during long periods. How has it happened that men have been so deceived ? This question is commonly answered by some vague statement that "man's faculties are limited, and therefore he can only discover truth by slow degrees." Of course our faculties are limited and we learn slowly ; but that does not compel us to believe error in the meantime. The limitation of my vision prevents my seeing what my friends in America are doing ; and I must wait for a letter to tell me ; but it does not force me to invent false statements about their actions before the letter comes. "Our faculties are not only limited in extent, but they are also liable to disease and perversion." But even this does not quite account for the existence of delusions. For instance, a little thickening in my eye-ball causes me to see, besides the real objects before me, a black spot. But this does not make me tell my audience that there is a black thing floating in the room ; and if I did say so you would not believe me.

Neither the limitations of our perceiving powers, nor their diseases, are sufficient to account, either for one person inventing a false opinion or for other persons accepting it.

I said that in *almost* every branch of knowledge errors have gained acceptance as truths. There is at least one exception, the Science of number. It is not too much to say that no set of persons ever accepts a numerical error. This is not due to any lack of errors being made. Most schoolboys know that mistakes occur in sums and equations as in everything else. The limitations of our faculties and the aberrations of our brain-action project themselves on to our direct perceptions, in number and space as on to any other field of mental activity. But the nature of the subject has forced mathematicians to recognise certain laws of *correction of error*, which act as safeguards against the fixing, the accumulation and the spreading of error. And thus they have been enabled, in spite of both the limitations and the aberrant working of the mental machinery, to create, slowly but safely, a science which is infallible so far as it goes, and in which no error can gain credence for a single week. Usually the same individual who makes the mistake is able before long to find out at which step his brain failed to act soundly. It does, however, happen occasionally that a man nurses a numerical error till it has got fixed in his brain as a delusion ; and he cannot be made to see that it is aberration ; but even in these extreme cases of brain-lesion, the error is always confined to the individual, it creates no public confusion ; it does not even occasion discussion ; much less is it accepted by any party. As a truth the man who persists in a numerical error never rises into any position of influence ; he falls out of the ranks and is heard of no more ; no *set* of persons ever believes in him.

Now, though the laws of correction or safe-guarding are most easily discovered in mathematics many of them are quite general ; they have reference, not to the special subject, but to the dangers and needs of the machinery with which man discovers truth ; they are general Laws of safety for the Truth-Seeker ; and they can be translated out of mathematical terminology into ordinary language. They are, in fact, Laws of the human transcendental organ. Man is emphatically a transcendental creature ; he is possessed of very limited direct perceiving powers ; but he is gifted with a faculty of inducing, by means of the limited data which he can directly cognise, knowledge about things which *transcend* the range of his perceptions. To take one instance, a picturesque and striking one, but not at all more truly significant than countless others : A comet comes within the range of vision for a few days or weeks ; yet we can know both where it goes

when it passes out of range (the Unseen) and when it will return (the Future). Now there is no syllogistic connection between a comet's path now and its position next week ; the missing link in the syllogistic chain is supplied solely by transcendental Faith. The fact of even one such feat being achieved is sufficient to prove the existence in man of powers which are strictly transcendental ; every branch of science is full of precisely similar achievements ; we all of us do work of more or less the same kind, whenever we arrive by induction at any truth not syllogistically deducible from the data at our disposal. For instance, we can cognise directly that three times four beans are as many beans as twice six beans, and so on ; but we cannot directly cognise, or even conceive, such entities as millions of miles or thousands of years ; and there is no actually syllogistic connection between the small numbers which we can cognise and the large ones which we cannot. Yet we all venture to work sums in the thousands and millions by means of the units which are within our direct grasp. We all then possess the power of transcending the limits of mere syllogistic inference from data afforded by direct perception. Those who most vehemently deny it in words believe it in fact. Everyone believes that an astronomer can tell when an eclipse will happen, as certainly as he can tell what time his chronometer indicates now.

Let us not then lose the plain revelation which is being given to us by stunning ourselves with the meaningless statement that the Laws of Arithmetic are mere Laws of *number*. Many of them are in no special way related to number ; they are Laws of the human transcending faculty. Every accountant receives transcendental revelation ; he sits down ignorant of some relation among big numbers, and, without obtaining any extra information from any man or book, he rises up possessed of the knowledge which half an hour ago he lacked. He has summoned that knowledge from the Infinite Unknown by simply using, according to its proper laws, the organ inside of him adapted to communicate with the Infinite Beyond.

In old times, all kinds of awe-struck superstitions gathered round the Wizard who could discover truth about numbers too vast for the mind of man directly to cognise. We are accustomed now to the idea that this power is the birthright of every man, woman, and child. Familiarity has dispelled our superstitions about the perpetual Arithmetical revelation ; but God forbid that it should diminish our reverent gratitude for the proof which it affords that we can summon to our aid, at our Will, the Infinite Unknown.

It is often said that we cannot have "mathematical *certainty*"

about spiritual truths. People talk about mathematical certainty without always reflecting what it consists in, or how it is attained. It is difficult to convey to those who have not specially investigated the subject, any notion how unattainable mathematical certainty would be to the mere intellect, were not the intellect itself safeguarded by habits that are properly ethical and spiritual. I do not mean that the exercise of the necessary self-restraint involves as much moral effort in mathematics as it does in other subjects ; if it did, I fear we should be as far from exhibiting them in mathematics as in anything else ; and mathematical certainty would be still a thing of the far future. The necessity for entrenching ourselves within the proper safeguards of the Truth-Seeker is more obvious in mathematics than elsewhere, the temptation to stray beyond them is less than in other subjects ; it has been made comparatively easy to find and do the right ; and thus the Science of number has become a little picture or prophecy of what man's knowledge may become whenever society accepts and observes the normal laws of these faculties by which the finite mind transcends the limits of its finite condition and receives revelation from the Infinite.

Man is at all times, and about all things, liable to momentary error.

Now, transcendental truth, in the act of entering a human mind, exerts on it some sort of photographing power ; any erroneous notion which happens to be in the mind when some truth of higher order is being revealed within it, is likely to become so imprinted on that mind, as to be afterwards indistinguishable from truth. A story is told of some great mathematician, hopelessly fogged in an investigation, and repeating over and over again, "five and seven are eleven," till his housemaid corrected him. Whether the story be true or not, it is at all events a picture of many things which do happen. We call such aberration "absence of mind," but it differs from mere dreamy and lethargic absence of mind, the mere negative failing to cognise facts. It is positive error, caused by the fixing of a momentary misapprehension owing to the intensity of the higher vision.

Many errors in Biology must have been due to this cause. Anyone looking into a microscope may mis-see an object. If there were nothing in his mind to cause special registration of impressions, the observer might proably discover his mistake on the next inspection ; but if he happens to make the mistake when his brain is intent on some principle or general truth, his eyes will be very apt to repeat their mistake of vision on subsequent occasions. The best observers are aware of this danger, and take precautions

accordingly. Unfortunately some biologists are not thus careful, and give to the public, as Science, things which have no existence except as fixed optical illusions in their own brains. In mathematics the caution is practically universal. An actuary charged with a difficult investigation is not trusted to correct his own mistakes by going over and over his own calculations; for a mistake once made during a period of intense investigation would tend to repeat itself automatically, by association, if he went over the same ground afterwards. Nor is it sufficient that an admiring subordinate should revise the superior's work; the corrector must come to the work with a fresh insight and unbiassed mind, and make all the investigations separately for himself. The results given to inquirers from a respectable actuarial office have been arrived at *independently*, by two or more persons. This is why actuarial Science is *Science*, and is not mere traditional guesses, handed on from generation to generation as truths.

For new truth has not only a photographing power, it has also some curious kind of magnetising power. The act of seeing transcendental truth at first hand makes the whole person *magnetic*, gives him a power to attract followers and to convey into their minds by sheer contagion, and independently of argument, whatever ideas are in his mind, the false along with the true.

I ask your attention specially to this point. We are prone to imagine that if a man or woman has seen any new truth, provided only that he or she is on the whole well-intentioned, it must be desirable that that person should impart what he sees, should win believers and adherents. The fact that so-and-so, who has seen some new truth, is attracting hearers, winning followers, exerting great influence, is often spoken of as if it were *of course* a good thing; is spoken of thus, both by the followers, and, what is worse, by the Seer himself. But the really wisest men know better; they know that the very force which attracts hearers is itself a double danger; it tends to fix on the teacher's mind, as if solid truths, any shadowy misperceptions that may have been floating about in it owing to his own aberrations; it also confers on him the terrible power of making his errors seem like truths to disciples; and they in their turn, by the fervour of admiration, impress the teacher back again with fresh convictions of the truth of his own erroneous notions. The best teachers are therefore very cautious to keep their influence well in check; to exert, not the most influence they can, but the least amount which is consistent with the fulfilling of their duty.

This modest self-restraint, this resolute keeping well in check of one's own power to attract and to influence, is, I hold, the

greatest and most essential safeguard of the truth-seeker. It has been raised by mathematicians to the level of a fine art. A good mathematical teacher exerts his personal influence *only* in fixing his pupils' attention on the step in investigation which they should be taking, and in encouraging them to investigate accurately he is specially careful to convey no hint, either by word or sign, or by indirect influence, as to what he supposes to be the correct answer. Hence it happens that though the teacher may make mistakes, every pupil acts as a corrector, not an intensifying reflector, of the teacher's errors.

The impulse to thrust one's own beliefs on other people gathers round itself so many associations of supposed piety, sentiment, philanthropy, that we cannot see it for its adventitious clothing ; but at the door of the mathematical temple, all these emotional trappings fall off, and if it gains an entrance at all, it is seen in its natural ugliness, as the hunting instinct gone astray into a civilisation where it has no place ; the impatient lust of the brute for arresting all life and motion except its own. And much of what is often called the colourless coldness of mathematics is in reality the white heat of a passionate resolve that each mind shall live out its own life at its own normal pace, and receive its own revelations, undisturbed by that intrusive hurry and scramble which are the curse of religious parties.

I said just now that transcendental Truth, in the act of entering a human mind or brain, tends to photograph on the brain whatever error it has been making. Now take the case of St. Paul. He had been studying Mosaism all his life, on the flat, so to speak, as carried out diagrammatically by a set of little flat rules. Then he caught sight of what we may call a singular solution of the Mosaic Law, an instance of its meaning on an unexpectedly high level. He at first became murderously angry ; then, suddenly, he received transcendental illumination, and saw the religion of Moses as one to which the life of Christ formed no contradiction. The famous Charity Chapter is the very essence of Mosaism, set free from the plains of Judæa, and, under the stimulus of Christ's life-commentary, projected back into the heavens whence it had descended. One has seen something of men who have gone through an experience relatively similar to that, only about the much more mild and less disturbing subject of curves in space. One knows how a man is affected for a long time after receiving such transcendent illumination ; what confused explanations and erroneous statements he will gravely write down, and how incapable he often is of understanding where he has been mistaken even when he is told of it ; one remembers how it took all the

energies of a devoted band of impartial critics to prevent his publishing, in perfect good faith, absolutely chaotic nonsense. Then one reflects that for many centuries Christians were expected to believe, and did believe, that Paul, after *his* experience, was more, not less, fit than any average person to describe exactly how the Lord's Supper was instituted, he not having been present ; to abrogate, off-hand, on the strength of a vision, a carefully worked-out set of rules of diet and hygiene ; to define, for all time, the position of woman ; and to settle for us that we may not teach, and that we must keep our bonnets on in church ! Can one wonder that Christian theology is a chaos ?

This condition of abject slavery to inspired seers is passing away. But even still, there are persons who, if one suggest that some statement of Paul's was probably a mere blunder, will solemnly refer one to the thirteenth chapter I Corinthians, as proof that he was "inspired," as if *that* made him incapable of mistakes ! I really do not wish to hurt anyone's religious feelings ; but the man who, after the murder of Stephen, so transcended his original standpoint as to be able to write that Chapter on Charity, must, one would naturally suppose, have been, for the rest of his life, dazzled, and mentally lopsided, like Jacob after wrestling with the Angel ; and I do not see what, except confusion, can come of ignoring or denying it.

Timid persons ask : If we cannot trust the great seers, how can we arrive at certainty in religious matters ? If we have arrived at certainty in mathematical matters, it has not been by treating transcendental seers as infallible. We are grateful to our Newton, for instance ; we love him dearly ; we feel our own work glorified and quickened by the reflection of his transcendent illumination; but it is *our* work we are each of us doing, not mere copies of his. And one main reason why our great mathematical apostles are able to remain sane, is precisely because no one treats them as religious apostles have been treated ; because, instead of letting them infect us with their mistakes, we keep them, so to speak, in a bath of healthy counter-magnetism. For lack of that counter-magnetism, nearly all the prominent seers of our own day are, to put it mildly, hampered and injured in their reasoning powers. Many of them, I am sure, started with the best intentions of keeping up friendly relations with non-believers ; but they grow too busy to do so ; each sinks back among a coterie of disciples ; each finds time to come out into the world occasionally to preach, but not to hear, to teach, not to be taught. A grave responsibility therefore rests on the admirers and pupils of a seer to keep him or her in that condition of balance which the individual is powerless

to preserve for him or herself. And I must say I think that, as a rule, the admirers and pupils of spiritual leaders understand their function in this respect very little as yet. If numerical questions were treated in the same manner as theosophical and spiritual questions have almost constantly been treated, every transcendental mathematician would have his brain spoiled for a working engine by being magnetised with some special set of fixed delusions; instead of a *Science* of number we should have only a chaos of contradictory guesses; and probably we might, at the present day, be quarrelling about the question whether five and seven make eleven, as one inspired mathematician repeatedly affirmed at a time of solemn revelation, or whether they make thirteen, according to the equally inspired dictum of some other transcendental seer! It is no special credit to mathematicians that they have avoided this slough of error and folly; as I said, the necessity of the case has forced them to accept and obey the laws of safeguarding of the transcendental vision. I simply suggest that non-mathematicians might learn something from the experience which has been forced on the students of numerical questions.

Another safeguard is this. Nearly every question which man can study presents itself first to his mind in a form too large and complex for it to grasp. It has to be broken up into parts which are investigated separately. In everything but mathematics we are tempted to give, to ourselves and others, some partial answer, for the true solution. In mathematics, a stern discipline keeps this tendency in check. The child is taught, from the first, that a partial answer is no answer at all *to the question asked*; and that he must not begin to talk about having found an answer till he has brought back into consciousness, and fitted together, all the elements which he successively suppressed in order to attend to only one at a time.

There is one other safeguard of the transcending faculty which I will just mention.

When a curve in three dimensions, however regular and harmonious, manifests itself as projected or shadowed upon a two-dimensional surface, it usually shows itself as an interrupted line; with sudden breaks or reversals. The same happens when a four-dimensional figure is shown to us dwellers in three dimensions. When a mathematician has been tracing a regular curve for a time, and, all of a sudden, it breaks off, or turns back, he does not agitate himself over the "disturbed harmony of the universe" and the "introduction of discord into God's world; he simply knows that the curve belongs to a higher order than appeared at first; that its unbroken and undisturbed form is to be sought in that higher

order. And he uses the broken curve as an implement of transcendent vision, as a means of acquiring accurate knowledge of some law of the higher order. Moreover, supposing his flat figure is ugly or unpleasing, and he desires to secure on a flat plane some projection of the higher figure, which shall be, so far as it goes, beautiful and harmonious in itself, he does not try forcibly to improve the flat figure which he already has by altering bits of it here and there ; he readjusts the whole position of his plane till the shadow which falls on it seems to him harmonious. Already a few spiritual teachers take that tone about interruptions of the ethical and spiritual order ; saying about any such interruption that it does not prove that Law is ever really broken ; it does prove that spiritual law is of higher order than we naturally suppose it to be. And they decline to join schemes for forcibly altering some special bit of human life to suit our notions of what is seemly ; they spend their energies in trying so to poise the whole plane of life, that the shadow which it presents of unseen things shall be, not grotesque and revolting, but, so far as may be, in harmony with the Actual from which it is projected. Earnest, good people are apt to be scared at this interpretation and this treatment of apparent violations of Divine Law ; they think the teacher who offers them is indifferent to moral *Truth*. I wish to point out that, in mathematics, such interpretation of irregularities in no way conflicts with Truth or conduces to laxity. And very much of mathematical certainty is due to the saving of that nervous tension, that emotional friction and that intellectual confusion, which are induced into the domain of spiritual thought by fussiness over irregularities and interruptions of moral order which appear in the mere shadow of the actual universe, projected on the plane of our present life on earth.

That faith is more difficult to cultivate in the spiritual order of things than in mathematics, I have already admitted ; no one who lacks it should be blamed. But surely those to whom it is possible should be encouraged to cultivate it. The attitude of those who do cultivate it towards sin seems to timid souls to threaten a great shock to the stability of moral truth ; but timid souls might take comfort from the reflection that mathematical truth has survived a quite similar shock ; and no one has discovered that it is in any way the weaker or the worse.

To sum up : Mathematical Science, though certain and safe, is eminently transcendental ; its possibilities of accuracy and certainty depend, not on the suppression of those faculties by which we transcend our actual position and gain knowledge of truths beyond the direct grasp of our limited faculties, but on the

habitual and universal observance, within the domain of mathematics, of certain conditions necessary for the safeguarding of those faculties. Most of these conditions, though hitherto chiefly insisted on by mathematicians, would seem to be as applicable in spiritual investigation as in numerical. Chief among the safeguards mathematically indicated are these :

1.—Constant recognition that man is as liable to error while his transcendental faculties are active as at any other time ; and, moreover, that errors which otherwise would have been immediately detected and corrected, tend, if made at that time, to become fixed and to appear like solid truths, unless carefully checked by some well-selected mode of correction (*e.g.*, the "proving" of a sum).

2.—Great reserve on the part of the teacher in even stating to pupils the special conclusions to which he has been led, lest he should arrest the normal exercise of their investigating faculties.

3.—Specially stern self-control in the use of personal influence to convince or to persuade.

4.—Modest reticence in the matter of courting applause by proclaiming any partial result before one has brought back into consciousness all those elements of a question which one had discarded from attention, in order to fix it for a time solely on some selected elements of the question.

5.—Constantly accepting apparent disturbances of harmony and order as proofs that the true law of the case belongs to a higher order than that in which the investigator is at the time working.

Our present position of certainty in numerical science has been built up by the steady observance of these precautions ; and, until we have at least tried the effect of a steady observance of them in spiritual investigation, we have no right to deny that man may some day arrive at mathematical certainty in spiritual science.

Part III

What is a Christian State?
(*The Unknown World, March* 1895).
Anti-Semitic Hysteria
(*The Unknown World, April* 1895).
The Sleeping Beauty of Zion: A Legend of Mount Everest
(*The Unknown World, May* 1895).
The Redemption of Hysteria
(*The Unknown World, June* 1895).
The Minimising of Suffering
(*Parents' Review, Jan.* 1895).
Natural Priesthood
(*Parents' Review*, 1895).
The Cost of Cheap Success
(*Parents' Review, Sept.* 1895).
Taking Things for Granted
(*Parents' Review*, 1896),
The Stamp Traffic as a Factor in Education
(*Parents' Review, April* 1899).

WHAT IS A CHRISTIAN STATE?

Read at the Christo-Theosophical Society

What is a Christian State? Most people define a Christian State in some way corresponding to one or other of the three following ideals:

1.—A State whose Government provides, at the public expense, for teaching certain doctrines of theology, chiefly about Christ.

2.—A State in which the laws governing the behaviour of citizens towards each other tend to make them act in a manner conformed to the commands of supposed wishes of Christ.

3.—A State whose rulers act in a Christian manner towards other States or peoples.

Neither of these answers seems to me satisfactory. Before entering on the discussion of a Christian State, let us try to form some idea what we mean by the word Christian itself. What is a specially Christian act; a Christian man; or ideal?

Some use the word Christian for "civilised" as versus "savage" or "barbaric."

Some for "good" as versus "evil."

Some for "altruistic" or "philanthropic" as opposed to "selfish."

These are slip-shod modes of expression. There were many civilisations, much good, much piety, before Christ's time. The precept, "Do unto others as ye would they should do unto you," was not unknown to the best Jewish teaching of Christ's age. It and many other sentences of the Sermon on the Mount are quoted from older Hebrew teachers. Nor is altruism synonymous with Christianity. There have been, in India, many non-Christian men far more distinctively altruistic than He was; many who would not kill the most undeveloped and low-type animal; whereas Jesus, we are told, ate fishes; and there is no indication, in anything we read of Him, of any tendency to let fishes, or any other creatures, eat Him. Mere altruism, as such, is by no means a specially *Christian* characteristic.

When we wish to reconstruct a living type of old, from fossil remains, we have to separate the special type from the matrix in which it was evolved. Now each teacher must develop in some special matrix; an age, a country, and so on. Jesus Christ was a Jew educated under the then existing compulsory education law of Palestine; a devout Churchman of His National Church. He possessed a well-marked temperament which gives certain attitude towards Nature; a love for "little flowers and little leaves and little blades of grass," and an innate conviction that the hairs on every head, the markings on every sparrow's wing, have their own distinct correlation to the Great All-Father.

Moreover, all who take part in social movements belong necessarily to one or other of the three parties, which, under varying forms, divide every age and church

The orthodox conservative, Church and State party, the party of organised decorum, in Christ's day called Pharisees.

The Secularist party, the party whose watchword is: Make the best of this material world and never mind the Unseen or the Future. This party tends to discard religious and National tradition; and therefore it enters into cosmopolitan alliances more easily than do the others. The Secularist compatriots of Jesus called themselves Sadducees.

The progressive-religious party, the party of reverent investigation in things spiritual, of gradual reform in ritual. It is non-ecclesiastical, and often becomes anti-clerical. Most of the Prophets of Palestine, and Jesus more than any, express this progressive-spiritual tendency. At the time of Christ the chief religious-progressives were called Essene. John Baptist was an Essene.

There are, in each party, good men and bad. It is easier to see the faults and hypocrisies in the other parties than in one's own;

Jesus discovered hypocrisies among the Pharisees at an early stage of His career; but He had good reason before the end to know that his own followers and friends could be hypocritical too; Judas was as deceitful, and Peter as self-deceived, as any Pharisee.

In passing, let me say a word as to what I cannot but feel is a special temptation to many of us of the Christo-Theosophical Society. Most of us belong to the party of free spiritual thought; we are so far like Jesus that we have no antagonism to the forms or doctrines consecrated by association with the piety of ages; we rather prefer that they should be kept up, provided no undue stress be laid on them; but we do not believe them to be of intrinsic importance. Now, I fear we are sometimes tempted to imagine ourselves Christians, merely because we happen to belong to the same thought-tendency as Jesus. We should not forget that the party He belonged to is as much a part of His local colouring, so to speak, as the country and age into which He was born. It is no doubt legitimate to find a certain kind of sentimental gratification in the thought of belonging to the same party as Jesus did; much as some find emotional gratification in gazing on the same landscape as He did; there is a certain charm in sharing His experiences. But no one imagines himself a Christian merely because he enjoys wandering among the olive groves of Palestine; whereas some of us are tempted to think there is something specially Christian in having the same attitude to things as Jesus had. All that is only local colouring.

What, then, is the distinctively *Christian* characteristic? What is it that distinguishes Jesus the special Revealer of a new Truth, the bringer of a new power, from Jesus, the healthy-minded man, the good, moral, pious Jew, altruistic from lovingness, a lover of Nature by constitution; and by temperament a spiritualist rather than a Pharisee or Sadducee? What was there in Jesus, over and above these qualities which He shared with other good, generous, kindly men of his age and party? What was the peculiar stamp of His personal mind, the product of His individual religious genius?

The order of Nature tends to fill the world fuller than it will hold, of creatures, of men, of nations, and also of conflicting aspirations and Ideals. There is not standing room on earth for all the possibilities that are conceived; not all can develop; we must eat or be eaten; it is only a question which shall eat the other. We ought to desire the survival of the *fittest*, the best. Now, in the physical order, the type which *suppresses the others* is the one which survives, leaves progeny and dominates the future; the one which is suppressed and sacrificed and put out of the way, in its youth, does not survive to people the earth. If the best is to survive,

that best *must consent to be the destroyer of the less good.* Even if we are vegetarian and will not kill animals for food, that only pushes the grim truth one step further back; we must kill the grubs and field mice which would eat our corn. We may do this as mercifully as we can; but it must be done. Jesus accepted this Law of the physical world. As I said before, he ate fish, and did not lie down and let fishes eat Him. Now most men, however good, pious, moral or humane, imagine that among Ideals too, the successful one has the best chance of living on into the future; each man thinks that when his party, his Ideal, finds, or makes room to assert itself as against a rival one, *that contributes a victory for his Ideal.* It seems, however, to have dawned on many oppressed and sorrowful Prophets in ancient times, that when we pass from the physical to the spiritual, we come to a cusp, or point of reversal, of the Law of survival; in the spiritual order, the one which survives and dominates the Future is not the one which suppresses the other, but the one which *accepts being suppressed.* Some perception of this inverse Law seems to me, as I shall presently try to show, dimly indicated by the myth of the citizen who saved Rome by jumping into a gulf. The perception of it formed a consolation to many when other hopes had failed. The distinctive characteristic of Christ's religious genius consists, I think, in the fact that He deliberately chose this principle for His main working leverage, from almost the outset of His career; and, in faith in it, gave up, early in life, brilliant opportunities of immediate influence for good.

To understand this we must try to form a mental picture of the state of Palestine at the time of Christ, and the temptation which He resisted. The Roman masters of Judæa had imposed on the province the governor Pilate, and a nominally Jewish king, who was not even a true Jew by descent, but an Edomite or Asmodean; a man without much respect for morality or anything else. The Sanhedrim was just then mainly composed of Sadducees. The Pharisees or religious teachers failed to arouse as strongly as they wished the national spirit of the masses, and would have come to terms, if possible, with any one willing to assist them in this object. The nation was looking for a Messiah; and the Pharisees, without exactly agreeing in all points with the young teacher Jesus, do seem to have, at first, hoped that he would form a rallying centre, and that it might be possible to utilise His exceptional gifts and power to charm.* They made

*The ordinary Christian account of the reason for the hostility between Jesus and the Jewish rulers is utterly untenable by anyone who knows anything of Jewish life or religion. The explanation which commends itself to me is that given above. See an article on "The Temptation of Christ," by Julia Wedgwood, *Sunday Mag.*, February and March, 1894.

many attempts to get from Him some statement of opinion which should, as it were, commit Him to their side of certain questions. They did not sacrifice Him till He had so flung the gauntlet in their faces as to make any union impossible.

Now, let us suppose England invaded by a foreign power; suppose the Parliament (deprived of all real power in important affairs), principally composed of Secularists; some of them sincere, such as Mr. Bradlaugh, and many, mere cynical, insincere imitators of Mr. Bradlaugh; the religious teaching in the hands of a High Church party. Now, suppose that one of us, a younger member of the party of spiritual progress, should, by his genius and piety, command influence and make the Church party think well of the desirableness of coming to terms with him, and sanctioning his ministrations. Would not most of us think our young friend ought to go as far as he honestly could in the direction of conciliation; that he must, if possible, take advantage of so favourable an opportunity to promote the interests both of religion generally and of our religious ideas in particular? Should we not urge him not to miss the opportunity of giving to spiritual tendencies a leading position in the state, a victory over both materialism and formalism? Just that victory Jesus refused to procure for the ideas which, as a pious Spiritualist, He held. Why so? Because the way to make spiritual ideas dominate the future was not that He, as their representative, should dominate the present, and throw rival schools or ideals into the shade; but that He, as their representative, should allow Himself to be suppressed by them. And so, He decided, it should be.

In the light of this decision of His, let us proceed to examine the ordinary conceptions of what is meant by a Christian State.

The idea that a Christian State is one the government of which compels the teaching, at the public expense, of such theologic doctrines as the rulers either believe or wish others to believe, need hardly be discussed in such a society as ours. We will pass on to the next in order.

2.—A State in which the Laws regulating the conduct of citizens towards each other have a Christian tendency. That Laws ought to favour *just* and *honest* conduct, is obvious; all legislation worthy of the name tends to make wickedness difficult and virtue easy. But those who think there can be such a thing as *Christian* legislation mean by the term something more than mere encouragement of honesty and justice; they would legislate in favour of conduct not only honest but actually altruistic. And in particular they would endeavour so to legislate as to unite the various classes of society together; to prevent the creation either of an exclusive

aristocracy or of a submerged and degraded proletariat. That such endeavour ought to be made, I do not dispute ; I am not sure that I do not think the prevention of this separation of classes ought to be the main aim of all legislation. But I entirely disbelieve that legislation—for this purpose or for any other purpose —has a right to be called *Christian*. The art of coercing some one else may be necessary and good, but it is not distinctively Christian. And on the other hand, when an action, however desirable to be done, is done under compulsion, or to avoid a penalty, it thereby loses whatever of distinctively Christian character it may otherwise possess.

And then again, if social righteousness could be made by Law, verily the Law of Moses would have made it. Many of the minute regulations in the Pentateuch, which seem to us, for want of understanding their true purport, trivial and superstitious, were in reality arrangements, carefully worked out in detail, for preventing the creation of a supercilious cultured class neglectful of their poorer brethren, and of an ignorant degraded unsanitary proletariat. Not only was there, in Palestine of old, compulsory education ; but no one could attain the higher levels of culture except on condition of making some attempt personally to share his culture with poorer neighbours. No one could kill an animal for food unless he had had some sort of priestly training, and could give proof of sobriety and decency of life ; nor on the other hand might anyone be a teacher unless he would share in amusements common to all classes. If we imagine a state of things here, such that no man might be slaughterman till he had taken Deacon's orders ; if we can imagine the College of Physicians personally superintending the scavenging operations ; and that no one could be a Member of Parliament, a clergyman, a schoolmaster, or a Professor unless he would take his Baths in public as an example, and spend Bank Holidays in sharing the pleasures of the lowest classes, that will give us a fair conception of what was attained in Palestine before the Christian Era. The Hebrew Pharisees were, in regard of legislation on behalf of social solidarity, hundreds of years ahead of anything that we in Europe have begun to dream of yet; and if any such legislation could be effective in creating true social harmony there would have been no need of Jesus.

But no organisation, however well-cemented, can prevent the occult forces which work unseen from seething underground, and causing rifts across the Forum. Suppose it were law in England that the Bishop of London and his family and household must keep Harvest Thanksgiving by picnic-ing on Hampstead Heath,

alongside of the Fulham crossing sweepers and their families—the old Hebrew Feast of Tabernacles meant nothing less than such an arrangement as that—this would not prevent contemptuous distrust from entering some hearts of one group, and envious suspicion from arising in the other. Jesus showed the law of harmonisation of the disruptive forces themselves. No human laws can adequately represent God's law; Quintus Curtiuses cannot be turned out wholesale by enactment. Then said Jesus: Lo, I come to do what no legislator could command: that is *will* to be suppressed and effaced. That—and that only—is the *Christian* way of acting.

3.—There remains the third conception of a Christian State, as one the rulers of which act in a Christian manner in their dealings with other States.

Such a description seems to me to involve a contradiction in terms. The rulers of a State must treat it, not as a mere spiritual ideal, but as a physical entity; and every physical entity is, as I said, subject to the laws of physical conservation. The business for which rulers are appointed is to preserve its integrity and identity as a State. If England were invaded by a foreign power, it would not be open for the Queen to say, "What does it matter whose name is on the tribute money? The image of the Kaiser or the Tzar will do quite as well as mine to adorn the coinage. My kingdom is not of this world; whatever valuable qualities the English character possesses will influence the world even more than they do now, when once we are enslaved and England, as a nation, is dead; if England is sacrificed she will enlist the sympathy of posterity."

No earthly sovereign may say such things; but Jesus said them; and they form this answer to the prospect put before Him of fulfilling the popular Messianic hope, by becoming the new Maccabæus, the earthly Saviour and Deliverer of a Nation. He chose to disappoint the people's hope; though, as a patriotic Jew, He wept over the downfall which He knew was all the more imminent because of His rupture with the rulers. That His choice was a sound one we know; the gods of conquering Rome have fallen from their altars before the Prophet of conquered Israel. In the spiritual order it is not the devourer but the victim which dominates the Future.

But civil rulers were not appointed to express transcendental theories about the conditions for remote and occult spiritual influence; their business is to keep the State intact. And if we ask: "What would Jesus do in their place?" the answer is plain: "He would not be in their place."

Is it then *anti*-Christian or wrong to accept the responsibilities and restrictions imposed by civil office ? By no means, provided that those restrictions be honestly accepted ; provided that the authorities, while doing their utmost to act justly, and (as far as is compatible with justice), mercifully also, do not (in their official capacity) play at pretending to be Christian. There is nothing immoral in the fact of *not* being Jesus Christ !

Has then the expression "*A Christian State*" no meaning at all ? I think it has a very serious meaning ; a meaning which has hitherto been obscured by attempts to give to it a sense which it cannot logically bear. We are to discuss to-day what conception should be attached to that expression. If I endeavour to give my own conception, it is only as a small contribution to what I hope will be a full discussion.

It seems to me that in a truly Christian State all officials, civil and religious alike, would recognise Christianity as something beyond and above Law ; something which *in their official capacity* they are forbidden to practice. They would pay to it the silent reverence of not, *in their official capacity*, professing Christianity. They would endeavour to re-create, by the help of ancient experience vivified by fuller science, that condition of social solidarity within which the first fruits of Christianity appeared in the person of Jesus, and in which, we may hope, the great harvest of a Christian community may some day slowly grow and ripen.

The religious teachers would be careful not to confuse the minds of the masses by allowing their official position to be used to sanction the delusion that their special beliefs or opinions are essentials of Christianity.

Then there is another point. Jesus, in His local character as a pious son of Israel, resented misuse of the Temple of the God of Israel. *We are not told that He ever interfered with the avowedly secular business or amusements.* He did, on one occasion, try to prevent certain persons from earning their bread by a trade which He considered was misleading the masses as to the very meaning of their ancestral faith ; Elijah or Judas Maccabæus might have done exactly the same thing for the same motives ; Jesus never laid stress on this act, as if it were the essential condition of His regenerating mission. He did not say, "If I coerce other people," but, "If I be crucified, I will draw all men unto me."

Contrast his momentary explosion of sorrowful wrath at the profanation of religious ritual with the jubilant tone of many so-called Christians who go about deciding, in the name of Christ, how other people shall conduct their secular studies and their worldly amusements ! I *can* imagine Jesus driving the changers

in modern language) storing up magnetic force, and so conferring on the caste a silent power to govern.

It is only in the later and disintegrating stages that any priesthood aspires to visible authority and the paraphernalia of grandeur; the true Ideal of every priesthood, in its best days, is to rule without visible means of dominion: to overawe, by its mere presence, the nominal rulers. And the way to ensure this silent dominion was quite as well understood in Egypt and Asia of old as ever it has been in Rome.

Well, some Hebrew, learned in the lore of one of the many priesthoods of the Silent Force, conceived the idea of creating in Palestine, *A Nation of Priests*. He forbade the worship of any other God except the nameless I AM, THE UNITY (the god of every philosophic caste); and then he imposed on the whole nation the dietary and discipline of a priesthood. The laws and regulations of the Pentateuch may be roughly divided into: 1. Precautions against the worship of any concrete idol; 2. Laws intended to impose on the whole nation the dietary and discipline of a priestly caste; 3. Devices for keeping the more cultured portions of the community in perpetual close touch with the poor and ignorant, by forcing them to share in the recreations and festivals of the masses, and in all such work as, while necessary to be done, has a tendency to degrade and brutalise.

Israel was to be *a Nation of Priests*. We Gentiles quote the words without much thought that they had any other than a theological bearing! They mean, in truth, that all Israel was to spend its existence in *storing up positive magnetism*, and in destroying in itself certain kinds of more passive and weakening sensibility.

Many things which the author or authors of the Pentateuch hoped to effect have failed; but the system has succeeded in this respect—the whole People of Israel are a priesthood of positive magnets.

There exists in Europe no other fact to which we can compare this one. For Christian priests either are celibate, or their function is not hereditary. We have among us no hereditary caste of positive magnets except the people of Israel. Knowing what some of us occultists know about the peculiar effect of certain dietaries and codes of discipline, steadily persevered in for even one lifetime, it should not need any great effort of imagination to realise that some special kind of force has been stored up in the nerves of a race which has practised for two or three thousand years a discipline primarily intended to give to a priestly caste influence to control the mighty ones of the earth. Surely we need not wonder that the nerves of unbalanced, untrained Gentile sensitives quiver

in presence of Jews ; and (like telegraph wires in electric weather) give forth irregular messages, easily misinterpreted, by the ignorant and hysterical, into accusations against the innocent causers of the magnetic disturbance.

If it be asked, what is the remedy for this anomalous state of things ? How can the magnetic tension, between the hereditary priesthood and us Gentile laity, be either safely utilised or quietly and safely let down ? I reply : Those are large questions ; and I am not prepared with an answer off-hand. Many suggestions might be made. But the first thing to do is to call the attention of Occultists to the fact that we have, in Judaism, a large permanent store of positive magnetism, which, *as long as it remains uninvestigated and unknown,* must be a perennial cause of confusion, misapprehension, and socially unstable equilibrium.

THE SLEEPING BEAUTY OF ZION

A LEGEND OF MOUNT EVEREST

In the following serio-comic Tale,

1. THE KNIGHT represents the modern Science of Mathematical Psychology.
2. THE GREEK, the Spirit of Æstheticism, of superficial adornment, of getting things to seem right for the present without reverence for the Past or care for the Future.
3. ZOROASTER, the leaders of Parsee Reform in India.
4. THE PRELATE is S. Thomas the Doubter ; supposed to be revived in Bishop Colenso.
5. THE GIANT is Thor, the Thunderer ; and represents the old Religion of Meteorology, of the Science of mere physical phenomena.
6. THE DRUID is the National Spirit of England.

SIR TRISTRAM heard of the famous beauty of Zion, and fell in love with her by report. He set out to seek her. The first person whom he met was a Greek, who accosted him :

"Ho, stranger Knight, now what seek'st thou ?
And to whom may thine errand be told ? "
"I am seeking the Beauty of Zion ;
I am longing her charms to behold."

Greek :

"The Beauty of Zion ? Thou dreamest !
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Then, springing ashore, he began scattering the dust which had been piled up. Zoroaster joined him, and they soon saw the Fire appearing from under it.

Sir T.—"That is right. Keep your courage up. I hope you will have it burning nicely by the time I come back."

Higher up the River, one sat on the bank, wearing the garb of a Christian Prelate. Across his knees lay the Scroll of the Pentateuch which he was studying with anxious care. His face was very sad, and Sir Tristram, hailing him, asked if there was anything he could do to assist him.

Prelate—"I am the Apostle of Rational Doubt. I love Jesus none the less because I cannot believe all the fables narrated in His honour by those who knew Him not. I stayed with the other Apostles till Saul of Tarsus came into our midst and made life impossible for me."

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Sir Tristram :

"Nay, say not such words ! thou blasphemest.
On her birthday the All-Father said
She was born to be ever immortal.
The Beauty of Zion dead ? "

Greek—"The Prophets of Western Asia did indeed predict immortality for her ; but they were only local oracles, and fallible, as all such. The great God Pan promises immortality to no individual man or race. And what does it matter ? Fair Iris, the ever living, is always ready to bring fresh messages from the gods."

Sir Tristram—"I care for no fresh messages ; I love the Beauty of Zion. If she be dead, pray show me her tomb, that I may slay myself thereon as an offering to her manes."

Greek—"I know nothing of old tombs ; I worship youth and living power. But here comes one who may perhaps know that of which you ask. Here, you old Jew, come and show this gentleman the way to the tomb of your ancestral Past."

The Greek then retired, and when he had gone out of hearing, the Jew said :

"Sir Knight, did they venture to tell thee
The Beauty of Zion is dead ?
That adds one more to the slanders
They have heaped on her desolate head."

Then he went on to say that :

"The Beauty had a very delicate organisation, and was therefore obliged to live under a strict law. She made a mistake about some trifle of domestic duty; held her needle or her distaff wrong, and pricked her finger, and fainted. But it is promised that she shall revive some day."

Sir T.—"Where is she ?"

O.J.—"At the source of the River Sabbation that runs through the Desert of Life."

Sir T.—"Have you been up there to seek her ?"

O.J.—"We float down the stream, trusting to God."

Sir T.—"Why do you not row up the stream and look for her ?"

O.J.—"It is contrary to our Holy Law to touch an oar on the Sabbath."

Sir T.—"And on week-days ?"

O.J.—"On week-days we land, and attend to our merchandise."

Sir T.—"How do you expect to find her ?"

O.J.—"We know not. She will be brought back in God's good time. It must be so ; the rainbow was to be a perennial token that God will interfere, by a miracle, to save her at last."

Sir T.—"Miracle ? This is the nineteenth century. If man wants miracles done, he must do them."

O.J.—"You are, then, an unbeliever ?"

Sir T.—"Not in the least. I believe most firmly that the All-Father works by Law, and leaves conjuring tricks for us, His children, to amuse ourselves and puzzle each other with, on condition that we study His Laws."

The orthodox Jew looked very much shocked, and, as he saw a Reform Jew coming along, he took his leave. Sir Tristram courteously stopped the new-comer, and repeated to him what he had heard.

Reform Jew—"Fainted because she had pricked her finger ? Twaddle ! She did not even know she had pricked herself, till a timid old Rabbi happened to notice that she was bleeding, and bustled forward to bind up the microscopic wound. She fainted of disgust at finding herself mauled about by a man of breeding inferior to her own. But it is promised that she will revive when she is kissed by any man brave enough to reach her."

Sir T.—"If that is the remedy, I feel called upon to become the physician. How does one reach her ?"

R.J.—"She is up in the Himalayas, near the source of the Sacred River, Sabbation. Just at the height where the climate resembles that of England, there is a grove of oaks, and she lies asleep among them. I wish I were free to seek her ! But I have a duty to my brethren, the People of Israel ; I must not part from them too far or for too long, for if all we strong ones leave them, what will happen to them ? God speed you, Sir Knight, I half envy you. Let me, at least, show you the way to our Sacred River and help you into a boat."

