



EMPIRE MARKETING BOARD

MAY 1930 to MAY 1931



JUNE 1931

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THE EMPIRE MARKETING BOARD

IN 1930-31.

WORLD-wide economic depression, grave though its consequences have been in many respects and in all parts of the world, has not arrested the growing habit in the United Kingdom of buying from the Empire at home and overseas. Twenty-two commodities, drawn from four Dominions and several Colonies, were noted in the Annual Report of the Empire Marketing Board for 1928-29 as having been imported into the United Kingdom in the previous two seasons in greater quantities than ever before in their histories. Again, the Board's Annual Report for 1929-30 showed that twenty-five new records had been set up, in the year then under review, by Empire foodstuffs, as regards volume of imports into the United Kingdom. Nearly half these did even better in the year now being considered, while a further substantial list of Empire foodstuffs, which failed in the previous year to reach the highest point hitherto recorded, exceeded, in 1930, all earlier figures.

The following list shows the Empire commodities for which records are known to have been established in 1930.

RECORD IMPORTS INTO THE UNITED KINGDOM FROM THE EMPIRE IN 1930.

Commodity.	Country of Origin.	Quantity in 1930.	Previous Record.
Apples	Canada	2,092,000 cwt.	1,860,000 cwt. in 1923
	New Zealand	380,000 "	342,000 " " 1928
Bananas ..	British West Indies	5,926,000 bunches	4,015,000 bunches " 1929
Butter ..	New Zealand	1,570,000 cwt.	1,304,000 cwt. " 1929
Cheese ..	New Zealand	1,961,000 "	1,801,000 " " 1929
Coffee ..	British East Africa	326,000 "	250,000 " " 1928
Currants ..	Australia	267,000 "	240,000 " " 1929
Eggs	Australia	5,660,000 doz.	3,752,000 doz. " 1929
	South Africa	4,675,000 "	3,940,000 " " 1929
Grapefruit	South Africa	46,800 cwt.	26,400 cwt. " 1929
	Palestine	10,300 "	3,000 " " 1929
Lamb ..	New Zealand	6,923,167 carcasses	5,879,066 carcasses " 1929
Oranges ..	South Africa	1,100,000 cwt.	670,000 cwt. " 1929
Peaches ..	South Africa	25,700 "	21,100 " " 1927
	Australia	130,000 "	58,000 " " 1928
Pears	South Africa	108,000 "	101,000 " " 1928
	Canada	64,000 "	60,000 " " 1928
	New Zealand	19,000 "	18,000 " " 1928
Plums ..	South Africa	27,200 "	17,700 " " 1927
Sugar ..	South Africa	2,114,000 "	1,935,000 " " 1929
Tobacco ..	India	12,998,000 lb.	11,854,000 lb. " 1926
Wines ..	South Africa	558,000 gallons	455,000 gallons " 1929

A number of other foodstuffs should also be mentioned in this connection, for which, while the 1929 record was not reached in 1930, the last year's imports surpassed all previous years, except 1929. These include Australian raisins and sultanas, which totalled 654,000 cwt. or 89,000 cwt. more than the highest total before 1929; New Zealand frozen pork, imports of which amounted to 137,000 cwt., exceeding by 15,000 cwt. the pre-1929 record; Ceylon tea, 152,700,000 lb., or within 500,000 lb. of the 1929 record; Australian sugar, 3,700,000 cwt., or 22 per cent. more than any year other than 1929, and British Malayan canned pineapples, 615,000 cwt., which fell short by 38,000 cwt. of the 1929 record.

Such figures do not, of course, indicate that the producers of the Empire have escaped from the prevailing depression. They do, however, suggest that, in bad times as in good, the people of the United Kingdom are proving themselves steadily more willing to buy from within the Empire. Many factors have combined to bring about this encouraging result, but four may, perhaps, specially be mentioned. First, more scientific attention is being paid to-day than ever before by Empire producers to the need for supporting the natural high quality of their goods by grading and orderly marketing in all its branches. Secondly, distributive traders of all kinds in the United Kingdom have shown themselves wholeheartedly resolved to further the progress of Empire buying along sound economic lines. Thirdly, the contact between producers overseas and wholesale and retail traders in the United Kingdom grows steadily closer. Fourthly, consumers in the United Kingdom, men and women, are becoming more aware of the excellent and wide range of Empire products and of the importance of Empire buying. Mention may appropriately be made at this point of the marked effect which is resulting from the persistent efforts of the publicity officers of the oversea Empire countries, stationed in the United Kingdom.

THE IMPERIAL CONFERENCE AND THE BOARD.

When the Imperial Conference met in 1926 the Board was only a few months old, so the Conference of 1930 was the first to be held since the Board began actively to perform its functions. The Conference passed the Board under review and adopted the following resolutions* :—

“ I. The Conference, having surveyed the work of the Empire Marketing Board, is satisfied that it is valuable to the Commonwealth as a whole, and recommends its continuance and its extension in certain directions, notably in the spheres of market intelligence, statistical surveys and market promotion.

* Imperial Conference, 1930, Summary of Proceedings. H.M. Stationery Office. Cmd. 3717. 2s. net.

“ II. The Conference takes note of the Empire Marketing Board’s programme of research, involving commitments approaching £2,000,000 from the Empire Marketing Fund, as well as independent contributions by so many Empire Governments. It finds that programme in accord both with the Resolution of the Imperial Conference of 1926 and the policy adopted by the Imperial Agricultural Research Conference of 1927.

“ III. The Conference commends especially that feature of the Board’s policy which aims at the concentration and development in the most appropriate centres of scientific team work upon problems of interest to the Commonwealth as a whole, and notes as an example of special promise the recognition and extension of the Onderstepoort Veterinary Research Station as an Empire centre of research in the field of animal health.

“ IV. The Conference also welcomes the facilities provided by the Board for enabling scientific workers to visit different parts of the Empire.

“ V. The Conference is of opinion that if effective advantage is to be taken of the opportunities for co-operative action within the British Commonwealth open to the Board :—

(1) The limitation of the Empire Marketing Fund to marketing in the United Kingdom should be removed.

(2) While the amount of its contribution must remain wholly within the discretion of the Parliament of the United Kingdom, it should be recognised that the efficiency of the Board’s work and its opportunities for effective planning depend upon a minimum annual income being assured to the Board over a reasonable period.

(3) The Board should therefore be constituted as a body with a fixed minimum annual income, with a provision enabling it to receive such other contributions from public or private sources as it may be willing to accept, for the purpose of furthering the marketing of Empire products.*

**Note.*—The representatives of the Union of South Africa considered that the Fund was and should remain the concern solely of the Government of the United Kingdom and could not, therefore, agree to paragraph (3) of Resolution V.

The following reference to this subject had previously been included in a statement made by the representatives of His Majesty’s Government in the United Kingdom to a meeting of the Heads of Delegations on the 13th November :—

“ His Majesty’s Government in the United Kingdom agree to reconstitute the Empire Marketing Board as a body with a fixed minimum annual income, with a provision enabling it to receive such other contributions from public or private sources as it may be willing to accept, for the purpose of furthering the marketing of Empire products.”

A Committee has since been appointed by the Chairman of the Board to consider and report as to the action desirable in relation to the resolution of the Imperial Conference and the statement made to the Conference on behalf of His Majesty's Government in the United Kingdom. In the meantime the limitation to marketing "in the United Kingdom" has been removed from the terms of the Board's Estimate for 1931-32 in accordance with the resolution of the Conference. In this connection it is relevant to quote the recommendation of the Sub-Committee on the Empire Marketing Board of the Committee on Economic Co-operation of the Imperial Conference. The Sub-Committee recommended that "while the Board should continue to concentrate its main publicity principally on the United Kingdom market—the one market in which all Empire countries can at present desire benefit from such propaganda—it should not be debarred, subject always to the concurrence of the Government concerned, from taking advantage of such opportunities as may present themselves for co-operating in publicity in oversea Empire countries."

Immediately after the Conference, the Chairman of the Board received from Mr. Benjamin Drage the offer of a contribution to the Empire Marketing Fund of £36,000, payable in seven annual instalments, to be applied for the benefit of the Imperial Institute. With the approval of the Board this generous gift was gratefully accepted.

CHANGE OF CHAIRMAN.

Mr. J. H. Thomas, on succeeding Lord Passfield as Secretary of State for Dominion Affairs in June, 1930, became Chairman of the Empire Marketing Board. Sir Archibald Sinclair, the representative of the Liberal party on the Board, was compelled by the pressure of his new duties as Liberal Whip to resign from the Board, and his place has been taken by Mr. L. Hore-Belisha, Liberal member for Devonport. Lord de la Warr became a member of the Board on succeeding Dr. C. Addison, as Parliamentary Secretary to the Ministry of Agriculture and Fisheries, and Mr. J. W. Downie, on assuming the post of High Commissioner for Southern Rhodesia, has, similarly, taken the place of Sir Francis Newton on the Board. There have been no other changes in the membership of the full Board, which is printed in Appendix I to this Report, with the names of all now serving the Board on its several Committees. The distinguished personnel of these Committees has placed a very wide range of expert knowledge at the disposal of the Board and has afforded them a practical guidance, without which they could not have approached effectively the diverse tasks that faced them.

THE BOARD'S METHODS.

Each of the methods hitherto employed by the Board for the furtherance of Empire marketing has again proved valuable in 1930-31. The policy of making grants for scientific research work in the United Kingdom and in the oversea Empire has been continued. Economic investigation and market enquiries

have been carried out on a more intensive scale ; and publicity, in all its branches, has been used to popularise the wisdom of Empire buying. It has always been the Board's view that, in every Empire country, Empire buying begins at home ; and the fact that the producers of the United Kingdom have first claim in their own country on the home consumer has, as always, been stressed in the Board's appeal.

MARKET INTELLIGENCE.

The importance of collecting information as to supplies of Empire and foreign commodities available from week to week, and of disseminating such information as widely as possible among Empire producers and others concerned in Empire trade, has been fully appreciated by the Board. The issue of weekly notes for the fruit and dairy produce trades has been extended. The latter include figures, hitherto unavailable, of butter in cold storage, and these have made possible a study of the consumption of imported butter, which in the first five months of 1931 was found to have risen by about 14 per cent. over the corresponding period of the previous year—an increase almost entirely derived from Empire sources.

CONSUMERS' PREFERENCE.

The Board's machinery for testing the differing market requirements of the United Kingdom has been extended, and a number of investigations have been conducted and their findings made available to producers and others concerned. Experimental shipments of Empire commodities which might find a market in the United Kingdom have been organised in co-operation with the authorities in the countries of origin. Studies of wastage in transit have been made.

MARKET PROMOTION.

While the Marketing Committee was set up by the Board at the end of the period covered by the last Annual Report, its establishment was effected so late in the year that its work may be fairly considered to have begun during the period under review. This Committee, devoting its attention to the field of direct market promotion which lies between the Board's activities in scientific research on the one hand and its publicity on the other, has incidentally canalized, to some extent, the efforts of the various trade committees which had previously existed, while it has added to their number a new body, the Food Products Committee. The activities of these Committees play a prominent part in the record of the year's activities.

TWO EMPIRE SHOPS.

The year has been notable for outstanding activity in this field. The experiment tried at Glasgow in the previous year of popularising and extending the sale of Empire produce by the opening of a shop, in which samples were sold to the public under conditions which secured the goodwill and co-operation of the trades, proved definitely successful. A similar shop was, therefore, opened in

Birmingham in January of this year, and plans are under consideration for acquiring the tenancy of other shop premises in various centres for periods not exceeding six months. These shop experiments have the merit of affording an opportunity to Empire countries in turn of making a special display of their produce in surroundings which are designed to stimulate public interest and under conditions which, thanks to the keen interest taken by the distributive trade, are likely to be productive of permanent results. The temporary establishment of an Empire shop in a particular district also provides a centre at which the publicity and marketing activities both of the Board and of the Governments concerned can be strikingly concentrated.

THE COLLECTIVE CONSUMER.

The importance of securing the practical interest of the large buyers of food-stuffs, such as local authorities, institutions, hotels, shipping companies and other bodies which undertake catering on a large scale, has been recognised from the outset, and tentative steps to develop this field of activity have been taken on more than one occasion. During the past year the Board felt justified, as a result of the experience they had gained since their formation, in beginning serious effort in this field. A special staff was, accordingly, appointed to call upon local authorities, after suitable introduction, and to discuss with them the extent to which their purchases of Empire goods might be increased. This experiment has already proved to be fully justified. The reception accorded to the Board's officers by local authorities all over England and Wales has been most encouraging, and some two hundred authorities have invited the Board to submit suggestions for incorporation in their tender forms, when these are under revision. The new forms of tender became operative, in the majority of cases, on the 1st April. It is too early yet to judge of the full effect of the changes which have been made as a result of the advice tendered by the Board, but there is no doubt that the purchasing power of local authorities is in course of being mobilised in the interest of Empire trade in no uncertain fashion.

A REGIONAL "SALES DRIVE."

Another extension of what may be regarded as the Board's more directly commercial activities in the field of Empire marketing is instanced in a special campaign which was undertaken, at the beginning of 1931, in Lancashire with a view to increasing the sales of home and oversea Empire butter in that area. Here long established prejudice in favour of casked butters of pale colour was held to be too deeply entrenched to permit an effective distribution being made of Empire butters, particularly those from Australia and New Zealand. The Board decided that, as large supplies of butter of first-rate quality from these Dominions were available, an effort should be made to overcome this sales resistance by a definite appeal to the distributive trades. The Board, therefore, called into consultation the London Managers of the Australian and New Zealand Dairy Produce Boards and invited their co-operation in a concerted effort.

An office was accordingly opened by the Board in Manchester early in January. Calls were made, in the first instance, upon the importers and wholesalers in Liverpool and Manchester and their co-operation in the scheme secured. The Board's officers then proceeded to call upon every retailer in Manchester and certain other Lancashire towns in order to influence those who did not at present stock Empire butters. The results of the campaign have been remarkably successful, as is shown in the more detailed information given in another part of this report. The close co-operation of the two Dominion Dairy Produce Boards unquestionably contributed to this success. There is clear evidence that the old prejudices against boxed butters have been broken down—it is hoped, permanently. The experience gained in this experiment of employing travellers without samples in close co-operation with the representatives of the oversea producers encourages the Board to believe that they have here a field capable of considerable extension. Indications suggest that the continued use of the three methods of approach, which have been a feature of the past year's work in the field of marketing promotion, may materially contribute to the Board's success.

PUBLICITY.

Eight methods of publicity have again been used.

First, advertisements have been inserted in the national press and in trade and local papers.

Secondly, posters have been displayed on the 1,750 frames distributed over 450 towns. The sets of posters have been changed seventeen times in the year. Hoardings were used at Birmingham. Reproductions of suitable posters with leaflets were issued to 22,000 schools in the United Kingdom which had applied for them.

Thirdly, display material for shops has again been sent out and leaflets, both for housewives and for schools, have been issued in great quantities.

Fourthly, lectures have been given.

Fifthly, wireless talks to housewives have been arranged, by courtesy of the British Broadcasting Corporation, following which 20,000 individual applications were received for leaflets. The Chairman of the Board and of the Research Grants Committee both gave talks in connection with the Board's work.

Sixthly, the Board have taken part, extensively, in exhibitions and shopping weeks.

Seventhly, meetings of business men, traders and producers have been addressed.

Eighthly, the distribution of films through theatrical and other channels has been developed.

THE BOARD'S ESTIMATE FOR 1931-32.

A total provision of £659,000 for the year 1931-32 is being proposed to Parliament, and a White Paper, giving a note on the finance of the Board up to 31st March, 1931, will be presented to Parliament in July.

I. GRANTS FOR RESEARCH AND DEVELOPMENT.*

IN the past year good progress has been made in schemes of research supported by grants from the Empire Marketing Fund. A full account of each research grant was given in last year's Annual Report. There is printed at the end of this Report a complete list of these grants, and a few of them may be selected for brief mention of the progress achieved. There is also included, under each heading, a note of new research grants approved since the issue of last year's Annual Report in June, 1930.

FOOD PRESERVATION AND LOW TEMPERATURE RESEARCH.

The Board have continued to support during the year 1930-1 low temperature research at Cambridge and East Malling, and research into the preservation and transport of fish at Aberdeen. A further grant has been approved for the year 1931-2.

Cambridge Low Temperature Research Station.

In view of the recent commercial developments in the rapid freezing of meats, experiments are in progress on two of the outstanding problems in this trade, namely, the critical thickness of the meat and the temperature of storage of the frozen material.

One of the most important problems in the storage of meat and meat by-products is the avoidance of any suggestion of an unpleasant taste in the fat. The chemical changes during storage occurring in some of the more common fats are being investigated, and an attempt is also being made to link up these changes with the composition and the changes in flavour of each fat. Two specific problems of economic importance in this field of enquiry are the storage of chilled beef and frozen mild-cured bacon.

The Canning Laboratory at the Low Temperature Research Station has yielded results of practical value on the effect of hydrogen-ion concentration on the corrosion of tin-plate containers by canned fruits. It has long been noticed that fruits such as cherries, dried prunes and bilberries, which are of low acidity, cause more losses from hydrogen swells and perforations than many fruits of higher acidity. Practical experiments with cherries and prunes, which normally give trouble, have shown that the addition of a small quantity of citric acid to the covering syrup checks such losses to a surprising degree, and there is evidence that this remedy will apply to other fruits of low acidity.

Investigations have also been carried out on the relation of a cold store to the canning industry, more especially with a view to prolonging the canning season, and a method for storing peas indefinitely in the frozen state in a condition fit either for canning or ordinary cooking has been devised. Methods for storing strawberries and cherries in the frozen condition with sugar or sugar syrup have also been tested.

* Provision was made in the Estimates for 1930-1 for an expenditure on research of £476,000.

In the last Report it was stated that the gas-storage of English apples by regulated ventilation was being tested on a commercial scale. The test was most successful, and it is understood that the losses during storage, which lasted for five months, did not exceed one half of one per cent. A second commercial gas-store is now being successfully operated.

Assays of the content of vitamin C in apples, made at the Lister Institute in co-operation with the Medical Research Council, show that the English variety, Bramley's Seedling, is remarkably richer than all others. Storage in the frozen state does not affect the vitamin content, but other methods of storage appear to cause some loss. The varieties Newton Wonder and Lane's Prince Albert have also been tested, and their vitamin content was found to be about the same as that in most varieties other than Bramley's Seedling.

Ditton Low Temperature Research Laboratory, East Malling.

