

University and to the University of British Columbia to enable them to analyse their medical school curricula; to the Georgetown University School of Medicine for revisions of the teaching programme; to the University of Kentucky for the design of a new university medical centre; to the University of Vermont College of Medicine for continued advice to small New England communities on the establishment of appropriate health and medical services. Support of the extended mental health programme of the Rip Van Winkle Clinic was continued, and the New York Academy of Medicine received grants for a study of problems in procuring and distributing whole blood in New York City and for a pilot study of the need and advisability of an intensive study of trends in the future development of medicine.

Medical research received twenty-five grants totalling 815,625 dollars. Nine were for studies of interaction between the organism and its environment, including studies of growth and development, rheumatic fever and arthritis, nine others for neurophysiological and endocrine investigations of integrative processes within the organism and the remaining seven for studies in basic biology,

including the porphyrins, the structure and function of nucleic acids and nucleoproteins, the biological role of steroids, histochemical studies of the sub-microscopic organization of cells and of extracellular substances, genetic studies of the mechanism of crossing-over and chemical studies of virus formation. A fluid research award was made to assist the intensive research programmes in the Divisions of Chemistry and Biology at the California Institute of Technology.

The report lists nineteen fellowships in the health field and seven other awards in support of creative work, totalling 564,056 dollars, awarded in 1956-57, and also 64 international fellowships for study and travel in the United States. The list includes twenty graduates of universities in the United Kingdom and eleven officers in the Home, Oversea, Australian and New Zealand Civil Services. In the continental programme, eight new awards were made to candidates in Austria, Italy, Switzerland, the Netherlands, Norway and Finland, and twenty-one fellowships received extensions of 3 to 9 months. Under the publications programme, which received a subsidy of 100,000 dollars, six books were issued during the year.

## FRAGMENTED HOLDINGS

THE problem of fragmented holdings constitutes a major obstacle to increased agricultural productivity in most of the countries of Europe. The Organization for European Economic Co-operation estimates that 28 million hectares (70,000,000 acres) of agricultural land are broken up into scattered fragments, often only a fraction of an acre in extent. An individual farm holding may often comprise a dozen or more of such fragments. The consolidation of these farms into more manageable and economic units is one of the most urgent needs in efforts to raise living standards among rural people. While this is widely recognized, it is difficult to obtain rapid results because of legal, social and financial difficulties. The four reports\* under consideration might suggest that there is an overlapping of effort by the Organization for European Economic Co-operation and the Food and Agriculture Organization, but whereas the Working Party of the latter has a continuing function, the report from the former is the result of a special seminar, held at Wiesbaden during June 27-July 8, 1955. Moreover, there was close collaboration and in several cases the country representatives at Wiesbaden included the members of the Food and Agriculture Organization Working Party. Portugal, which has played a leading part, both with the Food and Agriculture Organization and in practical activities in the country, was not represented at Wiesbaden. In neither case did countries east of the Iron Curtain take part.

The report of the Organization for European Economic Co-operation, which begins with a summary of conclusions, prints nine technical papers

which were presented at the seminar, with a brief note of the discussions, followed by summaries of reports from eleven countries and an example of consolidation from Germany.

The problems of fragmented holdings exist in the Republic of Ireland and have been energetically attacked in recent years by the Government through the Irish Land Commission, which is part of the Department of Lands. Subject to right of appeal, the Commissioners have sole power to determine from whom land is to be acquired, the price and, after consolidation, the person to whom the lands are to be allotted and at what price. Consolidation of holdings has, in fact, been part of a transfer from former landlords to tenant purchasers. The problem, as understood in Ireland and in many European countries where it is a burning political question as well as an economic one, scarcely exists in Britain. Powers were given to the British Government under the Agriculture Act of 1947 to deal with land lying idle through having been cut up and sold in plots to prospective house-builders rather than with fragmented agricultural holdings, which in the United Kingdom so often represent a deliberate attempt—unjustified though it may sometimes be—to secure land of different types to make up a balanced holding. The 1940-41 Farm Survey showed the average British whole-time farm to be rather less than 100 acres, or 40 hectares—enormous by comparison with most European countries. The European need is not only to bring fragments of land together within a 'ring fence' but also to secure a minimum area as an economic holding from which the farmer can expect to wrest a modest living. Though the size of a 'viable holding' was discussed at the Lisbon meeting, no conclusions were reached.

The conclusions of the Organization for European Economic Co-operation seminar are in very general terms—the need for an agreed procedure, simplified legal conditions, need for survey, and government financial help; the Food and Agriculture Organization recognizes the need for detailed studies.

\* Land Consolidation: Cheaper and More Simplified Methods. (Project No. 199.) Pp. 129. (Paris: European Productivity Agency of the Organization for European Economic Co-operation; London: H.M. Stationery Office, 1957.) 400 French francs; 8s.; 1.25 dollars. Report of the Working Party of Specialists on the Consolidation of Fragmented Agricultural Holdings, Rome, December 14-18, 1953. (Rome: Food and Agriculture Organization, 1954.)

