ten seconds, and was three times as bright as Venus, while the second was as bright as Venus and endured for four seconds.

Mr. W. Moss reports that he observed a first-magnitude meteor at South Kensington at 10h. 11m. on September 26. The meteor was moderately rapid, yellowish in colour, and left no trail. Its apparent path was from 40° , $+40^{\circ}$ to $52\frac{1}{2}^{\circ}$, $+32\frac{1}{2}^{\circ}$.

THE BRITISH ASSOCIATION AT PORTSMOUTH.

SECTION L.

EDUCATIONAL SCIENCE.

OPENING ADDRESS (ABRIDGED) BY THE RIGHT REV. J. E. C. WELLDON, D.D., PRESIDENT OF THE SECTION.

An Educational Review.

It is my duty, as it is my pleasure, to express my cordial thanks to the council of the British Association for the honour it has done me in asking me to occupy the presidential chair of the Educational Section at the annual meeting. It has remembered what I was almost beginning to forget—that I was once a schoolmaster. Yet perhaps he who has once been a schoolmaster can never entirely lose the scholastic temper or, at least, I am afraid, the scholastic manner. Some slight comfort, however, I find in reflecting that there is probably no profession which has been adopted and, I must regretfully add, has been abandoned, by so many distinguished men and women as the educational. It happened to me at one time to examine for a special purpose all the lives recorded in the "Dictionary of National Biography"; and the number of the persons who were there stated to have been more or less constantly engaged in tuition was not less surprising than pleasing to an old schoolmaster. Apart from such persons as were born, in the proverbial phrase, with a golden spoon in their mouths, it is safe, I think, to assert that one out of every three or four eminent Englishmen has at some time or other been a teacher. Nor is this the truth in England or in Great Britain alone; it is true everywhere. Not to speak of lifelong educators or of persons whose principal work was done in education, there occur to me the names of such men as Isocrates, Aristotle, Origen, St. Jerome, Cardinal Wolsey, Erasmus, Milton, Rousseau, Thomas Paine, Dr. Johnson, Diderot, Cardinal Mezzofanti, Mazzini, President Garfield, Emerson, and Carlyle, who were all content at one time or other to make a scanty living by teaching.

Perhaps the fact that so many persons have taken up education simply as a means of livelihood is the reason why there have been so many educational failures. In no profession have good men and good women done so much lasting harm, or have done it so often without being aware of it, as in education. For an educator, like a poet, is born; he is seldom made: if he is deficient in discipline or insight or sympathy, they are hard to win by practice; harder still is it to win the passion for young souls; yet the educational profession demands enthusiasm above all other qualities; and I used sometimes to say to young candidates for office at Harrow that, unless a man honestly felt he would sooner be a teacher of boys than a Cabinet Minister, he would not be a master altogether after my own heart.

Yet the educational profession in itself, if it is not the most striking or shining in the eyes of the world, may be said to be the most inspiring and the most satisfying of all professions. It is the only profession which is naturally and necessarily concerned with all the three elements of man's composite nature, his body, mind, and spirit. It aims immediately and instinctively at the two highest objects of human aspiration, viz. the diffusion of knowledge and the promotion of virtue. Nor does any schoolmaster rise to the full height of his own calling unless he realises that his true object is to prepare his pupils, in all their faculties and in all the relations of their after-lives, for good citizenship. I cannot help thinking that a teacher who ignores or neglects the spiritual side of his

pupils falls as far short of the scholastic ideal as if he were to think little or nothing of their bodies or their minds. The educational profession, when it is rightly understood, is capable of conferring signal benefits upon the community at large. There is an Oriental apologue which tells that in a time of grievous drought, when the king had vainly called upon the wizards, astrologers, and magicians to bring down rain upon his country, one humble unknown man at last stood forth to pray, and at his prayer the heaven above grew dark with clouds, and there was a great rain; the king desired to know who and what was he that had prevailed alone with God, and the answer was, "I am a teacher of small boys."

Education, as has often been said, is to-day in the air. More and more deeply the civilised nations of the world, and among them, at last, even Great Britain, are coming to realise that in the future the battle will be, not to the swift nor to the strong, but to the highly educated. It is the nation of the highest intelligence and widest cultivation which will assert its pre-eminence in the coming days.

But before any attempt can be made to criticise the existing educational system or want of system in Great Britain, and especially in England, it is necessary to state the principles underlying all true progress or reform in education. In the briefest possible language they are, I think, these:

(1) That every child shall enjoy the opportunity of developing in full measure the intellectual and moral faculties with which God has endowed him or her.

(2) That no difference of opportunity, or as little difference as possible, shall exist between the richer and the poorer classes of society.

(3) That the supreme object of education is to provide good citizens—citizens who, in Milton's stately language, will be able to "perform justly, skilfully, and magnanimously all the offices, both public and private, of Peace and War."

(4) That, as the personal influence of the teacher is a potent factor in education, it is the business of the State to ensure the highest possible efficiency, not only of intelligence, but of character, in the men and women who adopt the educational profession as their life-work.

It seems to me that all the educational questions of the day may naturally be ranged under these four heads. The first includes physiology and psychology as subjects directly bearing upon the teacher's art, the study of individual character, the size of classes, the specialisation of studies, the opportunity of self-culture, the time-table and the constituents of the curriculum, above all, the practical insight by which a teacher discerns, and the sympathy by which he or she encourages, the signs of genius or talent, even when they are overlaid by many faults and failings in a pupil. There is no more humiliating reflection than that teachers have so frequently been blind to the promise of distinction in their pupils. Of the public schools especially it is only too true that they have been, and in some degree still are, the homes of the average and the commonplace. They have applauded mediocrity if it conformed to the rules made by the masters for boys, and the yet stricter rules made by boys for one another; they have been not only oblivious, but even contemptuous, of such conduct as was felt to be a departure from, if not a reflection upon, the established norm of public-school life.

