

British industry. At the present moment a scheme which had every chance of success was being put forward by a Federation of the Central Committee of National Patriotic Organisations, the Herb Growing Association, and the Agricultural Organisation Society. Mr. Holmes, also of the Pharmaceutical Society, brought forward some interesting suggestions for the scientific improvement of medicinal plants.

Sir Sydney Olivier, the secretary of the Board of Agriculture and Fisheries, pointed out how essential it was to success that the industry should be established on such lines that it took its place in the commercial world as a specialised market-garden crop, with the prospect of reasonable remuneration.

Dr. E. N. Thomas raised the question of the relative merit in certain cases of the extraction from fresh and from dried leaves.

Among the other contributions to the section was a very interesting paper by Sir John S. Stirling-Maxwell on afforestation after the war. He advocated that the British Empire, as a whole, should aim at becoming self-supporting in the matter of timber. Dr. Borthwick, in the subsequent discussion, laid stress on the necessity for the training of those engaged in forestry in adequately staffed and equipped institutions.

Miss E. R. Saunders presented a report on means of bringing into closer contact those engaged in scientific breeding experiments and those commercially interested in the results. She suggested that the trades concerned should be encouraged to organise research departments, while the scientific workers might well unite to form a genetics association. She further advocated the issue of a new and readily accessible vehicle for the publication of literature on genetics and the establishment of a sub-section of genetics to the British Association.

The first of these proposals was warmly supported by Prof. Bateson, who saw difficulties, however, with regard to a new publication, which he did not consider was needed.

As the result of these discussions a committee was appointed from Section K to consider provision for plant pathology, and a joint committee from the Sections of Botany, Zoology, and Agriculture to consider provision for the application of genetics.

The meetings of Section K were terminated by a very pleasant and instructive expedition on Saturday, September 9, to the salt marshes at Alnmouth.

E. N. THOMAS.

THE BRITISH ASSOCIATION AT NEWCASTLE.

SECTION L.

EDUCATIONAL SCIENCE.

OPENING ADDRESS (ABRIDGED) BY THE REV. W.
TEMPLE, M.A., PRESIDENT OF THE SECTION.

THE spiritual side of human nature, the capacity for fellowship and for devotion, is best trained by the life of membership in a society. No instruction or study can take the place of this. This is the great inheritance that comes down to us, in England at any rate, from the Middle Ages. The side on which those great private institutions which are called public schools, and the older universities, are particularly strong is the social life which is their most leading characteristic. As the personality begins to develop it requires some society of which it may be a member other than the home on one side and the nation on the other. The nation is clearly far too big for the child to realise, or indeed to possess any effective membership in it;

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and the home, though not too small, is yet unsuitable in one respect, namely, that it is bound to be too much under the direction of the parents. Where life in a school-room is possible, and where there is a large family to share that life, some of the conditions which we require are present, but what is needed is a society which shall indeed be under general supervision, but of which the members actually determine the character and life, so that each feels that he is a member of this community in the fullest sense, that its welfare depends upon his loyalty, while his welfare depends upon its general character. I confess that I doubt the possibility of securing this fully realised membership otherwise than in a boarding school, but here I speak with great ignorance; at any rate I am sure that for the spiritual development of the rising generation we urgently need that corporate life in schools which the so-called public schools possess in so large a measure. Every member of one of these schools, or of one of our older universities, knows quite well that what has been most valuable to him in his training has been the whole life of the place, and not the specific teaching of the class-room or laboratory. It is probably true that the educational institutions which have especially cherished this ideal have tended to be slack, as they have certainly been amateurish, with regard to the intellectual or scientific life; but they have maintained this fundamental principle, that the spiritual nature is best developed through life as a member of a society, and that a society of such a kind that the membership can be real and effective.

