

of the stones had engravings, or decorations, upon them. He then spoke of the engravings on Megalithic stones in Anglesea (circles, lozenges and wavy designs), suggesting they may have been derived from Irish sources, and he compared them with similar patterns on examples in Brittany, Spain, Portugal and along the northern Mediterranean shore to its eastern limit, where engravings of an anthropomorphic character are well advanced. His address was illustrated by excellent lantern slides of subjects very difficult to photograph.

J. E. Lousley, as president of the Botanical Section, spoke on "The Amateur Botanist in 1954", saying that although botanical work now is so highly specialized that, besides expert knowledge, a modern laboratory is necessary, there still remains a great deal of work which can be successfully undertaken by the amateur. Mass observations on species and habitats are needed, and examples where amateurs can assist in collaboration with professional botanists are: a rose survey (charts would be provided and specialized knowledge is unnecessary); records of plant distribution within the vice-counties (plotting species upon maps using the 10-km. grid scale and marking with dots within the grid squares); noting the variation in numbers of a species in a known colony over a number of years; and the study of life-histories and of the method of conveyance of plants to new habitats, especially by the germination of seeds from bird droppings collected after careful observation. H. E. P. Spencer chose, for his presidential address to the Geological Section, the theme of "The Pleistocene Period and Work for the Amateur Geologist", and dealt with his recent work in East Anglia. He said that much remains to be investigated regarding the correlation of the fauna of the interglacial periods, and he suggested that amateurs could render considerable help by recording and collecting from temporary exposures. Norman Cook addressed the members on "Early English Antiquaries".

At the general assembly of the Union schemes for the development of its work were discussed and subjects for investigation outlined. Despite bad weather conditions, the full programme of excursions was carried out. The archaeologists visited the Roman villa in course of excavation at Lullingstone, the Keep at Eynsford Castle now being excavated by the Ministry of Works, and Bodiam Castle. The botanists and zoologists went to Funton Creek, Queendown Warren, Bedgebury Pinetum and the Maidstone Zoo at Cobtree Manor. The geologists had an excursion to the Peninsula of Hoo to study the Tertiaries, the Chalk outcrop and the history and development of the North Kent marshes.

The sixtieth annual congress of the Union will be held next year in Folkestone during April.

BASIC SCIENTIFIC RESEARCH AND PUBLIC POLICY IN THE UNITED STATES

DESPITE the concern still being expressed in the United States regarding the adequacy of support for fundamental research, of which Dr. W. D. Coolidge's plea for more fundamental research effort (see *Science*, 119, 110; 1954) is a recent example, there is not the same sharp note of anxiety on this score in the third annual report of the National

Science Foundation*. Removal by Congress of the 15 million dollar ceiling upon annual appropriations to the Foundation has permitted the Foundation to assume greater responsibility for the support of basic research; and the Board of the National Science Foundation has been encouraged by the sympathetic understanding of its problems by many members of Congress, although misunderstanding of science and its methods is still widespread. Wider public understanding of science, scientists and the implications of scientific development is of vital concern, in the view of the Board, not only to the Foundation itself, but also to the Federal and State Governments, academic institutions and industrial concerns.

The limits of expenditure on fundamental research are now set, the Board believes, not by financial resources but by the numbers of men and women with the capacity, interest and willingness to pursue science. They constitute a restricted section of the population, and science is not the only profession calling for high intelligence and disciplined ability. Accordingly, solutions to many current problems reside in the long-term functions of the National Science Foundation, and in his foreword to its annual report, Mr. Chester I. Barnard, chairman of the Board, makes it clear that the Foundation is increasingly concerning itself with these long-term functions.

Fundamental research has three relatively immediate consequences: the production of scientific workers; the production of new knowledge, much of which may prove useful in ways unforeseeable to-day; and the application of the results of research to the solution of practical problems. These consequences could encourage a tendency to utilize the Foundation for secondary purposes and administrative convenience, or else government interposition in science to an extent which, by attempting to dominate, might destroy it. Mr. Barnard insists that the Board is alive to these dangers and determined to operate so as to minimize them; and this contention is fully supported by the most important section of the director's report, namely, that dealing with science and public policy.

The detailed work of the Foundation during the year is described by Dr. A. T. Waterman. Studies carried out by the Foundation of the Federal Research and Development Budget on which he here comments have already been noted in *Nature* (172, 575; 1953). Dr. Waterman states specifically that it will be desirable to review periodically the relative support furnished to fundamental and applied science; but he points out that centralization of support of fundamental research in the Foundation will not be in the best interests of science unless, together with other research agencies, the Foundation can provide sufficient support for fundamental research to bring it in balance with the support given to applied research and development. Moreover, if operating agencies are to carry on fundamental research programmes directly related to their operating functions, they must be assured of a continuous direct flow of fundamental knowledge relating to their practical problems, and their staff should be in effective touch with other scientific workers.