Sir Tristram rowed vigorously up the stream, passing through an arid desert. He saw, on the bank, Zoroaster, sitting mournfully by a heap of rubbish. He crossed his oars, and asked :

Sir T.—"What, in the name of all that is holy, are you doing there ?"

Zoroaster—"Watching the remains of the Sacred Fire. It is nearly extinguished. Everyone who passes on throws something which chokes instead of feeding the flame, and I fear it will soon die out."

Sir T.—"Well, why do you not clear it off as fast as it is thrown on ? You only want a little encouragement ; let me help you."

Z.—"Who are you ? Have you a right to carry the Sacred Flame ? Are you of Persian origin ?"

Sir T.—"Never mind who I am. I am a loyal Knight, whose motto is, 'Serve God and fear no man.' I do not claim to carry

the Flame ; but surely there is no more desecration in allowing me to clear extraneous matter off than in letting all sorts of degraded Parsee canaille throw it on."

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Sir Tristram rowed on, and the river grew narrow. Presently a gigantic figure loomed before him on the bank. As the Knight

drew near, the Giant lifted a mighty hammer and held it over the boat saying:

Thor—"I guard the approach to the tomb of Queen Freya. No one may desecrate it. Turn back, or I let my hammer fall on your head."

Sir T.—"Keep your mountebank tricks for strangers, Thor; we, of the family, are not impressed by them," said Sir Tristram, making a private signal.

Thor—"Who are you? Do you know the password of Odin?"

Sir T.—"The Rainbow is a bridge by which a brave man can reach the abode of the gods on his own feet."

Thor's hammer dropped by his side.

Thor—"Pass on," said he, "you will not desecrate the tomb of Queen Freya."

Sir T.—"Don't be a fool, Thor. You, one of ourselves, a son of the Asa Race, to talk of tombs of the Immortals! You ought to be ashamed of yourself." And Sir Tristram rowed on.

The river led up to the Himalayas; and, at the foot of the highest peak, it became too narrow for navigation. On one side was a precipitous cliff, but on the other the bank was low. The Knight landed, and, after mooring his boat, prepared to walk up-stream. But a shining Angel stood on the bank, barring his progress with a glittering sword.

Angel—"I am the Angel who wrestled with Jacob. No man passes here until he has forced me to tell my name."

Sir T.—"May I venture to say, first, that the weapon in your hand does not look to me very real; and I am sure you have not the least intention of killing me. It may be a useful toy to frighten cowards with; but then, if I were quite a coward, I should not be here."

The Angel smiled, and the sword turned into an olive branch.

Sir T.—"Thank you. Now we can talk seriously. You say that you wrestled with Jacob. Tradition tells that you wrestled so hard as to lame him for life. Now, I am not more afraid than another man, either of wrestling or of being lamed, if so it must be. But please to notice this. Jacob was seeking to further his own interests, and doubtless it was well for him to have a check put upon his greed. But I seek to revive the Beauty of Zion; and I do not see how any aim of yours can be furthered by weakening me."

Angel—"Try to guess my name."

Sir T.—"How should I know who you are? Most people call you the Angel of Retribution. Wesley thought your name must be Love. I hardly think he can have been right; for all forms of

Love, from the highest to the lowest, are consecrated in heathendom. You are not Love, yet I think you must include Love, somehow, for you cannot be anything *less* good than paganism knows of."

Angel—"I am the Angel of *Rhythm*. I teach men to seek the Eternal by attending to the things of Time, to each at its fitting time ; and to do the will of God on earth as it is done in the heavens ; by due sequence and periodic alternation."

The Knight fell on his knees and bowed his face to the earth. "Mighty Angel," he said, "teach me to know thee, and not in name alone. I seek the fair daughter of Zion ; but if the time be not come for her to be given to the Gentiles, oh ! slay me rather than that I should touch her with sacrilegious hands."

The Angel lifted him up.

Angel—"Pass on," he said, "we shall meet again." Then he vanished.

Sir Tristram walked on, following up the stream, and always climbing higher and higher up the mountain. The path rose steeply, and he saw the River far below him. At last he was stopped by a blank wall of rock. On his right was a bare slope of rugged stones ; in front of him the inaccessible mountain-side ; on his left an awful chasm wherein the River ran. Beyond the River he saw a grove of oak trees ; and there, he knew, was his destined goal. But how to reach it ? Over the River and in front of the rock hung a mass of mist, veiling he knew not what. A false step, in that thick fog, might be fatal. As he gazed, pondering, the sun came out from a cloud behind him, and he saw a Rainbow on the face of the mist. "The Rainbow is the bridge by which the brave soul reaches the gods," thought he ; "I can but try ; if I am dashed in pieces, why, 'thus the brave man sees Jumala,' as the Finns say." He walked on ; and the Bow disappeared. But when he reached the spot where he had seen it, he perceived what had caused it. The River sprang from that place, and was, at once, broken into a mass of spray by striking on a ledge of rock. Commending his soul to Odin, he stepped on to the ledge, whereon he crossed easily to the other side of the chasm.

On approaching the grove, he saw a Druid, holding a golden sickle.

Druid—"I guard the repose of the Mistletoe-Queen ; no one passes here, unless he can read the token of the Mistletoe."

Sir T.—"We find the germ of the Future, when we go back to where a branch, in the Past, divided into two twin twigs."

Druid—"Pass on ; you will not desecrate the home of our Queen."

In the midst of the grove was an open clearing ; and in the

centre of it stood a magnificent oak, on a branch of which grew a Mistletoe. Just under it lay the Beauty, asleep, with a dry hazel wand beside her, as it seemed, just dropped from her hand. He had never seen her before ; yet he had known her all his life ; and, he now thought, he must have loved her in some former stage of existence. He knelt beside her, and awoke her by kissing her hand.

"The Beauty arose in a fury,
And to strike him she lifted her wand ;
But she started and stood in amazement ;
It had burst into leaf in her hand."

Then he told her how he had sought her ; and why ; and he persuaded her to return with him to the world of living men. He threw round her a veil which had fallen from her in her sleep ; then he cut down the Mistletoe and placed it on her head.

When they came to where the Druid still stood on guard, Sir Tristram said—"You may melt your sickle into coins ; for you shall never cut down the Mistletoe again, now that it is on the brow of the Queen." But she raised her veil for a moment ; then, picking off a spray, she handed it to the Druid, saying :

"My old foster-father, I love thee ; I will give thee a spray from my crown."

She invited him to come back with her to the world of living men. Then all three crossed by the ledge and walked down-stream to where the boat was moored. As they drew near the spot, the Angel appeared, with the olive branch in his hand. The Knight said :

"I bring the Beauty of Zion ; yet if the time be not come for her to be shown to the Gentiles, take her back, O mighty Angel, to her grove, and let me go on my way alone."

But the Angel, smiling, took a hand of each and joined them. The Beauty said :

"O Angel of Rhythm, my brother,
Come and sweeten the sad world with me."

Angel—"Pass on ; we shall meet again." And he vanished.

Then they two and the Druid got into the boat, and began to glide down the River Sabbation, as men had done in the ages that were past. The Beauty said :

"Sir Knight, thou has waked me from a living death ; yet even now I know not thy name."

Sir T.—"My name, fair Queen ! it is lost and forgotten ; I left it behind me in the mountain ; I will have no name henceforth, but that of Consort of the Beauty of Zion."

As the boat passed Thor, the Knight stopped it and said: "Well, Cousin, do you think our Freya needs a tomb?"

But she, raising her veil for a moment, said:

"King Thor, my kind guardian, my brother,
Come back to the live world with me."

Thor said he feared he might swamp the boat, or break a hole in it with his hammer. But he walked beside the stream, towards the world of living men, keeping pace with them as they rowed.

Zoroaster had the Fire burning brightly on a small portable altar. As the boat neared him, the Queen again lifted her veil, and said:

"Come, bringing thy Fire, my brother,
And brighten the dull world for me."

And Zoroaster entered the boat.

The Prelate had returned to the bank of the River; though lower down than before and nearer to the world of living men. A scroll lay across his knees. But his face was no longer sad; for the great ones of the earth had trusted Sir Tristram; and he no longer feared for his children. The Beauty said:

"Come, reading the Scroll of the Prophets,
And bring Truth to the mad world for me."

But the Prelate was not of the Race of the Gods, and for him she lifted not yet her veil; wherefore he knew her not; but he followed her voice as one in a dream.

At last they reached the world of living men; and Sir Tristram called them round that they might see the Beauty of Zion who was also Queen of the North Country. He said:

"Old Jew, who wast leaving her sleeping,
Young heathen, who thought she was dead,
See, here is the Beauty of Zion
With the Mistletoe Crown on her head.

Oh! Jew who didst boast of her Future!
Oh! heathen who scoffed at her Past;
Dare you look in the face the Eternal?
Has the Present a meaning at last?

You, who passively trusted Jehovah,
You, who dreamed the Immortals could die,
Know you not that the living Valhalla
Within reach of all brave men doth lie?

Oh! Daughter of Zion! Immortal!
My Goddess, my Queen, and my Bride;
Show thyself to the world in thy splendour,
That world that believed thou hadst died."

The Beauty was about to raise her veil and reveal herself before the eyes of living men, when a crowd of Rabbis flocked around her to protest that, if she were indeed a daughter of Israel, she might not be betrothed to a Gentile. She turned faint and would have fallen, had not the Knight put his arm round her. The Reform Jew now came forward and declared the Law of her Being :

> "She turns faint at the touch of a coward,
> But revives at a true hero's kiss."

He called forward the Martyrs of Israel who were hidden behind the Rabbis from the sight of living men ; and he bade them form a body-guard around the Queen. They said that they had had quite enough of the consequences of allowing her to be handled by cowards ; and they, one and all, made a solemn vow that never again, for ever, should any coward come near enough to her to touch her.

The Knight said that that care must henceforth rest on him ; and he told how she had been already affianced to him by an Angel who had joined their hands.

The Reform Jew said that, by the Law of Israel, she might not marry one of alien race.

Thor came to her left side and said :

"In my religion it is a rule that whoever can conquer King Biörn, Monarch of the Woods, takes his pedigree along with his hide. All brave men are equals ; and I do not understand the idea of our Queen Freya being disposed of according to parchment genealogies."

Reform Jew—"King Bear has only his own hide to lose ; but this Virgin is pledged to all the brave Martyrs, her brothers, who have suffered for her sake ; and I doubt whether she may lawfully give herself to a Gentile."

Zoroaster came in front of the Beauty, carrying his altar, and he said :

"Suffer me to speak a few words, for I have now taken for my motto—"*Serve God and fear no man.*" Sir Jew, I can see no logic in your position, if the man who helped me to revive the Sacred Fire is not the equal of a Jew."

R.J.—"I do not dispute the merits of this Knight. I am quite willing to admit him to be the equal of Jews in general, and superior to myself in particular ; but every person of Hebrew race owes a duty to Israel."

The Angel now appeared and asked :

"Who can tell my name ?"

All remained silent ; but the Knight fell on his face before the Angel. The Angel raised him and made him stand up, saying :

"Knowest thou me ?"

Sir T.—"Thou art He who beats time for the Orchestra of Creation."

The Angel lifted the veil of the Beauty ; and, taking her hand in one of his and the Knight's hand in the other, he asked :

"Does any man know cause or just impediment why these two should not be joined in Holy Matrimony ?"

No one spoke except the Reform Jew, who said, softly :

"He who knows thee, mighty Angel, has the same right to be called Israel as our father Jacob had."

The Angel said again :

"Whoever thinks he can show any just cause why they may not be lawfully joined together, let him speak now, or else, hereafter, for ever, hold his peace. And especially I charge you both that if you know of any impediment, do you now confess it."

As no one spoke, he joined their hands, saying :

"Whom God hath joined, let no man attempt to put asunder. Go forth and teach mankind to seek the Eternal by attending to the things of Time, to each at its due time ; and to do the Will of God on earth, as it is done in Heaven, by rhythmic alternation of contrary motions."

Then he vanished ; and the Martyrs of Israel congratulated Sir Tristram, and declared that they gave their sister willingly to him on whose behalf the Angel of Israel had revealed himself to living men. If the Rabbis said anything, their speech hath not remained upon record. Zoroaster prophesied and said :

"The Sacred Fire will burn undimmed as long as the Beauty of Zion is protected by scientific courage from the touch of coward hands."

A crowd of Christian Prelates came forward, headed by the Apostle of Rational Doubt. They knelt, bareheaded, waiting for the commands of the Queen. But she laid on them no commands, except to stand up and put on their head-gear, because in her religion men crawl not like slaves before man or woman ; or even before God. Then the Bishops arose and stood upright, trembling as they beheld her beauty. And the Knight said :

"Good Sirs, remember, hence forth, that you wear your mitres by command of your Queen, the Daughter of Zion. See to it, therefore, that you disgrace them not by pandering to idolatry, tyranny, superstition, or cowardice. Now we leave you, that you may reform your own religion according as grace shall be given to

you to see fit. And may the God of Israel bless whatever you may undertake."

Then he led his Bride away into the Garden of Eden, where grows the Tree of Knowledge. And no sword barred the passage to prevent their entering in; nor did any voice forbid their plucking the fruit, because it was now fully ripe. And they saw not there even the Angel of Time, because love is Eternal; but they heard the Rhythm of his motion in the rustling of the Tree of Life.

When they had gone for a season out of the sight of living men, the Druid raised aloft the spray of Mistletoe, and said:

"The Spirit of Prophecy hath descended upon me and the Sacred Fire hath touched my lips. Hear, therefore, the Oracle of the Mistletoe:

"We find the germ of the Future by going back to where twin twigs began to grow apart in the Past.

"Hear, also, the Oracle of the Hazel:

"Unto man it is given to reverse the lines of separation, to re-unite that which hath been severed in the course of Fate and of growth; putting unity where was division, and division where unity was.

"Hear, also, the Oracle of the Ash Tree:

"Knowledge is not multifold; but grows as one, like a Tree. Its root is the knowledge of earth, and its crown is the knowledge of heaven. Sever not the crown from the root, lest the crown wither and the root lose its glory.

"Hear, also, the Oracle of the Olive Tree:

"Brave sons of Asia went to the North Country and were called gods by the heathen whom they taught. Their leader was called Od-in, which means *The God.* Odin taught the lore of Palestine —that knowledge grows as one, like a tree; that the true Prophet is he whose mind is fed by both the Sacred Messenger Birds, Tradition and personal Inspiration; that the blending of all colours into one harmonious Bow leads a brave soul to the very home of the Gods.

"And, as Israel was born when a son of Abraham took to wife a daughter of his father's people; so shall Messiah be born from the true Son of Odin, who has been joined to the Daughter of the Race whence Odin sprang, by the hand of the Angel of Time."

The Reform Jew nodded silently, and the assembly then dispersed.

THE REDEMPTION OF HYSTERIA

In propounding a theory, or proposing a method of practice, new to any section of one's readers, it is well to clear the ground by coming to an understanding as to the exact sense in which one is using words. The word *Hysteria* is commonly used, vaguely, for any nervous disorder which the person speaking is unable to refer to any other category. As long as the public, the medical public especially, disbelieved in the existence of such phenomena as telepathy and thought-transference, the whole subject of nervous disorder was necessarily a chaos, and its nomenclature was of course confused. But the mere knowledge that such phenomena do occur (even prior to any close study of them) suggests at once a beginning of classification ; we are led to distinguish two distinct types of nervous organisation : the positive-magnet or impression-sending type ; and the sensitive or impression-receiving type. These types over-lap ; as do genera in natural history ; none the less are types themselves strongly marked ; and each is subject to its own kind of nervous aberrations.

Now many of the obscure symptoms commonly called "hysterical," when examined in the light of even the most elementary occultist knowledge, are found to be distinctly connected with failure of the will-power under subjection to accidental influence from some positive-magnet ; the symptoms in such cases can often be arrested by the will of some other positive magnet purposely directed to that end. I would venture to suggest that we confine the term "hysteria" to the nervous disorders of the receptive type. I am aware that the word is derived from the Greek name of one special physical organ ; but as the functioning of that physical organ is specially likely to affect, and to be affected by, disturbing magnetic relations, the very etymology of the word hysteria makes it not the less but the more adapted to the class of disorders to which I propose to confine it.

I use the word "redemption" rather than "cure" ; because I hold that hysteria is not a disease, but the abnormal exhibition of a special faculty which has been debarred from its normal exercise and outlet. The study and treatment of hysteria have been hampered by a foregone conclusion that the peculiar hysterical tendency to a dual life is a disease, which ought to be cured by restoring the patient to the stable condition of the positive-magnetic type ; the truth being that the tendency to lead a dual life is a power or faculty, which we should endeavour to redeem by directing it towards its true function.

The hysteriac is a potential *peacemaker* who has missed her vocation. Her true function is to be an interpreter between persons or classes in widely differing states of consciousness (and especially between persons in *polar* states of consciousness); to pass, by magnetic sympathy, into one of the opposing states; and then, while saturated with the knowledge given by that experience, to pass into the opposite mode of consciousness by similar sympathy with the other side. The conflicting states fuse together within herself; then (when she has recovered the immediate strain), she can interpret each to the other. Such work is at times somewhat painful; but is in no way dangerous if done under proper conditions. So far from its being unhealthy work, the magnetism of each of a pair of antithetic polars is the best prophylactic against injury from the magnetism of the other. The hysteriac is one who has been accidentally over-magnetised on one side without receiving due counter-magnetism. A steady training in the work of the interpreter constitutes *the Redemption of Hysteria* into Seerhood.

Spiritualists may object that I speak as if the function of the hysteriac were to interpret between man and man on earth; whereas (they will say) her true function is to be a medium of communication between those in the flesh and Unseen Beings. To which I reply that I am speaking of the process and means of Redemption, of the training of the medium for her ultimate task; not of that task itself. Training for a high and difficult task must be given by exercise in similar tasks at a lower level. The bane of Spiritualism has been that mediums are not taught to interpret between polar states of consciousness at such levels that the teacher can judge of the accuracy of their work. Given the mediumistic temperament, there is as much scope for careful training in accuracy of interpretation as there is in making a vocalist into a faithful interpreter between composers and audiences; and the master cannot train except by insisting, at first, on the faithful execution of comparatively easy tasks. In "Schools of the Prophets," the future interpreter between God and man was trained by acting as messenger or interpreter between his human teacher and the stupid worldly world.

To come down to our own day, its practical difficulties and possible solutions. I would warn parents to beware of any teacher who says of a nervously sensitive child: "She has genius for ——," the teacher's own special subject; it is far more likely that the child has a "genius" for thought-receptivity, and is being over-magnetised by this particular teacher; the most probable outcome of which is, a short brilliancy, followed by an

early (and perhaps fatal) break-down. Get any child who is said to have special genius counter-magnetised ; this will not destroy genius should it really exist ; but it will explode the bubble of a fictitious brilliancy due to the pupil thought-reading the teacher. If the latter expresses himself disappointed and leaves off predicting for the pupil a special career, the parent may infer that the supposed vocation never was a real one ; and should then set work to prepare the child for that career for which she is fitted, and for which her genius is real and can be cultivated into solid power, the career of an interpreter. Discourage the ambition to shine, *e.g.*, at examinations. Let the child learn few subjects, but be well-grounded in those. Keep her under magnetic teachers (as far as may be of the positive-magnet type). Let her study be always a little below the level of her age and capability. Let part of her regular work consist in assisting stupid or backward pupils of the *same* teacher to understand his instructions. This averts the dangers of one-sided magnetism, by keeping the girl in a proper alternation of consciousness between the clever teacher and the stupid pupils ; and it gives exercise to the interpreter faculty. See that she distinguishes carefully between her own ideas or impressions of the subject she is studying, and the actual teaching of the master. This caution is specially necessary when any special religious instruction is going on, as, for instance, during preparation for confirmation in a school.

It is good for such a girl as I am describing to spend a good deal of time in translating from one language to another. Train her to keep strictly to the sense of the original, while conforming to the idiom of the language in which she is writing.

An excellent occupation for such a girl after leaving school is to be assistant to an author or lecturer, or (especially) to a conscientious editor of a magazine, in any capacity which involves mediating between the man and his public. To be study-assistant to a mere investigator subjects the patient to one-sided magnetism, which mere ordinary social or family intercourse is usually found quite inadequate to polarise. The Redemption of Hysteria consists in making of the patient an actual medium of communication between influences which stand in some relation of antithesis or polarity to each other.

The freakishness and fickleness characteristic of hysteria result from the blind groping of thwarted instinct feeling out after the true remedy for its distress—*polarity of influence*. The result of systematically supplying the need for a time, is that the blind, groping desire becomes quickened into a true instinct of self-preservation ; and when once this has been established, the patient

may be left to take care of herself. The after-difficulties come, not from her, but from the prevailing condition of popular ignorance on the whole subject. This, however, is happily tending to diminish every day. During the years when I was making my chief study of hysteria, the proposition to put a girl, over-magnetised by some preacher, into friendly relations with the writer whom that preacher least understood and most rabidly denounced, for the sake of magnetic polarisation, called forth a storm of remonstrances! One's path was blocked and hampered at every turn by foolish prejudices, quite irrelevant to the matter in hand, which was the cure of disorder.

I have said that the hysteriac (actual or potential) should be kept as much as possible under teachers of the positive magnet type. The difficulty is to find strong positive magnets who do not misuse their power, from ignorance, desire to propagate some hobby, and delight in the exercise of magnetic influence. It is here that the peculiar temperament of the Jewish people comes to our aid. Their long training has not only made of them a race of positive magnets, but has also inbred in them a marvellous chastenedness in the use of the power so gained. It may be true that many Jews exert undue influence in matters of money and politics; they are usually guiltless of the far worse crime of weakening the will-power and destroying the nervous balance of pupils for the gratification of their own emotional vanity or the propagation of their spiritual or intellectual hobbies. I wish I could say as much for Christian preachers of any denomination, or for Gentile teachers of any Art or Science! The *magnetic tricks* —for such they really are, however disguised—by which many of the most refined among us gain what they please to call "influence for good," would offend the *taste* of a quite average Jew or Jewess. This chastened Jewish taste in such matters is the result of centuries of training, directed to prevent that massing round a teacher of *gobe-mouche* "followers," which, according to Jewish ideas, comes very near the sin of "idolatry." Whoever would know what Judaism is, as a silent influence for good in this fevered and crazy world of ours, should watch the wise calmness of Hebrew teachers in dealing with Gentile hysteriacs.

THE MINIMISING OF SUFFERING

"Parent's Review," Jan. 1895

"How animating is the thought that if by the labour of my life I can add one idea to the stock of those concerning Education, my life has been well spent."—THOS. WEDGWOOD.

THE writer of those words lived in what we may call the cradle of the modern doctrine of evolution. He was a pupil and fellow student of Erasmus Darwin, and maternal uncle of Charles Darwin. His constitution seems to have been originally healthy but over-sensitive ; it was brought, by the barbarous systems of medicine and of training in vogue in his day, to a condition of chronic nervous suffering, pitiable to think of. Having decided not to marry, he took up his abode in the house of his brother, and devoted himself to the task of helping to amuse and educate the little ones ; recording, for the benefit of Science, such observations on infant development as he was able to make. How it happened that the mother and servants tolerated in the nursery, at all hours, an inquisitive bachelor, with views of his own as to how babies ought to be fed, washed, clad, taught, exercised, and amused, we are not told ; but his note-books leave us no choice but to infer that they did so ; and it would seem, from other evidence besides that contained in them, that "Uncle Tom" was so beloved as to be given pretty much of his own way, there and elsewhere. His circle of friends, among whom were many well known to fame, expected much profit to the world from a book on education which he was engaged in compiling. He died at the age of 35 (1805). His sorrowing friends were evidently most anxious to publish his work ; why they failed to do so will probably never be known. After many years the MS. was reported "lost." Part of it was found, in 1882, in a sadly mutilated condition. On a blotted scrap of paper were scribbled the words which I have taken as the motto of this article.

Though the MS. is too fragmentary for publication, the "idea" which Wedgwood was chiefly eager to "add to the stock of those concerning education" is clear enough. It is so startling in its audacious simplicity, that one can hardly venture to present it to readers without first giving them reason to believe that Wedgewood was accustomed to careful observation and sound induction. He protests, with all the earnestness of a reforming innovator, against many nursery customs of his time ; and the practices which he condemns are such as we now consider barbarous and

obsolete ; his solemn advice to mothers about fresh air, diet, etc., reads like extracts from the most common-place modern text book of nursery hygiene. He was, in these and many other respects, far ahead of his age, but he was never fanciful or wild ; and Science has, since his day, endorsed his peculiar views on most subjects. There is therefore, so far, some reason to suppose that, to our descendants, his special view of the minimising of suffering may seem as obviously scientific and true as his advice on other topics does to us now. What he writes is at least worth thinking about.

There is another reason why Christians should not too lightly disregard his main suggestion. Though Wedgwood was not, in any external or formal sense, what is called "a religious man," his scientific insight led him to a conclusion about the meaning of suffering identical with that of Christian mystics at their highest level of philosophic perception.*

As an abstract philosophic idea is often best explained by a concrete instance, let us think of the meaning of *Education* in connection with the word *Fire.* Our conception would include such elements as the following : The pupil must learn successively : not to play with fire ; not to go carelessly too near the fire ; to walk steadily so that he may not fall into the fire ; to light a candle without setting fire to his clothes or surroundings ; to have presence of mind and know what to do in case of fire ; to have courage to help another person in danger of fire ; to know how to choose grates, lamps, etc., for a house, so as to minimise risk ; to understand fire-insurance and be able to insure his own house or crops on a wise basis ; to understand the scientific theory of combustion, and be able to try experiments with a minimum of danger and a maximum of intellectual profit; and, chief of all, to have the blood so sanitated by a hygienic life that, in the event of a burn, the flesh may heal as quickly as possible and without morbid complications.

Wedgwood's conception of Education includes all these elements ; but the "idea" which he desires to add to them is this : To have one's nerves so trained that one avoids being burned, not because it is *painful,* but because it would diminish one's future usefulness ; so trained that, if one were accidently burned, one would find the intensity of the sensation an *intense delight.*

At the first blush, this sounds mere craziness ; how can anyone be trained to enjoy pain ? Wedgwood did not suppose that any one could be trained to enjoy *pain.* But he perceived that pain is caused

*See an article by Rev. G. W. Allen in *The Unknown World ;* Sept. and Oct. 1894. Also J. Hinton : "Mystery of Pain."

not by injury, but by some kind of involuntary *resistance* of the nerves to the fact of being injured. Pleasure is the sensation which accompanies the nervous action of *welcoming* what is happening.

Let me own at once, the notion that Wedgwood's conception could be carried out in one generation would indeed be wild. He has put forth an Ideal towards which, as he supposes (and as I believe) the race must ultimately tend; and, however little progress any one generation may make, those have always (other things being equal) an advantage in the struggle for life, who are not "fighting against God," or, in other words, who are not opposing the general course of evolution. Progress, however difficult, is always a little easier, friction, however terrible, is always somewhat lessened, if we are, in the main, doing our little best in the direction of aiding rather than of hindering the Great Force which is guiding Humanity as a whole. If it be true that man is to become ultimately a creature not capable of feeling pain, then it follows that every child now living would grow up a more efficiently trained man or woman for the parents and teachers omitting from their codes of method *all such elements of treatment as tend to increase sensitiveness to any kind of suffering.* For Wedgwood, this is the ultimate and absolute test of educational method. Any element of education which tends to increase the child's future sensitiveness to any form of suffering, is thereby, he considers, sufficiently condemned. He was perfectly aware of what would be considered the moral objection to his theory; and he attacks that objection in its two principal strongholds, sufferings from pity and from shame. Would it be right to diminish the sense of shame and guilt which follow wrong-doing? Wedgewood replies that shame and sense of guilt are depressing emotions and weaken the power of resistance to both physical and moral disease. They might be, and they ought to be, absorbed and converted into eagerness to learn to do better in future. The teacher should say, not: "You have done wrong; you ought to be ashamed; I will punish you"; but "you will add to the sum total of human happiness if you will do differently next time." For it is important, not only to lead children to *do* right, but also to accustom them to act from such *motives* as, if powerful in later life, will prompt to good conduct. Now ambition, competition, desire of praise, or fear of blame, may keep children "good" during their school-life, but may make them, later on, selfish and worldly. The habit of merging one's own personality, and all thought of one's own goodness or badness, rightness or wrongness, in the consideration, "Am I so acting as to increase human happiness on the whole?" gives the best prospect for the ultimate formation of a noble character.

Wedgwood faces also the question of pity. Do we not wish our children to sympathise with those that sorrow ? To this he replies that sympathy is composed of two main elements : pain caused by the sight of suffering, and pleasure in relieving it. He holds that the teacher's aim should be to convert within the child all the force which runs to waste in the former of these elements, into added intensity for the latter. Before we condemn this suggestion, we ought to reflect how many of the cruelties of civilised lands are fostered by the fact that the cultured classes are too "sensitive" to bear suffering. If we felt less shrinking than we do from witnessing suffering, and more active delight in diminishing it, perhaps the formal inspection of barrack-schools and institutions for the afflicted, which seems so powerless to prevent abuses, would be more largely aided than it is by the good influence, on the attendants, of informal visits from cultured persons.

To return to the theory of the matter. Nature has evolved pain as a condition for self-protection. A race of animals or elementary savages, who could enjoy being poisoned or burned, would be speedily destroyed. But we, who have reason to guide us, why should not the protection of suffering gradually be withdrawn from us ? If we had the proper moral shrinking from destroying or debasing our powers, why need we also have that physical shrinking which causes the sense of pain ? If a man has enough moral self-control to abstain from drinking wine unless when medically ordered, why should we wish him also to dislike its taste when he has to take it as a medicine ? Why should he not enjoy the drug alcohol (or any other drug) if he can, provided that his enjoyment does not run away with his reason ?

And here we touch on perhaps the most remarkable of Wedgwood's applications of his main idea : the attitude which he takes up towards the question of the vices. For him, they are the most hopeful of all the facts of human development ; the rampant weeds which the unlearned explorer might contemplate with despair, but which, to his scientific fellow-traveller, only prove the fertility of the soil. The existence of vice proves to Wedgwood that man is not, like the beasts, fatally bound in the chains of mere natural evolution. Even if there were not already, as there fortunately are, examples to prove that man can rise above natural evolution, he at least knows that he is not bound to it, by the very fact that he can sink below it. If man were absolutely capable of finding pleasure, *only* in what ministers to the development of his personal ego, if he were fatally doomed always to experience shrinking from its destruction, how could he have

learned to like such a toxicant as alcohol? How *has* he learned to like vices destructive of his own organism? Wedgwood replies: *by Association.* Man's very flesh can be trained to respond with that automatic welcome which we call pleasure, and without that automatic resistance which we call pain, to whatever physical sensation is habitually and continually *associated with the sense of pleasurable mental or moral excitement.* The pleasure of mental excitement has, by long association, taught the very palate to enjoy the flavour of a drug which is, in its immediate effect on the mucous membrane, stinging and repulsive. The drunkard is one in whom the physical miracle of *transmutation of taste by Association* has been performed while he was at too low a level of moral bracing to turn the miracle to good account. Every drunkard is at least a living witness that the miracle can be performed. Courage, then! We have in our hands the Magic Wand Association, which can cleave for us the ocean of difficulty that seems to bar our escape from the land of bondage to mere natural evolution! If we do not like the harmful conjuring tricks which it seems at present to be playing, let those whom the matter most concerns—the parents and teachers of the next generation—study its properties and learn to use it as they think best.

So with the vice of cruelty. Every baby is born utterly self-centred, unable to take interest in anything except its own sensations, apparently locked up in a prison of mere selfish personality. How can we set it free from the slavery of caring for no one but itself? How can *we* set it free? We need not ask that question; nature will soon set it free. In a few years' time, if the child does not happen to have found out that it is interesting to give pleasure to others, he will have discovered that it is amusing to cause them pain; we shall find him intent on making his baby sister cry, or on pinching the puppy's tail. "It is horrible to see children cruel!" Is it so? Nature has done for you by far the hardest part of your task; she has broken up your child's self-centred immovability; she has decentralised his emotions, detached them from his own sensations, and created an altruistic interest in the sensations of other creatures; and left only a little misadjustment of his altruistic sympathies, so that you may have the pleasure of putting the final touch to his conversion. And you sit bemoaning "the wickedness of human nature," and trying to rouse in your child the depressing emotions of grief and shame; instead of showing how he might enjoy the double delight of influencing baby's sensations, and of making his mother smile! You deserve to have your next child born an idiot, incapable of being interested in anything except what he himself can eat and

drink. Such is Wedgwood's idea of the spirit in which vicious tendencies should be dealt with.

The Magic Wand, Association, by means of which we can so dominate the flesh as to transmute cruelty into active benevolence and (to a large extent at least) pain into pleasure, has two main branches—sweet emotion and pleasurable mental excitement. The power of the former factor over both pain and evil passion has often been dwelt on in sermon and song, and has to some extent been really believed in, and utilised, though seldom in a scientific or adequate manner. If the latter is to become the potent lever for the conquest of the flesh which Wedgwood expected it to be, our whole conception of education must undergo great change ; there must be much less communication of ideas by teachers to pupils ; much more cultivation in the pupils of the power of investigating for themselves. For it is chiefly during the process of *original investigation*, of *personal research*, of directly *forming conceptions at first hand*, that that psychological condition is set up, which has the power to transmute pain into pleasure ; no process by which *the ideas of one person are conveyed into the mind of another* contains more than a very feeble infusion of the great Elixir which converts pain into delight.

One of Wedgwood's practical suggestions is significant of his whole conception of method. All the newest and most intellectually stimulating toys are to be kept in a special cupboard, never opened except when some unpleasant accident occurs. Whenever a child falls, or receives any trifling injury not sufficient to require surgical care, the mother or nurse should not pick the sufferer up, condole with him, and kiss the place to make it well, but rush to the special cupboard, and instantly introduce into all the young minds the element of "roused curiosity," so that the sensations of a scratch, bruise, and burn, may for all their lives be associated in the children's minds with keen intellectual gratification.

Wedgwood's great consolation in his own sufferings consisted in the hope that his experience would enable him to do something towards increasing the pleasures and diminishing the pains of future generations. *Requiescat in pace !* For though his work can never now be published as he intended,* I hope that some readers of this journal will gain from him a new idea "concerning education."

*In 1912 a selection of the Wedgwood papers was published, edited by Miss M. O. Tremayne, under the title of "The Value of a Maimed Life," with an Introduction by Mary Everest Boole.

NATURAL PRIESTHOOD

"Parents' Review," 1895

PART I.—THE PARENTS

Now that the theory of unconscious mental action and the belief in the power of silent suggestion are accepted by a respectable section of the medical and educational public, it becomes possible to state a doctrine which has been held by some of the most thoughtful teachers in all ages—that of a Natural Priesthood, whose power it is not safe to ignore, because it comes direct from the Creator, and exerts itself without the aid of legal or ecclesiastical arrangements.

This priesthood falls into two divisions—that of parents in their own family ; that of certain individuals on society at large. I shall deal first with the influence of parents ; the psychological doctrine alluded to above, so far as it refers to them, is this : The ethical and religious ideal which should dominate the education of any child should consist of those elements of the general type ideal for humanity, *which at least one of the parents believes in, and which neither parent actually objects to.* The main importance of the principle I am here trying to explain comes in, not in questions of detail, but in the great questions of ideal, and of aim in life.

Books on ethical education usually contain not only scientific statements about the laws on which depend the formation of habit and the adaptation of educational means to ethical ends ; these statements are almost always mixed up with suggestions of what end we ought to pursue and what ideal of character we ought to aim at producing. But it must be remembered that the writers of such books can only give, at best, a general type ideal for humanity ; whereas the individual child is not only a human being, he is the child of some man and some woman. Dr. Schofield* tells us that parents can to a large extent conquer heredity by means of habit. No one agrees with that more heartily than I do ; heredity is a good servant, but we should never allow ourselves to think of it as master. If we cannot exterminate it, we can at least put it into harness and make it take us up-hill, instead of allowing it to run down-hill. We can conquer mere *heredity*. But what I assert is that one parent cannot, and ought

**The Unconscious Mind,* Alfred Schofield, M.D., pp. 202 *et seq.* The whole book is full of most interesting and suggestive matter.

not to try, to conquer the *will-force* of the other (even if, or perhaps I should say, especially if that will-force is exerted in silence, and manifested by no outward expression). For instance, the wife of a drunkard may do much to arrest hereditary tendencies in her children, by bringing them up as total abstainers. Very few men who have experienced the evil effects of intemperance would object to their children being prevented from following on their own down-hill road, if the matter were fairly laid before them in their best moments. But the case is quite different if the father is a sober man, with the rooted objection which many sober men have to the whole theory of total abstinence. Any attempt on the part of the mother to run counter to the father's desire to educate their palate to know good wine, would add to the children's chance of developing any and every form of neurotic instability, including (and I think especially) the tendency to alcoholism. The wise course for the mother to pursue in such a case would be to give no wine on ordinary days, never to give it at all in compliance with the child's desire, never to let wine come as the response to a craving or a whim; but on Sundays and family festivals to give a little to each child, as a sort of sacramental performance in honour of father's presence. I have chosen this instance because total abstinence for young people is one of my own very especial hobbies; but I do seriously believe that the danger of thwarting the deliberate will of the father is greater than that of occasionally taking what is, for children in average health, a needless and harmful drug. And I say this, not because of any notion about "a wife's duty"—for a mother owes more duty to her children's real interests than to her husband's mere wishes—but because I hold that a mother can hardly have any more solemn duty to her children, than to spare them those terrible mental conditions which are the result of one parent insisting on their pursuing a line of conduct, while the other is silently wishing them to pursue the opposite line; for let me repeat—it is not at all enough that conscience and good-breeding prevent the parents from audible disputes; silent will-tension is often more efficacious for harm than open disagreement

The ultimate outcome of this doctrine, if it were ever generally accepted, would be a new perception of the conditions of legitimate marriage. It would be seen that neither social convenience nor that personal attraction which we call "love" can suffice to justify two human beings in combining to put children into the world; that nothing can really justify it, except such harmony of *aims* whether those aims be high or low in themselves) as shall avoid tension between the two parents as to what they desire to make

of the children. A perception of the psychological principle here indicated underlay the ancient notion that one should not marry "out of the pale of one's faith." That was a crude object-lesson, intended to convey to the ignorant some faint glimmerings of the great question at issue, which is—not were the two intending parents confirmed in the same sect ? but—are their general aims and ideals the same ?

But most of the readers of this journal have to do with the offspring of marriages already accomplished. How can the danger of silent will-tension be best met and minimised ?

First of all, in reading books on Psychology and Education, make a clear distinction between the parts which refer to the ideal to be cultivated, and those which only teach the best mean towards certain aims. A novice would be much helped in this by marking the passages differently in the margin of the book, or by registering them in a note-book under the separate headings. If either parent has not time or inclination to study practical psychology and hygiene, it ought to be understood that he or she defers—as to matters of mere procedure—to the one who does study. But in the matter of aims, in all that has to do with the ideal we accept in regard to ethics towards man and faith towards God, the parents should take counsel frankly together. Let them decide first on such elements of ethics and of faith as they can heartily agree upon. These may amount to very little ; a husband and wife may kneel week after week at the same altar and listen to the same preaching, and yet have far less in common as to their ideal of desirable character than can often be found in common between a Christian, a Mahomedan, and a man who professes no particular creed. But I would say to the parents—the elements of devotion and faith, however little they may amount to, *which you truly hold in common,* are the spiritual inheritance of your children ; take care that you do not dissipate it by each fixing his or her attention on aims as to which you differ.

Next, select such elements of character as one parent cares about, and the other is simply indifferent about ; these come second in importance for the child's spiritual nurture. And for those elements as to which your desires, when you allow yourselves to form any, are conflicting, there is only one safe course to pursue —cultivate the habit of suspending all desires on those points. Turn away from the temptation to think of aims, however sacred they may seem to you, which conflict with the active wishes of your fellow-parent ; turn away from them as you would from temptations to physical infidelity. We are shocked when we hear of a young wife eloping from her husband in company of some

sentimental admirer, on pretence of intellectual sympathy ; but if a wife mentally elopes in company with her favourite religious preacher, the leader of some "movement," the founder of a "society," or the writer of some educational text-book, to a grand but impossible Ideal, into which the father of her children, being a practical man, cannot follow her, especially if, as often happens, by reason of such flight into the empyrean, she ignores any homely virtues or good customs which the father may be anxious to cultivate in his offspring, but which the society or sect of her choice has failed to see the need of, she commits a spiritual infidelity of which the other and grosser is only the physical analogue. It has been well said that "the father is the priest of the family ; and any woman who supposes that fact to be the less true because of any theological theories she may have learned elsewhere, only shows the radical unsoundness of her own theology."

But I am bound to add that, in my experience, mothers have seldom taken up the dangerous position of ignoring the priesthood of the father, except in cases where the father has voluntarily abandoned his function. How often does one hear a father say such things as this : "I never interfere with the religious instruction of the children ; that is the mother's province. I let her teach them what she pleases while they are young." The implied, and sometimes openly uttered addition is: "I will see that they are properly taught logic and philosophy later on, and then they will not believe in superstitions very long." Now the real meaning of this seeming liberality is not difficult to see. Anyone who honestly takes upon himself or herself the business of steering young minds, is driven sooner or later, to the conclusion that some kind of religion is a necessity. Where there are children, someone must perforce express some idea, or feeling, or hope, or aspiration about our relation to the unknown, the unseen and the future ; and all such ideas and aspirations are connected somehow with religion. Every parent who takes up his function must have a religion of some sort ; only by shirking his duties can the father enable himself to retain the agnostic position which satisfied him in his days of adult bachelordom. He leaves on his wife the whole burden of deciding—with such extraneous help as she can get—how to meet her children's questions about birth, life, death, the invisible and the beyond ; and meantime he himself is concentrating his thoughts, his will-power, on projecting into the children's unconscious mind the seeds of future conscious doubt. Now let us understand this clearly. If the father desires now that his children shall in future feel conscious doubt or disbelief of what their mother is teaching now, that is simply equivalent to

trying to project the seeds of doubt into the unconscious mind of now, in the belief that the seedlings will grow there for some ten or a dozen years before they emerge up into consciousness. Has the father who does this any conception of what poison those seedlings may be secreting and pouring out into the nervous system during those ten years ?

