

The Mathematical Association in Conference.

THE annual meeting of the Mathematical Association was held at the London Day Training College on January 4 and 5, with Prof. G. H. Hardy presiding. The report of the Council records continued growth in membership, and continued activity on the part of committees. The programme of the meeting consisted of three lectures and two discussions, in addition to the president's address.

Prof. E. N. da C. Andrade, whose subject was atomic structure, described the decomposition of a line spectrum into series, and Bohr's theory of the relation of these series to the constitution of the atom.

A lecture on modern theories of integration was in the nature of an experiment, and was brilliantly successful. After recalling the dual rôle of the integral in elementary work, Mr. Carey Francis showed the limitations imposed by any definition of the definite integral in which the only division of the range which is contemplated is a division into sub-intervals. He explained how the measure of a set of points extends the conception of the length of an interval, and introduced the Lebesgue integral and the Stieltjes integral as natural results of subdividing the range of integration into sets of points of any kind instead of into intervals only. Mr. Francis' achievement in making clear the nature and purpose of a mathematical method that was outside the curriculum in the student days of the majority of his audience seems to indicate a new and valuable function of the Association.

A forcible speech by Mr. E. R. Brown opened a discussion on the *Mathematical Gazette*, the organ of the Association; the remarks of different speakers emphasised the variety of tastes for which an editor may be asked to cater, without showing very clearly the sources from which he can draw.

Dealing with the measurement of intelligence, Prof. C. Spearman first illustrated the difficulty of reaching agreement either on a simple definition of intelligence or on the group of elementary qualities to be included in a composite definition. He afterwards explained the discovery that over a very wide range the observations can be systematised by the recognition of two factors, one which can be regarded as a measure

of general intelligence and another which depends on the subject in which the individual is being tested.

The president's address was entitled "The Case against the Mathematical Tripos." Examinations have their place in education up to a certain point as natural and effective tests of industry and of the ability to learn and to reproduce, but the claim made for the Tripos has been that it assesses qualities of a higher order. Because of this claim and of the prestige of the Tripos, training for the examination has been substituted for genuine mathematical education, with the mischievous result to the individual that at any time it has been possible to obtain the highest honours while completely ignorant of all the broad developments of the previous thirty years, and to the nation that in no subject except music has the international position of England been so deplorable throughout two hundred years as in mathematics. Not only is it difficult to present in theory a plausible defence of the claim made for the Tripos, but in practice, position in the Tripos is ignored in all but an insignificant fraction of appointments, and if the Tripos is less harmful to English mathematicians now than fifteen years ago, that is because there is no distinction now which a good student does not obtain as a matter of course. Convinced that the best that can be said for the Tripos is, that so long as no attention whatever is paid to it either inside the University or outside, its ill effects are negligible, Prof. Hardy advised mathematicians at Cambridge deliberately to lower the standard at every opportunity, and so to reduce the examination to an absurdity the abolition of which must be only a matter of time.

Time was allotted for discussion of a "Report on the Teaching of Mathematics to Evening Technical Students," which has just been prepared for the Association; unfortunately, the report was not in the hands of members, and speakers could refer only to a synopsis distributed at the meeting, but interesting views were expressed on such matters as the value of deductive geometry for these students, and appropriate methods of introducing logarithms and the exponential function.

Agricultural Education in the United States.¹

DURING the last half-century the importance of agricultural education has been increasingly recognised in America, until now every State has one or more agricultural colleges, forming a group of institutions occupying a prominent position in the field of education. During the decade 1910-1920 development was extraordinarily rapid, and very large sums of money were appropriated in many States for the provision of new agricultural buildings, the purchase of land, and the endowment of educational programmes. The colleges have had a long struggle for recognition, but have demonstrated their value and are now in such a position, financial and otherwise, that their future usefulness is assured. The immediate need is for trained teachers, investigators, and administrators, and in response to this, graduate work in agriculture has developed with amazing rapidity during recent years, though in certain colleges it is still seriously handicapped by lack of funds and accommodation. At present the full agricultural course extends over four years, but there is a suggestion to

extend this to five in some cases for the purpose of specialised training. In many colleges the curricula have been steadily changed in order to keep abreast of the modern requirements of agricultural education, though there are still some in which the work is too largely restricted to methods of production, resulting in a narrowed outlook.

The field of work covered is very wide, ranging over at least a dozen branches, which, however, are not rigidly separated but dovetail into one another to some extent. All branches have developed from small beginnings, shaping themselves according to the needs of the time, with the result that some subjects which were originally an integral part of one branch are now dealt with more fully and adequately by others. Agronomy was initially defined as covering that part of the general field of agriculture devoted to climate, soils, fertilisers, and farm crops, but it now tends to deal with the more fundamental and far-reaching problems of soil physics and chemistry, plant physiology, and plant genetics. It is claimed that the instruction in agronomy has had much to do with securing the improved crop production of the United States in recent years. Horticulture has almost always

¹ Land Grant College Education, 1910-1920. Part III.: Agriculture. Edited by W. C. John. U.S. Bureau of Education Bulletin, 1925. No. 4. Pp. 105.