The second head includes such difficult matters as the *carrière ouverte aux talents*, the ladder set up from the lowest educational standard to the highest, the provision of scholarships, the equalisation, so far as possible, of the conditions under which boys and girls compete for pecuniary and other rewards, the danger of social exclusiveness in schools and colleges, and the appreciation of qualities, other than mere learning, as adapting students for their parts at home and abroad in after-life.

Under the third head, if it be granted that citizenship is, or ought to be, everywhere the educational goal, it follows that the teacher may not unfairly claim from the State the opportunity of giving such an education to children, especially in the wage-earning class, where parents are tempted to take their children away from school at an early age in the hope of making them contributors to the family purse, that it may not be hopeless

to implant in them a certain knowledge, and with it that love of knowledge without which education, so soon as it ceases to be compulsory, is only too apt to become a negligible factor in the citizen's life. It follows, too, that where the interest of the State is not wholly connected with the interest of the parent, or the class, or the Church, some degree of regard for the State will ultimately prove to be a not unjust condition of receiving public money.

Yet, again, a sense of the importance attaching to the personal and professional qualities of the teacher leads almost necessarily to an insistence upon official registration as a condition of undertaking educational work, upon the training and testing of teachers by all such means as are suitable to prepare them for their responsible duties, and upon pension schemes for facilitating the retirement of teachers when they have lost or are losing their vigour and have earned a period of repose. For education is a science; it is exacting, as all sciences are; and while the educational profession needs to be made as attractive as possible, especially in days when so many other professions enter into competition with it, and while it loses attractiveness if teachers, both men and women, are compelled to retire from it at too early an age, yet it is obviously wrong to sacrifice the many to the individual or the scholars to the teacher by obliging a schoolmaster or mistress to continue in office when he or she is no longer able to perform the duties of the scholastic calling with full efficiency.

More than forty years have elapsed since the passing of the Education Act of 1870. That Act was a signal legislative achievement; it still reflects lustre on the names of Mr. Gladstone and Mr. Forster. In the intervening years it has been subjected to severe controversy, not so much on educational as on ecclesiastical grounds. It has undergone some grave modifications at various times, especially in 1902. But, after all, the main principles embodied in the Act of 1870, viz. that education is a national concern, that the children are the greatest asset of a State, and that it is the interest no less than the duty of the State to provide, or to see that provision is made, for the education of all children in elementary or other schools, have not been, and in all probability will not be, seriously challenged.

The Act of 1870 has proved to be a great moral reform. It lifted the nation as a whole to a new level of self-respect. For the child who has acquired even such elementary learning as is popularly symbolised by the "Three R's" is a higher being than the child who cannot read or write. The elementary-school teacher, not in denominational schools alone, has been a missionary of civilisation, and, I think I may say, of Christianity, in many a dark region of many a populous city. I have been told that to the influence of the Board Schools in East London was traceable a marked advance among children in kindness to the lower animals. Any disparagement or depreciation of the Education Act of 1870 is little less than treason to the moral interests of the people at large.

But it is permissible to inquire what fresh light has been shed by the experience of forty years upon the established system of elementary education in England.

Perhaps the two dangers most evident at the present time are the tendency of the Board of Education towards bureaucratic control over all the schools coming under its jurisdiction, and the habit of imposing upon the local education authorities, whether by Act of Parliament or by ordinance of the Board of Education, a number of new duties without ensuring any corresponding increase of the public funds which are placed at their service.

It is idle, and it would probably be foolish, to resist the concentration of educational authority in the Board of Education. There are signs that the Board will before long exercise a direct influence even upon the great public schools. But who or what the Board of Education is remains somewhat of a mystery. It is too apt to mean a subordinate individual acting in the name, but without the knowledge, of his superiors.

The Board may have stereotyped elementary education overmuch; it may have laid down too rigid rules or have administered its own rules with too much rigidity; it may have set an excessive store by results which could be easily tested by examination, forgetting that the best and most

lasting results of the teacher's influence are just such as cannot be easily weighed in the examiner's balances. But there can be no doubt that the control of the Board has exercised a wholesome influence upon the less satisfactory schools. It assures at least a minimum of efficiency. But the maximum of efficiency lies beyond the power of the Board. It depends upon the close, intimate, sympathetic, personal relation of the teacher to his or her pupils.

Nor, again, is there any doubt of the advantage arising from the gradual pressure of one and the same education authority, not only upon all schools of the same type, but upon schools of different types in the educational field. It is well that elementary schools should within certain limits exhibit something like uniformity of system; it is well, too, that the ladder by which students rise or may hope to rise from the lowest to the highest rungs of educational competency should be so set up as to make the process of climbing them no more difficult than it must needs be. But freedom, spontaneity, individualism, have been the rule in all departments of English life. No power can be more chilling in its effect upon intellectual enthusiasm than the dead hand of a code. Individualism with all its faults is better suited than the rigidity of the French or the formality of the German educational system to the hereditary genius of the English people. It is necessary, therefore, that the control of the Board of Education, while it is definite, should be as elastic as possible.

Again, the State has laid upon the local education authority the duty of supplying the necessary accommodation in elementary schools, except so far as it is supplied in non-provided or denominational schools through the agency of voluntary subscriptions. But it has scarcely taken account of the difficulties lying in the way of an education authority which can issue no precept of its own. Every education committee in England to-day is harassed by the obligation of persuading a body so hard-hearted as a city council, which is naturally inclined to look upon economy with more favour than upon education. The antagonism between the schools and the rates remains constant. Happy indeed is the education committee in a city where the council rises above the temptation of regarding education as an extravagance or a luxury.

