

THE SECONDARY SCHOOL  
CURRICULUM.<sup>1</sup>

THE Secondary School Examinations Council is an august body the members of which have for the most part more experience of university work and of administration than of secondary schools. The council was therefore well advised in selecting, for the investigation of the methods and standards of award of the seven approved first examinations, "panels" of experienced teachers. These have now made their reports, which are published for the information of all concerned. The conclusions reached are not so startling as to make the non-committal preface appear necessary in the eyes of a schoolmaster.

The mathematical investigators in particular have not exceeded their terms of reference, though a hint is thrown out that the present forms of compulsion may require revision. Thus "elementary mathematics should include arithmetic" seems a harmless proposition. To some examining bodies, however, "elementary mathematics" means algebra and geometry, and is not compulsory. Later there follows the sentence: "So long as mathematics is a compulsory subject for exemption purposes, the present standards for credit cannot well be raised, but they are in themselves unsatisfactory." It may be inferred that compulsory algebra is viewed with disfavour, a view which is shared by many examiners who have realised the appalling waste of time involved for half the boys and girls who try to learn algebra without attaining the power or even the need to apply it in the simplest way. Compulsory arithmetic is much more defensible, and it is a pity that the investigators have not maintained a clearer distinction between the two. In geometry it is recommended that the theorems on congruence of triangles, parallel lines, and angles round a point (*i.e.* Euc. i. 4, 8, 26; 27, 28, 29, 32; 13, 14, 15) should be omitted. We may infer that only the proofs of these theorems are indicated, and that the enunciations (*pace* Einstein) are to be assumed.

The science investigators have had to cover a wider field and to consider a greater variety of practice on the part of the different examining bodies. Thus in one examination a paper is set on "Elementary General Science," covering a very elementary treatment of heat, hydrostatics, chemistry, and botany, this paper having been recently introduced for the benefit of rural secondary schools. The "panel" is of opinion that further investigation of this general science work is particularly desirable. We may remark here that it would greatly help the movement if specimen copies of the paper referred to could be circulated among teachers and examining bodies. To quote the report: "The examination, like the syl-

<sup>1</sup> Secondary School Examinations Council. Reports of the Investigators Appointed to inquire into the Methods and Standards of Award in the Seven Approved First Examinations held in July, 1918. Group I., English, History, Geography; price 6s. Group II., Classics, Modern Languages; price 4d. Group III., Mathematics, Science; price 4d. (H.M. Stationery Office.)

labus in the schools up to the sixteen-year-old stage, should be suited to the capacity of the average pupil of sixteen, should cover a reasonably wide range, and should not encourage instead advanced work within a limited field. Further, it should not be confined to an abstract and academic treatment of the subject, but should require a knowledge of the applications of the sciences to everyday life. It must be remembered that at this age pupils obtain far more value from a concrete than from an abstract treatment of science, and this should be borne in mind both in drawing up a syllabus and in setting a paper. The investigators direct attention in this connection to the observations contained in paragraphs 47, 50, and 51 of the Report of the Government Committee on Science." Most teachers of science in schools will assent to this. The generation of science masters who began their science at the university is rapidly passing away. On them must partly rest the responsibility for the effort which has been made in the last thirty years to impart an appreciation of "scientific method" to boys at too early a stage. Now they are being followed by a generation of teachers who may have begun the systematic study of science at the age of twelve, and in some cases find themselves deficient in literary attainments. An undergraduate starting on geometrical optics is at a disadvantage if he has never handled lenses or prisms in such a way as to know their peculiarities; but if he has done this, and knows the meaning of the words used, he need not have been through a prolonged course of optical measurements, nor need he belong to the class of natural science students who come up "knowing how to measure every physical quantity, but with no ardent desire to measure any."

It may be remarked here that "general science" is no more than a branch of English, and that its teaching implies the demonstration to the various senses of the meaning of a number of English words. This has evidently been realised by the "panel" of geographers, whose remarks are worthy of quotation. They "are of opinion that geography should be a subject in Group I.; but they are of opinion that it should be a subject in Group III. also." Geography, in other words, is not only a branch of English, but also a branch of science. This is a bold saying, and it may possibly account for the cautious prefatory statement: "It must not be assumed that either the council or the board are at present committed to any or all of the suggestions." If geography is to belong to two groups, why not also general science? And why should not algebra find a place among the foreign languages? The insidious suggestion might lead to the collapse of all the walls of partition and to the survival of English as the one essential subject, as seen in a vision by Sir Arthur Quiller-Couch. For the investigators in English report thus: "They are of opinion that (in the interests of the language and of lucidity of expression) a reasonable standard of English should be required in all subjects of the examina-

tion." Again: "No candidate should obtain a certificate who does not show a good command of English and the power of writing it intelligently." If to this were added the power of reading English intelligently, which implies a knowledge of the meaning of a number of words in common use under the headings of geography, history, and general science, and, finally, the power of doing simple arithmetic, is it not conceivable that a candidate possessing these three powers might be thought fit to continue his studies at any university of the realm?

