

WHAT AND HOW TO TEACH

JAMES A. LINDSAY

Professor of Medicine, University of Belfast.

WE can never think too much of that we mean by education, how we propose to promote education, what we may fairly expect from education.

On the threshold of the subject we are confronted by a problem to which modern biology is beginning to make us attend. Education depends not only upon method but also upon material, upon the teachableness of the taught as well as upon the capacity of the teacher, upon health and brain stuff as well as upon gymnastic, linguistic and science. Breed tells as well as machinery. The State which by legislation, economic laws and social usage tends to sterilize its intellectual stock, will not succeed by multiplying schools and universities and the general apparatus of culture. This, however, is a question apart, a question which is destined to loom larger and larger upon the view of all those who have absorbed the spirit of modern science, but which lies outside the purview of the educator as such.

The object of education is threefold, viz., to train the mind, to develop the character, to cultivate the taste. Knowledge, action, sensibility,—these are its legitimate aims. Consider some testimonies on the subject by the world's keenest thinkers. Take the sonorous language of Milton:

That I call a complete and generous education which fits a man to perform justly, skilfully and magnanimously all the offices, both private and public, of peace and war.

Take Plato:

We are not now speaking of education in the narrower sense, but of that other education in virtue from youth upwards, which makes a man more eagerly pursue the ideal perfection of citizenship, and teaches him how rightly to rule and to obey. This is the only education which, upon our view, deserves the name. That other sort of training, which aims at the acquisition of wealth or bodily strength, or mere cleverness apart from intelligence and

justice, is mean and illiberal, and is not worthy to be called education.

Take Professor Paulsen:

Such is the threefold aim of study, and the task which it sets is therefore threefold,—to learn, to investigate, to philosophize. To learn—to assimilate through one's own efforts existing knowledge; to investigate—to pursue existing knowledge at some point to its ultimates, or to go beyond it; to philosophize—to round off one's knowledge into a complete whole, and interpret it by principles.

Take Sainte-Beuve:

I have arrived, perhaps by way of secretly excusing my own idleness, perhaps by a deeper feeling of the principle that all comes to the same, at the conclusion that whatever I do or do not, working in the study at continuous labour, scattering myself in articles, spreading myself about in society, giving my time away to troublesome callers, to poor people, to rendez-vous, in the street, no matter to whom and to what, I cease not to do one and the same thing, to read one and the same book, the infinite book of the world and of life, that no one ever finishes, in which the wisest read furthest. I read it then at all the pages that present themselves, in broken fragments, backwards, what matters it? I never cease going on. The greater the medley, the more frequent the interruption, the more I get on with this book in which one is never beyond the middle; but the profit is to have had it open before one at all sorts of different pages.

“To arrive at a full and right conception of things,” says Matthew Arnold, “to know one's self and the world—which is knowledge—and then to act firmly and manfully upon that knowledge—which is virtue; this is the motive, the indestructible impulse of the spirit of man.” “Education,” says a well-known Greek aphorism, “is not filling the mind with knowledge, but turning the eye of the soul towards the light.” “Life is not for learning,” says Herbert Spencer, “nor is life for working, but learning and working are for life.” “A liberal education,” says Vice-Chancellor Sadler, “is the discipline which liberates the spirit of man from the fetters of an obsolete tradition and of sluggish obedience to the conventional view of life.”

To recur to Matthew Arnold's pregnant remark that the object of knowledge is to know one's self and the world,—self-knowledge, physical, intellectual, moral and spiritual, must be the foundation. The “Know Thyself” of the Greek oracle is always obligatory. But education is still far from the attainment of this ideal. The growing youth still knows little of the structure or functions of his own body; he is rarely taught any sound psychology; his moral

and spiritual training is still mainly dogmatic instead of being natural and rational. The notion that a knowledge of natural structure and function is unnecessary, indecorous, and almost disgusting, is not yet obsolete although it is on the wane. The time is not far distant when biology will be regarded as not less indispensable for the developing intelligence than arithmetic or spelling, and when it will be regarded as criminal to allow the youth or the maiden to grow towards adolescence without knowledge of the laws of life and the meaning and function of natural instincts. Schoolmasters are beginning to study psychology, not before it was time. A rational theory of observation, attention, and memory must underlie any system of successful education. The laws of the evolving intelligence of the child and the youth, its natural tastes, its limitations and faults, its strength and its weakness, its line of normal development, its false starts and blind alleys, are known—but known to the few. Authority and blind dogmatism too often take the place of scientific knowledge, judicious guidance and well-directed stimulus. Receptivity is cultivated at the expense of judgment. The autonomy of the individual, intellectual and spiritual, is insufficiently recognized. Convention and tradition are accorded too honoured a place.

