SCIENCE

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THE YORK MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE meeting of the British Association at York from the first to the eighth of August has a peculiar historical interest in that this interesting and beautiful town was the seat of the foundation of the association seventy-five years go and was the meeting place twenty-five years ago. This time the York Philosophical Society, under whose auspices the first meeting of the association was planned in 1831, was again the host.

The many points of interest in the surrounding country and in the city itself, the numerous halls and meeting places, the beautiful garden and interesting collection of the museum and the great assembly hall, all combine to make York a most attractive and suitable place for this great gathering of the best in English science. The delightful hospitality of the people of York added much to the pleasure of this particular meeting. Perhaps the most attractive of the social gatherings were garden parties given by the Archbishop of York and Mrs. Maclagan at the picturesque and historical palace at Bishopthorpe; by the Sheriff of York and Mrs. Bentley at their beautiful home at Fulford Grange, and by the Messrs. Rowntree and Company at the celebrated cocoa works, while the museum and grounds of St. Mary's Abbey were lighted up by thousands of candles on two occasions for conversazioni. At the great cathedral an organ recital and a special

service with sermon by the Bishop of Ripon, were most impressive.

In view of the anniversary nature of this meeting, it is not out of place here to repeat the aims of the British Association which were set forth seventy-five years ago by William Vernon Harcourt as follows:

> To give a stronger impulse and more systematic direction to scientific enquiry, to obtain a greater degree of national attention to the objects of science, and a removal of those disadvantages which impede its progress, and to promote the intercourse of the cultivators of science with one another and with foreign philosophers. Therefore it is that I propose to you to found an association, including all the scientific strength of Great Britain, which shall employ a short period of every year in pointing out the lines of direction in which the researchers of science should move, in indicating the particulars which most immediately demand investigation, in stating problems to be solved and data to be fixed, in assigning to every class of mind a definite task, and suggesting to its members that there is here a shore of which the surroundings should be more accurately taken, and there a line of coast along which a voyage of discovery should be made.

E. Ray Lankester, in his presidential address before a brilliant gathering of 1,800 members and guests, reviewed some of the more important advances in science which had been made during the quarter century which has elapsed since the last meeting in York, and he characterized these advances as showing a 'continuity and healthy evolution in the realm of science' rather than any revolution or inconsistency in the previous course of human thought. His address, which was somewhat disjointed because of many cuts, was based largely upon contributions from certain leaders in different branches of science, and much was lost of that spontaneity which comes from personal opinion, although made up perhaps by the thoroughness of the presentation. Particular attention was given to radium on the side of the physical sciences and to human disease and to Metchnikoff's phagocytic theory of immunity on the side of the natural sciences. Curiously enough, one of the most widely-followed branches of modern research, experimental zoology, was not even mentioned.

In this brief outline only the general trend of the scientific work of the several sections can be given. Before Section A (Mathematics and Physical Science) President Griffiths gave a review of the progress of physical science in the last twenty-five years, emphasizing the need for more accurate measurements of the elements and for improved methods in scientific education to meet the modern requirements of the vast stores of accumulated knowledge.

Interesting discussions upon the evolution of the elements, opened by Mr. Soddy, and upon the notation and use of vectors, opened by Professor Henrici, were held in the departments of general physics and pure mathematics, respectively, while at a combined meeting of the two sub-sections a more generally interesting discussion was opened by the Honorable R. J. Strutt on radioactivity and the internal structure of the earth, in which it was concluded that no radium exists in the center of the earth and can be traced to a depth of only 45 miles, which is enough to account for the heat of the earth. The discussion was carried on by Professor J. Milne, Sir William Crookes, Sir William Ramsay, Mr. Soddy, Professor J. W. Gregory, Professor Lamb, Sir George Darwin and others. Other interesting work of the section concerned Professor Milne's seismological investigations, in which the interesting theory was propounded that a valley opens and shuts, opens by day and closes by night: and still another by Professor J. Swinburne on the nature of radiation from incandescent mantles.

In Section B (Chemistry) the work was confined chiefly to economic products, to

economic problems of commerce and to problems of diet.

In Section C (Geology) the president, Mr. G. W. Lamplugh, gave an address dealing with glacial problems of England and with special attention to local Yorkshire drifts. In the sectional meetings there was a preponderance of papers dealing with local geological problems; one of more general interest by Professor J. Milne on Certain Earthquake Relationships attracted wide attention, while a general discussion on the origin of the Trias was opened by Professor T. G. Bonney and Dr. J. Lomas.

