

Newton Moore, Agent-General for Western Australia, spoke of the immense saving of labour which such a bureau might have effected in his office last year, when the establishment of the University of Perth was under consideration. The delegates also resolved that it is desirable that the Congress should meet at intervals of five years, and that both in the United Kingdom, in the several great dominions and in India representatives of universities should meet annually.

The entertainments offered to the Congress were of remarkable interest. The Government invited the delegates to lunch at the Savoy Hotel. They were seated at thirty round tables, with a member of the Government or the Chancellor of a University at each. Prince Arthur of Connaught, President of the General London Committee, replying to the second Royal toast, said that the Royal Family had shown its appreciation of a university training by giving the Heir to the Throne the opportunity of sharing it for the last two generations, and that a university course is contemplated for the Prince of Wales. Mr. Lewis Harcourt, in a most felicitous speech, proposed the toast of the Congress, to which Lord Rosebery and Principal Peterson, of the McGill University of Montreal, replied.

In the evening Prince Arthur received the delegates in the Marble Hall of the University of London. Chancellors and Vice-Chancellors grouped themselves behind the Prince. The conversation which followed was attended by 2500 people, most of the men and many of the ladies in academical robes. On Wednesday and Thursday, delegates were invited to dinner by the Clothworkers', Merchant Taylors', Fishmongers', Vintners', and Leathersellers' Companies; the Countess Beauchamp received them later at her house in Belgrave Square. The Victoria League and the Marchioness Dowager of Bute gave a garden party. There was an "at home" at the Mansion House. The Royal School of Medicine for Women gave an "at home." Mrs. E. B. Sargent gave a delightful party at Claridge's. The Principal and Staff of King's College invited a large number of delegates to dinner. The British Academy arranged the second annual Shakespeare lecture for the Monday night, and followed it with a *soirée*. The delegates from overseas are now on tour, receiving similar hospitality at Oxford, Birmingham, Manchester, Liverpool, Leeds, and Cambridge. Before the meeting in London they visited the Scottish universities, Dublin and Durham.

Not the least important result of the meeting of the Congress will be the Report, which will necessarily be a bulky volume, since it will contain, in addition to all the papers prepared for and speeches made at the Congress, appendices of information regarding the regulations and practices of all British universities with regard to the matters which were discussed at the Congress. It will be published early in the autumn, and will be obtainable from the Congress Office, University of London.

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## GEODETIC WORK IN THE ORDNANCE SURVEY.<sup>1</sup>

IT is with very great pleasure that we record the issue of the first of a new series of Professional Papers by the Ordnance Survey. The fundamental work of the Survey is recorded in a series of volumes which form one of the most important contributions to geodesy that have been made; but in more recent years new material has oftener been referred to in the annual progress reports than dealt with thoroughly in special publications such as the one before us. At the present time, when there is already high-grade work in hand, and much more will be required in the survey of all parts of the Empire, the experience gained by the great survey establishments is of the highest value to those engaged on similar work in the oversea Dominions and the Crown Colonies.

The present paper deals with the measurement of a base-line at Lossiemouth, which is the outcome of a representation made by the Council of the British Association for the Advancement of Science in 1908 to the Board of Agriculture and Fisheries, that it was highly desirable to ascertain the accuracy of a portion of the principal triangulation of the United Kingdom remote from the principal bases at Salisbury Plain and Lough Foyle.

Three invar tapes, 100 feet long, were employed, and the first two chapters of the paper describe the preliminary operations and the procedure employed in making the measurements. The next three chapters contain a very valuable and interesting account of the standardisation of the 10-foot Ordnance Intermediate Bar, OI<sub>1</sub>, at the Bureau International des Poids et Mesures at Sèvres, the standardisation of a subsidiary standard bar, OI<sub>2</sub>, at Southampton, and of a 100-foot base, as well as of two standard invar tapes, at the same place.

In the field a 100-foot base was laid down with the aid of these two standardised tapes, and with it the three invar tapes which were used for the measurement of the base were compared on four occasions during the work.

The last two chapters contain a very useful discussion of the theory of tapes in catenary, due to Prof. O. Henrici, F.R.S., and Captain E. O. Henrici, R.E., which ends with a summary of the errors affecting a base measurement, omitting, however, the possibility that the tapes or wires may not always be at the same temperature as the air. All possible errors should be considered in determining the probable accuracy of a base, and not only the discrepancy between the two or more measurements made, as is sometimes the case. The final value for the base is given as 23,525.97944 feet, with a probable error of 1 in 900,000.

<sup>1</sup> "An Account of the Measurement of a Geodetic Base Line at Lossiemouth in 1909, together with a Discussion of the Theory of Measurement by Metal Tapes and Wires in Catenary." Ordnance Survey Professional Papers. New Series, No. 1. Pp. 39. (London: H.M. Stationery Office; Wymann and Sons, Ltd.; Edinburgh: Oliver and Boyd; Dublin: E. Ponsonby, Ltd., 1912) Price 2s.



We should have welcomed details of the measurements actually made on the different sections, for these are not given. The sections were of the length that could be measured in a day, and apparently between ten and twenty of them were comprised in the base, since they were from 1200 to 2400 feet in length; three measurements were made with different tapes, but we see no mention of each section being measured in both directions. A comparative table, setting forth all the measurements for each section, the temperatures, tensions employed, time occupied, &c., as well as the character of the weather encountered, would have been of much interest, for at least on one day we are told that the wind made measurement impossible. A plan of the base site and a section of the line would also have been very useful to geodesists, who will look forward with interest to further publications of this character by the Ordnance Survey. H. G. L.