In the light of what is now perfectly well known to medical science about the intimate connection between the unconscious mind and the nerves, we can see that it is simply cruel for any father to let his mind rest on the thought that his children will discard, by and by, hopes and aspirations which he silently permits their mother to instil into them now. For he thus starts a habit of general doubt of what they are being taught, a divorce between the conscious and unconscious cerebration ; whereas nerve-health depends on the two working together in harmony. It starts a habit not of that "honest doubt" which stimulates scientific investigation, but that vague slipshod dishonest kind of doubt which consists in lazily amusing one's conscious mind by supposing oneself to believe some sublime truth, till the time comes to act upon it, and then discovering that, after all, one is not sure enough about it to make sacrifices for it. Divorce between the conscious, uttered teaching of one parent and silent suggestion from the other, is, I believe, one of the most fruitful sources of nerve degeneration and practical inefficiency in after life. One main aim, if not *the* main aim, of all education should be to secure the closest possible harmony between the conscious and the unconscious cerebration. A few ethical principles, agreed on between the parents, acted on steadily by both, and enforced by both on the children in a cheerful matter-of-course way, lays the foundation of steady character and purpose. Religious and spiritual teaching given in words by one parent while the other refrains only in words from dissent or even from sneers, is, I believe, one of the most fruitful sources of nerve storms in childhood and of incapacity later on.

The priesthood of the parents is a fact, whether we like it or no. "This is a hard saying ; who can hear it ?" But it is true, whether we will or will not hear.

PART II

The second kind of Natural Priesthood is composed of persons who possess in any marked degree the faculty of winning what is called "influence for good" outside of their own families. Such

persons, as we all know, are the leaven of society ; they prevent us from settling down into a condition of contented and common-place selfishness. Therefore what I am about to say will seem to enthusiasts a terrible heresy ; but I fear that it must be said, of the majority of these inspired prophets and reformers, that too much of their society is undesirable in a house where there are children. It is true that a few words spoken in the hearing of a child, by a man or woman charged with a strong sense of some great mission to be accomplished, not unfrequently give impulse and direction to the child's whole future career, and do much to steady and energise its mind. But there are very few original and strong thinkers in whose company it is good for children or those in charge of them to spend much time. In the first place, any strong personality is likely to absorb the vital force of those around, and weaken their character ; and in the next place, an original thinker becomes the centre of the circle in which he moves ; he sets up so strong a relationship to himself that, without his intending it, the more common-place relationships often become insensibly slackened and weakened in his neighbourhood.

Serious people too readily take it for granted that an influence is necessarily "good" if it appears to tend in good directions, *e.g.*, in the direction of "altruism" rather than "egoism" ; of large aims rather than small ones ; of philanthrophy rather than personal or family aggrandisement ; of intellectual recreation rather than physical pleasure or mere social amusement ; of spiritual belief rather than materialistic opinions. In this matter, more perhaps than in any other, it is well to remember the proverb that *le mieux est l'ennemi du bien*, the impossible better is the enemy of the attainable good. Teachers and thinkers who have large and wide aims, perhaps for the very reason that they themselves so easily impress others, because they exert a strong influence without taking much pains to secure it, are often very ignorant about the mass of small threads of connection which go to form the practical bonds of life, and which must be preserved, if those who are ultimately responsible for the conduct of young people are to keep the kind of practical hold necessary for good discipline and for forming habits of self-restraint. If one were addressing leaders of "movements" and "reforms," one might say a good deal about the duty of reserve and caution in this matter ; one might warn them that influence towards good is not always and necessarily good to exert ; one might remind them of the harm which may be done by suggesting to impressionable people that some other system is higher and "better" than that which the hearers understand and are capable of carrying out.

But this journal addresses itself chiefly not to leaders of thought but to parents.

A young woman who has not been very serious before marriage is sometimes made so by motherhood ; there is a strong temptation, then, to seek shelter from the pressure of responsibilities for which she feels unprepared, by flinging herself into some religious, ethical, or spiritual movement, headed by a strong and earnest personality ; she thinks she ought to believe what clever, pious, earnest people tell her ; she hopes that, by acting under their direction, she will fit herself for the function which she undertook too lightly, but which she now feels to be overwhelmingly sacred and important. It may be well for her to check herself by remembering that the mother of young children is, or should be, to some extent "in retreat" ; not all things, "lawful" and good in themselves, are "expedient" for her. Just as there are certain forms of physical exercise, excellent for strong unmarried girls, from which she abstained for a few months before her child's birth, so there are certain kinds of intellectual, spiritual and emotional exertion from which she should abstain for a few years after it. This applies specially to any kind of new thought which causes in her irregular and exciting emotional strain. Whatever else is doubtful, it may at least be taken as certain that an atmosphere of doubt and unrest is bad for children ; and a woman who undertakes to live with them, and devote herself to them, thereby undertakes not to worry herself and distract her family relations by importing into her home ideas which disturb its peace, however sublime and lofty they may sound.

And if she fears that, by omitting to study at once the grandest ideas within reach, she may miss the opportunity of fitting herself to be in future a good spiritual guide for the young souls entrusted to her, she may take comfort from reflecting on one or two principles of development, quite established as scientific truths, though not always understood by enthusiastic reformers.

Up to the advent of man on earth evolution took place by means of conflict with external restraints and difficulties ; but all which is distinctly *human* in man's progress connects itself with the development of *restraint from within*, of a power to store up force by suspending impulse, and waiting for the fitting time before carrying impulse into action. Therefore a woman, powerfully impressed by some preacher or writer, seized by the afflatus of some great movement of reform, if she has the courage to postpone joining it till her children no longer need special care, will thereby not only make herself a better mother for the time being, but will put herself more in a line with all the philosophy of human

development, and with the essential truth of all high spiritual thought, than she would be likely to do by following out at once an immediate impulse, however lofty that impulse may seem.

Another very important principle is indicated by evolutionists in the statement that ontogeny follows and summarises phylogeny. That is to say that the development of the young individual, before reaching its mature phase, passes through successive phases allied to the successive stages of evolution through which its race has passed ; and it would seem only consonant with this well-established law of nature that a child should have some practical experience of working out in its own person the ethical ideas in which its parents were brought up, before it is forced into contact with those newer ideas which are ultimately to denominate its own generation. The mother therefore will better prepare the child for its own adult place in the world by teaching it well what little she herself well knows, than by plunging into a chaos of untried plans and hopes. Moreover the worst, the most retrograde, the most worldly plan of life contains the possibility of being so carried out as to afford scope for as much self-restraint and as much practical altruism in detail as young children are fit for. The excuse for random smashing up of old systems is, of course, that "We cannot put new wine into old bottles lest the bottles should burst." But *children do not need new wine.* Milk for babes does not need a specially strong vessel ; the important thing is to keep the vessel always clean and sweet. That is just what a young mother should do ; give endless attention to inventing ways of freshening up and cleansing whatever system of religion and of ethics she herself already understands.

To take a concrete instance. A young woman gets caught in the rush of some modern ideas about respect for labour and the injustice of the present relations between employer and employed. There are two courses which she may pursue. One is to fill her house with advocates of reform, who talk much and eagerly about the wrongness of existing conditions ; and to try and organise her own relations with her servants and tradespeople according to some ideas formulated by these apostles. If she does this, she will almost certainly make mistakes at first in carrying out those ideas, for no one can carry out a new and untried scheme without making mistakes. She will create some friction and confusion in her home, and probably excite some opposition in the minds of her nearest relatives, possibly also of her husband. She will perhaps think of this as her sacrifice to the cause of reform ; but there is another course she might pursue, another sort of sacrifice she might make to the cause of reform. She might keep the outer machinery of

life going in grooves to which she is accustomed, and yet be careful to organise detail in such a way as to turn her children's hearts, their unconscious minds, towards respect for every kind of labour. She might adopt such little homely suggestions to this end as were made at the conference last May—seeing that the children open the door for a servant who is carrying things in or out of the room; making them careful to thank the shop-assistant who serves them, thus instilling the conviction that the person who actually works, confers an obligation on the one who only pays ; speaking of the penny for the crossing-sweeper not as alms given to a beggar by a social superior, but as her contribution towards the recognition due by society to those who serve it. However the adults in the house may dislike street noises, as long as a child finds pleasure in listening to street music, it would be well that he should be encouraged to show respectful gratitude towards the performers. Much confusion may be caused in children's minds by speaking of taxes in any grudging manner. To a child, taxes should represent the cheerfully-paid salaries of park-gardeners, attendants at museums, and other officials, whose services he himself values. And the policeman should be introduced to his notice as the gentleman appointed by the community to organise street traffic, prevent accidents, help inexperienced people over crossings, and restore lost children and dogs to their homes, and to prevent rough people from disturbing quiet citizens. To carry out all this kind of detail involves a great deal of quiet, leisurely thought ; it cannot be done in an atmosphere of moral doubt and emotional turmoil.

Now my present point is, that the second of these courses, the one which involves carrying out principles into small detail, is by far the more likely of the two to educate future men and women willing to join the cause of reform, and able to work effectively for it. All experience shows that young people brought up in a turmoil of moral excitement caused by an atmosphere of generous revolutionarism in their early homes, become in later life, neither the most likely people to join in social reforms, nor the best able to grasp great principles.

A good deal of courage and faith is needed to enable a young woman, tempted by large and generous ideals, to grasp the reasons for the reticence here suggested. The things which prosaic educationalists recommend her to do seem so trifling compared to the vast changes which need to be made. The enthusiastic social reformer asserts so vehemently (and alas ! with so much truth) that all possible kindness and courtesy from the well-meaning portion of the wealthy class makes very little essential difference

in the fate of the labouring poor ; that what is needed is a sweeping and wholesale change of our whole social machinery, and in all the relations between capital and labour. But, however true this may be, it does not follow that a mother of young children should in any direct way occupy herself about the matter. She is, as I said, in retreat for the time being ; the business she has undertaken is the sowing of seeds, not the levelling of forests or the transplanting of trees.

For these reasons it does seem to me that a mother need not fear that she will be robbing her children of any valuable inheritance, if she decides to keep within narrow bounds, while they are young, her intercourse with all persons possessed of power to lead and influence thought, except such as show that they themselves have enough of ethical training and mental discipline to respect ancestral thought-modes, and the normal priesthood of parents.

So much I venture to suggest to parents who are sincere adherents of reform-ideas. As for the woman who insincerely courts the society of an earnest moralist, merely because he happens to be, for the moment, a social celebrity, she only gets what she deserves if a chance word spoken by him shatters the foundation on which their respect for her rests. An earnest reform-leader is a priest of living truth, an ark in which glows electric fire ; the idolaters of old, who knew that the very presence of truth suffices to shake false gods from their pedestals, were wiser than many fashionable mothers in our so-called "scientific" age.

THE COST OF CHEAP SUCCESS

"Parents' Review," 1895

ONE of the good results to be hoped from a union of parents of different social ranks, is that certain evil modes of making children non-troublesome, which are practised by many poor women on their own babes, and by nurses on those of their employers, will have a chance of being properly ventilated. That infants are drugged in order to keep them "well-behaved" out of doors, is, I fear, too certain ; and other mischievous devices are resorted to for similar purposes. I do not, however, propose to write an essay on the mere fostering of physical vices by the poor for the sake of convenience. I wish to call attention to certain convenient spiritual vices which are fostered by parents in the cultured classes, for convenience. I have often had occasion to observe that no girls are more spiritually astray, more undisciplined morally,

more un-alive to the idea of duty, more unprepared for a dutiful life, than some whose mothers say of them— "She is the best of my children ; she has never given any trouble ; she has never disobeyed me." Obedience in children is so convenient to the parents that there is a temptation to rest satisfied with having procured it, and not to ask oneself too critically on what one's apparent success has depended. Many children can be made absolutely obedient, by ways which have no relation either to fear of punishment, or to any emotion of respect, affection or trust, which involve very little moral discipline, and which are fatal to the after influence for good of the parents. In all civilised peoples, and especially in the cultured classes, there has been established, and become hereditary, a strong preference for what the French call "n'avoir rien à déméler avec la loi." Why, when I see a new plant at the back of a bed in the park, do I abstain from going near to inspect is (as I should do, at the cost of no matter what exertion, if it were growing wild) ? Not from conscience (for I should injure no one by stepping over the palings), not from *fear* of the amount of penalty that might be inflicted ; still less from affection or respect for the park-keepers. I have the cultivated Englishwoman's preference for not giving officials any excuse for interfering with, or commenting on, my actions. Now the process of establishing this attitude towards law constituted a true discipline for the generations during which it was being formed ; but for those in whom it has become instinctive and hereditary, it constitutes no discipline at all. Discipline involves struggle. A lady has no struggle not to step over the park fences ; she has no desire for anything which involves conflict with officials : she transfers her botanical longings to regions where there are no officials to interfere. Now in some children of the cultured classes the desire to shelter oneself from the touch of authority—the tendency to do so by turning one's longing into regions which authority cannot reach—is latent by heredity, and so strong that it may, from a very early age, be evoked, by injudicious management, in relation to all persons in authority. The results are practically convenient ; but obedience of this kind soon becomes not a bond of union, but a barrier of separation between parent and child, between teacher and pupil. Obedience which results from affection or respect—which involves any real, moral struggle —must, I think, be more or less intermittent for many years of childhood. The obedience which is perfect early is only too likely to be the result of premature self-respect and over-weening pride.

Now where children are being dragged up, haphazard, there is

at least this advantage—that, whatever of natural affection or good principle may be in the parents, makes itself known to the children, and felt by them in a natural, wholesome way. But wherever educational books are being read, and educational problems discussed, accidents are always liable to occur, which give to the children a warped idea of the motives of their elders. In Madame Campan's book on Education, one or two volumes contain tales and plays for school children. I have known a mother put, by accident, into her child's hands the wrong volume—one intended for parents only, and containing a sentence to the effect that children should not be allowed to see the springs and levers by which they are being acted on. I need not describe the effect on a small mind of this accidental discovery of what it assumed to be the tactics of adults generally. In one way or another, wherever educationalism is in the air, it is impossible to prevent clever children from finding out that the question is being discussed—*how to gain influence over them.* There is no harm in their knowing this, provided they are honestly taken into confidence: they may thus be won to try to co-operate with the parents. But if children find out *accidentally* that the "grown-ups" are discussing the best way of managing their minds, the whole thing may become, for them, a game of skill, in which they try to prevent the grown-ups winning, as earnestly, and with as little consciousness of doing wrong, as a child tries to outwit its mother's effort to "get a king" when they are playing a game of draughts together. Parents and teachers are too often blinded by a mistaken notion that, if any mental revolt were really going on, it would necessarily show itself in the form of external insubordination. As long as a child is obedient they suppose it is docile to influence; whereas the truth is, that if a child really desires to repel influence, to arm herself against the possibility of her parents manipulating her mind, she is not unlikely to find out, very early, that literal obedience to all formal commands is, so to speak, the best card in her hand.

The moral of all this is that it is much safer for children to be wholesomely rebellious and grow better by long slow struggle, than to be precociously immaculate. It is especially better to be wholesomely naughty than to be prematurely religious. Piety, in sensitive proud girls of hereditarily cultured families, often is a mode of self-protection from the influence of human teachers; a premature escape from the pressure of human affections, to revel in the vague unknown. Much of the vocabulary of grown-up piety has a disastrous meaning when adopted as the self-communing language of a child. "Whoso loveth father or mother

more than Me," "Crucify the affections," etc.; all these phrases were not written for children. Much of the desolating and pessimistic atheism, which so often attacks persons who in youth were ardently pious, is due not to speculative doubt, but to the fact that the piety never was anything but an escape into the ideal from the pressure of real ties and affections, and drops off as soon as the person contrives to escape the pressure of those ties in some other way. A well-meaning woman, of the conventionally correct type, was surprised and pleased to find her young daughter absorbed in "Law's Serious Call to a Devout and Holy Life." Little did she guess that all the passages which might have served as correction to the child's own spiritual faults slipped off her mind entirely. The key-note of the book, for her, was the chapter which describes how Miranda, by dint of cultivating a habit of pious reading and meditation, contrived to frustrate the aims of those whom in childhood she had to obey, and made of herself the very opposite of all that her conventional mother wished to make of her!

All this is not intended to discourage parents who are earnestly striving to discipline their children, but as a warning to those who are inclined to boast that they find their task *easy*. Virtues that cost little are worth even less. In a much more serious sense than is usually given to the words, "to whom much is already given from him shall much be required." If a child is born saturated with that instinctive self-respect, which produces without effort some of the outward results of a laboriously cultivated respect for law, then the parents may be sure that for them is reserved a very difficult task—that of cultivating the capacity for human relations, which is almost sure in such a child to be perilously weak. It is delusive to such a child to find herself praised as "good" and "obedient," when she is only cultivating the habit of so acting as to shelter herself from the annoyance of reprimands, remonstrances and interference. It is still more delusive to her to find herself considered "generous" and "kind" when she gives up possessions or foregoes pleasures. It is small sacrifice to a proud child to forego anything, provided she can feel that she is making a sacrifice: the gratification of pride quite outweighs the loss of the thing itself. It is sometimes a much greater sacrifice to share cordially in the amusements or pleasures of others than to forego them (on the pretext of ministering to an invalid for instance). In short, if a child has inherited the legacy of intellectual pride, it is possible, by playing on that string, to produce the outer semblance of any kind of virtues that may be desired, at the cost of cultivating the pride itself into a disease.

Evolution upward is the result of *heredity plus struggle.* If any law of biology can be said to be proved, it is that the tendency of *heredity without struggle* is towards *de*volution : a virtue or faculty which is not being raised by struggle towards a higher level than that at which it originated—which is not being laboriously adapted for a higher purpose than the one it was first created to meet—begins very soon to become a vice or a disease. Easy virtues are always vices in disguise.

There is one more caution which I would give about the injudicious fostering of defects that look like virtues. Weakness of the *time*-sense is often associated with two forms of deficient animalism : with languor of the digestive faculties, and a detachment from external pleasures which produces a false appearance of generosity. A mother will sometimes say of a girl, "Yes, she is dreamy and unpunctual ; but I cannot be hard on her about it, because she is so sweet and generous, and so good on the whole." The argument (I have medical authority for saying so) should run quite the other way. Unpunctuality in a healthy, greedy, animal child is mere carelessness ; it is not a serious fault ; it will be corrected naturally in the ordinary course of routine. A hungry child who has missed a meal by not being punctual, will be more so next time. But where the animalism is weak, unpunctuality is not likely to be a mere accident of carelessness ; it is probably associated with real weakness of that time-sense, the cultivation of which is of the greatest importance for the correction of those gastric and other weaknesses to which the dreamer is prone. From the point of view of medical psychology, to be late for dinner because you were absorbed in a poem, an errand of charity, or especially a pious meditation, is a fault of much deeper character than being late for school or prayers because you were playing cricket ; and those who accuse medical psychologists of materialism for judging thus, know sadly little about the *moral* after-results of loss of time-sense combined with inertness of the gastric appetite.

Teachers should be careful, before showing approval of any act of apparent docility or altruism in a child, to ask themselves, "Is the child really sacrificing something she desires for the sake of something her conscience tells her is better than her own gratification ; or is she only strengthening the bad habit of recklessly flinging away what is, so far as it goes, good, for the indulgence of spiritual pride, or to spare herself the moral effort of entering into communion with her fellows ?"

It is comparatively easy to steer among these psychological rocks and shoals where the two parents are on the same intellectual

level. The real difficulty occurs in cases where the two parents belong to very different intellectual levels. The children of such unions are naturally somewhat anomalous, and difficult to bring up ; and it too often happens that the practical business of education is left in the hands of the inferior parent, and of teachers selected by that one. Common-place women married to over-intellectual men not unfrequently have a sad later life on account of quite anomalous heartlessness or disregard of duty in the very children who in early years seemed models of docility and kindliness. I think that in all the cases I have known of such apparently inexplicable disappointment, the evil has been distinctly traceable to the mother mistaking for virtues the mere symptoms of an heredity too advanced for her to measure or understand, and might have been averted had she resolutely told herself that nothing which is the result of *heredity without struggle* is ever truly good.

TAKING THINGS FOR GRANTED

"Parents' Review," 1896

A WISE old lady used to say to me that most of the muddle in life comes not from anything erroneous that anyone has said, or has actively thought, but from things lazily taken for granted. A few illustrations of this principle occur to me, which may be interesting to young naturalists.

Walter Scott, in describing the lightness of Ellen's footstep (*Lady of the Lake*, I., 18), says that "E'en the slight harebell raised its head elastic from her airy tread." He had probably seen the occurrence as he describes it, and taken for granted that, had the girl been of heavier build, the results would have been different. But as a matter of fact, the fate of a trodden harebell depends not on the weight of the walker, but on the part of the stem trodden on ; a comparatively slight force applied at the root will break the stalk, but I have seen a harebell "raise its head elastic," and seem in no way the worse, after an exceptionally heavy man had stamped, with all his might, on the upper end of the stalk.

Usually, however, it is not the writer but the reader who takes things for granted, to the great confusion of his ideas.

Students of botany sometimes take upon themselves to be supercilious over the fact that Milton, in his *Lycidas*, invites to grace the same funeral a variety of flowers which we in England never see at the same time. They take for granted that he was

thinking of an English garden (although he invokes the *Sicilian* muse). In some countries of Southern Europe cool breezy hills alternate so closely with hot valleys that the flora of many climates and seasons may actually be gathered within the course of a morning's walk, and Milton apparently knew this, although some of us do not.

Shakespeare, again, describes samphire gathering as a "dreadful trade." I used to wonder how so great a man as Shakespeare came to make such a mistake. Having gathered the material for many quarts of "samphire pickle," and found the occupation not dreadful at all, but eminently delightful, I supposed that Shakespeare had been as inaccurate as Scott, that he had seen the plant growing, as, of course, it sometimes does, in inaccessible places, and had assumed it could not be found within easy reach. Long afterwards I learned that it was I who had blundered. The salicornia, which grows on low, flat shores, looks like young shoots of samphire, and is very nice to eat, and I had on one occasion made salicornia pickle by mistake. The true samphire, however, can be gathered by children ; the rock-ledges on which it grows are often safe enough, when once access has been gained to any part of the cliff. In this respect, as in many others, things are made easy for us nowadays, and I had not realised how different all kinds of seaside gatherings must have been in ancient times, before coast-guard authorities and local improvement boards had cut steps and made paths along our shores.

Most readers take for granted, as I used to do, that when a poet speaks of "the toad," he must necessarily mean the slow, grey reptile (*Bufo vulgaris*) so well known to all who walk on summer evenings along muddy lanes, or in kitchen-garden paths. I have often wondered how old writers could be so inartistic as to enshrine this helpless-looking nonentity among the paraphernalia of terror and witchcraft ; for though the "toad" is not a beautiful object, there is not enough appearance of intensity about it to justify its occupying any prominent place among the dramatic accessories of black magic. The ordinary visitor to, or even resident in, the country hardly ever, now, sees the natterjack (*Bufo calamita*) ; it has almost disappeared in cultivated regions. It must have been formerly far more often seen than now, and probably it was this creature the old poets meant when they connected "the toad" with the notion of uncanny wickedness. I believe it is in reality as harmless as its grey-brown cousin of the muddy lanes, but its appearance and behaviour might well suggest weird ideas to any imaginative mind. The other day I was sitting on the sea-shore when one of these creatures walked up to me and

stood apparently staring hard at my face. It was very much larger than the ordinary toad, being quite as broad across the haunches and so long as to be proportioned like a frog. Its back and head were seaweed-brown, with warty spots of blood-red. It had big prominent red eyes. Its walk and attitudes were as personal (so to speak) as those of a dog. When touched it "shammed dead" for a minute or two, then a sort of shiver passed through it, and it proceeded on its way. It walked down to the edge of the rising tide, scrambled on to a bunch of growing seaweed, and stood there letting wave after wave wash over it. After that, as it was walking towards the cliffs, one of our party turned it over on its back, whereupon it "shammed dead" again in a most masterly style, with all its four feet cramped into four different positions, expressive of agonised convulsions. The under side was yellow, spotted with lead colour, which, as it lay still, gradually swelling up, deepened into inky black. It was much too interesting to be repulsive (at least to me, who have been accustomed from childhood to pets of various kinds, including toads, owls, spiders, newts, worms, snakes, and snails), but I can only describe it as the most utterly eerie creature I ever saw in a wild state. Of course, many animals in zoological gardens are more odd than it, but the artificial surroundings disturb the impression they would otherwise make. The natterjack, when one meets him unexpectedly in his normal habitat, is really a startling phenomenon.

Why the toad was considered specially poisonous is not known. Both species secrete, when frightened, some fluid which must have an unpleasant effect on the mucous membrane ; a young dog or owl will snap eagerly at a toad, but after a few moments will drop it with a comic expression of disgusted terror. I have heard that if the secretion touches a human hand where the skin is cut, it sometimes produces inflammation, but it has no perceptible effect on healthy skin.

The sham death of many animals looks to human eyes like the result of a quite supernatural cleverness ; therefore, it may legitimately be taken, *for artistic purposes*, as an expression of devil-prompted cunning. It should always, however, be remembered that an artistic or emotional impression is quite a different thing from a scientific opinion, and never should be allowed to mislead us into forming an unscientific prejudice.

The power to feign death, so far as it exists in man in normal health, is the result of deliberate purpose, and of highly-cultivated skill ; it has, therefore, been taken for granted that it must be so in animals also. This kind of assumption—the rough-and-ready translating of impressions into opinions—leads one to many

mistakes, and to cruel misjudgments ; no one can be considered educated who does not often stand for a time patiently in front of some hitherto unknown fact, receiving in full force whatever impression it is fitted to produce, and then pull himself sharply together by an effort of will, and correct the first impression by the light of reason and scientific observation. It is well, therefore, to exercise, even when we are studying beetles and toads, that faculty of self-correction which is so essential if we are to deal justly by our fellow men. The phenomenon of sham death may in reality be a trance of terror, a suspension of the ordinary faculties, due to fear, and which, in some species, facilitates the secretion of a defensive fluid.

The habit of taking a sympathetic interest in animals, even in the uncanny and repulsive-looking, always seemed to me so valuable that when my first child was born I resolved never to let her be taught to shrink in disgust from reptiles and insects. I *took for granted* that she would (if encouraged to do so) bestow her affections on the same kinds of out-of-door friends as I had myself loved in childhood. Very early in her little life she began to educate her mother ! She toddled up to me holding her pinafore carefully rolled round some cherished object, and sobbed out : "Cook won't kiss my pretty birdie ; she says it's a nasty thing, but *you'll* kiss it, mother ?" and, unrolling her pinafore, presented to me a blackbeetle* from the kitchen—one of the very few kinds of live things to which I have a thorough dislike. It was evident that if I refused I should not only grieve the already wounded heart, but introduce into it an element of doubt as to the sincerity of my own teachings. The look of relief that came into the tear-stained little face when the kiss had been duly administered to the "birdie" showed me what a moral precipice we might have fallen into had I not screwed up my courage to the necessary point. Our children do sometimes give us a very bad quarter of an hour by simply pushing a little further than we intended some principle which we have been trying to instil ; we must never take for granted that they will stop where our own progress left off !

Well, the moral of all this is that when we are trying to study nature we must take no link in any chain for granted ; and when we are trying to understand an ancient poet (poet means maker, creator, artist), we must always distrust ourselves ; we often come upon evidence of careless, slip-shod inaccuracy and misadjustment, but *we* are much more likely to have been guilty of it than he.

*The so-called "blackbeetle" is not really a beetle ; it is allied to the cricket tribe, but seems to have lost its hopping powers and become degenerate.

THE STAMP TRAFFIC AS A FACTOR IN EDUCATION

"Parents' Review," April, 1899

IT is to be feared that a grave question, bearing on moral education, is getting itself settled, and settled wrongly, "by default," *i.e.*, haphazard, for lack of attention to what is going on. It used to be generally understood that well-bred children do not ask relatives or friends, and especially guests, for money, or for things which possess a money value. When first children began to make collections of old stamps, the stamps, once used, had no value. A child asked one to keep old envelopes for him, just as he asked one not to burn any other kind of rubbish till he had the opportunity of looking through it to see if he could find anything useful for his purposes, though useless for ours ; the favour consisted not in the value of the gift, but in the fact that one remembered his wishes and took trouble to gratify them. It was easy to make a child understand that friends are more likely to accede to requests of this kind if not made at inconvenient times and in an intrusive way ; and the result was on the whole good for manners, and the basis of wholesome relations. Parents (quite rightly then) encouraged the stamp hobby ; it affords a cleanly and noiseless amusement, it fosters habits of neat manipulation, and promotes the knowledge of history and geography. But now that old stamps are an article of commerce and almost a medium of circulation, children ask for them still. I have heard them beg for stamps from those who were in the habit of selling them. This is surely the thin end of a wedge which may split up many conventions of reserve and good breeding.

But there is far worse behind. Children not only beg for stamps, but traffic in them. If they do not actually sell them, they procure duplicates as a means of exchange. Juvenile bartering is harmless enough when confined to such personal possessions as marbles and knives, which have a real value depending on the cost of production. But the value of a stamp has no relation to the cost of production ; it is a fictitious value, like that of certain cards in a game, and is, in fact, a gambling value. Stamps are now an article not only of commerce but of speculation to many adults ; surely then the habit of looking out for profitable exchanges brings boys perilously near to something that one would wish to keep as far from them as possible. Stamp merchants employ little boys to sell stamps on commission among their school-fellows. Surely we do not wish our boys to gain their first notions of money transactions from

strange and often dishonest speculators and touts ! Parents do not quite realise what is going on, or what they are consenting to. I have heard a wealthy woman, a good, careful, anxious mother, say, in presence of her children, that she thought it a good thing for young people to buy stamps, because the collection will increase in value as the years go on. I wondered if she quite saw what she was putting into their little heads !

Till lately, it was a sort of convention in our upper and middle classes that children were to be discouraged from making money by traffic or speculation, till the school age is over. This unwritten law rested on a sound foundation. The children of the poor can actually earn money in holidays by going errands or helping in agriculture, etc. It is difficult for the children of the well-to-do to find any means of actually *earning*. Some middle-class parents do buy the produce of their children's gardens or poultry yards. But even this has been felt by the majority of well-bred people to be a mistake. Among the really poor the child's earnings are a contribution to the family comfort, and his work is therefore a training for communal life. But where all the pocket-money of which it is desirable that a child should have command can be provided by the parents without their feeling it a loss, the earning of extra money by the child is in no sense a training for family or communal duty. And if the child is able to contribute fruits, eggs, or vegetables to the family table, it is better that he should do so without payment, as a small acknowledgment of his indebtedness to those who liberally supply all his needs. This has been strongly felt by nice-minded parents, even where the children are earning in the true sense, *i.e.*, really adding to the world's stores of wealth ; making something or causing something to grow. But the reason against juvenile money-making among the well-to-do is far stronger where the money is made, not by labour but by traffic, because the latter, if begun young, is especially likely to pass over into speculation, which is in reality a polite term for gambling.

The desire to possess money as a means to an end is legitimate ; but making money *as an amusement* is a mere lust. The two things differ as using wine differs from setting up a vicious craving for it ; the difference is not in the amount taken, but on whether the wine is taken to promote the digestion of other things, or for the sake of the sensation of imbibing it.

The most gigantic and cruel of commercial frauds are those perpetrated not by men in whom the desire for possession is the chief motive, but by the commercial gambler, who knows that he is as likely to land himself as well as others in the bank-

ruptcy court or in jail, as to enrich himself by ruining others. The passion which sweeps away all ethical and human considerations is the lust, not for the wealth, but for *the excitement of gaining wealth*. No kind of stock-broking or financing remains honest beyond the point where it leaves off being carried on as a means of earning money that is desired for some purpose, and begins to be carried on for the excitement of the game itself. Finance differs in this respect from most other avocations of man. Agricultural, industrial, artistic and professional work, is *better* done when not merely for a livelihood, but also for the love of the work itself ; finance is fatal to character in proportion as it is carried on *con amore*, and not merely for the sake of the proceeds.

The instinctive perception of this truth has led well-bred parents, until lately, to be careful to utilise the early years of children's lives in fostering tastes and setting up hobbies and interests, undistracted by the excitement of barter or traffic, lest the latter should gain possession of the soil, and become in after years, not a mere means of earning money for the purpose of spending it or of providing for the future, but *an amusement followed for its own sake*. But the need of this caution seems in some danger of being forgotten ; not because anyone on reflection really doubts its wisdom ; but, as I said, by default, for lack of reflection. So many old conventions are being discarded now because the time has come when they are no longer useful, that people who mean well are in some danger of imagining that progress involves the discarding of all conventions, without any reflection as to whether we can safely do without them yet. "Traditional convention is to morals what the shell is to the nut; it is useless in itself ; but if it broken away too soon the nut will decay without germinating." The world is not yet in so spiritual a condition that wealthy people's children can engage early in any sort of trade without grave risk of becoming precocious stock-jobbers and gamblers.

There seems to be creeping in a sort of idea that encouraging children to be "sharp" in little exchanges and bargains is "a good preparation for business," that it will tend to make them successful as merchants or bankers. Surely this is a mistake. It seems to me that there could hardly be a worse preparation for any sort of business than premature sharp-practice. It trains the qualities which go to make the brilliant company-promoter rather than the successful merchant ; it has no tendency to train men who will add to the wealth of the nation while consolidating their own position ; it does not form the habits which are needed in the counting-house, bank, or insurance office ; it does inculcate

prematurely the lust for the vicious excitement of making smart bargains at other people's expense, of trusting to irregular advantages due to strokes of luck, aided by skilful playing on other people's blindness and ignorance. The "business habits" fostered thus are such as give their possessor an equal chance of becoming a millionaire or a pauper, an ostentatious patron of public charities or a criminal in the dock ; they make him in either case equally a curse to his country's commerce, and an injury to her reputation. Juvenile smart-bargaining does nothing to foster that other kind of business habit which gives the all but certainty of an honest living along with the possibility of wealth ; and which makes the business man a blessing to all around him. Those who wish to train children for real success in business should give a fixed allowance of pocket money, and permit no irregular money presents from relatives. They should encourage the children to keep strict accounts. They should give the children every opportunity for realising how much power one gains, both to buy what one really needs and to give generously to others, by avoiding careless expenditure and by making one's own tools and toys as far as possible. They should let the children see how much more friends value a gift from a child if made by his hands than if purchased with his money. And they should protect the children from all chance of making money by bargaining, until an interest has been set up and has grown strong, in several kinds of study or pursuit ; amongst these there should be at least one by which money can in future be legitimately earned. As for the educational value of juvenile collecting, there are many sorts of collection which are instructive and quite harmless, which depend on contributions gathered by the children themselves, not bought in shops : shells, pebbles, twigs, seeds, mosses, and best of all, paintings of flowers. It is as easy to make a child look out in the map the country whence comes a plant, the flower of which he has painted, as it is to make him look for the town where a stamp was issued. The secretary of the Bayswater Branch of the P.N.E.U., in inviting children to send Natural History collections for the annual exhibition, expressed a wish that shells, seeds, etc., should be sent in boxes not bought, but made by the children. This seems to me calculated to lay a far sounder basis for business training than is likely to be laid in stamp shops. The principle which lies at the rest of this whole question, because it is obvious and indisputable, is sometimes forgotten. The foundation of good business habits is the belief that every good shilling is worth exactly twelve pence, and that no bad coin is worth anything at all. Such ideas as that there is an off-chance of one's own particular

shilling turning out worth thirteen pence if one is lucky, or that if one is smart one may get thirteen pence for it by persuading someone else to believe it is worth fourteen pence; or that it is legitimate to accept twelve pence for a shilling which one got for sixpence because the former owner doubted its being good, lie at the root of habits which are commercially dangerous and socially degrading. To what extent it is possible for adult business men to keep a perfectly straight course in the present condition of commerce, I do not know, nor is this journal the place for discussing such a topic. Our duty surely is to see that we cause not little ones to take a fatally wrong road at the outset of their life's journey.

THE MATHEMATICAL PSYCHOLOGY OF GRATRY AND BOOLE

Translated from the Language of the Higher Calculus into that of Elementary Geometry, 1897.

TO HENRY MAUDSLEY, M.D.

DEAR DR. MAUDSLEY,—

You have often asked me to explain, for students unacquainted with the Infinitesimal Calculus, certain doctrines expressed in terms of that Calculus by Gratry and my late husband. That you permit me to dedicate my attempt to you will, at least, be a guarantee that the main ideas of mathematical psychology are based, not on mystic dreams, but on scientific induction.

I am glad of this opportunity of expressing to you my gratitude, both for your published works, and for much personal kindness to myself.

I am,
Dear Dr. Maudsley,
Yours very truly,
MARY EVEREST BOOLE.

PREFACE

IT is usual, in a preface, to express the author's thanks to those who have been helpful in the evolution of the book. Were I to attempt to do this, I should have to mention the names of most of the persons with whom I ever conversed, and most of the authors whose works I have read. The existence of my little volume in its present form is due to Mr. Percy Furnival, F.R.C.S., of St. Bartholomew's ; who, on learning the nature of the work which I have long had in hand, insisted that information which may possibly prove to be of some use to members of his profssion, ought to be made accessible to them without further delay. I have to thank him for his kind help in the final arrangement of my material.

M. E. B.

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CHAPTER I

INTRODUCTORY

How is it possible that questions of general Psychology should be mathematically investigated ?

And if such a thing be possible, what class of readers does the matter concern ?

In answer to the latter question, it is sufficient to say that I have been invited by members of the medical and educational professions to state, in the ordinary language common to all educated persons, certain conceptions about the nature of the process of original thought which have hitherto been expressed in a terminology intelligible only to mathematical specialists. Many to whom these conceptions have been explained viva voce seem to feel that it would be well if they were made accessible to all who are concerned either in fostering the development of original faculty, in distinguishing between genius and the mere inspirations of self-conceit, or in preventing the growth of hallucinations : that is to say, to young persons who either have or suppose themselves to have original ideas ; to parents and teachers ; and to those within the sphere of whose duties it may come either to minister to the special needs of genius, or to deal with that lurid shadow of genius which we call insanity.

But how can there be such a science as Mathematical Psychology? Mathematics is understood to be the science of number and space. It is true, indeed, that all large masses of data must be reduced statistically before the information which they are capable of affording can be made available as a basis for accurate reasoning; and statistics, of course, belong to the domain of mathematics. In that sense the adjective "mathematical" might conceivably be used to qualify the name of any science ; but, in any other sense

than that, how can mathematics be concerned in a treatise on human psychology ?

This initial question can best be answered by a parable. Suppose that by some means the inhabitants of Mars became possessed of a ladder of human construction—an ordinary ladder such as is used in our orchards ; and suppose they were informed that this instrument is one in common use among the intelligent inhabitants of the Earth for the purpose of reaching certain articles of food which would otherwise be unattainable. The first impression of the Martians would probably be that the instrument had some direct relation to the articles desired by men ; either that its shape is adapted to catch the fruits, or that the ladder has some property of attracting the fruits and causing them to come of themselves towards the person possessed of it. On that basis they might possibly construct a pseudo-science of earth-botany ; an elaborate scheme of hypothetical assumptions about the nature and growth of earth fruits. It would probably not occur to them at first that the ladder could reveal anything about the nature of man (except, of course, that they would infer a tendency in man to desire fruits growing out of his reach).

But suppose it came to their knowledge that the ladder has no magnetic attraction for fruits, and that its shape has no relation to any property of fruit except the one property of growing out of human reach ; their hypothetical botany would then be seen to be chimerical, and they would be driven on to a different line of speculation. If the ladder has no relation to the things to be reached, then it must be constructed in some very close relation to the normal action of the creatures who want to reach the things.

Starting anew on this sounder basis, it might be possible for them to arrive at some knowledge of the anatomy of the human climbing-limbs. Then suppose that beings on the other side of Mars acquired knowledge of our anatomy by some other means—suppose a book of anatomical plates or the legs of a human body were conveyed to them—we can easily see how, if the two sets of Martians came together and compared notes, the set who had investigated the ladder might supplement the more direct knowledge acquired by the other set and add to it elements of considerable value.

The science of mathematics is an intellectual ladder. The rather usual assumption that it is "a science of number, size, and form" is as erroneous as would be the assumption that a ladder is an instrument specially adapted to draw cherries from their natural level. Before we can truly grasp the conceptions of Mathematical Psychology, we must begin by realising a little how far mathematical

science is from being harmoniously adjusted to the laws of the subjects to which it is supposed to be necessarily attached. Mathematical processes may almost be said to have no relation to any property of the laws of number or of natural form, except, indeed, the one property of being too difficult for the intellect of man to grasp unaided. When we are clear on this point, when we have come to a true understanding of what mathematics is not, we shall be in a better position for entering on the question: What it is.

Mankind have invented names for each of the numbers in order, and have agreed on certain written signs to represent those names : 1, 2, 3, etc. Why, on arriving at ten, do we suddenly leave off writing fresh signs and begin to use combinations of the former ones ? No property of numbers is more absolutely certain than that of following in an unbroken and homogeneous series without jolts or breaks. Why do we make a break in representing them ? Because man is a creature who finds it more convenient to use classified combinations of a few signs than an indefinite number of separate signs.

But man easily uses twenty-six letters in his alphabet ; why, then, does he cut short his numerical alphabet at less than half that length ? Because, though our memory easily retains twenty-six or more separate signs of similar kind, few persons can visualise, or form a direct conception of, such a number as twenty-six. The largest number that an individual can clearly picture to himself or directly conceive varies, according to his degree of culture and his visualising capacity, from three or four in the very young child to twelve or sixteen in the average adult. Only exceptional persons can conceive of rather larger numbers.

Why, then, have we not chosen as the basis of our numeration the number twelve ? It is, by its own nature, an eminently suitable number for a base, because it has several factors, and therefore is divisible in more than one way. Why did we not evolve a duodecimal instead of a decimal notation ? Because man has ten fingers to count on, five on each hand ; and, therefore, the only two notations which have ever come into ordinary use are that by *fives* (the so-called Roman, in which six is written "five and one," or the fingers of a hand plus one) and that by *tens* (the Arabic, in which eleven is written "ten and one," or the fingers of two hands plus one).

