The Pretoria Meeting of the South African Association for the Advancement of Science.

THE twenty-fourth annual meeting of the South African Association for the Advancement of Science took place at Pretoria on July 5-10, 1926, under the presidency of Dr. E. T. Mellor. The meeting was very well attended, and 129 papers were read. Joint meetings of several sections were held. A popular lecture was given by the Hon. J. H. Hofmeyr, Administrator of the Transvaal, on "The Romance of Ægean Archæology." There was a reception by the Mayor and Mayoress of Pretoria, a conversazione by the Pretoria branch of the South African Biological Society, and visits to various places of scientific interest in the neighbourhood.

The president, Dr. E. T. Mellor, in his address, gave an account of "Science in Relation to Mining and other Industries in South Africa." He indicated how modern scientific thought and methods have entered into the everyday life of the people instead of being restricted to the laboratory. The Witwatersrand goldfield, he said, is probably the most concentrated and important one in the world, and in the development of South Africa, gold and diamond mining has played a very important part. Gold being stabilised in price, and with an unlimited market, permits friendly rivalry in efficiency of mines. Geology has benefited from mining through the study of auriferous conglomerate and the origin of gems. Deep-level mining yields information on rock temperatures at great depths. In physiology the effects of moisture and temperature on health have been studied. In pathology the study of respiratory diseases has been of greatest general benefit. Anthropology even has benefited as a result of mining. The discovery of deposits of platinum is the result of a geological survey. The importance of industrial research was indicated, and, in concluding, the president pointed out that science is not local but universal, and commended it as a life career of greatest interest.

"The Problem of Atmospheric Electricity" was chosen by Prof. P. G. Gundry for his presidential address to Section A. In speaking of pure and applied research, he stated that it is scarcely too much to say that no great forward step is ever made without being based on the work of those spurred by scientific curiosity alone. The place of South Africa in pure research such as astronomy is largely due to amateurs, to whose work also much of our knowledge of the electrical condition of the earth and its atmosphere is due. The Heaviside layer of the atmosphere, radio telegraphy, and the earth's electric field were discussed at length, as was recent work on very penetrating rays of cosmic origin. Ionisation of the air and Wilson's work on thunderstorms were described, and the suitability of South Africa for the study of thunderstorms was indicated.

Dr. St.C. O. Sinclair gave an account of "The Chemical Service of the Union of South Africa: its Organisation and Work" as his presidential address to Section B. This service is distributed between the staffs of the Division of Chemistry, the Schools of Agriculture, the Veterinary Research Institute and an industrial chemist. The Division of Chemistry has to undertake work for State departments, such as agriculture, justice, finance, public health, mines, posts and telegraphs. The staffs of the schools of agriculture act as research officers, teachers and extension officers. Biochemical problems and poisonous plants are dealt with at the Veterinary Research Institute. The systematic soil survey of the Union, brak investigation in relation to irrigation schemes, fertiliser experiments, the making of synthetic manure, investigation of the composition of fruit and its export under the best conditions, preservatives, tanning materials and prickly pear destruction were all discussed. The scope of the regulatory work of the Government Division ranges from work on food adulteration to the preparation of chaulmoogra oil esters for the treatment of leprosy.

The subject of Prof. P. A. van der Bijl's address to Section C was "Landmarks in the Development of the Science of Plant Pathology and Disease Control." Researches on fungoid diseases of plants, dealing with life-histories, biological races, disease resistance, mechanism of penetration by parasites and variations under environmental conditions, were discussed, as were bacterial plant pathogenes. Mosaic and protozoal diseases were also considered. The history of control measures against plant diseases was given and their importance indicated. The attention given to the study of plant diseases in different countries was noted, and the advantages to a country of systematic instruction through university training in plant pathology, as in America and South Africa, were indicated.

The presidential address to Section D was delivered by Prof. C. G. S. de Villiers, his subject being "Some Aspects of the Morphology and Ontogeny of the Skeletogenous Strata." The need of correlation of comparative anatomy, comparative embryology, phylogenetic palæontology and experimental zoology in investigations of the morphology of the chordates was first indicated. Neóteny was discussed and the origin of the mesodermal skeleton reviewed fully. The differentiation of the mesenchyme and the various views on the morphology and origin of the sternum in Amphibia were indicated. The ontogeny of the tissue giving rise to the zonal and appendicular skeleton is as yet unknown, though probably mesenchymatous. The nature of membrane bones requires further investigation. Phylogenetically, membrane bones are older than cartilage bones, and whether they acquire secondary relations to zonal, sternal, cranial or visceral skeleton, they are remnants of the original exoskeleton. Ontogenetically they may be derived from the cutis layer of the myotome. The use of the experimental method was noted. The solution of many obscure problems in osteology can only be solved when a clearer knowledge is obtained of the earliest differentiation of the mesodermal skeletogenous strata.

"The Need of a Scientific Basis for South African Native Policy" formed the subject of Mr. J. D. Rheinallt Jones's presidential address to Section E. Students of native policy in the past have been largely guided by historical considerations leading to partisanship. New lines of research are needed. The primitive mentality of natives needs careful study to determine if qualitative differences between the European and Bantu mind may be present. Levy-Bruhl's hypothesis of total difference in orientation of the native mind from that of the European was discussed. There appears to be something incompatible between the foundations of primitive culture and those of modern civilisation, but this does not necessarily prove that the difference is absolute and not one of degree. The modes of alteration of primitive mind were discussed, as was animism and its effects. The necessity for anthropological and psychological research was stressed.

