

of fans and ducts to circulate the cold air. The room is insulated throughout by a double layer of cork, faced with white polished asbestos boarding. Daylight is admitted by a vacuum-insulated window; but the room can rapidly be converted into an experimental dark room with controlled lighting. Three large concrete tanks with heating units have been built into the cold room so that constant-temperature baths at different temperatures can be operated at any one time.

An aquarium room with compressed air supply is also situated on the ground floor. Both the aquarium and cold rooms are already in use for experimental work on marine and freshwater animals. The aquarium room includes two large slate storage tanks for living animals, in addition to the usual small tanks.

The new building is equipped with a departmental photographic dark room and a small developing room. Equipment in the photographic room includes an optical bench with photomicrographic apparatus and an enlarger for both micro-film and ordinary-size negatives.

The ground floor also has three lecturer's rooms, a technician's room, a large research room occupied by two postgraduate students and a room equipped with sterilizing ovens and an autoclave. Store rooms for glassware, chemicals, general equipment and one for nets and other ecological apparatus complete the ground floor. A small lift for goods serves both floors of the building.

On the upper floor, apart from the professor's room, two lecturer's rooms and a research room, there are three laboratories, two of which, planned to accommodate about thirty students each, form part of the old block. The remaining new laboratory has been planned as a 'final honours' room, designed to take a dozen students. Each student has ample bench and cupboard accommodation, and the room has also been fitted with a small lectern and blackboard so that it can be used as a lecture and discussion room.

There is a small lecture theatre, capable of seating some sixty students and fitted with an epidiascope which can be sunk into the lecture bench, and also a departmental library equipped with steel shelving to take about four thousand volumes and with study space for about a dozen students. This library houses the majority of the zoological books in the College, and also includes a good selection of full runs of the more important journals in both zoology and physiology.

The new departmental museum, of modern design, measures some 70 ft. × 35 ft. It is lighted by a glass roof supported by four main reinforced concrete arches spaced along the length of the room. A narrow gallery, with 'Lenserete' panels in the floor to increase the lighting, runs along three sides of the museum and is reached from the upper floor of the Department. The concrete arches mark off bays at the ground-floor level of the museum, and glass display cases, 7 ft. 6 in. high, framed with Australian walnut and bronze fittings, have been placed around the walls and bays. Heating units have been sunk into the lower parts of the cases.

The sliding glass panels give excellent views of the collections displayed. Both the day lighting and the fluorescent lighting, hidden largely in the glass roofing, have been specially planned to minimize reflexion from the glass of the cases.

The museum collections are arranged phylogenetically and include dissections and skeletal prepara-

tions, many of which have been made by students of the Department as part of their course work. Many specimens have also been generously given by other departments and museums. It is hoped that the museum, though designed primarily as a teaching museum for the Department, will also serve as a centre for the colleges and schools in the area, since Southampton lacks a municipal natural history museum.

The gallery has at present only storage cases housing a large part of the smaller specimens used for general class purposes; but it is hoped that further display cases will be added there in the near future.

The centre of the museum is occupied by a few of the larger exhibits, including an 18 ft. long skeleton of the pilot whale, *Globicephala*, which was prepared last year in the Department from one of the specimens stranded on the beaches at Dunbar. While the present collections are mainly systematic and morphological, ecological and other exhibits are planned for the future.

The new Department was viewed by visitors after the opening ceremony, and demonstrations of the research work now in progress were laid out in the lecturer's and research rooms. They included physiological studies on the endocrine glands, studies on the growth of *Mytilus* and the infection of *Mytilicola*, and factors concerned in the hatching and ecology of *Chirocephalus*. Studies on the respiration of marine Copepoda, and of growth of bones in trout, and some ecological investigations on streams and ponds, and on beech-woods were also demonstrated.

The Department emphasizes ecological work, with the sea and the New Forest area (with its varied streams and woodland) only a few miles away. A small boat is operated in Southampton Water by the Department. At the same time, ecological work is combined so far as possible with experimental zoology. The facilities available for comparative physiology have been planned with the aim of developing this subject both as regards teaching and research.

Students also exhibited some of the dissections and preparations and special studies which they have in progress as part of their normal degree work.

## BRITISH FOOD MANUFACTURING INDUSTRIES RESEARCH ASSOCIATION OPENING OF NEW LABORATORIES

LADY ENGLEDDOW, wife of Sir Frank Engledow, Drapers' professor of agriculture in the University of Cambridge, on November 8 cut a ceremonial ribbon stretched across the entrance and declared open the fine new laboratories at Leatherhead of the British Food Manufacturing Industries Research Association.

The Association was formed in the beginning of 1947 by the amalgamation of two much older research organizations. Although nominally only in its fifth year, its work, which covers a broad (and ever-widening) field of food processing and preservation, is a continuance of research that has been developed during the past thirty-two years. In 1919, the British Association of Research for the Cocoa, Chocolate, Sugar Confectionery and Jam Trades was formed as

the result of the co-operation of manufacturers in these three fields. Premises were fitted out as laboratories in Holloway, and research commenced under the directorship of T. Macara. In 1925 a further group of food manufacturers, mainly concerned with meat and fish products, set up the British Food Manufacturers' Research Association, at the same address and under the same director of research.

