

levels have a very varied range of light organs and are deep red to bluish-black in colour. The tentacles may become long and whip-like with minute suckers, as in *Mastigoteuthis* and *Bathyteuthis*. Accompanying these external features there are often reduction of radula and loss of ink sac, with a general degeneration of musculature which is largely replaced by a gelatinous layer. *Heteroteuthis dispar*, with its luminous secretion, often regarded as a deep-water species, is usually captured in the upper 300 m. Dr. Rees's contribution was illustrated with colour transparencies of the various species under consideration.

A short discussion followed, in the course of which Mr. B. B. Boycott (University College, London) suggested that analysis of the variety of fin sizes and shapes shown in the animals described by Dr. Bidder and Dr. Rees can be made in terms of the stability requirements of their differently shaped bodies and arms. He reported observations on *Sepia officinalis* and *Loligo vulgaris*. *Sepia* is slightly lighter than water, and relatively broad and short: the two fins are long, movable, muscular flaps, one on either side of the visceral mass. *Loligo* is slightly heavier than water, and relatively narrow and long: the two fins are triangular flaps confined towards the apex of the visceral mass. In both animals when swimming fast ('giant fibre response'), the fins are shut down against the body. When moving gently, waves pass down the fins corresponding to whether the animal is moving forward, backwards or turning. The major propulsive force in both cases is produced by jets of water from the funnel. If the fins are removed in *Sepia*, manœuvring is not much impaired, though the animal does not maintain its position in the water as well as usual but tends to drift towards the surface. The main defect is that it rolls when moving. The fins therefore give the animal lateral stability during gentle swimming. This is probably true also for *Loligo*; but since the funnel is at one end, the fins probably also serve to keep the apex of the visceral mass up when the animal is going forwards and down when it is going backwards. That this is so is indicated by the fact that the head is higher than the visceral mass when moving forwards and lower during backwards motion.

### RECENT FLORISTIC STUDIES: BRAZIL, GUATEMALA AND TANGANYIKA

THE following floristic studies have recently been published.

In the Smithsonian Miscellaneous Collections (126, 1, pp. 1-290, with 128 illustrations; 1955), L. B. Smith has given a comprehensive account of the Bromeliaceae of Brazil, based on long and intensive observations. In preparing this work, the author has taken into account the particular interest of this group from the point of view of vegetative propagation, economic and horticultural uses—the pineapple belongs here—and, in some areas, the need for eliminating bromeliads in effecting the control of malaria. A classification of Brazilian Bromeliaceae made some twenty years ago comprised some five hundred native species; but since then 135 additional species have been discovered, and others are coming to hand. An account is given of the sources of

information (herbaria and earlier published work), geographical distribution and origin, and keys to the three sub-families and their genera and species, with line drawings of representative species.

A further contribution to the "Flora of Guatemala", Part II, "Grasses", by J. R. Swallen (with the section on "Bamboos" by F. A. McClure), is published as volume 24, Part II, pp. 1-390, of *Fieldiana*, 1955 (Chicago Natural History Museum). In this treatise, the author includes 120 genera and 455 species, native and introduced. This very considerable number of species is attributed in part to the diverse habitats, from tropical lowlands to sub-alpine meadows, which the territory of Guatemala provides. The largest genera are *Panicum*, *Paspalum* and *Andropogon*, these comprising about one-third of the total grass species. In conformity with the general arrangement of this Flora, the genera and species are set out in alphabetical order. An evident disadvantage of this is that certain closely related genera and species may be widely separated in the text. More than a hundred clear line drawings add to the value of this work.

The extensive hydrobiological survey of Lake Tanganyika, undertaken during 1946-47 under Belgian auspices, has yielded a further report, in which accounts are given, by different authors, of the Characeae, Hepaticae, Pteridophyta and certain families of flowering plants of the Lake region. ("Exploration Hydrobiologique du Lac Tanganika (1946-1947): Résultats Scientifiques." *Inst. Royal des Sci. Nat. de Belgique*, 4, Fasc. 2, pp. 1-82; Brussels, 1955.)

### NATIONAL OCEANOGRAPHIC COUNCIL

#### REPORT FOR 1954-55

THE chief instrument of the National Oceanographic Council is the National Institute of Oceanography at Wormley, near Godalming, and the two main fields of study pursued at the Institute are marine biology (centred about problems concerning the Antarctic whale fisheries) and marine physics (involving mostly studies of surface waves, wind stress, and more recently, storm surges). The annual report for 1954-55, recently issued\*, shows that relatively little work is done in marine chemistry and submarine geology. A comparative analysis of publications of the two leading oceanographic institutions in the United States suggests that the scientific programme of the National Institute of Oceanography most nearly resembles that of the Woods Hole (Mass.) Oceanographic Institution. The Scripps Institution, at La Jolla, Calif., places additional emphasis on biology, geology and chemistry, in descending order, and in this sense the Scripps Institution appears to present the most balanced programme. That the National Institute of Oceanography compares so favourably with the American institutions is all the more impressive when one considers that it is about one-third the size of either of them (inasmuch as budget and total number of persons employed are an index of size).

\* Annual Report of the National Oceanographic Council, 1 April 1954-31 March, 1955. Pp. v+33. (Cambridge: At the University Press, 1956.) 5s. net.