The Ditton Laboratory, erected at East Malling, Kent, for the study of fruit transport and storage problems on a semi-commercial scale, was opened during the summer of 1930. It contains a large model storage chamber constructed on the lines of a ship's hold, and fitted with several different systems of refrigeration. This chamber is surrounded by an air-space three feet wide, in which the temperature is independently controlled by means of refrigeration and electric heaters. Air is circulated rapidly by four large fans. Thus the temperature of the environment can be controlled and experiments can be made under conditions simulating those of a ship's hold in tropical waters or in high latitudes. The chamber itself can take up to 130 tons of apples and was loaded to capacity in the autumn. It is fitted with 200 electrical thermometers which are connected with a switchboard in the measuring room, and provide a constant record over long periods of the fluctuations in temperature in all parts of the hold. The distribution of cold by different methods of refrigeration, and the best methods of controlling fluctuations which are at present responsible for considerable wastage in fruit during transit, can thus be studied. This is believed to be the largest experimental cold store in the world, and possesses many unique features. Ten small controlled temperature chambers are also in course of construction at the Ditton Laboratory, and are to be used mainly for experiments on "gas storage."

Torry Fish Research Station, Aberdeen.

Work has now got under way at Torry on various problems connected with the preservation and handling of fish. A building has been converted into several laboratories, and an adjoining shed fitted with other apparatus. The main sections of the work relate to the freezing of fish, the chemistry of post-mortem changes, fish bacteriology, curing, and a study of the fats and oils of various types of fish. Three new controlled temperature cold chambers are in course of construction, and a brine-freezing plant has already been installed. During the year a drifter with trawler equipment, the "City of Edinburgh," has been bought. Her primary object is to obtain the fish to be used for experiments, so that they shall be caught under scientific supervision and landed quite fresh.

Survey of Trade in Frozen Mutton and Lamb.

The small expedition, under the leadership of Dr. Ezer Griffiths, F.R.S., which left England in September, 1929, to make a scientific survey of the trade in frozen mutton

and lamb from the abattoirs in New Zealand to the markets of Great Britain, was joined by Mr. C. R. Barnicoat, M.Sc., of the New Zealand Department of Scientific and Industrial Research, and Mr. N. E. Holmes, B.E., of the Commonwealth Council for Scientific and Industrial Research. Since the return of the expedition, Mr. Barnicoat has made the Low Temperature Research Station his main headquarters, whilst working on the chemistry of fats. Mr. Holmes, working with Dr. Griffiths at the National Physical Laboratory, has specialised on some of the engineering problems of food preservation. Both investigators have also spent some time at the Ditton Laboratory, assisting with the physical measurements in the model ship's hold.

A complete report of the results and conclusions arising out of the New Zealand survey has been prepared and made available to the various co-operating bodies.

ANIMAL HUSBANDRY.

Research into the Mineral Content of Natural Pastures.

The main results of the research into the mineral content of pastures have been given in previous reports. The information obtained and referred to in these reports is now being applied in practice. Further work is being done to ascertain the composition of pastures under the varying conditions of soil, climate and management in the natural grazings in different parts of the Empire, and experiments are in progress to find out the best means of improving the composition of these pastures or of making good by means of salt licks, whatever deficiencies are found to exist.

Wide interest has been shown in these investigations and work on similar lines is now being done in other parts of the Empire in addition to the work being continued at centres where it was begun with the aid of grants from the Empire Marketing Board.

Mention should be made of two new lines of investigation which have originated from this work on pastures. It has been found that the blood of animals grazing on pastures which are markedly deficient in either phosphorus or calcium, tends to be poor in these elements and it is thought that this abnormality in composition may be correlated with increased susceptibility to some diseases. This opens up a field of great economic importance, and fundamental research on the subject is being carried out in Scotland, South Africa and Australia. Work on somewhat similar lines on a disease found in sheep on deficient areas is being done in New Zealand.

The influence of deficiencies found in the pasture on the quality of wool is being intensively studied at all the main centres to which grants were made by the Empire Marketing Board. The main results obtained so far show that the amount of protein in the feed is by far the most important factor in determining the weight of the fleece.

A Report on the history and results of the investigations and containing recommendations as to the future scientific programme of the Station at Naivasha in Kenya has recently been published.*

ANIMAL HEALTH.

Onderstepoort Veterinary Research Station, South Africa.

Plans for the extension of the buildings at the Onderstepoort Veterinary Research Station have been drawn up and approved and work on the new Library will shortly be begun.

* "Sixth Report of the Committee on the Mineral Content of Natural Pastures." His Majesty's Stationery Office. Price 1s.

The three Onderstepoort-Empire Research Fellowships established by means of a grant from the Board have now been awarded on the nomination of a special Selection Committee in London consisting of Lord Rutherford, President of the Royal Society, the High Commissioner for the Union of South Africa, the Chairman of the Research Grants Committee of the Empire Marketing Board and the Director of the Imperial Bureau of Animal Health. The Fellowships have been awarded to Mr. R. Alexander, Mr. J. H. Mason and Dr. C. Rimington and they will be concerned respectively with methods of tissue culture and filterable viruses; bacteriological and physiological research bearing on the health of stock animals, particularly ruminants; and research into toxic principles of poisonous plants as they affect the major stock animals.

Investigations into the use of B.C.G. Vaccine in the Protection of Calves against Tuberculosis.

Further experiments at the Department of Animal Pathology, University of Cambridge, on the Bacillus Calmette—Guerin, a special strain of harmless (though living) tubercle bacillus first bred by Professor Calmette at the Pasteur Institute in 1906, show that the vaccine has the power, if suitably administered, to raise the calf's resistance to tuberculosis to a very high level. Many calves vaccinated with B.C.G. and then infected with virulent bovine tuberculosis germs have survived for from 8 to 20 months, although similarly infected calves which had not received the B.C.G. died within 3 weeks. In only one case has intravenous vaccination with B.C.G. failed to increase the resistance of the animal to tuberculosis. In some instances the resistance was of a very high order, the animal showing, when slaughtered after a year or more, only a few disseminated lesions. One animal, which was given B.C.G. by the mouth and then a strong dose of virulent tubercle germs, was alive and well three years later, and in the interval had given birth to a calf which was reared by the mother and which, at 10 months old, did not react to the tuberculin test. Further experiments on these lines are proceeding.

Animal Health Research in Australia.

In 1927 the Board agreed provisionally to contribute on a pound for pound basis with the Commonwealth Government towards the establishment of a research station in Northern Queensland. The Commonwealth Council for Scientific and Industrial Research have recently decided to develop an attack on animal health problems on lines proposed by Dr. Orr and Sir Arnold Theiler after their visit to Australia. These later proposals are closely allied to the purposes of the proposed Queensland Station and the Australian authorities expressed the hope that the Board would allow their promised grant to be devoted to this work. A definite scheme for animal health research has now been submitted by the Commonwealth Council for Scientific and Industrial Research and the Board have agreed to contribute on a pound for pound basis over a period of five years. The particular problems which it is proposed to study are black disease of sheep, caseous lymphadenitis, foot rot, pizzle disease, infertility of sheep and internal parasites. The Australian contributions to these investigations will be provided from the interest on a fund which is being established by Australian pastoralists and from other local sources.

WOOL.

Imperial Wool Research Conference.

The first Imperial Wool Research Conference was held in September, 1930, under the auspices of the Board. Delegates attended from the United Kingdom, Canada, Australia, New Zealand, South Africa, the Irish Free State, and the Falkland Islands. The Chairman was Sir Robert Greig, Chairman of the Executive Council for Imperial Agricultural Bureaux, and the Conference was formally opened in London by the Rt. Hon. J. H. Thomas, M.P. Visits were paid to Leeds, Bradford and Edinburgh, where various aspects of wool research were inspected. The proceedings of the Conference and the recommendations made by it (which were presented to the Imperial Conference) have been published by the Empire Marketing Board.*

This is claimed to be the first Conference yet held attended by workers from many parts of the Empire in order to discuss a single raw material from its scientific aspect.

Survey of Empire Wools.

As indicated in last year's report Dr. J. E. Nichols, an officer of the Wool Industries Research Association, has visited Canada, Australia, New Zealand, South Africa, Kenya and Palestine, where he has made a detailed study of the conditions of wool production and utilisation. A supplementary grant has been approved in the past year to provide for a visit by Dr. Nichols to Northern Ireland and the Irish Free State and to enable him to classify the material collected as the result of his tour and to prepare his full report by the end of July next.

HIDES AND SKINS.

Processing of New Zealand Pelts.

A grant has been approved in the past year to the New Zealand Department of Scientific and Industrial Research to meet half the cost of research on the processing of New Zealand pelts. In 1930 over 11,000,000 sheep and lamb pelts were exported from New Zealand, their value being over £1,500,000. Evidence from consumers in the United Kingdom, the United States of America and other countries show that New Zealand pelts, by virtue of their derivation from cross-bred flocks, are fundamentally the finest obtainable but that they are rendered unsuitable for the purposes for which they are best fitted by undesirable methods of processing. At present the bulk of New Zealand pelts is bought by American manufacturers who use them mainly for the cheapest purposes, such as shoe linings, and the present project aims at determining, by a series of experimental packs of pelts, the best methods of de-wooling, liming, de-liming, and the best method of pickling or alternative methods of preservation. The packs sent forward to this country will be examined by the British Leather Manufacturers' Research Association before being tried out on a manufacturing scale by various important firms. The other half of the cost of this research is being met in equal proportions by the New Zealand Department of Scientific and Industrial Research and the freezing companies.

* "Imperial Wool Research Conference, 1930: Report of Proceedings." His Majesty's Stationery Office. Price 1s. net.

DAIRYING.

Investigations into the Nutritive Value of Milk.

The experiments carried out on 20,000 school-children in Lanarkshire on the value of milk as a supplementary ration for children and on the relative values of raw Grade A (T.T.) and of Pasterised milk, have been completed, and a report has been published by the Department of Health for Scotland.*

The results were conclusive. The addition of milk to the children's diet had a striking effect in improving physique and general health, and in increasing mental alertness. No measurable difference could be found in the value of raw as against pasterised milk.

"Journal of Dairy Research."

Two further numbers of the Journal have appeared since the issue of last year's Report, and the number of subscribers has gradually increased to its present figure of about 200. A considerably increased circulation is, however, required before the Journal can be made self-supporting. The issues to date have contained valuable monographs on feeding standards for dairy cows, on methods of determining the numbers of bacteria in milk, and on the mineral requirements of dairy cattle. Original articles have been published on studies in lactation, rusty spot in cheese, a review of undulant fever, studies in the ripening of cheddar cheese, etc.; and abstracts and reviews covering bacteriology, chemistry, biochemistry, dairy husbandry and practical dairying have been included.

Research on Cheese Ripening.

A third year's grant has been approved to the University of British Columbia for the continuation of research on cheese ripening problems. The University is itself providing funds for this work on a pound for pound basis with the Board. The first of a series of papers dealing with this research has been received and will be published in an early number of the *Journal of Dairy Research*.

During the past year Professor Wilfred Sadler, who is in charge of the work, has visited the United Kingdom and discussed his investigations with dairy research experts in this country. Dr. Marsden, the Secretary of the New Zealand Department of Scientific and Industrial Research, after attending the Imperial Conference, returned to New Zealand via Vancouver, where he met Professor Sadler. As a result arrangements have been made for close collaboration between workers in the United Kingdom, British Columbia and New Zealand in the field of dairy research.

Investigation of the problem of "openness" in Cheese.

A grant has been approved to the New Zealand Dairy Research Institute for investigation of the problem of "openness" in New Zealand cheese. The New Zealand Government and the New Zealand Dairy Produce Board are financing those sections of the work of the Dairy Research Institute which have a direct bearing on manufacture, and the Empire Marketing Board's grant is to enable work of a more fundamental character to be undertaken on the chemical and bacteriological aspects of the problem of "openness." This is being carried out in close collaboration with dairy

* "Milk Consumption and the Growth of School Children: Report on an investigation in Lanarkshire Schools". By G. Leighton and P. L. McKinlay. His Majesty's Stationery Office. Price 3d.

research workers in this country at the National Institute for Research in Dairying at Reading and in Canada at the University of British Columbia. The quantity of cheese exported from New Zealand during the year 1930 was 91,000 tons, valued at over £6,000,000, all of which came to the United Kingdom.

Study of Tuberculous Infection of Milk.

A grant has been approved during the past year for an investigation in Scotland to ascertain the extent of infection of the milk supply with a view to providing information as to (a) the relative infection of different types of milk and (b) the need for and nature of legislation which would provide a greater safeguard against human infection from contaminated milk. The scheme provides for the examination, by extensive guinea pig inoculation tests, of the relative infection of samples of raw milk (other than graded milk), pasteurised milk, tuberculin-tested milk and miscellaneous samples. The raw milk is taken from churns on arrival at city railway stations or depôts. This indicates the extent of infection of mixed milk which would be supplied to the public if no heat treatment were given. The pasteurised milk is taken either at the pasteurisation depôt or over the counter. This indicates the reduction in infection resulting from present day commercial pasteurisation. Tuberculin-tested milk is taken from mixed milk at each licensed farm and as sold over the counter. This indicates the measure of freedom from infection resulting from the use of tuberculin-tested cows only. Miscellaneous samples are being taken from special outlying country districts.

Four Scottish municipalities—Edinburgh, Glasgow, Aberdeen and Dundee—have agreed to co-operate financially in the scheme over two years, for which period the experiment is planned. There will be examined at each centre a minimum of 650 samples of raw milk as received from the producer, 650 samples of pasteurised milk and 650 samples of retailed milk as delivered to the consumer in containers or from bulk. In addition, the Hannah Dairy Research Institute at Auchincruive will examine 1,000 samples of graded milk and 1,000 samples of miscellaneous milk, including condensed and dried milks.

Technique of Milk Examination.

From a public health point of view it is important to be able to express an opinion on samples of milk and to know the degree of experimental error. At present there is considerable trouble from litigation which could largely be avoided if a more satisfactory test were recognised.

A grant was approved in January, 1931, for an investigation by the London School of Hygiene and Tropical Medicine designed to work out as far as possible a technique of milk examination that will enable more consistent results to be obtained than is possible under the standards established by the Ministry of Health in 1923. The problem concerns designated or graded milk and is, therefore, of importance from the standpoint of marketing.

Arrangements have been made for the investigation to be carried out in collaboration with the National Institute for Research in Dairying at Reading, and other qualified bodies, and it will be conducted under the auspices of a specially constituted Committee of experts whose members have been nominated in consultation with the Chief Medical Officer of the Ministry of Health and the Chief Medical Officer of Health for Scotland.

Survey of Dairy Research.

During the past year the Board commissioned Sir William Dampier-Whetham, F.R.S., to survey the field of dairy research in England, Scotland and elsewhere and to indicate for the Board's guidance (a) the proper line of division between a specialist dairy research institute and the work of other research institutes in the sphere of nutrition, animal diseases and low temperature research, and (b) the extensions contemplated or desirable and the most important scientific or practical problems to which attention should be directed.

A comprehensive Report has now been submitted by Sir William Dampier-Whetham and will shortly be published.

EXPORT OF PEDIGREE LIVESTOCK.

" Assisted Passages " Scheme.

Since the issue of last year's Report the Board have agreed to continue assistance for the export of pedigree livestock to Northern Rhodesia for a second year and to Kenya for a fourth year. The Board have also approved a similar scheme for British Columbia. The table on page 20 gives the number and types of animals which have been exported under these schemes since their inception.

London Quarantine Station.

The London Quarantine Station is continuing to prove of great value in facilitating export of British stock to Empire countries, and since its opening in April, 1928, 1,845 animals have passed through the Station to Australia, New Zealand, South Africa, Northern Ireland, the Irish Free State, Southern and Northern Rhodesia, Nigeria, the Gold Coast, Trinidad, Antigua, Cyprus and Palestine.

ENTOMOLOGY.

Parasite Laboratory, Farnham Royal, England.

Investigations, suggested by the Canadian Government, have been carried on during the past year on the parasites of the Wheat Stem Sawfly, the Codlin Moth, the Oriental Peach Moth, the Peach-twig Borer, the Pine Tortrix, the Pear Slug, the Larch Case Bearer, and the Holly Leaf Miner. A total of 20 shipments of parasites or parasitised insects, comprising in all over 61,000 individuals, has been sent to Canada. A large shipment of Wheat Stem Sawfly material, comprising about 90,000 cocoons, of which a large proportion contains parasites, and a consignment of parasites of the Larch Case Bearer, are now in course of preparation.

The parasite of the Hawthorn or European Fruit Scale shipped to Western Canada is reported to have become thoroughly established and to be destroying a high proportion of the scales in the areas in which it was liberated. The parasites of the Pine Tortrix and of the Wheat Stem Sawfly have also been recovered from the areas in which they were colonised.

The Entomologist of the Commonwealth Council for Scientific and Industrial Research of Australia, who is attached to the Laboratory, has continued to investigate and ship to Australia the insects attacking St. John's Wort, and up to the time of preparing this Report a total of 24 consignments, comprising in all over 134,000

specimens, have been sent out from the Laboratory. A consignment of cocoons of the Pear Slug containing parasites, and of *Ascogaster quadridentatus*, an important parasite of the Codlin Moth, are also in preparation. A full report embodying the results of investigations on the natural control and bionomics of the Lucerne Flea, which is very injurious in certain parts of Australia, is being prepared and will be published in the near future.

A consignment of 700 specimens of the Codlin Moth parasite, *Ascogaster quadridentatus*, and another containing 5,000 specimens of the egg parasite *Trichogramma*, were shipped to South Africa in November, 1930.

A total of 51 shipments of insect parasites and insect enemies of injurious weeds has been sent out to New Zealand since the last report. These comprise a total of about 375,000 specimens of parasitised material or parasites attacking the Sirex Wood Wasps, the Earwig, the Woodlice, the Greenhouse White Fly, the Codlin Moth, and insects destructive to Gorse, Ragwort, and Blackberry.

One shipment each of *Encarsia formosa*, the White Fly parasite, and *Aphelinus mali*, the parasite of the Woolly Aphis were sent to the Irish Free State in 1930. A further consignment of *Aphelinus mali* was sent to the United Provinces, India, in July, 1930. Consignments of the parasite of the Woolly Aphis have been sent out from time to time to various parts of Great Britain and a store of this parasite is still available for distribution.

A lot of about 650 larvae of the fly *Mesembrina meridiana*, which in the younger stages attacks the maggots of the House Fly, was shipped to Fiji in February, 1931, at the request of the Government Entomologist. The object of the introduction of this species is to diminish the abundance of the House Fly, which is believed to be an important agent in spreading bacillary dysentery in the islands.

A consignment of *Trichogramma*, for use against the Pink Bollworm of cotton, has been despatched to Egypt, while another parasite of the same species has been sent to the South-Western United States at the request of the entomologists of the United States Department of Agriculture.

Up to April 1st, 1931, a total of 144 consignments, comprising in all approximately 659,000 specimens of parasites or insects for rearing parasites, have been shipped from the Laboratory to various parts of the Empire.