#### NOTES.

BOTANISTS in Great Britain have been considering the practicability of holding an Imperial Botanical Congress in London at which botanists from the overseas Dominions might meet their colleagues at home for the discussion of matters of common interest. Many subjects are ripe for discussion, such as the methods of training botanists for service abroad, the relation between the pure science and its applications and between the botanist and the commercial men interested in industries in which botanical knowledge should play an important part, more helpful co-operation between the home and the overseas botanist, botanical surveys of overseas Dominions, and others. After careful consideration it has been decided that it would be inadvisable to hold such a congress during the present year.

M. LUCIEN POINCARÉ, Vice-Rector of the University of Paris, will be entertained at dinner by the Groupe Inter-Universitaire Franco-Britannique on Monday, February 23. The dinner is being organised in connection with the formal opening of the British Bureau of the Office National des Universités et Ecoles Françaises by M. Poincaré. The chair will be taken by M. Petit-Dutaillis, Director of the Office National. Amongst the members who have intimated their intention of being present are his Excellency the Belgian Ambassador, his Excellency the Greek Minister, the Lord Chancellor, the Earl of Reading, Viscount Burnham, the Right Hon. H. A. L. Fisher (President of the Board of Education), the American Consul-General, Mr. Austen Chamberlain, and the Lord Mayor and Lady Mayoress.

THE anniversary of Sir Francis Galton's birth, February 16, was celebrated by the Eugenics Education Society as usual this year. Prof. Arthur Keith delivered the Galton lecture, and this was preceded by a dinner at the Connaught Rooms. These annual gatherings have been held since 1914 in every year but one, when war conditions stood in the way. In his interesting lecture, which will be printed in full in the next issue of the *Eugenics Review*, Prof. Keith gave a sketch of Galton's life in so far as it affected his work, and a broad and general account of his investigations and theories. The main thought running through his address was that Galton's work had not been adequately appreciated during his life, and that his reputation would increase as time went on. In Galton's day anthropologists concentrated

their attention on the individual man, whilst it was equally necessary to consider the distribution of men according to their qualities. Hence Galton's teachings made slow progress because they fell on unprepared ground, whereas in the future he would come to be recognised as one of the greatest men of science produced in England during the nineteenth century. Major Leonard Darwin was in the chair, and said that Galton always had practical aims in view and always had the courage of his opinions. If ever the name of eugenics came to be captured by cranks it would be because scientific men did not follow his example, and, through fear of contact with cranks, gave this important subject lukewarm support. The science of eugenics could never suffer in this way, because it was founded on indisputable truths. The proceedings terminated by a vote of thanks moved by Sir Robert Blair and seconded by the Dean of St. Paul's.

At the National Conference of Manufacturers and Producers, held at Kingsway Hall on February 11, Sir Robert Hadfield, representing the Federation of British Industries, proposed a resolution appreciating the work of the Department of Scientific and Industrial Research, and strongly urging all manufacturers, either individually or collectively by trades, to organise and maintain research facilities. In the course of his remarks Sir Robert Hadfield affirmed that science and industry are now in indissoluble partnership, and that further steps should be taken to organise research more thoroughly and efficiently than has been done in the past. We must recognise that, in these days of international competition, the prosperity of every British manufacturer and trader is bound up with that of British trade as a whole, and hence research must be regarded as a national rather than as an individual matter. While admitting the necessity for, and the value of, the research work done by big firms along the lines of their special activities, Sir Robert Hadfield pointed out that there are also a number of questions affecting whole industries the solution of which can be obtained only by the co-operation of many workers investigating special branches of the subject. In these cases everything is to be gained by carrying on the work of research in combination and making its results available to the whole of the organised industry. This is what the Department of Scientific and Industrial Research enables to be better accomplished, at any rate in certain trades and lines of work.

THE third annual Silvanus Thompson memorial lecture of the Röntgen Society will be delivered by Prof. W. H. Bragg in the Barnes Hall of the Royal Society of Medicine, 1 Wimpole Street, at 8 o'clock on Tuesday, March 2. The subject will be "Analysis by X-rays." Admission will be free.

PROF. A. DEPAGE (University of Brussels), Drs. Pierre Duval and A. Gosset (Paris), Prof. J. M. T. Finney (Johns Hopkins University), and Dr. Charles H. Mayo (Rochester, U.S.A.) have been elected honorary fellows of the Royal College of Surgeons of England.