Now, one main activity of a society composed of children or adolescents will necessarily be found in games. This is partly because physical growth is one of the main businesses of life at that stage, and it is right that the growing boy or girl should delight in developing and exercising the physical faculties. But it is also because a game is felt to be more communal than school work. With work arranged as it now is, it inevitably follows that school work is regarded as being done for one's own sake, while the boy who plays hard is regarded as serving the community; he does it for his house or the school as much as for himself. I shall suggest in a moment that experience shows that by changes, which are otherwise desirable, with regard to school work itself a good deal of this difficulty may be overcome, but it will still remain true, at any rate with boys, that games are the dominant interest, and athletic heroes more admired than boys of intellectual promise; and I desire to insist that this is a perfectly right thing provided only that the elders, whether parents or teachers, do not themselves adopt the boy's standard, and so fix it in the boy's mind, but while sympathising with the boyish interests, yet constantly lead the mind forward to a truer perspective.

We give too exclusive a place to books in school education. Many boys, not at all really stupid, are failures at school because they are bad at books. If manual work is given a larger place, it can be so arranged that the great moral difficulty about school work is removed—namely, its individualistic and competitive character. Co-operation cannot be carried far in book work. Learning from books must be done by each for himself. But manual work can be done in teams, so that a large co-operative element comes in, which is of great value as a training for citizenship.

It is possible to do something of this sort with regard to book work. At Repton a challenge-shield is at this time being presented, to be held by the house whose members together gain most marks according to a scheme which allots so many marks to a form prize, so many to a school prize, and so forth. This in so

far as it is successful in its aim will bring the communal and co-operative spirit into the school work.

In discussing the general atmosphere in which teaching is given, and the effect which by its constant, though often unnoticed, influence it produces upon the character, something must be said about the suggestion implied and offered by our present educational system, and the changes which are needed to remedy its evils. In the first place it is clear that the system rests on the belief that for most people all that is really required is a beggarly minimum. This is most of all apparent in that curious regulation which permits clever children who might profit by continued education to leave school earlier than others, while those who are more slow-witted and less likely to profit by prolonged education are kept at school for the full time. Clearly this regulation rests on and suggests the belief that there is a definable minimum to which all citizens should attain, but beyond which there is no vital necessity that they should pass. The point selected is unfortunate in the last degree, and that in two ways. First, it releases children from the discipline of school just at the moment when discipline begins to be most essential. Down to the beginning of adolescence what we need is something that may more fitly be called supervision, and for myself I have great sympathy with those who hold that under a general supervision there should be the utmost possible freedom for the child. But with adolescence there comes a temporary chaos in the psychological make-up, and during that period there is an urgent need, not only for supervision, but expressly for discipline as that word is commonly understood, namely, the imposition of restraint, forcible if need be, in order that certain impulses may not break loose and destroy the harmony of the whole nature. But the school-leaving age is unfortunate in another respect also. We teach the child to read, and then send him away from school at a time when it is too early to have begun the training of his taste and judgment. We have made him a prey to all manner of chance influences, but have not supplied him with the power of selection between these, or the means of resisting those which his better judgment condemns.

Something no doubt can be done by means of continuation classes, provided that the time for them is taken out of the hours of employment, and not added on to these; but nothing will really meet the case except an all-round raising of the school-age. And even then we still need to get away from the conception of a necessary minimum. What we have to aim at is the maximum attainable by each scholar, not the minimum that will make him a tolerable member of a civilised community. If we aim at a minimum, that will be what most of the scholars also aim at. But how are we to make this change? The obvious method is a large system of exhibitions, maintenance grants, and the like. But here, again, we come to another false suggestion. Any system of scholarships and exhibitions is false in principle, because it inevitably suggests to the child that it is to pursue its studies for the sake of its own advancement; the whole system coheres with the ideal of the educational ladder, by means of which men and women may climb from one section of society to another. Now it is undoubtedly true that the State is bound to secure for its own interest that brain-capacity wherever found shall be fully developed, and that if a child of a dock labourer has capacities fitting him to be a great statesman or a great artist it is for the public interest that these capacities should be fully developed. But we have also to remember that when by education you lift a child from one section of society to another, you expose him to one of the most insidious of all tempta-