Knowledge of the world—how much is contained in that expression! Knowledge not only of the world that now is,—the world revealed by chemistry and physics, by botany and zoology, by geology, by physiography and geography,—but of the world that has been—the world revealed by history, by literature, by archaeology, by palaeontology. The youth who goes abroad into the world should know the flowers, the plants and the trees that meet his gaze, the animals that walk the earth, the birds and the insects which fly in the air, the rocks and the earth which compose his dwelling place, the planets and constellations which stud the nightly sky. Ignorance of such things is senseless, and culpable; sources of the purest joy are thereby missed.

But a knowledge of man's past, of human history, of what man has done and thought and suffered, is not less necessary. The conflict between science and literature as organs of culture is as unthinking as a discussion as to whether it would not be better to see with one eye rather than with two. Not to know science is to be ignorant of one's self and of the world. Not to know literature, including in that term language and history, is to be ignorant of the past of man. Such ignorance involves an erroneous comparative estimate of the present and the past, a danger of overvaluing the present and undervaluing the past, the lack of a true criterion

of judgment, and the risk of holding views and making assumptions which have been definitely discredited as invalid. We cannot comprehend our own civilization without some knowledge of the civilizations which have preceded it. Our own language has its roots in the distant past. Our literature draws some of its inspiration from ancient springs. Our national character has been modified and shaped by forces no longer potent, by feudalism, by Puritanism, by the Revolution. It cannot be understood without reference to the factors which have directed its course or altered its bent.

Two ideals of education have been competing in modern Europe—the ecclesiastical ideal, which tends to be obscurantist, and the scientific ideal, which tends to be irreligious, the former leaning upon linguistics and philosophy, the latter leaning upon physics, chemistry and biology. The conflict is real and is dangerous, because the combatants seldom appreciate their opponents' case; they too often see only one side of the shield; they condemn and ignore what they do not understand. "*Wir sind gewohnt,*" says Goethe "*dass die Menschen verhohnen was sie nicht verstehen.*" Obscurantism, by which we mean disposition to deny intellectual difficulties which the obscurantist cannot solve, and to evade moral difficulties for which he can provide no answer, is one evil; irreligion in the wide sense, by which we mean a disposition to ignore forces, instincts, and movements which cannot be tested by the methods of physical and biological science, is another evil. A fog of misunderstanding and misrepresentation has covered the field of battle between religion and science. The matter of science comes from without, the matter of religion comes from within. Science deals with the *How*, and the *When*; religion deals with the *Why*, the *Whence* and the *Whither*. Evolution is a process, but science does not know when it began, how it began, or how it was able to begin. When we have traced matter and life back to a primeval cosmic nebula or mist, we have established something of vast importance, but we have not solved the mystery of cause. Science is omnipotent in her own field, and there she can tolerate no intruder, but that field is not co-extensive with human experience. The real synthesis will come when the disputants recognize the very obvious truth that the facts of religion—psychological and historical—and the facts of science—physical and biological—are parts of human experience, are data for reasoned belief, are facts which have to be accounted for, to be weighed in the balance, and to be assigned their relative degrees of importance.

What aim should the individual propose to himself, as the end of his education? High authority can be quoted for the answer

that the aim should be self-development, self-realization. This is the keynote of much of Goethe's philosophy. "Make an instrument of yourself," he says, "and wait and see what sort of place humanity will grant you in universal life." "Try thyself unweariedly" says J. S. Mill, "till thou findest the highest thing thou art capable of doing, faculties and circumstances being both considered, and then do it." "So to conduct one's life as to realize one's self", says Ibsen, "seems to me the highest attainment possible to a human being. . . . I believe there is nothing else and nothing better for us all to do than in spirit and in truth to realize ourselves." "I don't care" says Richard Wagner, "what happens to me, if only I become what, according to my nature, I ought to become." The wisest of the Greeks held the same opinion—"The best man," said Socrates, "is he who most tries to perfect himself, and the happiest man is he who most feels that he is perfecting himself."