The official Delegates of the Governments of the Empire attending the Imperial Entomological Conference, devoted a day to the inspection of the Laboratory and its work. The following resolution was subsequently passed by the Conference: "The Conference also records its appreciation of the action of His Majesty's Government in the United Kingdom in providing, through the Empire Marketing Board, funds for the establishment and maintenance of the Parasite Laboratory of the Institute at Farnham Royal. The Conference, having had an opportunity of inspecting the Laboratory, entirely approves the lines on which its work is being conducted; and trusts that, having regard to the immense importance to economic entomology of progress in the biological control of insects, and to the increasing demand for the services of the Laboratory, the financial support already accorded it may be maintained and augmented."

Biological Control of Insect Pests in the West Indies.

During the past year Dr. J. G. Myers, of the Imperial Institute of Entomology, has continued his investigations into biological control of insect pests in the West Indies and parts of South America and his preliminary Report will shortly be published by the Empire Marketing Board.

Separate enquiries into the problem of *Diatraea* and sugar-cane have been commenced in Trinidad and in Antigua, and a third is contemplated for British Guiana. One of Dr. Myers' more important functions is to correlate these investigations. In addition, work on this problem has been undertaken by the Government of Barbados. *Diatraea* takes a heavy toll from the sugar industry and it is, therefore, important to attempt a proper solution of this problem at a time when it is urgently necessary for sugar planters to reduce the cost of production.

Campaign against Desert Locust.

In last year's Report it was notified that a grant had been approved to enable the Imperial Institute of Entomology to undertake the collection and dissemination of information regarding the desert locust, as a preliminary measure pending the preparation of a systematic anti-locust campaign.

The Committee on Locust Control of the Economic Advisory Council have now prepared a five years' scheme, concentrating in the first place on the probable breeding grounds of the desert locust, namely the Red Sea littoral of the Anglo-Egyptian Sudan and Eritrea, the Northern Provinces of Kenya, Italian and British Somaliland, and Southern Arabia. The Board have not felt able, owing to financial stringency, to provide sufficient funds to enable the full five years' programme to be put into operation at once, but they have approved a grant for one year which, with the contributions promised by certain oversea Governments, will enable an immediate start to be made on a somewhat smaller scale than that envisaged by the Committee. They have also approved a further grant to the Imperial Institute of Entomology for headquarters expenditure on the maintenance of a locust intelligence bureau.

Stored Products Research.

During the past year the staff of the Biological Field Station, established at Slough by the Imperial College of Science and Technology by means of a grant from the Board, have continued the inspection of consignments of cacao and dried fruit at the London Docks. By arrangement with the Liverpool Cocoa Association, samples of West African cocoa arriving at Liverpool have been sent to Slough for examination. Special attention has been given to the infestation of dried fruit and several reports have been sent to the Australian Dried Fruit Board. A study of climatic conditions at the Docks has been begun with the co-operation of the staff of the Port of London Authority. Numerous enquiries have been received regarding infestation of products by insects and moulds, and in nearly all cases it has been possible to give help or at least useful information.

The investigation of certain tobacco problems has been undertaken on behalf of the Southern Rhodesian tobacco interests.

Experimental biological work has been concerned with the relation of humidity to the development of stored products' insects and with the effects of very low and of high temperatures on their control.

In connection with the mycological work, samples of West African cacao landed at Liverpool have been regularly supplied and arrangements have been made for the determination of their moisture, mould and insect contents. This more precise survey of the conditions of cacao as it arrives in the United Kingdom has already yielded interesting results, particularly in the number of fungi and insects affecting the produce. Co-operation with Government Departments in Trinidad, the Gold Coast and Nigeria is being maintained. A survey of copra moulds has been completed. This has shown that mould growth has ceased by the time the copra reaches this country and that mycological work could, therefore, best be undertaken in the producing countries. This view is shared by the agricultural authorities of Fiji and Malaya to whom assistance has been offered in the determination of copra moulds, the examination of consignments, and such other ways as they may suggest.

On the physico-chemical side investigations have been carried out on vapour pressures, rates of diffusion, and relative toxicity to insects of a number of fumigants.

Campaign against Warble Fly.

Last year's Report notified a grant to the Leathersellers' Company in aid of a campaign in England against the warble fly by means of controlled experiments and educational propaganda.

During the past year considerable progress has been made with the campaign. As a result of the work of the Committee which has been formed under the auspices of the Leathersellers' Company, regional demonstrations and controlled experiments were carried out during the warble fly season last year in a large number of areas throughout this country and also in Ireland. The demonstrations were based on the form of treatment which has been recommended by the Committee and the results were highly satisfactory. It has been definitely shown that a remedy is available which is safe, effective and economical, and the Committee is now concentrating on efforts to get the treatment of cattle adopted on the widest possible scale. Considerable interest has been aroused throughout the country in the subject, and it is hoped that in future years the application of the treatment to cattle will become general and that there will be a steady diminution of the damage at present being caused by the pest. A full report on the campaign during 1930 has been published by the Leathersellers' Company.*

Natural History Museum.

The new building at the Natural History Museum for housing entomological specimens was formally opened on the 5th December, 1930, by Mr. Ormsby-Gore representing the Empire Marketing Board. The Archbishop of Canterbury, Chairman of the Trustees of the British Museum, and Dr. Tate Regan, Director of the Natural History Museum, expressed their appreciation of the action of the Board in making this much needed extension possible by means of their capital grant.

Entomological Research in Australia.

During the past year the personnel of the Division of Entomology in Australia has been strengthened by the appointment of a Deputy Chief, and by the addition

* "Report on Warble Fly Campaign, 1930, by the Leathersellers' Company's Warble Fly Committee." Leathersellers' Hall, St. Helen's Place, London, E.C.3.

of several new members to the staff. Investigations are in progress on the sheep blowfly and the buffalo-fly problems, orchard and fruit pests, field-crop and pasture pests, forestry, noxious weeds, and systematic entomology.

Close relationship is being maintained with the Imperial Institute of Entomology through the organisation of the Parasite Laboratory at Farnham Royal. The Entomologist of the Commonwealth Council for Scientific and Industrial Research attached to the Laboratory has continued to investigate and ship to Australia parasites or insects for rearing parasites (*see* page 19).

Certain aspects of the noxious weeds research work are being carried out with the help of the Prickly Pear Board. An officer of the Board is studying the insects in Mexico which attack both *Xanthium* and *Lantana*. Endeavours are being made to control Clover Springtail, a serious insect pest. The Forest Insects Section is at work on the prevention of damage to timbers by Termites; and the Section of Systematic Entomology has taken up the problem of insect carriers of the Worm Nodule Disease in cattle. Facilities have been granted by the Director of the Veterinary Research Institute, Buitenzorg, Java, for a section of the buffalo-fly control campaign to be centred there. The policy is to strengthen the work in Java as it appears clear that, if a solution is to be found anywhere, it will be found in the Dutch East Indies. To this end Professor E. Handschin, Professor of Entomology in the University of Basle, Switzerland, has been appointed for two years to study the problem in the Dutch East Indies.

Entomological investigations in Mauritius and the Seychelles.

The beetle *Phytalus smithi* was introduced in Mauritius some twenty years ago, and is unquestionably the most injurious insect pest of sugar cane in the Colony. In spite of the organisation of hand collections of the adults and larvæ on a large scale and the establishment of two natural enemies, it continues to increase and spread, becoming more destructive and abundant even in areas which have been infested for many years. The Yellow and Black Thread Scales are the most important scale-insects attacking coconut in the Seychelles.

In November, 1930, the Board approved a grant for a period of two years to enable an entomologist to study in America the methods used against the Japanese beetle, a pest belonging to the same group as *Phytalus*, and to experiment in Mauritius with such methods against the *Phytalus* species. While in Mauritius he will search for parasites or predators of the coconut scales, and after a similar search in East Africa, he will go to the Seychelles to arrange, if possible, for the introduction of parasites into the Colony.

MYCOLOGY AND PLANT PATHOLOGY.

Imperial Mycological Institute.

The new building erected at Kew to house the Imperial Mycological Institute was completed and occupied during the winter, and is considered most satisfactory. Special accommodation has been provided for oversea students and mycologists on leave who wish to work at the Institute.

Virus Diseases of Plants.

Up to the present most of the work at the Rothamsted Experimental Station has, as a matter of convenience, been done with tomato plants; it has suffered from the disadvantage that winter grown plants were very different in their reactions to virus infection from those grown in summer. The difference between summer and winter results has been traced to the difference in the hours of light; when the winter day was extended by five hours of good artificial light the summer disease symptoms were produced in winter plants. Conversely, when the summer day was shortened by cutting off the light, the plants took the disease only slowly and abnormally. In complete darkness they failed to take the disease at all. It has been shown that the virus cannot travel across dead tissue nor can it enter the living cells of the plant from the xylem unless some rupture has occurred. A study has been made of the mode of formation of the intracellular inclusions found in cells of the diseased plants. A film of the process which has been made has attracted attention in scientific circles.

At the Experimental and Research Station, Cheshunt, an investigation of the physical and chemical characteristics by which infected tissue may be distinguished from normal tissue and the study of the influence of environmental and other conditions on the disease has been extended. The progress and severity of the disease in the living plant has been studied in relation to light of different wave lengths, varying duration and intensity of light, metabolism and inoculation methods. The results already obtained indicate definite progress along certain lines both in the evolution of methods of attack and data obtained by these methods.

Cotton Disease Research.

The experiments at the Rothamsted Experimental Station on the influence of environmental conditions on the black arm or angular leaf spot disease of cotton have been continued during 1930. The aim has been to confirm and extend the results already obtained on the influence of soil temperatures, air temperatures and atmospheric humidity on the disease.

A paper giving full constructional details of the design and equipment of the apparatus for the growing of plants in a controlled environment has been published* and also a paper embodying the results of the soil temperature experiments.† The results of the experiments on the influence of air temperatures will be published during the current year.

PLANT BREEDING.

Welsh Plant Breeding Station, Aberystwyth.

Last summer saw the first harvest of certain pedigree strains of grasses which were "grown-on" under contract by farmers in Montgomeryshire in order to obtain sufficient supplies for further testing and for despatch overseas. A good harvest was obtained by means of a travelling grass-seed thresher attached to a lorry, and in all some 3 tons of seed off about 17 acres was obtained. The bulk of this consisted of

* "Apparatus for the growing of plants in a controlled environment." By R. H. Stoughton. *Annals of Applied Biology*, Vol. XVII, 90-106.

† "The influence of environment conditions on the development of the Angular Leaf-Spot disease of Cotton. II. The influence of soil temperature on primary and secondary infection of seedlings." *Annals of Applied Biology*, Vol. XVII, 493-503.

pedigree strains of cocksfoot and perennial rye-grass ; timothy and red fescue were also grown. Both at Aberystwyth and at Palmerston North, New Zealand (where the Aberystwyth strains are being cultivated) good progress has been made in the establishing of selected pedigree families.

The scheme by which an Empire grassland officer is to act as liaison officer for grassland research between Empire countries—the first appointment ever made on these lines—has come into force.

Division of Plant Industry : Commonwealth Council for Scientific and Industrial Research.

In September, 1930, the Commonwealth Council for Scientific and Industrial Research approached the Board for financial assistance for the provision of an essential plant house and for a maintenance grant in aid of the activities of the Plant Industry Division. The Board, in November, 1930, approved of the capital sum required being provided by the diversion of a similar sum from the capital grant promised to the Entomological Division where certain savings had been effected. In view of the urgency of the work which the Division of Plant Industry had planned and of its general Empire interest, the Board also agreed to provide an annual maintenance grant for two years. The work of this Division falls into six main sections dealing respectively with plant pathology, plant breeding, plant introduction, agrostology, weeds and poison plants, and plant nutrition. The Division has been handicapped in three main lines of work, namely, fruit, cereal and agrostological investigations, and the Board's grant will enable field work to be developed in these directions. The chief task to be undertaken on fruit is an investigation of the relation between cultural conditions in the orchard and keeping qualities of the fruit, including its behaviour under cold storage conditions. This work is recognised to be an essential counterpart to the work of the Low Temperature Research Station at Cambridge, and it should possess considerable significance to all Empire countries exporting fruit. The cereal work will be concerned with the improvement of drought resistant strains of wheat and the control of certain mycological diseases and is of obvious importance to India and perhaps to other parts of the Empire where wheat is, or may be, grown under conditions approximating to those in Australia. The agrostological work will include a survey of the pasture plants of Australia and the question of the introduction of fodder plants suited to semi-arid conditions. This may be regarded as part of the Empire attack upon this great problem.

Research in the Production of Strong-strawed varieties of Oats and Barley.

There is an urgent demand in parts of the Empire for varieties of cereals suitable for cultivation on rich soils. The increased use of artificial manures, the more intensive use of concentrated feeding-stuffs for farm livestock, and the extensive development of the growing of wild white clover in temporary leys, are rendering tillage lands in the principal agricultural countries more fertile and in consequence there is a steadily increasing demand for stiff-strawed varieties of cereals.

The Plant Breeding Department of the University College, Dublin, has been pursuing investigational work of considerable economic importance on the production of strong-strawed varieties of oats and barley comparable to the work on the production of strong-strawed wheats at the School of Agriculture, Cambridge, and at the Plant Breeding Institute at Svalof in Sweden. More than twenty years ago, the Department of Agriculture established their principal seed propagation station at the

College farm and in the intervening period strong-strawed strains of the leading commercial varieties of cereals have been raised at this centre and distributed to farmers. More recently new stiff-strawed varieties of hybrid oats and hybrid barley have been propagated and placed on the market.

In June, 1930, the Board approved a grant for the extension of these investigations.

Experiments with Plants of the Tidal Zone with special reference to Spartina Townsendii.

During the past year the Board were asked to continue their support for work on Rice Grass (*Spartina Townsendii*) at the East Anglian Institute of Agriculture in Essex. A further grant to be spread over a period of three years has been approved for the purpose of investigations to test out the grass in different situations and to determine the best methods of transporting seeds and plants overseas.

HORTICULTURE.

East Malling Research Station, Kent.

Arrangements have now been made for putting into force the scheme for accommodating a limited number of fruit research workers from oversea Empire countries at the East Malling Research Station. Facilities will be provided for post-graduate workers to carry out individual research at the station for a period of two years.

Mr. Hatton, the Director, has visited Canada, Australia, New Zealand, Java and Ceylon during the year.

ECONOMIC BOTANY.

Royal Botanic Gardens, Kew.

During the past year Sir Arthur Hill, Director of the Royal Botanic Gardens, Kew, has visited the Union of South Africa at the invitation of General Hertzog, the Prime Minister. This is the first occasion on which a Director of Kew has visited the Union. Sir Arthur Hill then travelled through Kenya and Uganda and attended the Conference of Directors of Agriculture of the East African territories held in February at the East African Agricultural Research Station at Amani.

Mr. H. C. Sampson, the Economic Botanist at Kew, has visited the Bahamas.

TROPICAL RESEARCH STATIONS.

East African Agricultural Research Station, Amani.

During the past year further grants have been approved towards the maintenance during the financial years 1930-1 and 1931-2 of the East African Agricultural Research Station at Amani. This Station serves as a centre of research into tropical agricultural problems in East Africa. The Colonial Advisory Council of Agriculture and Animal Health have carefully examined the research programme of Amani and have recommended that, in view of the importance to East Africa of the coffee and sisal industries, the programme should be largely directed towards work on behalf of these industries and that the Station should, in fact, become the main research station in the Empire for fundamental work on these crops. Other crop investigations should include work on tea, cinchona and pasture and browse plants, and research into the problems of virus diseases should be continued.

Imperial College of Tropical Agriculture, Trinidad.

The Board have, during the past year, agreed to continue their contribution to the general maintenance expenses of the Imperial College of Tropical Agriculture, Trinidad, and have approved of a block grant being made available in respect of the College year ending August, 1931.

BANANA RESEARCH.

An account of progress in research into the transport and storage of bananas immune from Panama Disease has been published by the Empire Marketing Board in the form of a Report by Dr. Wardlaw and Dr. McGuire.* Bulk trials have been carried out in the new experimental cold store built at the Imperial College of Tropical Agriculture in Trinidad with funds provided by the Board. As a result, the authors of the Report state that the varieties Cavendish and Lacatan show promise of being suitable for export to the United Kingdom.

A conference was held under the Board's auspices in July, 1930, to discuss banana research, the main object being to secure effective co-ordination between the different bodies engaged in such investigation. The meetings were attended by representatives of the Colonial Office, the Department of Scientific and Industrial Research, the West India Committee, the Royal Botanic Gardens, Kew, the Imperial Institute of Entomology, the Imperial Mycological Institute, and the Imperial College of Tropical Agriculture, Trinidad. The storage, plant-breeding, mycological and biochemical aspects of research were considered and suggestions were made for further studies of the ripening of bananas, the chemistry of ripening, and the organisms and conditions of infection giving rise to wastage. It was further recommended that trials should be carried out on a commercial scale to test recently devised methods of controlling stalk rotting, and that surveys should be undertaken of the nature and seasonal variation of wastage in bananas, and of the temperature and other conditions in ship's holds.

TEA.

Tea Research in India.

Last year's Report notified a grant to the Indian Tea Association towards the cost of establishing and developing at Tocklai a laboratory of plant physiology where problems connected with the constitution and composition of the tea plant could be studied.

During the past year the Chief Scientific Officer of the Association has visited this country and selected a Physiologist who proceeded to India in November to take up his duties. A new laboratory has been erected and equipped and further housing accommodation for staff has been built at the Association's Experimental Station at Tocklai.

Tea Research in Ceylon.

During the year the new and fully equipped headquarters of the Institute have been opened at the St. Coombs Estate and research into many aspects of tea growing and manufacture will be developed. The Institute has received a loan from the Ceylon Government on account of capital expenditure and the experimental machinery purchased with the Board's grant has been installed.

* "The Behaviour and Diseases of the Banana in Storage and Transport," by C. W. Wardlaw and L. P. McGuire. E.M.B. 36.

RICE.

Rice Research in Burma and Bengal.

Following discussion with Sir T. Vijayaraghavacharya, Vice-Chairman of the Indian Imperial Council of Agricultural Research, a scheme for the development of rice research in seven Provinces of India was prepared by the Council and submitted with a view to financial assistance from the Empire Marketing Fund. In view of financial stringency the Board were unable to recommend a grant to meet half the cost of the total scheme but they offered to meet half the cost of the Burma and Bengal parts of the scheme as being of more immediate interest to the Board. These sections were marked out for priority since Burma is the chief exporting territory and because Bengal exports Patna rice and the area under rice in that Province is about 50 per cent. greater than in any other Province. The Council accepted the Board's offer and, in addition to agreeing to meet the other half of the cost of the Burma and Bengal schemes, decided also that they would themselves meet the total expenditure on the schemes in the five remaining Provinces. The Board have suggested that efforts should be made to introduce and develop for the export market the best available exotic types rather than to concentrate merely on the improvement of indigenous types.

