

lished in the *Quarterly Journal of Forestry* (vol. xiv., 1920, p. 253).

The joint discussion with the Botanical Section on "Plant and Soil Survey Work" brought forward an interesting group of papers on both the chemical and botanical sides. Mr. G. W. Robinson (Bangor) described the results of his soil survey work in North Wales, and showed that attempts to classify the soils according to the geological formation from which they were derived had proved unsatisfactory. This was partly due to large areas having been obscured by glacial drifts, and also to the fact that, even in the case of soils derived from the underlying rock, the variety of soil types is by no means so great as that of rock types.

The soils have been classified into twelve types, four of which are composed of soils mainly derived *in situ* from the underlying rock, while the other types include transported soils such as drifts and alluvia.

Mr. E. A. Fisher dealt with the important question of soil acidity, and suggested doubts as to the trustworthiness of the ordinary methods for determining the "lime requirements" of a soil.

Prof. R. G. Stapledon described his "Surveys of Grassland Districts"; while Miss W. H. Wortham gave a summary of the results of a botanical survey of North Carnarvonshire and Anglesey.

Sir Daniel Hall, Messrs. C. G. T. Morison, T. J. Jenkin, C. T. Gimingham, and R. Alun Roberts, Miss E. N. Miles-Thomas, and others took part in the discussion which followed. Sir Daniel Hall said that

there did not always appear to be a clear conception as to the object of the work. He suggested the simplification of methods, if possible, and a closer attention to the economic side of the question.

From the discussion two points emerged: (1) The soil chemists were quite agreed that the time had come for a revision of the methods of soil sampling and analysis at present in use, and it was felt that it was not desirable to embark on any extensive new work before this was done. (2) It was evident that there was need for a much closer co-operation between the soil chemist and the plant ecologist, both in planning survey work and in carrying it out. This is more true of England than of Scotland.

It was resolved to appoint a joint committee representing plant ecologists and soil chemists to consider and report on the whole question.

At the closing meeting Mr. G. S. Robertson described the results of his most recent investigations on manuring with ground rock-phosphates. He referred to the increasing demand for phosphates both at home and abroad and to the difficulty of maintaining the supply of superphosphates and slag. The experiments showed that ground mineral phosphates gave results which compared very favourably with the returns given by the old basic Bessemer slags.

Amongst the other papers read were "Experiments on Green Manuring," by H. J. Page; "The Sugar-Content of Straw," by S. Hoare Collins; and "The Varieties of Oats," by C. B. V. Marquand.

ALEXANDER LAUDER.

### Studies of Heredity.

MR. C. C. LITTLE has studied (*Journal of Genetics*, vol. viii., 1919, pp. 279-90) colour inheritance in cats, with special reference to black, yellow, and tortoiseshell, and gives an explanation—not a very easy one—of the rare occurrence of tortoiseshell males which may be either sterile or fertile. The genetic constitution of the normal colour varieties of cats as regards yellow and black pigmentation appears to be as follows: B=a factor producing black pigmentation, Y=a factor which restricts black from the coat, and y=a factor allelomorphous to Y and hypostatic to it, allowing black pigment to extend to the coat. Mr. Little also discusses (*Science*, vol. li., 1920, pp. 467-68) a curious case in the Japanese waltzing mouse of hereditary susceptibility to a transplantable tumour. He concludes provisionally that from three to five factors—probably four—are involved in determining susceptibility to the mouse sarcoma; that for susceptibility the simultaneous presence of these factors is necessary; that none of these factors is carried in the sex (X) chromosome; and that these factors Mendelise independently of one another. In another paper (*Amer. Naturalist*, vol. liv., 1920, pp. 267-70) the same investigator criticises Dunn's suggestion that there is a linkage between the genes for yellow and for black in mice, and shows that the facts may be explained by assuming that yellow, when present, hampers the action of a lethal factor in much the same sort of way that it hampers the activity of the black-forming factor in the skin and hair. In a note on "Some Factors Influencing the Human Sex-Ratio" (*Proc. Soc. Exper. Biol. and Medicine*, vol. xvi., 1919, pp. 127-30) Mr. Little concludes: (1) That a significant excess of males is observed in the progeny of human matings involving racial crosses as compared with matings within the race; (2) that racial crosses between the European races studied (Italian and Spanish) will produce in the first hybrid

generation a significant excess of males (which will be economically important to the United States); and (3) that there are significantly fewer stillbirths among the progeny of the hybrid matings studied than among the pure matings. In another paper (*Amer. Naturalist*, vol. liv., 1920, pp. 162-75) Mr. Little deals with exceptional colour-classes in doves and canaries. These have been explained on the hypotheses of "partial sex-linkage" and "non-disjunction," but the author thinks it is more legitimate to suppose a factorial change from one gene to its allelomorph, perhaps as the effect of "intergenic and intra-cellular environment." In a note on the origin of piebald spotting in dogs (*Journal of Heredity*, vol. xi., 1920, pp. 1-4, 3 figs.) Mr. Little deals with two cases in dogs which give direct evidence as to the origin of spotted individuals, and suggests that a spotted race may arise from a self-race, by mutation, without passing through a series of minute gradations directed by selection.

