

The Pan-Pacific Science Congress, Australia, 1923.

THE relationships of the Australian flora were the subject of several communications at the recent Pan-Pacific Congress. Dr. J. McLuckie said there was a strong Antarctic element in the Australian flora, the main centre of which to-day was Tasmania; these Antarctic elements ranged northwards throughout Victoria and New South Wales, chiefly along the western slopes of the main range, and their northerly limit was determined by the climate. Mr. L. Rodway (Tasmania) stated that there were more endemic species in the wet west of Tasmania than in the drier east; thus the western pines were vestiges of a former flora which elsewhere had been overwhelmed by migrations from Australia. All the Proteas had dry country characters although they grew in wet areas; one of the two species of beech was very like a Northern Hemisphere tree. Dr. Rogers (South Australia) pleaded for the recording of the distribution of orchids as this might throw light on former land connexions. Dr. E. D. Merrill (Manila) stated that representatives of several families of plants, for the most part confined to Australia, occurred in the Philippines, but were scarce in other parts of Malaysia. His conclusion was that Australian plants, as well as those of New Caledonia and New Guinea, reached the Philippines through remote geological connexions, but were inhibited by constant arms of the sea from travelling the shorter distance to Borneo and Java. According to Mr. R. H. Cambage (Sydney), the original acacias belonged to the tropics, and there seemed no doubt that the wattles had entered Australia from the north; some of them suited themselves to dry conditions by dispensing with small leaflets, and by developing their leaf stalks into flat blades, or phyllodes, which served as leaves; in all cases the first leaf of a seedling was pinnate. One species in the Blue Mountains could revert to leaves after it had developed phyllodes.

Information was given of the experiments made by the Queensland Government with the view of combating the growth of the prickly pear which has ruined enormous areas and is increasing at an alarming rate; numerous kinds of insects have been imported from various parts of America, and it is hoped that some of these, combined with destructive fungi, may prove effective. The Sections of Agriculture, Entomology, and Forestry combined in recommending that the distribution of plant diseases and insect pests should be limited as much as possible by plant quarantines, and that plant diseases, insect pest surveys, and epidemiological studies, which are prerequisite to intelligent action, be undertaken in all countries bordering on the Pacific. The Section of Botany recommended that botanical surveys be made of Macquarie Island and the Aleutian Islands to obtain records of distribution and migration of the Antarctic and Arctic floras, and that the survey of Krakatau Island be continued. It was also recommended that there should be more interchange of information and specimens in the Pacific area.

It is generally recognised that reforestation has become a matter of urgency if the needs of the population in Australia fifty years hence are to be provided for, and resolutions were suggested by the Section on Forestry to the Commonwealth Government to establish and maintain an efficiently equipped Forest Products Laboratory and to reserve permanently for forestry all suitable timber-bearing areas in the Commonwealth. All Pan-Pacific countries were asked to give immediate attention to the planting of coniferous woods in regard to the approach-

ing world's shortage. Further investigation was required on the drying and seasoning of various kinds of wood, on the treatment of timber to preserve it from attacks of rot and insects, on the utilisation of waste timber, and on the mechanical testing of all commercial woods. The conversion of waste timber into alcohol was regarded by Mr. I. H. Boas as of the most fundamental importance for Australia, as alcohol must become the fuel of the future, and it was the only known fuel which did not draw on the stored energy in the earth.

The topics discussed by the Section of Zoology comprised marine biological investigations in the Pacific, the geographical distribution of certain animal groups in the Pacific, the phylogeny of the marsupials, and the problem of introduced pests and their natural enemies. The entomologists suggested that the Federal Government should provide funds for a Federal Bureau of Entomology for research to combat the danger to Australian industries from insect pests and also that provision should be made for the training of economic entomologists in the Australian universities. One meeting was devoted to the discussion of certain parasitological problems, such as hookworm and beef nodule; the latter, which is caused by the Nematode worm, *Onchocerca* (the carrier of which is still undiscovered), has been the cause of enormous losses to the cattle industry in Northern Australia. Dr. R. J. Tillyard (New Zealand) said that the first insect fauna was received by Australia from Gondwana-land, and that remnants of it still persist, though all are absent from New Zealand. The insect fauna of New Zealand had resemblances with that of Tasmania through unions with Antarctica, and with Queensland through the northward union with New Caledonia, Australia, and New Guinea; it thus belonged to the Australian region, but it lacks the latest immigrant groups from the north into Australia, as it lacks the earliest. Prof. J. Cossar Ewart (Edinburgh) said there was a veritable gold mine for Australia in a study of the principles of genetics as applied to sheep. He also aroused great interest by his account of his researches into the ancestry of domesticated breeds of sheep, and of his crosses between certain primitive breeds quite unknown in Australia. Prof. A. F. Barker (Leeds) referred to the experiments at Cambridge on breeding a double-purpose sheep (wool and mutton) on Mendelian lines, and further dealt with genetics applied to wool production.

Australian biologists took advantage of the Congress to emphasise a matter which is very dear to their hearts, namely, the adequate protection of their native fauna from the extermination which is threatening many of their most interesting species. The mongoose in New Zealand and the fox in Australia were introduced to prey upon rabbits, but they have done serious damage to native birds; for example, the spotted pigeon, scrub turkey, and even the emu are threatened with extinction in Queensland. Dr. M. Oshima (Formosa) declared that the preservation intact of the Australian fauna was an international affair as the nation was trustee to the world of a unique possession. Of late years public interest has been thoroughly aroused in this matter, and in addition to the legal protection of many species throughout a part or whole of the year, extensive National Parks have been set aside as animal sanctuaries in various States. Prof. Harrison (Sydney) stated that reservations were required upon various types of country so that suitable environment might be available for all kinds of animals.