SUGAR.

Sugar Research in the West Indies.

In February, 1931, the Board approved grants for one year to Barbados and British Guiana to enable the Departments of Agriculture in those Colonies to continue their work on breeding improved varieties of sugar cane. Good work is being done in Barbados on the raising and selection of new sugar cane varieties on which approximately £12,000 per annum is being spent. The B.H.10 (12) variety cultivated in Barbados has, in one district, given as much as 90 tons of cane to the acre, the equivalent, in a modern factory, to a yield of 10 tons of sugar. Since 1925, the scientific development of sugar cane breeding has been systematised in Barbados and the methods and technique employed are now as advanced as those of any other cane breeding station in the world.

It may be mentioned here that the Empire Marketing Board are convening a Conference on sugar research in July next immediately following the Conference of Colonial Directors of Agriculture in London. The objects of the Conference will be to consider programmes of sugar research in the Empire, to promote co-operation and interchange of views and to examine the financial provision necessary for further development. Although the main business of the Conference will be concerned with questions of sugar research, the Board are arranging for the preparation of an economic survey of the sugar position.

TOBACCO.

Tobacco Research in Southern Rhodesia.

A block grant spread over a period of two years has been approved to assist the Government of Southern Rhodesia in the establishment of a Tobacco Research Station at Marandellas. There is urgent need for research in the growing and production of tobacco within the Empire, and the work to be undertaken at Marandellas will not be confined to Southern Rhodesian problems only, but will aim at securing results of

benefit to neighbouring countries, namely, Northern Rhodesia, Nyasaland and the Union of South Africa. Plant breeding and selection will be given first consideration and special attention will be directed to the problems of producing tobacco possessing the burning qualities, flavour, aroma, etc., required by tobacco markets.

TUNG OIL.

Tung Oil Production and Research.

A beginning has been made by the Research Association of British Paint, Colour and Varnish Manufacturers with the chemical part of the scheme for Empire development of tung oil. Considerable bulks of tung oil fruit from China and Florida have been examined for their chemical and physical properties. Crushing experiments have been carried out on these samples and a report furnished on the characteristics of the oils obtained. Small supplies of fruit from New South Wales, the Transvaal, India, Malaya and Hong Kong have been similarly treated. A detailed study of the gelation of tung oil under heat has been made as the first stage in the investigation of the properties and behaviour of the oil with a view to devising precise methods of scientific evaluation.

The results so far obtained are of distinct value to the complementary part of the scheme which aims at encouraging production, since they contribute to the elucidation of the various technical problems arising out of the Imperial development of tung tree cultivation.

A memorandum on Tung Oil Production in the Empire* prepared by the Imperial Institute with the co-operation of the Tung Oil Sub-Committee of its Advisory Committee on Oils and Oilseeds has been published by the Board during the past year.

FORESTRY AND FOREST PRODUCTS.

Forest Products Research Laboratory, Princes Risborough.

Last year's Report referred to the provision of funds by the Empire Marketing Board to enable the Forest Products Research Laboratory at Princes Risborough to include the testing of Empire timbers as one of its normal functions. The new laboratories built at the Board's charges to allow for the expansion and centralisation of the station were opened and occupied early in 1931. Various sections which were previously located at Oxford, London and elsewhere—*e.g.* mycology, wood technology and wood chemistry—have been moved to Princes Risborough.

The Board have agreed to continue their maintenance grant to the Laboratory in 1931-2 and the grant makes provision for a due expansion of the Utilisation Section designed to bring more effectively to the notice of the users of timber throughout this country the results of investigations of Empire timbers carried out by the Laboratory.

MECHANICAL TRANSPORT.

In last year's Report mention was made of the grant by the Empire Marketing Board towards the development of mechanical transport suitable for use in undeveloped parts of the Empire and the appointment of a Directing Committee and Council consisting of representatives of the various contributing oversea Governments and of the Board.

* "The Production of Tung Oil in the Empire." E.M.B. 31.

A unit to handle a useful load of about 15 tons carried by an eight-wheeled tractor and two eight-wheeled trailers is now nearing completion. By spreading the load over twelve axles it is possible to keep the laden axle weight considerably below that of the standard heavy lorry, thus minimising the wear caused to the road surface when running on earth roads and the weight imposed on culverts and short bridges.

Investigations are in progress with a view to producing a unit to handle a considerably heavier load than this over the same class of cheap earth roads. Whether the problem can be better solved by the use of caterpillar tracks or a multiplication of wheels is one of the principal points which will have to be determined. Tracked vehicles have up to date been costly to construct and maintain, and the experiments and investigations that have been carried out by this Committee have indicated that a solution of the problem of comparatively cheap maintenance has not yet been reached. It is clear that an answer must in the first place be found to this question by small scale experiments before the production of a large and expensive vehicle can be embarked upon. These experiments and tests are, therefore, being pursued.

The evolution of a Diesel engine thoroughly suited to motor transport requirements would assist greatly in reducing transport costs, especially in tropical areas at considerable distances from the sea. An engine running on heavy oil will cover a considerably greater distance per gallon of fuel than will even the highly developed petrol engine of to-day. Added to this advantage, there is no loss from evaporation when using heavy oils and no danger from fire. The Directing Committee are, therefore, keeping in close touch with all heavy oil development.

Considerable progress has been made during the last two years with regard to large section tyres and the Committee are carrying out experiments with tyres specially designed for soft and sandy surfaces.

A quarterly Bulletin is issued dealing with the construction and maintenance of cheap roads and containing details of the latest vehicles likely to be of interest to oversea officers engaged in transport, together with information regarding developments in heavy oil engines, tyres and other components. The need for a journal dealing with these subjects has been felt in many quarters, and the publication of this Bulletin has accordingly been widely welcomed. The first six numbers were issued for the confidential information of Government Departments, but owing to representations received from various quarters the Bulletin is now being issued as a public document and can be purchased.*

FISHERIES.

Cod Liver Oil Research.

The Report by Professor J. C. Drummond of London University and Professor T. P. Hilditch of Liverpool University on their investigations into variations in the vitamin content of Cod Liver Oils and on methods of manufacture and refinement has now been published by the Board.† The investigations carried out have demonstrated beyond doubt the unrivalled medicinal value of the cod liver oils produced

* "Oversea Mechanical Transport Bulletin." Issued quarterly by the Oversea Mechanical Transport Directing Committee, 2, Wood Street, Millbank, London, S.W.1. Price 1s.

† "The Relative Values of Cod Liver Oils from Various Sources." By J. C. Drummond and T. P. Hilditch. E.M.B. 35.

in Scotland and Newfoundland. This result, together with the improvement in technical quality which is being effected in Newfoundland, should go far to establish the position of cod liver oils from Empire sources.

Fishery Research in Newfoundland.

Last year it was reported that, following discussion with Sir Richard Squires, Prime Minister of Newfoundland, the Newfoundland Government and the Empire Marketing Board had provisionally agreed to finance a scheme of research directed to the economic development of Newfoundland fisheries and embracing work on the preservation, handling and marketing of fish (including brine freezing), the utilisation and marketing of surplus fish and fish by-products and a systematic and statistical review of fishery resources. In the first instance arrangements were made for Dr. Harold Thompson of the Fishery Board for Scotland to visit Newfoundland last summer to survey the position and prepare detailed plans and estimates. His full report and recommendations for a programme of research have now been accepted by the Government of Newfoundland and the Empire Marketing Board and the Board have ratified their conditional offer to finance the scheme of research on a pound for pound basis with the Government of Newfoundland. Dr. Harold Thompson has himself accepted the post of Director of Research and arrangements have been made for the scheme to be put into operation immediately. Premises have been obtained at Bay Bulls, about 18 miles from St. John's, for use as laboratories. Several Fishery Officers have been appointed; after preliminary training at the Fisheries Experimental Station at Halifax they are to collect biological material and statistics in the outports, and endeavour to improve, by means of demonstrations and advice, the methods of fish processing commonly in use.

The primary objects of the station will be to study the distribution and life-histories of Newfoundland's marine fauna, to act as a bureau for the dissemination of advice and information and for the forecasting of fish fluctuations, and to find improved and more economical methods of marketing fish and utilising by-products. It is proposed that attention should be focussed first, in view of the importance of the salt codfish industry, on the improvement of the cure, and secondly on efforts to market a larger proportion of Newfoundland fishery products in a canned, smoked, chilled or frozen state.

MISCELLANEOUS.

Comparative Trial of Geophysical Methods of Survey.

The Report of the Imperial Geophysical Experimental Survey, which was jointly financed by the Empire Marketing Board and the Commonwealth Government of Australia, will be published in July by the Cambridge University Press at 15/-.

Comparative Study of Methods of Soil Analysis.

At the request of the Imperial Bureau of Soil Science and the Executive Council for Imperial Agricultural Bureaux, the Board have approved a further grant to enable the University College of North Wales to continue for a second year a comparative study of methods of soil analysis. A large number of soils have yet to be examined and many aspects of the general problem remain to be considered. So far the work has proved the contention that the "International Method" is unsuitable for several Empire soils, but it indicates that with comparatively small alteration it may be made of use.

Research on Fluctuations in the Numbers of Wild Rodents.

The research work at the Department of Zoology and Comparative Anatomy, University of Oxford, which has been assisted by a grant from the Empire Marketing Fund, has been specially directed to the creation of a system of forecasting the periods of abundance and scarcity of various species of wild rodents. The co-operation of some 600 voluntary observers in the United Kingdom has been secured through whom data is collected about mice, rabbits, squirrels, etc. Parallel with this is conducted research along more intensive lines upon food, breeding, climatic influence, diseases, etc. Information from European countries is correlated and a large amount of information from Canada and the United States is handled at Oxford. Altogether information from some 1,500 observers is centralised at Oxford where it is mapped and put together for publication. This centralisation has made possible methods of co-ordination which would be otherwise impossible.

Economic Ornithology.

In June, 1930, a grant was approved to meet half the cost of a scheme of economic ornithology to be carried out under the direction of the Departments of Zoology and Agriculture at Oxford University.

While certain foreign countries have given much practical attention to the subject of economic ornithology very little has been done within the Empire. Two advantages of interest to the Empire Marketing Board may be expected to follow from the ornithological field work. First, the economic importance of birds to agriculture, as consumers of crops and of insect and other pests, will be systematically studied. Secondly, a number of young observers passing through the University on their way to appointments in the oversea Empire will be given some training in the methods of economic ornithology.

TRAVELLERS.

During the past year the Board have continued their policy of promoting visits to oversea countries of the Empire by experts from the Home Country and by representatives of oversea producers and others to this country. Mention has already been made of the visit of the Director of the Royal Botanic Gardens, Kew, to Africa, of Mr. Sampson to the Bahamas, and of Mr. Hatton, the Director of the East Malling Fruit Research Station, to Canada, Australia, New Zealand, Java and Ceylon. In addition Mr. F. A. Stockdale, Agricultural Adviser to the Secretary of State for the Colonies, has visited the East African territories, Seychelles, and Cyprus, and has presided at the Conference of East African Directors of Agriculture held in February last at Amani. Mr. R. E. Montgomery, Adviser on Animal Health to the Secretary of State for the Colonies, sailed on March 25th for a visit to British Guiana and certain of the West Indian Colonies. The cost of these tours by Mr. Stockdale and Mr. Montgomery will be met from the Colonial Agricultural Service Fund to which the Empire Marketing Board contribute. Dr. I. B. Pole Evans, Chief of the Division of Plant Industry in the Union of South Africa, has visited Bechuanaland to make a survey of pasture grasses and has accompanied General Smuts on a botanical visit to Southern and Northern Rhodesia. Mr. F. D. Odell, Deputy Director of Agriculture, Burma, has carried out an enquiry into the marketing of Burma rice with special reference to the reasons for the present market depression. His Report

will be published by the Indian Imperial Council of Agricultural Research. Mr. D. D. Brown, Southern Rhodesian Tobacco Expert, has visited the United Kingdom at the Board's charges to study problems connected with the marketing of Southern Rhodesian tobacco. In accordance with a Resolution of the Imperial Botanical Conference of 1924 that steps should be taken to promote the interchange of botanical workers in different parts of the Empire, the Board approved a grant to enable Mr. Dillon Weston of the School of Agriculture, Cambridge, to visit Canada to work at the Dominion Rust Research Laboratory at Winnipeg. At the same time arrangements were made for Mr. Craigie, of the Winnipeg Laboratory, to come to Cambridge. Mr. G. L. M. Cuthbert, General Manager of the South African Co-operative Deciduous Fruit Exchange, Ltd., has visited the United Kingdom and was able to study, in co-operation with the Board's officers, the marketing of peaches, pears, plums and grapes. Dr. H. H. Allan, Economic Botanist of the Plant Research Station, Palmerston North, New Zealand, was enabled to attend the International Botanical Congress held in this country and to carry out research for a short period at Kew. Dr. C. W. Wardlaw, the Pathologist attached to the Banana Research scheme in Trinidad, and Dr. L. P. McGuire, the Physiologist, have both visited this country. Sir Edward Davson, a member of the Board, has visited the West Indies and discussed in particular questions of sugar research with officers of the Departments of Agriculture, while Mr. Lloyd, the Board's Assistant Secretary, has been to Canada and the United States where he established fruitful contacts and made a special study of marketing organisation and intelligence.

II. ECONOMIC INVESTIGATION AND MARKET INTELLIGENCE.

MARKETING OF HOME AGRICULTURAL PRODUCE.

(a) *Standardisation.*

The standardisation work carried out by the Ministry of Agriculture and Fisheries on behalf of home agricultural produce, with the aid of the grant made in 1926 of £40,000 a year for five years, has been continued and developed and has now reached the stage where appreciable results are apparent.

The programme is one of logical development. Each commodity is submitted to thorough investigation, which is followed by the practical demonstration of reforms and, finally, by the application of the reforms to normal trading operations.

Investigations.—The results of the investigations are published in the Economic Series of Reports, which have now reached a total of 25 volumes with sales up to 31st December, 1930, exceeding 86,000 copies. During the past year, two new reports have been issued dealing, respectively, with the Marketing of Cheese and the Preparation of Fruit for Market. Further reports on the sugar beet industry and the marketing of honey and beeswax will be issued shortly, while others in preparation deal with the marketing of vegetables, of sheep, mutton and lamb, of hides and skins, of veal, and of butter and cream.

Demonstration.—Practical demonstrations of the principles of standardisation as applied to commodities already brought under the National Mark, as well as to certain commodities to which the National Mark could appropriately be applied, were staged at nine of the principal agricultural shows during the summer of 1930. Similar displays were arranged at a number of other shows and exhibitions during the year, including the World's Poultry Congress and the Imperial Fruit Show.

Application.—The National Mark scheme, which rests on the legislative basis afforded by the Agricultural Produce (Grading and Marking) Act, 1928, is the method by which the standardisation of home agricultural produce in terms of grade and, where relevant, pack and package, is being voluntarily applied to commercial practice. Encouraging progress has been made. The National Mark is now becoming widely recognised both among the distributive trades and the general public as the sign of home produce of dependable quality. During the year, new commodity schemes have been introduced as follows :—

<i>Commodity.</i>	<i>Date of Introduction.</i>
Strawberries	19th May, 1930.
Dressed Poultry	2nd June, 1930.
Canned fruits, peas and beans	4th June, 1930.
Cherries	18th July, 1930.
Cider	23rd March, 1931.

Over 500,000 of the small commodity marketing leaflets—dealing mainly with the various schemes—have been distributed.

Results.—A few results may be given as illustrations of the dimensions which some of the schemes have already attained.

Over 244 million eggs were handled by National Mark packing stations during the year.

The output of National Mark canned fruits, peas and beans reached the total of 17,000,000 cans, being over 50 per cent. of the total output of canned fruits and vegetables in England and Wales. The demand has been such that the leading canners have made arrangements for a big extension of their activities during the 1931 season.

251,740 sides of beef (home-killed and Scotch-killed) were graded and marked for the London market alone. In London, National Mark beef is now on sale in over 1,500 butchers' shops and the scheme is firmly established. Though, owing to local difficulties, the Scheme received a setback in Birmingham in the summer of 1930, the ground lost has since been recovered. Following the recommendation of an Inter-Departmental Committee, the Beef Grading Scheme was extended on 26th January, 1931, to Leeds, Bradford and Halifax, with encouraging results.

Schemes for applying the National Mark to honey, cheese and mutton are under consideration.

(b) *Publicity.*

As a matter of administrative convenience arrangements were made in April, 1930, for passing through the Empire Marketing Fund a special supplementary grant of £55,000, made by His Majesty's Government for foreground publicity on behalf of the National Mark. The principal objects of expenditure were :—

National Mark Weeks in some 18 provincial towns, at which displays of National Mark products were staged at local exhibitions, or shop premises hired for the purpose ;

Press advertising in national, provincial and trade newspapers ;

Advertisements on London omnibuses, and on hoardings, trams, and vans in certain other cities and towns ;

Display material for issue to traders stocking National Mark products ;

Circular letters to over 150,000 housewives in certain areas of London and Birmingham ;

Publicity booklets and leaflets of which over 4,000,000 were distributed ;

Lectures, films and cookery competitions.

(c) Organisation.

With the aid of a special grant of £12,000 a year for three years, made in 1929, investigations have been instituted into the problems and methods of marketing organisation at home and abroad. These, so far, have had special reference to potatoes and wool and will, in due course, be the subject of reports in the Economic Series. Over 45,000 leaflets dealing with particular aspects of the organisation of marketing have been distributed.

(d) Miscellaneous.

Sub-grants have been made by the Ministry to certain University Departments of Agriculture, Agricultural Colleges and to co-operative and other commercial organisations to enable them to conduct various marketing investigations or experiments, or to serve as demonstration centres.

SCOTLAND.

Including a special sum of £7,500 provided by His Majesty's Government for foreground publicity, which was passed through the Empire Marketing Fund as a matter of administrative convenience, grants amounting to £14,700 were made available to the Department of Agriculture for Scotland. These were devoted to services in respect of egg and tomato marketing, beef grading, Scottish National Mark labels, exhibits of Scottish National Mark and other home produce, economic enquiries, publicity for Scottish National Mark products, and other activities. For the financial year 1931, a grant of £12,500, which includes £4,000 for foreground publicity purposes, has been approved.

The Scottish National Mark has now been applied to the following products :—Eggs, tomatoes, ware potatoes, malt products and beef. The scheme for beef is still an experimental one.

The number of registered packers of eggs now operating is 33. Since the beginning of the scheme, 81,925 National Mark labels have been issued, representing approximately a quantity of 1,942 thousand dozens of graded and tested eggs produced in Scotland.

Twenty-four firms have been approved as registered packers of Scottish National Mark tomatoes, and to date 13,850 labels, representing about 74 tons of tomatoes, have been issued to them.