The provision of free meals for hungry children is an admirable reform. For if children under the law must go to school, they cannot go with any advantage if they are hungry. But free meals cost money; and the money spent upon the meals may easily be deducted from the total sum which is spent, or ought to be spent, upon education.

Not less admirable a reform is the physical inspection of children in elementary schools. Educational as well as medical science has learnt that hygiene is a powerful factor in the success of schools. But it is necessary to pay for a doctor's time and a doctor's skill; and if the physical welfare of the children is improved by medical attention, it is possible that their mental welfare may be impaired for lack of money.

It must be added that, in proportion as Education Committees undertake and prosecute the benevolent work of caring for the crippled and afflicted children of the country, their just demands upon the public purse will necessarily become more pressing.

Upon the whole I am not disposed to criticise the education which is given in the different standards of elementary schools. It is not, I think, ill adapted to the twofold object of preparing the children for their normal duties in after-life, and of offering to especially intelligent children the chance of rising to a higher position than that in which they have been brought up. But no teaching, however reasonable in itself, can be properly imparted where the classes of children are too large. If I have learnt any lesson by my educational experience, it is that difficult cases—and these are the cases which try the teacher's skill—need a great deal of individual time and thought. I used to feel, when I was a schoolmaster, that there were not more than two or three of my pupils whom I did not think I could have helped and possibly saved, had it been in my power to spend sufficient thought and time upon them. It is overcrowding which is the difficulty in schools as well as in homes; and I do not believe that any schoolmaster or schoolmistress can do full justice to a class of more than twenty or at the most twenty-five small children.

But this, again, is a matter of expense, and as a matter of expense it touches the rates.

Upon the whole, too, I do not regret the substitution of Education Committees for the original School Boards. It is true that the ideal picture of School Boards consisting of educational experts who cared pre-eminently or exclusively for the educational needs of their city is naturally pleasing to the imagination. But the School Board, with its power of invading the public purse, lent itself to friction with the civic authority. At present the Education Committees connect the education of a city by a direct personal chain with its civic administration; and if the civic element upon the Education Committees should ever seem to fail in educational knowledge or interest, the opportunity of coopting educational experts, and among these experts men and women who might often shrink from the ordeal of a hotly contested election, would seem to afford a sufficient guarantee against indifference.

But after some careful consultation with persons who in Manchester and elsewhere have studied for many years the problem of public elementary education, I have been led to the conclusion that the reforms needed at the present time are principally the following:

The control of the Board of Education over local education authorities has become too strong and too stringent. It is probably stronger and more stringent now than it has ever been since 1870. It would be wise, I think, to leave or to place greater administrative power in the hands of the local education authority. Local authorities understand local needs. So long as they do not depart from the general principles laid down by the Board of Education, they should be free to expend each its share of the public monetary grant in the way which they hold to be best for their own communities.

I see no need for a dual system of inspectors in elementary schools, and I think it tends to the interference of H.M. inspectors with details upon which their judgment is sometimes more confident than their knowledge is profound.

It is difficult in speaking of inspection to refrain from all allusion to the notorious circular letter which was issued some time ago in the name of Mr. Holmes. That letter was not, I think, so wrong in sentiment as in language. Inspectors chosen from the ranks of the elementary-school teachers may be deficient in breadth of sympathy, as other inspectors educated in the ancient universities may be deficient in practical experience. It is much to be hoped that the unnatural contrast between the antecedents of two classes of inspectors will pass into the background, and that the duty, which lies upon all education authorities, of appointing the best men or women as inspectors, whatever anyone's antecedents may have been, will regulate all appointments in the future.

The period of a child's school life is now too brief. There should, I think, be a universal minimum age at which children may leave school. It should probably be fourteen years. But whatever that age is, it should be absolute. It should be wholly independent of local by-laws, of the passing of standards, or of attendance at school before the age of fourteen.

The question of evening schools is fraught with difficulty. To make attendance at such schools compulsory would be to run a serious risk of over-pressure. It is probable that sympathetic cooperation between local education authorities and the employers of labour in the locality will in this matter afford the best hope of success. For it is the interest of the employers themselves that their employees should not cease to improve themselves in knowledge so soon as they leave the elementary schools.

The need of the local education authority for increased financial help out of public funds was recognised, I think, in Parliament during the debates on the last Education Bill. The State cannot make fresh demands upon the education authorities without granting them fresh funds. Yet there can be little doubt that the feeding of necessitous children and the care of the epileptic, feeble-minded, and crippled children will soon or late become duties imposed by Parliament on all local education authorities.

Lastly, the connection between the elementary school and the university or the technical school should be made complete. At present the elementary school provides education for children up to their fifteenth year. The university

or the technical school does not admit pupils under sixteen years. But education, when it is once broken, is hard to resume. The educational system, if it is to be efficacious, must be continuous.

A public elementary system of education must be complete in itself, so far as it prepares children physically, intellectually, and morally for the affairs of life. But it must not lose sight of the possibility that some, and those the most promising, of the children educated in elementary schools will deserve to rise to a higher than an elementary educational standard.