In the Section of Anthropology, as in other Sections,

there were papers of more or less local interest, as well as others that dealt with general problems. Sir Edgeworth David (Sydney) produced evidence to show that certain stone implements were contemporary with the last glacial age of Tasmania, which was then united to Australia. Mr. A. S. Kenyon (Melbourne) gave a classification of Australian stone implements; some of those from the south resemble Tasmanian types, but there is no evidence that these are older than other types; no chronological sequence has yet been established. The material culture of the Maori was illustrated by lantern slides and cinematograph films by Dr. P. H. Buck, and Mr. H. D. Skinner discussed the affinities of the Moa hunters of New Zealand. The linguistic problems of Oceania were discussed on several occasions. Dr. van H. Labberton gave the preliminary results of a research into the original relationship between the Japanese and Polynesian languages, in which he demonstrated that in the earliest form of the Japanese language there were numerous close affiliations with the Austronesian family of languages which have been overlaid by a later Asiatic language. He also showed that comparisons between various recent Oceanic languages and those of Indonesia and of mainland Asia are apt to be misleading, since changes have taken place in course of time, and comparison is valid only between the oldest forms of the words.

Capt. G. H. Pitt Rivers read an elaborate paper on variations in sex ratios in relation to racial decline, the main result of which was to show that more exhaustive and precise information was required before the causes of the decline in native populations could be established, this being a very complex problem; he adduced evidence which suggested that a preponderance of males over females was an indication of a declining population. The decline in native populations in the Pacific was also discussed in conjunction with the Section of Hygiene.

A discussion took place on the organisation of research in anthropology and ethnology, at which were read suggestions made by distinguished British anthropologists. It was agreed that the most urgent preliminary step to take was the establishment in Australia of a chair of social anthropology, and the suggestion was made that the professor should teach anthropology (*a*) in co-ordination with geographical, historical, psychological, anatomical, and other departments of the university to which he may be attached; (*b*) as a training for Government officials, missionaries, and others; (*c*) as a training for investigators in the field; and should himself undertake and direct field research. A report was drawn up indicating the need for research in Oceania and Australia and the objects of that research. This was desirable since the attention of the anthropologists at the first meeting of the Congress in Honolulu was largely confined to Polynesia. The suggestion was made that the various main regions of Oceania should severally be more particularly investigated by certain countries, so as to avoid undue overlapping and permit of more intensive study.

The problems of the relations of the various cultures and peoples in Oceania and Australia were discussed on several occasions. The latest conclusions of Mr. W. J. Perry (London) were submitted by him and led to interesting debates by Prof. J. Macmillan Brown, Mr. H. D. Skinner (both of New Zealand), and others. The final meeting consisted of a joint discussion with the Section of Geography in which Prof. T. Griffith Taylor (Sydney) explained his views on "zoning" and the geographic principles governing early migration—corridors, shatter-belts, etc. Dr.

Haddon gave a blackboard demonstration of his views concerning the early distribution and migrations of peoples, more particularly of the Indo-Pacific area, which differed fundamentally from that proposed by Dr. Griffith Taylor, though resembling it in some particulars.

Several papers were concerned with various aspects of hygiene, connected more especially with Australian and tropical conditions. There was a joint discussion of the Sections of Hygiene and Geography on tropical settlement, a subject which is engaging wide attention at the present time in view of the "White Australia" policy. If the tropical portions of Australia are to be settled solely by a white population, it is obvious that the settlers must adapt themselves and their mode of living to climatic conditions, and the respective State Governments should provide all the alleviations in their power, give instruction in hygiene, and supply a sufficient medical staff. A meeting in conjunction with the Sections of Entomology and Veterinary Science discussed the distribution of insects in relation to disease.

The subject that, not unnaturally, engaged the greatest attention was the hygiene of mining. Dr. W. Watkins-Pitchford (South Africa), from long and successful experience in the Transvaal, showed that silicosis (wrongly termed "miners phthisis") could readily be almost eradicated if precautions were taken to prevent miners and others from inhaling minute particles of silica; these are conveyed into the areolar tissue of the lungs by means of wandering cells, and there give rise to fibrous tissue; this new tissue is eventually absorbed if the patient changes his occupation and escapes a tuberculous infection. As a disease, this simple silicosis might almost be ignored were it not that the patient becomes specially liable to tuberculosis. The arrangements for preventing the inhaling of silica dust and for the prevention of tuberculous infection are very imperfect in some Australian mines, and the inspection of the miners, clinically and by radiographs, is often inadequate. In certain mines, such as those at Broken Hill in N.S.W., the hygienic conditions are, however, fairly satisfactory. Apparently nowhere in Australia are radiographs taken periodically of all the miners, as they are in the Transvaal. Apart from the health of the miner and the risk of early death, the matter is of economic importance, as compensation has to be paid to those patients who have become seriously affected. Although no new method of prevention or treatment was presented, the Section of Hygiene as a whole, and individual members in their visits to various mines, performed a valuable service to Australian miners and mine managers.

The decline of population in the Pacific was discussed in conjunction with the Section of Anthropology, and the following resolution was passed: "That the scientific problem of the Pacific, which stands first in the order of urgency, is the preservation of the health and life of the native races by the application of the principles of the sciences of preventative medicine and anthropology."

A. C. HADDON.

In addition to the resolutions referred to above, and in the article which appeared in *NATURE* of October 27, p. 635, a number of further resolutions were discussed in the various sections.

A question which caused considerable discussion and on which there was wide difference of opinion was the proposal that in future the Pan-Pacific Congress should include all branches of physical and natural science, and that in particular chemistry, mining and metallurgy, and physics should be