To condemn this ideal as selfish is a shallow criticism. Without some measure of self-development, it is obvious, the individual will be a burden to himself and useless to the world. Self-development, self-realization, ought not to be confounded with egoism, or put in opposition to altruism. Everything depends upon two things, viz., first, what is comprehended in true self-development? and secondly, to what ends is self-development to be devoted? All the deeper thinkers are agreed that in true self-development room must be found for self-sacrifice, self-abnegation. Self-development by self-sacrifice is one of the deepest notes of the Gospel. It is profoundly true, not in any mystic or esoteric sense, but psychologically, that he that loses his life shall find it. The life which is self-centred is doomed to sterility. "The end of existence," says Rabindranath Tagore, "is a complete and happy union with the life of others." S. Butler, that subtle if somewhat erratic thinker, urged the importance of the life that is lived vicariously in others. To recognize, he holds, that you are living in the Karma of others, and in turn to contribute to that common heritage, is the secret of living fully. Self-realization, not for selfish but for social ends, is on all accounts to be approved. The youth or the maiden who seriously realizes that by reason of heredity and circumstance he or she has acquired a certain stock of capacity and energy, a stock capable of much if not quite indefinite enlargement, that such enlargement is the problem of education and the most elementary of duties, has taken one of the most important steps in life. It is a curious subject for chastened reflection how much of the brain power of the nation is allowed to run to waste, for lack not only of opportunity but of clear aim and steady purpose. Probably the number of

those who make the most of themselves, who turn potential into actual faculty, is but small. "The powers given to us by Nature," says P. G. Hamerton, "are little more than a power to *become*." "It is the prerogative of man," says Burke, "to be in a great degree a creature of his own making." The lesson that the work of self-development should begin betimes is too seldom learnt. "Most men," says J. R. Lowell, "make the voyage of life as if they carried sealed orders which they were not to open until they were fairly in mid-ocean." "A man who is young in years," says Bacon, "may be old in hours if he have lost no time." Those who have lost no time are few. As has been well said, some waste all of it, most waste much of it, all waste some of it. Jowett was in the habit of saying that little time is lost through sickness, much through idleness. Self-development, self-realization, is a task which never ends. Cato learned Greek in his old age. Eckermann records of the great German poet in his last years—"Goethe will immer weiter, immer weiter, immer lernen, immer lernen." It is true age will not be gainsaid: youth learns more easily than age. As the Jewish Mishnah puts it—"If one learns, as a child, what is it like? Like ink written on clean paper. If one learns as an old man, what is it like? Like ink written on blotted paper." But there is no real arrest of mind, except from disease. Age, which hinders and limits, is not without compensations. It helps to judge and to distinguish, to appraise the different sorts of knowledge at their true valuation, to see things in their just proportion, to rate wisely the opportunities which remain. Life, it has been well said, is like the Sibylline books—it is the more precious the less of it remains.

Self-realization, it is evident, may contemplate two objects—not identical though closely inter-related. It may aim at the development of the faculties in general, at the promotion of the faculties of observation, judgment and taste, and what is commonly called general culture, and, on the other hand, at the acquisition of knowledge and capacity devoted to the special walk in life for which the individual is intended. Most of the confusions which beset the problems of education arise from the fact that we have not made up our minds what is the relative importance to be assigned to these two objects, viz., liberal culture, and vocational culture, or the relative value of the machinery by which these ends can be best achieved. If we fix our gaze too exclusively upon general culture, we shall be apt to over-rate the importance of linguistic and mathematical studies. If, on the contrary, we think chiefly of material and practical ends, of efficiency in the narrower sense, we shall be apt to over-rate the importance of

physical and biological science. The just mean is not easily attained, but its attainment should be at least the object of our thought and endeavour. The problem varies from age to age. "Each age," says John Adams, "demands a new statement of educational theory, just as it demands a new translation of a great classical work. It wants all the matters that affect it to be brought into direct relation with its particular form of civilization, and not with some other, however superior that other may be intrinsically." If we contrast the attitude of Socrates towards physical science with the attitude of the modern man, we gain an important object lesson. Socrates, wearied by the ineffective physical and cosmical speculations of the Ionian philosophers from Thales onwards, taught that knowledge of such things was both out of reach and useless, that physical speculations should give place to the study of ethical problems; that, in short, the proper of study of mankind is man. He did not foresee the day when by the aid of instruments of precision—telescope, spectroscope, microscope, polariscope—man would gain a profound insight into the constitution of the universe. His view is instructive, but evidently would be an anachronism at the present day. Our danger to-day is just the reverse—viz., that we may over-rate the mere accumulation of facts and under-rate the study of mind, and of human nature. We have to find the equation between knowledge as the organon of education, and the discipline of intellect and character which is the other side of the problem.