Thirty-four potato growers and merchants are authorised under the National Mark scheme for ware potatoes and 34,500 labels have been issued.

The number of manufacturing firms authorised as packers of malt extracts and malt flours manufactured wholly from Scottish home-grown barley is the same as in 1929, viz. twelve.

The experimental scheme for the grading and marking of Scottish-killed beef which was begun in October, 1929, was continued throughout 1930. During the year, the scheme which was originally confined to certain districts of Aberdeenshire and Banffshire was extended to other districts in these counties and also to certain parts of Moray. The number of butchers and dealers taking advantage of the scheme in 1930 was 187. During the year 126,197 sides of beef were graded and marked, representing an average of 2,427 sides per week. From the evidence before the Scottish Department it appears that the scheme has been instrumental in stabilising the prices of the better grades of live cattle in those districts where the scheme operates.

During the year the Department organised displays of representative Scottish agricultural and other produce at exhibitions and shows recognised by the Board in England and Scotland and, also, at a number of the more important agricultural shows in Scotland.

At the International Grocers' Exhibition in London in September, 1930, and at the British Industries Fair at Olympia in February, 1931, the Department's displays comprised a very complete reproduction of Scottish products and occupied a whole stand. It was reported to the Department that as a result of these displays numerous enquiries leading to business were received from a number of wholesale firms. Several retail traders also intimated that in consequence of these exhibitions they were now stocking Scottish products and finding an increasing demand for them.

The monies specially provided by His Majesty's Government for foreground publicity, which were passed through the Empire Marketing Fund as indicated above, enabled the Department to organise a special publicity service for Scottish National Mark products. The service was provided by means of a demonstration motor-van which toured in certain counties during August and September, 1930, and through the distribution of display material and literature. A special campaign on behalf of Scottish National Mark eggs was conducted in Glasgow through press advertising, window displays and the issue of letters to householders. In addition a contribution was made towards the cost of advertising National Mark beef in London.

The additional funds made available by the Board for the year 1931 will ensure the continuance of the Department's activities in connection with the marketing of home agricultural produce.

The economic investigations into the marketing of livestock and potatoes have reached an advanced stage and the preparation of reports is about to be put in hand. Enquiries into the marketing of grain and grass seeds are to be undertaken in 1931-32.

Further progress has been made with the scheme of investigations into the improvement of pork and bacon production in Scotland which is being carried out by the Scottish Department with the aid of a grant from the Empire Marketing Fund.

NORTHERN IRELAND.

Two grants have been made from the Board's Fund to the Government of Northern Ireland. The first, of £900 per annum for three years, is being devoted to investigations into the Marketing of Northern Ireland Agricultural produce. This enquiry has now been in progress for some two and a half years. In the initial stages of the work a number of specific enquiries were carried out regarding the marketing of certain agricultural commodities. Later, however, the principal direction of the enquiry has been in connection with a survey of the general marketing organisation for farm produce. A survey of markets in Northern Ireland was undertaken and special attention has been directed to the development of alternative channels for the disposal of produce otherwise than through a country market. During the past year the work has dealt mainly with the marketing of live stock. Field work has been very largely completed and, at present, the data which has been collected is undergoing analysis preparatory to the issue of a report upon the whole field covered by the enquiry.

The second grant of £600 per annum for three years is in connection with the economics of small holdings, and half the cost of this enquiry is being defrayed by the Government of Northern Ireland. Financial records are being kept of about sixty farms. The survey method has, also, been employed to obtain data on the economic position of small farms, 15 to 30 acres in size, from which, in the main, it has not hitherto been found possible to obtain satisfactory financial accounts. A report upon a survey of a group of small farms of this character is at present in the press.

A REGIONAL "SALES DRIVE."

The objects of the Board's campaign to increase the sales of Empire butters from home and oversea in Lancashire are discussed on page 10. The following table shows the results of this campaign in Statistical form :—

Town.	No. of shops covered by calls.	No. already selling Empire Butters.	No. not selling Empire Butter.	Promises to order by shops in Col. (4).	No. of promises fulfilled before revisit.	Total No. stocking Empire Butter on revisit.
Manchester ..	2,041	1,164=57%	877=43%	629	503	1,667=84.4%
Stockport ..	538	227=42.2%	311=57.8%	218	162	389=72.3%
Wigan ..	384	187=48.7%	197=51.3%	146	124	311=81%
Warrington ..	234	94=40.2%	140=59.9%	113	91	185=79%
Chorley ..	181	86=47.5%	95=52.5%	58	46	130=72.9%
Bolton ..	913	314=34.4%	599=65.6%	431	343	659=72%
Oldham ..	890	316=35.5%	574=64.5%	301	262	578=65%
Bury ..	194	65=33.5%	129=66.5%	80	51	116=60%
Rochdale ..	538	220=40.9%	318=59.1%	198	135	355=66%
Blackburn ..	707	267=37.8%	440=62.2%	263	246	513=72.6%

MARKET INTELLIGENCE.

(a) *Fresh Fruit.*

Weekly Fruit Intelligence Notes.—The first intelligence service to be established by the Board was that for fresh fruit. The Imperial Economic Committee in its third

report recommended that such a service should be started by the Board and, although the Committee's recommendation related only to the provision of information to the producers in the various parts of the Empire, the Board early recognised that the cause of orderly marketing of Empire fruit in the United Kingdom would be definitely advanced if similar information regarding the movement of fruit to this country were to be made available to importers and distributors.

The "Weekly Fruit Intelligence Notes," have, therefore, ever since they began, been circulated alike among Empire producers and fruit traders. The scope of the service has been substantially enlarged, and an organisation has been built up through which both producers and traders are kept constantly informed of the supply position in regard to practically all fruits and a number of the more important vegetable crops.

The information given in the "Weekly Fruit Intelligence Notes" covers a wide range. The immediate supply position is indicated by weekly imports of each kind of fruit into the 25 chief ports in Great Britain, and by statements of arrivals and prospective arrivals based upon complete lists of fruit cargoes afloat to the United Kingdom. Crop reports and prospects in Empire and foreign fruit-growing countries give an indication of the probabilities of the supply position a few months ahead, and particularly the intensity of the competition which Empire growers are likely to experience in the British and Continental fruit markets. These crop reports are supplemented by special reviews in which the available information is summarised and provisional estimates are made as to the coming season's supplies of the various fruits. Finally, the market possibilities over an even longer period are dealt with by showing the trend of production in fruit-growing countries, and the development of imports into consuming countries.

Prices at Auction Markets in the Netherlands.—During the summer of 1930, special arrangements were made to obtain daily telegrams giving the prices ruling for soft fruits at the leading markets in the Netherlands. This service was introduced primarily for the benefit of the home fruit-grower, whose position as a seller was weakened by lack of information as to the prices that were being paid to his competitors on the Continent. The prices received were distributed by wire and mail to fruit-growers' organisations, so that growers could receive, either on the same evening or on the following morning, an indication of the prices ruling at the morning sales in Holland. A similar service was instituted in respect of tomatoes and cucumbers.

Annual Supplement.—In response to a number of requests that the special articles appearing in the "Weekly Fruit Intelligence Notes" should be made available in more convenient form for permanent record, a supplement to the Notes has recently been issued, reprinting certain of these articles, and also including statistics of annual imports of each kind of fruit.*

(b) *Dairy Produce.*

Weekly Dairy Produce Notes.—The Imperial Economic Committee in its fourth report, on Dairy Produce, recommended that an intelligence service similar to that previously recommended for fruit, should be started by the Board for Dairy Produce. It was not until May, 1929, however, that it was found possible to issue the first number

* "Fruit Supplies in 1930." E.M.B. 38.

of "Weekly Dairy Produce Notes." These Notes closely resemble the "Fruit Notes" in general form and in their subject matter, and as in the case of "Fruit Notes" they are distributed both to producers and to traders.

Pig Products.—The Imperial Economic Committee, in its twelfth report, recommended that similar weekly intelligence should be undertaken for pigs and pig products. The Board felt that in view of the close relationship between dairy and pig products, over both production and distribution, the Committee's recommendation could best be met by extending the scope of the existing "Weekly Dairy Produce Notes." Accordingly, from April, 1930, the "Weekly Dairy Produce Notes" have included information about pigs and pig products on similar lines to that already given in respect of butter, cheese, condensed milk, poultry and eggs.

Stocks in Cold Storage.—The Board, with the approval of the provision trade and the co-operation of the proprietors of cold stores, were able to begin, in December, 1929, the collection of figures of quantities of butter held in cold storage, on a national basis. The aggregate figures are published in the "Weekly Dairy Produce Notes."

The figures are furnished, voluntarily, at fortnightly intervals by proprietors of cold stores and, although one or two firms continue to withhold information as to stocks, the aggregate figures secured are believed to represent fully 95 per cent. of the butter held in cold storage in the country. They are thus sufficiently complete to enable reasonably accurate calculations to be made, with the help of the figures of weekly imports published in "Weekly Dairy Produce Notes", of the movement of imported butter into consumption throughout the year. Moreover, as separate figures are obtained for box and cask butters, it is possible to measure the changes in relative consumption of the former, coming mainly from Australia and New Zealand, and the latter which is imported chiefly from Denmark and other European countries. It is interesting to note that the figures of stocks and imports indicate that the consumption of imported butter during the twenty weeks ended May 16th has averaged 135,000 cwt. per week, whereas in the corresponding period in 1930 consumption averaged only 118,500 cwt. per week, an increase of 14 per cent. The bulk of the increase has been in box butter imported from Australia and New Zealand.

(c) *Dried and Canned Fruit.*

The Board's intelligence service in connection with dried fruits has followed somewhat different lines from the fresh fruit and dairy produce services. The dried fruit service was started at the suggestion of the London Agency of the Australian Dried Fruit Board, which were anxious to obtain more adequate information as to the relative progress being made in the consumption of Empire and foreign dried vine fruits respectively and the probable course of future prices. The keynote of the service consists in the weekly figures of sales of Australian sultanas and currants, and the circulation of the Notes is strictly limited. The Commonwealth Dried Fruit Board in their Sixth Report dated July 1930 expressed their appreciation of the Board's intelligence service.

A weekly intelligence service for canned fruits has, recently, been instituted at the suggestion of the London Agency of the Australian Canned Fruit Board. The first number of this service was issued in May of this year following meetings of an advisory committee of representatives of both producers and traders. At the same

time this service includes particulars about the dried fruit trade so far as this concerns dried fruits which compete with canned fruits. It is expected that in course of time the service will be made as complete as those for fresh fruit, dairy products and pig products.

The periodical survey of the statistical position of dried vine fruits is being continued for the use of the Empire dried fruit producers' organisations.

WORLD SURVEYS OF PRODUCTION AND TRADE.

The preparation of statistical surveys of world production and trade in certain agricultural products arose out of definite requests received from producers in the Empire for advice as to the probable future balance of supply and demand in respect of particular crops. The first such survey, on Oranges (E.M.B. 15), was issued in April 1929 and the second, on Cocoa (E.M.B. 27), in May 1930. All the available data are assembled in these surveys as to the trend of production and consumption; where possible, estimates are made as to the probable trend of future production and such conclusions as may legitimately be made as to the future possibilities of the industry are set out.

During the past year further surveys have been undertaken for beef and wool, the latter with the assistance of a small advisory sub-committee. The survey on beef is now almost completed, and the first part of the wool survey is also nearing completion. A short preliminary survey on copra and competitive products has been compiled for distribution to Empire producers of oilseeds and nuts.

FURTHER DEVELOPMENT OF MARKET INTELLIGENCE AND WORLD SURVEYS.

The favourable response which had attended the Board's efforts to provide timely crop and market information and long range surveys of the trend of production and consumption, led the Board to consider, during the past year, whether some further development of this class of information might not be desirable in the interests of Empire producers. Miscellaneous information about developments in production in competing countries has been circulated among Empire producers as it came to the Board, but neither the collection nor the distribution of such information has been on a systematic basis. Moreover, the very existence of an Intelligence Branch of the Board, publishing regularly crop and market intelligence about fruit and dairy produce, has resulted in an increasing number of requests from producers and traders for additional information regarding these and other products. Similarly, the publication of world surveys has led to numerous enquiries for corresponding information in regard to other commodities.

The Imperial Conference recommended in November last that the Board's work in the spheres of crop and market intelligence and world statistical surveys should be extended, and replies to enquiries addressed to the Colonial Governments have given evidence of the value to the British Colonies of these aspects of the Board's work, together with a number of suggestions for additional commodities for which intelligence services and world surveys would be welcomed by Empire producers.

Upon the recommendation of the Board's Agricultural Economics Committee, work has been begun upon world surveys relating to oilseeds and vegetable oils, and mutton and lamb.

TRADE AND PRODUCTION IN EMPIRE COUNTRIES.

In view of the increasing number of applications received by the Board from teachers, students and the general public for statistical information relating to production and trade in the various countries of the British Empire, the preparation of a series of statistical memoranda was begun in the second half of 1930. These memoranda fall within clearly defined limits, the statistics included relating to area and population, production and external trade. The tables are so arranged as to indicate, quickly and simply, the chief products of the country and the development of production over an extensive period; the country's exports and imports, in order of importance, with an indication of the chief destinations of the exports and sources of the imports; and the growth of external trade in the main items of export or import over a period of years.

The series will be completed in about 28 parts, of which 15 have already been issued, and the rest are in various stages of preparation. Lecturers, teachers, students and the general public have expressed their appreciation of these tables, and the Board hope to be able to revise them as more recent statistics become available. For those who require additional or more detailed information, a list of original sources and other official publications is included.

RETAIL SURVEYS.

The Board have fully appreciated the need for research into market requirements and consumers' demands. The results of the Board's earlier enquiries (described in previous reports) amply confirmed the value of this line of investigation and pointed to the importance of further study as a means of assisting producers and their representatives in the development of their selling and advertising policies.

Members of the wholesale and retail distributive trades willingly assisted by supplying the information requested and the various trade associations actively co-operated in the enquiries. It is generally agreed that the surveys have yielded a large amount of exact, uniform data which had not hitherto been available, and numerous requests for further and more comprehensive investigations of the kind have been received.

It was felt that the full value of the method could only be realised if simultaneous enquiries were made in different areas and a survey of the retail marketing of butter was, accordingly, undertaken on a national scale. The Ministry of Agriculture for Northern Ireland co-operated with the Board in extending the survey to cover Belfast. Nearly 6,000 records from retailers in different parts of the country were obtained by personal interview, and information was also secured from the headquarters of multiple organisations and from members of the wholesale trade. Problems of local preferences, competitive supplies and trends of consumption were investigated. A special study was also made of distribution in relation to seasonal supply and ports of entry. The information revealed by this survey (E.M.B. 34) has thrown fresh light on different phases of marketing policy and has served as a practical guide to the Board in the selection of areas for special canvass and local propaganda.

In the report of a similar investigation on canned fruits (E.M.B. 37), which has recently been published, regional preferences for different fruits are discussed, specific recommendations to producers are made in regard to size of containers and methods of grading, and the scope of the enquiry was widened to include a comparative study of the systems of marketing adopted by various countries.

A later report, "Changes in the Demand for Butter" (E.M.B. 39), demonstrates a further application of this type of enquiry. The large increase in the total supply of imported butter during 1930 and the heavy fall in wholesale prices made it apparent that very considerable changes in consumption and in the demand for different kinds of butter must have resulted. It was, accordingly, decided to undertake a special study, and, as a survey in certain Midland towns had been made in November 1928, the same shops were again visited in November 1930, and comparable information secured. The results of this enquiry showed an increase in the average weekly sales of butter in the area of about 12 per cent., but the most striking feature was in the case of New Zealand butter, the consumption of which had more than doubled over the two-year period.

Further "repeat" surveys of this kind will be undertaken from time to time for certain commodities. The Board have already made considerable use of this type of investigation in assessing the results of its local propaganda campaigns.

In general, the retail surveys have served to demonstrate a method of investigation which is capable of extension to a wide range of commodities and which can be developed in scope and application according to special conditions. The practical value of the enquiries to producers, in assisting them to adjust production and marketing methods to existing conditions and to anticipate changes in demand, has been fully proved by experience.

Plans for other surveys are under consideration, including an extended enquiry into the demand for deciduous fruits to be undertaken in co-operation with the South African Deciduous Fruit Exchange.

WASTAGE IN IMPORTED FRUIT.

The rapid expansion of the fruit trade within comparatively recent years is to a large extent directly attributable to the use of refrigeration, which has extended the storage life of fruit and made possible its shipment over long distances. On account of the perishable nature of the product, however, considerable losses from wastage are still incurred, and intensive research into preventive measures has for some time been in progress at experimental stations in the main producing countries. The work already accomplished has revealed the complexity of the underlying problems and it is evident that cultural, harvesting, storage and marketing procedure must all be adjusted to a narrow range of conditions if fruit of satisfactory quality is to be produced and delivered to the consumer with a minimum of loss.

The Board have given grants (*see* page 58) to assist these basic investigations, both at home and overseas. As a supplement to this work, a systematic survey was begun early in 1927 with the object of ascertaining the nature, extent and incidence of wastage in imported Empire fruit. Exact quantitative data as to existing conditions have in this way been secured and fields for future research defined. Special attention was directed towards methods of control of wastage under commercial conditions, and in certain cases experimental shipments to test specific methods were arranged in co-operation with scientific departments overseas. Throughout the survey, close contact was maintained with the officers of the Cambridge Low Temperature Research Station of the Food Investigation Board.

In the course of the survey, cargoes of fruit were examined at all the principal ports, but the greater part of the work was concentrated at London and Liverpool. Information was also obtained on the post-shipment development of wastage by the re-examination of selected samples, and, more recently, the experiment has been tried of inserting cards in boxes of fruit for return by retailers with particulars of the wastage found.

A report has been published on Canadian Apples (E.M.B.30) while similar reports on Australian and New Zealand Apples and on Palestine Oranges are in preparation. Interim reports were also prepared, from time to time, during the course of the survey. These publications have been extensively quoted in various scientific papers, and appropriate extracts were reprinted in the Report of the recent Royal Commission on the Nova Scotian apple industry.

Work in this field could not have been efficiently conducted without the active co-operation of Oversea Dominion representatives in the United Kingdom, of the Departments of Agriculture concerned and of the port authorities, shipping companies and members of the fruit trades.

EXPERIMENTAL CONSIGNMENTS AND MARKET ENQUIRIES.

Mention has been made in earlier reports of the Board's co-operation with overseas Governments in arranging experimental consignments. These experiments are designed to test the possibility of developing a trade in commodities not previously exported and have covered a wide range of foodstuffs. Many have been concerned with highly perishable articles, such as fruit, and experiments extending over several seasons have in some instances been necessary in order to compare different methods of harvesting, packing and transport. On arrival, the consignments are examined by the Board's officers and observations are taken on such points as condition, method of packing, and grading. Selected samples are retained under observation in the laboratory. Other samples are submitted to members of the wholesale and retail trades for technical opinion. Reports on the consignments include particulars of competitive supplies, while suggestions have frequently been made for further experiments to test specific factors. A number of reports of more general interest have been published in a special series and have been reprinted in various overseas journals.

