

menting on this report, Profs. Hobson, Love, and Sir J. Larmor were of opinion that to limit the mathematics of science students to those portions which might be considered of direct utility would destroy that logical unity which is the essential feature of the subject, and relegate it to a subservient position little in keeping with its importance. Sir A. G. Greenhill uttered a warning against the excessive attention engineering pupils are apt to give to descriptive geometry, to the detriment of their studies in the calculus. Sir J. J. Thomson was in favour of physicists learning mathematics from pure mathematicians, if the latter would reserve some of their latest refinements for special lectures.

Prof. D. E. Smith (New York) presented a report on intuition and experiment in mathematical teaching in secondary schools. The object of the inquiry was to ascertain to what extent intuitional methods are at present employed. A general spirit of unrest is apparent. In geometry it may be said that it is the plan of the Teutonic countries to mix the intuitional and deductive work from the outset, while in France, and now in England, the plan is to let an inductive cycle precede a deductive one. The United States is only beginning to talk about the question, whatever tendency there is being towards the Anglo-French plan. The second important movement is the elaboration of the function concept; starting in France within the last twenty years, and vigorously advocated in Germany within the last decade, the movement is, as a whole, too recent to judge of its permanence. A practical form of outdoor mensuration seems to be developing, especially in Austria, Germany, and Switzerland. Geometric drawing and the graphic representation of solids are passing from the hands of the art teacher to the mathematician. Graphic methods of representing functions have become universal in the last generation. The contracted methods of computation that were prominently advocated fifty years ago do not seem to have advanced materially, owing to the feeling that they are not really practical; on the other hand, logarithms have come into general use, and the slide rule is in great favour in technical schools. In general, it may be said that intuitional and experimental methods have made more progress in Austria, Germany, and Switzerland than in England, France, and the United States.

At the final meeting of the congress it was resolved to accept the invitation to Stockholm for the next meeting in 1916. Informal invitations to Budapest and Athens for subsequent meetings were also noted.

THE BRITISH ASSOCIATION AT DUNDEE.

BY the time this issue reaches the reader the British Association will be in full session, and meanwhile there seems to be every prospect of an unusually successful meeting. Dundee is a town of comparatively small population, largely made up of the working classes, but the number

of persons resident in the town and neighbourhood who have joined the Association is remarkable. The various towns in which the Association meets are found to differ greatly in this respect, and it occasionally happens that the number of local associates is exceedingly small. Since the year 1901 the Association has held its annual meetings on two occasions abroad and on nine occasions at places within the United Kingdom. The average number of tickets sold at these nine centres before the opening of the reception rooms is 460, and the highest number so sold at any one of the nine was 643; but considerably more than 1100 tickets had already been sold in Dundee by the local committee before the opening of the reception rooms, and by Tuesday evening some 2000 tickets were issued.

This large local addition to the ordinary membership of the Association, together with the unusually large attendance of foreign, American, and Colonial guests, however gratifying it may be to the officers of the Association, renders the task of the local committee a difficult and anxious one. The various halls and Section rooms will be taxed to the utmost, and the various excursions and entertainments will scarcely be sufficient for an attendance so greatly in excess of the estimates that were based on the statistics of recent meetings.

As has already been stated in these columns, the attendance of scientific men from abroad is unusually great, beyond anything indeed that has been seen since the great meeting at Manchester; and this large gathering of foreigners has had its effect in helping to attract the scientific men of our own country. Within the last few days a number of eminent mathematicians, who have attended the recent congress at Cambridge, have made known their intention to be present; geologists are mustering in strength from many countries, tempted to a large extent by the promise of excursions of unusual interest, and a still larger gathering of notable physiologists are coming to do honour to a physiological President.

Every nook and corner of the town is filled almost to overflowing, and members who arrive without having made their arrangements beforehand will have little chance of finding even the simplest houseroom. Private hospitality has provided for between 700 and 800 guests, and every hotel in the town and in the near neighbourhood was filled up many days ago.

It is sometimes said that the British Association is losing ground, but the experience of this meeting shows that the belief is without foundation; not only is the attendance this year fully comparable to the average attendance in the best days of the Association, but there is every prospect also of animated discussion and abundant scientific work. We print this week the inaugural address delivered last night by the president, Prof. E. A. Schäfer, F.R.S., and also the address to be delivered by Prof. H. L. Callendar, F.R.S., before Section A this morning. Other addresses, and reports of the proceedings of the various Sections, will appear in later issues.