### THE SHEFFIELD MEETING OF THE BRITISH ASSOCIATION.

#### PROVISIONAL PROGRAMME OF SECTIONS.

**A**RRANGEMENTS for the programmes of the various sections of the British Association at the meeting to be held in Dundee on September 4-11 are now approaching completion. By the courtesy of the Recorders of the sections we are able to give a forecast of the main subjects to be brought forward for discussion. Judging from this provisional statement, the scientific proceedings of the meeting promise to be of wide interest.

**SECTION A (MATHEMATICS AND PHYSICS).**—The presidential address in Section A will be delivered at 10 o'clock on Thursday morning, September 5, by Prof. H. L. Callendar, F.R.S. The principal items arranged by the committee for subsequent days consist of three discussions. The first, to be held in conjunction with Section G (Engineering) is to be opened by Prof. J. A. Fleming, on the subject of the scientific theory and outstanding problems of wireless telegraphy. In his opening remarks, Prof. Fleming intends to put forward a large number of questions which still require an answer, and to make suggestions of his own towards supplying a complete answer. It is expected that Prof. A. E. Kennelley, Prof. A. G. Webster, and Prof. A. Sommerfeld will be able to attend, together with a large number of British investigators, and it is hoped that the meeting will form an exceptional opportunity for physicists, mathematicians, and engineers interested in this question to expound their own and criticise each other's views. The second discussion is on the atomic heat of solids, and is to be opened by Dr. F. A. Lindemann, of Berlin. Section B will collaborate in this discussion. There is probably no subject which combines in a greater degree speculation and experiment, and there is certainly none which can claim to be more the question of the present day, and it is intended that the discussion should familiarise English scientific men with the subject. The third is on series in spectra, with Prof. E. T. Whittaker as its opener. Dr. Whittaker is expected to deal with it chiefly from the dynamical point of view. Papers are coming in, but the programme is still incomplete. Those who desire to read papers are reminded of the new order

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of the council that "no abstract shall appear in the annual report unless it is in print before the meeting," and no abstract can be so printed unless received during this month.

**SECTION B (CHEMISTRY).**—The proceedings of Section B should prove very attractive to followers of organic chemistry and its biological application. A sitting will be devoted to the carbohydrates and allied subjects, at which papers will be read by Prof. Irvine, Dr. A. Harden, Dr. S. Mills, and Dr. E. F. Armstrong. These should provide a valuable account of the progress which is being made in this field. A second sitting will be occupied by a discussion of a more general nature on the migration of groups: Dr. A. McKenzie will open this with a summarised account of the Walden rearrangement, and a second paper will be read by Prof. K. J. P. Orton. At a joint meeting with the Botanical Section, fixed for Friday, September 6, several important papers are promised of interest to agriculturists and botanists, as well as to chemists. Dr. J. V. Eyre will deal with the enzymes of flax and the variations of the flax plant with locality, and it is expected that some discussion will ensue as to the possibility of reviving the growth of flax in the British Isles. Mr. A. Compton, of the Pasteur Institute, will give an account of some of the recent French work on plant enzymes; Prof. F. Keeble and Dr. E. F. Armstrong will deal with the biochemistry of flower pigmentation. Other papers on organic chemistry are promised from Dr. R. H. Plimmer, Prof. C. R. Marshall, and Dr. J. K. Wood. A joint meeting will be held with Section A, when, following the discussion on specific heats, papers will be read by Dr. A. Holt, Dr. C. H. Desch, Prof. H. Marshall, and Mr. A. J. Berry.

**SECTION C (GEOLOGY).**—A large number of important papers has been promised for the meeting at Dundee, and these include several which will form the basis of discussions. Dr. Gordon, of the Geological Department of Edinburgh University, will read a paper on the fossil flora of the Pettycur Limestone, Fife, and its bearing on botanical evolution, which will be followed by a discussion, in which several leading members of the Botanical Section have promised to take part. A paper by Dr. J. S. Flett on the sequence of volcanic rocks in Scotland in relation to the Atlantic-Pacific classification of Suess, will also form the basis of a discussion, which, as several leading petrologists are expected to be present, should prove of considerable interest. Papers dealing with the recent discoveries of fossil remains in the Chert and Green Schist Series of the Highland border, north of Stonehaven, and in the neighbourhood of Aberfoyle, will be read by Dr. Campbell and Dr. T. J. Jehu, and the latter will also give an address on the geology of the country round Dundee and St. Andrews. Dr. Peach and Dr. Horne will contribute a joint paper on the Archæan rocks of the Island of Lewis. In all about twenty-five papers have been promised up to the present time. Excursions will take place during the meeting, including a visit to the famous fossil fish locality at Dura Den, where the quarry has been specially reopened, and at the close of the meeting a joint excursion with the Geologists' Association to Aberdeen and Arbroath has been arranged.

**SECTION D (ZOOLOGY).**—The president of the section is Dr. P. Chalmers Mitchell, F.R.S. There will be a joint discussion with Section K on the origin of life, opened by Prof. E. A. Minchin, and a joint discussion with Section I on physiological conditions in aquatic animals. Prof. A. Pütter (Bonn) will speak upon this subject. Among the papers to be brought before the section are the following:—Life-history of a water beetle, Balfour Browne; note on some results of the