In Section D (Zoology) Mr. J. Lister took as his subject for the presidential address the Life History of the Foraminifera, in which the old question of the significance of dimorphism of the foraminifera was clearly and conclusively answered. There were two discussions before this section and one before a joint session of Sections D and K (Botany). The first, on the Protozoan Life Cycle, was opened by G. N. Calkins and discussed by Mr. Lister, Professor Marcus Hartog and Professor Hickson. The second was opened by J. E. S. Moore on the Tanganyika problem and was discussed by Professor Lankester, Dr. Coningham, Professor Pelseneer, Mr. Boulenger, Mr. Stanley Gardiner, Professor J. W. Gregory and Mr. F. S. Harmer, the general sentiment being against Dr. Moore's theory that the characteristic fauna of this African lake indicates the early connection of this lake with the sea. The third discussion, held in joint session with K, was largely attended; the subject, The Nature of Fertilization, was opened by Mr. Vernon H. Blackman with a general historical treatment of the origin and significance of maturation chromosomes, and by G. N. Calkins and Mr. L. Doncaster, the former on the Life Cycle, with special reference to Maturation, Fertilization and Parthenogenesis in Protozoa, the latter on the Maturation of Parthenogenetic Eggs. The interesting discussion following these papers was by Professor Havet, Dr. Rosenberg and Professors Johannsen, Hickson, Poulton, Hartog and Wager.

In Section E (Geography) the presidential address, by Sir George Goldie, dealt with the history of geography during the last twenty-five years and clearly showed that from pioneer work the subject of geography has developed into a science recognized in all grades of education, thus taking a larger place in the life of the nation than ever before. Interesting papers were read by Major John M. Beacom of the American Embassy, London, on Irrigation and National Prosperity in the United States, and by Mr. Clement Reid on Coast Erosion, which was followed by an animated discussion by Mr. Stanley Gardiner and Mr. John Spiller.

In Section F (Economic Science and Statistics) Professor A. L. Bowley dealt with the inadequacy of present methods in collecting statistics, with the need of better training for statisticians, with mathematical statistics, and with the problem of the unemployed. In the program four general divisions of the subject were made, viz., Transportation, Industries, Labor Questions and Miscellanies. British and American methods of transportation were compared by R. L. Wedgewood and P. Burtt, of the Northeastern Railroad, and by Professor E. R. Johnson, with particular reference to special problems of traffic-handling, gauge limits and the like. The woolen industries were considered by Professor Clapham, Local Yorkshire Industries by Mr. J. Backhouse and Mr. Turnbull, while a discussion on the question of the Unemployed was well attended. The most generally interesting of the miscellaneous subjects were those of Mr. Lees

Smith on the Minimum Wage Policy; by Professor Edgeworth on Distribution; and by Dr. Cannon on Public Finance.

Dr. Ewing's presidential address before Section G (Engineering) dealt with the molecular structure of metals, with especial reference to their reactions under strains and to the conception that they are aggregates of crystals. He considered the matter of fatigue in metals, their recovery by rest, and the manner in which they break down under repeated alterations of stress. A long and varied sectional program of some twenty-three papers followed, many of special or local interest, some of more general value, such as Modern Armor and its Attack, by Major W. E. Edwards, and some Recent Developments in the Steam Turbine, by Mr. Gerald Stoney. Several excursions to neighboring engineering plants were made by the members of this section.

One of the most popular sections in point of attendance and of general interest was H (Anthropology). The general bearing of the president's address by Professor Sidney Hartland was the Origin and Early Relation of Magic and Religion. Many of the sectional papers dealt in a popular way with travels and peoples, customs and traditions. Amongst these one of the most interesting was by Dr. A. C. Haddon on The Ethnology of South Africa. Similar papers on special topics were numerous.

In Section I (Physiology) Professor Gotch criticized the view of vitalism in modern biology and attempted to show that physiological processes might all be interpreted in complex physical and chemical terms. The conception was advanced that the nervous system acts as a purely automatic mechanism based upon physico-chemical changes. One of the most interesting and most important discussions of the meeting was opened by Professor T. D. Acland on the Physiological Value of Rest. It was discussed, together with a paper on the neuron theory given by Dr. Bevan Lewis, by Professors Sherrington and Myers, and Drs. McDougal and Rivers. It was in this section, too, that perhaps the most acrimonious discussion took place over a paper by Dr. Hime on The Insufficiency of Preventive Measures against Infectious Disease. His view that isolation is unnecessary in infectious diseases was especially provocative and met with some sharp rejoinders.