The two organizations continued to work in close association, but retaining their separate entities, until 1946, when amalgamation was decided on and plans drawn up for the construction of new laboratory premises at Leatherhead. In the meantime Mr. Macara had retired and had been succeeded as director of research by Dr. L. E. Campbell. At the first general meeting of the new Association, held in March 1947, Sir Frank Engledow was elected president, an office he still holds. The new laboratories were completed towards the end of 1950. Dr. Campbell relinquished his post in May of this year to join the United Nations Food and Agriculture Organization in Rome, and Dr. F. H. Banfield, who had been deputy director since 1948, took over as director of research.

On the opening day and on the day following, the laboratories were open for inspection by members of the Association and those interested in food research. Between four and five hundred visitors attended and studied the exhibits arranged in the laboratories to illustrate the work and scope of the Association. With a floor area of more than 19,000 sq. ft., the building has been planned on modern lines and the laboratories laid out and equipped in a most up-to-date manner. There are general laboratories accommodating teams of laboratory workers, specialized laboratories such as that devoted to micro-biological investigations, a number of small laboratories housing one or two research workers, a large technical laboratory equipped for carrying out a range of factory processes on a small scale, and a spacious library containing some thousand books and ninety periodicals. The staff numbers about sixty, including some thirty graduates.

The work of the Association is balanced to cover the interests of the various groups of member firms. These groups include manufacturers of bakers' prepared materials, cocoa and chocolate, jam, margarine and compound cooking fats, meat and fish products, pickles and sauces, sugar confectionery, and various miscellaneous products, such as jelly tablets, starch and flour preparations, lemon curd, etc. Research being undertaken falls into two main categories: fundamental research, such as the investigations of problems connected with the rancidity of fats, and research into specific problems arising in connexion with particular manufacturing processes.

Of the general apparatus and equipment displayed on the two days that the laboratories were open, mention may be made of the exhibits designed to illustrate the various methods for the estimation of moisture in foods, the recording of the colour of foodstuffs, the measurement of the strength of gels, the measurement of the viscosity of chocolate and the use of refractometers in factory control. Among the demonstrations of application were the determination of air in margarine, the examination of the aerating properties of egg albumen and its substitutes, detection of fermentation in foodstuffs, measurement of particle size with particular reference to particles of sugar in chocolate, and the study of the properties of starch gels and pastes. For the last-mentioned pur-

pose two viscometers were shown, the Shirley consistometer and the corn industries viscometer. Another instrument recently installed is the Unicam photoelectric absorption spectrophotometer with application to the estimation of vitamin A in marine animal liver oils. Other investigations being undertaken by the Association which were fully demonstrated to visitors were those in connexion with the effect of various methods of cooking on the digestibility of meat proteins, the shrinkage of meat and fish pastes in jars, the sedimentation of sauces, the preparation of gelatine from pork rinds, and the corrosion resistance of stainless steels and other alloys to the action of fruit juices, pickling brines and similar products.

In the micro-biological laboratory both the desirable and undesirable activities of micro-organisms in the preparation of manufactured foods are under investigation. Among desirable activities is the part played by bacteria in the curing of bacon in brine, and in the brining of vegetables. The growth of micro-organisms in pickles or canned goods or of mould on jams is, however, clearly undesirable. Strawberries preserved for jam-making in sulphur dioxide are sometimes subject to a breakdown as the result of the activity of enzymes, and investigation into the exact nature of this action is a subject of research.

A short account of the work of the Association would not be complete without mention of some of its other manifold activities. The suitability of fruits for commercial jam manufacture is one important item, and samples of jam prepared in the laboratories were displayed for inspection by visitors. In the entomological laboratory the means for the identification and control of pests liable to infect raw materials are under continual review, as are the methods of controlling rodents.

Analysis of foodstuffs plays a most important part in food manufacture. The extensive laboratory at Leatherhead devoted to this purpose is fully engaged in the testing of new official methods and the development of methods of analysis suitable for routine factory control. The part played by the Association in assisting members to conform to the standards demanded by modern conceptions of purity in foods, and with the food laws of the countries to which their goods are exported, is of the greatest help to members.

## GEOLOGY AND MINERAL RESOURCES IN THE BRITISH COLONIES

THE first number of the second volume of the quarterly bulletin issued by the Mineral Resources Division, Colonial Geological Surveys, which has recently been published by H.M. Stationery Office, gives further evidence of the valuable work being done by the expanded Geological Surveys of the Crown Colonies, and of the advantages gained from the limited measure of central organization which came into being after the Second World War.

Much space in this volume is devoted to an article on Sierra Leone, by J. D. Pollett, director of the Geological Survey Department of the Colony. The benefits of government-sponsored geological investigation are here illustrated particularly well. Although the first survey of the Colony, during 1918-21,