We see, then, that arithmetic corresponds from its very origin to properties which are distinctively human, not numerical. Its processes are, from the first, anthropomorphic, not, as is commonly assumed, purely abstract. Our systems of numeration

truth—the truth that man has ten fingers; there is, therefore, nothing improbable *a priori* in the suggestion that mathematics may contain indications of psychological truths. Indeed, it has been shown that it does contain such indications; the very existence of any such invention as a system of numeration points to the psychological doctrine that both man's capacity and his desire to register and combine numbers are greatly in excess of his power of directly conceiving them. This particular psychological doctrine happens to be one which we could have discovered without reference to mathematics; therefore the specially mathematical evidence of it attracts little attention. We shall see in the sequel whether mathematics contains evidence of any other truths of psychology—of any truths not easily discovered without its aid.

As we trace arithmetical and algebraic reasoning through successive gradations of increasing complexity, we find at nearly every step the same artificiality. The processes are artificial in relation to the subject-matter, but they are well adapted to meet the limitations of our direct faculties, and to assist us in attaining knowledge unattainable by our unaided powers.

So far as we have now arrived, there is no great difference between arithmetic and so-called natural sciences. Most of the implements and methods of science betray their distinctively human origin. Optical instruments, for instance, are implements whose primary function is simply to extend the range of human vision; special adaptations are in some cases made for the observing of special classes of objects; but the function of the microscope is essentially to enable man to see more minute objects than he naturally could do; and that of the telescope is to enable him to see more distant ones. The text-books of nearly all the natural sciences contain, mixed up with information about the particular science, instructions about devices for enabling man to supplement his limited faculties, physical or mental, and to extend the scope of their activities. Most scientific books, therefore, contain, implicitly, information about human anatomy or psychology, or both. When a teacher, in order to demonstrate to his class the structure of a leaf, shows a skeleton leaf, the cuticle under a microscope, and the cellular substance, and then appeals to his class to conceive these various portions combined, and acting on each other, in the growing leaf, his method follows, not in the nature of vegetation—it is not the nature of a leaf to grow its cuticle, its ribs, and its parenchyma separately, and then combine them—but the nature of man, whose faculties are constructed to work under such conditions of alternate analysis and synthesis.

We have arrived at nothing, as yet, to show that mathematics

is psychologically more instructive than botany ; but we have at least, it may be hoped, cleared out of our way the popular but erroneous conception of mathematics as a science differentiated from most other sciences by being purely abstract, non-human, out of line with vital processes.

If we turn now to another department of elementary mathematics, that which relates, not to number, but to size, form, and motion, we are again confronted with an anomaly similar in kind to that which we encountered in arithmetic. Before we can enter on such a study as the line of a planet-path we have to become familiar with the properties of the plane ellipse. Now, no such thing occurs in Nature, so far as we know, as a plane ellipse. The path of a planet in space is an elliptical spiral. Could anything be more artificial, as regards the planet-path itself, than to pretend that we have cut it by a plane, and then pretend that our paper is that plane, and then pretend that the spiral path has cast a shadow on the paper ? Yet that is what we are virtually doing when we draw an ellipse on paper and use it to study or teach the action of natural forces in producing planetary motion. Even supposing there were a real, living ellipse, supposing that anything in Nature did run in an elliptic line on one plane, what is the meaning of all the straight lines, the axes, tangents, and radii vectores pictured in our text-books ? What are the rectilinear co-ordinates of algebraic geometry ? All these devices have been invented, not to suit the nature of the motion under investigation—most of them have no relation to that motion—but to meet the needs of the human mind in its efforts to understand what is beyond its comprehension. And they answer their purpose perfectly.

Let us turn back now to elementary arithmetic.

Suppose a student desires some knowledge which is not at present in his mind—say about the mode of fertilisation of a particular plant, or the chemical constituents of a particular article of food. He must go outside of himself for the information which he lacks ; he must either investigate a specimen of the plant or substance, or he must refer to some book, or be instructed by some one better informed than himself. It may happen, of course, that he is able to recall to memory what he desires to know, but in that case he is only ransacking a library of impressions stored up within him, which impressions were produced originally by information from the outside. If he never yet possessed the knowledge he now seeks, he cannot now re-collect it from within ; he must seek it outside himself. The mythical philosopher who "evolved a lion out of his moral consciousness," instead of looking at the real lion in the Zoological Gardens, is proverbially ridiculous.

But suppose that you, my reader, have occasion to know how many days there are in two million four hundred and eighty-one thousand seven hundred and forty-nine years—that is to say, how often the earth will turn on its own axis while it is going round in its orbit a number of times far, far too great for you to conceive or imagine—it is obvious that you cannot acquire the information you need by direct inspection of the facts; you will not live to count the days in two million odd years. But you will not, in such default of direct source of knowledge, consult any written book or appeal to any human teacher; nor need you distress yourself by laborious ransacking of your memory; the chance are greatly against your ever having known the exact number of days in the precise number of years about which you are now inquiring.

You will take a blank sheet of paper and a pencil,—instruments whose sole function is to register successively your own mental processes as they take place, and so to assist you in keeping order among them,—and within five minutes you will be able to state with absolute certainty the fact of which, five minutes before, you were ignorant. How did you acquire the new knowledge? Not by any process of mere syllogistic logic; there is no similarity between the process of arithmetical multiplication and such ordinary syllogism as "All men are mortal; John is a man; therefore John will die." In any valid syllogism, the conclusion is really contained in the premisses; the syllogistic process only puts into more convenient form knowledge already possessed.

If any fanatic were to propound such an argument as this: "All men are mortal, therefore the archangel Gabriel will die," how he would be laughed at! What know we of archangels? Nobody ever saw one. Yet it is just as true that nobody ever saw a million years; nobody ever *saw*—truly saw and cognised—a million of anything. Yet we are permitted to infer something about three hundred times two million from the mere datum that three times two are six. This proceeding must certainly be non-syllogistic, extra-logical. We shall see this all the more plainly if we remember that, as was shown above, the names two million and three hundred are purely artificial. Numbers themselves form a homogeneous and unclassified series; there is no more natural connection between the number which we have chosen to call three and the number which we have chosen to call three hundred than there is between three and nine; the whole nomenclature and classification of numbers is an affair of purely human psychology and human anatomy. Yet every school child makes statements about

three hundred times two million for which he has no data, except that he has counted what three times two make.

It will be noticed that the knowledge gained by the process of multiplication is, in one sense, relative to ourselves. The answer we get, if large, is not conceivable by us ; but it is expressed in terms of the base of our system of numeration ; *i.e.*, of some number chosen by us as base because we can conceive it (*e.g.*, ten, the number of our fingers).

The process of multiplication is capable of indefinite expansion. It does not become more intricate as it is pushed further ; it is as easy to manipulate billions or trillions as hundreds or thousands ; the only extra cost is the labour of writing extra zeros. It is as if, when we reached the top of a cherry-ladder, we found it perfectly simple to add on another length and climb that ; and then another, and another, till we reached the stars. In physical sciences, progress is hampered by the constant need for some fresh facts to lean the ladder on ; the arithmetical ladder starts, indeed, from a physical basis—our ten fingers—but it never needs anything to lean on any more. And there is no limit to its expansibility.

Scientific men of all "Fachs" agree in asserting that the rough guesses of mere average common sense and *a priori* probability need to be corrected by the dicta of science. And the delightful complacency of their consensus on this point has caused them to overlook the fact that the expression "correcting an unscientific guess by scientific investigation" may refer to either one of two processes as unlike each other as possible.

A man widely known for fidelity and trustworthiness suddenly robs his employer. Three months later he becomes delirious, and soon after dies. Average common sense supposes that he yielded to the pressure of some exceptional temptation, and then went mad of remorse, and that the strain of that remorse caused his death. Medical science declares that common sense has mistaken cause for effect ; that the man died of softening of the brain, which must have been coming on before the date of the robbery, and that in that disease decay of the moral instincts frequently precedes intellectual and physical failure.

Or a girl appears depressed in spirits, and talks mysteriously about some one having ill-used her. She dies suddenly. General probability suggests that she made away with herself ; the probability seems all the greater when it is reported that she lately bought beetle-poison. Chemical investigation proves, however, that the beetle-poison contained no ingredient fatal to human life ; and at the autopsy no trace of poison is discovered, but a clot of blood or a tumour is found on her brain ; and medical

science declares that this cause accounts for depression, for imaginations about being ill-used, and for sudden death.

In these cases scientific experts can correct unscientific guesswork by reason of having access to facts not generally known.

But now let us take the case of the Eastern potentate who, according to tradition, bade the inventor of the game of chess to name his own reward. The learned man asked that a grain of corn should be given to him for the first square, two for the second, four for the next, and eight for the next ; and so on till the end of the series of sixty-four squares. The monarch considered this request a modest one, till the wise man showed him that the year's harvest would not furnish the amount of corn necessary. In this case the scientific expert had access to no facts hidden from his unscientific hearer ; there were no facts to be taken into account, except the obvious one that the board was divided into sixty-four squares ; the two men differed because the one had gone through a certain set of mental processes which the other had not gone through.

One remarkable difference between mathematical certainty and what is called scientific conviction must here be pointed out.

"The general laws of Nature are not, for the most part, immediate objects of perception. They are either inductive inferences from a large body of facts, the common truth in which they express, or, in their origin at least, physical hypotheses of a causal nature, serving to explain phenomena and to predict new combinations of them. They are, in all cases, and in the strictest sense of the term, *probable* conclusions ; approaching, indeed, ever and ever nearer to certainty, as they receive more and more of the confirmation of experience ; but of the character of probability, in the strictest sense of that term, they are never wholly divested. On the other hand, the knowledge of the laws of mind does not require as its basis any extensive collection of observations. The general truth is seen in the particular instance, and it is not confirmed by the repetition of instances . . . the perception of such general truths is not derived from an induction from many instances, but is involved in the clear apprehension of a single instance. In connection with this truth is seen the not less important one that our knowledge of the laws upon which the science of the intellectual powers rests, whatever may be its extent or its deficiency, is not probable knowledge. For we not only see in the particular example the general truth, but we see it as a certain truth,—a truth our confidence in which will not continue to increase with increasing experience of its verifications."*

*Boole : *Laws of Thought*, Chapter I.

When a professor illustrates some principle he has been stating by one or two instances only, he uses those instances, not to prove the principle, but simply to make the pupils understand exactly what it is that he asserts.

Now if he is teaching any physical science, the pupils are expected, if not to believe the principle on the word of the teacher, at least to accept it provisionally as a working hypothesis till they gain, by repeated and long-continued experience, the right to hold an opinion one way or other on its truth. But if the principle be a mathematical one, such, *e.g.*, as that $a \times b = b \times a$, the pupils are not expected to suspend judgment till they gain certainty by experience; when once they have grasped what the principle is that is being stated, they see and know for themselves that it is absolutely, certainly, and always true.

One singular characteristic of mathematics is the automatic power of self-correction which the mind possesses in relation to it. No such thing is possible as the existence of either a persistent or a widely spread error, or a serious difference of opinion, as to the result of a calculation. And this is not due to any special immunity from error which we have in connection with the subjects called mathematical. Every schoolboy knows that it is as possible to make a mistake in a sum as in any other exercise; and the greatest mathematicians occasionally make mistakes in calculations. But there seems to be some mysterious court of arbitration within man which detects mathematical error. Any two persons who have come to different conclusions as to the result of a calculation can find out which of them was mistaken, without appealing to any external authority. Nor need they examine any outer facts; they need look at nothing outside of themselves except the slates or papers *which contain the register of their own successive mental acts*. They judge between themselves, and judge infallibly. When one child only has done a sum, he may need to look at the "answer in the book"; if his result does not correspond with that answer, he thinks that his processes must have been wrong somewhere. But when two persons have made the same calculation with differing results, there is no need to compare the results with the answer in a book; they revise and compare their own mental processes as registered by themselves.

This power of absolute and unerring correction and mutual correction, which man possesses in regard to arithmetic, is popularly supposed to be due to something in the nature of the subjects commonly treated mathematically (*i.e.*, number and quantity). "Man can know number and quantity more accurately than he can know anything else," is the ordinary explanation.

But when we examine it, we fail to find any warranty for the assumption that man has more natural power of being accurate about number and quantity than about any other kind of truth. The chess-board legend already alluded to, and such well-known puzzles as that about the nails in the shoes of a horse, prove that people make just as wild guesses about number as about any other department of the Unknown when they dispense with systematic investigation and trust to their unaided judgment. And, as was previously shown, we use with ease an alphabet of twenty-six letters; if our arithmetical alphabet were as large, we should become hopelessly fogged in our calculations. Most of us could probably recognise at sight any one of some hundreds of persons, of words, of flowers, of any sort of objects with which we are familiar; but when we come to numbers our powers of direct cognition seem much feebler and more limited. If dots are arranged in patterns, each number having its own pattern, as is done in the printing of playing cards, we recognise any one of the first ten numbers easily, as we know our friends apart by their faces; most of us would know at a glance the look of twelve dots, or perhaps even of any number up to twenty. After twenty we should probably have to begin to spell out the numbers—*i.e.*, to count or calculate. That is as if we could not read at a glance any words except some sixteen or twenty of the shortest and simplest in the language; or as if we could not recognise by sight more than twenty of our most intimate acquaintance.

This weakness of our power of direct cognition with regard to numbers, as compared to our faculty of cognition in some other directions, may be partly due to lack of exercise. It might be possible to strengthen it by practice. But at least it leaves us no excuse for asserting that numbers, as such, are easier for us to cognise with certainty than facts of other kinds.

What, then, is the true import of our easy and familiar access to the Great Unknown on the side of number? What is the source of the unerring certainty which we can all attain with regard to it?

"Necessity is the mother of invention." Is it not possible that the very limitation of our direct numerical faculties has forced mathematicians to create, unconsciously, the ladder on which man can safely climb to The Infinite?* Is it not possible that mathematics is, after all, a science, not of number and quantity, but of the conditions under which man can make his progress towards unknown Truth uniform and safe, and can preserve

*"This process is a process of prayer." Gratry: *Logique*. Chapter on "L'Induction Géométrique."

himself from being seriously misled by the mistakes which he is sure to make on his way ?

This question unavoidably presents itself, sooner or later, not, of course, to all mathematicians—that is to say, all users of mathematical formulæ—but to all serious students of mathematical philosophy. It is in this century that it has taken concrete form and come into open expression in print ; but it seems to me that it must always have been haunting the imaginations of the more subtle thinkers, ever since the first Abacus was invented as an aid in reckoning ; ever since circles were first drawn by some inspired savage, by means, perhaps, of two thorns linked together by a strip of bark.

But more than I have yet indicated has dawned on the imagination of a few mathematicians (in this century certainly, and I have reason to think earlier).

Is not mathematics emphatically a miniature edition, so to speak, of the science of sane inspiration ? Does it not contain the clue to an accurate distinction between the sane inspirations of genius and its aberrations ? (Or, to use old Asiatic phraseology, between inspiration from the true God and sorcery or magical possession.) It is easy for flippant critics to say that the whole distinction between inspiration and sorcery was a squabble between the priests of rival deities ; but no serious student of the old religious writings can doubt that more was involved than a mere contention as to whether the Source of Inspiration should be called Jehovah, Jove, or Lord. Pan, the Unknown *X*, the Unity, the cosmic Force, the Great I Am, gave inspiration freely ; the question was what internal disposition, what mental attitude, what sequence of mental attitudes, create normal receptivity, putting the human machinery into such a condition that light from the Beyond enables it to see new truth without causing it to mix that truth with delusion. The belief of the mathematicians whose point of view I am trying to give is that mathematical science contains the answer to this great question. What they affirm is, not that studying mathematics as applied to number and quantity tends to promote sanity ; that has often been said, and may be to some extent true, but is not the special dictum of Mathematical Psychology. Nor do they say that *all* right and normal action of the human thinking-machinery must be mathematical in its sequence ; that is very far, indeed, from being the case, as I hope in the sequel to show. But they affirm that when a human being desires to induce into himself light from an internal and unseen source, he should then set his mental machinery to work on the subject, whatever that may be, as to which he desires such

light, in the same order of sequence as that followed by the mathematician about number and quantity. When we desire to know how a particular flower is fertilised, how a certain bird builds its nest, how an operation is performed by those skilful in it, that knowledge must come to us from the outside : we must see the facts, or hear lectures, or read books. Or, if we wish to know what the learned suppose to be the interpretation of certain phenomena, we must get the learned to tell us, either by speech or by writing. But if we wish to "think out for ourselves" the meaning of phenomena—*i.e.*, to receive, without human instruction, new light about facts we already know—then we must keep mathematical order in our sequence of mental operations, or a delusion may come upon us, and we shall be likely to believe a lie, and perhaps to fix it on the texture of our thinking-machinery

Moreover, some mathematicians have believed (though I have not met this statement in print) that such individuals as are, by natural organisation, specially liable to receive sudden and involuntary illumination from above or within, should safeguard themselves from hallucinations and fixed delusions by frequently practising the specially mathematical sequence of mental actions, as a hygienic gymnastic for the brain.

It is, therefore, surely desirable that all psychologists should learn to distinguish what is the essentially mathematical order of sequence, so as to be in a position to begin to investigate the two important questions : whether it is in itself hygienically valuable, and whether it affords the means of arriving at any test of the exact boundary line between the inspired and the insane conditions. The books in which the subject has hitherto been treated are written in the language of the Differential Calculus; but the doctrines of Mathematical Psychology, so far, at least, as they mainly concern the ordinary psychologist, are expressible in terms of ordinary geometry ; and it is this task which I have been invited to undertake.

CHAPTER II

GEOMETRIC CO-ORDINATES

We must now turn our attention again to that branch of mathematics which relates to the measuring of plane or solid figures. Its name, Geometry, indicates that its original function was to measure and compare areas on the earth's surface, both in the interests of land distribution and to assist men in finding their

way about on the planet. One important principle of psychology comes out in the very words used to describe direction ; we say that a town lies to the "north-west" of us, or that the wind is blowing from "south-east and by east." Just as the signs by which we denote numbers are compounded from the primary signs by which we designate the first numbers, so the names of all possible directions are compounded from the names of four directions, taken as primary—north, south, east, and west. Why should four special directions be called by their own simple names, and all others be referred to those ? Not for any reason which is re-al—*i.e.*, connected with the nature of the things to be studied,— but for a psychological reason. It happens, indeed, that the particular directions chosen as primary were not in themselves quite arbitrary as to the facts. The north-south direction is parallel to the axis of the earth's rotation, and the east-west direction perpendicular to it. The Equator affords a natural base line from which to measure latitude (*i.e.*, north-south distance) for measuring longitude (*i.e.*, the east-west distance) any meridian can be chosen at pleasure ; very often a writer chooses the meridian which passes through the chief observatory of his own country. When we leave navigation and turn to pure geometry, the system of construction lines (as they are called) —*i.e.*, the artificial scaffolding of measurement—seems purely arbitrary ; each proposition of Euclid has its own set. But when we come to seriously complex form, the navigator's artifice comes into use again ; as a pure artifice this time, without any excuse derived from the earth's axis of rotation. It is a usual feature of mathematical artifice that it fastens itself at first to some natural fact, and by and by detaches itself and becomes generalised. In books on algebraic geometry, we are presented with two lines at right angles to each other ; these lines are called co-ordinates. One is usually called the axis of X, the other the axis of Y ; the point where they cross is called the origin. (The Equator is, for the navigator, an axis of X, and the particular meridian from which he reckons is his axis of Y.)

When the geometrician has to deal with solid forms, he uses a third axis, supposed perpendicular to the plane on which X and Y lie ; it is called the axis of Z.

When once the artifice of co-ordinates appears in pure mathematics it remains, so to speak in possession of the field. Algebraic geometry and the infinitesimal calculus rest upon it. As the science progresses, it shakes off its bondage to earth and to things ; it dissevers itself from all its attachments to outer fact one by one, but without losing its great psychological characteristic. First,

as was said, it dislocates itself from the earth's special position in space, and refers itself no longer to a north-south and an east-west axis, but to a *Y* and an *X* axis ; any two lines cutting each other at right angles will serve its purpose. Next, the lines need no longer be at right angles. Then it is found that straight lines are no longer necessary ; curvilinear co-ordinates are admissible ; or one co-ordinate may be the length of a revolving line and the other an angular measure. Or the tangent and radius may be co-ordinates, and in that case the actual curve-direction of one point is one of the co-ordinates for the next. This case is especially interesting psychologically. Later on, time is taken as one co-ordinate, and velocity or force may be the other. But throughout this long and varied chain of devices to facilitate the acquisition of knowledge there runs the same principle : Man, when he withdraws from the observation of outer facts by means of his senses, to seek from beyond or within fresh light upon the meaning of facts already observed, conducts his mental operations by referring them to two or a few selected ideals. These ideals may be partially or wholly fictitious ; the question of their objective reality in no way affects their value as psychological factors. The true thinker will use such ideals for his own education without being in bondage to any of them, will reserve to himself always the right to form a judgment about the reality of each in complete independence of its psychological utility. To suppose, for instance, that, because Buddhism has educated thinkers, therefore any such Being as Buddha must necessarily have existed is illogical. But no attitude of mind is more foolish or more superstitious than that of men who harden themselves against religious impressions on the ground that "we have no proof of the actual existence of either gods or devils," and who yet talk of mathematics as "pure truth," and of such ideals as co-ordinates, tangents, and normals as if they were realities. It is natural to man to climb to truth on a ladder of fiction ; if mathematical ideals have led to purer truth than theological ones, it is not because mathematicians have abstained from dealing in fictions. Probably the cause rather is that they have been from the first aware of the limits of their own knowledge, honest in avowing ignorance, and careful to distinguish between necessary psychological apparatus and objective truth.

It may be worth noticing that geometric investigation is made easier by choosing for co-ordinates two standard lines or ideas which are essentially independent of each other.

The rectangular co-ordinates of algebraic geometry afford a good type of such independence. The two co-ordinates are not opposite to each other, not contradictory : they are not one north

and the other south ; but one may lie north-south, and the other east-west ; so that progress along the one would not *necessarily* involve either progress or retrogression along the other. The law of any particular curve is then ascertained by finding out, in that curve, according to what law progress in one of the polar directions is accompanied by progress or retrogression in the other—*e.g.*, what distance from axis X coincides in that curve with a certain distance from the axis Y.

The co-ordinates of latitude and longitude, for instance, are so arranged that we can, on a map or globe, follow any meridian from the North to the South Pole without altering the longitude, or a parallel of latitude through all the degrees of longitude without deviating to the north or south. By means of this arrangement, it is made possible to mark exactly the track of any ship by saying that at such a parallel of latitude it was on such a degree of longitude.

When we have properly understood the doctrine of co-ordinates, we begin to see how psychology comes into contact with the law of the parallelogram of forces. If a body of men has to act as a whole, while the individuals composing it are swayed by a variety of motives, empirical common sense and good feeling declare that "each side must yield a little," that "a compromise must necessarily fall short of carrying out to the full the ideal of any one" ; but when common sense and good feeling put themselves under the guidance of mathematics, they are introduced to a higher conception of what compromise may mean. In geometry it means something perfectly definite and accurate. It would, of course, be false reasoning to assume that because a ball pushed by two forces follows the diagonal, therefore a diagonal *can always be found* in human affairs ; but we have a right to point out that, so far as regards geometry, the human mind has long ago left off guessing empirically at the *best* compromise to come to between two motions, having found itself perfectly capable of knowing exactly what is the *true* compromise ; and, moreover, that much inspiration of fresh knowledge has been gained by insisting on arriving at such exact knowledge.

We may observe, too, that the problems presented in life resemble those of the geometric parallelogram in this respect, at least : Two motives may partially neutralise each other's action, or they may partially assist each other, or they may be so adjusted to each other as to act quite independently. In mathematics we have, in the first case, the short diagonal of an obtuse-angled parallelogram (with part of the force converted into heat within the body on which the conflicting forces act). In the second case,

we have the long diagonal of the parallelogram. In the third case, we have the diagonal of a rectangular parallelogram; that is to say, a complete resultant, which gives full effect to the whole action which each force would exert if acting alone.

CHAPTER III

THE DOCTRINE OF LIMITS

ONE of the mathematical artifices which is most important psychologically is what is called the doctrine of "limits." It may be illustrated by trying to sum up the series $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} +$ etc. It will be noticed, first, that the series itself has no natural termination; however long we write, we shall never write its last term. Next, that, however many terms we write, we shall never make up a sum quite equal to 2; the sum is always 2 minus a fraction equal to the last term we have written. Thirdly, that the more terms we write, the nearer their sum will approach to 2; so that by writing more terms we can make the sum as near to 2 as we please. The sum of the series approaches the limit 2, as the last term approaches the limit zero. These facts are expressed by the equations:

$$\text{Sum of } 1 + \tfrac{1}{2} + \tfrac{1}{4} \ . \ . \ . \ \textit{ad infn.} = 2.$$

$$\text{Last term of series—}$$
$$1 + \tfrac{1}{2} + \tfrac{1}{4} \ . \ . \ . \ \textit{ad infn.} = 0;$$

or by the statement that 2 is the limit of the series $1 + \frac{1}{2} + \frac{1}{4}$ as the last term approaches the limit 0. These are fictitious statements; no series is ever written out *ad infn.*

In the same way it is stated that the parabola touches a certain imaginary straight line, the asymptote, "at infinity," or that the asymptote is the "limit" of breadth of the parabola, as it approaches ∞ in length. The parabola is a re-al line, the curve traced by a projectile. In any given case it comes to an abrupt termination, because the projectile is stopped by the earth; but it does not naturally join ends like an ellipse; it is potentially of indefinite length. Man, in investigating the parabola, finds it useful to invent the imaginary asymptote, and then to show that, supposing the asymptote existed, the parabola would touch it "at infinity" (*i.e.*, never), but be always approaching nearer and nearer to it the longer it grew. That this device assists man is a psychological fact.

We are all familiar with the device of the *reductio ad absurdum*, as employed by Euclid. He supposes, or guesses, or thinks he sees that a certain thing cannot be; but, instead of arguing: "I should think it cannot be," or "Of course it is not," etc., he boldly faces the supposition: "Suppose it were," and then traces out the logical consequences of that supposition till he lands himself in some impossible absurdity or sheer logical contradiction. This device has found its way to some extent into ordinary logic. But in mathematical reasoning it allies itself with another, to which I have already alluded: the fact that man is assisted in understanding a curve by the device of inventing the notion of tangents. Take any real curve, say the path of a planet; the pious dogmatist asserts that this curve is traced, as a whole, by the Will of God. The mathematician analyses the action, at any point, of God-Will, or One-Force, into two imaginary forces: the centrifugal, which is supposed to act along the tangent, and the centripetal, which pulls towards the sun. These two forces are, of course, as imaginary as the conception of Baldur and Loki, or of Ormuzd and Ahriman, or any other pair of antithetical deities. No one ever saw a planet either fly off at a tangent or rush into the sun, nor is the student intended to calculate the probability of any planet doing so. But it is a fact of human psychology that man understands the action of the One-Force better by first splitting it, in thought, into antithetic imaginations, and then combining the conception of them.

We have now, I think, reached a point where we can gain valuable light from mathematics on the solution of certain discussions which disturb mankind. The ordinary good citizen, whether of the unlearned or of the learned world, is fond of saying that you must not push any logical argument to extremes, or it lands you in some absurdity. Wherever mathematics touches, it instructs us to push everything to the extreme (in thought, in words), in order to be landed in absurdities; because only so can our premisses be thoroughly tested. It is only by pushing in thought our tangent to infinity and our radius to the focus that we can properly understand our curve. The object of so pushing to the ultimatum is that we may understand the curve. When we understand it, we will discard altogether those fictitious entities, tangent and radius; *that* is, for the mathematician, a matter of course. But the world imagines that the tangent or the radius—or both—are meant for lines of direction as to conduct; and is shocked, or argues to prove that such conduct would be unwise. When told that the suggestion in question was never meant to be acted on, the world asks what is the use of discussing un-

practical theories that were not meant to be acted on. The reply to that question is to ask another : What is the use of a tangent ? The mathematical step next in order of sequence, after following the tangent into space in its centrifugal flight, and the radius vector to its origin at the focus, is to find out what would be the effect of two forces acting in combination on the same body, one of which forces has been imagined as carrying it along the tangent, and the other as carrying it down the radius vector ; in other words, we have to calculate to what kind of curve our two imaginary straight lines are radius and tangent. If any student should stop short of this, should insist that either the tangent or the radius is the planet path, we should remind him that he has not completed his investigation ; just as we should do if a child handed in one line only of a sum in long multiplication, mistaking it for the answer to the sum itself. Whenever in the sequel I speak of uncompleted mathematical sequence in thought process, I would wish the reader to understand that I mean something more or less analogous to mistaking the tangent or the radius for the planet-path. I call it completed mathematical sequence when the mind has gone through a succession of processes analogous to those which in mathematics lead to a true conception of an orbit.

It is interesting to note that biologists in not a few cases find their way, empirically or by instinct, to the exact mode of procedure dictated by Mathematical Psychology. *E.g.* : one such instance has been given in Chapter I. : that of the three fictitious elements of the leaf, by the union of which the student has to construct within his mind a conception of the leaf as it grows. In this case, and I think most others, the analysis, or separation into fictitious elements, is made by projecting the mind outwards, as it were ; by the observation of outer facts. But the synthesis which completes the sequence takes place within.

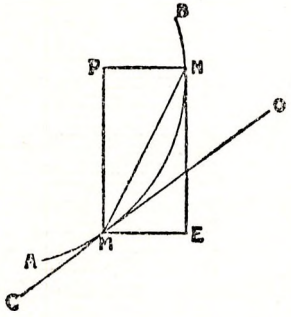
CHAPTER IV

NEWTON AND SOME OF HIS SUCCESSORS

Until the time of Newton, the Science of Mathematics was comparatively slow in its growth ; mathematicians became accustomed to the use of artificial processes so gradually as hardly to notice their unreality.

Newton and his contemporary, Leibnitz, created an instrument

called the Infinitesimal Calculus, or Differential and Integral Calculus, the unreality of which, its lack of conformity to the nature of things, was so glaring that it called forth a momentary protest. I have no right to assume any knowledge of the Calculus on the part of my readers; and, of course, it would be futile to attempt to analyse it here. It is sufficient to say that the method rests on a certain modification of the theory of the diagonal of forces combined with a peculiar extension of the doctrine of limits. In the case of rectilinear motion along a diagonal, two or more forces are supposed to act for a definite time, each in one straight line. In the case of a curve, no force acts for an instant, or for any fraction of an instant, in one straight line; change of direction is as continuous as the motion itself; we have nowhere to deal with the diagonal of any actual parallelogram. By Newton's method, we, as it were, invent a non-existing parallelogram, *E M P N*, two opposite angles of which are on the curve. Then we suppose



N to draw nearer to *M* along the curve. By reason of the curvature, the shape of the parallelogram alters as well as its size; the ratio between the sides changes as well as their actual length; the direction of the diagonal changes as the diagonal diminishes. The Newton method investigates the limiting condition to which the ratio between the sides approaches as the length of the sides approaches zero. This limiting ratio expresses the limiting direction of the diagonal; or, in other words, the actual direction of the tangent at *M*, *M O*.

In speaking of this device, Gratry says: "We have analysed the finite in order to know the infinitesimal. From what we have learned about the finite we have effaced the character of finiteness; what remains is found to be true for the infinitesimal element, that is to say for the analysis and the study of the indivisible

and the infinite (curve). We have analysed the discontinuous, the divisible, the finite, and have thus found the law of the continuous, the indivisible." This is what Gratry writes in this century.

In Newton's time, however, the mathematical world was startled at the roundabout and apparently senseless process invented by him. How can any truth be arrived at by first taking the ratio between two sides of a parallelogram imagined as existing, and then supposing them not to exist? Surely when they vanish to nothing, all reasoning based upon the supposed existence ceases to have any validity. Reasoning about the relation of black men to white men may be still valid in an island where there remain only two black men and one white one; but surely no such reasoning can prove anything about a country where all the human inhabitants have been killed off.

The answer is that Newton's method enables men to solve satisfactorily problems hitherto unsolvable. Not only has astronomy made giant strides by means of it, but modern investigations in electricity, mechanics, statistics and actuarial science depend on it. Mathematicians at, or soon after, Newton's time settled down to the use of the artifice invented by him; accepting it, for the most part, without understanding why it should be helpful. And less than half a century ago, it was still possible for a Cambridge graduate to introduce a pupil to the Calculus with the remark that "no one can understand why this method should answer; it seems contrary to the nature of things; but if we trust to it the results come out right; it is like putting corn into a mill-hopper; you cannot see what happens, but it comes out flour at the end."

What happens is the same as happens when we do a multiplication sum; we put our inspiration-receiving machinery through a process consonant to its nature, though unrelated to the facts we wish to investigate; and we thereby raise it to a position where it can grasp truths previously out of reach.

The lines whose evanishing to zero give us the knowledge which we seek, were construction lines, fictions, not portions of the curve, but made by the investigator as helps in the investigation.

For those who are seeking from the Calculus information about human psychology, it is a fact of overwhelming importance that the special knowledge about the curve which is to be got by means of the varying ratio between two fictitious elements comes only at the moment when those elements vanish; *i.e.*, when the subject-matter which has been under investigation vanishes to No-Thing. When once this principle has been grasped, it becomes easy to see that it is latent in mathematics from the very beginning.

The vivid sense of the sacredness of that psychological moment

when the differential elements are reduced to zero and the sides of the parallelogram vanish into No-Thing, has led many mathematicians to feel an impassioned reverence for all forms of worship of The Eternal No-Thing, in Whom all contrasts vanish, Who "is at once the slayer and the slain"; and to conceive an abhorrence of idolatry; by which such men always mean, not the worship of the *wrong* mental Eidolon, but the act of worship of any concrete entity, any mentally conceivable Eidolon at all. The ordinary pious clamour on this topic, founded on the perfections of Jesus, affect them much as medical men would be affected by a claim that some particular foreign body, being of pure gold, must be fit to introduce into the heart-valves and can do nothing but good. From the point of view of the higher mathematics, the adoration of the concrete and manifested is not a mistake in theology but a brain-vice. The mathematical standpoint is not: There cannot be an incarnation of good in contrast with a personal devil, but: If there be an incarnation, the worst use we could put it to is to worship it or mistake it for God. Boulanger, a devout mathematician of the last century and one of the great forces of the intellectual revolution led by the Encyclopedists, wrote a book on the Origin of Eastern Despotism, with the motto *Monstrum Horrendum Ingens Difforme,* in which he expounds the doctrine that no tyranny could keep itself in existence were not the minds of the peoples weakened by some form or other of the practice of putting a concrete ideal in the place of God. He has defined idolatry in language on which it would be difficult to improve. "Idolatry does not consist, necessarily, in taking a statue, an animal, or a man, as the representative of God; to define it fully we must say that every form of worship or code of law is idolatrous which takes as divine that which is not divine. It is not only idolatrous to treat a stone, a beast, or a mortal as if it were God; we are also guilty of idolatry if we imagine that the words of that man, or the oracles pronounced through that statue, are the very words and decrees of Deity. We are guilty of idolatry when we prefer speculations and mystical chimeras to reason; when we treat any legislative code as if it were dictated by the Almighty; when we endow with a divine character the servants of the theocracy; when we try to regulate the conduct of men here below by laws suited only to celestial beings; when we confuse Heaven with earth; when we mistake our own position and pretend to be more than mortal; and when we forsake our own place as citizens of this world and subjects of the civil government, either to tyrannize over other men in the name of God, or to live as recluses, despising or forgetting our fellow-men." He adds that

he considers it essentially idolatrous to regulate our conduct in this world as if we were already in a better.

Boulanger believed in a Revelation from God to man ; but he believed that Inspiration comes through the Zeit-Geist of the age ; and will surely so come if men are not hindered from receiving that Zeit-Geist in its entirety.

But if we are to take the Zeit-Geist as a whole, we must take into account, amongst other essential psychological factors, the passionate protest of so many earnest men as to the necessity of some concrete human centre for the religious, moral, and emotional life. The desire to understand and do justice to the Christian conception gave, forty years ago, a great impetus to the study of what are called Singular Solutions of Differential Equations, by means of which a whole set, or, as mathematicians say, a "family," of curves is investigated from the point of view of their common relation to some special point or curve. The nature of the method may be indicated by saying that the Singular Solution of a family of Differential Equations is subject to the law which is the characteristic law of the Family, but in a different way : elements which are constant in one of the others are variable in the Singular Solution ; and elements which are variable in one of them are constant in the Singular Solution. It would be possible, and might for some purposes be instructive, to conceive of an extra planet, moving among the planets and comets of our system, and cutting across their orbits, in a complex curve so arranged as to "touch" each of the existing orbits once. (When two lines coincide at a point without cutting across each other, they are said, in mathematical language, to "touch.") The Equation of this imaginary orbit would be a Singular Solution of the System of Equations of the actual planetary orbits. Now, if certain calculations were found easier to arrange, by referring them to such a fictitious Singular Solution of the general equation of the planetary family, no astronomer would therefore think that there must exist an actual planet running in the orbit he had formulated.

The new science of Singular Solutions turned out to be not only useful in certain kinds of investigation, but intensely fascinating in itself. Its wonderful charm exerted a softening influence on certain mathematicians of whom De Morgan may be taken as a type. It corrected the tendency to conceive Humanity as a collection of individual intellectual powers, each holding isolated communion with The Eternal No-Thing ; and brought them, not indeed to actual worship of any concrete eidolon, but to the conception that it may be helpful to prepare for seeking inspiration

from the Inconceivable No-Thing by mental contact with an Ideal of Manhood. An eminent mathematician once wrote to me enthusiastically about the inspired utterances of a Christian preacher; and added: "I have made out what puts the whole subject of Singular Solutions into a state of Unity."

Unscientific persons of pious tendency catch only too willingly at the suggestion that there are Singular Solutions in nature, and that this fact somehow proves the doctrine of Incarnation; on the other hand scientific people accustomed to rigid inference object that the existence of curves in space cannot prove the historic truth of Incarnation. Both parties forget that in the first place Singular Solutions are not objective facts, but psychological entities in the mind of Man; and, in the next place, Mathematical Psychology cannot deal with historic facts; the most it could be supposed to attempt to prove is that a tendency to refer a group of individuals to an Ideal Type, in contact with all the members, yet differing from all, leads in mathematics to a better knowledge of the laws which govern them; and that therefore, when the same tendency is discovered in writings on religion and ethics, it should not be assumed to be abnormal, idolatrous, or unmeaning.

Those who wish to pursue further the subject of the connection between Mathematical Psychology and the higher religious life should read the second volume of Gratry's *Logique*. It is full of most instructive suggestions. We have, however, to bear in mind in reading Gratry that, at the time when he wrote, comparatively little was known about Singular Solutions; and there is no evidence that he was acquainted with even that little. He was groping his way through that part of the subject by sheer instinct, the instinct, moreover, of a Catholic; and the portions of his treatise which refer to "Le Verbe Incarné" are less clear than might be desired.

It has now, I hope, been made sufficiently clear that the modern Science of Mathematical Psychology does not rest on any such false basis as that of assuming analogies between facts of different orders. The analogies on which Mathematical Psychology rest are analogies of logical process, not of facts or things. It would indeed be false reasoning to assume that because a certain order prevails in the star-paths, it must therefore manifest itself among phenomena of other kinds; but it is valid argument to say that a mode of sequence in reasoning which is considered admissible, and which leads to true results, in mathematics, ought not to be treated with contempt as baseless and fanciful when applied to human affairs.

But though modern mathematicians do not offer to the world

as proven, statements incapable of proof in the strict scientific sense of the term, those of them who have approached their subject from the standpoint of psychology have received suggestive clues from certain ancient sages who were free from modern conventions and restrictions. The mighty founders of ancient religions did not feel themselves bound to prove their statements ; they found out, by instinct and experience, certain things about the conditions on which man can approach Unknown Truth with safety and profit ; and they boldly stated what they knew, leaving any one to contradict who dared. They pointed, for instance, to the Rainbow, a temporary explosion of contrasted colours, which soon fades into the Unity of white light, leaving No-Thing behind ; and declared that it was the token of God's covenant with man, the ever-young and always fresh messenger from the gods ; or, as our sturdy Scandinavian fathers put it, a bridge by which the brave soul reaches the abode of the Divine on its own feet. They instructed disciples to pray that the Will of The Eternal may be done on earth as it is in the Heavens ; *i.e.*, by a rhythmic alternation of apparently contrary motions ; by incessant, unopposed, and orderly Re-volution. They cut a forked stick from a tree, and held it first in its natural position, and then reversed, putting Unity where there had been separation, and separation where Unity had been ; and they called this symbol of analysis and synthesis a "rod of divination," that is to say, of inspired knowledge. They held it as the symbol and instrument of man's conquest over the difficulties which beset his path.

What part mathematicians took in ancient days in the investigation of psychological problems, we have now no means of finding out. Mathematicians were often considered as wizards ; and their books were burned by the ignorant and superstitious.

It seems to me certain that ancient sages had arrived, by what process we cannot now ascertain, at a knowledge of the value, for true inspiration, of that psychological element on which the Calculus is founded ; the importance of the moment when something which had been elaborated with accurate care vanishes and is reduced to nothing. They tried to teach this psychologic truth to the unthinking masses by object-lessons ; declaring that the true Inspirer would descend at the moment when the suppliant had burned to ashes some product of his labour which he considered specially valuable (a perfect animal, or the first fruits of tillage). Their attempts were followed by results often ludicrous, sometimes disastrous. The psychological doctrine became confused with and lost in one pseudo-inspiration after another—in heathendom with the mere wild animal love of killing, with

childish delight in big blazing fires, with triumph over human foes ; in corrupted civilisations, with the diseased love of inflicting torture ; in Palestine, with the desire of hygienists and moralists to insist on the public slaughter and inspection of animals intended for food ; in some cases with that abject lust for indulging the sensation of reckless devotion which is a mere perversion of the sex-instinct ; in other cases with the ascetic disease, which may be described as a form of suicidal mania, bearing the same kind of relation of inversion to man's normal desire for pleasant sensations that actual suicidal mania does to normal Will-to-live. The particular afflatus or pseudo-inspiration which is just at present obscuring and confounding the true mathematical law of *inspiration by extinction* is what is called Altruism ; a doctrine which is partly true, but which sometimes runs into the belief that however foolish an action may be in itself, it is glorified if done at the sacrifice of something valuable to the doer for the sake of somebody else.

