THE TROPICAL PRODUCTS INSTITUTE

THE Tropical Products Institute of the Department of Scientific and Industrial Research held its first open days during October 19–20 when more than 500 people accepted invitations to be present. These included representatives of diplomatic missions; scientists from other Government institutions, universities and industry; representatives of commercial firms dealing in tropical products; and visitors from tropical countries. During the open days most of the laboratories were open to visitors and special displays were arranged to describe work in progress. This varied from the short-term advisory work to long-term research projects.

The Tropical Products Institute began as a part of the Scientific and Technical Department of the Imperial Institute and, therefore, has a history going back nearly seventy years. During most of the post-war years it was attached to the Colonial Office, but in 1959 was transferred to the Department of Scientific and Industrial Research, primarily in order that its services could continue to be available to Colonial territories after they had attained independence. In 1960 a total of nearly 1,000 inquiries was received from 62 Colonial, Commonwealth and foreign countries. These covered aspects of all the subjects on which specialists' advice is available at the Institute, including foods, fruits, essential oils, plant drugs, pesticides, oilseeds, fats, waxes, leather production, fibres, pulp and paper-making, board-making and solar energy. A comparatively new section at the Institute, the importance of which is growing considerably, is that dealing with inquiries on the economics of the production and marketing of tropical products; it also advises on suitable small industries for under-developed areas.

A research project with which the Institute has been concerned for many years is that of the pyrethrum industry in Kenya. Scientists at the Imperial Institute were instrumental in introducing this crop into Kenya in 1928 and it is now a very important export. One of the lines of work at present in progress is directed to improving the strains of the plant by breeding, and investigations are going on with Rothamsted Experimental Station to estimate the individual toxicities of the four esters responsible for the insecticidal activity of pyrethrum. These are separated by two-stage chromatography and sent to Rothamsted for testing. Another part of the Institute's work on pyrethrum is the investigation of the biosynthesis of pyrethrins in the plant. In particular, work has been directed at finding the site of synthesis and, for example, the effect of fertilization of the flower head. For this purpose acetic acid or mevalonic acid labelled with radioactive carbon is fed to the plant, the pyrethrins are isolated and, if radioactive, the site of labelling is determined. From this work it has been found that the synthesis occurs in the flower head and that fertilization of the flower does not influence the production of the insecticide.

One of the important projects in the Oils, Fats and Waxes Section has been an investigation into the factors which make Nigerian palm oil difficult to bleach. As a large part of the palm oil produced is used for margarine it is essential that it should be easily bleached to remove the reddish coloration which is normally present. Malayan palm oil has always been more easily bleached, and therefore has fetched a higher price, than palm oil from Nigeria. Work at the Institute has shown that the poor bleaching qualities of the Nigerian oil are due to the high initial carotene content and to oxidation caused by delays in processing which occur when primitive methods of collection and extraction are used. Oxidation by lipoxidase has been shown to take place when unsterilized and bruised fruit is left for long periods before extraction, and atmospheric oxidation during processing also takes place, usually due to iron contamination, where the iron acts as a catalyst. As in much of the Institute's work a fundamental chemical investigation has been followed by practical recommendations, and the small-scale producers of palm oil in Nigeria are now being encouraged to give more attention to the preparation and processing of the oil.

The accommodation at the Tropical Products Institute includes a pilot-plant laboratory which was on show to visitors during the open days. Here wax was being extracted from banana skins on a fairly large scale in a continuous process using about 7 l. of solvent. Heat is supplied by a steam-heated glass coil. The wax, which is removed by this method, constitutes 8–9 per cent by weight of the banana skin and may prove to be of use in the formulation of polishes. Investigations are also being carried out of the esters of a triterpenoid alcohol present in the wax. Also in the pilot plant laboratory are stills for the hundredweight-scale extraction of essential oils from bark, leaves and other plant materials. These provide very useful information for overseas growers who wish to produce these oils under larger-scale conditions.

In the Fibres Laboratory visitors were shown methods used for the physical testing of fibres, including a hybrid sisal which has been developed in Tanganyika. This has a much greater yield than the normal variety, and at the Institute the physical characteristics of the two types are being compared. Initial tests have shown that the hybrid gives a finer fibre and compares favourably in other respects with ordinary sisal. Other work in this Laboratory involves a study of the structure of fibres using methods similar to those used in electron microscopy. A cellulose acetate replica of the surface of a longitudinally cut fibre bundle is made, and this is metal-shadowed with chromium under high vacuum. The preparation is then examined using a light microscope and magnification of about 1,000.

The Pesticides Information Service of the Department of Technical Co-operation is also housed at the Tropical Products Institute and its work was shown to visitors during the open days. Much of the work in London is in providing information and abstracts, but there is also a laboratory where the control of bilharzia disease is being studied. This disease is caused by a parasitic worm and spread by various tropical snails. A colony of one of these, *Australorbis glabratus*, is maintained at the Institute so that promising chemicals can be tested as molluscicides.