To observe, to enquire, to accumulate data is important, but to judge, to discriminate, to infer, is not less important. To develop character, self-control, energy, industry, respect for the rights of others; to teach thinking; to gain knowledge; this must always be the threefold aim of education, and this order is the order of relative importance. We must beware that we do not attempt to reverse the order. A large part of the information acquired at school and college is useless, but the habits of mind thus acquired are not useless. Munsterberg goes so far as to affirm that the only formal gain in school education is the acquisition of the power of concentrating the mind upon a subject. This is an exaggeration, but it suggests a useful caution. The mind should not be over-loaded with facts which possess no disciplinary value, or which are incapable of practical application. Memory can be manipulated; it can also be fatigued, and over-burdened. History should be no mere recital of campaigns, battles and sieges, of kings and princes, of political struggles, and the strife of parties. It should trace tendencies, and teach principles; it should study social evolution, the progress of sociological and spiritual ideas; it should record the growth o

science and the development of art. It was said by Schiller and reaffirmed by Bismarck that "*Die Welt Geschichte ist das Welt Gericht.*" That is untrue, or only partially true, but it suggests an important use of history as an element in education. History is the perpetual reminder that effects follow causes, that good and bad alike work out their inevitable consequences. For general culture, literature must always take a leading place. It is the condensed history of man, the record of what he has done and thought and suffered. To be ignorant of this record is to be ignorant indeed. No knowledge of the world as it now is can compensate for ignorance of how that world has come to be, how man to-day is the child of the man of yesterday. Rawnness and crudeness of mind are the inevitable penalty of neglect of the past. Mental culture must, of course, ultimately have a practical aim. Still another point of view must not be forgotten—viz., that the object of education is to increase the range of the imagination. Social evils, war, international enmities, bigotry, class wrongs, injustice to women, cruelty to children, and many other bad things flourish in large measure through lack of imagination. The individual, the class, the sect, the nation does not comprehend, is incapable of entering into the alternative point of view. For the relief of many of the worst evils of the world we must look in large measure to the growth of imaginative sympathy. The capacity to put one's self in another's place, to regard a question from a new standpoint, implies some power of mental detachment, some control of prejudice, some victory over impulse. It is one of the most precious fruits of education, of true culture.

Let us consider some phases of the temper in which education should be envisaged, and approached. Anatole France is of opinion, and Lord Bryce has expressed the same thought, that the key-note to education is the effort to stimulate curiosity. The growing intelligence is naturally curious. The healthy child is for ever asking questions. This tendency should be encouraged. Education should be suggested to the child and the youth, as, upon its intellectual side, chiefly concerned in satisfying a healthy curiosity regarding the world, man, and history. This curiosity, never wholly absent, but sometimes dormant, should be awakened and then satisfied. The simplest questions will be found to possess a perennial interest. What makes the succession of day and night, of the seasons, of the tides, of the phases of the moon, of the constellations in the heavens, of flower and fruit and vegetable? What happens when the thunder roars, or fire burns, or a cyclone rages? How were the mountains upraised, or the plains lowered, or the rivers made to

flow, or the cliffs undermined? What laws underlie the distribution of plants and animals upon the earth's surface? How did man evolve from savagery and build up the edifice of civilization? What was the origin of language, and how have its varieties and its phonetic and syntactical laws come into existence? What gave the first impulse to music and the drama, and what has been the course of their development? These questions might be multiplied a hundredfold. The young mind should be taught to ask them, and to expect an intelligible answer. Bacon reminds us of the importance of asking the right questions—*Dimidium sapientiae prudens interrogatio*. The young child too often left to the care of ignorant and superstitious nurses is fed with follies and fables, which are difficult to eradicate. It would be well to remember the tender saying of Anatole France—"Into so delicate a receptacle as the mind of a child let us put nothing but what is exquisite."

Education should be presented, not as something hard, mechanical, or dogmatic, but as something natural, free, satisfying to human instincts. To aid rather than to compel, to draw out rather than to put in, to stimulate compliance rather than to enforce obedience, to be a guide and not a task-maker—such principles are sound and will be found to work in practice. The autonomy of the individual should be recognized. The child or the youth is not plastic material to be forced into any mould that the teacher may prefer or convention dictate. Rather is he a plant, demanding proper conditions of growth, with special possibilities, peculiar limitations, not to be forced in a hot-house, but freely exposed to the winds and rains of heaven. It is possible for education to be too lax; it is also possible for it to be too strenuous. Education should have a purpose and an end, but it is best when these are allowed for the most part to be subconscious rather than conscious. "It cannot but be doubted," writes Bagehot, "how far such teaching as that of Arnold tends to introduce a too stiff and anxious habit of mind; how far the perpetual presence of a purpose will interfere with the simple happiness of life, and how far, also, it *can* be forced on "the lilies of the field," how far the care of anxious minds and active thoughts is to be obtruded on the young, on the cheerful, on the natural." It is the old problem of how to reconcile liberty with authority. In Germany education had become rigid, stereotyped, mechanical, with subservience to the State as its key-note. The methods of the drill-sergeant and the barrack had invaded the class-room and the lecture-hall. The individuality and autonomy of the child and the student were forced into the background. Obedience, discipline and order were the predominant elements. The re-