Commodities which have been tested by these methods include oranges, grapes, apricots, pomegranates, mangosteens, water-melons, figs, cashew nuts, almonds and carob syrup.

A large number of enquiries into the market prospects for various commodities have again been made at the request of overseas Governments and producers. The reports have included information on market requirements in regard to quality, grading and packing, wholesale and retail prices and the extent and nature of competitive supplies. Recent enquiries of this type have covered canned tomato products, canned vegetables, maize preparations, fresh pineapples and citrons preserved in brine.

A report on the demand for citrus fruit juice was prepared after a comprehensive enquiry in conjunction with the South African Trade Commissioner's Department. This report was distributed in South Africa and other countries interested and was reprinted in the trade press.

III. PUBLICITY.*

1. NEWSPAPER ADVERTISEMENTS.

The following advertisements were inserted during the year in a wide range of newspapers circulating throughout the United Kingdom.

A series of five reasons "Why we should buy from the Empire" :—

1. "The Empire stands for Peace."
2. "Men will Talk but Women must Act."
3. "Housekeeping on £1,000 a Minute."
4. "Why is the Empire our best Customer."
5. "Fair Labour Conditions."

Attention was also drawn in a special series of advertisements to the following commodities :—

1. Australian and New Zealand Butter.
2. Home National Mark Products.
3. Irish Free State Dairy Products.
4. South African Oranges.
5. Indian Rice.
6. Canadian Apples

Advertisements were inserted in the local press in connection with Exhibitions and Empire shopping weeks in which the Board assisted in a large number of localities and also in connection with the Board's Empire Butter Campaign in the North of England and the Board's Shops at Glasgow and Birmingham.

2. POSTERS.

(a) *Displays on the Board's own Poster Frames.*

Seventeen sets of posters were displayed during the year on the 1,750 poster frames which the Board have erected in some 450 towns in the United Kingdom. The sets displayed were as follows :—

- Interchange of Trade between New Zealand and the United Kingdom.
- Interchange of Trade between Canada and the United Kingdom.
- Home Fruit and Vegetables.
- Home National Mark Products (letterpress).
- Australian Dried Fruits.
- Interchange of Trade between South Africa and the United Kingdom.
- Interchange of Trade between the Irish Free State and the United Kingdom.
- Builders of Empire.
- Flags of Empire.
- Interchange of Trade between Australia and the United Kingdom.
- A medley of various sets that had been displayed previously.
- East African Development.
- Milestones of Empire Trade.
- British Industries Fair (letterpress).
- Empire Communications.
- "The Empire can supply your every need" (letterpress).
- Agricultural Maps of Canada and Australia.

* Provision was made in the estimates for 1929-30 for an expenditure on publicity of £213,000.

(b) *Displays on the Commercial Hoardings.*

The Board made displays on the commercial hoardings in the Birmingham area in connection with the Birmingham Empire Shop.

(c) *Poster Reproductions for Schools.*

Reproductions of eleven of the Board's posters were issued to approximately 22,000 schools in the United Kingdom.

(d) *Shop Display Material.*

Sixteen new bills, cards and window strips were designed and issued for display in shops to advertise various Empire products. Reprints of many earlier designs were also issued.

(e) *Contract Posters.*

Approximately 5,000 copies and 20,000 reproductions of contract posters were issued for display in the factories of firms in receipt of orders from the Empire overseas.

3. LEAFLETS.

New leaflets were issued on the subjects of :—

Newfoundland Salmon.

Five reasons why we should buy from the Empire.

Reprints were issued of the leaflets on :—

St. Vincent Arrowroot.

British Deep Sea Fish.

New Zealand Apples.

East African Coffee.

Australian Dried Fruits.

Indian Rice.

Fruits and Vegetables of the Empire.

Empire Recipes for Economical Meals.

New leaflets to accompany the school reproductions of posters were prepared on the following subjects :—

Farming in the Irish Free State.

Farming in Northern Ireland.

Farming in England and Wales.

Farming in Scotland.

Forests of British Columbia.

British Columbian Salmon.

Australian Dairy Farming.

Australian Dried Fruits.

Jaffa Oranges, and

British West Indies.

In all, approximately two million leaflets were distributed in the year.

4. LECTURES.

At the beginning of the year the Board's original lecture scheme, which had been in operation for three years, was considerably modified ; the subsidy in aid of general Empire lectures was discontinued and lecturing work was concentrated in a small panel of about twenty selected speakers all dealing directly with the subject of Empire Marketing. In all 768 lectures were organised by the Board during the year and the audiences, mainly Women's Organisations and Trade Associations, totalled over 60,000.

5. BROADCASTING.

The series of morning talks to housewives, noted in the Board's last Report as having begun in February, 1930, continued until the middle of June. More than 20,000 individual applications for leaflets dealing with the commodities which were the subjects of these talks were received by the Board.

Between September and December an evening series of seven talks on various Empire products was arranged by the Board, the speakers in each case being actual producers of the commodities in question.

A new series of Tuesday morning talks to housewives was begun in January, 1931, and is still in operation.

6. EXHIBITIONS AND SHOPPING WEEKS.

A.—The Board participated in the following Exhibitions :—

Date.

1930.

- 29 April—8 May.—Manchester Grocers' Exhibition.
- 12—17 May.—Belfast Empire Exhibition.
- 14—24 May.—Nottingham Grocers' Exhibition.
- 2—5 July.—Aldershot Command and District Horse Show.
- 4—10 July.—Colchester Empire Carnival and Exhibition.
- 22—30 July.—World's Poultry Congress.
- 6—12 September.—Bakers' and Confectioners' Exhibition.
- 20—26 September.—International Grocers' Exhibition.
- 24 October—1 November.—Imperial Fruit Show.

1931.

- 16—27 February.—British Industries Fair and British Cotton Textile Exhibitions.
- 11—21 March.—Plymouth Grocers' Exhibition.

B.—The Board assisted in Empire Shopping Weeks in the following centres :—

Mexborough	Caerphilly
Ipswich.	Nelson (Lancs).
Battersea.	Northampton.
Belfast.	Armagh.
Newtownstewart.	Ballygawley.
Chingford.	Ballymoney.
Clapham.	Banbridge.
Maidenhead.	Limavady.
Tunbridge Wells.	Staines.
Hythe.	Glynneath and Cwmgwrach.
Southend.	Lisburn.
Berkhamsted.	Ballycastle.
Aberdare.	Coleraine.
Epping.	Woodhall Spa.
Newtownards.	Retford.
Castlederg.	Islington.
Clogher.	Ashby-de-la-Zouch.
Fivemiletown.	Bangor.
Cookstown.	Witham.
Ballymena.	Abertillery.
Portadown.	Plymouth.
Portrush.	Consett.
Neath.	Gillingham.
Thorne.	Londonderry.
Welwyn Garden City.	Ebbw Vale.
Rathfriland.	Halstead.
Enniskillen.	Nuneaton.
Omagh.	Guildford.
Colchester.	Newcastle-on-Tyne.
Magherafelt.	Bromley (Kent).
Dungannon.	Harwich.
Bexleyheath.	Porth.
Lurgan.	

C.—The Board have again acquired the lease of a shop, this time in Birmingham, where displays on the lines of those made in Glasgow are being made during the six months ending June 13th, 1931.

7. TRADE MEETINGS.

Members of the Trade Branch have addressed meetings of Business Men, Distributive Traders and Producers at the undermentioned places during the last twelve months :—

Glasgow, Birmingham, Colwyn Bay, Belfast, Edinburgh, Chelsea, Plymouth, Pitlochry, Newcastle-upon-Tyne, Liverpool, Islington, Clapham, Kensington, Bristol, Port Talbot, Hull, Oxted, Manchester, Hendon, Northampton, Middlesbrough, Walsall, Wisbech, Portsmouth, Caerphilly, Nottingham, Harwich, Rochester, Reading, Blackwood, Abertillery, Lewes, Merthyr, Southall, Thrapston, Southend, Uckfield, Mexborough, Newport (Mon.), Nelson (Lancs).

8. CINEMA.*

The Imperial Conference adopted the following Resolution† :—

“ The Conference, recognising the value of films for propaganda purposes, whether direct or indirect, in connection with inter-Imperial trade, as well as for other purposes, and realising that the present period is one of rapid development and, therefore, of great opportunity, recommends that attention should be devoted to establishing and maintaining contact between the different parts of the Empire in relation to film production with a view to the sharing of experience and the promotion of the production of such films as will best serve the interests of the several parts of the Commonwealth.”

The Board's Film Officer visited Canada early in 1931 and established valuable personal contacts with the officers of the Canadian and Ontario Government Motion Picture Bureaux. He was received with the greatest cordiality and, as a result of his visit, co-operation between the Board and the Canadian authorities in the field of cinema has become a working reality.

A.—*Films produced under the Board's supervision and released for commercial distribution.*

One Family—synchronised. A film on the theme of the King's Christmas pudding, illustrating the food products supplied by Empire producers at Home and Overseas

A Southern April—synchronised. A film illustrating the South African fruit industry.

B.—*Films prepared for School and other non-theatrical circulation.*

(a) Three reel film :—

Conquest—illustrating the exploration and development of the Canadian Prairies.

(b) One reel films :—

Home Agriculture (Humorous cartoon film).

The Cranes of London.

Floating Steel.

Snows of the Prairie.

A series of Empire News Journals.

(c) A series of short (2-300 ft.) advertising films on the following subjects :—

English National Mark Eggs.

English National Mark Canned Fruits.

Scottish National Mark Eggs.

Scottish National Mark Tomatoes.

South African Fruit.

South African Grapes.

New Zealand Lamb.

New Zealand Butter.

Indian Tea.

Australian Wool.

Australian Peach Growing and Canning.

* The films produced by the Board and referred to in the last Report have continued in active use.

† “ Imperial Conference, 1930, Summary of Proceedings ” Cmd. 3717, Page 77.

C.—*Cinema displays to the Public and to Schools.*

(a) *Automatic Daylight Cinemas at Exhibitions.*—The Board have made considerable use of automatic daylight cinema projectors as central features of their displays at Exhibitions. Specially prepared short advertising films have been displayed by the projectors.

(b) *Empire Marketing Board Cinema at the Imperial Institute.*—The Board have continued the grant to the Imperial Institute for the maintenance of a cinema in which Empire films are shown daily. During the year 357,000 persons visited the cinema, including 78,000 school-children in organised parties. These figures represent an increase of 23 per cent. over the previous year, and bring the total attendance since the opening of the Cinema in 1927 to over 1,477,000 persons.

(c) *Loan of Films.*—The Board's Library of films, compiled from its own and other Empire production sources, has been maintained for school and other types of non-theatrical display and has been considerably extended.

APPENDIX I.

(1) THE EMPIRE MARKETING BOARD.

The Secretary of State for Dominion Affairs.

(The Rt. Hon. J. H. THOMAS, M.P.) (*Chairman*).

The Parliamentary Under-Secretary of State for Dominion Affairs.

(Mr. W. LUNN, M.P.) (*Vice-Chairman*).

The Financial Secretary to the Treasury.

(Mr. F. W. PETHICK-LAWRENCE, M.P.)

The Parliamentary Secretary to the Ministry of Agriculture and Fisheries.

(The Rt. Hon. the EARL DE LA WARR.)

The Lord Privy Seal.

(The Rt. Hon. T. JOHNSTON, M.P.)

The Parliamentary Under-Secretary of State for the Colonies.

(Dr. T. DRUMMOND SHIELS, M.C., M.P.)

The Rt. Hon. L. S. AMERY, M.P.

Mr. L. HORE-BELISHA, M.P.

Sir EDWARD CROWE, K.C.M.G.

(Comptroller-General of the Department of Overseas Trade).

Sir THOMAS ALLEN (United Kingdom).

Sir WILLIAM CRAWFORD, K.B.E. (United Kingdom).

Mr. W. A. WILSON (Canada).

Mr. F. L. McDOUGALL, C.M.G. (Australia).

Mr. R. S. FORSYTH (New Zealand).

Mr. J. DIMOND (Union of South Africa).

Mr. J. W. DULANTY, C.B., C.B.E. (Irish Free State).

Mr. H. A. F. LINDSAY, C.I.E., C.B.E., I.C.S. (India).

Hon. J. W. DOWNIE, C.M.G. (Southern Rhodesia).

Sir EDWARD DAVSON, Bart. (Colonies and Protectorates).

Mr. S. G. TALLENTS, C.B., C.M.G., C.B.E. (*Secretary*).

Mr. E. M. H. LLOYD (*Assistant Secretary*).

(2) THE RESEARCH GRANTS COMMITTEE.

- Dr. T. DRUMMOND SHIELS, M.C., M.P.
(Parliamentary Under-Secretary of State for the Colonies) (*Chairman*).
- Mr. W. LUNN, M.P.
(Parliamentary Under-Secretary of State for Dominion Affairs).
- The Rt. Hon. the EARL DE LA WARR.
(Parliamentary Secretary to the Ministry of Agriculture and Fisheries.)
- Mr. W. A. WILSON.
- Mr. F. L. McDOUGALL, C.M.G.
- Mr. H. A. F. LINDSAY, C.I.E., C.B.E., I.C.S.
- Sir EDWARD DAVSON, Bart.
- Sir BASIL P. BLACKETT, K.C.B., K.C.S.I.
(Chairman of the Colonial Development Advisory Committee.)
- Major WALTER E. ELLIOT, M.C., M.P.
- The Rt. Hon. W. G. A. ORMSBY-GORE, M.P.
- Mr. F. W. PETHICK-LAWRENCE, M.P.
(Financial Secretary to the Treasury.)
- Mrs. MAY MELLANBY.

Mr. E. M. H. LLOYD (*Secretary*).

(3) THE PUBLICITY COMMITTEE.

- Mr. W. LUNN, M.P.
(Parliamentary Under-Secretary of State for Dominion Affairs) (*Chairman*).
- Sir WILLIAM CRAWFORD, K.B.E.
(Governing Director of Messrs. W. S. Crawford, Ltd.) (*Vice-Chairman*).
- The Rt. Hon. the EARL DE LA WARR.
(Parliamentary Secretary to the Ministry of Agriculture and Fisheries.)
- Sir THOMAS ALLEN.
(Director, Co-operative Wholesale Society.)
- The Rt. Hon. L. S. AMERY, M.P.
- Sir WOODMAN BURBIDGE, Bart., C.B.E.
(Chairman and Managing Director of Messrs. Harrods, Ltd.)
- The Viscount BURNHAM, G.C.M.G., C.H.
- Mr. E. R. EDDISON, C.B., C.M.G.
(Deputy Comptroller-General of the Department of Overseas Trade.)
- Mrs. COTTRELL.
(Director of the Co-operative Wholesale Society, Ltd.)
- Mr. J. W. DULANTY, C.B., C.B.E.

THE PUBLICITY COMMITTEE—*continued.*

- Lieut.-Gen. Sir WILLIAM FURSE, K.C.B., D.S.O.
(Director of the Imperial Institute.)
- Mr. D. G. GERAHTY.
(Director of Publicity for Canada in the United Kingdom.)
- The Right Hon. T. JOHNSTON, M.P.
(Lord Privy Seal.)
- Mr. H. A. F. LINDSAY, C.I.E., C.B.E., I.C.S.
- Mr. F. L. McDOUGALL, C.M.G.
- Sir WILLIAM PERRING, J.P.
(Representing National Chamber of Trade.)
- Mr. F. W. PETHICK-LAWRENCE, M.P.
(Financial Secretary to the Treasury.)
- Mr. F. PICK.
(Managing Director, Underground Railways, and London General Omnibus Co., Ltd.)
- Lieut.-Col. N. G. SCORGIE, C.B.E., M.V.O.
(Deputy Controller of H.M. Stationery Office.)
- Mr. J. C. STOBART.
(Director of Education of the British Broadcasting Corporation).
-
- Mr. G. HUXLEY, M.C. (*Secretary*).

(4) THE MARKETING COMMITTEE.

- The Right Hon. T. JOHNSTON, M.P.
(Lord Privy Seal) (*Chairman*).
- Sir THOMAS ALLEN.
- Sir THOMAS CLEMENT, K.B.E.
(Chairman and Joint Managing Director, Messrs. Andrew Clement & Sons, Ltd.)
- Sir WILLIAM CRAWFORD, K.B.E.
- The Rt. Hon. the EARL DE LA WARR.
(Parliamentary Secretary to the Ministry of Agriculture and Fisheries.)
- Mr. J. DIMOND.
- Mr. J. W. DULANTY, C.B., C.B.E.
- Mr. R. S. FORSYTH.
- Mr. T. W. KING, C.B.E.
(Director and General Manager, Civil Service Supply Association, Ltd.)
- Mr. F. W. MACKINNEY, C.B.E.
(Chief Officer of Supplies, London County Council.)
- Mrs. MURIEL E. W. NICHOL.
-
- Mr. LACHLAN MACLEAN, O.B.E. (*Secretary*).

(5) FILM COMMITTEE.

Mr. W. LUNN, M.P. (*Chairman.*)
Mr. P. W. L. ASHLEY, C.B. (Board of Trade.)
Sir WILLIAM CRAWFORD, K.B.E.
Major WALTER ELLIOT, M.C., M.P.
Lieut.-Gen. Sir WILLIAM FURSE, K.C.B., D.S.O. (Director of the Imperial Institute.)
Mr. L. HORE-BELISHA, M.P.
Mr. H. A. F. LINDSAY, C.I.E., C.B.E., I.C.S.
The Hon. Mrs. ALFRED LYTTLETON, G.B.E., J.P.
Mr. E. H. MARSH, C.B., C.M.G., C.V.O.
Mr. F. L. McDougall, C.M.G.
Mr. F. W. PETHICK-LAWRENCE, M.P. (Financial Secretary to the Treasury.)
Mr. H. VISCHER, C.B.E. (Colonial Office.)
Mr. HARRISON WATSON (Chief Canadian Government Trade Commissioner in the United Kingdom.)

Mr. G. HUXLEY, M.C. (*Secretary.*)

(6) AGRICULTURAL ECONOMICS COMMITTEE.