It is probable that the ascent of pupils from one class of school to another will become more usual in future years. This ascent will be effected or facilitated, as to some extent it already is, by the provision of free places, bursaries, exhibitions, and scholarships. Even now boys educated in elementary schools have attained the highest honours in the ancient as well as in the modern universities. Some such boys have won admission to the public schools, and among these schools to boarding schools as well as to day schools. Whatever amount of social exclusiveness may still apparently linger in that most truly democratic of English institutions, a public school, it seems to me impossible that in a democratic age there should ultimately remain any school which will not open its doors to pupils who are drawn from every social section of the community. In the education of girls, the schools of the Girls' Public Day School Company and other similar schools, whether publicly or privately governed, have done much to mitigate, if not to dissipate, the social differences among girls living in the same locality.

But the agencies by which children of comparatively poor parents have in the past been enabled to receive an education in the schools, and indeed in the universities, of the rich are, I am afraid, coming to be gravely abused. Scholarships and exhibitions were designed to remedy the disadvantage of the poor, not to accentuate the privilege of the rich. To confer pecuniary rewards upon boys and girls whose parents can well afford to dispense with them is to foster a double abuse. It is to spend money where money is not needed, and to withhold money where it is needed. Yet in the public schools, and to some extent in the universities, scholarships and exhibitions tend to become the perquisites of the rich. In the field of secondary education the competition for scholarships and exhibitions has become so severe that scarcely any boy in the examination for them stands a chance of success, except at the cost of three or four years spent beforehand in an expensive preparatory school. But as rich boys are the only boys whose parents can afford this preparatory expenditure, it follows that rich boys are generally the successful candidates for scholarships and exhibitions. The evil is scarcely capable of exaggeration. It were bad enough that a rich boy, if he competed on equal terms with poor boys, should obtain a pecuniary reward which they do, and he does not, need for educational purposes. But when it is the rich alone who enjoy the opportunity, or the most favourable opportunity, of winning the pecuniary rewards which were justly intended for the poor, a case for drastic reform seems to be made out.

At the ancient universities the sons of rich parents, although they are generally eligible for such prizes as scholarships and exhibitions, do not possess the same advantage in competing for them. More, too, has been done in the universities than in the public schools to provide means by which the sons of rich parents may enjoy the distinction without the emolument of a scholarship. But it is an urgent matter that, alike in the colleges of the universities and in the public schools, the pecuniary benefits, by which alone deserving boys can rise above their hereditary surroundings, whether bursaries, exhibitions, or scholarships, should be strictly confined to the sons of the poor.

Here perhaps it is permissible, as it is certainly natural, to enter a protest against the established tyranny of examinations. Examination was once the obvious remedy for favouritism. But a mere examination in knowledge can never test some of the highest qualities which fit men and women for the service of the State. In India even more than in Great Britain the failure of examinations is conspicuous. A facility for answering questions upon paper is easily associated with grave defects of intellect and

character. In proportion, then, as favouritism ceases to be a public danger, examinations will, I think, lose something of their fatal authority. It is difficult to doubt that in the future candidates for public office will be required to pass a qualifying examination, but that the election will, at least in some degree, turn upon qualities which are not so easily tested by examination in writing.

Nor is this the whole evil. There is only too much danger that examinations may create a false ideal of educational success. The object of all education, as I have said, is to prepare pupils for the civic duties of mature life. It is not the intellectual attainment of the young at the age of thirteen or eighteen or even twenty-two, it is rather the service which they render to the State in the maturity of their powers, which is the proof of the teacher's influence upon their lives. The preparatory schools, which have become such important features in the field of secondary education, have done much useful work. The decadence of bullying and perhaps of other evils in public schools is largely due to the elimination of quite young boys from public-school life. The years of a boy's life from nine to twelve, but not, I think, to a later age, may well be reserved for the preparatory school, as the years from thirteen to eighteen for the public school. But the forcing process which is sometimes applied to young boys in preparatory schools, not only in their lessons but in their games, is fraught with serious peril. A preparatory-school master, if he thinks of his own school alone, may do even worse harm than a public-school master by sacrificing the future of his pupils to the present. When I was a headmaster, I knew of one preparatory-school master who tried to win boys to his school by offering what he called pre-preparatory scholarships to boys of eight or nine years of age, in the hope that these boys might after a time serve as advertisements for his preparatory school by winning scholarships from it at the public schools. But preparatory-school masters are not alone in fault. It is, I am afraid, easy to think of headmasters who have attained what I can only call an ill-deserved reputation, because their pupils have won numerous scholarships and exhibitions upon leaving school, when those same pupils had been mentally exhausted in youth, and their after-life in no way answered to the promise of their early days. "By their fruits ye shall know them"; but the fruits of a true education are seen not in the spring but in the summer or the autumn of a well-spent life.

It is with reference to the final goal of education that the subjects suited to the secondary curriculum must be judged. If the possible subjects are too many, it becomes necessary to strike the balance between utility and culture, and so to decide which subjects are indispensable and which may fairly be subordinated or postponed.

The most striking change which has come over secondary education has arisen from the number of subjects now claiming admission to the curriculum. Scarcely more than fifty years ago the headmaster of a public school was almost at his wits' end to fill up the time-table of his pupils. Dr. Arnold was appointed to the headmastership of Rugby in 1828, and Dean Stanley says of him that "he was the first Englishman who drew attention in our public schools to the historical, political, and philosophical value of philology of the ancient writers, as distinguished from the mere verbal criticism and elegant scholarship of the last century." He adds that, "besides the general impulse which he gave to miscellaneous reading both in the regular examinations and by encouraging the tastes of particular boys for geology and other like pursuits, he incorporated the study of modern history, modern languages, and mathematics into the work of the school, which attempt, as it was the first of its kind, so it was at one time the chief topic of blame and praise in his system of instruction." Other public-school masters followed suit, but they followed slowly. What the system of education had hitherto been may be judged from Malim's "Consuetudinarium," which specifies no subject of instruction except Latin, with a little Greek grammar in the sixth and seventh forms. The dancing-master was a more ancient and more honourable figure in some public schools than any mathematical master. Mathematics, in fact, were not introduced into Eton until 1836. Other subjects in addition to the classics came even later.