sult was a high degree of efficiency, with a serious sacrifice of spontaneity and individuality. Educational experiments of this type could succeed only with a docile and well-drilled nation. Unity based upon the State is a good ideal for war, but a bad ideal for education. It is not desirable that we should all think alike. America stands for the opposite ideal, for variety based upon the individual, for the autonomy of the intelligence and of the conscience. England has little definite system, and is still wavering between inherited tradition and modern tendencies. Recent legislation, with its standards, examinations and rewards for excellence of approved patterns, tends to stereotype education, to cultivate the false assumption that what is good for one is good for another, that individuality in mind is not important. One of the problems in education which await solution is how to reconcile State control, State supervision, and the standardising of merit, with sufficient regard for the individuality of the pupil and the discretion of the teacher. It is a difficult problem, but it will be a gain when it receives adequate attention and when a solution is at least attempted.

A due estimate of the true value of knowledge is part of the necessary temper for successful education. "All ignorance is dangerous," says Schopenhauer, "and most errors must be dearly paid. And good luck must he have that carries unchastised an error in his head unto his death." "All knowledge is good," said Abelard, "even that which relates to evil, because a righteous man must have it. Since he should guard against evil, it is necessary that he should know it beforehand: otherwise he could not shun it. Though an act be evil, knowledge regarding it is good; though it be evil to sin, it is good to know the sin, which otherwise we could not shun." Plato says that the Athenian felt himself "possessed and maddened by the passion of knowledge"—a truly noble form of madness. It is best when the love of knowledge is disinterested, when it has no other object but the satisfaction of an intelligent curiosity. "La vertu, le génie, la science," says Bacon "quand elle est désintéressée et n'a pour objet que de satisfaire le désir qui porte l'homme a pénétrer l'enigma de l'univers. . . Tout cela peut ennoblir." The demand that the pursuit of knowledge should always have a practical aim is one of those hasty generalizations which contain more error than truth. It is a false generalization for two different and contrasted reasons—*first*, because it ignores the fact that knowledge without ulterior ends is a source of the purest joy; and *secondly*, because it is impossible to tell what knowledge will ultimately be found to be fruitful. When Faraday discovered the induction of

electric currents he did not foresee the telegraph, the telephone, electric traction or electric light.

Education should impress upon the learner that it is not the time spent in study which is so important as the temper in which study is pursued. One of Jowett's pupils has recorded of him that "I owe him the most valuable piece of practical advice which I ever received: to limit my reading to five hours a day, including lectures, but *always to read with concentrated attention.*" Lord Morley has told us that he always reads with note-book in hand, as he is of opinion that any book worth reading is worth taking notes from. If we interrogate our experience, we shall probably find that even the careful reader forgets most of the points in his reading which are worthy of recollection, unless they are committed to paper at the time.

The motives for study deserve consideration. These may be regarded either as extrinsic or as intrinsic; i. e., they may be viewed objectively or subjectively, according as they affect the individual's outer relations or his inner self. Of extrinsic motives the chief are—emulation, love of praise, hope of reward and practical utility, advancement in life: of intrinsic motives the chief are—intelligent curiosity, the desire to know, the love of knowledge for its own sake; admiration for the sublime and beautiful in nature and in art, sympathy for the past history and achievements of man, the desire for self-realization, the impulse to find materials for creative work. These motives are of very various degrees of ethical value. Emulation, rivalry, the desire to shine and to excel, is a primitive human instinct. It played a large part in the aesthetic education of the Greeks. The masterpieces of Greek literature were in large part composed for competitive contests. Æschylus, Sophocles, Euripides and all the lesser lights of Greek drama composed their works for public competition. Even Herodotus read his history at the Olympic games. We still allow a large place in education for the spirit of emulation, without perhaps reflecting deeply on its doubtful ethical quality. That there can be such a thing as a noble rivalry, and that the defeated candidate or candidates may heartily salute the victor and bow before superior merit is possible, but emulation has not usually this generous quality. It is more often akin to envy—a love of victory because that victory involves someone's defeat. Love of praise is natural, and, within limits, laudable. Milton thought that the love of fame was "the last infirmity of noble minds." Lord Beaconsfield applauded "that noble ambition which will not let a man be content until his intellectual power is recognized by his race. . . . The heroic feeling, the feeling that