Report of the First Session of the Working Party on Consolidation of Fragmented Holdings, Sub-Commission on Land and Water Use of the European Commission on Agriculture, held in Lisbon, February 17-18, 1956. Report of the Second Session, held in Vienna, October 1-3, 1957. (Rome: Food and Agriculture Organization, 1957.)

Though the problem differs considerably from one country to another, it may be illustrated from Greece. Out of 1,007,000 farms, only 1,033 exceed 50 hectares (125 acres), whereas 860,304 are less than 5 hectares (12.5 acres). There, rather more than half the land belongs to the farmers, rather less than half to the State, monasteries or a small number of landlords, "whose interest in agriculture is slight or non-existent". Progress in consolidation varies greatly. As the report from Spain says, "the problem has been a matter for discussion for more than 100 years"; despite the urgent necessity, no order was made until December 20, 1952. Now, schemes can be started there either officially or at the request of at least 60 per cent of the farmers affected. It is

interesting to note that even in the short time since the passing of the order, 257 villages covering 385,000 hectares and affecting 40,000 farmers have applied. Although France is not so badly affected, a law of March 9, 1941, had led by October 1954 to 4,910 schemes affecting 3,600,000 hectares out of a total of 50,500,000 of the agricultural area of the country. In general, it would seem that with varying speed the needed agricultural revolution is taking place. But it would also seem that the owner-occupier small-holding is being made the ideal; peasant-proprietors are replacing landlord and tenant. Consolidation into large holdings of several hundred acres, which technologists claim as the most efficient economically, remains almost unknown. L. DUDLEY STAMP

## SIZE DIFFERENCES IN CUCURBITA

SIZE differences have been studied by K. E. von Maltzahn (*Canad. J. Bot.*, **35**, 809, 831; 1957) in vegetative organs of two pure-bred strains of *Cucurbita pepo* L. which differ greatly in size by their genotype. The growth pattern of plants of the selected strains was found to be essentially the same in the two types. The two strains exhibited great differences in mature organ size, but only small differences in number of organs. No correlation was found between embryo size and mature size. In the early stages of primary shoot development, however, a correlation was found between embryo size and the rate of initiation of new organs. This correlation disappeared during the later stages of plant development. The parental strains had similar rates of organ formation, while the crosses showed hybrid vigour with respect to rate of new organ formation. Sizes of the apical meristems and organ primordia were essentially the same in the large and small strains and did not appear to determine mature organ size differences.

Development of size differences between the same organs of the two strains and the crosses was found to be mainly due to duration of organ growth. Rates of organ growth differed only slightly between the strains. Increase in size of successively formed organs of the same strain was also found to be mainly due

to duration rather than to rate of organ growth. Mature organ size has been analysed for the two strains on the histological and cellular levels with particular emphasis on mature internode size. Differences between the strains in tissue and cell size were observed for the main tissue and cell types. Differences in internode length were determined both by differences in cell size and cell numbers. Cambial activity as expressed in numbers of radial immature derivatives and in number of divisions in the inter-fascicular regions was found to be much greater in strain *CF* than in *SRC*.

No important differences were found between the large and small strain in the size of the meristematic and submeristematic regions. Early internode growth in terms of cell division and cell enlargement was also found to be similar in the two strains. It is concluded that the cellular differences found in the mature organ must be due to a longer duration of growth mainly in terms of cell enlargement but also in terms of cell division. This conclusion is supported by the results obtained on internode growth described in a previous paper. Grafting experiments with apical buds of the two strains did not show any influence of the stock on the scion; mature organ size was determined only by the scion.

## THE SEA OTTER

AN account of the sea otter has been given by Karl W. Kenyon of the United States Fish and Wild Life Service (*Oryx*, **4**, No. 3; November 1957).

In general form the sea otter, *Enhydra lutris*, resembles the weasel and river otter, but is larger in size. The male attains a weight of 85 pounds, the female about 65 pounds; the young at birth weigh 3-5 pounds. It is peculiar among members of its family, the Mustelidae, in having deserted dry land and fresh-water to take up a marine life. Among marine mammals it is peculiar in its adaptation to the sea. It does not possess an insulating layer of blubber but is protected from the chill of the North Pacific waters by a blanket of air trapped among the fine and closely packed fibres of its inch-long, delicate fur. Unlike the river otter and fur seal, the sea otter has but little protective coating of guard hair. The fine guard hairs present add to its beauty but do not offer much protection to the under-fur. Unlike other marine mammals, the sea otter has never taken to the

open sea. It usually feeds in shallow water from 5 to 50 ft. in depth. Its food consists primarily of such sedentary forms as sea urchins, rock oysters, mussels, a variety of snail-like molluscs and, in California, abalones. Occasionally fish and octopus are eaten.

Although the sea otter is not ideally adapted to its marine environment, it is far more at ease in the water than ashore. The flipper-like hind feet are clumsy on land and the long flexible body is poorly suited to walking. When otters haul out to sleep or preen, they seldom venture more than a few feet from the water.

Otters come ashore in greatest numbers when storm waves make food-diving difficult. When the weather is calm they usually sleep on the surface of the sea, simply pulling a strand of kelp over their bodies, resting the head on the chest and placing their forepaws over their eyes.

In the Aleutian Islands at least, the breeding season of the sea otter is not well defined. Most pups are