Such was the developmental phase of the science of botany when I accepted the Glasgow chair in 1885. Botany was no longer a valley of dry bones: a progressive and living aspect had been given to it. But at Kew and the British Museum great systematists still upheld the old classificatory traditions: and there appeared to be some danger of British botanists separating into two camps—as systematists or as physiologists. On the Continent, however, an ameliorating influence sprang from the work of Warming, who combined under the name of ecology the records of function and of distribution: thus presenting to systematists a living aspect of their study. Here at home Sir Joseph Hooker was the Colossus who had a foot down in both camps. It was, in fact, a forecast of ecology that he had practised in the Antarctic. But he was never a teacher, nor did Kew compete with the colleges, which had drifted off with a dangerous and almost exclusive bias towards the 'New Botany'.

(To be continued.)

Progress of Food Investigation

AS in previous years, the report of the Food Investigation Board for 1934* describes the researches carried out at the various research stations of the Board by the members of the food investigation staff and emphasises the ways in which laboratory results have been applied commercially. Sir Frank Smith was appointed chairman of the Board, in succession to Sir Joseph Broodbank, who resigned; Mr. E. Barnard was appointed director of food investigation and Dr. Franklin Kidd superintendent of the Low Temperature Research Station, in succession to the late Sir William Hardy. That the work of the Board is of value to all parts of the Empire has been signally recognised by the contributions made by Dominion Governments, which amount to nearly £10,000 a year, and show the wide extent to which Imperial co-operation in this field of research has already grown.

The discovery that beef can be stored in the chilled state for 60–70 days when the atmosphere contains 10 per cent of carbon dioxide has quickly led to the importation of considerable amounts of chilled beef from Australia and New Zealand; during 1934, no less than 4,400 tons were imported in gas storage from these two Dominions, and it is now practicable to secure the necessary gas-tightness in the holds. At the same time, the careful preparation of the meat and the hygiene of the slaughterhouse floor are probably of even more importance than control over the conditions of transport.

A number of problems, however, remain for solution, including the correct storage to prevent chafing, and the proper conditions as regards cooling, humidity and air circulation for the preservation to the fullest extent of the natural appearance or bloom of the meat. Loss of bloom is largely due to the oxidation of hæmoglobin to methæmoglobin; the reaction is monomolecular with respect to the concentration of reduced hæmoglobin and roughly monomolecular with respect to the partial pressure of oxygen; the rate is maximal at a partial pressure of about 23 mm. of carbon dioxide. The results show that 10 per cent of carbon dioxide in the atmosphere has a negligible effect, but with this concentration that of oxygen must be increased to more than 60 per cent if the production of methæmoglobin is to be appreciably retarded.

Important developments have taken place during the year in the application of refrigeration to the herring industry. Experiments had shown that herring, although containing much more fat than white fish, could be brine frozen at the usual temperature of −5° F., and would make good kippers after at least five months' storage at that temperature. 800 tons of herrings were then frozen in one of the East Coast factory ships with the view of using them for kippering, for canning and for consumption fresh during the early months of this year (1935) when home-caught herrings are not normally available.

The gas-storage of home-grown fruit has gone on apace. During 1934 the number of commercial gas-stores in Great Britain increased from 12 to 40, and the number has probably doubled in the course of the succeeding twelve months. It has been found that the winter temperatures of English warehouses are too low for the satisfactory ripening of several varieties of imported pears and plums. Conditioning for a brief period at a temperature of 70° F., however, greatly improved the quality of South African and Australian William pears and of South African Kelsey plums. The best conditions for commercial conditioning have yet to be ascertained, but there is little doubt that conditioning will soon be considered essential for the successful marketing of certain varieties of imported pears and plums.

* Department of Scientific and Industrial Research. Report of the Food Investigation Board for the year 1934. Pp. 261+x. (London: H.M. Stationery Office, 1935.) 4s. net.

The use of wrappers treated with a solution of iodine in potassium iodide has been found to retard the development of fungal rotting in grapes, tomatoes and oranges. Brown rot of plums and peaches has also been reduced by iodised wraps. The appearance and flavour of the fruit are not impaired, nor is ripening hastened. On the other hand, certain varieties of plums and peaches are adversely affected; they fail to ripen properly or may even turn black. When iodine is successful, it is because spores and young mycelium at the critical stage of infection are far more susceptible to its action than are old mycelium and the tissues of the fruit; it can thus be used in concentrations sufficient to retard the development of moulds without causing damage to the fruit.

Further results of interest have been obtained from the continued study of the critical changes occurring in the apple at the climacteric, the most important of which is the identification of the active substance which is given off by apples at their climacteric change, and which itself stimulates this change in other apples. It was identified by absorbing it in bromine at −65° C., afterwards preparing a crystalline derivative identified as diphenylethylenediamine. The suggestion that the active substance is ethylene was, therefore, confirmed. About 1 c.c. is apparently given off during the whole of an apple's senescence.

An accidental discovery of great practical interest was made in the course of gas-storage trials of the 1934 season; a set of ripe, strongly-smelling, post-climacteric apples was included in some of the experimental cabinets among several other varieties in the pre-climacteric condition. The ripe fruit caused a considerable amount of physiological damage to the rest of the fruit in the form of spotting round the lenticels.

Progress is recorded in the study of two common diseases of stored apples, namely, scald and low temperature breakdown. Scald is produced by changes in the tissues of the fruit occurring weeks or months before the injury becomes apparent; prevention by oiled paper wrappers is chiefly efficient during these early predisposing changes. Scald was also almost completely prevented in Newton Wonders stored at 3° C. by brief intermittent warming of the fruit at 15° C. Scald is probably due to an excessive accumulation in the superficial tissues of the fruit of some volatile substance.

Among other points in the report to which attention may be directed is the investigation into the stability of synthetic vitamin C (ascorbic acid) during canning. It was added to runner beans, which do not naturally contain much vitamin C, to spinach and to apples and apple jelly; in no case was the loss greater than 25 per cent during the canning.

This brief summary of some of the investigations described in the report will give some idea of the range of the researches carried out by the Board, and their importance for the nation's food supply.

Obituary

Dr. Griffith Evans

DR. GRIFFITH EVANS, whose death on December 7 we regret to announce, was a pioneer in the study of protozoology in connexion with infections, and the first man to associate trypanosomes with the production of disease. He was born at Tymawr, near Towyn, Merionethshire, on August 7, 1835. After studying medicine for a short time with a medical practitioner at Towyn and Aberdovey, he entered the Royal Veterinary College, London, where he qualified as M.R.C.V.S., and later passed into the Royal Artillery, with which regiment he served in Canada during the American Civil War. During his years of service in Montreal he registered in the Medical Faculty of McGill University, and graduated M.D., C.M. in 1864.

On his return to England in 1871, Evans was transferred to the Army Service Corps and continued his medical studies at King's College, London, and elsewhere until 1877, when he was sent to India. It was there that his great work on blood parasites was carried out. Microscopy had been his hobby since his earliest student days, and an important part of the equipment which accompanied him to India was a portable microstand, the best lenses which he could obtain up to 1/12th immersion, a suitable condenser, etc.

On arrival in India, Evans was appointed to investigate an endemic disease which for many years had been fatal to cavalry and artillery horses; by microscopic examination of the blood, which revealed the specific bacillus in the blood of every patient, Evans at once proved the disease to be anthrax fever. What surprised him most in his investigations was the fact that the first change in the blood seen under the microscope was a great increase in the number of the large white corpuscles before the bacillus could be seen; moreover, when the bacilli came, they appeared to be closer to the white corpuscles than to the red. He reported his conviction that the large