in old days produced demigods." A more subtle analysis would probably reveal that this feeling is of mixed ethical value. The line between a laudable love of praise as the reward of merit and right action, and, on the other hand, personal vanity is not easily drawn. Ambition may be good or bad, according to the temper in which it is pursued, and the aims to which it is directed. The hope of reward bulks largely in the machinery of education. Prizes, exhibitions, scholarships and fellowships play a large part in the life of schools and colleges. It is by no means certain that their influence is always salutary. To gain a prize is an object which should be subordinated to acquiring the knowledge or efficiency of which the prize is the outward token. The large financial gains which accrue to superior talent and industry in the life of colleges and universities are not wholly legitimate. These endowments should be directed to discovering, conserving, and developing the brain power of the nation, especially that portion of the brain power which without their aid would owing to the *res angustae domi* never find its opportunity. This object is not clearly realized. These emoluments are supposed to be the natural and legitimate rewards of superior merit; the financial position of the recipient is disregarded; the wealthy exhibitioner, scholar or fellow receives money of which he has no need, and deprives some one else to whom the benefaction might open up a path to usefulness and honour.

When we approach the subject of the appropriate materials and organs of education, we enter a region of controversy. Assuming that the elements of literary and mathematical knowledge have been acquired as the necessary basis of education, the question arises as to the direction of its further development. What place shall be assigned to languages—the student's own language, modern languages, ancient languages,—to mathematics, to physical and biological science, to philosophy, to art? How far was the Greek scheme of music and gymnastic adequate? What shall we say of the validity of the mediaeval *trivium* and *quadrivium*? How are we to view the ever-expanding range of modern studies? What about physical culture? Should secular, and religious education be separate or united? These questions could easily be multiplied. Let us take the simplest question first. What is the sound view to take regarding physical culture? Is the modern cult of athletics sound or unsound? No one disputes the importance of health or the need for proper physical development. Games are also defended as inculcating fair-play, good nature, a high sense of honour, ability to be modest in victory and calm in defeat. These are excellent things, and the public school system of England prides itself upon

them—not without some cause. But there is another side to the question. Too much devotion to muscle may mean too little devotion to mind. Much play is often made of those cases where the stroke of the college boat or the captain of the college team has risen to be a statesman or a judge, but it may be affirmed with some confidence that the hero of the athletic field is seldom in the front rank intellectually. It would be surprising if he were. Eminence in the schools leaves little time for distinction in the field. It should also be borne in mind that professional athleticism is not sound hygienically. The professional athlete has a good time until he is thirty, not so good a time from thirty to forty, and before fifty is reached he is often dead or invalided. Another caution which is needed in this connection is to contradict the popular delusion that for the tired brain the best remedy is a tired body. That is quite an erroneous view. The brain is to a large extent a store-house of muscular energy. When that store is exhausted it needs rest before it can exercise vigorously in the field of mentality, and the converse is equally true. Athletics are good—even indispensable—but *ne quid nimis*.

The acute controversies of to-day belong to another field. What is the relative value as *organa* of culture of linguistics, mathematics, and the physical and biological sciences? In the field of linguistics, are the classical languages indispensable, or could they be profitably replaced by the languages and literature of modern Europe? Can philosophy be safely ignored? What place should be assigned in education to the aesthetic faculties, to the plastic arts, and to music? These questions are much complicated by the fact, too much ignored, that the value of these studies is not absolute, but relative—relative to the tastes and capacities of the individual. The linguistic faculty and the mathematical faculty are seldom well developed in the same individual—oftener the activity of one involves more or less the feebleness of the other. The mathematical genius is not at home with the *Phaedo* or a chorus of Euripides, or the literary expert with the sixth book of Euclid, the binomial theorem, or the integral calculus. We must recognize these natural differences and adapt our educational machinery accordingly. The growing mind must be left to some extent to find its appropriate pabulum.

The classical languages are now on their defence, and the case for compulsory Greek is already lost. But the end is not yet. Latin and Greek had for long the field almost to themselves. Now they have many competitors. Let us see what can be said in their favour. The following arguments may be put forward:—

a. That the study of an inflected language—and it is admitted that Latin and Greek are the most finished types of inflected languages—conduces to clear thinking, to the proper use of words, to accuracy, to the growth of the critical faculty.

b. That Latin is useful as the key to English etymology and indispensable for the study of law and medicine, and a gateway to the modern Romance languages.

c. That Greek is the key to the greatest literature of the world, to philosophy, to aesthetics.

d. That modern civilization cannot be understood without reference to its fountain heads in Greece and Rome.

e. That a knowledge of the ancient world, with its peculiar institutions and ideals, is a useful corrective of prejudice and narrowness of view—more useful than a knowledge of civilizations contemporary with our own.

f. That a knowledge of classical literature is the common possession of the learned men of all nations, and hence is a bond of sympathy and mutual comprehension.

g. That translations are wholly incapable of conveying the peculiar quality, aroma, and stimulating power of the ancient literatures.

h. That experience has shown that Latin and Greek are efficient implements of culture, and that the proof that the modern languages are equally efficient is not yet forthcoming.

