

Whether "the need for specialization can be met without a major retreat from Wristonization," whether the Government should "create its own undergraduate Foreign Service Academy," whether the merit system should be so extended as to exclude political appointments altogether are but some of the ticklish issues which Elder discusses with vigor and insight. Not everyone will agree with the answers he suggests, but no one can quarrel with his statement that "a creative adaptation of organization and policy to a world . . . in flux is essential if America and Western Civilization are to avert a decline similar to that of so many great nations and civilizations of the past."

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The Grasses of Burma, Ceylon, India and Pakistan (Excluding Bambuseae).

N. L. Bor. Pergamon, New York, 1960. xviii + 767 pp. Illus. \$25.

The Grasses of Burma, Ceylon, India and Pakistan replaces volume 7 of Sir Joseph Hooker's *Flora of British India*. It is a must for anyone interested in agrostology, for it contains a wealth of carefully compiled, concise information on most phases of the subject. Moreover, it is of much importance to the agriculturist interested in forage crops, grazing, or soil conservation: there are many notes on these subjects, as well as lists of species adapted to these purposes. The foreword, written by George Taylor, director of the Royal Botanic Gardens at Kew, includes a brief history of work at Kew on Indian grasses and a paragraph about the author.

The book is divided into a general part and a systematic part. The general part includes a chapter on the morphology of the grass plant which the author divides into the vegetative shoot, the reproductive shoot, and the flower. Numerous examples are given to illustrate the terms. There follows a chapter on dispersal of grass fruits and seeds, by wind, water, and special devices, also with illustrative examples. The third chapter discusses the uses of grasses for food, grazing, and fodder. A list of introduced and exotic fodder grasses is provided, among which are some of our own native grasses. Grasses for essential oils include 15 species of *Cymbopogon*. A brief account of the oil and oil pro-

duction from each is given. Other genera producing aromatic oils are *Vetiveria*, *Bothriochloa*, and *Capillipedium*. Grasses used for paper making, lawns, soil binders, and miscellaneous uses are noted briefly. It is of interest that *Pennisetum clandestinum* has been "an astonishing success in hills where rainfall is high, and is one of the most valuable introductions. It provides an excellent fodder, forms a close turf, and wears well." The final chapter on obnoxious grasses mentions poisonous grasses, grasses causing mechanical injury, and weeds. Two of the worst weeds are *Imperata cylindrica* and *Saccharum spontaneum*; both are aggressive.

The systematic part presents a brief history of the "old systematics," which covers the period from pre-Linnaean times down to about 1930. The change from the old concept of large genera such as *Andropogon* and *Panicum* to smaller, more homogeneous ones is given as an example of advancement during this time. "No matter how perfect that system may become from the standpoint of the cytogeneticist, anatomist, physiologist and so on, the task of the taxonomist will still be the correct identification of his plants. That task will not be helped by knowing the chromosome number of the plants before him . . ., but will be based upon easily observable characters from which keys can be constructed. . . . After all, the taxonomist's business was to name plants, and in his classification it must be remembered that the remarkable thing about it was not that so much was wrong, but that so much has been proved right."

In the "new systematics" a taxonomist considers, in addition to gross morphological characters, the following topics: size and basic number of chromosomes, leaf anatomy, first seedling leaf, lodicules, embryo, hilum, root hairs, starch grains, nucleoli, and the nature of the shoot apex. A brief account of the importance of each and what has been accomplished is given. There is a brief discussion of the origin of grasses, and the several phylogenetic arrangements that have been proposed. Of particular interest is the statement attributed to C. E. Hubbard, that "the ancient primary grass consisted of leafy-branched flowering shoots, each of which was many-noded and bore at each node a sheathing leaf. In the axil of each leaf would be found a prophylum-like scale and between it and the leaf-base a typical monocotyledonous flower."

In the systematic list, the grasses are divided into two groups, the Panicoideae—consisting of the tribes Maydeae, Andropogoneae, and Paniceae—and the Pooideae, consisting of 36 tribes, most of them relatively small. The arrangement is strictly alphabetical throughout, an arrangement which greatly increases the volume's usefulness as a ready reference work. It is also a very commendable plan because of the rapid changes taking place in the concepts of grasses. "It seems obvious that a great deal more information must be gained, before even a tentative scheme with a moderate chance of acceptance can be produced."

There are dichotomous keys to the groups, tribes, genera, and species. A complete citation, important synonyms, geographical distribution, uses, principal exsiccatae, and chromosome number, if known, are given for each species. Numerous pertinent taxonomic discussions are included when they are necessary to explain the reasons for using a given name. There are no species descriptions. These would have been very desirable, but they would have doubled, at least, the size of an already large volume. An appendix contains the Latin descriptions of new tribes, genera, and species, including a rather large number of species of *Agropyron*.

The book is well printed and easy to read. There are 80 full-page illustrations, most of them drawings taken from the *Flora of West Tropical Africa*, *East African Pasture Plants*, and *The Cultivated Races of Sorghum*.

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Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, but to the publisher or agency sponsoring the publication.)

Carnegie Institution of Washington. The report of the president, 1959–1960. Carnegie Institution, Washington 5, 1960. 74 pp.

Protein Structure and Function. Report of a symposium held 6–8 June 1960. Biology Department, Brookhaven National Laboratory, Upton, N.Y., 1960 (order from Office of Technical Service, Department of Commerce, Washington 25). 266 pp. Illus. \$2.50.

La Recherche Scientifique aux U.S.A. Report on a study made under the auspices of the Ford Foundation. André Molitor. Conseil National de la Politique Scientifique, Brussels, Belgium, 1960. 61 pp.