tions, the temptation to despise his own people. And if once his native sympathies are thus broken up, it is unlikely that he will grow any more. An educational system which depends upon the ladder is in a fair way to train a nation of self-seekers. Our demand, and here I know that I am speaking for the whole community of labour, must be for the educational highway. Our aim must be, not chiefly to lift gifted individuals to positions of eminence, but to carry the whole mass of the people forward, even though it be but a comparatively little way. We want the whole system to be all the while suggesting that the child's faculties are being trained, not for its own advancement, but for the benefit which the community is to receive. And the right way to suggest this, while also securing for the community the maximum benefit, is, as it seems to me, nothing less than a system of free education from the elementary school to the university, which, instead of offering exhibitions to enable those who are capable to proceed, will on the contrary exclude at certain wisely chosen stages those who are unable to benefit further by school education. At each of such stages there should be for those who are excluded from further advance some form of apprenticeship, and if the stage comes early this should be conducted so far as possible according to the principles of school life, with all its discipline as well as supervision.

The tutorial-class movement, which owes its origin to the Workers' Educational Association, and for a full account of which I must refer to Mr. Mansbridge's book, "University Tutorial Classes," has made two important discoveries. The first is that there is a very great amount of literally first-class ability in the country going to waste for lack of opportunity. That many of us had formerly been convinced must be the case; it is now proved. The other discovery is this. A man who has had no secondary education at all can take up work of the university type when he is of full age if his mind has remained alert. I believe many continuation classes fail through ignorance or neglect of this fact. We always tend to restart the teaching process at the exact point which the student had reached when he left school. That is a mistake. The man or woman whose education ends at fourteen or thirteen, and who becomes desirous of more at twenty-one or later, has lost much in the way of knowledge; but if the mind has remained alert the development of faculty has gone on and the appropriate method of study is that of the university, not that of the secondary school. This is of the utmost importance. We shall not for many years to come secure such a raising of the school-age or such a remodelling of our system as shall guarantee the full development of every child and adolescent. Thousands will continue to be dropped by our educational system at fifteen, if not sooner. Of course, a healthy-minded boy who leaves school at fifteen means to have done with his books. He promptly throws them away unless he is Scotch, and then he sells them. But six or more years later he may wake up to his need for more knowledge and intellectual training. Our tendency has been to give him school teaching; that is wrong; he is of the age to which university teaching is adapted, and only in that will he find what he is wanting.

Provided there has been established such a social life as I have described there will be less harm than otherwise resulting from some degree of specialisation in secondary schools. The students of different subjects will be mixing with one another, and will learn from one another a great deal of those subjects which they are not themselves definitely studying. Certainly one of the great advantages of the college system at the universities is that it gathers together in very intimate

social intercourse students of different subjects. At the present time there is a great denunciation of the prevalence of classical studies and a demand for education in natural science. But it is worth while just now to insist that specialisation in mathematics or natural science, if divorced entirely from the more human studies, or from intercourse with those who are pursuing such studies, may be educationally disastrous in the last degree. Of course, it is sometimes suggested, as I remarked earlier, that the study of natural science produces a scientific type of mind. But this is one form of the confusion to which I alluded at the outset which results from our speaking of natural science by the general name of "science." The study of languages and history can be, and ought to be, just as scientific as the study of physics.

We may state the question perhaps in this way. In order that a man may live his life and discharge his responsibilities as a citizen he needs knowledge. What is the most important sort of knowledge to have? None can be put on a level with the knowledge of human nature. Whatever a man is going to do he will have to deal with his fellow-men and find his own place among them. This knowledge cannot be adequately obtained from books alone, and, as I have said already, training through membership in a social life is the best means to it. But it may be also fostered in a very high degree by what are called the humane studies: the study of the best that men have thought in philosophy, the study of their highest aspirations and deepest woes in literature, the study of their attempts and their achievements in history. This is the most serviceable of all scientific studies that a man can undertake. But it is no doubt true that we have allowed two evil things to happen. In the first place, we have not sufficiently recognised the value of natural science in education, and, still more disastrous, we have tended to identify the study of the humanities with the study of the classical languages.