No one questions the educative value of the scientific study of languages, and of good literature. Accuracy, judgment, the critical faculty and taste are thereby promoted. An acquaintance with the best that has been thought and expressed by man in the past must necessarily enrich the mind, enlarge the intelligence and refine the taste. It may be doubted if any other study is equally efficient for such ends. But it is agreed that a purely literary education is apt to lead to weakness on the volitional side. How far this is a just criticism, if we place a literary education in competition with a mathematical education, may be doubted. But the real controversy of to-day is rather between the ancient and the modern languages for the leading place in linguistic culture. Our own language, while possessing one of the greatest of literatures, probably second only to the Greek literature, is uninflected and has a scanty grammar and accident. It is not comparable to the ancient languages as an instrument of culture, but the education which does not involve the capacity to speak and write English with some degree of facility, accuracy and elegance fails in the most essential of requirements. How far French and German, taught on modern lines with adequate attention to philology and phonetics and to the literatures, can take the place of Greek and Latin is a question with regard to which a consensus of educated opinion has not yet been reached. The

modern languages can claim practical utility in their favour; their cultural value is still a matter of controversy. Experience will assign to them their just place. Germany has a great poetic and romantic literature; France is eminent in the drama, and supreme in prose. The place of German and French in higher education in the future will depend largely upon those into whose hands their administration falls, and whether they can be taught in the scientific spirit and with the critical and philological apparatus characteristic of the best classical scholarship.

The value of mathematics as a cultural agent of high importance—as conducive to hard thinking, accuracy and thoroughness—has never been questioned and is not in dispute to-day.

A more controversial question is involved in the cultural value of physics, chemistry and biology. These subjects have hitherto been studied mainly for their practical importance, admittedly great, but we need some definite doctrine as to their value as organs of general culture. Are they, or are they not, worthy of a place of equal importance with linguistics and mathematics? Does their study conduce to clear thinking, to accuracy, to the development of the judging and critical faculty, to the promotion of will power, to the refinement of taste? On these points it is not too much to say that educators have not yet made up their minds. Science is clearly of great value as a stimulant to the capacity of observation. In this respect it obviously excels both literary and mathematical studies. The scientific student walks abroad in the world with his eyes prepared to observe. He is disposed to ask—what can I see, hear, touch, notice?—rather than, what is the accepted teaching? what have other men thought? what is the proper dogma or tradition? He is thrown upon his own resources, he makes appeal to his own faculties, he is a free man in a free world, which is waiting to reveal its secrets. Science is often erroneously supposed to be hard, mechanical, materialistic, unimaginative. This is a profound delusion, possible only to those who have never had any real scientific teaching. No beauties of literature, no profundities of mathematics can stir deeper emotion or unveil wider vistas than such doctrines as the Nebular Hypothesis, The Electron Theory of Matter, the Law of the Conservation of Energy, or the Theory of Evolution. These great generalizations raise problems of supreme interest, of overwhelming importance, problems which make their appeal not only to the intellect, but to the feelings, problems which reveal the greatness of man, and of mind. Anatole France says truly—*“Ce qui est admirable ce n’est que le champ des étoiles soit si vaste, c’est que l’homme l’ait mesuré.”* No study can stir deeper emotion

than that of astronomy. In modern days the microcosmos has become as wonderful as the macrocosmos, the microscope reveals as great wonders as the telescope. Science need not be taught in any narrow, utilitarian, materialistic spirit. It may direct the gaze to the heavens or to the earth, to the star or to the worm, sure of finding material for speculation, for reflection, for wonderment, for awe. Science has not, as some have foolishly supposed, robbed the universe of its romance or reduced it to a dull mechanism. Rather has it revealed depths and spaces before which the mind of man reels, found law and order where chaos was supposed to reign, deepened in thousandfold our sense of the mystery of the universe. Science, when it sharpens the eye of the mind, does not dull the eye of the soul. Foolish people have sneered at Darwin for devoting long and patient attention to the habits and work of earth-worms. It is a sufficient reply to say that apart from such studies the constitution of the earth is unintelligible.