Dr. C. B. Davenport (*Proc. Nat. Acad. Science*, vol. iv., pp. 213-14) deals with an hereditary tendency to form nerve-tumours (multiple neurofibromatosis). Proliferations of the connective tissue-sheaths of nerves result in numerous sessile or pedunculate swellings. The course of the disease, which is rare, is influenced by metabolic changes in the body. There is sometimes an associated production of pigmented spots in the skin. There is evidence that the disease may occur in successive generations, and that it behaves as if it were a dominant, occurring in about 50 per cent. of each affected fraternity. "The fact that neurofibromata have an inheritable basis strengthens the view that cancers in general have such a basis." In another paper (*Journal of Heredity*, vol. x., 1919, pp. 382-84) Dr. Davenport reports a case of a Cleveland family where a tendency to multiple births has appeared in each of four successive

generations. We have also received Dr. Davenport's annual report as director of the department of experimental evolution and of the eugenics record office of the Carnegie Institution of Washington. It gives us a glimpse of a manifold activity. Investigations are

in progress on the modifiability of the germ-plasm by alcohol, the control of sex in pigeons, the sex-intergrades in *Daphnia*, the heredity of colour in dogs, cats, doves, and canaries, heredity in aristogenic families, inbreeding in man, and many other subjects.

### The Pan-Pacific Scientific Conference.

THE first meeting of the Pan-Pacific Scientific Conference was held at Honolulu on August 2-20. At the close of the meeting a number of general resolutions were passed which concerned the conference as a whole. It was resolved that similar conferences should be held at intervals of not more than three years, and that the Governor of Hawaii should be invited to take action to make the conference a permanent organisation. Other resolutions dealt with the desirability of establishing an International Research Council, and with the need for the equipment of ships by the Governments concerned for the purpose of carrying out scientific research in the Pacific Ocean. The last general resolution was concerned with the promotion of education and with the need for the better payment of scientific workers; this was dealt with more fully in NATURE of October 21, p. 249.

The sections of the meeting have also published a number of recommendations. The section of anthropology advocates measures which are similar to those urged by Prof. Karl Pearson in his presidential address to Section H (Anthropology) of the British Association at the meeting this year at Cardiff. It recommends that centres for study and research in anthropology should be developed by the expansion of university departments or by the alliance of universities with other research institutions, so that such schools may combine all the features of museums and of research and teaching institutions. Research is particularly necessary into the history and culture of the Polynesians in order to reach a satisfactory solution of the ethnological problems of the Pacific.

The resolutions of the section of biological science can be divided into three groups; the first deals entirely with marine biological survey in the Pacific. It is contended that the work should be undertaken by the Governments of those countries bordering on the Pacific Ocean, and that steps should be taken to avoid the overlapping of work which might otherwise occur. The second group of recommendations deals with the land fauna of the Pacific islands. A survey of the fauna, and particularly of the mollusca, on both the better-known and the comparatively unknown islands in the Pacific is advocated. The last group of recommendations deals with the flora of Polynesia. Surveys are again necessary, and attention is directed to the importance of investigating carefully the flora of new lava-flows.

Surveys are also the burden of the recommendations of the geographical section. Topographical maps of many land areas in the Pacific are incomplete, and surveys of the shore-line and coastal waters are neces-

sary. Continued work is also necessary in order to complete the general magnetic survey of the Pacific Ocean, and to extend this work to coastal waters where the magnetic phenomena are known to be complex. Recommendations dealing with physical oceanography merely emphasise those put forward by the biological section when referring to marine biology; the two ends could be served by the same expedition. Meteorology is also included in the scope of the section on geography. Observation at the place of origin of typhoons, cyclones, etc., and of the motion of these disturbances is necessary, and the establishment of an observatory on the Island of Hawaii and the resumption of observations at Macquarie Island are advocated. In most cases it is urged, on the plea of expense, that the work should be undertaken by the States bordering on the Pacific.

The section dealing with geology passed a number of resolutions advocating extensive geological surveys in the Pacific area. It recommends that three maps on the international scale of 1:1,000,000 should be drawn, one showing topographical features, another geological formations, and the third mineral resources. Another important group of recommendations deals with the importance of subaerial and submarine erosion, and asserts the need for research on the geological side of these matters. A plea was also made for the planning of research in such a way as to correlate the efforts of different workers and to promote a uniform mode of publication of results.

Three motives, the need for localised work, for publication and for the education of people in providing safeguards against disaster, and for precise geophysics, were the basis of the resolutions passed by the section on seismology and vulcanology. The section recommends the establishment of more volcano observatories, and also the intensive study of earthquakes in seismic provinces as likely to lead to advances in geophysical knowledge. It also advocates that complete statistics of earthquakes and eruptions for the whole world should be compiled. This project could be furthered by the establishment of a central bureau for the Pacific which could collect and disseminate information of a seismological nature, and later the same scheme could be applied to the world. An important resolution was that dealing with the training of people in proper methods of construction and in behaviour during emergencies in countries liable to seismic disaster.

Polynesia is to be congratulated on having successfully gathered together her men of science in an endeavour to increase our knowledge of the Pacific Ocean and of the conditions existing in the archipelagoes of that side of the world.

### Mathematics in Secondary Education.

BULLETIN No. 1 (1920), recently issued by the U.S. Bureau of Education, shows that the authorities at Washington are fully alive to the difficulty of the problems that confront the secondary schools in this era of reconstruction. It contains, under the heading "The Problem of Mathematics in Secondary Schools," a report of a committee which confesses at the outset that it has been unable to come to definitive con-

clusions. The committee has therefore contented itself with throwing out suggestions based upon an analysis of the existing situation in the hope that the result will be such a series of discussions and experiments as will enable future committees eventually to arrive at definite proposals for reconstruction.

At the outset the present state of affairs is acknowledged to be entirely unsatisfactory. Traditions are