In Section K (Botany) President F. W. Oliver gave a somewhat technical address on The Seed—A Chapter in Evolution. The papers at the sectional meetings were all of a technical nature, one discussion being held, as already noted, in conjunction with Section D.

Finally, in Section L (Education) Professor M. E. Sadler pointed out in his presidential address the fact that education is becoming more and more a national problem. He showed that the interdependence of the various parts of education is becoming more fully realized and that the different branches are tending towards greater unity. It was also shown that more definite needs were apparent in regard to individual instruction, especially as concerns the obligations to the state. As usual with this section, the program was drawn up with respect to a central topic. This year the topic selected was The Balance of Subjects in the Curricula of Schools of All Grades. The discussions on Primary Grade Teaching, on Nature Study, on Leisure Pursuits, etc., were animated and suggestive. 'Health in Schools' was presented by Professor Sherrington; Physical Training, Training for Work People, School Training for Home Duties of Women, etc., were all discussed. The

section held a joint meeting with Section A, in which the teaching of mechanics by experiment was discussed.

As usual at these association meetings there were some evening lectures on more general topics. A most interesting lecture on Volcanoes was given by Mr. Tempest Anderson, of York; another was on the manufacture of light, by Professor Sylvanus Thompson, and another on The Electrical Signs of Life and their Abolition by Chloroform, by Dr. A. W. Waller.

In 1907 the association meeting will be held in Leicester; in 1908, in Dublin; and in 1909 in Winnipeg, Canada.

GARY N. CALKINS.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.
SECTION F—ZOOLOGY.

SECTION F at the Ithaca meeting held joint sessions for the reading of papers with the American Microscopical Society, June 29 and 30. The following papers were read under the auspices of Section F.

Chromosome Relations in the Spermatocytes of Oniscus: M. LOUISE NICHOLS, University of Pennsylvania.

In the equatorial plate of the first maturation division, chromosomes differing from each other in shape may be discovered. They are of three kinds: First, straight or dumb-bell-shaped, in which the halves of the bivalent chromosome lie end to end; second, curved or crescent-shaped, in which the halves lie end to end but with the extremities curved toward each other; third, a form in which the halves lie side by side. In each type a split may be seen running the length of the individual chromosome and the first division is reductional. In the prophases of the first maturation division chromosomes of the first and second types are present as straight or curved rods; the third type is represented frequently by rings, complete or nearly so, occasionally by V-shaped structures. The reduced number of chromosomes, as far as could be determined, is sixteen. Of this number, two have the ring form in the prophase, two the crescent form, while the remainder are straight or dumb-bell shaped. The chromosomes vary somewhat in size, but the differences are not strikingly great. The largest have the ring form, the smallest are straight. A tendency to localization in the nucleus is observable. The ring forms usually lie on opposite sides of the nucleus, separated by a crescent. Similarly the crescent forms lie on opposite sides with a ring between.

Notes on the Poison Organs in Fishes: H. D. REED, Cornell University.

Axillary poison glands are found in all species of *Noturus* and *Schilbeodes*. In *S. gyrinus* and *S. nocturnus* poison glands are found enveloping the pectoral and dorsal spines. Wherever found these glands are invaginations of the skin, in which respect, as well as in structure, they are identical with the poison organs of the weever fishes.

Exhibition of Bird Drawings: L. A. FUERTES, Ithaca, N. Y.

Exhibition of and Remarks upon Certain Rare or Unique Specimens in the Cornell University Museum of Neurology and Vertebrate Zoology: BURT G. WILDER, Cornell University.

Among the specimens are the smallest recorded manatee fetus; a human embryo about 4 mm. long attached to the vitellus; an embryo shark with undivided cerebrum; the brain of the anguin, or frilled shark, presenting the indifferent relation of the cerebral and olfactory portions more nearly than in any other known vertebrate; the brain of *Ceratodus*, presenting the characteristic dipnoan ventral cerebral extensions; the brains of *Tarsius*, *Cheiromys*