Dr. S. Evans discussed "The Politician and Political Economy" in his presidential address to Section

F. The present misfortunes of many countries are, he said, due to ignorance and contempt for elementary economic principles by responsible authorities during and since the War. Lack of experience in subject or administration is no disqualification for ministerial responsibilities. Rhetorical idealism still has more power over the mind than knowledge or reason, and rhetoricians become ministers with power to interfere with the conduct of industries and commerce, of which they know nothing. The primary producers always suffer most from ignorance of the principles of political economy by those in power, and by support of sheltered industries at their expense. Europeans are not coming for agriculture to South Africa, as conditions which repel the capitalist have been created, and over-taxation of the mining industry has checked them and curtailed the profitable operation of gold. The probable life of the Witwatersrand goldfield was discussed. Johannesburg is becoming more independent of the mines, but their decreased spending power will affect the whole of South Africa adversely, unless made good by expansion in some other direction. The necessity of a policy to foster private enterprise and to introduce foreign capital and European immigrants for development of industries was urged.

The next annual meeting of the Association will be held under the presidency of Prof. H. B. Fantham, professor of zoology in the University of the Witwatersrand, Johannesburg, Transvaal, at Salisbury, Southern Rhodesia, in July 1927.

[The above brief summaries of the presidential addresses to the sections were sent by Prof. H. B. Fantham, who included also the names of authors and the subjects of papers read before the various sections. We regret that limitations of space prevent us from printing this account of the sectional proceedings.—ED. NATURE.]

The Fisheries of Ceylon.

DETAILS of the marine biological research carried out by the Ceylon Government are contained in the reports for 1924 [1] and 1925.[2] In the first of these reports is an account by Commander J. C. Kerkham, the Marine Superintendent, of the Government research vessel *Nautilus*. This, a German-built steam trawler 132 feet in length, has been fitted out with laboratory accommodation and apparatus for carrying out scientific trawling, dredging, and hydrographic investigations. In addition she is equipped with a steam-driven, direct-expansion ammonia refrigerating plant with two insulated chambers for the storage of fish.

A biological survey, commenced in 1920 by the Government trawler *Lilla* and continued by the new trawler, has been fruitful in disclosing the possibilities of two fishing banks, the Wadge and the Pedro: some results of a survey of these banks are given by Dr. Pearson and his assistant biologist, Mr. Malpas, in the 1924 report, and more details are now given in a further paper.[3] The banks give a combined area of 3000 square miles, with an average depth of 25 to 50 fathoms. The advantage to be gained by the employment of two steam trawlers by the Government is shown, calculations being based on a conservative estimate of 1¼ tons and 1½ tons of fish caught per diem for the respective banks. Steam trawling should not seriously affect the fisheries of the native fishermen—not only because the grounds are too far afield for them, but also because they fish chiefly for drift-net and line-caught fish that are not captured in the trawl. In 1925 actual catches were carried to Colombo in the cold-storage chambers of the research steamer, and it was demonstrated that the fish arrived in good condition and that a ready sale was obtained for them. It is considered that if an assurance of a steady supply of fresh fish could be guaranteed to passenger shipping using Colombo as a port of call, the present spasmodic demand made by them would become regular; and it is believed that the prosperity of the trawling industry would depend on the measure of support given by the shipping. The employment of up-to-date fishing methods is therefore urged.

In somewhat less hopeful vein comes the report for the Pearl Fisheries of 1925,[4] in which is an interesting account by Dr. Pearson of the previous scientific investigations from the time of the late Sir William Herdman's survey in 1902 to the present day. Dr. Pearson critically reviews the situation and puts forth his own views on the matter. The pearl fisheries in the past have been essentially intermittent, only 39 fisheries having taken place in 125 years. It was such fluctuation that was responsible for the failure of the ill-fated Ceylon Company of Pearl Fishers that started operations in 1905, burdened amongst other things with the pledge to spend between £3000 and £10,000 annually on cultural and experimental research. It has been the aim of scientific inquiry to seek the causes of this irregularity and hence, if possible, a remedy, so as to ensure a productive regularity in the industry.

Chief among the suggestions put forward has been that of the employment of cultural methods such as those used in the oyster industry of Arcachon. Dr. Pearson takes the view that previous workers have been unduly optimistic in their hopes and considers that the site and conditions of the Ceylon pearl fisheries are such that cultural methods *in situ* are out of the question, and that the fisheries must mainly be controlled by natural agencies. In this he is probably right, seeing that the pearl oyster is essentially a deep-water shellfish compared with the Portuguese oyster at Arcachon, which lives in the tidal zone. The fact that the pearl-oyster grounds are extremely narrow may be of great significance in the irregularity of the supply, since the two maximal spawning periods occur when the south-west and north-east monsoons are respectively at their highest, and the pelagic larvæ may be carried far from suitable ground by currents. To control the fall of spat in the open sea is beyond human power. As James Steuart said in 1843: "It is only when, in the infinite wisdom of the Creator of all things, the oyster brood descends upon the banks suited to nourish and support it . . . that it comes within our power to watch its advancing age . . . "

However, given a successful spat fall a good fishery is not necessarily ensured; in late life the oyster beds are liable to decimation, as Dr. Pearson shows by figures for the crops in recent years. Two of the greatest dangers to the growing crop are perhaps the action of currents, which may uproot the oysters

[1] Ceylon Administration Reports for 1924. Part 4: Education, Science and Art (F).

[2] Administration Report of the Government Marine Biologist for 1925. By Dr. Joseph Pearson. Pp. F16. (Colombo: Government Record Office.) 35 cents.

[3] Sessional Paper 14, 1926. Prospects of Trawling in Ceylon. Pp. 12. (Colombo; Government Record Office.) 20 cents.

[4] Ceylon. Sessional Paper 15, 1926: Reports on the Pearl Fishery of 1925. By Dr. Joseph Pearson. Pp. 80+11 plates (Colombo: Government Record Office.) 2.25 rupees.