

pecially dried and preserved, and form a most valuable addition to the herbarium, for few plants have previously been collected from this area. They have not yet been wholly worked over, but it is probable that they contain a percentage of new species which will be of horticultural interest. Seeds of a number of plants likely to prove of horticultural value have been sent and distributed to the more important gardens in the country. The Maharajah of Bhutan kindly granted permission for this expedition to remain longer in the country than originally arranged, and thus enabled collections to be made after the rains were over, which had not been possible in the previous season. Miss Gulielma Lister has presented the 221 original drawings of the "Lister monograph" on Mycetozoa published by the British Museum. The drawings are of considerable artistic beauty and scientific accuracy.

Marine Biology in Ceylon

MR. A. H. MALPAS, acting marine biologist to the Department of Fisheries, in his Administrative Report (Marine Biology) for the year 1933 (Ceylon, Part 4. Education, Science and Art (G), April 1934, Ceylon Government Press, Colombo) expresses his regret at the severe loss the fisheries research in Ceylon has sustained by the departure on leave, preparatory to retirement, of Dr. Joseph Pearson, who has done so much for the fisheries, especially the fish resources of Ceylon. The survey of the pearl banks in 1933 revealed a promising sign of repopulation of the banks, small branches of oysters being found over most of the paar areas, especially over the West Cheval, usually the first paar to receive spatfall after a long period of barrenness. These oysters are not themselves of any fishable value, but are important as they may produce subsequent spatfalls to repopulate the banks. It is anticipated that a considerable area will be covered with spat at the next inspection. Favourable prospects are also shown for a series of fisheries of the window-pane oyster. Experiments were conducted with the view of ascertaining the effects on pearl oysters of abrupt changes of salinity. It was found that oysters kept in a mixture of 1 part of fresh water to 2 parts of sea water were unaffected after several days, while others kept in a mixture of equal parts of fresh-water and sea-water quickly succumbed. Although the experiments are not conclusive they indicate that, as the pearl banks are some miles distant from land, it is not possible for flood-water to bring about such a reduction in salinity as would be harmful to the pearl oysters.

Survey of Salmon and Freshwater Fisheries

PROBLEMS of biological interest are raised in the Ministry of Agriculture and Fisheries Report on the Salmon and Freshwater Fisheries for the year 1933. In at least three rivers, the Wye, the Severn and the Exe, there have been reports that the size and number of smolt shoals migrating seawards in 1933 were well above the average. It is considered that the great majority of these will have arisen from the 1930 spawning, and that year was noteworthy as one

in which the number of fish observed on the spawning beds was unusually low. Under such conditions the eggs will have been relatively undisturbed and well distributed. The possibility arises therefore that the presence of too many fish on the spawning beds may be detrimental by causing disturbance of the already spawned eggs and overcrowding of the newly hatched fry. The production of good broods in years when the breeding stock does not appear to be large has also been observed among some sea fish. A further problem of considerable interest is afforded by the occurrence in 1933 of spring-run salmon in the River Plym, where spring fish are not normally found. Their occurrence follows on the introduction of salmon fry from eggs of early running Scottish fish in 1928. If this is an indication that such fish breed true, always producing spring fish, the results of experiments to eradicate the autumn fish running up after the close season will be watched with interest. Although in the year under review there had been a slight decline in the total catch of salmon and migrating trout, the reported mortality of fish as a result of pollution or from furunculosis has fortunately been low in spite of the dry weather conditions. Much work of interest and value is being conducted at the Alresford Experimental Station from the chemical, botanical and zoological points of view, and the usual surveys of a large number of rivers have been made.

Balance of Life in National Parks

THE institution of animal reserves, on a large or small scale, eventually raises a question as to whether artificial control of conditions should be encouraged or abolished. Everyone will agree with the dictum that the object is "to preserve National Park areas in as nearly as possible their natural condition and at the same time to make them accessible to the people for study, for recreation, and for play". Dr. Joseph Grinnell quotes with approval, and suggests (in a short article in the *Journal of the Society for the Preservation of the Empire*, Jan. 1935, p. 61) that animal life in national parks should simply be left alone. "It can be encouraged in amount and variety most practically by desisting from any avoidable interference with the full range of natural conditions of food and shelter. A *do-nothing* policy is the soundest policy. . . . Also introduction of non-native kinds of animals should be guarded against like the plague." In general, Dr. Grinnell is correct, but the guardian of reserves, especially of those on a small scale, must be on the alert to correct any tendency to extremes in the population. The reason is that no reserve is a thoroughly 'natural area'; it has somewhere a boundary, and at the boundary natural migrations are checked, and unnatural slaughter takes place which rebounds upon the reserve population.

