CARNEGIE INSTITUTION OF WASHINGTON

THE feature of most general interest in Dr. Vannebar Bush's report as president of the Carnegie Institution of Washington for the year ended October 31, 1947 (Year Book No. 46), is his review of the range of the Institution's activities, and particularly the relation of the Institution to Federal support. Dr. Bush points out that the Institution has always recognized that research stands or falls by the men who are responsible for its prosecution, and from its earliest days has consistently sought the exceptional man and provided him with facilities and resources to pursue problems which he discerned and by his own methods. Latterly, in establishing its own research centres, the Institution has recognized that such centres are of ultimate value in the search for knowledge only as they are utilized by groups of investigators including leaders of proved skill and acumen and younger men of real promise. Dr. Bush pays a high tribute both to the creative work of the Institution's scientific staff, and is also satisfied with the general plan of organisation of the work and with the effectiveness of its administration. Discussing next the termination at the end of the War as expeditiously as possible of all research for the Government, to enable the Institution to return to its own programmes of fundamental research and its policy of free dissemination of results, he considers the policy of the Institution of not seeking broad support for its research from federal funds in the light of the increasing support of fundamental investigation from Government funds.

Dr. Bush considers that the policy governing grants by the National Government for fundamental research has so far been characterized by vision and wisdom, and that it is highly important the federal policy should continue. Acceptance by the Carnegie Institution of such funds for enlarging its research programmes should depend first, however, on any such research activity forming as nearly as possible an integral operative and administrative unit, or that the activity can be terminated easily if the support terminates. The activity should, moreover, be one both intrinsically worth while and a natural addition to the Institution's own regular programme. It should also be one to which the Institution can genuinely contribute by reason of the skills and operations of the regular staff and the presence of the regular programme. Finally, the conditions under which the Institution accepts such funds should in no way infringe the independent status of the Institution in pursuing its own regular programme of research, and they should be genuinely adapted to the prosecution of fundamental investigation of the highest quality.

In reviewing the research activities of the past year, Dr. Bush notes that 1946–47 was the first since 1940 in which all departments and divisions had been fully engaged on normal programmes. Continuing his investigation at Mount Wilson Observatory of the general magnetic fields of stars, Dr. H. Babcock has surveyed likely stars down to the sixth magnitude, finding magnetic fields stronger than 1,000 gauss in several and a polar field of 5,500 gauss in one. At the Geophysical Laboratory, the development of a new type of pressure apparatus has facilitated the study of equilibrium relations in hydrous mixtures. In the magnesia – silica – water system, all the commoner natural hydrous silicates of magnesia, as well as two anhydrous silicates, could be prepared with only the solid phases and vapour present. Equilibria up to 900° C. at pressures up to 15,000 lb. per square inch and at 800° C. up to 30,000 lb. have been determined. New procedures developed in the Department of Terrestrial Magnetism have indicated that, within the accuracy of the measurement, the strength of the magnetic field of the earth has not changed during the past 30,000 years. A large increase in the intensity of cosmic radiation at all observing points except at the equator was observed at the time of a marked solar flare and radio blackout on July 25, 1946.

Extensive study of a wide variety of plants in the Division of Plant Biology indicates that the chloroplast pigments essential in the photosynthetic apparatus of all plants have changed but little in the evolution both of the species in major taxonomic groups and of the main groups themselves. The active pigments of present-day green algæ are thus the same as those possessed by their fossil ancestors, and results obtained in the further study of the unicellular alga *Chlorella* have shown that while the chemical composition of the alga varies widely with the culture conditions selected for its growth, the nature of the chlorophyll pigments is unchanged. The grass-breeding programme of the Division of Plant Biology undertaken in co-operation with the Soil Conservation Service of the United States Department of Agriculture has yielded hybrids of high promise owing to their combination of favourable yield, resistance to disease and continued activity in dry summer weather. The species used in the crossings produce most of their seed asexually but, unexpectedly, it was found that two-thirds of the hybrids between asexual parents were themselves sexual.

The aerosol method developed in the Department of Genetics for investigations involving the treatment of *Drosophila* with chemical solutions has been used for testing the power of various carcinogenic agents to effect mutations in genes. Most of the carcinogens thus tested were mutagenic, and most substances related chemically to the carcinogens but not themselves carcinogenic did not produce mutations. Dr. Dobzhansky's work in the same Department has shown that the proportion of certain types of *Drosophila* in wild populations changes with the season. The fly thus shows substantially the same kind of differentiation into altitudinal races as Drs. J. Clausen, D. D. Keck and W. M. Hiesey, of the Division of Plant Biology, found for species of *Achillea*.

In the Department of Embryology, Dr. L. B. Flexner and his colleagues, using radioactive sodium and heavy water, have obtained further evidence that the ratio of water within the cells of newborn infants to extracellular water increases as growth proceeds, and further studies of the permeability of the placenta are being pursued. Dr. S. R. M. Reynolds is investigating the physical forces involved as the uterus accommodates itself to its growing contents, as a contribution to the fuller understanding of the problems of advanced pregnancy and of parturition.

