SCIENCE IN PUBLIC SCHOOLS.

THE seventeenth annual meeting of the Association of Public-School Science Masters was held at Eton College on January 3 and 4. In his presidential address, Prof. H. H. Turner dealt with two main points, namely, that few boys have in them the making of scientific investigators, and that more openings are required for those who possess these attributes. Just as some boys have no sense of appreciation for music, so others are dead to scientific things, and may have a habitual dislike to them. It must, of course, be acknowledged that such types exist, but like indifference or antipathy can be found to all school subjects. Prof. Turner dealt with instruction in science as if its intention was to produce experts, whereas up to the age at which specialisation is permitted in a school course, the scientific teaching should be that which can claim a place in general education as justly as the teaching of letters, history, and mathematics. Boys who specialise in science afterwards may become investigators, but at present the careers open to them are few, and the prospects in them are unpromising. Prof. Turner suggested the formation of a Research Civil Service, parallel to the existing Administrative Civil Service. There is plenty of work to be done, such as the survey of our Empire, geodetically, magnetically, gravitationally, bathymetrically, and in other ways. There are forestry and fisheries, and industrial research of many kinds. Work is less likely to fail than workers. Modern researches are often of embarrassing length and involve much labour, but schools may help with some of them, and Prof. Turner gave a number of instances, of which "upper-air research" was one. He quoted Capt. Cave's opinion that such work is suitable for boys, and would be scientifically valuable. Mr. O. H. Latter, of Charterhouse, in seconding a vote of thanks to the president, proposed by Mr. C. E. Ashford, of the Royal Naval College, Dartmouth, thought that the views of parents would have to be taken into consideration when contemplating purely scientific investigation in schools. In this connection he read the following letter received by him as typical of the attitude of many parents towards certain studies of natural history:—

"I wonder if I may ask your co-operation in regard to my son? I believe you are the principal natural science master, and that he has been under your tuition from time to time. The boy's extraordinary liking for what I regard as the most repulsive branch of natural history—newts, beetles, and insects—is a source of much disappointment both to his mother and to me. Can you either directly or indirectly turn his mind to a higher and more refined branch of the subject—birds, trees, or flowers? I cannot help feeling that the tendency of his present study is degrading, and I shall be glad to know if you think you can influence him in the way I suggest. If you can, I shall be extremely grateful to you."

Prof. R. A. Gregory, in opening a discussion on "Science for the Rank and File," said it is necessary to distinguish clearly between courses of work suitable for the rank and file and those intended as preliminary training for scientific or industrial careers. One has to do with science as an essential element of a liberal education; the other with vocational instruction. The former is at least as important as the latter, and little justification can be found for the concentrated attention given to a few subjects, with the view of imparting knowledge of experimental methods, when such a course means that the wonders of the fields beyond are kept outside the range of vision. For the imparting of the rudiments of a liberal education to all pupils the descriptive and qualitative school science of a generation ago is better adapted than the quantitative work in the narrow fields mapped out for instruction to-day. A plea was made for the introduction of descriptive lessons and reading intended to stimulate interest in scientific work and achievement and their relation to modern life, instead of limiting the teaching to dehumanised material of physics and chemistry.

Different aspects of this general subject of science for all were put forward in papers on:—A scheme of instruction in science for all boys throughout their school career, *i.e.* some science indispensable for all boys, by Mr. F. S. Young (Bishop's Stortford); the teaching of science on the classical side, by the Rev. S. A. McDowall (Winchester); the age for beginning serious science, by Mr. W. D. Eggar (Eton); classics the basis of a scientific education, by the Rev. A. L. Cortie, S.J. (Stonyhurst); how far can the advantages derived from teaching classics be derived from science? by the Rev. F. G. Forder (Charterhouse).

On the second day of the meeting, the first subject of discussion was technical bias in schools, and the papers read were:—School science in its relation to modern industrial problems, by Mr. E. R. Thomas (Rugby); school chemistry with a technical bias, by Mr. W. J. Gale (King's College School, Wimbledon); value and danger of giving a technical or topical trend to scientific education, by Mr. D. Berridge (Malvern). There was also a discussion on the place of text-books in science teaching, opened by Mr. G. N. Pingriff (University College School).

In the course of the discussion on technical bias in schools, Prof. A. Smithells said that in teaching science it should never be forgotten that however perfect might be the inculcation of scientific method, however sound the mental discipline, however powerful the intellectual weapon they supplied, unless they showed how science bore upon the environment and avocations of human life—unless, in fact, they humanised it—science could not flow effectually into the general culture of the nation.

Mr. C. L. Bryant, secretary of the association, in reading the report of the committee, said that towards the end of 1915 it was decided to arouse public opinion on the lack of appreciation of science in this country, and as the result of the work of a sub-committee, Mr. M. D. Hill was able to form what became known as the "Neglect of Science Committee." The committee of the association has also drawn up a memorandum containing a statement of facts, principles, and policy, which served as a text for discussion between a deputation and the Government Committee on Science in Education. In view of the growing opinion that training in science forms an essential part of a liberal education, the committee of the association has drafted a scheme of work which it considers to be suitable for all boys at the public schools up to the age of about sixteen and a half years. The meeting passed, *nem. con.*, a motion expressing general approval of this scheme.

FERTILISERS AND AGRICULTURAL PRODUCTION.

THE January issue of *Blackwood's Magazine* contains an important article by Prof. W. Somerville entitled "Increased Agricultural Production." As indicative of the present position of British agriculture, the author points out that of the food consumed we produce only one-fifth of the wheat, rather more than half the meat, one-quarter of the butter and margarine, one-fifth of the cheese, and nearly all the milk. The chief factor causing the reduction of the area of land tilled was the great increase in the