But within the last fifty years, not only mathematics but the English language and literature, foreign languages, natural science in its various branches, history and geography, have become competitors with the ancient classical languages for recognition in the curriculum of public schools. There is no one of them which is not worthy of such recognition. But the average intelligence of a public-school boy has remained the same, and the average length of his life in the public school has been diminished by as much as one-half. It has become necessary, therefore, to make a selection between the subjects which might well, if they could, be taught to all boys alike. Nor is this truth less applicable to girls than to boys.

It may be thought that not enough attention has been paid to the order in which particular subjects are taught. The number of subjects imposed upon a child of ten to twelve years is at times not less alarming than forbidding. Psychology suggests the adaptation of particular subjects to the awakening of particular powers at different ages. Even in literature there is a natural affinity which is too often disregarded between books and the ages at which they ought to be read. How many children have read "The Pilgrim's Progress" at too late, or have read "Hamlet" and "Paradise Lost" at too early, an age for true appreciation! In literature as elsewhere discrimination is the watchword of educational success.

From these considerations it seems to follow that the scientific educator must choose certain subjects as the basis of secondary education, and I venture to think that these subjects should be as nearly as possible common to boys and to girls. Other subjects can be left to the choice of particular students at a later period of their lives. Not all subjects are possible or useful to all students. Soon or late, then, uniformity of teaching must give way to specialisation.

Yet education loses a great part of its value unless it ensures to all educated men and women what may be described as a common educational property. It is desirable that they should not only all learn some things which are worth knowing, but that they should learn the same things. For upon community of information or of interest depends the sympathy of all educated people. If one person knows nothing but French, a second nothing but chemistry, and a third nothing but mathematics, it is evident that they possess no common stock of knowledge; no interchange of sentiments or ideas is possible between them. All sound secondary education, then, postulates a broad basis of common knowledge, or, in other words, a certain body of knowledge which is possessed by all students in common. Upon this basis must be built a superstructure varying in accordance with the needs or capacities of the pupils.

What, then, are to be the basal subjects of secondary education?

They must be few, they must be suitable to the tender years of school life, they must be practically useful, and yet they must possess the element of culture.

Religion, of course, will be one, for it is the paramount factor in the discipline of character.

The study of mathematics possesses the unique merit that it shows what proof is; it distinguishes certainty from probability; it evidences the narrow limits within which certainty is possible.

Natural science in its various branches is especially valuable as cultivating the faculty of observation. Scientific facts can be generally tested by experiment. It is only the pupil who has learnt at least the elements of natural science that begins to feel at home in the world in which he or she lives.

But among educational subjects the palm, I think, belongs to language, if only because language is the subject which stands, by its character as well as by its origin, in the most intimate relation to human nature. Men and women are not generally concerned with questions which can be absolutely and ultimately determined. Most questions in life are probable, but not certain; it is "probability," as Bishop Butler says, which is "the very guide of life"; and such, too, are generally linguistic questions. They do not admit of certainty; they can be decided only probably; and the decision of them requires tact, judg-

ment, and feeling. That is the reason why the school of languages is called *Literae Humaniores* at Oxford. Language is the one pre-eminently human or humane study.

But it is evident that different languages, as instruments of education, may stand on different grounds.

English boys and girls cannot afford to be ignorant of their own language or literature or history. For they use every day the English language; their minds are fed by English literature; and the past history of their country affords them guidance in the present and the future.

Foreign languages, on the other hand, are practically useful in the relation of Englishmen to other nations. It is possible that these languages will become less important as the English language spreads over the world. But for the present at least a knowledge of some modern language is desirable, not only as a means of mental discipline, but also as a means of intercommunication. One modern language at least, then, may fairly be regarded as entering into the basis of secondary education; and that language at the present time would naturally be French, although much is to be said for German and something for Spanish.

The educational difference between languages and other subjects is, I think, more clearly marked than the difference between one language and another. Whatever intellectual benefit is derivable from an ancient language may in a greater or less degree be derived from a modern language. But it has been shown by many writers, as, for instance, by J. S. Mill in his rectorial address at the University of St. Andrews, that a classical language, like ancient history, if only in virtue of its remoteness from present interests, possesses some educational advantage, and this advantage is particularly clear when an ancient language stands in the relation of Latin to the Romance languages or to any considerable number of languages in actual use. Latin must therefore enter into the general curriculum, and I attach great value to keeping Latin as a subject of general study in secondary schools. For the prejudice of parents in the present day against dead languages is unhappily strong. I have spent much of my time in trying to convince parents that their sons would be better educated by the study of Latin, if not of Greek also. It is for this reason that I regret the somewhat pedantic insistence upon pronunciation of Latin according to a method which, whether it be historically correct or not, will certainly tell against the universality of Latin as a subject of study. I do not believe the modern pronunciation is correct; but whatever may be the philological value of that pronunciation, I feel no doubt that the artificiality, as it seems to parents, of the non-English way of pronouncing Latin will, like the artificiality of the Greek type, create a prejudice in many minds against the study of Latin. Nor is this all; for the study of Latin loses a good deal of its practical value if every or nearly every Latin word is by the method of its pronunciation divorced from the corresponding word in English. It does not really matter in the present day how Latin is pronounced. Latin is no longer a medium of oral communication, even amongst scholars. The vital matter is that Latin should be one of the subjects constituting the permanent basis of education in all secondary schools.

