

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

most natural, comprehensive, useful, important and effective taxonomic unit applicable to all groups. It is probably also the unit—the genus being most simply defined as a group of related species—of greatest use to the non-taxonomic botanist.

In his discussion of the difficulties of generic delimitation, Dr. Lawrence considers that taxonomists must function as synthesizers, and bring to bear on each problem all relevant data from related fields of botanical study. He also suggests a number of practical steps which may be taken to achieve this desirable end. Dr. Bailey considers that it is essential to determine what contributions anatomy can actually make to taxonomy, since some characters that appear to be relatively stable in some groups may be highly plastic in others; that is, internal characters are inherently no more reliable than external ones. One of his conclusions is that, because the anatomical approach is so time-consuming, it should in the main be reserved for those specially difficult problems where the significance of the results is likely to justify the effort expended. The anatomical approach to taxonomy has been especially rewarding in certain groups, in particular in certain ancient and primitive woody dicotyledons. Dr. Eames points out that, in taxonomic and phylogenetic studies, the internal structures of the flower are just as valuable as, and, in some instances, for example, where parts are vestigial, may be even more valuable than, the external form. But the evaluation of internal floral structures, as evidence of natural relationships, requires a wide knowledge of this field of observation and an awareness of the prevalence of evolutionary parallelisms and convergences. At the generic level, groups of floral anatomical characters, and even some rather specific ones, may be surprisingly well defined. Dr. Eames gives many interesting examples of the application of floral anatomy to problems of taxonomy; in the Ranunculaceae, for example, which has long been regarded as a "very natural family", the anatomical evidence yields a quite contrary view, and indicates that some of the included genera should be raised to family status. This illustrates the critical importance of the combined taxonomic and anatomical approach.

In a critical discussion of the cytogenetical contribution to the delimitation of genera, Dr. R. C. Rollins makes the point that, in determining the nature and limits of a particular genus, it is not a question that the investigation must be done at the generic level or not at all: rather, the interest should centre on the relatedness of the species involved; and it is here especially that cytogenetics can make an important and, in some instances, essential contribution. Examples are cited where the genetical evidence has pointed the way to the correct generic placing of previously intractable species; but because of the time involved, genetical studies can only be directed towards especially favourable groups.

The value of a knowledge of chromosome numbers in taxonomy is critically considered and the use and limitations of the data assessed. Chromosome number affords valuable evidence for taxonomic purposes in some instances but not in others. Where the chromosome number is constant within a genus, a useful test is available for the inclusion or exclusion of a species where doubt as to its affinity exists; on the other hand, if both aneuploidy and polyploidy occur within a genus, the cytological evidence may not be of much assistance in delimiting the genus, although it may be useful as an indication of relationships

between the species. It is held that chromosome morphology, critically ascertained, may perhaps offer greater possibilities in generic definitions than chromosome numbers; but where the chromosomes are of very small size, or present in large numbers, this approach tends to be beset with difficulties. The general conclusions reached are that chromosome study provides, for taxonomic purposes, essentially the same kind of evidence as that derived from other parts of the plant, and that cytogenetics may aid substantially in the construction of the kind of generic classification that most adequately reflects the evolutionary relationships of the component species and of the families to which they belong. The respective contributions of embryological and plant geographical studies to an understanding of genera are also adequately discussed. The general effect of this collection of papers is to bring before the reader a fund of valuable and interesting information on many aspects of botany as they relate to a central and traditional theme.

STUDIES IN SOCIAL ANTHROPOLOGY

SIR JAMES FRAZER, a classical scholar and a type of prehistorian more than he was a historian, was interested in what he termed "the general laws which have regulated human history in the past, and which if nature is uniform may be expected to regulate it in the future". The lecture by Prof. Max Gluckman on "Rituals of Rebellion in South-East Africa"* is the Frazer Lecture for 1952, and that by Prof. M. Fortes†, which is his inaugural lecture as William Wyse professor of social anthropology in the University of Cambridge, is in agreement with Frazer, Haddon, Malinowski and Radcliffe-Brown that there are regularities independent of period and place in social organization and culture, defined as morals, law, custom and socially acquired capabilities and habits. Therefore, it is appropriate to consider here Frazer on the topic of uniformities about man's natural status.

Frazer was distinctly uncritical in his acceptance of what missionaries wrote about primitive culture and personality. For example, of the Kai Papuans of the 1899–1902 and earlier period, Charles Keysser remarked that they were fearful of the military power of an enemy, and parsimonious about making payments to allies whom they needed to mount successful offensives, preferably with superior force, against some neighbouring small group of Kai they termed sorcerers. On account of these traits of character, the leaders of the small territorial groups into which the natives were divided before their conquest sometimes delayed launching attacks against sorcerers for some interval of time after their fellows' deaths which they regarded as provocations. They attributed droughts, inroads of garden pests, bad luck in hunting and epidemics of colds in the head, which sometimes supervened in time of delay and of unreadiness for mounting attacks against sorcerers, to the wrath of the spirits of their kindred, which they worshipped in a manes cult, but whose deaths—to discuss dead men as if they were spirits—had not

* *Rituals of Rebellion in South-East Africa*. (The Frazer Lecture, 1952.) By Prof. Max Gluckman. Pp. ii+36. (Manchester University Press, 1954.) 3s. 6d.

† *Social Anthropology at Cambridge since 1900: an Inaugural Lecture*. By Prof. M. Fortes. Pp. 47. (Cambridge University Press, 1953.) 2s. 6d.