More detailed accounts of the investigations in progress or completed during the year are to be found in the departmental and divisional reports which follow that of the president, and to which bibliographies are appended. From this it is only possible to select a few further investigations for mention,

such as the attention being given by the Geophysical Laboratory to thermal measurement and to studies on radioactivity, and by the Department of Terrestrial Magnetism to studies of the earth's crust and of the upper atmosphere as well as to cosmic ray research. A feature of this report is the review of the magnetic survey and observatory programme of the Department over the period 1904–46. In the Division of Plant Biology, investigations on the chemistry of chlorophyll formation have been extended to include analysis of the process at different temperatures, and in that of Embryology tests have been made of the action of a large series of dyes related to Nile Blue on tumours in mice. Full accounts of work on the organisation of the chromosome, of cryptogenetic studies of maize and *Neurospora*, of chromosome studies on gall midges, and of work on mouse leukæmia and on the genetic structure of natural populations are included in a long report from the Department of Genetics, while that from the Division of Historical Research deals with the results of the expedition to Bonampak, in Chiapas, Mexico, the field work in the Guatemala highlands and the preparation of a hand-book of ceramic technology for archæologists and a preliminary analysis of Usulatan ware.

INTERNATIONAL COMMITTEE FOR BIRD PRESERVATION

A MEETING of the European Continental Section of the International Committee for Bird Preservation held in Paris during July 17–20, under the chairmanship of Dr. Boje Benzon, was attended by representatives of Austria, Belgium, Denmark, France, Great Britain, Hungary, Italy, Netherlands, Norway, Sweden and Switzerland; though the German National Section has not yet been reorganised, the interests of that country were represented by the chief game warden of the British Zone accompanied by a German adviser and by a German adviser from the American Zone. The president of the Zoology Section, International Union of Biological Sciences, and an observer from the Natural Sciences Section of Unesco attended, and the Conseil International de la Chasse was also represented.

The chief business of the Conference was the discussion of proposals for the revision of the Paris Convention of 1902 for the Protection of Birds Useful to Agriculture, on which the International Committee for Bird Preservation commenced work thirteen years ago. In 1935 representatives of the Finnish, Norwegian and Swedish Governments drew up a Draft Convention for the International Protection of Birds which was presented at a Conference of the International Committee for Bird Preservation held in Brussels that year. After due consideration it was decided at this Conference that an entirely new Convention was not practicable and that proposals for the revision of the Paris Convention of 1902 should be put forward. Lord Justice von Seth (Sweden), on behalf of the Scandinavian countries, accepted this suggestion with the proviso that the broad outlines of the Scandinavian proposals should be maintained. The matter was then referred to an International Sub-Committee consisting of M. A. Chappellier (France), (the late) Dr. Percy Lowe (Great Britain), Prof. M. Siedlecki (Poland) and Lord Justice von Seth (Sweden), with Miss Phyllis Barclay-Smith (Great Britain) and M. Leon Lippens (Belgium) as secretaries. Each national section in Europe was then requested to send to the secretariat suggestions relating to the modification of the Paris Convention. The Sub-Committee, taking into consideration the views of all countries, drew up these suggestions into a general report to serve as a basis for the discussion of a definite final proposal.

The report of the Sub-Committee was discussed at a conference in Vienna in 1937, attended by representatives of twelve European national sections, and proposals for a revision of the Paris Convention agreed. The necessary diplomatic steps to bring these proposals to the attention of the Governments concerned were in progress on the outbreak of war.

However, at a conference held in London in June 1947, attended by representatives of fourteen European national sections, it was decided that in view of the many changed circumstances during ten years, the Vienna proposals were in need of further revision. The matter was again referred to an International Sub-Committee consisting of Dr. Boje Benzon (Denmark), M. G. Olivier (France), Mr. R. A. H. Coombes (Great Britain) and Dr. J. H. Westermann (Netherlands), with Miss Barclay-Smith and M. Lippens as secretaries as before. This Sub-Committee met in Brussels in November 1947 and drew up recommendations which were forwarded to all the national sections of Europe for their comments before being discussed at the Paris Conference in July 1948.

The proposals for the revision of the Paris Convention, 1902, agreed upon at this Conference meet not only the changed conditions and circumstances but also the change in outlook during the course of nearly fifty years. Whereas the Paris Convention was designed to afford protection to birds useful to agriculture (with emphasis on the small insectivorous birds), the scientific, educational and æsthetic aspect of bird life is now recognized, and in point of fact, at the present day, the larger birds are in need of as much, if not more, protection than the small insectivores. Therefore, the fundamental basis of the present proposals is that all birds should have some measure of protection. Far more is known about migration than was the case in 1902, and the countries are becoming more and more aware of their interdependence and obligations towards each other in this matter; it is now appreciated that it is not possible for the country in which migratory birds breed to maintain the stock unaided. The broad outlines of protection now proposed are that birds should be protected during their breeding season and, so far as migratory species are concerned, during the times of their *return* to their nesting grounds; also that birds in danger of extinction should have special protection. Allowance for exceptions is made when and where necessary in the interests of agriculture, forestry, fishing, science, education, etc., and for the special economic conditions in certain regions. It is also realized that the all-important balance of Nature should be maintained in every way possible, and that any bird which may constitute a menace to other species must be kept in check. The sentimental idea of a 'sanctuary' for all species where everything is inviolate is, in fact, no sanctuary, and there have been far too many instances of this: to take one example, tern colonies have almost disappeared under the onslaught of gulls, to whom an all-embracing 'protection' has afforded an undue advantage.