

discussed by van Arkel, while Prof. Carl Benedicks gave an account of the applications of microchemistry to the study of slag inclusions, segregation, corrosion and general analytical work.

Recent advances in welding methods and applications were discussed by Granjon and Brillie, while a further paper, dealing with the welding of aluminium and its alloys, was contributed by J. Douchemont.

#### APPLIED GEOLOGY

Under the presidency of M. Cayeux, the Applied Geology Section held discussions upon a wide range of papers dealing with sedimentary and alluvial deposits. A number of these communications were devoted to the geology of the French North African colonies, which are particularly rich in a variety of metallic ores, most of which are unfortunately unexploited, although the cobalt deposits of Bou-Azzer are being fully developed and also contain valuable auriferous minerals.

The influence of geological studies upon the execution of public works was another subject discussed by this section of the congress. In the construction of dams, railways, roads and even buildings, it was pointed out, it is of great importance to have precise information as to the nature of the ground where

these works are being undertaken. The increasingly important part played by geology in agriculture was also brought out in the course of a further paper contributed to this section.

Recent geophysical research work was also described, with particular reference to electromagnetic prospecting by low-frequency alternating currents. Regional studies were also described, dealing with prospecting in Alsace, and magnetic anomalies in Madagascar and north Java.

The importance of geology in the exploitation of natural resources necessitates the establishment of an organisation for dealing with research and information, and to these questions the congress gave some consideration, dealing specifically with applied geophysics, the geology of petroleum, the preparation of geological surveys and the prosecution of researches on mineral deposits.

One other feature of the congress was an interesting exhibition of testing equipment arranged in the Ecole Centrale des Arts et Manufactures. Visits to manufacturing and scientific centres were also arranged for the visitors.

This large-scale conference was undoubtedly a triumph of organisation and hospitality, and those attending were welcomed with the utmost friendliness by their French hosts.

## Progressive Teaching in Geography

### GEOGRAPHICAL ASSOCIATION

THE annual Conference of the Geographical Association was held at the London School of Economics on January 1-3 under the presidency of Mr. James Fairgrieve. Mr. Fairgrieve retired at the end of last session from the readership in education with special reference to the teaching of geography, which he has long held at the Institute of Education (University of London), and in what he described as the 'Swan Song' of his teaching career asked the question "Can we teach geography better?" In the course of the careful reasoned answer to his own question, he suggested that teaching is essentially the giving of the opportunities to learn. Whilst boys and girls are contrasted mentally as much as they are physically, the same three stages are apparent in each: the wonder of the child; the realism of the boy, and the idealism of the youth or adolescent. The mental diet must be carefully suited to each stage; to serve mental beefsteaks to the child is as stupid as teaching a caterpillar to fly—a function which belongs naturally to a later stage in development. The teacher who destroys the natural wonder of the child is committing a crime closely akin to murder. Mr. Fairgrieve urged strongly the desirability of teaching small children by means of vivid examples, leaving 'logical sequences' of knowledge to the third stage. Whilst every thinking teacher will admit the wisdom of this, Mr. Fairgrieve perhaps overlooked the supreme importance of logical thinking on the part of the teacher in the selection of good examples.

Mr. Ernest Young, the other half of the internationally famous combination of 'Fairgrieve and Young', lectured on a voyage round the world by cargo boat, and in a series of delightful word pictures supplied just those vivid examples of life in varied

parts of the world which his colleague had urged should be used in infant teaching.

The Association devoted a morning session to the subject of soils. Dr. W. G. Ogg, director of the Macaulay Institute for Soil Research, Aberdeen, dealt with the soils of Britain and their classification. He showed clearly that whilst certain soil types, for example, podsoles, are clearly defined and recognisable, many British soils are 'skeletal' or 'immature'; over the whole of lowland Britain the classification of the 'brown soils' is a matter of extreme difficulty, since these soils owe their characters in large measure to the processes of cultivation, and the normal sequence of soil development has been profoundly changed. It is thus possible to indicate on a map where certain soil types occur, but present knowledge makes it impossible to attempt more than a hypothetical soil map of Britain. Dr. S. W. Wooldridge, in a contribution entitled "Practical Soil Studies for Geographers", urged that texture has played a very important part and is a characteristic of soils which can be studied by the geographer. He introduced a simple and ingenious diagrammatic way of representing a physical analysis and showed the relationship of certain crops to soils with different physical characters. Dr. L. D. Stamp, dealing briefly with the utilisation of British soils, urged that the geographer should make his own contribution to the subject by mapping and recording details of land use, determining or defining minor land use regions, and then ask the soil scientist for his help in explaining the phenomena observed. This, he suggested, is a more valuable approach than any attempt to enter the pedologist's own sphere.