Through all these ideas one can detect here and there, in the writings of the more inspired teachers of them, an ever-recurring consciousness of the great truth : that the true direction for progress is revealed to man at the moment when something which he has been constructing with elaborate care vanishes into No-Thing.

CHAPTER V

THE LAW OF SACRIFICE

THE word sacrifice may seem to strike a keynote which does not belong to any scale in which mathematical conceptions can be expressed ; but this should not prevent us from inquiring whether the Laws of Sacrifice find expression in mathematical operations. When we study the question impartially, we are led to see that they do find such expression. Sacrifice forms an integral portion of every true inspirational cycle. In the life of religious inspiration the necessary sacrifices are large enough to involve a serious and often painful moral effort ; whereas in mathematics they are so slight and so habitual that we are hardly aware of making any sacrifice at all. But this difference is one of size, not of kind ; the acts of sacrifice imposed by the Laws of Mathematics are proportioned to the minute scale on which the sequence is being carried on, and to the comparatively small value of the knowledge sought.

Of course there is a sense in which all study involves sacrifice ; the sacrifice of inclination, of laziness, of amusement, and so on. But in mathematics, as in the higher spiritual life, something quite different from this is involved : the continual giving up, not only of impulses hostile to study, but also of the very results which we have been toiling to attain.

When a child looks out a word in the dictionary, it is one of the words in the passage he will have to read ; it is also a real word of the language we wish him to learn. When we tell him a fact, in History or Natural History, we intend him to remember that fact. He may forget it ; but, if he does so, he will have to learn it again, for it forms part of the subject he is learning. Every result of his labour, in these cases, is a something which we intend he shall retain as part of the furniture of his memory. The process of learning arithmetic differs in this respect from the acquirement of knowledge from any finite source. Take as an instance the problem, mentioned in a previous chapter, of finding the number of days in 2,481,749 years. The child has to plod conscientiously through the labour (to him no light one) of multiplying the long row of figures by 5 ; then by 6 ; then by 3 ; but none of these laboriously attained results is shown in the final answer. They are, so to speak, immediately effaced, merged in a total which bears no trace of their existence. In a complex calculation the worker goes through a long series of whole sums, the answer to each of which is merged in the next.

Even when a child has finished his sum, he has acquired no tangible knowledge which we wish him to retain in his memory ; the result of his toil is, not a stock of information, but skill in drawing information from the Unseen Stores whenever he may need it.

This apparently useless labour, this seeming waste of pains-taking effort, is not made necessary by the laws of number ; there is no reason in the essential nature of things why the number of days in a year should be expressed by three separate figures, why we should not have a sign to express that number as a whole, and multiply by it directly ; the sole reason lies obviously in the nature of man's faculties ; the effaced and unrecognised steps in the calculation are rungs of the ladder by means of which our finite intellect reaches up to receive knowledge, direct from The Unseen, about truths beyond our own power to grasp directly.

A touching letter from James Hinton to Ellice Hopkins may be quoted here :

"A little girl of ten said to me, 'Do tell me about the fluxion.' (I'd been talking in her hearing about Newton's fluxions, which I

don't at all understand, a great deal of it.) So what do you think I did? Such a happy thought came to me. I told her plainly, so that she quite understood all I meant.

"I said (but I can only give you the barest notion), 'Multiply 17 by 3. So you know we get 3 times 7 is 21, 1 and carry 2; 3 times 1 is 3 and 2 is 5 = 51. Now,' I said, 'do you see what you have done with that 2? You have put it down and then rubbed it out; it was neccessary to have it, but not to keep it. Now, a fluxion is this: it is a thing we need to have, but are not intended to hold; a thing we rightly make, but in order to unmake.' And indeed that is the whole point. But this simple case shows also perfectly how it comes, how the law of it comes upon our life. For you see our making 21 comes only from our taking the 7 of 17 by itself, isolating it from the 10. In the 3 times 17 there is no 21; we make the 21 simply by separating the 17 into 2 parts and taking one only first. That is, the 21 is an isolation-right, a right or truth that comes by leaving out.

"Now, all isolation-rights are fluxions in this sense; we have to do them, but in order that we may undo them.

"And this is the law of man's life, because Nature is so great and rich that he is compelled to take her piecemeal; and, in all things, he makes for himself, by his inevitable leaving out at first, 'isolation-rights.'

"And the difficulty of his life—the difficulty above all others—is that these isolation-rights have got to be not kept, but used; not held as they come, but 'carried' on into another mode of being, which seems like their being lost.

"This is the pathos of man's life. He makes isolation-rights, and has not known the law of it and recognised its meaning.

"Now, this applies to all things. It is so pretty I can't show you even a fraction of its bearings. But you can think of many of them if you choose. Look at all our sciences. Are they not, clearly enough, every one of them, parts—no more the whole than 7 is, not only of 17, but of a whole page full of figures? Each one of them, therefore, makes for itself an isolation-right or true, a truth which comes only by its being isolated, wants not holding, but to be lost, as the 2 of the 21 is lost in 5, when the one is taken in (*i.e.*, the 1 of the 17).

"And the very relation of the figures in numeration, whereby each term means not one, but many of those before it, comes to have a distinct significance all through our mental life.

"In fact, the world is so beautiful I don't know what to do; only, as you know, the condition of that joy is consenting to bear pain; and one scarcely dares to say one is happy, because it makes

the pain confront one, and the words have lost their meaning ere they have passed one's lips.

"Look at this very fluxion; it is such joy to see it, such pain to have to live it. . . . Oh, me! I am happy and sorry; and just now I cannot see a bit whether that gladness I think is coming on the earth is coming or not."*

We adults have become so accustomed to sacrifices in arithmetic that we make them without reflection, as mechanically and calmly as the farmer throws down some of his precious crop to rot in the ground; the "sowing in tears" goes on perpetually, only the tears are omitted. When the process goes on on a larger scale, we are tempted to become pessimistic and talk of the "futility of human effort," "the disappointing nature of things," "the unsatisfactoriness of life," and so on. But no one can study much of Mathematical Psychology without discovering that, for creatures constituted as we are, the unsatisfactoriness and futility are conditions of any true inspirational life.

In mathematics, however, much of the painful sense of futility is avoided by our knowing exactly what sacrifice is necessary for obtaining the special knowledge sought. Nearly nineteen centuries ago, a suggestion was made, which, when followed up, imports into the subject of sacrifice for Inspiration much of the exactness which robs mathematical sacrifice of its sting; and changes the sowing in tears recommended by piety from the condition of vague scattering of treasures at random, to that of well-calculated planting of good seed in appropriate soil. The suggestion occurs in a passage in the New Testament, on which much mystical comment has been written by theologians. It was pointed out to me long ago, by Professor Boole, as containing a psychological clue specially well worth following up. It seems to me to sum up and make available for purposes of practical guidance that theoretical knowledge about the nature of our own inspiration-receiving powers which we gain from mathematics generally.

"The wind bloweth where it listeth, and thou hearest the sound thereof, but canst not tell whence it cometh or whither it goeth: so is every one that is born of the Spirit."† This evidently cannot refer to wind regarded as travelling in a straight line; we do know of a trade wind whence it comes and whither it goes. The path of the whirlwind was a matter of observation long before the Christian Era, and might have been suggested at any time to an intelligent observer by the motion of particles of dust. If the reader will look at the diagram of a dust-whirl, and suppose himself to be one

*_Life and Letters of James Hinton_, Chapter XV.
†John iii. 8.

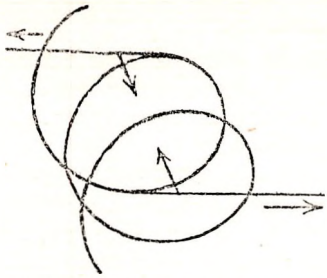


DIAGRAM OF A DUST-WHIRL.

of a cloud of gnats caught in the gust, or to be steering one of a flotilla of ships caught in a hurricane, he will see that the sentence contains both an admirable picture of a society on which has descended an inspiration to think on some new topic, and a canon of guidance for an individual who desires to find the main line of progress and to preserve his own sanity and safety.

The Zeit-Geist sets men thinking on some common topic, but in all manner of ways; some feel impelled to go north, some south, some east, some west; no one knows how to steer, for no one can judge, merely from the direction in which he feels impelled to go, what is the main direction of progress, or whereabouts safety can be found. If we could trust always to mere momentary inspiration, the matter would be simple enough; each individual would be carried round and round, and advance on the whole with the wind as a whole. But man, when once he has arrived at consciousness, cannot let himself be blown about by every wind; he must organise, formulate, translate momentary direction-impulse into definite tangential direction. It is useless to rail at this tendency; it is a law of the human mind (else, why need mathematicians have invented tangents ?). But each man, or each group of men, mistakes *the human tendency to invent a tangent* for *divine inspiration acting in one continuous straight line.* This gives birth to all kinds of conflicting and erroneous opinion; each sect or group believing that the tangential direction it has formulated for itself, by inference from some inspired utterance of its leader, is the true line of inspiration; whereas, in fact, the still centre of calm and uniform progress lies between any two parties whose paths lie in opposite directions; *i.e.*, between any two whose original inspirations were diametrically opposite. Therefore, any individual who sees that another has been blown in the direction exactly opposite to the one in which he himself is drifting, has the clue he requires for finding out where lies the still centre

of calm and orderly progress. By steering towards one's absolute opponent—not in the direction towards which he is drifting, but towards himself—one would reach the calm centre of the storm. This gives a distinct rule for discovering where lies the still centre.

Of course, as a general rule only the philosopher even desires actually to live in that central position. Most people are content to be swayed to some extent by personal afflatus. But as tangential direction leads at last to drifting away from the centre of force, safety, for every one, depends on keeping not too far from the centre; every one should treat the direction in which he feels impelled to go as one co-ordinate, and the path which leads towards those who seem to him in error as the other co-ordinate, and should frequently correct his own aberrations by acts of conversion towards the centre. Therefore the sacrifice appropriate to any given situation of difficulty or doubt is that which converts the force which is taking the individual along his habitual path into energy of union with opponents. Unfortunately, religious conversion too often takes the form of joining the ranks of former opponents, of adopting their opinions and imitating their customs. A mere glance at the figure is sufficient to show that this is not the kind of conversion which leads to the true centre of progress and of peace; that centre is not on the line which the opponents are following, but on the line which runs from us to our opponents.

The act of conversion from the path of personal afflatus to that along which union with opponents is effected should precede the attempt to learn what is the true path of progress along which the inspiring storm is to carry humanity as a whole.

This interpretation of the geometric figure used by Jesus would seem to be in line with many of His most distinctive utterances, which have been supposed to be canons of some peculiar code of ethics taught by Him. It would seem to me probable that they were hardly intended to supersede, in ordinary cases, the ordinary ethics of the Jewish hearth and home; but were rather meant as suggestions of methods for bringing about the special state of mind in which pseudo-inspiration or personal afflatus becomes "converted" into energy for reaching the centre of progress. It is interesting to note that ever since the time of Christ, the Christian world has been overrun and perplexed with various theories of "conversion." It seems agreed that true inspiration is to be attained, and the favour of the Inspiring Deity to be secured, when the individual is truly "converted"; but there have been many discussions as to what constitutes valid conversion. About these discussions nothing need here be said, except that the dis-

putants, however they may disagree, are unanimous in neglecting to pay to Christ the ordinary courtesy expected by every geometrician from his brothers of the craft—that they will take the trouble to draw the figure which he describes, and study it carefully, before publishing speculations about his probable meaning. It is to be hoped that students of Psychology have been trained in scientific rather than theologic conceptions of the respect due to a Teacher from those who aspire to learn from him.

The Parable of the Wind-storm, when closely analysed, bears out Boulanger's definition of Idolatry quoted above—We need no higher inspiration (it seems to teach) than that of the Zeit-Geist of our own age; but we must take that inspiration as a whole; we must not let ourselves be tempted too far out of the general movement by mistaking for it *any* tangential direction; we must try to get to the calm centre by unifying contrasted motions. Authorities of one sort or another, religious, political, or educational, priests of this or that Eidolon, are constantly trying to arrest this vital process of conversion, by telling us that this or the other portion of the common afflatus is specially wrong or dangerous. As Boulanger says—"Priests were appointed to lead men into truth; but in all ages they have feared lest men should find the truth and walk in it."*

From the point which we have now reached, we are able to distinguish pseudo-inspiration from genuine revealed knowledge of the destined path of progress for humanity. Pseudo-inspiration is personal afflatus, formulated into a tangent, and not yet corrected by conversion towards those who are impelled by the opposite afflatus.

CHAPTER VI

INSPIRATION *VERSUS* HABIT

It will be well to give here a summary of what has been found out mathematically about the contrast between the cultivation of the Inspirational powers and the training which forms habit and what (in non-mathematical affairs) we call character. The apparent conflict between the two modes of treatment is similar to that between the actions of a gardener who is making soil fertile for plants and that of his assistant who is making paths as unfit as possible to grow weeds; almost everything that is right for the one to do, is, for the same reason, wrong for the other

*Boulanger: *Origine du Despotisme Oriental.*

to do; but the two workers come into no conflict because the territory is well marked out between them; whereas, in the treatment of young minds, the psychologist who is endeavouring to foster the growth of original faculty often finds himself in antagonism with the experienced schoolmaster.

He whose mission is practical education has to equip his pupils for life. He has to secure for them, as best he can, such knowledge of facts as is necessary for conquering Nature; such knowledge of prevailing human opinion and sentiment as is necessary for finding a place in society; a set of habits convenient to the individual and not annoying to those with whom he will have to live; and an upright and kindly character.

Now the knowledge of facts is derived, not from inspiration or mathematical induction, but from observation and reading. The knowledge of human opinion and feeling should be based on a solid habit of study. Owing to what is now called suggestion or telepathy, it is easy to form pseudo-inspirational guesses as to what others are thinking or feeling; and this instinctive imbibing of other men's thoughts is among the most dangerous and misleading forms of pseudo-inspiration, unless severely corrected by studying the actual utterances of others. Besides, even for the kind of knowledge which inspiration is an appropriate means of receiving, inspiration, in its true sense of completed synthesis, is a slow and laborious process. He who trusts too many of his actions to the guidance of inspiration will find that he has not time to complete either his analyses or his syntheses; he must act in the meantime; and he will find himself driven to act on pseudo-inspiration, *i.e.*, incomplete sequence; on uncorrected, untested flashes of impulse. In the interests, therefore, of the inspirational life itself, it is essential that a large part of the conduct of the practical life should be guided by habit. Now all formation of habit is destructive of that mental elasticity on the free play of which the possibility of pure inspiration depends. Habit means the arresting of free play in certain directions; it means setting up a preponderating tendency to do this rather than that, so that the organism, unless absolutely controlled to the contrary by the higher centres, will automatically do this and not that. Whereas the cultivation of genius, of original power, of intuitive and inspirational faculties, depends—as a writer in the last century said—on "keeping the mind in a live and sensible (*i.e.*, sensitive) state,"* ready to respond freely to the slightest stimulus of fresh suggestion. For we must never forget that true genius, true inspiration, depends on *correction of error*; and this

*T. Wedgwood : MS. Treatise on *Genius*.

implies the "right to go wrong." It would seem impossible to combine this with the formation of good habits, except by a careful demarcation, made by each adult for himself, and by parents for each child, of the field in which his genius shall be allowed to play.

The peculiar antithesis between the formation of character and the cultivation of genius (or the exercise of the inspirational faculty) seems to me to throw light on some utterances of certain great ethical teachers, which appear to conflict with family duty and social harmony. For the formation of habit and character, it is of primary importance to cultivate kindly sentiments towards those with whom we come most frequently in contact; *i.e.*, members of our own household, nation, and sect, those with whom we have common interests. But, as was pointed out in a previous chapter, this consolidation of habits leads to the formation of special tangent-paths, along which the individual, or the family, or the group, wanders off from the centre of force. It becomes at times necessary to correct this tendency by a deliberate conversion towards the "enemy," towards those who are following the opposite tangential direction. And as not all members of the group are keen to seek new inspiration thus, there follows a disruption of ties such as has been figuratively described as "hating one's father and mother," etc. When the parable of the circular storm has taken its rightful place in psychology as the basis for the study of the inspirational faculty, much domestic tragedy will, we may hope, lose its tragic character. Here, too, the sowing in tears will still be gone through, but the tears will be fewer, and will have lost some of their bitterness.

The antithesis between the cultivation of habits and that of the intuitional powers has been brought in mathematics to a satisfactory settlement. I do not mean, of course, that all teachers, or the majority of them, teach Arithmetic and Algebra as they should be taught; but that those teachers of mathematics who know their business best are able to make of mathematical lessons a training, perfect so far as the limits of the science extend, for both the formation of habit and the conduct of the intuitional life.

The following principles have been ascertained as to the relation of habit to intuition, in mathematics:

When an action or sequence of actions has become habitual, it has lost its freshness as a training for the intuitional faculties.

When an action or sequence of actions has been utilised to the full as a training for the intuitional life, the pupil is then in the best possible condition for making of it a settled good habit.

A pupil need never, and should never, be required to act on a principle till he has himself recognised it by the pure exercise of his own faculties, unwarped by any kind of authority from without.

This by no means implies that a pupil is never to go through a process the use or meaning of which he is at the time unable to understand. Very often the best way of leading him to grasp a principle is by causing him to carry it out in practice. But in that case, though the master is guided in the sequence of steps enjoined by reference to the principle which he wishes to illustrate, the pupil acts, for the present, on no principle at all (except one which he already does recognise—*i.e.*, that he must *do* as he is bidden).

In all ordinary works on education, we may notice constant discussion about the particular mode in which influence should be brought to bear; whether by individual commands, unvarying rules, hopes or fears about consequences, appeals to affection, the contagion of example, or that more subtle form of influence called by the pious "intercessory prayer," and by modern Science "suggestion," or "telepathy." The whole discussion usually turns on the rival merits of the various modes *of bringing influence from without to bear on the pupil.* It seems assumed that it is always legitimate to exert influence. In mathematics, however, the main question kept in view is: When may the teacher exert influence ?

For mathematical purposes, all influence from without, which induces the pupil to admit a principle as valid before his own unbiassed reason recognises its truth, come under the same condemnation.

But when a principle has been admitted as valid, there is usually more than one possible way of carrying it out in any given case. The pupil ought to be able to see that the methods are essentially equivalent; but he is not at first capable of judging which of the several possible alternative methods is the most practically convenient. He will not be able to do so for many years to come ; and meantime he ought to be forming the habit of some convenient method. It is here, therefore, that the principle of authority comes in (using the word authority in the sense indicated above, of any force or motive brought to bear on the pupil from the outside to induce him to do this rather than that).

Two examples will illustrate what I have been saying :

We introduce a child to compound subtraction by asking him what will be left in his purse, if he goes out with so much in it and spends so much. The novice usually begins by reckoning the coins of highest value first. (If asked why he does so, he sometimes

says: "Because if I were really doing it, I should care more how many shillings I had left than how many pennies; so I should count the shillings first.) He should be allowed to use any order he pleases at first. Then he should be asked: Would the result be the same if you paid out the coins of smaller value first? He should be allowed to grope his way to the answer at his own pace; for now he is in contact with the Inspirer, and no man should interfere, except by questions calculated to lead him to see for himself whether his process is incomplete or in any particular inaccurate. But when he has satisfied himself that it is immaterial in principle at which end of the line of figures he begins to work, when he is satisfied not only that, in the special case under his notice, the results are the same whichever end he begins at, but that the two methods necessarily lead to identical results in every case, then is the time for authority or influence to be brought to bear on the formation of a mechanical habit of beginning at that end which the experience of mankind has found to be most practically convenient.

Again, a child should not see a multiplication table till he has made one. The squares should be ruled for him, and questions asked: What are 2×3? 2×4? and so on. Authority should come in only so far as to indicate in what square each answer should be written. If he makes a mistake, he should be led by questions to detect it himself. When the table is complete, he should be encouraged, and assisted by questions, to analyse it in all directions, finding out all that he can about its principles of symmetry. Then, authority should come in to induce him to commit it to memory, and should dictate the precise order in which he repeats it.

Tables of weights and measures belong entirely to the domain of authority; all children should be taught to distinguish between such a question as: What are 6×7? the answer to which comes to him direct from an Unseen Source, and such a question as: How many lbs. are there in a stone? the answer to which must be sought outside of himself.

When once authority has taken possession of a subject and begun to create a habit, it should permit no variation from the selected form or method, at least during school hours. If a child desires to try fresh experiments in working a sum backwards, or in any way altering established order, he should be allowed to do so in times of re-creation, on holy-days; *i.e.*, times of escape from the pressure of allegiance to man, of return to commune with Eternal Unity, in Whose sight, we hope, all honest methods are equivalent.

In some departments of mathematics one method would be

abstractly as convenient as another; it is necessary for convenience and mutual understanding that one should be chosen and adhered to. This is the true field for mere *conventionality*. Authority must, in these cases, interpose to create a habit of working in the usual method.

It is important to teach pupils to distinguish between several different kinds of wrongness:

$5 \times 4 = 19$ is a wrong statement, because untrue in itself.

$\frac{21}{7} = 3$ is wrong when given in answer to the question:—What is $\frac{21}{7}$?

It is wrong to begin a subtraction sum by the coins or number-places of highest value, because it necessitates cumbersome and unnecessary corrections.

It is wrong to write units to the left of tens, because, if you do so, other people will not understand what you have written; and yourself will become confused in passing from your own figures to those written by others, and will lose the advantage of forming a steady habit for reading and writing figures.

At some points along the chain of mathematical development it is found advisable to cultivate a habit of being able to use with equal facility either of two equivalent processes. For instance, it is for some purposes convenient to be able to calculate with equal facility by the ordinary decimal notation or by some other, such as the duodecimal. On the teacher rests the responsibility of deciding which of the two is to be used in any given case. For if it be desirable to practise different notations, it is for the sake of being able to use, at will, whichever is most convenient on a given occasion. This is not a matter which can be settled by inspiration; questions of convenience must be settled by experience, which the pupil as yet has not. Leaving it to him to decide which notation he will use, is leaving it to be settled by his laziness or his freaks.

But the discipline in mathematics, however strict, is entirely positive. There is in mathematics no "Thou shalt not." Provided that the necessary amount of practice in right methods be secured, during school hours, no one watches to see that wrong ones are avoided at other times. No mathematician worth mentioning has any objection to his pupils trying experiments in bad methods to any extent they please in their spare time. It never occurs to any one that boys are likely to form bad habits, or be the less teachable in class, because of any vagaries they may practise out of it. Mathematical method is a thing about which there exists no *esprit de corps*, no public opinion, nothing resembling either a canon of taste or an ethical code: and when conventions are

imposed on the young by authority, it is with the distinct understanding, from the first, that any one who likes will be at liberty to alter the method in his spare hours; that he will be even applauded for doing so if he is fortunate enough to hit upon a more convenient one. In no department of study is reverence for precursors more cultivated than in mathematics; but that reverence is entirely dissevered from the notion that ancient methods should be adhered to; it is connected rather with a feeling of gratitude to those who, by inventing clumsy and imperfect processes, have helped successors to better ones.

Yet mathematics is the science about which there exist no guesses, no disputes, no delusions. And as was pointed out in Chapter I., whatever the reason for its immunity may be, it is certainly not any natural infallibility of individual man about this particular subject.

The only great hiatus, so far as I know, which exists in mathematical teaching between sound theory and the best actual practice, is of this kind: Mathematical induction is essentially inspirational work; and should be done during periods when discipline is relaxed; periods of leisure, of re-creation from labour; during the Sabbath of the Inspirer, the Unity; ultimately even during sleep. Children are expected to do it to order, under the same conditions as those in which they do ordinary study; *i.e.*, in school, where discipline must not be relaxed; where time must be kept; where examinations are looming ahead. Thus bad habits are formed, which weaken that synthetic faculty on which true inspiration depends, and which cause the pupil to become a victim either to routine or to pseudo-inspiration. I am trying to induce a certain educational society with which I am connected to adopt the custom of introducing the children to each mathematical principle, by some easy examples, in play, several months before it will be used in the work of the schoolroom; so as to utilise each to the full as a growing ground for the inspirational faculty before it is given over to be hardened by the formation of convenient habits.

CHAPTER VII

EXAMPLES OF PRACTICAL APPLICATION OF MATHEMATICAL LAWS OF THOUGHT

THE method of the Calculus was applied by Gratry to devise a plan of study adapted to the purpose of training the brain to

act in normal sequence. He studied several sciences, each from its own text-books and by the methods specially suited to it; and formed the habit of sitting alone, once a day and so far as possible at the same hour, pen in hand; he suspended thought, making silence within the soul, and then wrote down whatever thoughts came to him about the Unity of Nature. What is so written, Gratry says, is found fruitful of suggestions of syntheses which prove useful for future study. When the habit is fully formed, he adds, the brain will do synthetic work even during sound and refreshing sleep.

It will be necessary for the success of this or any similar method of self-culture that the student should not too much indulge in the reading of books on the analogies of Nature (such, *e.g.*, as those of the late Henry Drummond); such books do for the reader that mental work which it is desirable to induce in the brain the capacity to do for itself.

The precise plan of study adopted to carry out the mathematical method must vary according to circumstances and the nature of the individual's duties. My occupation in life has chiefly been that of assistant or secretary to intellectual men; especially such as are engaged in philosophical or religious reform-movements. I make it a rule to seek and cultivate the personal acquaintance of the chief intellectual opponents of my employer for the time being; especially those of whom he speaks slightingly, or whom he believes to have injured him or been unjust to him. Then, when he comes to a hitch in an investigation, and I find myself unable to help him, I contrive to see one or more of these persons. A conversation with them clears my brain. I do not find it needful or advisable to take them into counsel about the special point on which we need light; usually it happens that one could not do so without breach of confidence. I find that during any serious conversation with them, something is said which helps me to find the clue that we need.

I have been surprised to observe how often, in such a case, a learned man suspects that his assistant is being "led astray" by his opponents, is in danger of becoming "converted" to their opinions or ideas. He seldom seems able to realise, at first, that one is seeking light, not from man, but from that creative Inspirer Who descends into the mind wherein is being effected the union of contrasted polar-opposites; that one is making the sacrifice prescribed by Jesus as a preliminary to receiving inspiration, the sacrifice of prejudice and habit for the sake of effecting union with opponents; that one is being "converted," not to any human opinion, but towards the calm centre of Force.

Gratry's plan of study and my own are intended for the purpose of increasing brain-power and assisting normal brain-action. I will next give a few instances to show how the method of the Diagonal can be applied to the sanitating of brains which are working abnormally.

A death had occurred under circumstances which involved excessive fatigue and strain to the relatives of the deceased. There were, unfortunately, special reasons why the order for the head-stone should be given immediately. The nearest relative of the deceased had religious prejudices against the erection of a cross; the legal owner of the ground had an equally strong objection to any other kind of monument. Either would, in normal health, have given way, but both were ill and feverish; and each imagined it her duty to carry out her convictions. The medical man, James Hinton, said to the owner of the ground: " If you get your own way, you will have a stone imitation cross on the grave ; if you yield, you will have a real one." The whole nervous tension subsided instantly, simply because the matter was presented in a way which did full justice to the patient's own convictions. That is what I mean by a compromise which is—in antithesis to one which is not—a true diagonal. The patient was in a state of tension between two apparently conflicting motives; her conviction that there ought to be a cross on a grave, and her feeling that she ought not to thwart the other sufferer; the doctor's solution enabled her to feel that both convictions were done full justice to. It might conceivably have been arrived at by a happy instinct on his part; but I know that he had just then been studying the parallelogram of forces from the psychological point of view. In the next instance which I will mention, the solution could hardly have been arrived at except by the process of solving a psychological equation to find the exact diagonal.

A girl of seventeen had contracted a habit of falling every night, on lying down, into a condition of semi-cataleptic coma; eyes staring, limbs rigid, etc. There were real causes of mental disturbance—the girl had too early and too often witnessed serious discord among her elders. There was also a certain amount of tension on religious questions, intensified by the influence of one of those electric or magnetic preachers who are responsible for so much hysteria.

Empirical common sense would have suggested, of course, that the disease should be left to *wear itself out*; that the patient should be removed from the influence of the divine; and that religious topics should be avoided. The mathematical prescription was of precisely opposite kind. The divine had been making him-

self conspicuous by an angry assault on an agnostic from whom he would have courteously differed had he understood him, but whose meaning he had seriously misrepresented. "Common sense" would have suggested that this painful incident should be kept from the knowledge of the hysterical girl, who was already ill from hearing about misunderstandings and quarrels. Mathematics differed on this point especially from common sense. The patient was therefore told of the blunder made by the preacher, with the remark that it would be a good thing if the curriculum of clerical study included such knowledge as would protect pious men from injuring their own cause by mere linguistic blunders. The hope was gently instilled into her that she might some day do something to aid preachers in understanding the language of antagonists, so as to know how to address them. Under cover of this hope, she was induced to study some beautiful and sympathetic passages from the writings of infidels, especially the one who had called forth the wrath of her pastor. The time chosen for such reading was the last hour before the time at which the comatose fit was due. The reading was followed by normal sleep from the very first. In cases of nervous disturbance aggravated by tension on religious doctrines, I have found it useful to say that I consider it disrespectful to Jesus to know so little as most Christians do of the ritual in which He was brought up. The patient is thus, without discussion or antagonism, induced to attend a synagogue ; no sense is aroused of being false to the Christian faith. Going thus, not to criticise, but in the spirit of reverence for the ritual followed by the Founder of Christianity, she is free to absorb the healthful influences of a religious atmosphere where she escapes all allusion to the special doctrines on which there has been tension.

The same principles of treatment along the line of the diagonal may be usefully carried out in dealing with what may be called epidemic or corporate hysterical tension. For instance : I am sometimes asked how I, who know nothing about vivisection and very little about biology, can venture to write, lecture, and take action on committee, on the subject of vivisection. I know at least more of biology than I do of what a million years is; for *that* is, nothing at all. I know as much about vivisection, of my own knowledge, as any astronomer can know, of his own knowledge, about the portion of space in which lies the aphelion of a comet's orbit—which is also nothing. There is a certain standpoint which I think I am fully justified in taking, by certain psychological facts bearing on the case, which no one disputes.

One party, under the afflatus of desire for knowledge, writes in one way about vivisection. Another party, under the afflatus

of a desire to spare suffering to animals, writes in another way about it.

I examine whatever specimens I happen to come across of the two groups of utterances. I observe that the two forms of afflatus are not in any necessary or logical antagonism ; there is no essential contradiction between a desire to know biology and a desire to make animals happy. Some compromise ought to be at least theoretically possible which should embody and give full scope for both forms of afflatus. Yet there is a tone of antagonism between the two sets of persons. This (as there is no essential antagonism between their respective aims) is a reason for suspecting that they are not inspired but only pseudo-inspired; that is to say, that each of the two movements is animated by some personal element besides the essential aim which inspires it. To make sure, I test some representatives of each side by confronting them with some scheme* (such as Dr. Hickman's scheme for organised morti-section) which promises to open up access to fresh stores of biologic knowledge in ways which do not involve hurting any living creatures; and I watch how they act in presence of it. When a biologist is lukewarm in desiring the success of such a scheme, or when an anti-vivisectionist refuses to aid it because she does not care "to foster in any way the curiosity of those wretches, the biologists," I no longer suspect—I know that the two cases are clear cases of pseudo-inspiration.

There is a third party involved in the matter—the mild, moderate, good doctors, who decide that cruelty for the mere gratification of curiosity is reprehensible, but when it really comes to a question of saving human life it may be necessary to sacrifice animals. Now this may be true, but it fails to give due effect to one main element of the problem, the afflatus of desire for knowledge for its own sake. These moderate people are no doubt safe moral guides in periods of ignorance; but it is not through them that I should expect true inspiration to come. True inspiration comes not from ignoring any pseudo-inspiration, but from converting each to meet its opponent. I have ventured to affirm that light on the vivisection question is to be expected whenever vivisectionists and anti-vivisectionists combine in some positive and active scheme for prosecuting biologic study. Therefore I have, for many years past, been endeavouring to draw off attention from the question of vivisection and fix it on various schemes for the promotion of biologic science which do not involve causing pain. I do this, not because I have an opinion, or the right to form an opinion, as to the merits or feasibility of any such

*See Appendix.

scheme in particular; but because I know that in the direction of such effort lies the hope of a genuine inspiration.

Moderate persons often say to rampant anti-vivisectionists: "Do not excite yourself so vehemently; do not dwell so constantly on one topic; or you will injure the elasticity of your brain." That sounds to me very like saying to a neurotic patient prone to violent movements: "Do not toss your arms about so vehemently or so much"; such advice is the resource of well-meaning ignorance. The gymnast, who has studied the laws of sequence, says: "*Do* throw out your arms vigorously; and when you have done so, compensate by an equally sharp movement of return; by practising this normal alternation, you will develop a healthy muscular instinct which will warn you when you have exerted yourself sufficiently, and a healthy condition of the muscles which will enable you to rest." The gymnast does not know, or profess to know, what the patient ought to do with his muscular force when he has it; he only shows how to substitute health for neurotic aberration. And just so, I say to my anti-vivisectionist friends: "Preach the rights of animals vigorously; but every time you have gone on an anti-vivisectional campaign, take care to compensate, by an equally vigorous movement in the direction of trying to help biologic investigation; then you will get power to receive inspiration as to what to do next."

There are in the world persons who really like causing suffering. This motive is in logical contradiction to that of those who wish to be humane. If the argument were ever used on behalf of vivisection that it affords an opportunity for the exercise of cruelty, we should then have to solve the equation of that case on its own merits, as we do the problems of sport and of war—by some mental process analogous to that of finding the short diagonal between the obtuse angles of a parallelogram. But I am not aware that any one has yet tried to justify vivisection on the score of its affording an outlet for savage or diseased instincts.

It would be out of place to enter here on any such questions as those of the necessity or utility of vivisection, or of its abstract morality; we are only concerned with its psychology. It appears to me clear that, in the present state of the vivisection controversy, no person can be occupied about the matter in any way, either by writing in favour of or against the practice, by doing it or witnessing it, without grave risk of becoming the victim of some pseudo-inspiration, unless he alternates his action in the matter with vigorous exertions in the direction I have indicated; that of promoting the study of biology in ways which cause no suffering. But there is a further consideration in connection with the subject

which ought to be suggested to those who propose to take charge of the health of others.

The physician may not cut open the patient to see from what disease the latter is suffering; the range of direct experiment on patients is also very limited; nearly everything, for diagnosis, depends on being able to make a perfectly accurate synthesis of such data as are readily accessible. Correct diagnosis depends, in fact, on the power of rapidly extracting from any fresh set of data, the truth, the whole truth, and *nothing but the truth* that is in those data. This synthesis must go on within the doctor's mind. All true synthesis is done within a mind; and this is especially important in the case of synthesis for diagnosis. Facts concerning animals other than man may be valuable in assisting to form a judgment; but knowledge of this kind would be dearly purchased, if, in the course of its acquisition, the synthetic faculty itself were either weakened or distorted. If the purely sanitary precaution indicated above were neglected in medical education, the result would probably be pseudo-inspiration of the faculty of diagnosis; or, in other words, a tendency to make brilliant but unreliable diagnoses.

I would wish it to be distinctly understood that I personally have no knowledge whatever as to what amount or kind of vivisection is practised in medical schools in England. I hope, therefore, that what I have said will not be interpreted into an attack on the medical profession on the score of "inhumanity." Medical practitioners, so far as I know of them, compare favourably on the whole, as to kindness and generosity, with any other section of society. But rumours reach the outside world of complaints that "research" is not as free in England as abroad; and that there are those who wish to remove restrictions on its freedom. We hear, moreover, that medical examinations are being made almost yearly more and more stringent, because it is increasingly necessary to make some selection among the too numerous candidates. It concerns the public to know what principle of selection is being acted on in this matter; whether the examinations are being so arranged as to exclude, or to admit, a preponderance of persons in whom the faculty most essential to true synthesis, the faculty of "knowing when they don't know," of "knowing the feel of ignorance" (*i.e.*, of knowing instinctively when they have got all they can out of a set of data, when they have touched the exact boundary line between ignorance and knowledge), has been weakened or injured; whether, in fact, medical examinations are being so arranged as to select for success those who can answer a great variety of questions about what goes on, under given

conditions, inside of non-human animals, or those who can make an exact synthesis of the information to be got in a given case from the phenomena presented for observation.

CHAPTER VIII

THE SANITY OF TRUE GENIUS

It seemed to me that before completing my present task I ought to see for myself something of actual insanity. The physician of a large asylum kindly allowed me to spend a week or two occasionally among his patients. This experience cured me of many romantic illusions, especially that of supposing that only a fine line divides genius from insanity. My verdict would rather be that, in one important respect at least, genius and insanity are further apart than either of them is from the ordinary state of man. If they are points on the same ellipse, then one is at the aphelion and the other at the perihelion. Both, indeed, are characterised by periods of strong disinclination, amounting at times to incapacity, for attending to outer facts; by a strong tendency to withdraw at times into some inner world, and there receive fresh light upon facts previously known. But they seem to me to deal with this inner inspiration in opposite ways.

Men of great genius, so far as I know them, however they may differ in some respects, are all marked by one common characteristic—all develop, at the moment of greatest inspiration, the instinct to protect themselves from aberration by conducting their thinking according to complete mathematical sequence.

When the inspired fit of genius is passing off, the instinct to complete sequences is often the first to fade. If the individual has no conscious knowledge of the Law of Sequence, he is, during that portion of the inspired fit which succeeds the fading of the mathematical instinct, as prone to delusions as any lunatic; and these delusions, owing probably to the extremely sensitive condition of the brain during inspiration, tend to fix themselves on him, and often cause him to mislead his followers; whereas he who consciously knows the Laws of Thought is on his guard, and knows when his good angel is leaving him.

The genius and the hallucinate are alike prone to resent either contradiction or the attempt to argue against their delusions. But I have often tried the experiment of completing the individual's own sequence according to the mathematical formula. Genius

acknowledges such addition to its own thought processes, such completion and automatic correction of them, as sound; the lunatic either flies into a rage, or loses interest in the conversation and turns to another topic, or goes away. For instance, in the course of my attempts to sanitate anti-vivisectionist minds by directing their attention to schemes for assisting biologic research on non-pain-causing lines, I meet with more or less of difficulty in persuading common-place enthusiasts to adopt a hygienic mode of activity. But an anti-vivisectionist of true genius, however rampant in his antagonism to biology as it exists, however ignorant and indifferent about science of any sort, recognises by instinct that the path of sanity and wisdom for him lies in the direction of aiding all schemes for prosecuting biology on non-pain-causing lines. The fanatic who is insane on the vivisection question listens to no argument in favour of assisting biologic study in any manner which does not involve the incessant *denouncing of vivisection.*

I would almost venture to predict that in times to come, the test of lunacy will be, not whether the patient holds this or the other erroneous opinion, not whether he sees ghosts or hears voices or dislikes his near relations, but how he responds when the doctor completes, according to the mathematically ascertained Laws of Thought, the patient's own unfinished thought-sequences.

When I use the word "genius" I apply it only to persons of unmistakable power, who, amid whatever aberrations, have solved some of the world's problems by original and sustained thought. Many pass as inspired in small coteries, who, for any power they possess of making a true thought-sequence or appreciating it when made by some one else, might be as mad as any patient in Bedlam.

What is called Megalo-Mania, I believe to be, in itself, a perfectly normal concomitant of inspiration. It occurs in the highest order of genius as markedly as in some forms of insanity. The "modesty of true genius," about which so much has been written, is the result not of natural humility, of the absence of self-exaltation, but of the completion of a sequence of which self-exaltation is the first half. The inspired person feels sure that some thought which has come into his mind—or, rather, the fact of its coming there,—is of more consequence to the world than any outer event. The lunatic stops at this conviction; the man of genius completes the sequence, by seeing that thoughts which come to others are also of more importance than outer events; instead of his development being arrested at the stage of Megalo-Mania, it rises to a general conviction that Inspiration is more important than organisation; that all possible glory of all visible kingdoms

would be dearly purchased at the cost of demoralising that Kingdom of Heaven which is within. Not only Megalo-Mania, but many other phases of lunacy, are gone through in the minds of men of great genius, and often in their conversation with their intimate friends or trusted assistants; these phases of insane thought are not mere accidental aberrations, they are essential portions of the path to discovery; but the greater the genius the less the individual feels prompted to express his ideas in this immature stage to any persons except those who are actually working with him at his subject. Premature exposure is never a sign of strength.

There is, indeed, one terrible form of brain disease which I think is distinctly traceable to genius; not, indeed, to the patient possessing, or being possessed by, the temperament of genius, but to his not understanding the nature of the gift, to his thinking it his duty to violate its self-protecting instincts.

A man makes a discovery or two in some physical science, or a new departure in some art. He is appreciated, lauded, honoured. He is well aware that his success is due to his having been somehow led to practise some exceptional kind of thought-sequence. It occurs to him that if only mankind knew how to practise that special mode of sequence, most people could do genius-work and make discoveries for themselves in any direction they pleased. He longs to throw open the realm of genius to the world at large. To do this he must initiate the world into the special mode of sequence. If he really understood what that is, he would do as Gratry did—write a calm and sober treatise about it, which a few thinkers would profit by, and which could do no harm. But he does not understand his own thought processes well enough to write about them abstractly; he tries to give the secret to the world in some concrete form. What concrete subject shall he select to illustrate his method? It would be of no use to write on Physiology, or Mechanics, or Botany, or Musical Composition, or whatever the subject may be by which he made his reputation; if he did that, his new book would only be supposed to be a fresh treatise on that subject; would appeal only to a circle of readers desirous of studying it; and even they would only get out of it technical instruction. He therefore selects some topic of general interest, and proceeds to try, by his method of sequence, to solve some of the problems connected with it, carrying on a process of solution, as it were, *coram populo*. He writes, or lectures, or preaches about, say, the relation between rich and poor, education, or the marriage laws; simply thinking aloud, and pouring out to all comers those half-inspired and very erroneous flashy half-truths

which are, as I said above, the raw material, out of which appropriate correction would ultimately evolve inspired truth. But long before the poor man has arrived at the ultimate correction of his own absurdities—which he would have done had he been able to think in peace—the world has run away with a notion that he means so-and-so, that he is doing so-and-so—that he is trying to induce his hearers to do so-and-so,—mistaking for seriously-given advice hints which he uttered with a misleading air of inspired earnestness because he feels them to be steps on the road to final illumination, but which he himself would be the last man in the world to dream of acting on. Before he well knows what is happening, he is involved in some tragedy, of which the antagonism and scorn of conservative opponents are the least painful portion ; the grief and anxiety of his true friends is far worse to bear ; but worst of all is the bitter remorse caused by finding that injudicious admirers are attempting to follow advice which he never meant to give. He becomes delirious from sheer moral torture, much greater than what ordinary men could bear ; much greater than anything which ordinary men are usually called on to bear ; and then the world declares that genius is allied to insanity !