Mr. F. L. McDougall, C.M.G. (*Chairman.*)
Sir DAVID CHADWICK, C.S.I., C.I.E. (Secretary, Imperial Economic Committee.)
Mr. HENRY CLAY.
Mr. H. M. CONACHER (Department of Agriculture for Scotland.)
Mr. R. R. ENFIELD (Ministry of Agriculture and Fisheries).
Mr. R. B. FORRESTER (London School of Economics, University of London.)
Mr. J. B. GUILD, M.B.E. (National Farmers' Union.)
Mr. H. D. HENDERSON (Economic Advisory Council.)
Mr. H. A. F. LINDSAY, C.I.E., C.B.E.
Mr. E. M. H. LLOYD.
Mr. J. P. MAXTON (Agricultural Economics Research Institute, Oxford.)
Mr. C. S. ORWIN (Director, Agricultural Economics Research Institute, Oxford.)
Dr. J. A. VENN (School of Agriculture, University of Cambridge.)
Mr. K. WALTER (Horace Plunkett Foundation).

Mr. F. GRANT (*Secretary.*)

(7) FOOD PRODUCTS COMMITTEE.

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(8) FRUITS COMMITTEE.

Mr. W. A. Wilson (*Chairman*); Sir E. Davson, Bart.; Mr. J. Dimond; Mr. F. C. Faraker (Australian Government Commercial Representative); Mr. A. E. Gough, O.B.E. (Overseas Farmers' Co-operative Federations, Ltd.); Mr. M. M. S. Gubbay, C.S.I., C.I.E.; Mr. B. W. Harlow (South African Co-operative Citrus Exchange, Ltd.); Mr. C. H. Lewis, O.B.E. (Mil.) (Representative of the National Federation of Fruit and Potato Trades Associations (Incorporated), Ltd.); Mr. E. M. H. Lloyd; Mr. L. Maclean, O.B.E.; Major E. G. Monro, O.B.E., T.D.; Mr. F. W. J. Moore, O.B.E. (Representative of the National Federation of Fruit and Potato Trades Associations (Incorporated), Ltd.); Mr. J. Forsyth Smith (Canadian Government Fruit Trade Commissioner); Mr. H. E. Stephens (New Zealand Fruit Board); Mr. H. V. Taylor, O.B.E. (Ministry of Agriculture and Fisheries); Dr. C. West (Cambridge Low Temperature Research Station, Department of Scientific and Industrial Research); Mr. J. W. White, O.B.E. (Representative of the Fruit Brokers' Federation of Great Britain); Mr. N. L. Wright (Scientific Liaison Officer, New Zealand); Sir William Hardy, F.R.S. (Director of Food Investigation, Department of Scientific and Industrial Research) (Assessor); Mr. G. M. Dykes (*Secretary*).

(9) COLONIAL GRANTS SUB-COMMITTEE
(OF THE RESEARCH GRANTS COMMITTEE).

Sir Edward Davson, Bart. (*Chairman*); Sir Gilbert Grindle, K.C.M.G., C.B. (Imperial Economic Committee and Colonial Office); Sir A. W. Hill, K.C.M.G., F.R.S. (Director, Royal Botanic Gardens, Kew); Dr. E. J. Butler, C.I.E., F.R.S. (Director, Imperial Mycological Institute); Mr. H. Brown, O.B.E. (Imperial Institute); Mr. F. A. Stockdale, C.B.E. (Colonial Office); Mr. E. M. H. Lloyd; Mr. W. P. Hildred; Mr. R. F. Jenkins (*Secretary*).

(10) DAIRY RESEARCH COMMITTEE.

Professor R. Stenhouse Williams, M.B., C.M., D.Sc., D.P.H., L.R.C.P. and S.E. (Director of the National Institute for Research in Dairying, University of Reading) (*Chairman*); Mr. J. F. Blackshaw, O.B.E. (Ministry of Agriculture and Fisheries); Mr. R. E. Montgomery, M.R.C.V.S. (Colonial Office); Professor R. H. Leitch, M.A., B.Sc., N.D.A., N.D.D. (West of Scotland Agricultural College and Department of Agriculture for Scotland); Mr. N. C. Wright, M.A., Ph.D. (Hannah Dairy Research Institute, Scotland); Mr. R. H. Wilkinson (Ministry of Agriculture, Northern Ireland); Mr. W. A. Wilson; Mr. W. Wright (Inspector of New Zealand Dairy Products); Mr. J. Dimond; Mr. A. Poole-Wilson, M.B.E. (Department of Lands and Agriculture, Irish Free State); Mr. E. M. H. Lloyd; Mr. A. More, A.R.C.S., F.I.C. (Government Chemists' Department); Mr. V. Stott, B.A., F.Inst.P. (National Physical Laboratory); Mr. A. J. Smith, Ph.D. (Cambridge Low Temperature Research Station); Mr. E. B. Black, B.Sc. (Institute of Agricultural Engineering, Oxford); Professor G. S. Wilson (London School of Hygiene and Tropical Medicine—nominated by the Medical Research Council); Mr. R. F. Jenkins (*Secretary*).

(11) INFESTATION OF STORED PRODUCTS COMMITTEE.

Mr. E. M. H. Lloyd (*Chairman*); Professor V. H. Blackman, Sc.D., F.R.S. (Imperial College of Science); Mr. H. Brown, O.B.E. (Imperial Institute); Dr. E. J. Butler, C.I.E., F.R.S. (Imperial Mycological Institute); Dr. W. R. Thompson (Imperial Institute of Entomology); Dr. P. A. Buxton (London School of Hygiene and Tropical Medicine); Mr. J. C. F. Fryer, O.B.E. (Ministry of Agriculture and Fisheries); Mr. F. Laing (Natural History Department, British Museum); Mr. T. W. Macara (British Association of Research for the Cocoa, Chocolate, Sugar, Confectionery and Jam Trades); Mr. H. C. Sampson, C.I.E. (Royal Botanic Gardens, Kew); Professor J. W. Munro, M.A., D.Sc. (Imperial College of Science); Mr. C. H. Wake (*Secretary*).

(12) RETAIL GROCERS' ADVISORY SUB-COMMITTEE
(OF THE MARKETING COMMITTEE).

Mr. Lachlan Maclean, O.B.E. (*Chairman*); Mr. F. Blakemore, O.B.E., J.P. (National Chamber of Trade); Mr. R. G. Birmingham (Federation of Grocers' Associations of the United Kingdom); Mr. G. Bolton (Birmingham Grocers' Protection and Benevolent Association); Mr. D. Cameron, J.P. (Alloa Co-operative Society); Mr. S. Chambers (Grimsby); Mr. J. Clarke, O.B.E., J.P. (Manchester, Salford and District Grocers' Association); Councillor A. E. Cobbin (Greater London Council of Grocers' Associations); Mr. J. H. Finlay (Belfast Grocers' Association); Bailie D. Fisher, J.P. (The Scottish Federation of Grocers' and Provision Merchants' Associations); Mr. J. W. Fletcher (Birmingham Co-operative Society, Ltd.); Mr. W. J. Guilford (Messrs. Selfridge & Co., Ltd.); Mr. C. W. Hewitt (Federation of Grocers' Associations of the United Kingdom); Mr. A. E. James (Cardiff Grocers' Association); Mr. A. A. Jones (Hull Retail Grocers' Association); Mr. F. W. King (Liverpool and District Grocers' and Provision Dealers' Association); Mr. W. W. Waite, F.G.I. (Institute of Certificated Grocers); Mr. W. J. Whitney (Parliamentary Committee of The Co-operative Congress); Mr. T. Wilkie, J.P. (The Scottish Federation of Grocers' and Provision Merchants' Associations); Mr. T. F. Skilton (*Secretary*).

(13) RETAIL FRUITERERS' ADVISORY SUB-COMMITTEE
(OF THE MARKETING COMMITTEE).

Mr. Lachlan Maclean, O.B.E. (*Chairman*); Mr. G. E. Bousfield (Manchester Association of Retail Fruiterers, Florists and Fishmongers); Mr. P. Breen (The Co-operative Wholesale Society); Mr. J. W. Clay (Bournemouth and District Fruiterers' and Florists' Association); Mr. R. M. Cowley (Liverpool Fruiterers' Association, Ltd.); Councillor G. Hall (Manchester Association of Retail Fruiterers, Florists and Fishmongers); Mr. R. Hayward (The Retail Fruiterers' and Florists' Association, Ltd.); Mr. F. G. Hitchman (Birmingham and District Retail Fruit and Vegetable Dealers' Association); Mr. V. Josephs (Messrs. J. Lyons & Co. Ltd.); Mr. R. Loveridge (Bristol and District Retail Fruiterers', Greengrocers' Fishmongers', and Florists' Association); Mr. T. D. Matkin (Secretary, The Retail Fruiterers' and Florists' Association, Ltd.); Mr. T. E. Metcalfe (Secretary, National Federation of Retail Fruiterers, Florists and Fishmongers); Major E. G. Monro, O.B.E., T.D.; Mr. H. Payne (National Federation of Retail Fruiterers, Florists and Fishmongers); Mr. G. W. Ritchie (National Federation of Retail Fruiterers, Florists and Fishmongers); Mr. W. B. Shearn (London); Mr. J. J. Slater (Sheffield and District Retail Fruiterers' and Florists' Association); The Rt. Hon. Sir William Turner (Belfast); Mr. A. Walker, M.B.E. (Glasgow Fruiterers' and Florists' Association); Mr. T. F. Skilton (*Secretary*).

(14) EDUCATION SUB-COMMITTEE
(OF THE PUBLICITY COMMITTEE).

Lieut.-Gen. Sir William Furse, K.C.B., D.S.O. (*Chairman*); Mr. H. A. F. Lindsay, C.I.E., C.B.E.; Mr. J. W. Peck, C.B. (Scottish Education Department); Mr. J. C. Stobart (The Education Director, British Broadcasting Corporation); Mr. S. H. Wood, M.C. (Board of Education); Mr. J. Wilkie (*Secretary*).

(15) DAIRY PRODUCE INTELLIGENCE SUB-COMMITTEE
(OF THE AGRICULTURAL ECONOMICS COMMITTEE).

Mr. E. M. H. Lloyd (*Chairman*); Mr. K. H. Bond, M.C. (Ministry of Agriculture and Fisheries); Sir Thomas Clement, K.B.E.; Mr. H. E. Davis (New Zealand Dairy Produce Board); Mr. F. Grant; Mr. F. Killick (*Secretary*, London Provision Exchange); Major J. R. King, D.S.O. (Australian Dairy Produce Board); Mr. A. Lovell (*Chairman*, London Provision Exchange); Mr. W. A. Wilson; Mr. G. S. Dunnitt (*Secretary*).

(16) CANNED FRUIT INTELLIGENCE SUB-COMMITTEE
(OF THE AGRICULTURAL ECONOMICS COMMITTEE).

Mr. E. M. H. Lloyd (*Chairman*); Mr. W. B. Cooper (*Secretary*, Australian Canned Fruits Board); Mr. J. H. Dimond; Mr. F. C. Faraker (*Commercial Officer*, Commonwealth of Australia); Mr. J. H. Gorvin, C.B.E. (Ministry of Agriculture and Fisheries); Mr. F. Grant; Mr. W. Jolley (Messrs. J. C. Houghton & Co.); Mr. J. F. Owen (*Deputy Agent*, Malayan Information Agency); Mr. H. W. Packer (*Secretary*, National Food Canning Council); Mr. F. Travers (Messrs. Joseph Travers & Sons, Ltd.); Mr. W. A. Wilson; Mr. W. E. Knox (*Secretary*).

(17) WOOL STATISTICS SUB-COMMITTEE
(OF THE AGRICULTURAL ECONOMICS COMMITTEE).

Mr. E. M. H. Lloyd (*Chairman*); Mr. P. W. L. Ashley, C.B. (Board of Trade); Mr. S. E. J. Brady, M.B.E. (Board of Trade); Sir David Chadwick, C.S.I., C.I.E.; Mr. W. P. Devereux (Australian Wool Growers' Council); Mr. Arnold Frobisher, B.Sc., F.S.S. (Wool Industries Research Association); Mr. F. Grant; Mr. W. Harrison (British Wool Federation); Mr. E. J. Martin (National Wool (and Allied) Textile Employers' Council); Mr. C. Nathan (Ministry of Agriculture and Fisheries); Mr. G. H. Wood, F.S.S. (Woollen and Worsted Trades' Federation); Mr. R. A. Dunn (*Secretary*).

APPENDIX II.

GRANTS OUTSTANDING FOR RESEARCH AND OTHER SCHEMES APPROVED BY THE SECRETARY OF STATE ON THE ADVICE OF THE EMPIRE MARKETING BOARD (JULY, 1926 TO MAY, 1931).

GRANTS APPROVED FROM JUNE, 1930, TO MAY, 1931, ARE SHOWN IN ITALICS.

Object of Grant.	Department or Body to whom Grant made.	Expenditure Involved in Schemes Approved by the Board.	Contributions by other Bodies on which Grants from the Empire Marketing Fund have been made conditional.
<p style="text-align: center;">BIOLOGICAL AND AGRICULTURAL SCIENCES.</p> <p>Development of Biological and Agricultural Departments of the University of Cambridge.</p>	University of Cambridge	£10,000 p.a. for 5 years..	£700,000 from International Education Board; £50,000 from Exchequer; £379,000 from other sources.
<p style="text-align: center;">FOOD PRESERVATION AND LOW TEMPERATURE RESEARCH.</p> <p>Development of the work of the Low Temperature Research Station, Cambridge.</p> <p>Erection of the Ditton Laboratory, East Malling, for cold storage experiments on a semi-commercial scale.</p> <p>Research into the preservation and transport of fish at Torry Research Station, Aberdeen.</p> <p>Survey of trade in frozen mutton and lamb from abattoir in New Zealand to the wholesale market in London.</p> <p><i>Continuation during 1931-32 of food preservation and low temperature research at Cambridge, Ditton and Torry.</i></p>	<p>Department of Scientific and Industrial Research.</p> <p>Department of Scientific and Industrial Research.</p> <p>Department of Scientific and Industrial Research.</p> <p>Department of Scientific and Industrial Research.</p> <p><i>Department of Scientific and Industrial Research</i></p>	<p>£38,500 capital; £8,000 p.a. for 5 years.</p> <p>£55,000 capital; £25,000 spread over 5 years.</p> <p>£33,300 spread over 3 years.</p> <p>£1,250</p> <p><i>£37,266.</i></p>	<p>£750 from the New Zealand Meat Producers' Board.</p>

ANIMAL HUSBANDRY.

Research on the mineral content of natural pastures, with special reference to certain deficiencies in the soil and their effect on the growth and strength of livestock.	(a) Rowett Research Institute, Aberdeen.	£25,000 spread over 5 years.	
Do. do.	(b) Commonwealth Council for Scientific and Industrial Research.	£3,000 capital; £1,875 p.a. for 5 years.	£3,000 capital; £1,875 p.a. for 5 years, half from Commonwealth Council for Scientific and Industrial Research and half from the University of Adelaide.
Do. do.	(c) New Zealand Government.	£2,000 p.a. for 5 years ..	Similar sum provided in equal amounts by New Zealand Government and Cawthron Institute, New Zealand.
Do. do.	(d) Government of Southern Rhodesia.	£2,500 capital; £2,500 p.a. for 3 years.	Similar sums from Government of Southern Rhodesia.
Stock-rearing problems in Palestine ..	Ad hoc Committee ..	£4,900 spread over 3 years	Similar sum from the Zionist Organisation.
Erection of silo at School of Agriculture, Cambridge, for trials of the economic value of silage made from grass.	School of Agriculture, Cambridge.	£200.	
Grants in aid of work at Cambridge University on the physiology and growth of farm animals, etc.	University of Cambridge	£5,000 capital; £400 p.a. for 5 years; £500 guarantee.	£11,000 capital.

ANIMAL HEALTH.

Extension of the activities of the Onderstepoort Veterinary Research Station. <i>Research on Animal Health problems in Australia.</i>	Government of the Union of South Africa. <i>Commonwealth Council for Scientific and Industrial Research.</i>	£10,000 capital; £11,000 p.a. for 5 years. £8,000 p.a. for 5 years ..	<i>Similar sum from Australian sources.</i>
Research into Metazoan Immunity ..	Liverpool School of Tropical Medicine.	£3,000 p.a. for 3 years ..	Similar sum from Liverpool School of Tropical Medicine.
Investigation into use of B.C.G. vaccine in the protection of calves against tuberculosis.	Department of Animal Pathology, University of Cambridge.	£3,000 capital.	
Provision of additional laboratory accommodation at the Department of Animal Pathology, University of Cambridge.	Department of Animal Pathology, University of Cambridge.	£4,250 capital	Similar sum from Development Commission.

Object of Grant.	Department or Body to whom Grant made.	Expenditure Involved in Schemes Approved by the Board.	Contributions by other Bodies on which Grants from the Empire Marketing Fund have been made conditional.
WOOL.			
Standardisation of wool quality ..	Wool Industries Research Association.	£7,800 capital; £15,200 spread over 5 years.	
Sheep breeding and biology of wool ..	Animal Breeding Research Department, University of Edinburgh.	£3,000 capital; £800 p.a. for 5 years.	
Survey of Empire wools.. .. .	Wool Industries Research Association.	£2,000 p.a. for 2 years; supplementary grant of £1,250.	
Supply of wool packs for trials in Australia, New Zealand and South Africa.	Wool Industries Research Association.	£175; supplementary grant of £300.	
<i>Imperial Wool Research Conference ..</i>		£600.	
HIDES AND SKINS.			
<i>Research on processing of New Zealand pelts.</i>	New Zealand Department of Scientific and Industrial Research.	£500 p.a. for 5 years ...	Similar sum provided in equal proportions from New Zealand Department of Scientific and Industrial Research and Freezing Companies.
DAIRY RESEARCH.			
Survey of literature on the condensing and drying of milk and milk residues.	Hannah Dairy Research Institute, Scotland.	£500; Supplementary grant of £250.	
Study of faults in dairy products, including "Red Spot" in cheese and "fishiness" in butter.	National Institute for Research in Dairying, Reading.	£3,150 capital; £3,900 spread over 2 years; Supplementary grant of £2,500 for period up to 31.3.31.	
Production of Dairy Research Journal..		£1,000.	
Feeding of milk to schoolchildren in Scotland.	Department of Health for Scotland.	£5,000	£2,489 from other sources.