Dr. E. B. Worthington lectured on a biologist's view of Africa, and Dr. H. J. Wood, who has recently returned from a year's study in the United States,

on irrigation in the western part of that country. He dealt with economic aspects and drew an interesting distinction between the economically sound schemes in California and the south, and the schemes undertaken for political reasons farther north where farming is handicapped by a short growing season.

Numerous papers and discussions dealt with varied aspects of the teaching of geography, and a joint session was held with the Le Play Society. An extensive exhibition of maps was arranged by the Land Utilisation Survey of Britain; the results of the Survey have now been edited and the one-inch maps prepared for nearly half the country; the number of published sheets is now thirty.

The president and the council of the Royal Geographical Society were the hosts at a reception at Kensington Gore, and the thanks of the Association were expressed by the new president, Sir Josiah Stamp.

#### INSTITUTE OF BRITISH GEOGRAPHERS

The Institute of British Geographers held its third annual meeting at the London School of Economics on January 2-3. In the opening paper, Mr. S. H. Beaver (London) analysed the growth of the Bulgarian State Railway system, evaluating the relative importance of political, economic and physical factors in its gradual evolution. By means of an excellent series of maps, the traffic on the railways—mainly lignite, wood and agricultural produce—was used to show the present trends in economic development. In his paper on the economic geography of wheat, Dr. R. O. Buchanan (London) demonstrated the outward movement of the geographical margin of production during the War and post-War periods of rising prices. With falling prices, especially since 1929, the natural tendency has been towards a reduction of area and a retreat of the margin of cultivation from the poorer lands, but this has frequently been hindered by political action.

In an important paper on the evolution of shoreline curves, Mr. W. V. Lewis suggested that the action of longshore currents has been greatly exaggerated, and that the curves of shingle beaches in particular are closely related to the direction of wave approach. The largest storm waves seem to play the most important part, but the smaller waves of calmer

weather also play a considerable part. The examples analysed are those where both large and small waves alike approach from one narrowly defined direction—as in the Christchurch, Poole, Weymouth and Lyme Bays of the English Channel—and it is found that the shingle beaches form long sweeping curves at *right angles* to the dominant wave direction. The importance of Mr. Lewis's conclusions was agreed in the discussion which followed the paper, and Mr. D. L. Linton (Edinburgh) mentioned experiments in a trough which confirm the general theory.

Mr. A. Stevens (Glasgow), in a paper entitled "Geometrical Geomorphology", urged that the majority of the topographical and structural features of the globe follow rectilinear courses which are either great circles or secondaries of great circles, and attempted to show that the structure lines may be related to a tetrahedral scheme.

Mr. W. G. East (London) urged the use by geographers of the mass of information contained in the semi-official agricultural surveys of the counties of Britain which were initiated by the newly formed Board of Agriculture in the 1790's. He showed reproductions of a number of the soil and land utilisation maps, and indicated their use in comparison with the maps of the present Land Utilisation Survey now in course of publication. In the discussion, the Director of the Survey mentioned how often a comparison of the maps supports the generalisation that on the best and the poorest soils of the country there has been comparatively little change in land use; the great changes have taken place on soils of intermediate quality or fertility—land which it may pay to work as arable land only in periods of economic prosperity.

Dr. R. A. Pelham (Birmingham) presented a study of the distribution of population in England in the fourteenth century based on the enrolled Poll Tax returns of 1377 and on an analysis of parliamentary representation throughout the century. The figures available do not permit the construction of an absolute population map, but show clearly areas of relative heavy density—the agricultural counties of the East Midlands and East Anglia. Among towns, London (with 30,000-40,000 people) was already larger than the four towns next in size combined—York, Coventry, Bristol and Plymouth. L. D. S.

## Science Masters' Association

### ANNUAL MEETING

**T**HE thirty-sixth annual meeting of the Science Masters' Association was held on January 1-4 at the Chemistry Department, Imperial College of Science, South Kensington, with evening meetings at King's College of Household and Social Science.

At the opening meeting, which was attended by nearly four hundred members, the presidential address was given by Sir William Bragg, his subject being "School Science after School". Sir William, contrasting the state of school science to-day with its condition fifty years ago, asked whether our science boys are doing well for themselves and for the community, and whether any efforts on our part could help them to do better. In these days, scientific knowledge and the application of scientific

knowledge grow at a rate which takes everyone by surprise. Sometimes our new powers are turned to excellent advantage; sometimes they fall into hands that use them with deplorable effect. Science has become highly important in the life of the nation. But, at the same time, the nation is beginning to think more and more of itself as a family in which each one is responsible for the welfare of the others. Scientific workers must do what they can to help in solving the many problems that distress and perplex mankind.

Sir William pleaded for a place for science in the team which should work for a common end, namely, to guide the nation and guard its welfare. We must be specialists, but not specialists only. To make a