The object of the present treatise is not to advocate any special method for either the detection or the cure of lunacy ; but to put within reach of those whom it may concern a clue to the stores of psychological knowledge locked up in mathematical science. It may therefore conclude here with an abstract of some doctrines towards which the Calculus of Logic seems to be tending. It has received sanction from several non-mathematical students of theology, of medical psychology and of mental science, on general grounds of psychology and of religion.

THE CREED OF SANITY

Unity is the property of the Infinite, the Absolute, the Eternal. Dividedness is the property of the finite, the phenomenal, the transitory. Every attempt, either to eternalize phenomenal distinctions, or to phenomenalize Eternal Unity is contrary to the true nature of man ; and tends towards the destruction of mental health. The great All is a jealous God, and will not suffer His honour to be given to any partial manifestation of good. Every finite or phenomenal good which man invests with attributes belonging only to the Infinite, avenges the majesty of the Unseen Unity by injuring the brain of man.

What force or creative energy is, in its own nature, we do not

know; but we know that every mode of it with which we are acquainted works by a pulsation of contrary motions. All forms are evolved by pulsating Force, yet itself is necessarily formless.

Man is the child of this pulsating or alternating Creator; not His mere handiwork, made arbitrarily, unlike Himself; but the outcome of His very thought-processes; and sanity, for us, means thinking as He thinks, so far as we think at all. And He thinks, or at least works, in an incessant rhythmic pulsation of alternate constructing and sweeping away. Man should imitate this pulsating activity within his own mind; his studies should alternate the formation of defined and contrasted conceptions with the unifying of those conceptions; and his religious exercises should suspend all concrete conceptions in adoration of the inconceivable Unity. If we thus embody the principle of pulsation in our thought-life, it becomes a source of constant power like the movement of our lungs; if we forget it, we waste force at each effort. False religions tend to arrest the natural fading away of things that have served their purpose, whether those things be visible forms or mental conceptions; but the token of the covenant made by Infinite Knowledge with man is the Rainbow, which no man can capture, or embalm, or enshrine; which is made by the breaking up of the one light into many colours, to fade, before long, into the unity of white light again; and which, when it fades, leaves nowhere in the world a trace of its ever having existed, except on man's heart an impression of spiritual beauty; and in his mind a knowledge of the laws of light.

It is vain that we haste to rise early and late take rest, and devour many carefully compiled text-books; to those who love the Invisible, formless, alternate-beating Unity, the knowledge which is power comes even during sleep.

APPENDIX

THE scheme alluded to in the text grew out of the Presidential Address of Dr. Wm. Hickman to the Harveian Society, January, 1883, from which I quote a few sentences:

". . . If necropsies were the rule instead of the exception our mortality statistics would be enormously increased in value; something too might be gained even from the simplest and least doubtful case; and in private practice much more may often be learned from an individual post-mortem than in public or hospital practice, the patient in the latter case having usually been but a very short time under observation, whereas in private practice the examination may explain and throw light on the history and symptoms of a life-time. The practitioner would also be led to watch, with a greatly increased interest, all the

signs and symptoms of every case under his care, and a vigour and certainty would be imparted to his practice which could be obtained under no other circumstances. A large number of cases, too, occur in private, of which very few are seen in hospital practice, and these present a vast field for future pathological research. What are the obstacles in the way of general mortisection? First, of course, the prejudices of the public. . . . It will be difficult and will take time to overcome these prejudices, but they may and will be overcome. The public must be taught by every means to understand the usefulness and the necessity of post-mortem examinations; they might be made to see how these would tend to their immediate advantage, in making practitioners more careful and more accurate in their diagnoses; and if the necropsies were made by independent men, men who made pathology their special study and business, the public would have some test of the knowledge and capabilities of their advisers, by the corroboration or disproof of their opinions afforded by post-mortem examination.

"It has always been a source of wonder to me why the public do not insist rather on post-mortem examinations, and choose advisers who they know have had the greatest experience in them."

In consequence of the publications of the Address in question, a few non-medical persons attempted to found a Mortisection Society. They expressed no opinion as to the amount or kind of benefit to be expected from a more general adoption of the practice of mortisection; they proposed only to give to the medical profession a fair opportunity of testing the truth of such ideas as Dr. Hickman's. He had told a member of the Mortisection Committee that, in his opinion, *certain kinds* of vivisection are scientifically unreliable; and that he believed these particular methods might be superseded by more scientific modes of research if medical practitioners could know with something like certainty, during the lifetime of a patient, that his body would ultimately be available for necropsy. The Mortisection Committee therefore proposed to organize a system of public registration of persons willing to offer their bodies for post-mortem examination. The scheme fell to the ground, owing, not to any one's opposition, but to the indifference of both biologists and anti-vivisectionists towards a movement which did not start by making positive assertions and which contained no element of antagonism to anything or anybody. We are here concerned only with the Psychology of such indifference. From the point of view of the Mathematical Laws of Thought, it seems strange that any one should expect fresh light to illume the darkness in which the vivisection question is enshrouded, as long as such utterances as those above quoted, emanating from serious students like Dr. Hickman, are lying unheeded, while no one has proved that they are fallacious, and no one cares to carry into effect as much of them as may prove sound. Such light *may* come, but if it does it will be of the nature of an "uncovenanted mercy," and mixed with guesses and errors; it will not be what a mathematical solution is—the normal response to an orderly mode of appeal "from finite minds to the Infinite for Light on finite concerns."

ON EDUCATION: 1900 AND LATER

1900 The Story of a Garden.
1900 Saturday Talks.
1900 Holiday Talks with Schoolgirls.
1901 Boole's Psychology as a Factor in Education.
1903 Educational Food or Educational Physic.
1905 Scientific Research by Natives of India.

THE STORY OF A GARDEN

This was published as an introduction to "Saturday Talks," 1900, and was re-issued as a booklet in 1908 under the title of "Miss Education and her Garden."

Once upon a time there lived on earth a giant child named Education. She was of the race of Gods ; and, as gods and giants develop slowly, she was still quite childish when she had been on earth a few thousand years. She had a garden, which she tilled in the capricious and empirical manner common to all baby-gardeners. But, about the middle of the nineteenth century, it occurred to her that she was growing quite a big girl, and that she would like to begin now to take her garden seriously and till it properly, as grown-up people do. Education had a brother much older than herself, whose name was Physical Culture. He also had a garden, which he tilled with fair success ; and she took him into confidence about her new scheme. "It's lucky you spoke to me, little one," said he, "I think I can perhaps help you. One of my teachers, Dr. Biology, has made some wonderful discoveries about laws of growth. He gave me a patent fertilizer and a powerful weed killer, both of which I find answer admirably. Suppose you consult him about your garden. He's a roughish chap to talk to ; but don't you be afraid of him ; he is a right good fellow at bottom, and clever enough for anything."

Education resolved to call on Dr. Biology and ask his advice. She found him in the act of starting off to see a patient to whom he had been summoned. "So you are the sister of my pupil, Physical Culture ? " said he. "Yes ; there is a strong likeness between you. Very glad to make your acquaintance, my dear. Sorry I can't stop to talk just now. You must come and see me again when I am at leisure, and tell me more particularly what you want to grow in your garden. Meantime you had better take some of my fertilizer

and a little of the weed-killer from my store-house, and try some experiments. You will find the fertilizer in a barrel, labelled '*Habit of Periodic Alternation*'; and the weed-killer in a tub labelled '*Fixed Habit.*' Your brother will tell you how to use them. Good morning."

Now poor Education had been trusted, when she came upon earth as a baby, to a good old foster-mother called Prejudice. Prejudice had many virtues, but she was one of the most essentially disorderly persons ever seen, though she managed to deceive herself and many other people by a superficial appearance of extreme tidyness. She had a big cupboard, labelled "Good," in which she stored away everything of every sort which she had found answer any useful purpose; and she had a dust-bin labelled "Evil," into which she threw, pell-mell, everything which had, to her knowledge, done harm. There was at times considerable re-arrangement between the two receptacles; things had to be shifted from one to the other in a way which was not only confusing but very insanitary. But Nurse Prejudice never learned by experience, and never succeeded in grasping the conception that the same thing may be good for one purpose and bad for another; so poor Education had been brought up on what one may call whited sepulchre ideas of order and accuracy. She had come to Dr. Biology with the notion that he was to give her something *good* for her garden; she did not ask herself which part of her garden it was to be good for;; and Dr. Biology went off in too great a hurry to notice that his visitor had come provided with only one basket.

Education went into Biology's store-house as he had suggested. She found the barrel and transferred a small portion of its contents to her basket; but unfortunately the tub of weed-killer was easier to reach; she filled up the basket from it and made haste homewards with her load.

Biology had advised her to try *experiments*. Poor Education had only one notion of experiment, viz., that it was to be performed on a wholesale scale. She promptly overlaid her whole garden, paths and all, with the contents of her basket. These, having been thrown in at random, had mixed together, but very imperfectly; it was pure matter of chance where the fertilizer fell and where the weed-killer. Many weeds shrivelled up, but some throve faster than ever. And alas! quite as large a proportion of the plants in the beds shrivelled as of the weeds.

What was to be done now? Oh! what *was* she to do?

One thing that she was to have done she entirely forgot; she was to have gone to her brother, or to Biology, for further instruc-

tions. It never occurred to her that she might have misunderstood the action of Biology's specifics; she had been misled by false advisers (that was how she put it to herself). Perhaps the Unseen Powers were angry because she had neglected them, and were causing her garden to wither as a punishment. She would consult the clergyman of the parish and see if he could suggest to her any means of propitiating them, and so averting the mysterious blight which had fallen on her crops.

The clergyman, Mr. Religion, soon perceived that the child's mind was running on some weird old heathen notions instilled into her by her nurse Prejudice. As a corrective, he advised her to study carefully a Book which he gave her, in which the true principles of reconciliation with the Unseen Powers were insisted on and superstitious incantations denounced. But he was nearly as ignorant as herself of Laws of Cause and Effect, and he could give her no practical advice about the tilling of her garden.

The Book which Religion gave to Education contained many admonitions about the value of Periodic Alternation as a vitalizer. "I'm sure that is the very name Dr. Biology called *his* stuff," exclaimed Education; "but it is a complete failure. At least it does not suit my crops. After all, Religion and his book are old-fashioned; they are not up to the present level of evolution. I think I'll go and see the famous Occultism that everyone is talking about just now, and see whether she can help me."

Now the history of Occultism was this. In the Book recommended by Mr. Religion were many warnings against a dangerous witch named Sorcery, who lived in a mysterious cave, and who deceived people by false promises and illusory miracles; and thus seduced them away from the service of the true Logos or Wisdom. Sorcery had fallen gradually into disrepute since the writing of the Book; and was at last driven to pick up a precarious living by telling fortunes to kitchen maids, till Queen Fashion accidentally found her when she was living in a cellar in a slum, and took the fancy to set her up in a mansion hard by her own Royal Palace. Fashion presented her with a complete equipment of costumes of the most novel cut, gorgeously embroidered in showy tinsel. And, lest the readers of the old Book should imbibe from it doubts of the legitimacy of having dealings with *Sorcery*, Fashion advised her to change her name; and bestowed upon her a title; she was now known as Milady Occultism. But in spite of the new mansion and the new Court dresses and the brand new title, Occultism had no new secrets; she trafficked in the same old wares which had served her purpose when she lived in a cave and called herself

Mistress Sorcery. Her secret was this. Close by the Church where Religion officiated there bubbled out a spring called Joy. It came from several underground springs which flowed out together into a little rock pool, in proportions which constituted an agreeable and healthful beverage. One of these ingredients was a powerful stimulant called Magnetism, which filtered upwards from a stratum deep down, and imparted a slightly but delightfully exhilarating quality to the waters of Joy. Now Occultism, alias Sorcery, had in the earliest ages found a crooked underground passage leading down to the spring of Magnetism. This passage opened outwards into a small cave. In the old days when the Book was written, Sorcery lived in this cave and thus had access to the Spring of Magnetism in an undiluted condition; and she sold its waters as an intoxicant, claiming the monopoly as her special privilege and scaring off those who would have invaded her dwelling by playing upon their superstitious terrors. Hearing, however, of a young chemist named Science that he laughed at superstitions and had no respect for monopolies, she began to fear that he might be bold enough to pay her a domiciliary visit, and so discover her secret. It was then that she deserted her cave and went to live in the slums, planting brambles and thorns round the mouth of the cave; so that Science, being busy with many other things, did not, for a long time, suspect that anything worthy of his notice was hidden there. Sorcery visited the cave in secret, bringing home supplies of the stimulating water, which she mixed with colouring matters procured from various drug-shops—some of them from the laboratory of Dr. Science himself. She labelled the various bottles "Palmistry," "Astrology," "Faith-Healing," "Clairvoyance," "Spiritualism," "Divine Science," etc., and she supplied each customer from one of the bottles, according to the colour which he preferred.

When Education called on Occultism, the latter quickly perceived that her new customer, though young and crude, had too much natural good taste to like the coarse colouring of the bottles on her shelves. She listened with an appearance of great attention to the child's recital of her difficulties, and then proceeded to compound a special remedy to meet Education's special case. She nearly filled a large flagon with the stimulant, Magnetism, and then coloured it sky-blue by means of a fine powder called "complacent cock-sureness," which she had got from a firm of wholesale dealers in materials for the adulteration of food and medicines, Messrs. Ignorance, Self-Assurance and Co. She was wondering what name she had better give to the compound, when she suddenly remembered a circumstance which had occurred some time

before. She was calling on an acquaintance, who lived in a foul and evil-smelling house, when a Sanitary Officer named Character came in and pulled out of his pocket a bottle of a well-known and efficacious disinfectant, Personal Influence. The label had fallen off from the bottle, and Sorcery had picked it up, taken it home, and stowed it away among an assortment of miscellaneous odds and ends which she kept by her ready for emergencies. It now occurred to her that this label was exactly suited to catch the fancy of such a child as her present customer. She stuck the label on the bottle by means of a patent glue named Cant, warranted to make anything stick for a short time to anything else. Handing the bottle to Education, the disguised witch gravely assured her that she need distress herself no further about her garden. "Everything watered with this compound," said she, "begins immediately to grow apace and is sure to come very early into blossom ; if any plant fails to do so, be sure it is because you have not given it enough of the stimulant. Therefore use it freely and come back for more when this supply is exhausted."

Education accordingly proceeded to water her garden plentifully with the mixture of Magnetism and Complacent Cock-sureness, falsely named Personal Influence.

She soon had reason to congratulate herself on the result. Nearly all the leaves in the garden showed a brighter green, the plants which had half-withered under the touch of Fixed Habit miraculously revived, the garden was soon full of blossom, and presently there appeared a large crop of small green fruits.

There was, however, in the garden a sensitive plant which some people had nicknamed Genius and some Inspiration. It had sprung up spontanteously from seeds dropped by some migratory bird. No one knew whence it came, nor what sort of crop it was likely to yield. Nurse Prejudice had strongly advised Education to get rid of it as soon as possible. "Because," she said, "if you encourage things that spring up of themselves, what's the use of calling the place a garden at all?" But Education had a fancy to see what Genius would come to and had let it grow in a neglected corner, where it had somehow escaped the weed-killer. But a sprinkling of the adulterated Magnetism reached it, and immediately its leaves closed with a tremulous shiver. "How queer," exclaimed Education, and thought no more about the matter ; everything else was going on so well, and Genius was, after all, only a weed, and not the business of a gardener.

But the green fruits dropped off without ripening, and the plants began prematurely to droop and shed their leaves. In vain Education exerted all her strength to bring constant fresh supplies

of the witch-water; the plants had been forced into premature bloom, and were simply tired out.

Education was now in worse distress than ever, her last hope seemed to be gone. Even now it did not occur to her that she had never taken real instructions from Biology or Physical Culture. All her advisers had misled her—that was how she put the case to herself. The Unseen Powers were against her, and her earthly advisers misled her; to whom could she turn? and what, oh, what was she to do? Hardly knowing what she was doing, she wandered along the high road, wondering where to turn next for help. Her meditations were interrupted by a greeting—"Good morning, Friend."

She was passing the garden gate of a farm owned by a thriving quaker named Geometry. This good man was known as being the most uniformly successful farmer in the whole countryside. He confined his attention to a few kinds of produce, of which he sent large crops to market. His land was in perfect order, and was considered uninteresting by romantic souls. But it was reported that he had at the back of his house a conservatory, wherein he grew, for the private delectation of himself and friends, the most wonderful orchids and lilies ever seen on earth. Education had never visited Geometry in his home and therefore had never seen the flowers; but she had occasionally procured from him a few cabbage plants; and she recognised him when he addressed her. "Good morning, Friend," said he; "excuse me; perhaps I have no right to claim acquaintance; but thou seems in trouble; and if there is anything I can do to help thee. . . " "Things go wrong in my garden," sobbed Education; "they won't grow as they should, they seem promising for a time, but they wither unexpectedly, and I *can't* find out why; I suppose I haven't yet got a strong enough fertilizer." "I use a fertilizer that I have never known fail," said Geometry; "it is called 'Alternation'; Biology and I discovered it between us, when we were lads together; I have used it ever since, and could not wish for anything better." "That is the very stuff Dr. Biology gave me," said Education; "it quite killed some of my plants; and made nearly all of them droop." "Thou doesn't say so?" exclaimed the farmer; "that is strange; I never heard before of its hurting any growing thing. But I have no experience except of just the few things that I grow myself. I don't know what thou hast been trying to raise. But, by the bye, thou had'st some cabbage seedlings of me; the fertilizer suits them of course?" "It killed them nearly all!" exclaimed the girl. "There is something very strange about that," said the farmer, "but thou seems tired and upset; thou hast had a long walk; come and rest

awhile, do." He led the girl through the house to a shady seat at the back, from which she could see into the glass-house. The luxuriant beauty of the flowers there was a revelation which took her breath away; and, for a time, she could do nothing but gaze bewildered. But at last the good farmer drew out of her the whole pitiful story of her many blunders. When she had finished her tale, he smiled in a fatherly way, and said: "See here, maiden; I do not offer advice of things I know nothing about; but would'st thou care to hear how I make my own crops grow? It may amuse thee a bit while thou rests; and possibly thou might'st pick up a hint or two that thou could'st turn to account in studying thine own affairs. At any rate thou would'st know in the future how to grow my homely cabbages; that would be something gained." "It would be very good of you," she said meekly, "if you are sure you have really no objection to share your wonderful secret with me." "No objection in the world, my child; I should be glad if I can help thee in any way. I have no secrets; all the world is welcome to hear all that farmer Geometry can tell, and to see all he does, from one year's end to the other. And I would be glad to do all I can for a maiden in trouble. Well then, this is my method. I keep all my materials in separate receptacles, each carefully labelled according to its nature and purpose. I fasten the labels on with stickfast glue, so that there shall be no chance of their falling off, and getting mixed, and being stuck on the wrong vessels. I never take any man's advice till I have carefully gone over with him all the words he has used, and made sure he and I understand them in the same sense. When I try an experiment it is on a very small scale, so that I can watch every step and register results; and I never try anything on a large scale till I am sure how it acts on a small one. Moreover, I never finally register a result till I have verified it by at least a second mode of investigation.

"I don't feel quite as Mr. Religion does about his old books; but that is partly because I was by when some of them were written, and even lent a helping hand; but this thou may depend on:—When I have either registered a result as arrived at by me, or given to it my assent as having verified it, I assume it as true when the time comes to apply it, either in reasoning or in action. If an observation turns out not true enough to trust my crops to, I put my pen through it in my register, so that none of my servants may be misled by it.

"As I firmly believe that all which happens in the visible world is the expression of Invisible Forces, I should treat as a charlatan an individual calling herself by any such name as *Occultism*—as if anything could be more occult than everything is. I have seen too

bath is not duly kept by merely putting out of sight the History of Europe and the sum-slates, and going to Sunday School in new frocks, to learn the History and Geography of Palestine, so as to win a good place in the next Scripture examination. On Sabbath we should put aside the competitive and the mechanical aspects of life, and go to Truth's own school with fresh hearts, to learn, not the outer facts either of Europe or of Palestine, but our relations to the Eternal, and the principles of Social Ethics and true Citizenhood.

MENTAL HOUSE-CLEANING

If my readers are following my suggestion as to using a few minutes of Saturday in preparing for Sabbath by inducing a mental attitude towards certain questions, the inverse of that promoted by school-work, they are likely before long to be confronted with a question of this kind—"Why," it will be asked, "do you disturb the children's minds by upsetting their ideas about the subjects taught at school ? If you think they are badly taught, change the school. If you think the school good on the whole, then do not lightly interfere with its methods. It is barely possible that, even at a good school, some things may be said to which you have a conscientious objection, and you may feel it your duty to guard your children against what you believe to be grave errors ; but why interfere about trifles ? Why need there be, how can there be, more than one way of stating such a plain fact as that twelve pence are one shilling ?"

The answer, though simple enough in itself, would be difficult to put into words, were it not for the happy accident that another question, precisely analogous, was so often asked half a century ago ; and has now been so satisfactorily answered by modern sanitary science. The query to which I refer was of this kind :

Paterfamilias of 1850, loquitur—"My dear Jane ! if you think that bureau would be more convenient in some other part of the room, it shall be removed. Our furniture seems to me suitable to our needs ; but if ever you desire to have any of newer pattern, pray tell me so, and I will meet your wishes as far as possible. I always, as you know, take into careful consideration any suggestions you may see fit to make as to changes in our establishment. But what mania is it that comes over you periodically, that you and your maids come into a room where no one can find a crumb on the floor, a speck of dust on the table, or a thing out of order, you drag everything out of its place, put every article of furniture into the most inconvenient spot you can find, turn chairs upside down

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"As I firmly believe that all which happens in the visible world is the expression of Invisible Forces, I should treat as a charlatan an individual calling herself by any such name as *Occultism*—as if anything could be more occult than everything is. I have seen too

many miracles happen in my own glass-house to need to have recourse to magic waters that spring up in mysterious caves ; just look at that great white blossom there, growing straight out of a dry stick. What could be more miraculous than that ?

"I find most young plants need care, for a time, to protect them from blight and mould, such for instance as the fungus of Idleness. For that purpose I find Personal Influence the best preservative. I generally sprinkle a very little of it on seedlings. I always get it direct from Character; what he supplies is genuine ; and I don't find anything grows the worse for a little of it ; but I have to be careful not to use too much ; it is not a plant-food ; and too much of it will injure the crop as much as the fungus. As for the stuff thou got'st from Sorcery, or Occultism, or whatever her name is, no one knows what mixture *she* sells. A friend of mine saw her one night coming stealthily out of the shop of a firm of dealers in adulteration materials. I wouldn't trust anything she sold ; plants, especially seedlings, are very apt to be hurt by adulterated manures.

"The last thing I have to say is that I force nothing into premature bloom, for I have raised such good crops by slow methods that I have no temptation to be in a hurry. I think that is about all I can tell thee, my dear."

Poor Education was woefully disappointed. She had hoped for some great new light, and the farmer's talk sounded prosaic and uninteresting. But she could not doubt his good faith. There could be no doubt, either, of the luxuriance of his crops, homely as they were. And oh! those orchids and lilies ! There must be something in his methods after all. She thanked him courteously and went home pondering over his words.

"Poor lassie!" said the farmer to himself, "she's a bonnie maid, and means well. But did anyone ever see such an uneducated, neglected and ill-trained bairn ! It's a sore pity she has no one to teach her the alphabet of reason."

She was, indeed, ignorant and ill-educated, poor child, and what was worse, she had thought herself very clever. But her instincts were good, and she had too much generosity to be permanently obstinate. After pondering for a few centuries over the farmer's words she came to a resolution. She threw the weed-killer mixed with fertilizer into the dust-bin, and the magnetism down the sink. She humbly asked her brother to accompany her on a visit to Dr. Biology, who helped her to some more of the fertilizer, and, what was even more important, explained to her the proper conditions for trying an experiment. She began modestly on a small scale, trying the fertilizer carefully on a small bit of ground

at a time, and inviting Physical Culture every season to check and correct her results. She became at last the most successful gardener in the world. And they all lived happy ever after.

[What happened to the sensitive plant is not known for certain; but a local tradition exists to the effect that it took kindly to the pure fertilizer, throve apace, and at last produced splendid crops of flowers allied to those in Geometry's glass-house, but far more magnificent.]

EXTRACTS FROM SATURDAY TALKS ABOUT WEEK-DAY LESSONS

This was published in 1900 *but some of the material was afterwards incorporated in other books.*

THERE IS A TIME FOR EVERYTHING

HOLY DAYS ARE NOT FOR INACTION, BUT FOR RENEWAL

BESIDES his friends, Biology and Astronomy, Geometry has three sisters, Arithmetic, Algebra, and Logic, who belong to the same school of quiet, undemonstrative, and deeply reverent monotheism as himself. None of them is prone to bang the big drum and shout sacred names in public; but they all have wise counsels to give when asked, for the guidance of the moral and spiritual life. If these counsels do not exactly belong to the domain of Sunday religion they are at least good as Preparation for Sabbath. It is proposed to publish here a small selection from the suggestions made by them to one who has consulted them often and loves them dearly.

Many moralists are complaining of the deadening effect on spiritual life of modern education, and reproach school authorities for the warp given to the young mind by too much book-learning. It seems to me unfair to rail at school authorities for going along a road in which they are being driven by circumstances. The fault lies with the parents if they neglect to make use of "Sabbaths and Holy Days" (including the Saturday holiday) for the purpose of balancing or complementing the effect of School systems. I propose to offer to parents a short series of Saturday jokes or mind pictures; intended to help them to "prepare for Sabbath," by putting "Commercial Arithmetic," and all that thereunto belongs, back into its proper place in the mind and imagination; thus leaving a space clear for the true work of Sabbath. For the Sab-

bath is not duly kept by merely putting out of sight the History of Europe and the sum-slates, and going to Sunday School in new frocks, to learn the History and Geography of Palestine, so as to win a good place in the next Scripture examination. On Sabbath we should put aside the competitive and the mechanical aspects of life, and go to Truth's own school with fresh hearts, to learn, not the outer facts either of Europe or of Palestine, but our relations to the Eternal, and the principles of Social Ethics and true Citizenhood.

MENTAL HOUSE-CLEANING

If my readers are following my suggestion as to using a few minutes of Saturday in preparing for Sabbath by inducing a mental attitude towards certain questions, the inverse of that promoted by school-work, they are likely before long to be confronted with a question of this kind—"Why," it will be asked, "do you disturb the children's minds by upsetting their ideas about the subjects taught at school ? If you think they are badly taught, change the school. If you think the school good on the whole, then do not lightly interfere with its methods. It is barely possible that, even at a good school, some things may be said to which you have a conscientious objection, and you may feel it your duty to guard your children against what you believe to be grave errors ; but why interfere about trifles ? Why need there be, how can there be, more than one way of stating such a plain fact as that twelve pence are one shilling ?"

The answer, though simple enough in itself, would be difficult to put into words, were it not for the happy accident that another question, precisely analogous, was so often asked half a century ago ; and has now been so satisfactorily answered by modern sanitary science. The query to which I refer was of this kind :

Paterfamilias of 1850, loquitur—"My dear Jane ! if you think that bureau would be more convenient in some other part of the room, it shall be removed. Our furniture seems to me suitable to our needs ; but if ever you desire to have any of newer pattern, pray tell me so, and I will meet your wishes as far as possible. I always, as you know, take into careful consideration any suggestions you may see fit to make as to changes in our establishment. But what mania is it that comes over you periodically, that you and your maids come into a room where no one can find a crumb on the floor, a speck of dust on the table, or a thing out of order, you drag everything out of its place, put every article of furniture into the most inconvenient spot you can find, turn chairs upside down

on tables, and raise a fearful dust, when you neither need nor desire any real alteration, as is well shown by the trouble you take, a few hours afterwards, to replace every article in the exact spot where it stood yesterday?" Poor Jane knew not what to answer. She went on never-minding, of course (women who respect themselves always do); but she had nothing to say. The Jane of now, however, having attended Hygiene classes and Extension Lectures, is fully equal to the occasion. If her husband asked her the question asked by his grandfather, she would reply: "It is true, Charles, that you have provided me with carpets of excellent quality and furniture of convenient shape; and I hope I take a proper pride in keeping them in such condition that our neighbours, when they call on us, can find no visible signs of what is called 'dirt'; 'dirt' being, as you know, the unscientific name for what is called in scientific terminology, 'Matter in the wrong place.' But, Charles, besides the visible dirt that might be brought in on boots, or dropped as crumbs from the table, other forms of dirt exist in our rooms; the impalpable dust, generated by the action of 'life, time, and atmosphere,' accumulates slowly behind the most carefully polished furniture and under the most spotless-looking carpets. And among that dust there are occasionally blown in from outside those potent germs of evil called *microbes*. Microbes, if allowed to accumulate, may at any time be blown out into our midst by some chance puff of air. When, therefore, you see me apparently wasting energy or turning things upside down for no *visible* reason, tell yourself that I am carrying into the enemy's very stronghold the war with those *invisible* foes, who, if left too long in peace, will employ their leisure in mustering recruits and laying in stores of ammunition, and will ultimately become powerful enough to be a danger to our health. My ambition aspires not to fresh articles of furniture wherein dwells the latest fashion, but to a fresh atmosphere and a freshened home, wherein dwell purity and health."

That is what the modern housewife would say if her husband were foolish enough to ask the question asked by his grandfather. But Charles has attended extension classes also, and he knows better than to remonstrate or interfere when he sees a microbe-hunt in progress. He takes himself out of the way, thanks Heaven for the division of labour which makes it needless for him to look after the microbes, and comes home in the evening with a pot of fresh flowers to ornament the freshened home.

Well, dear reader, there are mental as well as physical microbes. Some mental microbes are known to logicians by the name of *fallacies*. They generate in the course of life, time and habit. They

a new theory there, but a fresh conception of earth and sky wherein dwell simplicity and reason.

There are people who suppose that, if they have found it convenient to put a thing out of their minds in order to be free to attend to something else, they need never again remember the thing thus put out of mind. With those people we have nothing to do at present; they are heathens, idolators (the essence of all idolatry consists in *permanently* taking a part instead of the whole; whereas taking a part instead of the whole *for a short time* belongs to the essence of scientific method). These people need missionaries as much as any savages do.

But there are many people, civilised, highly educated monotheists, worshippers of the true Logos, or Wisdom, who know very well that if we have occasion to put earnestly out of our minds, for a time, something which is an essential part of our true life, in order to fix our minds entirely on something in itself less important, but which for the moment needs our whole attention, the fact that we have thus deliberately put the important element out of sight and out of mind is in itself a caution to us to recall the suppressed element with the same earnestness on the first convenient opportunity. Some of these people write grand, wise, holy books, on purpose to remind us of this duty, and to recall us from the idolatries into which we may be tempted to stray. In these books they say, or at least clearly imply, that arithmetic contains no warnings about the limits of application of its own formulæ, no indications of the true nature of the human mind and the methods of its higher culture, no cautions about the duty of re-calling elements of thought temporarily suppressed, no hints of the conditions under which the unity of human nature can best be safeguarded. One cannot help wondering where such writers get their notions of what arithmetic does teach! Perhaps they were brought up by parents who held wise, bright, fallacy-expelling talks about other branches of work-a-day affairs, but who neglected the arithmetic, geometry, and mechanics. When one has been studying Mr. Babbage's account* of the insight into the possibilities of human thought and feeling, brought home to him by the working of his calculating engine, or Gratry's solemn analysis of the proof afforded by the process of geometric induction of man's relation to some Infinite Inspirer,† if then one turns to read what writers of the Ruskin school say about the impossibility of getting spiritual good out of any machine or mechanical mode of analysis, one feels as if some great wise man had never heard the word

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come from no one knows where, they blow into all minds alike, however furnished with school knowledge, and quite irrespective of whether that knowledge is valuable or useless, whether the school method is good or bad, old-fashioned or new ; they increase and multiply unseen, they are a perpetual menace to intellectual and moral health ; and the remedy against fallacies consists in the occasional pulling of everything out of its usual place into some other, and a turning upside down of many ideas which, before they can be used again for practical purposes, must be put back into the old position.

When Education is as developed as her brother Physical Culture, everyone will understand that the periodic upside-downing of furniture is as necessary in the mental world as in the physical; and teachers will do as the modern Charles does—thank Heaven for a division of labour which makes it the business of parents and clergymen to do the fallacy-expelling ; and which gives them (the teachers) a possibility of going on peaceably with their proper work of providing mental furniture and food for the business of this visible world. At present teachers are sometimes rather jealous and suspicious when they hear of parents and friends upsetting in the holiday ideas which they have arranged. Many difficulties connected with educational matters will settle themselves and disappear when the principle of mental house-cleaning is accepted. At present this seems to be what is happening : school authorities know that they must and ought to carry on the every-day work of the mental house ; some educational theorists, on the other hand, see the need for mental house-cleaning or fallacy-expelling ; these latter make the mistake of trying to persuade the authorities to *have the cleaning done while the work is being carried on* in the mind ; i.e., during school hours. This naturally leads to confusion ; just as it would if the schoolroom were to be spring cleaned at the very time when classes are going on there. A little intelligent good humour makes it possible to adjust things ; let the school authorities do their proper work and teach convenient working-methods five days a week, and leave the hunting out of Fallacies for HOLY DAYS and times of Re-Creation ; the more it is done as mere fun the better.

One of the many reasons for arranging that house-cleaning and fallacy-hunting shall take place in a cheerful matter-of-course way at stated intervals is that if you do not do so, if you leave the microbes too long undisturbed, if you let them increase too much, there is sure to come at last a condition of things which is unbearable. Then the upsetting has to be done at some inconvenient time, when everyone is ill of the stench, or frightened at the

danger, or busy nursing the sick. The dragging out of things and the cleaning behind them is done in a hurry, accidents happen, people are bruised and hurt, things are scratched and torn, some valuable things are smashed to bits and can never be restored. The French Revolution was one such feverish and irregular house-cleaning. Our English Reformation was another. Even a long-delayed and violent house-cleaning is better than none at all. But why delay till it has to be violent ? We pray that God's will may be done on earth as it is in Heaven—that is to say, by quiet, orderly, prepared-for revolution in which nothing is smashed or injured.

Apropos of the Heavens, that was a typical sort of mental house-cleaning which Galileo instituted. The old Astronomers had started a simple and excellent school ; a system of observing and registering the movements visible in the sky. One would think men could not be led far wrong by looking at God's blessed sky, and writing down what they saw there. But fallacies crept in, false assumptions, little errors, little misapprehensions, false beliefs born of those misapprehensions ; little inventions of a (supposed) invisible bar here and a (supposed) invisible rigid circle there, till the whole science of astronomy was one mass of false hypothesis. What Galileo said was, virtually, this : "We have stood still too long on the convenient and orderly assumption that the sun rises and sets ; suppose we invert it, and picture to ourselves that it is the earth which moves and the sun which stands still." The Church became flustered and angry. "What is the use of upsetting people's ideas? Wise teachers of old spoke of the sun moving ; why not let things be ? They are all right enough." "No," said Galileo ; "they are not all right ; there are fallacies behind." And so there were indeed !

It is obvious to us, now, that Galileo was doing no harm. He did not alter the facts of nature. Nor did he really much alter our immediate use of the facts. We go on, as our forefathers did, seeing the sun rise and set, and feeling the solid ground under our feet. Astronomers now do as the old Astronomers did, observe appearances in the sky and write down what they observe. But we, all of us, Astronomers and all, occasionally, for a few minutes, picture to ourselves a stationary sun and an earth moving round him (though it is not true that the sun is stationary, nothing in Nature really is so ; everything alike is in motion). In consequence of this occasional inversion of our mental attitude, the atmosphere of modern Astronomy is light, and pure, and fresh ; it is not poisoned and clogged by masses of accumulated fallacies. Galileo's régime of inversion has given to Astronomy, not a bigger telescope here and

a new theory there, but a fresh conception of earth and sky wherein dwell simplicity and reason.

There are people who suppose that, if they have found it convenient to put a thing out of their minds in order to be free to attend to something else, they need never again remember the thing thus put out of mind. With those people we have nothing to do at present; they are heathens, idolators (the essence of all idolatry consists in *permanently* taking a part instead of the whole; whereas taking a part instead of the whole *for a short time* belongs to the essence of scientific method). These people need missionaries as much as any savages do.

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"tree" except as used by a valet about "boot-tree," had never seen a branch except as used by a costermonger to beat his donkey, knew of no birds or flowers except in milliners' shops, and, upon that much information wrote a sermon to warn men that trees and birds and branches and flowers can convey no knowledge of nature or of life! Sometimes one is reminded of the philanthropist who wrote a solemn treatise to prove that, whereas copper is poisonous and silver is used to make spoons, the statement "twelve pence are a shilling" is a danger to the public health.

The poet Longfellow entered a noble protest against this deadening perversion of facts. "There is something divine in the Science of Numbers. Like God, it holds the sea in the hollow of its hand. It measures the earth; it weighs the stars, it illumines the universe; it is law; it is order; it is beauty. And yet we imagine—that is, most of us—that its highest end and culminating point is book-keeping by double entry!"*

What Ruskin might have done for the religious and educational life of England, if he had learned the truth about the system of analysis which he was discouraging, is past all guessing. By bringing the force of his influence in artistic and religious circles to bear against a philosophy, about which he knew only a few of its perversions, he made it difficult for those who knew the truth to gain a hearing (quiet students are easily dissuaded from trying to make the public listen, because they hate the struggle for who-can-scream-loudest); and thus he gave to ambitious and noisy perverters of mathematical method the prestige of being supposed by the public to be the true, the only true, exponents of "modern mathematical method!"

RE-COLLECTING

When all the lines of a multiplication have been separately performed, the child adds them together, re-collects them into a whole. The analogy to that, in the case of a child who was first made to attend to lacing up his boots, and then encouraged to forget his clothes and give himself up to the enjoyment of his walk, would be a mental review of the day's proceedings as a whole, including a reflection that the walk had been more satisfactory with boots properly fastened than it would have been had they been dropping off and the laces hanging loose and tripping up the wearer. How is this reflection to be brought into the child's mind? It is just here that Arithmetic will be found to give valuable and much needed warning.

*Kavanagh.

There are some mothers who improve every occasion by making appropriate moral reflections in words. If we look at the analogy of the sum we see that that is not in line with good teaching. The teacher ought not to add the sum up and prompt the child with the answer ; the process of re-collection or combination should go on *within the child's mind*, it is not at all enough that its mere result should be drilled into him by someone else. Then again there are mothers who, perceiving the uselessness of perpetually making moral reflections aloud, fix their minds on the precise idea which they wish to instil ; and hope, or pray, that it will transfer itself silently into the child's mind. That is as if a teacher should, as soon as the child had finished multiplying, do the addition in her head, fix her mind on the final answer, and *wish* that the child may be prompted to write down the special figures which the teacher has in her mind. A good deal of this kind of thing is done (in History and Literature though not actually in Arithmetic) by young teachers, who are made nervous and irrational by the pressure of modern hurry. But it is not *teaching* in any true sense ; nor is it, as some suppose, a legitimate exercise of personal influence ; it is mere semi-hypnotic "suggestion," or, as some call it, "personal magnetism" which is a powerful stimulant, and, like the other stimulants, useful at proper times and in small doses. Used promiscuously, it saps mental energy as surely as does the gin which the drunkard takes instead of food and healthy exercise. Such misuse of magnetic suggestion was formerly called *Sorcery* ; it is none the less evil because we are now too polite to call it by harsh names. What the teacher should aim at is easily seen in Arithmetic ; it is to get the pupil into such a mental condition that at the right moment, when he has finished his manipulation of separate parts, his mind will naturally turn to the business of combining the separate portions, and will effect the combination, and get out the correct result, without any help from the teacher.

One hardly likes to say a discouraging word to the mother who, having a wise thought in her mind which she thinks it not tactful to express in words, prays that the thought may pass unspoken into her child's mind. But she might, to better purpose, pray that, by means of her whole character and the general trend of her influence, she may get him into the habit of quietly and spontaneously combining for himself the results of his various experiences.

It will be noticed that I am not here reasoning by any forced analogy. The analogy is not between an outward act of lacing boots and another outward act of writing down figures. I am dealing only with the *mental* process of splitting up a difficulty too

great for one's powers, and fixing attention on its various elements in turn. This mental process is *really* the same in both cases ; but in Arithmetic we see, more easily than elsewhere, in what manner such a process ought to be brought to a close, how the mental cycle can be most healthily and naturally completed.