Among the many other exhibits of work in progress, visitors were able to see types of building board made

of waste materials such as groundnut shells, work on the formulation of insecticides for the malaria control campaign of the World Health Organization, the study of the flavouring constituents of pineapple using gas chromatography, and the analysis of the amino-acid content of animal feeding stuffs.

The open days gave many people an opportunity to see something of the wide range of scientific work which the Tropical Products Institute is doing on the renewable resources of the less-developed countries of the world, for producers and users alike.

B. R. SMITH

NEW INSTRUMENT ASSEMBLY WING OF THE CAMBRIDGE INSTRUMENT CO., LTD.

A NUMBER of scientists, industrialists, and well-known scientific and engineering journalists were among the 150 guests who attended a luncheon on October 23 to mark the opening of a new wing at the Cambridge Works of the Cambridge Instrument Co., Ltd. The guests were met by Dr. P. Dunsheath, chairman of the company's Board of Directors, and Mr. H. C. Pritchard, managing director, and the opening ceremony was performed by Sir Keith Joseph, M.P., Minister of State, Board of Trade.

After luncheon they toured the new wing, the Research Block which has been in use for two years, and Production Departments producing instruments for use in medicine and gas analysers for research and industry. In addition, a number of research projects and special displays of instruments made by the Company's two London factories were exhibited.

The new wing—which is 150 ft. long, 50 ft. wide and provides, on two floors, a working area of approximately 15,000 sq. ft.—is primarily intended to accommodate production departments for the final testing and assembling of instruments prior to dispatch. Immediately obvious features are the clean functional sweep of its two raised storeys, the ground-floor-level car-park and loading bay beneath, and the harmonious way it blends with the research laboratories, opened two years ago (see *Nature*, **184**, 1364; 1959), to which it has been planned as a logical architectural extension, and to which one end is joined by connecting doors. The other end of the wing is connected to other works buildings and the loading bay by a link block containing stairs and toilet facilities.

Structurally, the reinforced concrete frame of the raised building rests on a solid concrete slab supported by two rows of circular columns along its length, over which the slab is cantilevered out about 8 ft. front and back. The second floor and roof are mounted on pre-cast pre-stressed concrete beams spanning the full width of the building, so that the floor areas of both storeys are uninterrupted by intermediate columns. Windows are double glazed and the infill panels below faced with golden buff bricks. Air supplied throughout the building is conditioned and filtered by plant contained in two penthouses on the roof. Essential services, ventilating and heating inlets, gas, compressed air, water, electrical supplies, telephones, etc., are laid in horizontal ducts running the full length of the building below the windows and, to reduce fire risks, all work benches are wired with mineral-insulated metal-sheathed conductors.

Two-thirds of the first-floor area, adjacent to the entrance hall, is used as Production Offices and the remainder is occupied by the Microanalyser Department. This Department is responsible for assembling and testing 'Microscan' X-ray analysers and for the production of sealed and flow-type proportional counters. It is also concerned with the commissioning and servicing of 'Microscans' and operates an advisory service, including the analysis of samples provided by prospective customers. Complete installations are assembled in specially designed cubicles, each of which is supplied with its own special services. Conditioned air supplied to this Department undergoes an additional degree of filtration in view of the need for absolute cleanliness during final assembly of a 'Microscan'.

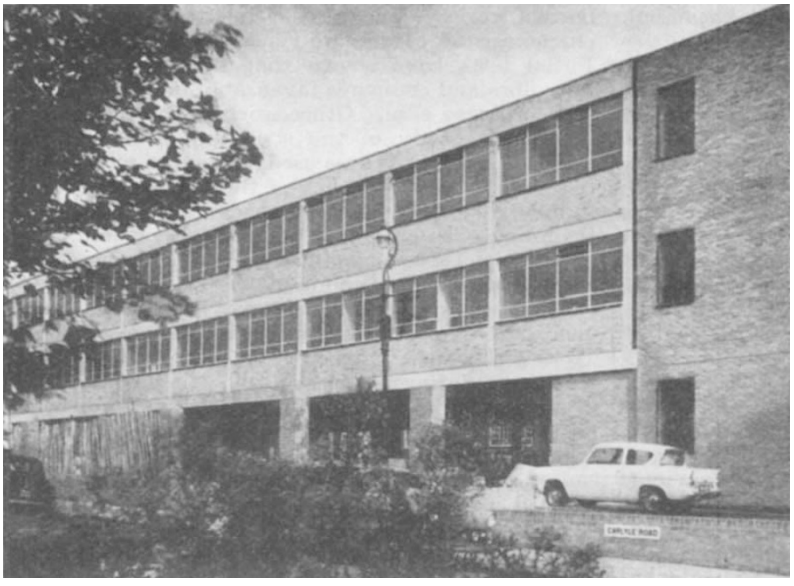

Fig. 1. Instrument assembly wing of the Cambridge Instrument Co., Ltd.

The whole of the second floor is devoted to final assembling, wiring and testing of a wide range of galvanometric indicators, recorders and controllers. Here again a dust-free atmosphere, so necessary for the assembly of intricate precision instruments and components, is provided. The functional interior design with its modern décor makes the new building a pleasant and comfortable place in which to work.

The new wing is the latest illustration of the considerable