Quality of Wheat

THE quality of wheat as influenced by environment is the subject of a recent paper by F. T. Shutt and S. N. Hamilton (*Emp. J. Exp. Agric.*, 2, p. 119). The question is not one of scientific interest only, but also of the first commercial importance in the flour-

milling and baking industries. Value in wheat depends chiefly on the character and amount of the protein (gluten) it contains, but whereas the former is essentially an inherited factor, the latter may be considerably influenced by environmental conditions. The time which elapses between the formation and ripening of the kernel practically controls its gluten content—the shorter the period the higher the percentage—so that seasonal conditions such as high temperatures and absence of excessive moisture during the later stages of development, which tend to hasten ripening, result in a valuable high-protein wheat. Conversely, a starchy grain is produced if climatic conditions tend to prolong growth during this period. The richness of the soil, even as regards its nitrogen content, does not appear to have much influence on the quantity of protein in the grain, but its moisture absorbing capacity may be of considerable importance as it is necessarily closely associated with the rate of ripening of the crop. From data which have been collected over a period of twenty-eight years at a number of stations in Canada, it has been deduced that the excellent quality of the wheats from the prairie provinces is largely to be attributed to the favourable seasonal conditions that obtain, and not solely to the selection of the most suitable varieties for that district.

Forest Products Research

THE annual report of the Forest Products Research Board with the report of the Director of the Forest Products Research Laboratory, Princes Risborough, for the year 1933 has recently been published (London: H.M. Stationery Office, 1934). In a general statement, the Director notes that the progress of timber research has been satisfactory, whether regarded from the point of view of the actual results achieved or from the value of the results when applied in the timber-using industries and professions. Sir Ralph Pearson retired from the post of director during the year, and Mr. W. A. Robertson, late of the Indian Forest Service, was appointed. The report states that there is evidence of the increasing interest taken by industry in the activities of the Laboratory. The work carried out during the year on seasoning of timber, both kiln and air-seasoning, on steam bending, the structure and mechanical strength of wood and on preservation, is summarised. As a result of investigation work, it is stated that "there is no material difference between old and new timbers from the point of view of shrinkage and expansion", thereby disproving a common belief. Investigations were carried on in connexion with dry rot and insect damage. Tests were also carried out on the cricket bat willow.

Birefringence of 'Viscabelle'

DR. N. H. HARTSHORNE, of University College, Swansea, writes: "With reference to my letter on the birefringence of 'Viscabelle' in the issue of NATURE of February 16 (p. 269), my attention has been directed to a note on the birefringence of 'Cellophane' contributed by Mr. Arthur M. Grundy to *Watson's*

Microscope Record in 1931 (Sept., p. 22). The name 'Cellophane' is commonly, though mistakenly, used as a general term for artificial cellulose sheet, and as Mr. Grundy did not state the source of his material, I am uncertain as to its exact nature. It was, however, doubtless very similar to, if not identical with 'Viscabelle'. He noted the uniformity of its optical character, and the fact that specimens of different thicknesses gave appropriately different polarisation colours, but he gave no data for the relative retardations associated with different thicknesses. He expressed the view that the optical uniformity of the material ruled out stress as a cause of its double refraction. As regards 'Viscabelle', I do not think that the double refraction is due in any degree to stress in the finished material, but, as I indicated in my letter, the stress involved in the spinning process (that is while the material is being drawn from the spinning slot into the coagulating bath) almost certainly causes an orientation of the cellulose molecules, and this accounts for the observed direction of 'slow' vibration. I regret that I did not see Mr. Grundy's note earlier, and I gladly acknowledge his prior discovery of the double refraction of artificial cellulose sheet."

Native Chinese Drugs of Animal Origin

REMEDIES derived from the animal kingdom bulk large in the old Chinese literature, and three instalments dealing with this Chinese materia medica, compiled by Mr. Bernard E. Read, assisted by Chinese scholars, have been published by the *Peking Natural History Bulletin*. The first instalment, containing the 'animal drugs', and the second the 'avian drugs', were issued some time ago, and now the third dealing with 'dragon and snake drugs' has been published ("Chinese Materia Medica". 7: "Dragon and Snake Drugs". By Bernard E. Read. Pp. 66+6 plates. Peiping: The French Bookstore, 1934. 1.50 dollars). Besides products derived from snakes, crocodiles, lizards and others, preparations from the fossilised bones of gigantic extinct saurians are included. Attempts are made to identify the creatures mentioned in the old works, and a Chinese index is appended. The whole forms a scholarly work of considerable interest and importance.

British Mosquitoes

A REVISED second edition of the pamphlet entitled "British Mosquitoes and their Control", Economic Series 4A, published by the British Museum (Natural History), has recently appeared. The authors, Messrs. F. W. Edwards and S. P. James, describe the characters and the habits of the twenty-eight species of these insects found in Britain. Measures for the control of mosquitoes and their larvae are also described, together with means of protection against bites of the insects. The object of the pamphlet is to assist medical officers and others engaged in mosquito control with up-to-date information. It is obtainable, price 4d., from the British Museum (Natural History), Cromwell Road, London, S.W.7, or through booksellers.