Science, as a cultural agent, has another advantage—it conduces to truth both in observation and in thought: it is the foe of prejudice, of tradition, of dogmatism. It asks, are these things so? Not, if these things are so, will any inconvenient consequences ensue? Science teaches man one of the most elementary and indispensable of ethical lessons—viz., that truth is best, that error, although often agreeable, is always noxious. To realize its full possibilities as an instrument of culture, science must be taught not in a narrow utilitarian spirit, but with a wide outlook upon principles and generalizations. Each science must seek its affinities with other sciences: chemistry with physics; physics with geology; geology with biology and palaeontology. Science must do more than observe and reason: it must dream; it must philosophise. Its appeal must be not only to the intellect and the reason, but also to the feelings and the imagination. It has here a much wider field than has been generally supposed.

As science has gained in range and influence, philosophy has lost ground as an instrument of culture. But philosophy, if of doubtful value from the point of view of assured results, is valuable as a discipline. The discussions which it raises regarding such questions as the theory of knowledge, the nature of cause, determinism and free-will—to mention only a few out of many—are of perennial interest, and furthermore cannot be ignored. Everyone has some philosophy of these questions, clear and defined, or else confused and vague. That it is a useful discipline even to formulate these problems, to realize that they exist, to apprehend something of their difficulties, cannot be seriously denied. While metaphysics

has receded, psychology has advanced. It is now studied not only by theologians and philosophers, but by teachers and educators of various grades. The psychology of the child, the psychology of the crowd, the psychology of nations, are now receiving attention. The subject is being developed on the experimental side. A strong case could be made out for including psychology in the curriculum of medicine. It is certain that the student or practitioner of medicine cannot go far in brain physiology or in neurology, or in the study of insanity, without encountering problems to which psychology holds—sometimes precariously—the key. That some training in aesthetics, some cultivation of the artistic faculties, should form an indispensable element in general education is still insufficiently recognised. Of this necessity Ruskin is the modern prophet. A study of his works is a useful adjunct to the usual curricula. He taught that music and dancing should be primal instruments of education, that the faculty of admiration should be developed by the study of beautiful nature, that schools should be hung with works of art, that botany, mineralogy, and ornithology should be studied from the artistic side. This is not sentiment, it is sound sense. Much of the joy of life is lost to those who have never been taught to realize the beauty of cloud and landscape, to appreciate a good picture or good music, to recognise the wonder, as well as the utility, of the plumage of bird, or the colouring of insect or flower. We see these things, but often with little capacity of appreciation; our eyes are too often holden.

How shall we determine whether education has been effectual, has attained its destined end? Herbert Spencer gives us one suggestive answer, viz., "The test of education is—Can you do what you ought, when you ought, whether you want to do it or not?" The "can" implies both capacity and willingness, i. e., both an intellectual and a moral element, mind and will; the ability to do and to serve, and the impulse to right action and to useful service. The chief test of moral education is the extent to which the individual has fitted himself to render service to his fellow-men. With the development of the social sense, and the growth of humanitarian sentiment, occupations and professions will be graded in the esteem of mankind by their capacity for rendering service to humanity. We are still far from this ideal. Education must keep it steadily in view. It must inculcate that we are not here to enjoy ourselves, or to look pretty, or to indulge in idle speculation, or to live on the produce of the labours of others, but to serve mankind, to mitigate the evils of life, to bring nearer the more perfect day which we may hope is in store for the world. "Men's proper business," says Ruskin, "in this world is to know themselves and the existing state

of things they have to do with, to be happy in themselves and in the existing state of things, to mend themselves and the existing state of things, as far as either are marred or mendable." And those who choose this path will not fail of their reward. "No one," says J. A. Symonds, "is happy who has not a deep firm faith in some ideal far beyond this world, in some law of majesty, beauty, goodness, harmony, superior to the apparent meanness, ugliness, and discord of the present dispensation." George Meredith has a similar thought: "I think that the right use of life," he says, "and the one secret of life is to pave the way for the firmer footing of those who will succeed us."

Our present educational methods are far from perfect. They are still too much under the dead-hand of the past. They are imperfectly adjusted to the environment of the modern world. They overvalue convention and tradition. They deal too much with facts, too little with ideas. They are based upon an imperfect psychology. They have not sufficiently re-adjusted the standard of educational values. They carry too much superfluous cargo. They are too mechanical, inelastic, bound to routine. But they are rapidly improving. The breath of the modern world is blowing upon them. Education is gradually asserting its autonomy; it is no longer the willing slave of authority and tradition. It is tending to become what it is well worthy to become, the work of a trained professional class, adequately remunerated and accorded their right social position. If civilization does not collapse in the furnace of militarism, the future of education should be bright.