

for five years to the radio education unit of the University College of the West Indies; £20,000 over three years on a tapering basis to the Government Central Pedagogical Institute, Allahabad, for teaching English; up to £4,000 to the University of Hong

Kong to enable Prof. J. E. Driver to purchase equipment for his Department of Chemistry, and £3,600 over three years to the Institute of Child Health, Calcutta, for studies of the pattern of disease in a sample group of children.

## PROGRESS IN FOOD INVESTIGATION

FOR many years the annual report published by the Department of Scientific and Industrial Research under the title "Food Investigation" has reviewed the work of the Food Investigation Board and of three research institutes, namely, the Low Temperature Research Station at Cambridge, the Ditton Laboratory, Maidstone (with its associated unit at Covent Garden), and the Torry Research Station, Aberdeen.

In 1958 the Council of the Department of Scientific and Industrial Research decided on a series of administrative changes: (1) to disband the Food Investigation Board; (2) to retain the Torry Station as an independent establishment of the Department; (3) to transfer the other two institutes to the Agricultural Research Council. This latter change was brought about "because the two Councils believe that it is in the national interest to bring all Government research on food, other than fish, under one organization, the aim being to make the research more effective". From now onwards a report on the Torry Research Station will be published annually by the Department of Scientific and Industrial Research; the report, "Food Investigation 1958"\*, is limited to the Cambridge and Ditton Laboratories and will be the last to appear under the auspices of the Department.

The Cambridge and Ditton Laboratories are complementary to one another: at Ditton the emphasis is on problems associated with fruits and vegetables; at Cambridge, although important work is being carried out on plant tissues and products, the major stress has been on animal products—meat (including bacon and poultry), eggs and animal fats. At both centres there have been fundamental investigations in biochemistry, biophysics and microbiology, and the report illustrates how difficult it is (in any event in the field of food technology) to draw a distinction between pure and applied research; the examination of the factors governing the quality of meat, eggs or

fruit has stimulated basic work on the chemical composition of these materials and on the nature of the enzymes present; in turn, the newer information obtained has helped in the solution of practical problems of food storage and preservation.

The Cambridge section of the report includes summaries of investigations on three recent developments in food technology, namely, the administration of oestrogenic hormones to young animals (to increase the rate of gain of weight and the efficiency of food conversion), the use of antibiotics in poultry storage and of radiations in meat preservation. Details are given also of recent research on the phenolic constituents of plants; these compounds—ranging from relatively simple molecules to complex polymers—are now known to play a significant part in the control of colour, flavour and texture in a wide variety of foods.

The Ditton Laboratory records the increased commercial use of the hydrocooling process for vegetables such as watercress and lettuce; controlled experiments have shown that vegetables subjected to this process should arrive fresher on the market and retain their quality for a longer period. Another important line of research is concerned with the storage of potatoes in bulk using a new method of suppressing sprout growth—the introduction of nonyl alcohol vapour into the ventilation system of the store. An account is given also of various lines of research in plant physiology and biochemistry, and in refrigeration and other aspects of 'biological engineering'.

The food industries in the United Kingdom owe a debt of gratitude to the Department of Scientific and Industrial Research for sponsorship of research over some decades; the annual reports of the Food Investigation Board and other publications from the individual laboratories have played an indispensable part both in stimulating industrial research and in placing food storage and processing in the United Kingdom on sound scientific foundations.

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\* "Food Investigation 1958." Pp. vi+32. (London: H.M. Stationery Office, 1959.) 3s.

## THE HOVERCRAFT

A DEVICE for forcing out compressed air between a ship's surface and the water was patented in 1883. It did not work. Many similar fruitless attempts were made in the next sixty years until, in 1953, Mr. C. S. Cockerell began experimenting with air lubrication. His success is now universally recognized and the first hovercraft has begun the hard task of practical development, foreshadowing a new contender in the field of maritime transport.

Cockerell began as had De Laval, by attempting to contain a sheet of air between the surface of a vessel, in this case a planing craft, and the sea. He found that the reduction in drag was offset by the

hull modifications needed to supply the air. He then attempted to contain the air lubricating sheet between vertical plates but these plates increased the skin friction drag. The answer was to replace the solid containing plates by curtains of air and so the hovercraft was evolved.

The experimental version now flying, the 'SR-NI', is an oval dish on top of which are mounted the propulsion and control systems, and the air compressor. The compressor is a 7-ft. diameter ducted fan powered by a 435-h.p. internal combustion aero engine. Two-thirds of the compressed air is fed to two concentric annular slots near the periphery of the