We have here the first slight indication (without, it is true, any proof) of a principle which has been proved repeatedly and "up to the hilt" by means of various branches of higher mathematics, i.e., that man is a creature, one of whose normal functions is to *conceive* Unity where he has been *cognizing* separation or contrast. Man has many faculties by which he learns various kinds of things by various processes. If we want to know how to spell or translate a word we ask somebody, or look in a dictionary ; if we want to know facts we look at them, or refer to books which tell about them. But besides these faculties and processes, and all others which we use to gain knowledge from *visible* sources, Mathematical Psychology recognises in man a faculty of quite different kind; a faculty which stands in no direct relation to outer facts, which can tell us nothing about outer facts, which must be supplied by the other faculties with all the facts with which it is to deal ; a faculty by means of which direct intercourse takes place between us and The Infinite, by means of which we breathe in, or pump into ourselves, from some Invisible Source, new knowledge about the meaning and relations of facts. About the Nature of that Source Mathematics has nothing to say ; but mathematical processes give specific information as to the proper cycle of action of the faculty itself. It receives Truth from the Invisible at the moment when the mind re-laxes from tension on keeping separate some elements of thought, and re-verts to the idea of some Unity between those elements. This is the central and fundamental doctrine of Mathematical Psychology. No doubt has ever been thrown on it from the Mathematical side. Great medical authorities, when they are told of it, say that it agrees with all that they have observed about what constitutes normal action of mind. It was almost certainly known to Newton ; and quite certainly to his contemporary Leibnitz. It was formulated in 1750-1760. An elaborate proof of it was given in France by Gratry in 1855; and another, of different form, was worked out in England about the same time, by a group of Mathematicians (among whom was De Morgan) who generously assisted George Boole to present to the Mathematical public the result of their common work. It was rediscovered by James Hinton, who at the age of forty took up the study of Mathematics on purpose to clear up his ideas on medical psychology. All the mathematical authorities here referred to agree in thinking that no

religion can really be regarded as destined for man by the Creator of man, unless, besides conveying specific information and stirring spiritual emotion and moral aspiration, it provides opportunity and encouragement to each individual to think for himself on Holy-days or periods of re-laxation and re-creation, about some Unity underlying those very elements which his ordinary work presents to him as contrasted or separated, or as rivals, each claiming undivided attention. I hope my readers will kindly remember that I am giving here, not a recipe for doing something which high-falutin' philosophers wish to do, and other people do not care to do, but an ascertained law of the machinery by means of which we do all our thinking, and therefore a law which we cannot habitually contravene without injury to the machinery itself.

The objections brought forward against the teaching of this law have been of three kinds :

First, "it is contrary to religion." This objection is not made by intelligent and active-minded clergymen of any denomination. The best exponent of the doctrines of mathematical psychology, Gratry*, was himself a priest, and the conclusions drawn by him from mathematics have been republished, separately,† without the mathematical portions of his work, in a little volume which is a favourite work of edification of pious people both Catholic and Protestant. The "religious" objection has been raised by hangers-on of religious cliques, who know as little about theology as they do about mathematics, and who think whatever is unfamiliar must necessarily be heretical. I will only answer this class of objectors by requesting my reader to form a mental picture : A person whose chief Sunday observance is going to sleep in his pew ; and who declares that the sermons of the new Curate are "unsound" because the new voice is so clear and emphatic that it disturbs the soundness of his Sunday nap.

The second objection is that "it is impossible that any light on the spiritual life can come from so mechanical and uninteresting a quarter as Mathematics or Physics." Those who make this kind of objection are persons who either never opened any work which deals with the subject of Mathematical Psychology, or who have excellent reasons for not understanding any such work ; viz., they know much less of mathematics itself than is necessary to qualify a boy or girl for passing the ordinary "London Matriculation" on leaving school ; they are quite ignorant of the nature of scientific shorthand, and, as a rule, they are not even aware of the existence of any such dialect ; they read a statement of the "twelve pence are a shilling" order, as if it meant something analogous to "copper

*Gratry, *Logique.* †*Les Sources,* Gratry.

is silver." This condition of serene omni-nescience of the subject of course perfectly qualifies them for instructing the public as to the exact limits of possible achievement for mathematical method!

Picture: An eminent painter, born deaf, who happened to see a great violinist perform, and who solemnly warned the public that no spiritual thought could ever be suggested by such a trivial amusement as that of scraping the hairs of a horse's tail (the bow) against the intestines of a cat (the cat-gut violin-strings).

The third objection to the doctrines of mathematical psychology is that "most mathematicians and most psychologists know nothing about them." To this we may reply that most psychologists know little of mathematics, and most mathematicians almost nothing of psychology. A man may know a good deal of mathematics without knowing anything about electricity or chemistry; but if he is studying either of those sciences, his studies become more profitable, his knowledge more precise, if his material is organised by the help of mathematical analysis. So it is with psychology or the science of mind. A man may be Senior Wrangler, and know nothing about the Science of Mind; but a psychologist gets his knowledge of his subject made much more clear and certain if he studies it by the help of the formulæ of mathematical psychology.

The picture I should like to ask my readers to fix on their minds is this: A teacher neglecting the duty for which she was appointed, neglecting to train her pupils into any methodical way of doing multiplication sums; then, suddenly, setting them to multiply two large numbers together, fixing her mind on the figures of the correct answer, and *praying* that those figures may rise up in the pupils' minds and be written down by them: asking, and probably not having, because she asks amiss. A very great deal of just such mis-teaching and mis-praying is being done at the present time, by teachers, ignorant of psychology, who officially profess to represent a Great Teacher Who is said to have *known what is in man*.

A LESSON ON EVOLUTION

To-day's picture, if lodged in a child's brain at a suitable age (i.e. any age between six and twelve years) and settled there in a judicious manner, may assist him, at some future time, in dislodging fallacies from behind a group of expressions among which are: "same," "same kind," "species," "evolution," "continuity," and "permanence."

On rain-water in barrels and small quiet ponds, we often find

floating the whole, or a broken portion, of a little grey boat built of gnat's eggs. If we transfer these eggs to a bowl of water, and keep it in the house, this is what we shall see happen : A tiny creature escapes from each egg, head downwards into the water. It has a breathing tube at the tip of its tail ; and it often comes to the surface of the water, tail uppermost, to breathe. When it has reached its full growth it changes into a creature of similar shape, but of different habits ; it now has two breathing tubes on its head, it comes up for air head uppermost, and keeps its tail folded under its big head. All this time it feeds and spends most of its time below the surface of the water. After a certain time it falls ill and dies (really I do not know how else to describe what happens ; the first time I saw it happen I thought the thing was really dead). The symptoms of illness vary in different individuals, somewhat as do the "last illnesses" of human beings. Sometimes one is reminded of partial paralysis ; the creature comes up sideways and has to right itself by a jerk. Sometimes there are long spells of lethargy and inaction ; sometimes there is a spasmodic movement. At last the insect lays itself out on the top of the water—sometimes with a convulsive shiver—turns a ghastly, earthy, leady-white colour, and thereafter remains motionless. After an interval, which I think in some cases lasts an hour, a tiny crack in the head opens a very little way, and a gnat slowly emerges, stands for a minute or two poised on the empty shell, and then floats into the air.

When this happens with a child looking on, do not preach. To disturb the direct impression of such an event by a word of comment is utterly bad psychology. The utmost that is permissible in such a case is to quote a few words from the funeral service of whatever church you belong to ; *e.g.* : "It is sown in weakness; it is raised in power" ; but it would be better to say them as if to yourself, or to some other adult, than directly to the child. Above all, make no attempt to explain them. The child is not wanted, just then, to understand anything, or to notice anything, except the facts under his eyes. The use of the words (if any be used) would be that the mere association of sound may help to recall to his mind whenever he goes to a funeral of a human friend, the wonderful scene of the water-wiggler's death-bed and the gnat's resurrection. Another caution to be observed, is, not to talk about insect-transformation when someone is dying in the house. No connection between insect transformation and death should be suggested till *after* the child has witnessed and pondered over the death of some human friend or animal pet. Another reason is that people who insist on preaching and "improving the occasion" at every turn, too often precipitate young people into the detestable

habit of thinking that facts can be proved by fanciful analogies. No analogy can prove, or go any way towards proving, a fact. The sound course of reasoning in this matter is not: "The water-wiggler became a gnat and got wings; therefore my grandmother has wings and is an angel" but: "I saw grannie die, and her body was dead, and we are going to bury it; and it all *seems* very sad, but then I saw the water-wiggler die; and I saw his dead shell lying on the water, and I took it out afterwards and threw it away; and perhaps that seemed sad to the other wigglers; but all the time something was going on which I had not expected and which most likely the other wigglers could not see. Perhaps something is going on now, which I cannot see. "The use of analogy is not to prove facts but to recall the individual to consciousness of his own limitations, to cultivate the delicate instinct for knowing "the feel of ignorance," for feeling the exact limits of one's true apprehension of facts; to suggest possibilities beyond the reach of one's own direct apprehension.

Insect transformation should not be spoken of in connection with death, till the child has had personal experience of loss and sorrow. Meantime it has a function in education of a quite different kind. We say nothing to the child about the first gnat which he sees emerge; nor the second; nor perhaps the third or fourth. But, when the process has become quite familiar to him, we can utilise it in connection with a play-logic-lesson. We describe the life of, say, an owl or other night bird; how miserable it becomes if exposed to light; how happy and contented it is in dimness or darkness; how it feeds and thrives on the flesh of mice. When that impression has fully formed, we ask if it would be right to keep a robin or canary always in the dark and give it no food except raw flesh. The child of course knows that it would be cruel to do so; we get him to tell why, to explain clearly that Robin or Dickie is not the same *kind* of bird as the Owl. We then have a little talk about the use and nature of *experience*; we bring out, in simple words, the principle expressed in the scientific formula "Like operations, *performed upon like subjects*, produce like results"; we emphasise the statement that it is wise to give to an animal the treatment which experience has shown agrees with the *same* kind of animal, but that it is not wise to transfer such experience to an animal of *different* kind. Having got this expressed in words intelligible to the child, and accepted by him, as a practical working-formula (with emphasis on the words 'same' and 'different') we ask him some day why the gnat does not go under water; seeing that all the experience of its life has gone to prove that water is the element which suits it best; the gnat is the very *same* individual

who, till an hour ago, was very healthy and comfortable in water, and would have died if taken out of water. We leave him to ponder over the question till he arrives at the conclusion that the gnat, though the very *same* individual which lived under water, is by no means the same *kind* of creature as it was an hour ago. We clear up and strengthen the impression thus made by a mock threat to send Tommy out in the perambulator, and give him no food but milk, because such treatment agreed with him a few years ago. We thus bring into full consciousness the conception that Tommy, though the same individual, is by no means the same *kind* of individual as the Tommy who now eats beef and plays cricket. Perhaps also we may casually elicit the remark that a change even greater than that which took place in Tommy gradually in the course of years, has come on in the gnat apparently almost suddenly.

So much for Tommy himself. To Tommy's parents and teachers, and any other persons who are interested in Tommy's development, intellectual, spiritual, or moral, I suggest another picture. A benevolent gnat, anxious for the welfare of his species, exerting himself to tear off the wiggler skin from his brothers in the water; and a biologist trying to explain to the insect that if the brothers on whose behalf he is so eager, are assisted prematurely to emerge into the air, the wings, not having had time to develop under shelter, will become aborted, and their owners will be condemned, through life, to crawl instead of flying ; and the air-lungs, forced too soon into action, will be likely to set up some disease. The gnat, instead of listening quietly to the explanation, cries aloud that learning makes human beings callous and selfish and indifferent to benevolent efforts for progress and enlightenment.

Analogy is no argument. But it sometimes helps one to understand what an argument is about. There are many controversies on educational matters the true bearing of which would be easier to disentangle if readers started with some clear idea in their minds of the kind of conversation which might be supposed to take place between the benevolent gnat and the obstructionist learned man.

CONFLICTING AIMS

See "The Dog's Path", Logic of Arithmetic

Among the principles involved in the lesson are the following:

The lines you drew are lines of thought, not of fact ; they represent the dog's impulses, or rather your thought about his impulses.

The curve itself was not copied by you from anything you had seen ; nor was it the outcome of what is ordinarily called "artistic genius" ; it was summoned "out of the everywhere into here" by your simple obedience to a rhythmic Law, and probably without your having any clear notion beforehand what manner of curve you were going to evoke.

The curve is not fanciful ; it is true to "nature" ; i.e., it represents, not indeed the exact path taken by any dog on any special occasion, but the path which a dog would take under the conditions specified.

If the dog had not been thwarted, his path would have been a mere straight line (*a* to 1) ; all the beauty has been imported into his course by the rabbit's desires putting the obstacles in the way of the dog carrying out his own desires.

In one of your diagrams the rabbit ultimately disappoints the dog ; in the other the dog ultimately kills the rabbit ; in either case the line of pursuit is a beautiful curve.

Your power to evoke this beautiful curve has depended on *artistic* treatment of the struggle ; that is to say, whether your personal prejudice goes with the hunting animal or with the hunted victim, you have, while drawing, set prejudice aside and dealt impartially with both alternately.

The impartiality which you (acting under mathematical guidance) have exercised has been neither the heartless impartiality of apathy nor the despairing impartiality of philosophic pessimism, but the artistic impartiality which gives full expression to the facts on both sides.

Mathematical Science, besides imposing on you artistic impartiality in dealing with the conflicting parties, has provided you with a ready means of *combining* your alternate sympathies.

The relation of Mathematics to number, magnitude and measurement is here made evident ; numbers and measurement are used in the problem, as the pencil and paper are used ; i.e., as highly convenient, *but not indispensable*, tools and adjuncts of the Art of Thinking.

The reader who has carefully worked out a few Curves of Pursuit, and has realised that these and other similar exercises, such as the paths of projectiles, are being done by very merry and not at all over-worked children of six to eight years old, will not be astonished to hear that adult Geometers are pouring out every year, in mathematical journals, curves of wonderful beauty. Many of these suggest the outlines of orchids and other flowers ; others might be flower-forms of orders unknown to the Botany of this planet. Wherever Geometry finds impulse checked by obstacle

and following "the direction of least resistance," it finds the materials for beauty. Gravitation interfered with by momentum is a familiar example. Lately I saw an exquisite set of tracings made by calculating how water would act if its direct flow towards a drain-pipe were checked by intervening obstacles round which it must turn. Water and air, and such like fluent things, get round obstacles by taking the direction of least resistance, and, in doing so, generate beauty which the Geometer makes manifest to the human eye. If the obstacle be itself moving and fluent, Geometry shows how the opposing movements are most naturally and harmoniously combined. The main use of all this is not the mere enriching of Mathematical Journals with masses of lovely forms undreamed of by the general public ; the main purpose is to reveal to all of us the laws of harmonious working of our own thinking-machinery. We learn how to think artistically about the dog and the rabbit, and the piece of onion-peel in the sink, chiefly in order that we may think artistically about the object which eludes our grasp and the obstacles which interfere with our direct course. When we have learned how to combine on paper the gravitation of water with the momentum of rushing air, and found that our calculations truly interpret the action of Nature's Forces, we are prepared to combine, according to the Laws of the Art of Thinking, the thoughts prompted by our own aspirations and desires with the thoughts of those whose aims seem incompatible with our own.

"THE SABBATH OF RENEWAL"

Children are sometimes brought to me in holidays with the request that I will "find out why my boy (or girl) is so puzzled and unhappy over the sums." Occasionally a school-child calls on me and proffers a similar request. I set the child an easy sum. He begins in a plodding, mechanical manner to do the sum as he would do it at school.

This is the kind of conversation which takes place : "Why do you begin that way ?" "It is the right way." "How do you know it is the right way ?" "It is the way we are made to do it at school." "What would happen if you began this way ?" (I suggest some clumsy method.) "The sum would come wrong." "Would it ? Well, you are not in school now, and it does not matter if it does come wrong. Suppose you try." The child does his sum the wrong way, and finds that the ultimate result is the same as that of the school method, but the school method is rapid and neat, whereas mine takes longer, and usually involves some

scratching out, leaving the paper untidy and confused. Then we do a few more sums, upside-down fashion, and discuss the reasons for the school arrangement. The conversation ends (if the child is thirteen or older) by my saying something of this kind: "My dear child, you have got into a fog, because you thought you could be educated at school. Only half an education can be given in school-hours, or by a teacher; the rest must be got by yourself out of school. Your schoolmaster is paid to teach you the methods and habits which have been found convenient, to get you through certain examinations, to give you a good start in your outer, worldly career, and to see that you are able to go through your life as a decent citizen; it is not his business to teach you the Art of Thinking and Understanding. It may be that he knows it and delights in it. In that case he would thoroughly enjoy having just such a chat with one child as you and I have been having now. But he has no more right to spend school-hours thus than to spend them in dancing or painting pictures for his own amusement. If you wish to learn to be a *thinker*, you must do that for yourself at home in holidays. All that you learn at school will come in usefully as material; but the Art of Thinking, of using thought material according to the natural Laws of the Mind, is a holiday recreation. The best way to begin learning it is to try to do every sort of sum by some different way to the way you are shown at school." I have never found the least difficulty in making a boy or girl understand such advice; nor have I ever found one get on the worse at school after such a conversation; on the contrary, any friction there may have been at school is diminished.

But if a young child is brought to me by its parents, I have to address my explanation to them, and in that case I find difficulties of more than one kind. Some parents say: "I don't like a child ever to do things the wrong way, even in holidays; it starts bad habits," or "it interferes with the formation of good habits." This objection is due to confusion as to the meaning and place of habit. Absence of habit means absence of culture. Laxity or weakness of habit means inefficient culture. Uniform *unbroken* habit is a weed-killer; a very useful thing in its proper place, but *not a means of culture*. Good habit, rigidly preserved during regulation hours, and periodically *inverted*,—not merely dropped, but *inverted*—is the great mind fertilizer. If you wanted a boy to become a merely stupid mechanical bank-clerk, sure of never making a mistake, and also sure *not to understand enough of what he is about to find out when his superiors are cheating the public and the shareholders*, you should make him do his sums always one way, and forbid him to experiment on any day of the year. If, on the contrary, you

wished him to become a mere busy-body, clever at detecting errors in other people's sums, but incapable of keeping accounts properly, let him always do his sums by roundabout and "natural" methods. But if you want a capable arithmetician, able both to do the business he is paid for, and also to understand what is going on round him, and find out for himself how to do things which he was never shown, insist on rigid method during hours of work, and encourage very free and lawless experimentation occasionally. So it is with needlework or carpentering ; if you meant a child to become a mere abject slave of the head carpenter or dressmaker, you should *never* allow the tools of the craft to be handled except in strict obedience to rules that have been found to work conveniently ; but that is not the way to produce what we mean by a capable and efficient workman or woman. As things are, we too often get neither the capable workman nor the mechanically accurate slave ; because teachers find that *absolute* obedience *always* is too hard for human nature ; so the rules are approximately kept all the time the tools are being used, but only approximately. The true educator is the alternation of absolute accuracy for most of the time with absolute free-fling at intervals. Art—in all its branches—requires the combination of two apparently incompatible characteristics—the most delicate accuracy and the most audacious and riotous indifference to rule and convention ; these can be combined within the brain and nerves of any individual, on condition that he shall first have full experience of each *at separate times.*

Of course there are many regions in which the Art of Thinking must be set aside, in which considerations of duty and convenience must rule supreme. Education has a large garden ; and the soil is so fertile, if well tilled, that she can afford to spare a good deal of it, for broad, well-kept paths, where the absence of weeds is secured by processes which make it as nearly as may be impossible for anything to grow at all. *Unbroken* habit is a patent weed-killer (that is exactly the reason why it should not be put where we want things to grow). There is no need for a child to think, ever in his life, about rubbing shoes on a mat ; what we want is that he should never bring mud into the house, nor ever be spoken to or disturbed about the question after he is grown up ; therefore we should *not* allow him to come in with muddy boots on any day of the week. We do not want the man to reason ingeniously or think poetically about thumping on a piano ; what we desire in that matter is that he should never break piano strings ; therefore the baby should be made to understand that thumping the piano is an entirely taboo proceeding, a severely "No—no" action, never per-

mitted on any account, even as a Saturday or birthday treat ; there should be no association of "piano" except with musical sound ; people who wish for a birthday treat of harsh noise must bang an old tea-tray, or the big alarm bell. But we do wish children, if they learn music at all, to develop artistic taste and an intelligent interest in time, tune, harmony and technique ; therefore while the regulation-practising should be always kept strictly accurate, the child should be allowed, as a holiday treat, to improvise in defiance of all rules of time, melody, counterpoint, and fingering.

All this subject has been much cleared up by recent medical investigations on the effects of physical gymnastic. But the essential theory was scientifically worked out a century and a half ago by a French Mathematician, who thoroughly realised its connection with the questions at issue between Pharaoh the slave-holder and Moses the Liberator, and with the original institution of Sabbath. He wrote a remarkable book* about the intimate connection between the doctrine of Unity, the emancipation of slaves, the training of *citizens,* and the true use of Holy-days. Sabbath and jubilee, he said, mean, not inaction, but renewal. He added this scathing comment: "Priests were appointed to lead man into truth ; but in all ages they have feared lest men should find the right road and walk in it."

On this last point my experience does not coincide with his. The clergy are wiser than they used to be ; they, as a class, are not, nowadays, obstructive to scientific treatment of the subject of re-creation. No class is so as a whole ; the great obstructors are those individuals, in every profession, who formulate opinions about things they have not investigated and who dislike other people detecting their blunders.

The chief obstacle, however, to carrying out the biologic mathematical doctrine of re-creation by reversal of attitude lies not in the antagonism of any set of people, but in lack of mutual understanding between different sets. Parents often say to me : "I quite understand what you mean ; but, if I set my children doing things the wrong way, the school teacher will think I am setting them in opposition to her" ; and again many teachers say : "I am sure what you say is true, but if I were to suggest to the children to do things the wrong way in holidays, I should come to some muddle with the parents." The various authorities ought to be able to agree on the limits of a safe exercising ground for the children ;

**L'Origine du Despotisme Oriental,* by Nicholas Boulanger, Military Engineer of roads and bridges to the French Government. He died in or near the year 1759.

it may be fenced round as rigidly as is found convenient ; what children need is *not* license to play pranks all over the thought-world, but a good play-ground and gymnasium.

Within the limits of the gymnasium *every position is permitted and encouraged which would be considered indecorous and disorderly in class.* So it should be mentally. There are many things about which children cannot judge, and as to which, therefore, they should not be encouraged to think at all till maturity is reached, but told what they are to say and do. But about anything as to which they are to *think*, they should be encouraged to think, when not at school, with absolute freedom and to evolve the Laws of Thought from within. Every mental faculty which a human being is to exercise at all, should be used, alternately, in "work"—that is to say, in subservience to necessities or rules imposed from without—and in "re-creation"—that is by evolving its own laws from within. If this is not done the mental faculty flags ; and work, which should be truly mental, is done—(ill or well)—as a mere trick of brain and nerves without any full or true mental action. Then when the teacher wishes the mind to act, she stimulates its flagging powers by exhortations to "think," by a stimulating manner, by pouring out her personal magnetism. Trying to quicken by magnetic influence faculties which are narcotized by lack of normal inversion, induces false action of the brain and nerves, and thus tends to sow the seeds of future nervous and mental disease.

RECREATION FOR THE TEACHERS OF THE PEOPLE

Each class of workers needs some specific form of "Preparation for rest," some recreation suited to neutralise its special form of one-sided strain, and thus to induce the equipoise necessary for complete repose. As long as work hours are short, and pressure light, instinct is a sufficient guide ; the child, for instance, well knows what series of kicks and sprawls refresh it, after the strain of "walking properly," or of sitting straight and holding its spoon tidily. But, as work increases, the need for recuperation increases, while the time available for it diminishes. The instinct to find the right recuperation becomes deadened ; few European needle-women know—till someone shows them how to find out—what sequence of stitches is pleasant to their fingers and wrists. Hence the need for Art-teachers (using the term in its widest sense, to include teachers of dancing and gymnastic) ; we need to be shown some series of exercises specifically arranged to train the muscles

and sense-organs back to the possibility of knowing what gives them pleasure.

Now there exists a recipe for the training back towards recuperative enjoyment of serious persons, of enthusiasts, of propagandist teachers—(in Press, Platform, or Pulpit)—of all persons, in fact, who make it their business to promulgate, or who feel it their duty to be loyal to, special ideas or causes. It is simple and thoroughly scientific :—"Study those who misrepresent you ; learn from those who despise you ; and try to help those who are trying to hinder you."

This, dear collaborators, is not, I assure you, a sermon in disguise. It is possible that, if you take the prescription here given, it may result in your preaching sermons to yourselves ; but I do not intend to get into the pulpit ! These are Saturday Talks, not Sunday Homilies. I am promulgating neither a code of ethics which I suppose possible to be carried out in the business of this life, nor a "counsel of perfection" which sacrifices this life to a future one ; I offer simply a suggestion for temporary recreation ; a means of occasionally escaping from the strain of serious thought by a short revel in the Art of Thinking.

You have been engaged in propagating some idea ; therefore, probably, in opposing some party which denies or obstructs that idea. After a long struggle you become tired, worried ; you need a holiday. "Go away and forget the subject," your friends say. If your heart is in your cause, you may not find that easy to do ; the cause has got "on your nerves" ; it haunts your brain ; perhaps it even disturbs your sleep. An ardent anti-vivisectionist, for instance, may resolve that she will try to forget the cause during her holiday tour ; but she cannot consult a doctor abroad without wondering whether he is "sound" on the one great question ; or pass the gate of a medical school without imagining horrors going on in its back premises ; or pat a strange cat in the street without wondering whether it will be stolen and sold to torturers. How can an anti-war propagandist *forget*, while every newspaper brings war news ? Where can an enthusiastic Ruskinian go to obtain forgetfulness of sordidness, jerry-building, machinery, inartistic costume, and the destruction of natural beauty ? While lying in a wood, listening to nightingales, he wonders how soon the spot he is on will be covered with villa-residences ; even in mid-ocean he hears the throb of the screw, and the smoke of the engine falls on the volume of Poems in his hand ! No, dear collaborators, when we care for a cause forgetfulness is not to be had at will. But scientific recuperation can be taken at any spare moment ; and the one from whom we can best take it is the antagonist whose activity exerts itself to the detriment of our cherished aims, whose

aims we have therefore been obstructing, and whose very existence we are now advised to forget. The true preparation for repose consists in an honest effort to imbibe as much as we can of whatever inspiration has been given to that opponent in trust for the world, and a sincere attempt to assist him in any way that we honestly can.

Suppose, for instance, that you are a "Preservation-of-Natural-Beauty" advocate, and have been worsted and worn out in a conflict with someone who is going to turn your favourite bit of woodland or heath into an ugly slum. The person who could best refresh you is some fanatic on the other side ; one who thinks that all natural forms hitherto evolved on this planet are clumsy and imperfect attempts to manifest true beauty, who looks forward to the future extinction of birds and flowers as calmly as he looks back on the extinction of Pterodactyles ; and who has a somewhat contemptuous pity for you, because you cannot read the revelation inscribed on the two surfaces of the water in a gutter drain. Get him to show you what happens when a bit of solid matter obstructs the free flow of the water towards the sink hole ; the ripples of water on the top, the ripples of light reflected on the bottom. Try heartily to see with his eyes for an hour or two ; then think whether you have any influence in a technical or art school, and, if so, whether you could induce the authorities to admit among the Free-hand studies, series of water-curves and of lines of reflected light. *Then*, go and forget, and take your holiday. You will not find any the less loveliness in trees and streams because of the lesson you have had. Whatever you could see before, you will see even more clearly after. But a polluted stream will not hurt your soul as it did before ; for you will realise that, however much of beauty it may have lost, the beauty which remains is still infinitely great.

Posterity is sure to discover that there was some truth on each side, and some misunderstanding on each side ; the world's wisdom and science are made by successive discoveries of unity where disputants had been seeing nothing but antithesis. But we are talking now, not of abstract wisdom for the world after your death, but of recuperation for you now. If you would do, now *in the first relaxation from the strain of your struggle* (for that is the true hygienic moment) what disputants usually leave for posterity to do, i.e. find out the good and truth of both sides, it would freshen your nerves as nothing else can. It has the same sort of effect on a propagandist that Swedish drill has on a sedentary school girl, or the Gymnasium on a draper's shopman. It tends to induce sleep, and thus sets him up for future work.

Those to whom this prescription is new, will think of it as involving a heroic moral effort. That is what the anæmic clerk thinks the first time that, instead of indulging what he supposes to be the desires of his limbs, he goes, by the doctor's orders, to the fencing-school or the gymnasium; he feels very virtuous and heroic about it. But if the recreative exercise is really adapted to his condition and properly modulated, he soon finds that his evening's stroll and his night's rest are, because of the gymnastic exercise, more really restful than used to be the case, for the repose is deep and thorough; and no longer disturbed by fits of "the fidgets." He also finds that he looks forward to the gymnastic as much as to the repose, for it has become a luxurious enjoyment in itself. Those of us propagandists who have tried the great prescription for nerve-recreation, have made similar discoveries about it. It takes off the strain of working-thought, by plunging one into a glorious revel in the Art of Thought-combination, and thus it tends to promote sleep—sound, dreamless sleep, fruitful of fresh inspirations for the waking hours. Do not be afraid that it will make you faithless to your own cause; you will be all the better servant to it for not being a slave to the prejudices of its more inelastic supporters, a victim to the fallacy-microbes which infest their unsanitated minds. Your influence, too, will be increased as well as your strength. Mere hangers-on of your party may think the less of you for what they will call your "inconsistency"; but they are not the persons who most need your instruction. With the not-yet-convinced portion of the public your influence will be all the more practical and more far-reaching, because your holiday excursion to the enemy's camp will tend to protect your future utterances from mistaken assertions about points not essential to your own purpose. After all, the world is governed on the whole, not by the conscious opinion of any section of fanatics, but by the survival of the fittest; and, in these days of nervous exhaustion, the chances of survival are, on the whole, in favour of those who possess the power to sleep soundly after worrying work, and to procure recuperation of energy by artistic combinations among elements each of which may have seemed unbeautiful until the combination was effected.

A SATURDAY TALK ABOUT SUNDAY LESSONS

I HOPE no one will infer, from the title of this final paper of the series, that I cherish any pretensions to advise religious teachers as to what they ought to do in their parishes or how they ought to

preach in their pulpits. But they, like other people, must need rest at times ; and for them, as for others, repose is promoted by the artistic impartiality which does full justice to both sides of some disputed question. I can conceive of no more refreshing change for a weary preacher of righteousness than an excursion to the other side of that curious barrier which hangs between him and the essentially scientific turn of mind ; I do not mean a plunge into reading of the results of science ; (most people nowadays do more or less of such reading) but a touch of sympathetic contact with the scientific mind itself ; with the attitude of mind from which the consideration of moral right and wrong is absent, which seeks to know what is rather than what ought to be, and which assumes that, if there be a God, all that happens is somehow an expression of the Divine Will. The barrier which keeps religious people from enjoyable contact with minds in this condition seems to many of the former to be impassable. "There is no barrier more impassable than a curtain of cobwebs, thick with the dust of ages, as long as people believe that the cobwebs are solid and the dust sacred. As soon as they decide to act as if the barrier had no existence it ceases to exist." In the course of a long career as secretary and humble coadjutor to a succession of men well known in the world of thought, I have been led to see what a chaotic mass of misconceptions goes to make up the supposed antagonism between the religious and the scientific attitude of mind. This matter has evidently got on to the nerves of people on both sides, and causes needless pain and tension, especially to the sincerely pious. The tension is rather added to than diminished by elaborate attempts to explain away this or that difficulty ; it is like trying to get rid of cobwebs by laboriously unpicking the threads. It is simpler just to brush them away.

Many people have a fixed idea that Science and Philosophy tend towards disrespect for ancient authorities and that they are setting up some claim to supersede Scripture. As to the first point, the scientific manner of *expressing* respect is somewhat different from the theological ; no science-teacher worth mentioning wishes anyone to "believe" a thing because he says it. Respect is shown in a Science School by taking pains to ascertain exactly what the teacher does say and then experimenting to test in what sense it is true. Science-men do to religious teachers *as they themselves wish to be done by*. As to superseding Scripture, that is a chimera. Science and Philosophy always tend towards ideal maxima attainable only by the few ; Scripture lays down minima for the masses. The Greek search for beauty included the beautiful in conduct ; but it was carried on by Artists and Philosophers, while slaves did

the menial work; Israel's moral codes were for all classes. Our physicians give advice about diet and sanitation which practically includes all the best of the physical regimen enjoined in the Pentateuch; but only the comparatively wealthy among us can do what the doctors advise; whereas no Jew might eat what was contrary to the hygienic code of the Hebrews. Our philosophers believe, as the same class in ancient Egypt seem to have believed, in One Creative Power; the core and centre of the Mosaic Code was, not that there *is* One God, but that no man, woman or child in Israel should be distracted by rival, partial conceptions of Deity.

One of the most remarkable things in the Bible is the negative fact that it contains so little record of what men of learning and leisure said to each other, except when they talked on behalf of the masses. Socrates, we are told, sent his wife and children away from his death-bed in order that he might express, undisturbed, to chosen friends, his hopes about his future life. Who, in the Bible, arranged similar favourable conditions for promulgating sublime Philosophy? Moses sent his most intelligent followers away from his death-bed to lead the People into Canaan; Elijah's last conversation with Elisha was not about Elijah's hopes of Heaven, but about Elisha's mission on earth. Probably the learned and refined and pious exchanged their personal sentiments and aspirations, in Palestine as well as elsewhere; but apparently no one thought it worth while to record what passed. The Psalms—which people try to compare with the utterances of our most devout philosophers—were hymns for public worship.

Then again, we are told that "the religious festivals of Palestine were 'only' what we now call Bank Holidays, accompanied by the public slaughter of animals used for food." But there was this difference; educated society in Palestine was expected to take part in both the labours and the recreation of the masses. When we have in Europe a condition of things such that when animals are killed for food the gentry and clergy of the parish must be present to prevent cruelty and drunkenness, that no man can be a college professor unless he and his wife and children spend vacations camping out in the company of working men and charwomen, and that the Bishop of London and his family find rational amusement for Bank Holidays upon Hampstead Heath, then we may begin to consider the possibility of "superseding the Bible by the light of modern wisdom." Till then, it seems to me, the question is, not whether we can supersede it, but whether we shall ever arrive within measurable distance of catching a glimpse of its true Ideal.

The real antagonism is deep and deadly enough; it lies, how-

ever, not between the teaching of religion and the teaching of other subjects, but between ideal perfection (whether physical, intellectual, or spiritual) for the few, and some attempt at tolerable life for all. It rages within every department of thought and of science. No antithesis can be more complete than that which exists between the methods adopted by investigators, and by popularisers, respectively, within the same science.

The antithesis of which I here speak creates more disputes among secular teachers than most people are aware of ;* the world hears comparatively little of such disputes ; the little which leaks out presents itself to the public, either as "difference of opinion about the best methods of teaching," or as "rivalry between Professors of different Sciences, each claiming that his own is most important and most educative." When a conflict of precisely similar nature occurs between a scientific man and a theologian, the animus on one side is ascribed to "the antagonism of religious people towards scientific truth" ; the impertinences of the other side figure as "the contempt of scientists for religion." The real omnipresent and perennial causes of antagonism are : the disgust of inspired investigators for popularisers of mere knowledge (whether in their own subject or any other) ; and the revolt of teachers of the masses against those who wish to sacrifice the utility of knowledge for all

*Mr. Huxley, for example, published an account of what he was pleased to consider the training and procedure of "the mathematician." It is really a fair account of what takes place when an average class is being instructed in Euclid by an average teacher ; it has no resemblance to anything which happens when a mathematician is either prosecuting his own studies, or teaching his own children, or training pupils of whom he hopes to make mathematicians ; the two modes of procedure are as unlike as, let us say, the methods of the average general teacher using Mr. Huxley's books to prepare a class for a Pass-Examination in Biology, and Mr. Huxley's own methods of training future Biologists. He was evidently contrasting in his mind the ordinary teaching of Euclid with methods such as his own in Biology. This kind of cross-cornered comparison, whether expressed or implied, is of course unfair. Professor Sylvester, the mathematician, retorted and a somewhat unseemly controversy followed. Now any Bishop might have written exactly what Mr. Huxley wrote ; (anyone might have done so who had been only "taught mathematics," not trained to *see* mathematically). If a Bishop had done so, all the world would have heard of the quarrel between him and Professor Sylvester ; the ignorant platitudes of one side would have been ascribed to "the unfairness of religious teachers towards science" ; and the angry satire on the other side would have been quoted as a "revolt of intellectual pride against the admonition of spiritual pastors." As Mr. Huxley was a "scientific man," hardly anyone outside of mathematical circles ever heard of the episode at all ; mathematicians said what was the exact truth :—that Huxley talked nonsense about what he did not understand ; and that Sylvester lost his temper. Huxley and Sylvester, of course, still remain, in the non-scientific mind, two united elements of that great scientific solidarity which is supposed to be the antithesis of "religious influences."

See Macmillan's Magazine 1869 ; and Preface to Sylvester's "Laws of Verse."

to the luxury of personal investigation for those specially able to approach the Infinite Unknown and see with their own inner vision.

The Bible ideal contains a combination of both our rival ideas. Israel was to be a Nation of Priests:—That is to say, every man was to be instructed enough to teach the elements of hygiene, sanitation, Hebrew literature, history, and religion to his own family; and decorous enough to be fit to take his turn of official ministration in public worship. But was the rapture of personal Inspiration to be forfeited, stamped out, in the effort to secure universal instruction and decorum? "Would to God that all the Lord's People were Prophets, even as I am," said the Legislator; aspiring to nothing less than that every man, woman, and child should share in the sublime joy of personal communion with the Infinite Unknown, and draw down knowledge fresh for himself. All citizens were to be decorous, orderly, moral, and regularly industrious; yet none were to be conventional; all were to Prophesy and see Visions and dream dreams, the lion is neither to interfere with the sheep, nor be exterminated lest he should injure the sheep. Room is to be found, together, for elements which to us seem incompatible.

But where is that Holy Mountain in which nothing hurts or destroys anything else? "The Kingdom of Heaven is within you."

How much of the Heavenly Ideal any of us will live to see realised in outer fact, and how, or in what form, the realisation is to come, God alone knows; but how to use our leisure so as to fit ourselves for being ready to do our own share of the work as time shall unfold it, we ourselves know,—or can know if we will. Man is a creature, one of whose most vital functions is to conceive Unity *where he has been perceiving antithesis*. The fittest to survive, and to teach, are those who know how to procure recuperation by returning to the *thought* of Unity after each working period of tension on conflict. Whenever and wherever we perceive antagonism, there, in the next period of preparation for repose, we should do well to seek for some Ideal Unity. In the effort to see Unity for mankind lies our best hope of renewing our own energy and strength.

HOLIDAY TALKS

WITH SCHOOLGIRLS ABOUT THE SOURCES OF KNOWLEDGE

To Mary from Granny

(This booklet contains the substance of what many of the generation now passing away would like to say to the children.)

"Turn the heart of the fathers to the children, and the heart of the children to their fathers."

I

We hear a good deal nowadays about the necessity of education, and the value of knowing things. Have you noticed that you have other teachers besides the ones whom you meet at school?

In the course of a lesson a question might occur, involving reference to the latitude of Cairo, or the distance between Constantinople and Pekin, or the date of a battle. If you did not know the latitude, distance, or date, you would probably ask your class-teacher. If she did not know, she would look in some book. If no book in the house contained the information, she might look it up in a library, or ask one of you to do so; and communicate it to the class on some future occasion. In either of these cases, the knowledge would come to you from some human teacher.

Learning from a book is really learning from a human teacher, who does not happen to be present, and who instructs you by writing. You can have no access to knowledge of history and geography, except through some human being.

Now, I want you to notice that the possibility of a person teaching another depends on some relation or kinship. A man can convey more information to you than to a dog; this is partly because the dog is incapable of receiving as many kinds of the teacher's knowledge as you can; but it is also partly because the power of conveying information from one to the other, even where that other desires it, is less where there is less kinship.

There are ways of learning which do not depend on kinship with a human teacher.

You might need to know how many stamens a crocus has, or in what order a spider spins the threads of its web. In either of these cases you *might* ask your teacher, or look in a book; but there is a

better thing to do, take some opportunity of looking for yourselves ; thus you learn direct from Nature, to which we are akin and which has evolved in us senses and faculties suited to consult and learn from her. You might wish to know how many days intervene between the sun seeming to set behind a special tree or chimney, and its seeming to set behind a certain other. Here again it would be better to watch and count the days as they pass than to ask someone else. For it is well to take suitable opportunities of cultivating the power of holding intercourse with Nature and learning directly from her.

But suppose that you have occasion to wish to know how many days there are in fifty-seven years. Will you ask your class-teacher ? It is almost certain that she knows no more about it than you do yourself. Will you look in a book ? It is most unlikely that any book in the house contains the information. Will you ask your teacher to look the question up in a library ? No. What will you do then ? Consult Nature herself ? Wait patiently for fifty seven years, and count the days as they go by ? Oh ! dear, No ! You can find out in five minutes. You will take a blank sheet of paper, and a pencil, and multiply the three easy small numbers, 3, 6, and 5 by the two small numbers 5 and 7, then add the results together, with extra days for leap-years, and presently there appears on your paper, in your own hand-writing, the answer to the question you asked. When one comes to think it over, it does seem very strange that the mere fact of writing down the answers to six easy questions which we knew all about before, should be the means of conveying to us information about a difficult question which we knew nothing about. But so it is. We do multiplication sums so often, and they so constantly come right, that we forget to wonder at it all ; but when we stop to reflect, it does seem a very wonderful process. Who told us the number of days in fifty-seven years ? Think of this question for a few minutes sometimes between this and our next talk.

II

We left off with a question. Who told us the number of days in fifty-seven years ? I hope you have thought it over and are a little more prepared for the answer than you would have been if I had thrust it on you just when you had been busy listening to what I said about the other ways of getting knowledge.

Whoever it was that told us the number of days in fifty-seven years, could have told us the number of seconds in fifty-seven years, or fifty-seven millions of years. Who, or what, was it ?

Those of you who are learning about heat have heard that there is diffused warmth in the air even when it feels to you chilly. There is latent force in most things; that is why rubbing things hard makes them feel warm. Savages can light up wood into a blaze by rubbing it, even in cool weather; that is because plenty of force was stored in both the wood and the cool-feeling air. In some books the word immanent is used, not im*m*inent (which means threatening) but immanent, which means that the force exists and can be called out into an active form, though it is not at present perceivable by man.

You know how electricity is got, for lighting our houses or ringing our bells, or running our machines? There are several ways of getting it. Franklin put a wire up into a thunder cloud and drew down some of the electricity which was making lightning. Some people rub something with silk or with wool; others use what is called a battery, which is made by dipping metal plates in acid. All these processes depend for their success on the fact that there is a store of latent force all round us; the processes of rubbing, etc., bring it "out of the everywhere into here"; out of the diffused condition into a focus; out of the latent condition in which it ministers to our life and health but does not make us aware of its existence, into some condition which affects our senses and our consciousness, in which it performs some special bit of work which we desire to have done. Men do not make the force by rubbing glass or dipping metals into acid; as I said: what they do is to bring it "out of the everywhere into here," to localize and focus it.