Apart from these subjects, viz. religion, English, French, Latin, mathematics, and natural science, there is none, I think, which can justly claim a part in that knowledge which I have ventured to describe as the common property of all boys and girls in secondary schools. It is, in my judgment, a happy circumstance that preparatory-school masters have practically decided to relinquish the teaching of Greek, and to concentrate their efforts upon such subjects as form the natural basis of secondary education.

But upon the basis so constituted the teacher will try to erect a varying superstructure, by offering as wide a range as possible to individual tastes. For if the secret of education lies in discovering what a pupil's capacity is, and so in helping him or her to cultivate it, education must pass soon or late from the common basis of subjects to specialisation. It is not my business now to decide how the principle of specialisation should be applied. That is a

problem which the individual schoolmaster or schoolmistress must work out for himself or herself. The two points upon which I would venture to insist are the common educational property and the wide elasticity allowable so soon as this common property has been gained. But I am of opinion that, while specialisation is allowable and desirable in the later years of a boy's or girl's life, it should never be complete. The dying out of double degrees in the Universities of Oxford and Cambridge has always seemed, and still seems, to me unfortunate. For it means that nobody now gets so thorough an education as was possible if the student applied himself through his life at school, as well as at the university, both to classical and mathematical studies. The amplification of the several studies may have justly affected the course of education in the universities; but it is my deliberate conviction that a boy or girl whose time is wholly or mainly given to one subject only during school life loses a signal opportunity of obtaining a generous education.

It is tempting to me as an old schoolmaster to linger on the field of secondary education. But the limit of time at the disposal even of the president of a section forbids me to think of adverting to more problems of secondary education than the two following:

Public opinion has always been divided in the education, whether of boys or of girls, between boarding schools and day schools. Adam Smith in his "Theory of Moral Sentiments" went so far as to say "that the education of boys at distant great schools, of young men at distant colleges, as well as ladies in distant nunneries and boarding schools, seems in the higher ranks of life to have hurt most essentially the domestic morals, and consequently the domestic happiness, both of France and of England." The complete severance of a boy or a girl, except during the holidays, from parents and family is evidently, or may evidently prove to be, an evil. It tends to undermine some of the graces of character; it produces in boarding schools the same defects, but perhaps, too, the same merits, as are observable in celibate religious institutions, like monasteries and nunneries. There is too much tendency, especially among parents of the wealthy class, to feel that they have done their duty to their children in paying their children's school fees, and to hand them over to the schoolmaster or the schoolmistress without any thought of the influence which the home ought to exercise upon young lives. It is reasonable to suppose that, if the sense of parental responsibility could be revived, fathers and mothers would be more anxious than they are now to keep their children at home in the early years of their lives. Preparatory day schools, at least in the great cities, will, I think, acquire a growing importance. But at present the choice between boarding schools and day schools for boys, and in a less degree for girls, is largely determined by pecuniary considerations. For in truth the great public boarding schools are such characteristic features of English life among the upper social class, they have gathered to themselves such a wealth of tradition and influence, they are so deeply rooted in the confidence and affection of the English-speaking world, that it would be difficult, if not impossible, to replace them. Nor can it be doubted that the education given in these schools, however rough and ready, however deficient in some respects it may have been, has yet done much, in Canning's bold ecclesiastical phrase, to produce "a supply of persons duly qualified to serve God both in Church and State," and has tended to foster some of the qualities by which the English race has attained its sovereign position in the world.

Again there is the question of co-education. For if the early education of boys and girls may, as I have argued, safely proceed on the same lines, it may be held that they can well be educated together. Nor is there any valid educational reason why boys and girls should not be educated together, as they are in the United States of America. In England itself they receive their early education, and they are beginning to receive their academic education, together. It is at least conceivable that co-education throughout the period of school life may come to be the rule in day schools. In boarding schools, however, where the life is ordered on somewhat artificial principles, co-education would almost certainly create problems which

would enhance the difficulties of the master or mistress. I do not, therefore, anticipate that co-education in schools will assume a large importance in English life.

So far I have tried to indicate a few of the problems calling for the attention of persons who are engaged or interested in secondary education. Here at least I may claim to speak with some degree of experience. It is with hesitation that I approach the subject of the highest education as given in the universities, especially in the Universities of Oxford and Cambridge.

The elasticity which is characteristic of English life has in the last half-century created a number of local universities beside the two ancient universities. It would be unwise, even if it were feasible, to aim at assimilating the ancient and the modern universities. It is not impossible that the modern universities will lead the way in educational reform. The dead hand of the past lies heavily upon the historical seats of learning. No fact of educational history seems to be stranger than the inability, perhaps I ought to say the unwillingness, of the universities to reform themselves. It might have been anticipated that a home of learning would be a seat of powerful reforming energy. It has not proved to be so. The Universities of Oxford and Cambridge have been reformed more than once, but the reform has come from without and not from within. Whether the present Chancellor of the University of Oxford will succeed in persuading the university of which he is the distinguished head to reform itself without waiting for the action of Parliament is a question on which it would be unsafe for me to venture an opinion. But his plea for reform is itself a proof that reform is needed. It will not, however, be unfitting that I should insist upon the value, and the ever-increasing value as I think, of the work belonging to the modern universities in the great cities of the land—can I be wrong in saying pre-eminently to the Victoria University of Manchester? History seems to suggest that the association of a seat of learning with a great centre of industry may produce the best results, in so far as it imparts culture to industry and practicality to learning. The modern universities have appealed with striking success to the generous instincts of local patriotism. They have shown the possibility of gathering an earnest body of teachers, and through them of imparting a genuine intellectual culture to a large number of students, without imposing artificial restrictions upon their studies. They have proved the possibility of uniting men and women upon equal terms in the same academic institutions. The Victoria University has aimed with conspicuous success at solving the difficult problem of uniting the teachers who belong to the different branches of the Church in a common faculty of theological learning. In some of these respects, if not in all, the Universities of Oxford and Cambridge will probably follow suit. It can scarcely be doubted that the time is not distant when Oxford and Cambridge will open their doors to students without insisting upon the so-called compulsory study of the Greek language. I speak as one who more than a quarter of a century ago argued against the policy of requiring some knowledge of two dead languages from all students as a condition of entrance into the ancient universities. Such a requirement may have been possible, and even reasonable, when educational subjects were few. It cannot be maintained when those subjects have been greatly multiplied. For the result is either that the study of two dead languages, or at least of one among them, is little more than a farce, or that it causes an unhappy disturbance at a critical period of a boy's intellectual life. Nay, I should be tempted to say that to boys who have received their education on the modern sides of public schools the obligation of acquiring some smattering of Greek knowledge is both a farce and a nuisance.

