

(1000 francs), for a young French scientific worker; the Thorlet prize (1600 francs).

*Special Foundations.*—The Lannelongue foundation (2000 francs), to one or two persons in need of assistance belonging either themselves or through their parents to the scientific world; the Laplace prize, to the first pupil leaving the Ecole Polytechnique; the L. E. Rivot prize (2500 francs), between four pupils leaving each year the Ecole Polytechnique.

*Research Foundations.*—The Trémont foundation (1000 francs); the Gegner foundation (4000 francs); the Henri Becquerel foundation (3000 francs); the Bonaparte foundation, for assisting researches by workers who have already given proofs of their capacity and lack sufficient resources to undertake or pursue their investigations (minimum grant, 2000 francs); the Loutreuil foundation (125,000 francs); the Charles Bouchard foundation (5000 francs), for the assistance of researches in medicine or physiology.

#### APPLIED PLANT MORPHOLOGY.

THE importance of a knowledge of the special physiology of a crop plant in attempting to improve the yield or quality of the product needs no demonstration. The case for the study of the morphology of the plant is no less clear, and is reinforced by the fact that the two lines of investigation should go hand in hand. There are numerous familiar instances where successful cropping depends upon the correct understanding of morphological principles, and those botanists wise enough to reflect upon the lore of the intelligent practical man are aware that the knowledge possessed by him of the essential morphology of the plants with which he deals is frequently of no mean order.

There can be little doubt that fuller investigation of the morphology of economic plants (and especially of those of the tropics) would be profitable from both the scientific and commercial points of view. An example of such work is afforded by the fourth of Dr. C. A. Barber's memoirs on Indian sugar canes, in which he deals with the tillering or underground branching of the plants (Memoirs of the Department of Agriculture in India: "Studies in Indian Sugar Canes," vol. x., No. 4, June, 1919). Since in the sugar cane (*Saccharum*) the crop comprises aerial stems derived from the branching of the underground rhizome, the desirability of a full knowledge of the methods of branching and of the factors regulating the process is evident. By careful organisation Dr. Barber and his assistants have dissected and examined a large series of canes (both adult plants and seedlings), and the results so far obtained are of considerable interest and promise.

The chief classes of canes occurring in India include "thick" canes obtained from tropical sugar-growing countries, and Indian cultivated canes, together with wild *Saccharums* not used for sugar production. The results of the research show that branching in the various groups, from the wild *Saccharums* to the thick tropical canes, is of the same nature, but of very different degree. Taking *a* to represent main shoot, and *b* its branches, *c* branches of *b*, and so on, Dr. Barber arrives at a series of formulæ for the structural composition of the clumps at crop time varying from  $a+mb+c$  in the thick canes to  $a+mb+nc+nd+me+f$  in the wild *Saccharums*; while the different groups of Indian canes can be arranged in a series between these two extremes. The difference in form and size between the branches of different orders in the same plant have also been carefully studied. The general tendency is for the later branches to be suc-

cessively thicker, to have longer joints, and to show greater curvature at the base. The characters of the branches of different orders are found to be so definite that the harvested canes can be easily separated at the mill and classified into early and late canes. This opens up a new line of work, since it becomes possible to examine these different classes of canes separately at the mill and to ascertain their relative sugar content and milling qualities. A further point of practical interest arises in connection with this question. The differences exhibited by canes of varying ages in the same clump are often much more marked in clumps raised from seedlings than in those grown from cuttings. The question as to whether this variation is handed on when the seedling is propagated vegetatively is not yet definitely known, and experiments are being conducted to determine this point, which is of considerable importance in the proper selection of seedlings.

The factors influencing the amount of tillering in a plant are, of course, both inherent and external. Different species and varieties, as well as seedlings from the same parents, differ widely, but such differences are complicated and often masked by others brought about by variations in environment which in the case of the sugar cane appear to be translatable into terms of amount of food available. Dr. Barber points out that light, spacing in the field, moisture, soil constituents, and manuring appear to be the chief controlling factors, and of these he regards the light as "probably the most important limiting factor in the production of the greatest number of canes per acre." The results obtained in the investigation raise the hope that it may be found possible to develop the work along the lines indicated by Dr. Barber.

#### THE ROYAL SOCIETY OF WESTERN AUSTRALIA.<sup>1</sup>

WESTERN AUSTRALIA has followed the other Australian States in the development of its senior scientific society into a Royal Society, and has issued the first four volumes of the Journal in its new form. Thanks to the enlightened support of the State, which undertakes the printing and publication, the society is able to issue a better journal than would be possible if it were dependent on its still small roll of members. The society has started well owing to the cordial co-operation of the new and democratic local university with the scientific services of the State. The first four presidents have been Profs. Dakin and Ross, Mr. Gibb Maitland (the Government Geologist), and Mr. Montgomery (the Government Mining Engineer).

As the reorganisation of the society marks a new start, the journal appropriately includes some synopses of existing knowledge of Western Australia; thus Mr. Alexander begins an interesting series of papers on the early history of Australian zoology, and he also contributes a list of the Orthoptera, Mr. Hedley has compiled a useful catalogue of Westralian *Molusca*; and the third volume is mainly occupied by W. V. Fitzgerald's memoir on the botany of Kimberley, including the description of two new genera and eighty-eight new species. In the presidential addresses Prof. Dakin deals with vitalism, adopting a non-committal conclusion, but being quite unconvinced that there is in life any non-material factor; and Prof. Ross discusses the problems of national scientific organisation and education in the light of

<sup>1</sup> Journal and Proceedings of the Royal Society of Western Australia. Vol. i. Pp. xxx+251+16 pls. (1914-15.) Vol. ii. Pp. xv+112+7 pls. (1915-16.) Vol. iii. Pp. xii+227+2 pls. (1916-17.) Vol. iv. Pp. xii+54+1 pl. (Perth, W.A., 1916-19.) Price 5s. each.