Dr. Waterman's report indicates certain steps already taken by the Foundation towards the

* The Third Annual Report of the National Science Foundation. Year ending June 30, 1953. Pp. vii+110. (Washington, D.C.: Gov. Printing Office, 1953.) 40 cents.

co-ordination of Federal research, and he refers to the appointment by the Foundation, in accordance with the recommendation of the President's Materials Policy Commission, of a committee to assist in formulating a broad programme of research and training directed towards strengthening the exploration and discovery of mineral resources; the development of measures to finance and execute such a programme; and the identification and study of background data and questions of policy which affect the conduct of research and training in this field. Of even wider interest, however, is the section of this report which deals with travel restrictions on foreign scientists, and this puts the question of contacts between scientific workers in its widest perspective.

Dr. Waterman then turns to the question of admission of foreign scientists to the United States. Since the restrictions were enlarged between 1948 and 1950, and afterwards embodied in the codified law which became effective in December 1952, it has been the practically unanimous opinion of scientific workers that relations between American scientists and their opposite numbers in countries friendly to the United States, particularly in the United Kingdom and other countries in Western Europe, have deteriorated. At least half of all foreign scientists who apply to enter the United States meet difficulties or serious delays. Refusals of permission to enter are much less frequent, and the chief damage to international relations arises from a few instances of refusals to outstanding persons, and from the tediousness and uncertainty of the procedure even for those who are admitted.

In testifying in October 1952, before the President's Commission on Immigration and Naturalization, concerning the impact of existing immigration laws on science, Dr. Waterman pointed out that creative scientific ability is not circumscribed by national boundaries. He referred to America's dependence on findings and accomplishments in pure science abroad in achieving her own advanced technology and standards of living. Excluding students, about three thousand foreign scientists are estimated as having visited the United States in 1951, and Dr. Waterman said that their importance to the scientific strength of the United States was out of all proportion to their number, as, generally speaking, they represented the best scientific minds of the free world outside the United States.

In closing his comment, Dr. Waterman made four specific recommendations which would, he believed, achieve a better balance between security by isolation and security by technological achievement. First, he suggested a distinction between procedures and criteria for temporary admission, particularly a visit of a few weeks or months, and those for permanent residence. For the former, he suggested that the criterion for exclusion might rationally be based on present sympathetic association with a foreign subversive organization, rather than, as now, affiliation in an extremely broad sense of the word at any time in the past with such an organization. Third, he suggested that provision should be made for selective audit from time to time of applications for temporary admission by a competent, reliable and disinterested group with appropriate experience both inside and outside government. This suggestion is prompted by the wealth of experience accumulated with security programmes in which a balance must be struck between isolation and technological achievement.

Lastly, if these suggestions prove impracticable, Dr. Waterman recommends the establishment of a separate section of the immigration law, creating a simplified and expeditious system for admitting students, trainees, teachers, guest research workers, professors and leaders in fields of specialized knowledge and skill who have applied for admission for a purpose directly related to the activities of a government agency, an accredited institution of higher learning or a scheduled meeting of an accredited international professional organization.

It is not known what reception these proposals met; but if in due course even the fourth only is adopted, some of the friction at present experienced should be removed and a real contribution made to the exchange of thought, of experience and of knowledge upon which the advance of science and technology alike depend. As Dr. H. W. Dodds, president of Princeton University, remarked in a recent comment in the *Universities Quarterly* on the Seventh Congress of the Universities of the Commonwealth last July, one welcome result of the presence of its American guests was to remove some misunderstandings outside the United States as to the extent to which current Congressional practices have endangered freedom of scholarship and of communication. None the less, it would be ungenerous not to welcome the firmness of Dr. Waterman's evidence in favour of scientific and technological mobility and communication or to fail to note that the leadership of the National Science Foundation is in the hands of those who understand so clearly the fundamental conditions of the advancement of science and technology and who are not afraid to add their testimony to that of other leaders in science, scholarship, teaching or industry, whether in the United States or elsewhere in the free world.

PLANT GENERA

THE *Chronica Botanica Co.* has once again placed botanists in its debt by bringing together the papers of a symposium (Cornell, 1952) of the American Society of Plant Taxonomists and the Botanical Society of America under the title of "Plant Genera, Their Nature and Definition" (*Chronica Botanica*, 14, 3, 89-160; 1953; 2 dollars; *Chronica Botanica Co.*, Waltham, Mass.; Wm. Dawson and Sons, London, W.C.1). The book contains a foreword by Dr. Frans Verdoorn, an introductory essay by Dr. Th. Just on "Generic Synopses and Modern Taxonomy" and the following symposium contributions: "Plant Genera, their Nature and Definition: the Need for an Expanded Outlook", by Dr. G. H. M. Lawrence; "The Anatomical Approach to the Study of Genera", by Dr. I. W. Bailey; "Floral Anatomy as an Aid in Generic Limitation", by Dr. A. J. Eames; "Cytogenetical Approaches to the Study of Genera", by Dr. R. C. Collins; "Cytology and Embryology in the Delimitation of Genera", by Dr. M. S. Cave; and "Plant Geography in the Delimitation of Genera: the Role of Plant Geography in Taxonomy", by Dr. H. L. Mason. Interleaved with these essays are facsimiles from early generic Floras.

As the above titles indicate, the nature of the botanical genus in its many aspects and relationships is very fully reviewed and discussed; and while the delimitation of genera in all classes of plants by hard-and-fast rules has not yet been found possible, there is general agreement that the genus is probably the