Nobody feels more keenly than I the intellectual benefit of studying the Greek language and literature. It is my sincere hope, as it is my firm belief, that, when Greek rests upon its own intrinsic merits as a factor in human culture, the study of Greek, if it is less general, will not be less profound than it has been. But times change, and compulsory Greek as a universal subject is unsuitable to the present time, not because it is useless in itself, but because it bars the way more or less against other studies which are still more important. The universities enforce their law upon secondary schools. The schools must teach what the

universities require; they cannot teach, or they can only teach within a fixed limit, what is not required at the universities.

In my own mind, however, the abolition of compulsory Greek is only a step to a change in the intellectual atmosphere of the universities. I hope that Oxford and Cambridge will cease to insist upon Greek; but I hope that, when they cease to insist upon Greek, they will require from all students the evidence of some serious learning in some subject or subjects of higher education. Nobody who is conversant both with the ancient and with the modern universities can fail to be aware of the difference in their tone. The atmosphere of a modern university is intellectual. Men and women come there as students: they come to learn, and they do learn. At Oxford and Cambridge the atmosphere is much more social; and the number of undergraduates who can in any sense be called serious students is but a fraction of the undergraduate body. The time is, I hope, approaching when a degree conferred by the Universities of Oxford and Cambridge even upon a passman will be a certificate of a certain definite proficiency in some recognised subject of academic study. For it seems to me that the ancient universities in conferring degrees without an adequate guarantee of knowledge are largely responsible for the indifference of English society as a whole to the value and dignity of learning.

No doubt there is force in the plea that the universities cannot afford the pecuniary loss which would result from the policy of excluding passmen, or of pressing hardly upon them. It may be answered that no pecuniary consideration can justify a university in ceasing to be primarily a learned body. But women students are more earnest than men; and if the universities grant degrees, as I hope they will, to women equally with men, they will probably find that they will receive as much money from the addition of the serious students, who will then belong to them, as they now receive from those students who are not serious at all.

The Universities of Oxford and Cambridge have made frequent appeals for pecuniary support. Education—especially scientific education—is expensive, and it tends to increase in expensiveness. But I have sometimes wished that, before money is poured into the exchequers of the universities, a commission, composed of men who are fully sympathetic with academic culture and yet have been trained in the habits of business, could issue a report upon the use now made by the universities and by the colleges of the funds which they severally command. I am of opinion that such a commission would not prove unable to suggest the possibility of large economies which might be carried out without impairing the efficiency of the universities as seats of learning, or even of the colleges as homes for the students whose proper object in their academic life is to acquire learning.

All that remains is to offer an opinion in some few brief words upon some subordinate matters of academic education.

There is something to be said in favour of, but more perhaps to be said against, the proposal for two concurrent kinds of degrees, the degrees of Bachelor and Master in Arts and of Bachelor and Master in Science. For the academic degree possesses a recognised advantage as setting one and the same hall-mark upon all persons who possess it. It would be less distinctive, and therefore less valuable, if its significance were not uniform. Nor does there seem to be any valid reason against conferring the degree of B.A. and M.A. upon all students who have shown themselves to possess a certain uniform culture, whatever special study or studies they may have pursued and whatever degree of excellence they may there have attained, after satisfying the requirement of culture demanded from all persons who aspire to the possession of an academic degree.

Again, it is desirable that every university should be free from theological restrictions. I look forward, therefore, to the time when the Universities of Oxford and Cambridge will recognise Nonconformists no less than Churchmen as eligible, not only for degrees, but for lectureships and professorships in the technological faculty. There is a broad distinction between the study of theology and the profession of theological beliefs. It is no hardship upon a student that he should be examined in theology so

long as he retains his complete freedom of theological opinion. That theological recognition should be accorded to none but persons of particular views upon theology is in conflict with the highest interests of theological learning. At present the Universities of Oxford and Cambridge are the close preserves of the Church of England; the natural result is that the modern universities tend to become the preserves of Nonconformity, and neither class of university is benefited by the consequent one-sidedness of theological study.

The co-education of men and women in the universities, whether ancient or modern, is already an established reality. The only difference is that co-education is recognised in the modern, and is not recognised in the ancient, universities as necessarily leading to an equality in the matter of degrees. The real objection to placing women on an equality with men in their relation to a residential university is the difficulty of finding room for a number of female as well as male students within the precincts of the same university. On that ground alone there is some advantage in universities or colleges for women only, such as the Royal Holloway College; but experience has shown that colleges for women do not flourish except in close relation to a university in which the education of men is carried on, and I feel no doubt that the granting of academic degrees at Oxford and Cambridge to women as well as to men is merely a question of time.