The chief point that I wish to urge is that the classics are not the only available form of humane study. I should like to see an experiment conducted on the following lines. The staple of the school curriculum to be European history and English literature. At the bottom of the school there should be elementary Latin, which undoubtedly provides good mental gymnastics, and, of course, elementary mathematics and natural science. Perhaps also French, though of this I am more doubtful. Those boys who showed real facility in Latin should, if they so desired, begin to study Greek at about the age of sixteen or sixteen and a half. They should then have one term in which they do very little except Greek. Experiments suggest that in forms consisting only of boys who have already shown some aptitude for a classical language one term's concentrated study will bring them to the point reached by efforts of several years according to our present methods, and the devotion of a single term to this would not seriously interrupt the general course. There would not be a classical side and a modern side, for the staple study of the whole school would be history; but there would be, above the point indicated, divisions for Latin and Greek as there now are in classical schools for mathematics. These would have allotted to them all the hours on the time-table that were not required for the history and literature, for it is of no use, broadly speaking, to read classics after that time unless they are given almost the whole of the student's attention. The study of ancient civilisation, which is what the study of the classics ought to be, is itself something far too rich to come under any condemnation of specialism. Boys who do not take this classical course would take mathematics, science, and at least one modern language, the mathematics and the science being so far as possible com-

bined; specialisation either in the linguistic or the scientific branch would be encouraged in the highest departments. There would also, of course, be opportunity for specialisation in history by means of divisions which would provide a course of study supplementary to that which formed the staple of the school curriculum.

Meanwhile there is one serious evil which could be remedied at once. It is the business of the universities to be the guardians and upholders of a true educational ideal against the natural utilitarianism of the man of affairs. By their scholarship system the universities exercise a far-reaching influence on secondary schools. They give far more scholarships for classics than there are deserving candidates; they do a good deal for natural science and mathematics; they do something, though absurdly little, for history; but they practically do nothing at all for modern languages. To this branch of study they give no encouragement such as might help the schools to treat it in a truly educational way. I want to see boys and girls who study modern languages reading the great literatures which constitute the value of those languages as boys at the top of a classical side read Æschylus and Plato. But we shall not reach that without help from the universities, and at present the universities refuse their help.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—A Grace has passed the Senate sanctioning the admission of women to the first and second M.B. Examinations under conditions similar to those under which they are admitted to the Previous Examination and the Tripos Examinations.

The Appointments Board has just issued its third quinquennial report. It gives ample evidence of the valuable services which the board is rendering to graduates of the University, as well as to firms and public bodies who are in need of highly trained young men. The report shows that a large number of firms have employed Cambridge graduates on the administrative side of their business, and some forty firms are in the habit of applying to the board for scientific assistants. Among the industries represented by these latter firms are chemicals, iron and steel, coal-mining, dyeing, brewing, and the manufacture of paper, drugs, explosives, soap, and glass. Geologists, agricultural chemists, botanists, and mycologists have also found technical employment. Satisfactory as this record is, the board hopes that after the war the range of employment may be greatly increased. The engineering students have been appointed to mechanical, electrical, and civil engineering firms, iron and steel and ship-building firms, firms manufacturing aircraft, chemical engineering works, railways, and a number of public works departments in different parts of the Empire. The agricultural students also obtain employment over a large area, including various British Colonies. Of the work of the board during the war it is not yet time to speak in detail.

LONDON.—At a meeting of the Senate held on November 15 the Rogers prize of 100*l.* for 1916, for an essay on "The Nature of Pyrexia and its relation to Micro-organisms" was awarded to Dr. J. L. Jona.

It is announced that Messrs. Baldwins, Ltd., have given 10,000*l.* to the Swansea Technical College for the endowment of a chair of metallurgy.

MR. C. FENNER, principal of the Ballarat School of Mines, has been appointed superintendent of technical education in South Australia, a position created under the South Australian Education Act.