Similarly we localized a certain bit of knowledge (about the number of days in fifty-seven years), which must have been in existence somewhere, though not in our consciousness. Indeed, it must have been in existence everywhere; for we can get at it wherever we are. We localized it out of the everywhere on to the bit of paper that was under our eyes. But who or what had that knowledge before it appeared under our eyes? There must be some supply of latent knowledge diffused all around. In Him,—(or It)—we live and move and have our being.

Whether we do or do not localize knowledge and focus it in consciousness, it is about our bed and about our path, as the Psalmist said. Any process we can carry on with regard to it can only be a localizing, focussing process; we neither create the knowledge itself, nor make our own relation to it.

Mathematicians have invented processes for focussing immanent knowledge on a certain range of questions—questions about number, quantity, etc. Religion-founders undertook the far more important task of focussing it on questions of conduct, of managing

our relations with our fellow-men. It is a grand conception, terrible in its intensity, and importance ; but one feels it is a task with which man is meant to deal and must deal. We do not always know how to manage our life with other people ; we must try to get the immanent knowledge to focus itself and show us light.

Let us see now what we clearly know as to our relations with the Immanent Eternal.

The great heat-god is always about us, invisible, keeping us from dying of cold. It manifests itself to our senses whenever we light a fire. The thunder-god is always about us, keeping life in our nerves. It localizes and makes itself evident on any bit of wire which anyone links with a properly-made battery, or electric wheel. The great mind-god, the Inspirer, the Father of our minds, is always about us without our perceiving Him ; and localizes on any bit of paper on which we write figures in proper order. The heart-god, Love, is always about us, keeping society alive, and localizes and becomes manifest whenever and wherever we take suitable steps to make the localization happen.

All this is as simple and as certain as the multiplication-table. And yet things are sometimes said, in books and sermons, which *seem* to children as if the grown-ups did not quite recognize it. It is about that *seeming* that I want to say a few words to you, in our next talk.

I will ask you to think a little in the meantime about the process known as spring-cleaning ; why it is necessary : what it involves ; and how you consider that a well-bred girl would feel and act if, on coming home from school in the evening, she found the domestic arrangements not quite as orderly and intelligible as usual.

III

We said last time that the grown-ups do not always *seem* to understand the Immanence of the Eternal Inspirer. Things are not always as they seem to be. I am going to tell you about something now happily over, but which left traces still visible here and there.

The business of religion is, as I said, to concentrate the Immanent Heart-light and focus it on the difficulties which we find in living among our fellows. The great religion-founders always said this. They instructed us, when we wish for Light on our special difficulties, to *begin* by speaking to Him as Our Father :—then they told us of various other things to do with a view to focussing His help here, or there, where it is wanted. The beginning of

religion consists in recognising that the Immanent Love is already Our Father ; the rest of it has reference to the process of focussing, concentrating, bringing Love out of the everywhere on to where we want it.

But—as if this real task of religion were not sublime enough and mighty enough—some crazy persons, long ago, who called themselves followers of the Founders, pretended, and I believe really imagined, that their business was to organise *our relation to the Immanent* Itself. (Some have even dared to suppose that it was left to them to create that relation). It seems incredible and inconceivable, but it is true, that, for many centuries, religious teachers insisted on trying to tell us on what conditions we may consider ourselves the children of the God Who is our life, of the Immanent Knowledge Who focuses Himself visibly on any bit of paper whereon a schoolgirl scribbles a few figures !

The times of this ignorance God winked at :—much too long, some of us in our impatience are tempted to think. The Eternal is never in a hurry ; with Him, a thousand years are as one day. And, though His mills grind slowly, they grind very effectually. The pretension of religious teachers to interfere about our relation to the Immanent, if not quite "as dead as the Dodo," is as evidently dying out as the Giraffe. It is being artificially preserved in certain technical phrases as an ornamental appendage to the ecclesiastical office ; much as wild cattle are artificially preserved in certain aristocratical parks ; but for any practical influence which it now has, it may be said to come under the category of "extinct monsters." So now the Churches are able to start on their true function, i.e., teaching men, women and children orderly methods for bringing spiritual electricity into focus, as steady light on human affairs ; localizing the inspirations of the Immanent Father on to questions of personal conduct and social organization. But you now see that your elders have been busy house-cleaning, and perhaps have not always had time to understand clearly either all your questions or all your requirements. They were working chiefly for your good ; most of them will not live to enjoy the fresh pure home which they hope to leave for you. And oh ! my dears, it has been weary and sickening work ! The task laid upon us was not the mild and orderly process which is carried on every spring in every well-regulated house. We have had to turn out rubbish which has been accumulating ever since the dark ages, generated by that inconceivable horror which I told you of:—the claim of mediæval theologians to take possession of our relation to the Immanent Father. There is no word in English fit to describe the mass of nonsense which that idea gathered round itself

in the course of ages ; in German we might call it *"ungeheuer."* It was so big, so complicated, and so revolting a mess that some people a generation ago were eager to get rid of the whole conglomeration at once. But you know, my dears, if you found yourselves in a grand old castle, where great spiders had been spinning webs over everything for fifteen centuries, it would not be wise to send the whole contents to the crematorium without investigation, priceless treasures might be lost to the world for ever in that way. We have been house-cleaning that grand old erection called Religion, clearing everything out bit by bit ; and some of you will live to be thankful that we did so. Your parents have, for the most part, kept you at school, busy with other things and out of the way of the muddle ; wisely so, for house-cleaning on that gigantic scale is unsanitary work, and too fatiguing for children. But that is no reason, dears, why you should not be expected to have a little more sympathy than some of you *seem* to have with the fatigue and sickness of the house-cleaners.

Seem to have. Now I must preach my own sermon to myself; probably you are not really as hard-hearted and thoughtless as many of you *seem* to be. Now we have done the worst of the work, the clearing away of unhealthy, unsavoury rubbish, I am sure you will try to help us to do the final tidying up, to put the treasures back in their proper places.

IV

To-day we will go over some of the statements which you are to arrange.

Every time you go into a dark room and light it up by just touching the electric button, you prove yourselves children and heirs of the Being we read of in Genesis, Who just said :— "Let Light be," and light was.

The heir to an inheritance is not trusted with full control while he is a child.

In dropping the mistaken old belief in the right of religious teachers to interfere with our relation to the Immanent Light, we must not forget the need which still exists for some orderly process of bringing that Light to bear on special questions concerning our relation to our fellow men.

In spite of the diffused warmth, you would feel very cold sometimes, if some one did not make a concentrated heat spot (a fire) in your homes.

Lighting a fire is a sort of form, or *ritual*, which makes heat perceptible at a particular spot. Charging an electric machine is a

ritual which makes immanent electricity available for special purposes.

The unseen warmth and immanent electricity of the atmosphere act fairly well on us all, young and old, wise and foolish, good and bad alike ; but arrangements for concentrating and localizing the latent force and bringing it to our consciousness must be carried on with due regard to what experience has to teach about the disastrous effects of mismanaged concentration.

Doing a sum is a *ritual*, whereby immanent knowledge, about numbers too great for us to cognise, is focussed on some particular question concerning certain of those numbers.

A ritual may be dull, monotonous, uninteresting ; but it must be gone through regularly if we are to get a regular result. However great our knowledge of principle (in arithmetic or electricity) or however deep our interest in the general subject, the light will not *appear* just where it is wanted, unless some appropriate ritual is gone through.

A religious ritual is a monotonous performance intended to focus light on our relations to one particular section of humanity—our fellow worshippers.

Sermons, when they are good, tell us by what processes we can bring similar light to bear on our relations to other sections of the community.

We are told that God is Love ; and also that God is a consuming Fire. Many people think that the statements cannot both be true ; because if they were so, that would work out to the conclusion that Love is a consuming fire. But that conclusion is quite a true one. Love is a fire ; and whoever lights a fire ignorantly or carelessly is likely to burn not only himself, but also the house which he intended to warm. Think of that sometimes when fine phrases are flying round you, such as Love of *Country*, Love of *Oppressed Races*, Love of *Humanity*, and Love *of Truth*.

If you want a nice, wholesome, amusing book to read in the holidays, read Darwin's *Earthworms*. And, as you read about these creatures who make agriculture possible for us by plodding quietly underground each at his own concerns, tell yourselves that Darwin himself, who lighted up all modern Science, as if by a touch on an electric button, had first plodded quietly, till he was fifty years old, at the monotonous business of charging his battery and making it complete and safe. And when he had lighted up the whole world of Science, he settled down quietly in his study to watch how earthworms feed and grow.

The pulsating force which is quivering all round us localizes itself of its own accord, without the aid of man, in rainbows and

plants, in shells and flowers. But if a man, even one who has no knowledge of Art, has patience to go through a certain humdrum routine with some cog-wheels and a pendulum, that same pulsating force will localize where he pleases—it will trace on paper forms of endless varieties of loveliness such as no artist could have conceived; it will pour out on bits of glass colours that no chemist could create, no painter imitate, which, as they move, might be fairies dressed in rainbows, dancing to the music of the spheres. Yet there are girls who think it necessary to make tragedies in their own lives and other people's because they fancy that what is humdrum and quiet cannot be interesting or beautiful!

What is that I hear you ask? *What is the upshot of all this talk, and what am I advising you to do?* My dears, I am not going to work out your sum for you. The teacher who consents to do that is a bad friend for young people. The idea that it was some teacher's business to tell men what God had to say to them was the source of the mediæval muddle that we have been so busy clearing away. I have set your sum; that was my part to do. I have selected a few elements which my experience leads me to think you ought to be able to combine without undue strain on your minds. As you wrote on your paper the five figures I dictated, so now write on your memory the elements I have recommended to your attention. Let them rest there quietly. Presently the answer will appear on the surface of your mind. The answer to the bigger question about 57 × 365 came when you *put together* the easy answers which you knew already. The union in your mind of things which, when you first heard them, seemed disconnected or perhaps even contradictory, is the *ritual*, by means of which you focus the help of God, the Eternal Unity, on to your own special difficulties and needs. The sooner you learn to seek His help for yourselves in the silence of your own souls, the safer you will be throughout your lives.

The wiser you grow, the more you will see the wisdom of getting all the help you can from the knowledge stored up, in religious books, rituals, symbols and creeds, about the best conditions for evoking Light from the Unseen to enlighten your path through this visible world; you can do so all the better because we, your elders, have cleared up for you the confusion which used to exist between the fire on your hearth and your share of the unseen warmth; between definite information about facts and general inspiration of Unity; between personal affection and Immanent Love. We hand over to you clear and pure the treasures which we have found in that confused mass of contradictions mis-called Theology; you must arrange them now to suit your own require-

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ments. You, not we, will have to live in the freshened-up, new-old home. We are tired, and are going to rest in the bosom of the Immanent Truth, our Father. We are ignorant of many things which you children already know. We have done things which we ought not to have done, and left undone many things that we ought to have done. God, we hope, will forgive us, because He is our Father ; and if ever you are tempted to feel bitterly because of some trouble brought on you by our sins, of omission or of commission, reflect that at the cost to us of a struggle, the full bitterness of which you will never know, your world has been cleared of many confusions which darkened our youth ; and you are left free to hold converse in Peace with God, the Eternal Teacher.

EXTRACTS FROM BOOLE'S PSYCHOLOGY

AS A FACTOR IN EDUCATION

This was published as a booklet in 1901 *but parts of it were used in other books.*

I SHOULD like to make an effort to put before the general reader an idea of what Boole's method means to those who understand it. If the reader happens to be a parent or teacher, the matter concerns him deeply. I will begin by showing why it does so. To make this clearer I would ask him (excuse the seeming bathos, kind reader ; it is only apparent ; I hope soon to prove to you that the plunge down is only a plunge into the trough of the sea, between the crests of two high waves)—I would ask the parent or teacher to fix his mind, for a few moments, on man's dealings with such entities as, say, flax or spinach. What man primarily asks of the spinach is soft stuff to eat. He would like, if he could, to persuade nature to grow the soft stuff without any hard fibre. On the other hand, if he happened to be dealing with flax or hemp, he would like the fibre to grow without any soft stuff. But nature declines to do either of these things ; she persists in declaring that the soft stuff must be supported by more or less of fibre ; and fibre in its turn must be clothed and fed by more or less coating of softer material. We therefore keep kitchen-maids whose business is, after the spinach has grown, to rid it of as much of its fibre as they can, and cooks of whom we expect that they shall entirely disguise the rest. We also keep hecklers who send the flax-fibre to the spinning mills, scraped and washed clear of its cuticle, and its soft tissue (parenchyma). These operations are performed entirely for

man's convenience; they have no relation to the health or development of the plant; on the contrary, they destroy its life. But so much are we the slaves of mere habit, and of our own immediate convenience, that many persons, when they hear the word "spinach," think of a lump of amorphous green stuff in a dish; while the word flax suggests to them nothing more interesting than white threads tied in a skein. If the reader will kindly suppose that the Spinach, in the above parable, stands for Arithmetic, and the Flax for Logic, it will spare much explanation.

Before going further I must say a word to reassure persons who may be tempted to fear that anything wildly revolutionary in education is being suggested, anything analogous to making children eat the stalks of spinach, or wear frocks made of flax stained with sap. Nothing of the kind is desirable or is here suggested. For practical and business purposes Algebra and Logic must remain what they have hitherto been. But there come to the human intelligence times of revival, when it dawns on people that man stands, after all, in some other relation to nature than that which is expressed by treating her productions as things to eat and things to wear; that he must treat them sometimes as things to understand. For this purpose they must be manipulated by methods quite different from those of the heckler and the cook; the processes used by these functionaries must even be reversed. For instance, leaves, including spinach-leaves, must be subjected to a solvent, which discharges the green stuff, leaving the fibres naked; not, however, as the heckler does, in convenient bundles, but in a manner which preserves their original form, thus manifesting their mutual relation and their mode of growth. Then, also, sections of stalks, including flax-stalks, are carefully taken, and put under the microscope, to show the mutual dependence of the fibre and the other portions. And then different plant-skeletons are compared together, and the properties common to various species brought to light. And, above all, the student is encouraged to watch the plants in a spirit of reverent patience, as they grow without human interference. There have been farmers, not a few, who scoffed at all such study, as useless and unpractical. Their antagonism has had to give way before an argument which appealed to them on their own premisses. There are blights before which the practical farmer stands helpless, till the botanist and microscopist show him how to get rid of them. There is all round us just now growing restlessness among parents and teachers; a feeling that it is not good for children to sit perpetually devouring and wearing the results of nature's evolution and of man's toil, without comprehension and, therefore, without gratitude or reve-

rence. Many are beginning to wish that children should to some extent understand the delicate beauty, the divine mystery of the processes by which thought is evolved. If this is to be, some one must approach the subject from a standpoint which is not that of mere convenience, must subject thought-growths to processes of manipulation different from those of the heckler and the cook, the examiner and the examination coach.

Some time in the week or year, some time, somewhere, in a young life, leisure must be found for treating thought-growths in accordance with no laws except those of the mind itself, in subservience to no necessity except that of its harmonious development. There is no time for this, we are told, in our bustling pushing life ! But what about those mysterious incomprehensible blights ? What numbers of intelligent boys and girls, now, cannot learn even Algebra or Arithmetic ; and what crowds even of those who have passed stiff examinations in these and higher branches of Mathematics, are as helpless as savages would be when it comes to applying the Calculus to investigations in the action of real Forces ! With what tragic absurdity has mathematics been *mis*-applied to the whole field of Political Economy !

To take for the present only the obvious failures, the children who cannot learn Arithmetic or Algebra (who are almost always the specially logical, the intellectually conscientious). I wish it were possible to give to parents even a glimpse of what I have seen about the main cause of such failure, in the course of twenty-five years' experience as a consulting physician to so-called "hopeless duffers" in mathematics ! The failure is usually—I think I may say invariably—due to the fact that the child has been taught mathematical processes by some one who did not himself understand the metaphysical skeleton of those processes. The teacher has been trying to "prove" to his class something which is false in fact. With the majority, he has been more or less successful, from his own point of view ; i.e., he has succeeded in inducing a bad habit of being satisfied with a sham proof. Such children as those brought to me as incompetent are those with whom he has failed to attain that end ; but has, instead, induced a habit of hopeless non-comprehension ; perhaps also one of self-protecting and contemptuous non-attention.

I am far from wishing to assert that it is advisable to introduce a child to much of metaphysical conception, before he asks for it. But it is important that the teacher should have in his own mind the right metaphysical conceptions, and should frame in accordance with them his answers to children's questions. People who think that this is a mere question of degree, that Arithmetic

taught on a false basis is only less good for the mental development than Arithmetic taught on a true basis, are very much mistaken. A teacher who, after giving "proofs" to his pupils, either discourages their questions, or answers upon a false basis, is doing very much to injure whatever of mental capacity they may possess. It would be better for both their mental and their moral development to learn no mathematics whatever, to get such culture as can be got out of languages and the natural sciences, than to be subjected to the hideous process of distortion known in many schools as "learning" Algebra and Geometry.

It is much to be desired that teachers should be provided with a solvent, by means of which they might, at will, occasionally discharge from their field of view the parenchyma of Algebra (or Arithmetic), and leave standing clear the fibre which marks the course of its evolution.

Now Boole's method is essentially just such a solvent. The reason why it has been so little used for that purpose or any other connected with educational, ethical, or psychological truth, is that it rests on two discoveries of his which should have been formulated separately. Had this been done, they would indeed have appealed, primarily, to minds of quite different orders ; but some would have seen, as he saw, how they bear on each other. Fused into one, as he presented them in the Laws of Thought, hardly any kind of person seems able thoroughly to disentangle them. I propose now to formulate them separately and then try to show their connection.

The first of these discoveries he made in the year 1832 or 1833, at the age of seventeen. As he long afterwards told me, it flashed upon him suddenly one afternoon as he was crossing a field. It was the mystic secret, the open secret of all the ages ; the same which has been known to all great Seers, Mystics, Religion-Founders from the dawn of History, viz :—that the mind of man is encased in a mechanism which, besides receiving impressions through what we call the senses, receives information also from some source, invisible and undefinable, the access to which opens whenever the mind, after a period of tension on the difference, contrast, or conflict between any elements of thought, turns to contemplate the *same* elements as united, or as forming parts of a unity. The highest form of this mental exercise is, of course, that recommended by certain religious moralists, i.e., when we wish for religious inspiration, to prepare for it by seeking the bond of brotherhood and friendship with the person with whom we have been at enmity. This form of reunion after separation is the highest in illuminating power ; the preliminary tension, or sense of separateness, being more acute, and usually more prolonged, than where the sense of

contrast is merely intellectual ; and more of the nervous system is involved in personal hatred or anger than in a mere sense-perception, such as that the harebell is blue and the ragweed yellow. But a small and non-emotional effect of the kind indicated is produced when we turn to consider the qualities common to two plants, or other objects, after we have been studying the respects in which they differ.

(Also, when we form a conception of the direction taken by a body acted upon by two forces, or by one force which we represent to ourselves as acting in two diverging directions. This last, as Gratry and Hinton showed, was the secret of Newton and Leibnitz, the essence of the revealing-power of the Calculus invented by them.)

This secret for inducing inspirations of new knowledge is embodied in Boole's Thought-Equation,

$$x + (\text{not-}x) = 1.$$

where 1 stands for the Unit of Thought for the time being. George Boole often tried to translate this Equation into words. But many circumstances combined to hinder his publishing any word-version of it. In 1855, to his great joy, Père Gratry the Oratorian, formulated the truth which it expresses, in language on which George Boole felt he could not improve. Gratry made the Law of re-union after tension on contrast the basis of a method of procuring suggestions and revelations ; a method as systematic and regular,* and as scientific as any invention used by electricians for inducing currents. Gratry explains how he also used his method for the purpose of procuring sound and dreamless sleep and for making such sleep fertile of new thoughts. He prepared both for repose and for inspiration by fixing his mind on the properties common to things seemingly different, and about which he had been acquiring concrete knowledge by methods totally diverse.

As to the portion of Boole's work which runs parallel with Gratry's, I am offering here a mere statement, nothing like explanation or proof is needed ; the Mystic Law is intelligible, as soon as stated, without explanation, to simple and unconventional souls ; and they at once see its truth by the light of their own experience, without need of other evidence.

Boole's method, so far as we have now got, might be summed up thus :—"Let us have courage to follow up a principle of thought-guidance which we all know to be true ; then, each of us might become Aristotle, Socrates, Hegel, and Spinoza on a scale proportioned to his own intellectual gifts."

**Logique* (Gratry) Vol. II.

George Boole's second discovery has been understood only by the very learned in Mathematics and Logic. He supposed* that it would be made intelligible by ordinary Arithmetic and a very little Algebra; and so it would be, if those who have been taught these things understood what they have learned. But, owing to the manner in which such subjects are usually taught, comparatively few except very advanced investigators ever arrive at any comprehension of what is involved in a sum or equation. For most people, the comprehension of this is hampered by two false assumptions, belief in which is encouraged by nearly all teachers, and from which only the most learned escape. I propose to try, in this paper, to clear away these assumptions by proving their absurdity, and thus leave ordinary not specially mathematical persons free to come into touch with George Boole's second discovery.

The first assumption which I would clear away is that Arithmetic (and therefore Algebra, which is Arithmetic in a more abstract form) has for its sole subject-matter questions of Number and Quantity. Arithmetic deals with several other conceptions besides those of Number and Quantity: *e.g.*, the determining of a Unit of thought; the conception of Negation; the effect of mutually neutralising actions; reasoning by analogic operation; the Law of Sacrifice; and others. Let us take the five mentioned in order.

1. *The Determining of a Unit of Thought.* The symbol 1 may stand for a half-inch or a whole one; for a yard or a mile; for a penny or a shilling; for a man or a sheep. We have to go through the mental operation of deciding in which category we mean to do our reasoning; the whole working out of a given question will be quite different according as we take our unit smaller or larger. 1 is therefore not merely a number. Indeed, it is doubtful whether it can be logically considered as a *number* at all; 2, 3, 4, etc., express the numbers of times the unit is repeated; but 1 expresses rather the unitary concept fixed upon, than a number.

2. *Negation.* Zero (0) is not in any sense a number; it expresses the mental Act of Negation, of treating the Unit as non-existent.

3. *The balancing of mutually neutralizing operations.* Many difficulties in teaching Arithmetic and Algebra arise from the fact that this logical conception is not first made clear in itself, before being mixed up with the question of number. The well-known difficulty of making children understand why "minus multiplied by minus makes plus" disappears when we treat the operation involved simply as the passing over of a residual

*Laws of Thought: Preface.

make-weight, necessary to complete the balance between mutually neutralizing actions. It is at this point that good methods in mathematical teaching might probably do most to train the brain and conscience of the future man, citizen, political economist ; it is here that bad methods do so much to stupefy and degrade the consciousness. A well-known moralist spoke to me lately of the *wicked* manner in which the moral conscience is stamped out by the confusion thus generated. I feel sure that the same illogical methods to which he objected on ethical grounds do much to induce incapacity for applying what one knows of mathematics to the investigation of natural phenomena. Two opposite-seeming actions may neutralize each other in one respect and yet be cumulative in all serious respects ; the arithmetic teaching given to a child should cultivate insight here ; careless teaching deadens it shockingly, and thus tends to prepare needless difficulties in afterwards understanding algebra. A good method would make clear from the first the difference between omitting an act (or part of it), and adding a (total or partial) neutralizer. Carelessness in this respect generates a condition of mind which makes the real comprehension even of Arithmetic needlessly difficult. If the Higher Mathematics are then taught in the same careless way, one can hardly realize what the effect must be on the pupil's future dealings with actual forces.

4. *Reasoning by analogic operation.* The whole field of mathematics is crowded with illustrations which should throw light on this most fascinating branch of psychology. But the minds of both children and teachers are fogged by our persistent use of a terminology which is derived from number and does not readily lend itself to transfer. It cannot logically be transferred even as far as to the domain of fractions. All mathematics would be simpler if we used a non-numerical phraseology, as we surely should do if we were less enslaved than we are by the convention of asserting that Arithmetic deals only with questions of number. Much confusion in the teaching of fractions is caused by popular mis-use of the words "to multiply" and "multiplication," which essentially belong to the domain of number, and have no meaning where the symbols involved represent unity, negation, or fraction. Some word should be chosen instead of "multiply" which is not associated with the idea of *number* or of *increase* ; this word should be defined in the teacher's mind as "doing to the operand what, when done to Unity, produced the operator" and should be explained by him to the children in a sense consonant with that definition. What but confusion can come from telling children to

multiply half a shilling by one-half, when the thing you mean them to do is to diminish the equivalent of sixpence down to threepence? What you want him to do to the half-shilling is something which, if done to the unit of thought, produces the conception one-half. The definition here given is valid for all values numerical, fractional, and logical. Whatever be the terminology chosen, it should lay the foundation for a habit of thinking of the symbol $\times$ as suggesting not the increase of things, but a mental action. This facilitates the future conception of reasoning by analogic process.

5. *The Law of Sacrifice.* The whole process of numeration depends on and expresses the power and the need of the human mind to merge a group of its ideal units of one stage into a single higher unit. It represents therefore the Law of Sacrifice. It embodies indeed both forms of that Law; the merging of lower units into higher; and the decomposition or breaking down of a higher unit into lower ones.

When we speak of sacrifice in this connection, we attach to it, of course, no idea of emotion or of tragedy; we refer only to the metaphysical conception of a law which underlies all our emotions and tragedies. The farmer goes forth casting his "rice seed on the waters," and his corn down to rot in the ground, "sowing in tears,' but omitting the tears because he understands what he is doing, and knows he is not wasting the good seeds but preparing the crop of the future. We also, in our sums, go through all the tragic drama of life, with the tragic element suspended by the presence of pure abstract comprehension.

All these, and several other conceptions which are essentially metaphysical, or spiritual, or psychological, are dealt with in Arithmetic and Algebra as much as the conception of number; and with the same truth and the same certainty as the conception of number.

The second false assumption which I would hope to dispel is that the processes of Arithmetic are founded upon and consonant to the *Laws of Number.* The processes of Arithmetic are founded on and express the Laws of the normal action of the human mind when dealing with ideas beyond its direct grasp; whether those be of numbers too large for its immediate cognition or such metaphysical concepts as Unit, Negation, Sacrifice, etc. Those laws are anthropomorphic, and, in a sense, biological. No law of *number* for instance requires us to count in tens; we do so because our ancestors had ten fingers to count with before they had names or signs for numbers: a purely biologic and anthropomorphic fact. We at one time merge "units" into "tens," pence into shillings, inches into yards, and at another time break up the

larger units into smaller ones, not because the Laws of Number require us to do so, but because the Law of Sacrifice imbedded in the constitution of our minds requires us to do so.

Now George Boole's second discovery was that of a *solvent,** which, so to speak, soaks away and washes out from Arithmetic all questions of Number, and leaves the rest of it standing, complete, a perfect skeleton-picture of the mind's normal action when engaged in evolving the Science of which Number is the material. It thus stands clear as a contribution to the Science of human Psychology, showing how minds of old worked when engaged in mastering difficulties.

Having thus reduced Algebra to its fibrous skeleton, he next compared it with that of Logic, and proved their complete homomorphism.

What I have called the solvent consists in an Equation the roots of which (or, in school-boy language, the answers to which) are 0 and 1. That Equation is

$$x^2 = x$$

or, otherwise

$$x \times (1 - x) = 0.$$

This equation is "satisfied" (*i.e.* turns out true), if either of the values 1 or 0 is substituted for x, but not if any *number* is substituted for x. An instance given in the Laws of Thought to illustrate the logical bearing of this equation is the following: From all the creatures in the world, select in your mind, sheep. Let the class-concept "sheep" be, for the moment, your unit of thought. From that unit, select the class of "horned things"; you thus get the concept "horned sheep," in contrast with a rejected background "sheep that are not horned." Your selection of "horned" from among sheep has really altered your concept "sheep," given to it clearer definition and a narrower scope. Now repeat on the class-concept, "horned sheep," the operation of selecting "horned things," this does not have any further effect; "horned sheep which are horned" are identically the same class as "horned sheep." On the other hand, if you apply the operation of selecting the horned individuals to the other class, "not horned sheep," the result is 0; for there are no horned things in that class.

Boole proved (to the entire satisfaction of the learned) that the so-called "dictum of Aristotle," (on which all Logic taught in European Universities up to his time had been founded) was a particular case of the equation,

*This was anticipated by Leibnitz.

$$x \times x = x.$$

The learned failed to seize the gently suggested moral; I will give it here in plain words. This is it: "Aristotle, by treating mind as a mechanism whose normal action is to swing between 1 and 0, created a system of Logic which has stood the test of two thousand years. Let us now discard that system, and learn, instead, how to use our minds as Aristotle used his, viz., in accordance with its Natural Laws. Let us dare, henceforth, to be every man his own Aristotle. Let us make methods in Logic, each for himself, as we go along, by treating each element of thought alternately as 1 and 0. This is the *real* "Boole's Method," as practised by himself. To prove to the world the feasibility of his plan, George Boole applied it to create a new Formal Logic, a "Method," related to that hitherto used in Logic-classes, as a quartz-crushing machine is to a quarry-man's hammer. This method (known as Boole's Calculus) depends on treating his two Equations—The Mystic Law, or psychological equation,

$$x + (\text{not-}x) = 1$$

and the logical equation,

$$x \times x = x$$

as simultaneous. Boole's logical Calculus is worked out between them. It is needlessly clumsy; and has been modified and much improved by such men as Jevons and Venn. None of their systems, however, concerns the ordinary business of life. Boole's real method: *Let us be everyone his own Aristotle,* concerns everybody, especially teachers of children.

After the publication of the Laws of Thought, George Boole wrote two text-books, assisted in bringing his grand conception down to the level of ordinary mathematical notation, by his enthusiastic pupils. He often longed to write still further on Psychology, which he was all the time studying devotedly, with the help of all the medical knowledge he could get. He was hindered from publishing anything further on the subject by not being able to clear up certain points; till, shortly before his death, I suggested to him that a certain well-known passage in the New Testament about the Wind, might refer to the course of a Circular Storm or Dust-whirl. After thinking it over for some time George Boole said: "Stick to that; you have got the clue now." He added that it would be worth my while to lay aside all other lines of inquiry, and follow up the clue which I had found. He died shortly after this. Anyone who will take the trouble to draw the Dust-whirl with its tangents will readily perceive that it is the expression, in intellectual and emotionally depolarised

terms, of the advice to forgive one's enemies as a preliminary to seeking inspiration. It gives in fact the great law of brain vitalisation by Counter Magnetism ; it expresses in terms of Meteorologic Phenomena, the condition for procuring control of that force to which men give the name of Inspiration. It forms, therefore, the great clue between the Science of Electricity and that of Human Psychology.

As I said before, Boole's Calculus, though interesting to special students, and useful for certain purposes, is not needed for any of the ordinary business of life. But the two Equations on which it rests concern every human being who has to do with other human beings. They concern teachers especially ; and most especially teachers of Arithmetic and elementary Mathematics. For they are the Equations of the mechanism in which, and by means of which, mathematical and logical ideas are being evolved in each child (or are being distorted and prevented from evolving, as the case may be). The thinking mechanism of man is an organ the power of which to absorb knowledge without injury to itself depends on its keeping up a perpetual rhythmic beat between the thought of contrast and that of re-union. And it surely is of importance to the politician, historian, electrician, chemist, to all whose business it may be to deal with or to analyse the action of social or cosmic forces, that they should have early acquired the habit of realizing that tendencies antithetic in one respect may increase each other's power in another respect ; and of being keen to distinguish between the mutually neutralizing and the mutually cumulative portions of the same tendencies.

The teacher of young children should, therefore, before he gives any explanation, subject it in his mind to the following tests. He should ask himself, First : Will this explanation present a clear Unit of Thought, of such nature that it can be divided into two class-concepts, x and not-x, which shall be mutually exclusive, and which, between them, make up the whole unit without any overlapping ?

Secondly : Am I prepared, as soon as the children have adequately grasped the respects in which not-x contrasts with x, to encourage them in seeking the underlying unity between x and not-x, the properties common to them both ?

It may be that there do exist polar class concepts (cases of x and not-x), the similarity or unity between which children should *not* be encouraged to dwell on. When we find any such, we should avoid leading children to dwell on the contrast between those concepts. We should avoid setting up any mental cycle, the due completion of which we are not prepared to permit. For instance,

a teacher may not wish to encourage his pupils in finding out how much there is that is common or alike in the Church which he represents and some rival Church or heathen religion. But, till he does wish this, he has no right to tell them anything about the contrast between his Church and rival Churches, or to boast of its superiority over other Churches. The equation of sanity is x + (not-x) = 1. To start a young brain into tension on the contrast between x and (not-x) and then try to arrest its normal fall back, at the proper time, to Unity, is not religious teaching, but the deliberate propagation of mental and nervous disease.

And, for teachers of Arithmetic and Algebra, there is a third test, viz.: Would the explanation which I am giving of any operation on number need to be retracted or modified, if, in place of the numbers, I substituted 1, 0, or fractions? An explanation about number may need to be *amplified, expanded,* before it can cover the field of fractions or that of logical concepts; but if it needs to be retracted, it is illogical, or in other words, it puts the human brain through a process not consonant to the Laws of its action.

The reader will observe that I am offering no proof of the validity of Boole's method. He himself gave an elaborate proof, addressed to the learned in Mathematics; the object of this paper is not to *prove* the validity of it, but to assist the imagination of the reader in forming an idea of its nature, and of the causes which have obscured the general conception of it. Boole's method has been hitherto ignored by the mass of teachers, and treated by the learned far too much as a mere method in Logic. It is before all things a method in Psychology, whose main function is to assist in preserving the balance and sanity of the human mind. Boole's Equation is essentially the equation of Sabbatical repose, the Law of the mental process which should be gone through when the mind is to seek recuperation from the effects of the stress and strain induced by attention to contrast or to conflict. Special instances of its application to this purpose will be found in my recent Article on Ethical Stability and in my little book "Saturday Talks." I have no wish, however, to insist on any special application of it; it is far more important to keep in view the principle on which it rests.

The various movements which of late have come to us from America, supposed to be new and calling themselves "Science" ("Christian," "Divine," or "Mental") prove that a desire is spreading among us for some mode of managing the mind which shall be directed not by rules invented for external convenience but by the Laws of the very mechanism by means of which mind

works in man. It seems advisable therefore, just now, to remind the Public that a method was formulated nearly half a century ago, by an Oratorian Priest, a method based on a Principle calling itself Logic and confessedly as old as History; which he proved to have been incorporated into the foundations of the Higher Mathematics. That method can hardly be suspected of being allied to superstition or quackery.

The principle underlying all Logic is that man is by nature akin to Unseen Unity. We go out from that Unity into a world of phenomenal or conceptual manifoldness ; we go out as to a school, for concrete study, for exercise, for play, and to take in stores of material. But when we need either repose or fresh inspiration we must summon before our minds the very same elements about the diverseness of which we have been exercised, and seek to see an underlying Unity between them. For Unity is the home of man's mind, and in it alone can we find true inspiration and repose.

EDUCATIONAL FOOD OR EDUCATIONAL PHYSIC ?

"Journal of Education," May, 1903

THE discussion about Prof. Perry's suggestions for reform in mathematical teaching is hampered by the fact that the minds of his opponents are haunted by one unpleasant word, which they are too polite to utter. May I, one of his most ardent admirers, venture to say it for them ? That will, perhaps, enable discussions on both sides to get a little "forrader." Here is the word : "Quackery."

The instinct of every manly schoolmaster warns him, and warns him truly, that Prof. Perry's methods are "allied to quackery." So they are ; but that does not necessarily condemn them. All remedial measures are "allied to quackery"—in this sense, that they would become so if offered as normal diet. Prof. Perry is recommending a remedy for a disease which alas ! is very common in England, and probably elsewhere—a disease to which I have given the name of "mathematical rickets." It will be the country's own fault if it mistakes his remedy for normal diet ; he himself is much too good a physician to make such a mistake. Medical practice accepts certain preparations which are neither normal food nor, in any true sense, drugs : they are concentrated preparations of some element necessary to nutrition, and suited to patients whose early diet has been lacking in that element.

Prof. Perry's position would be better understood if readers would picture him addressing John Bull thus : "My dear sir, your boy is suffering severely from the fact that you stuffed him too early with grown-up food which he could not digest and neglected to give him in infancy a sufficiency of milk. Give him, therefore, plenty of this syrup of phosphates for a few years ; and, pray, take care to bring up your next baby so that he will not need my remedy."

A schoolmaster very properly resents the notion of accepting a condition of things which implies that schoolboys *ought* to need coddling with remedies. But he need not therefore decline or neglect to administer them to a boy who does need them. The present case, however, is complicated by the fact that the schoolmaster has rickets himself, and so had his precursors for many generations. He is so accustomed to the present rickety condition that he does not see that his pupils are ill, and, therefore, cannot see that they need any particular remedy. Such a thing as a normally developed mathematical faculty is so rare that when a master comes across a specimen he usually mistakes it for exceptional genius (which is a very different thing), and sometimes gives bad advice in consequence.

What may be called the natural bone-forming aliment of the mathematical faculty consists in a process of groping to the solution of easy problems by effortless and unorganized ways which impose no real methodized labour. If children have plenty of practice of this kind early, they do not need it later, except as occasional amusement out of school hours. Nature directs children to seek this element of groping and fumbling after truth by irregular methods ; we call Nature's way "getting into mischief," and we seek to restrain the children from following it. "But," as a lecturer once said, "if we insist upon taking children out of the gutter because we object to filth, we owe it to them to supply, in some less objectionable form, plenty of opportunity for making mud pies." So, if we keep little children out of "mischief," we must supply some unobjectionable opportunity for irregular groping and fumbling and experimenting, or their scientific and logical faculties will be rickety. The present Master Johnny Bull has mathematical rickets very badly indeed ; Prof. Perry is therefore trying to mix phosphates in the school soup. I agree entirely in his diagnosis of the disease and essentially in his view of the remedy indicated. Most schoolmistresses, I think, would feel as I do on one point : they would prefer, instead of Prof. Perry's irregular scheme, special lessons to remedy the existing bad conditions of the logical framework—something that

might be described as a compound syrup of naughtiness, a tested preparation of various unacknowledged, unscholarly, and, anti-academic ideas on mathematical subjects, which could be administered at proper times and in suitable doses, and which would not tempt young teachers by giving any excuse for slipping into lax ways of conducting the ordinary class-work. That, however, is a detail of execution. My present point is that Prof. Perry has, in my opinion, diagnosed more truly than his opponents ; he has detected the existence of a widely spread disease which calls for a specific remedy, and he ought not to be suspected of any charlatanic tendency. On the contrary, his dearest hope for the country would be that the next generation should be so brought up as to need neither his remedy nor mine.

SCIENTIFIC RESEARCH BY NATIVES OF INDIA

"The Indian Spectator," Feb. 25th, 1905

FROM what I hear from friends who are natives of India or who have resided there, I gather that some soreness prevails in relation to the attitude of the English Government and Officials towards research in Physical Science. Not being a scientist, I will not enter into detail ; I can speak only, as a psychologist, as to mental attitude. There would be no bitterness, if men quite understood each other. A little incident which occurred after a lecture and demonstrations at the Royal Institution of London, by Dr. Bose of Calcutta, seems to me to throw a vivid light into some obscure corners of the scientific world.

An eminent chemist said to me : "Is not this wonderful ?" I replied that Dr. Bose's performance looked to me very wonderful, but that I was no judge whether it was genuine. The great man said, with what I felt to be a mournful tone in his voice : "Oh ! it is *genuine* enough ! But the thing is that none of us can find out how it is done."

Now the man who thus spoke was, personally, modest, and quite incapable of any such feelings as envy. Had Dr. Bose only succeeded where he, the Englishman, had failed, he would have rejoiced, and congratulated Dr. Bose most cordially ; of that I am perfectly sure, but there was more in Dr. Bose's triumph than the success of an individual in doing what others had failed to do. There was evidence that Hindu fingers possess, stored up from some hereditary cause, powers of manipulation which no amount

of genius and no kind of training could give to any English fingers, in the present generation or the next.

This means, of course, the need for a re-adjustment of all the relations between England and India in matters of Physical Science.

That such a re-adjustment must come, sooner or later, somehow, has been known to a few Mathematicians here, ever since my uncle, George Everest, came home (before 1830) ; and, more specifically, since De Morgan wrote his preface to Ram Chundra's book. But Dr. Bose's performance struck the conviction home to the very heart of our *Physical* Science.

Probably, very few of our scientists realize, as yet, what it is that has happened. But it *has* happened, none the less. English Science has, whether individuals are conscious of it or not, received what, in a human body, we call "a serious nerve-shock."

A dentist, who had taken out a girl's teeth under anæsthetic, told me not to imagine the nerve-shock was any the less because the child was not aware of having had it. I ought, he said, to keep her quiet, and not expect her to work ; but treat her as if she had suffered pain. So it is with a corporate body. Dr. Bose has given to English Science a powerful nerve-shock ; and now it must be allowed to be quiet and recover, before it can take the exertion necessary for the re-adjustment of its relations to India. A pause is not only inevitable, but is psychologically *normal*, healthy and good for the sanity of both races.

England, when hurried, often loses her head and acts brutally. When she has time to re-collect herself, she usually takes the generous side. And as to the Indian outlook on Dr. Bose's exhibition of skill and its future consequences, let us remember this : A stupid, vulgar man, on suddenly coming into an unexpected fortune, is in a wild hurry to enjoy it immediately. A wise man, in like case, pauses, re-collects himself ; takes time to think reverently of, and do homage to, the ancestors from whom he inherits ; meditates also on the claims of those whom his wealth may benefit ; and, with the very first fruits of his new possession, makes an offering to his gods and a present to the poor ; praying, the while, that he may retain his senses and have the blessing of the Unseen Holy One. Let us hope that India may be wise in her attitude towards Dr. Bose's declaration of her magnificent inheritance.