No critic of the ancient universities, and certainly no one who has spent some happy years there as an undergraduate and a Fellow, can forget that the social as well as the intellectual side of the life is a part of its privilege and benefit. But that social intercourse would lose something of its value if students of different classes and different creeds did not mix freely. It is too often forgotten, in the zeal for ecclesiastical propaganda, that one element of education lies in teaching people who do not agree to work together. To make the least, and not the most, of personal differences is a factor in the life of universities. It is for this reason that I do not look with any great favour upon the institution of special colleges set apart for Churchmen or for Nonconformists or for men of poor and humble circumstances. It is better that such students should, as far as possible, associate with other students; for in such proportion as undergraduates of religious feeling or of strenuous self-denying character are educated by themselves, there is a diminution of their valuable influence on the mass of the undergraduate body. There might as well be Conservative Colleges and Liberal Colleges as colleges of a special and exclusive theological character.

Colleges are expensive features of academic life, and they tend to become more expensive; but the expense is justified by the benefit which the students may receive from the influence of their teachers upon their lives. But if colleges are to exist as integral parts of the university, there should be a sufficient number of Fellows and tutors living within their walls. No feature of modern life at Oxford or Cambridge is more pitiable than the spectacle of a married don coming into his college at a late hour of the evening, with his carpet-bag in his hand, to fulfil the statutory obligation of sleeping within the walls. No deep personal interest or influence of a tutor in the lives of his pupils is possible in such circumstances as these. If only it were possible to defer the opportunity of marriage until a man has rendered some years of service by residence within the walls of his college, and then to grant it only to men whose service the college wishes to retain, the collegiate life of the ancient universities would be less likely to lose its effective value.

But when all is said, how great is the charm of the ancient English universities! They are unique; they exercise a lifelong spell upon pupils who have spent three or four years within their ancient walls; they foster, even if unconsciously, a noble sense of patriotic duty; they haunt the memory: they are fruitful in high and generous and sacred inspirations.

What is the spirit of a university? How is it born? How does it operate? Why is Cambridge in a special sense the home of mathematics, and Oxford of letters? Why is it that Oxford finds so many, and Cambridge so few, representatives upon the public Press? Cambridge, it seems, has played the greater part in the thought, and

Oxford in the life, of the nation. But why is it that Cambridge has given to the world sons more famous, it may be, than any whose names belong to the sister university—Bacon, Newton, Cromwell, Milton, and Darwin? Why, above all, is Cambridge in so pre-eminent a degree the university of the poets? Such names as Milton, Ben Jonson, Herrick, Cowley, Byron, Gray, Wordsworth, Tennyson, belong to Cambridge alone. Nothing can replace, nothing perhaps can greatly affect, the relation of the ancient universities to the country the ornaments of which they are. What is needed, and will be more and more needed as democracy extends its power, is to enhance the strength of the influence which the universities exercise upon the national life at large.

So I bring this imperfect review of the educational problem in its present aspects to a close by insisting in two or three final sentences upon the supreme dignity of the teacher's profession. The man or woman who elects to become a teacher chooses a great responsibility. It is well that teachers should be disciplined for their calling by a system of training in the educational art. The theory of education as set forth in the writings of great educators like Comenius, Froebel, Pestalozzi, Arnold, Thring, Fitch, and many others, should be well known to them, even if the practical side of education is best learnt, or can only be learnt, by practice. Education needs the best men and the best women. It must, therefore, be set free from such bonds as have tied it to the clerical profession; nor can I think it is ever well to exact religious tests of teachers, for tests are apt to affect tender consciences alone. If only teachers are asked whether they wish to give definite religious instruction or not, and are subjected to no drawback or disadvantage if they choose not to give it, I think the teachers in all grades of schools may be trusted not to abuse their sacred opportunity. They must teach their pupils to love learning and virtue, and to love them for their own sakes. They must remember that it is the personality of the teacher which is the chief source of his or her influence on the pupils. They must ever be trying to make themselves more and more worthy of their responsibility. "Thou that teachest another, teachest thou not thyself?" must be the motto of their daily lives. But where the educational profession is one in all its branches, where it is actuated by a due sense of responsibility, where it aims in season and out of season at cultivating habits of self-respect, self-sacrifice, patriotism, and religion in the children who will be the citizens of the future, where it remembers that the supreme triumphs of educational skill are good men and women, good fathers and mothers, good servants of the State and of the Church, there is no ground of fear for the country or the Empire.

CHEMISTRY AT THE BRITISH ASSOCIATION.

THE meetings of the Chemistry Section were of unusual interest and briskness, all the speakers copying the example of clearness combined with brevity so admirably set by Prof. Walker in his presidential address. The section had organised its programme carefully beforehand and the arrangements made were strictly adhered to: as was to be expected, the subjects discussed were largely of a physical chemical character. A feature of the attendance was the presence of a number of members from the Physical and other sections; it was evident that papers of a type likely to bring sections together and to provoke discussion between the sections are those most required at the sectional meetings of the association.

There still remains much to be done by those responsible for the organisation of the Association in the way of preventing overlapping; it was noticeable, for example, that several chemical papers were read in other sections which should properly have been brought before Section B. It seems a pity also for a section which is taking part in a joint discussion to arrange for a separate meeting of the section at the same time, as this procedure affords specialists an excuse for avoiding the joint meeting. They thus neglect the opportunity of realising how differently in many cases the same facts are interpreted by followers of another branch of science.