Research on cheese ripening	University of British Columbia.	£1,100 spread over 2 years; supplementary grant of £800 for third year.	Similar sums from University of British Columbia.
<i>Investigation of tuberculous infection of milk.</i>	<i>Department of Health, Scotland.</i>	<i>£1,400 p.a. for 2 years.</i>	
<i>Investigation into the problem of "openness" in cheese.</i>	<i>New Zealand Dairy Research Institute.</i>	<i>£500 capital; £2,000 p.a. for 4 years.</i>	
<i>Investigation into the technique of milk examination.</i>	<i>London School of Hygiene and Tropical Medicine.</i>	<i>£600 p.a. for 2 years.</i>	
POULTRY.			
Research in poultry nutrition problems	Rowett Research Institute, Aberdeen, and Hillsborough Experimental Station, Northern Ireland.	£7,300 capital; £2,440 p.a. for 5 years.	
Research on the scientific feeding of poultry.	Animal Nutrition Institute, University of Cambridge.	£890 capital; £1,870 spread over 5 years.	
Investigation into the production and marketing of table poultry, eggs, etc.	Harper Adams Agricultural College.	£5,000 capital; £8,492 spread over 5 years.	
Study of quality in eggs and the effect of dietary factors on the hatching capacity of eggs.	Ontario Agricultural College, Guelph.	£350 capital; £670 p.a. for 5 years.	Similar sums from Ontario Department of Agriculture.
EXPORT OF PEDIGREE LIVE-STOCK.			
Towards cost of transport of pedigree livestock from the United Kingdom.	Government of Commonwealth of Australia.	£5,000 p.a. for 2 years ..	Similar sums both from the Commonwealth Government and, in equal proportions, from the State Government concerned and the importer.
Do. do.	Government of British Columbia.	£1,500	Similar sum from the Government of British Columbia.
Do. do.	Government of Kenya ..	£3,000 for first year, £1,500 p.a. for second and third years. Balance from preceding years for fourth year.	Similar sums from the Government of Kenya.
Do. do.	Government of Northern Rhodesia.	£600 for first year; £1,000 for second year.	Similar sums from the Government of Northern Rhodesia.

Object of Grant.	Department or Body to whom Grant made.	Expenditure Involved in Schemes Approved by the Board.	Contributions by other Bodies on which Grants from the Empire Marketing Fund have been made conditional.
EXPORT OF PEDIGREE LIVESTOCK— <i>contd.</i>			
Towards cost of transport of pedigree livestock from the United Kingdom.	Government of Southern Rhodesia.	£2,280 for first year, £2,000 for second year and £1,200 for third year.	Similar sums from the Government of Southern Rhodesia.
Erection and maintenance of the London Quarantine Station.	Royal Agricultural Society of England.	£7,750 capital; £3,250 p.a. for 5 years.	
ENTOMOLOGY.			
Establishment of a laboratory for breeding beneficial parasites.	Imperial Institute of Entomology.	£15,000 capital; £30,000 spread over 5 years.	
Biological control of insect pests in the West Indies.	Imperial Institute of Entomology.	£2,000 p.a. for 3 years.	
Desert Locust Control	Imperial Institute of Entomology.	£1,020; £2,720 for 1 year	£2,720 promised by certain overseas Governments.
Research on the digestion of meat by the larvae of flies and on the part played by micro-organisms in the nutrition of larvae.	London School of Hygiene and Tropical Medicine.	£1,500 spread over 3 years.	
Preliminary survey of problems of insect nutrition.	Hebrew University, Jerusalem.	£75 capital; £227 10s. p.a. for 3 years.	
Research into the infestation of stored products.	Imperial College of Science and Technology	£10,775 capital; £15,936 spread over 5 years.	£300 towards research on tobacco problems from Southern Rhodesian tobacco interests.
Towards cost of campaign against the warble fly.	Leathersellers' Company	£1,000	Similar sum from various interests represented on the Warble Fly Committee of the Leathersellers' Company.
Identification and accommodation of entomological specimens.	Natural History Museum, London.	£30,000 capital.	

Establishment of an organisation to pursue entomological investigations in Australia.	Commonwealth Council for Scientific and Industrial Research.	£21,000 capital; £39,052 spread over 5 years.	£21,000 capital and £57,673 spread over 5 years from Commonwealth Government.
Research into entomological control of noxious weeds.	Cawthron Institute, New Zealand.	£1,333 capital; £2,000 p.a. for 5 years.	£200 capital and £2,000 p.a. for 5 years from Cawthron Institute and £667 capital and £2,000 p.a. for 5 years from the New Zealand Government.
Towards cost of tsetse fly research and experimental reclamation in Tanganyika Territory.	Government of Tanganyika Territory.	£2,000 p.a. for 5 years ..	Substantial expenditure by Government of Tanganyika Territory.
Control of pests and diseases of glass-house produce.	Cheshunt Experimental and Research Station.	£1,600 capital; £1,760 p.a. for 5 years.	
<i>Investigation of entomological problems in Mauritius and Seychelles.</i>	<i>Governments of Mauritius and Seychelles.</i>	<i>£1,800 p.a. for 2 years.</i>	
MYCOLOGY AND PLANT PATHOLOGY.			
Erection of new building to house the Imperial Mycological Institute.	Imperial Mycological Institute.	£8,000	£4,000 from the Imperial Mycological Institute.
Investigation of the problem of dry rot disease in swedes and turnips.	Ministry of Agriculture and Fisheries.	£1,320 spread over 3 years	
Study of fungal wastage of fresh fruits exported from Palestine.	Zionist Organisation ..	£1,520 spread over 3 years	£170 from the Government of Palestine.
Research into virus diseases of plants ..	Rothamsted Experimental Station.	£1,835 capital; £12,800 spread over 5 years.	
Do. do.	Cheshunt Experimental and Research Station.	£1,040 capital; £6,350 spread over 5 years.	
Do. do.	Scottish Society for Research in Plant Breeding.	£4,450 capital; £8,000 spread over 5 years.	
Do. do.	University College, Dublin.	£3,250 capital; £5,500 spread over 5 years.	
Cotton disease research	Rothamsted Experimental Station.	£600 capital; £200 p.a. for 4 years.	

Object of Grant.	Department or Body to whom Grant made.	Expenditure Involved in Schemes Approved by the Board.	Contributions by other Bodies on which Grants from the Empire Marketing Fund have been made conditional.
<p align="center">PLANT BREEDING.</p> <p>Prosecution and co-ordination of research in grasses and clovers. Appointment of Plant Breeding Expert for study of Empire grassland problems Establishment of a Plant Breeding and Seed Research Station at New Zealand Agricultural College, Palmerston North Experiments with plants of the tidal zone with special reference to <i>Spartina Townsendii</i>. <i>Research into production of strong strawed varieties of oats and barley.</i> <i>Towards the maintenance of the Division of Plant Industry.</i></p>	<p>Welsh Plant Breeding Station, Aberystwyth. Welsh Plant Breeding Station, Aberystwyth. New Zealand Department of Scientific and Industrial Research. East Anglian Institute of Agriculture. <i>University College, Dublin</i> <i>Commonwealth Council for Scientific and Industrial Research.</i></p>	<p>£4,350 capital; £23,375 spread over 5 years. £3,850 spread over 2½ years. £2,500 capital; £2,500 p.a. for 5 years. £220; <i>supplementary grant of £1,000 spread over 3 years.</i> £1,550 capital; £425 p.a. for 5 years. £4,000 capital; £6,000 p.a. for 2 years.</p>	<p>£9,500 capital and £5,670 p.a. for 5 years from New Zealand Government. £11,500 capital from Australian sources.</p>
<p align="center">HORTICULTURE.</p> <p>Fruit research and standardisation of horticultural material. Extension of facilities for research and provision of accommodation for Imperial Bureau of Fruit Production. Investigations into the keeping qualities of fruit and its relation to the nutrition of the tree and soil conditions. Fruit Research investigations in New Zealand. Improvement of methods of packing, grading and shipment of citrus fruit. Appointment of an Agricultural Officer to devote special attention to the development of a citrus industry.</p>	<p>East Malling Research Station, Kent. East Malling Research Station, Kent. Long Ashton Horticultural Research Station, Bristol. New Zealand Department of Scientific and Industrial Research. Government of Palestine Government of British Honduras.</p>	<p>£9,050 capital; £27,300 spread over 5 years. £13,200 capital; £8,100 spread over 3 years. £7,025 capital; £12,975 spread over 5 years. £2,350 capital; £9,300 spread over 5 years. £1,000 p.a. for 3 years .. £280 p.a. for 3 years ..</p>	<p>Similar sums from the Government of New Zealand. Similar sum from Government of Palestine. Similar sums from the Government of British Honduras.</p>

Establishment of an experimental fruit farm with the object of testing the economic cost of growing and shipping bananas and grape fruit.	Government of Sierra Leone.	£1,500 capital; £1,500 p.a. for 5 years.	Similar sums from Government of Sierra Leone.
ECONOMIC BOTANY.			
Visits of Economic Botanists to Dominions and Colonies and employment of botanical collectors for work overseas.	Royal Botanic Gardens, Kew.	£20,000 spread over 5 years.	
Classification of Herbarium specimens . .	Royal Botanic Gardens, Kew.	£15,567 spread over 5 years.	
DIETETICS.			
Research into the vitamin content of fruits, vegetables and dairy products at the Lister Institute.	Medical Research Council	£24,000 spread over 5 years.	
Research into the physiological and pathological conditions associated with certain rationed and specialised diets, with special reference to Kenya native tribes.	Rowett Research Institute, Aberdeen.	£3,000 p.a. for 3 years.	
COLONIAL AGRICULTURAL AND VETERINARY SERVICES.			
Towards the cost of Headquarters Organisation, including appointment of Advisers on Agriculture and Animal Health.	Colonial Office	Approx. £6,000 up to 31.3.31 and £7,000 p.a. for 5 years.	Similar sums from Colonial Governments.
TROPICAL RESEARCH STATIONS.			
Development of a training centre for the study of tropical agricultural problems.	Imperial College of Tropical Agriculture, Trinidad.	£21,000 capital; £55,000 spread over 4 years. £16,000 for fifth year.	£21,000 capital from Lancashire Cotton interests.
Towards cost of maintenance of Amani Station.	East African Agricultural Research Station, Amani.	£6,000 p.a. for 3 years. £6,000 p.a. for fourth and fifth years.	Contributions estimated at £12,000 per annum by the East African Governments.

Object of Grant.	Department or Body to whom Grant made.	Expenditure Involved in Schemes Approved by the Board.	Contributions by other Bodies on which Grants from the Empire Marketing Fund have been made conditional.
<p style="text-align: center;">BANANA RESEARCH.</p> <p>Prosecution of research into the production of a variety of banana immune from panama disease and investigation into transport of bananas under cold storage conditions.</p>	Imperial College of Tropical Agriculture, Trinidad.	£5,774 capital; £3,806 p.a. for 5 years.	
<p style="text-align: center;">TEA.</p> <p>Towards the cost of establishment and development of a laboratory of plant physiology for the investigation of problems connected with the constitution and composition of the tea plant.</p>	Indian Tea Association..	£3,125 capital; £3,375 spread over 5 years.	Similar sums from the Indian Tea Association.
<p>Purchase of experimental small scale machinery and plant for the factory of the Tea Research Institute of Ceylon.</p>	Tea Research Institute of Ceylon.	£1,000 capital.	
<p style="text-align: center;">RICE.</p> <p><i>Development of rice research in Burma and Bengal.</i></p>	Indian Imperial Council of Agricultural Research.	£2,500 capital; £12,745 spread over 5 years.	Similar sums from Indian Imperial Council of Agricultural Research.
<p style="text-align: center;">SUGAR.</p> <p>Development of sugar research in Mauritius.</p> <p><i>In aid of work of breeding of improved varieties of sugar cane.</i></p>	Government of Mauritius	£2,000 p.a. for 5 years ..	Similar sums from the Government of Mauritius.
<p style="text-align: center;"><i>Do. do.</i></p>	Government of Barbados..	£2,000 for 1 year ..	Approx. £12,000 p.a. is spent by Government of Barbados on cane breeding.
<p style="text-align: center;">TOBACCO.</p> <p><i>Towards cost of establishment of tobacco research station in Southern Rhodesia.</i></p>	Government of British Guiana.	£1,000 for 1 year ..	A sum of £2,988 is expected to be spent by British Guiana on cane research work in 1931.
	Government of Southern Rhodesia.	£3,000 spread over 2 years	Approx. £5,680 from Southern Rhodesian Government.

TUNG OIL.			
Distribution of Tung Oil seeds for cultivation in various Empire countries and comparative study of the technical properties of Tung Oil from various sources.	Royal Botanic Gardens, Kew, and Research Association of British Paint, Colour and Varnish Manufacturers.	£800. £750 p.a. for 5 years.	
COPRA.			
Research into the best methods of preparing copra of high quality for export.	Government of the Federated Malay States.	£1,150 p.a. for 4 years.	Similar sum from the Government of the Federated Malay States.
Improvement of methods of cultivation, handling, drying and grading of copra	Government of Fiji ..	£750 p.a. for 2 years.	
OIL PALM PLANTATION.			
Establishment of an experimental oil palm plantation.	Government of Sierra Leone.	£1,500 p.a. for 2 years ..	Approx. £6,000 p.a. from Government of Sierra Leone, and £2,000 p.a. for 4 years from United Africa Company Ltd.
LAC.			
Towards cost of marketing expert in England to supplement lac research being carried on in India.	Government of Bihar and Orissa.	£500 p.a. for 5 years ..	Similar sum from the Government of Bihar and Orissa.
SERICULTURE.			
Towards the development of the silk industry in Jamaica.	Government of Jamaica	£1,900 spread over 3 years	Similar sum from the Government of Jamaica.
Towards the revival of the silk industry in Palestine.	Government of Palestine	£100	£300 from the Government of Palestine.
FLAX.			
Development of research into problems of flax industry.	Linen Industries Research Association, Northern Ireland.	£2,250 capital; £16,500 spread over 5 years.	£750 capital and £8,500 spread over 5 years from Government of Northern Ireland.
Flax development in Cyprus	Government of Cyprus ..	£2,500 spread over 3 years	Similar sum from Government of Cyprus.

Object of Grant.	Department or Body to whom Grant made.	Expenditure Involved in Schemes Approved by the Board.	Contributions by other Bodies on which Grants from the Empire Marketing Fund have been made conditional.
<p style="text-align: center;">INSECTICIDES.</p> <p>Towards cost of collecting and investigating plants possessing insecticidal properties with a view to their commercial exploitation.</p>	<p>Government of British Guiana.</p>	<p>£200 p.a. for 5 years.</p>	
<p style="text-align: center;">FORESTRY AND FOREST PRODUCTS.</p> <p>Maintenance of the Imperial Forestry Institute.</p> <p>Extension of the functions of the Forest Products Research Laboratory, Princes Risborough, including work on the utilisation of Empire timbers.</p>	<p>Imperial Forestry Institute, Oxford.</p> <p>Department of Scientific and Industrial Research.</p>	<p>£4,750 p.a. for 2 years.</p> <p>£30,000 capital; £7,500 spread over 2 years; supplementary grant of £7,000 for third year.</p>	
<p style="text-align: center;">MECHANICAL TRANSPORT.</p> <p>Experimentation and development of Mechanical Transport suitable for use in undeveloped parts of the Empire.</p>		<p>£60,000 spread over 5 years.</p>	<p>Similar sum from Oversea Governments of the Empire over a period of 4 years.</p>
<p style="text-align: center;">FISHERIES.</p> <p>Fisheries Research in Newfoundland ..</p> <p>Cod Liver Oil research</p>	<p>Government of Newfoundland.</p>	<p>£5,000 capital; £5,000 p.a. for 5 years.</p> <p>£3,000.</p>	<p>Similar sums from Government of Newfoundland.</p>
<p style="text-align: center;">ECONOMIC INVESTIGATION.</p> <p>Establishment of a Chair of Imperial Economic Relations at the London School of Economics.</p> <p>Marketing of home agricultural products with special reference to the improvement of the existing methods of distribution and preparation for market.</p>	<p>University of London ..</p> <p>Ministry of Agriculture and Fisheries.</p>	<p>£2,000 p.a. for 5 years.</p> <p>£40,000 p.a. for 5 years; supplementary grant of £42,500 approved for 1931-2.</p>	

Investigations into problems of marketing organisation.	Ministry of Agriculture and Fisheries.	£12,000 p.a. for 3 years.	
Marketing of Scottish Agricultural produce.	Department of Agriculture for Scotland.	£5,150 for 1929-30 ; £6,200 for 1930-31 ; £7,500 for 1931-2.	
Organisation of Egg Marketing in Scotland.	Department of Agriculture for Scotland.	£1,000 p.a. for 5 years.	
Improvement of Pork and Bacon production in Scotland.	Department of Agriculture for Scotland.	£3,750 capital ; £407 p.a. for 5 years.	
Investigation into the marketing of Northern Ireland Agricultural produce.	Ministry of Agriculture, Northern Ireland.	£900 p.a. for 3 years.	
Investigation into the economies of small farms in Northern Ireland.	Government of Northern Ireland.	£600 p.a. for 3 years ..	Similar sum from Government of Northern Ireland.
Collection and dissemination of data concerning the economics of agricultural production within the Empire, with special reference to the technique and results of cost accounting and survey methods.	Agricultural Economics Research Institute, Oxford.	£700 p.a. for 5 years .	
CO-OPERATIVE MARKETING.			
Fostering co-operative organisation of producers in the Empire and in aid of production of Year Book.	The Horace Plunkett Foundation.	£1,500 p.a. for 5 years ..	Similar sum from Horace Plunkett Foundation.
MISCELLANEOUS.			
Research on fluctuations in the numbers of wild rodents.	Department of Zoology and Comparative Anatomy, University of Oxford.	£3,010 . spread over 3 years.	
<i>Scheme of Economic Ornithology</i>	<i>Departments of Zoology and Agriculture, University of Oxford.</i>	£250 p.a. for 3 years ..	<i>Similar sum from other sources.</i>
Preliminary investigation into problems of the maturation of wine.		£1,250.	
Comparative study of methods of soil analysis.	University College of North Wales, Bangor.	£430 for 1 year ; <i>supplementary grant for second year of £450.</i>	

APPENDIX III.

PUBLICATIONS OF THE EMPIRE MARKETING BOARD.

1. Single copies of the following publications may be obtained, free of cost, on application to The Secretary, Empire Marketing Board, 2, Queen Anne's Gate Buildings, London, S.W.1.

Leaflets:—

- The Empire Marketing Board : a brief description of the Board's work.
- The Empire Marketing Board and the Home Producer.
- Why should we buy from the Empire ?

Booklets :

- A Calendar of the Fruits and Vegetables of Empire.
- A List of Empire Tobaccos.

Recipe Leaflets :

- A series of leaflets descriptive of various foodstuffs produced within the Empire and giving new recipes for their use.
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2. The following publications are obtainable from the sale offices of His Majesty's Stationery Office.

LONDON: Adastral House, Kingsway, W.C.2. MANCHESTER: York Street.
 EDINBURGH: 120, George Street. CARDIFF: 1, St. Andrew's Crescent.
 BELFAST: 15, Donegall Square West.
 Or through any Bookseller.

E.M.B.1.	AGRICULTURAL ECONOMICS IN THE EMPIRE. Report of a Committee appointed by the Empire Marketing Board	6d.	(7d.)
E.M.B.2.	TROPICAL AGRICULTURAL RESEARCH IN THE EMPIRE with special reference to Cacao, Sugar Cane, Cotton and Palms. By C. A. Barber, Sc.D., C.I.E.	<i>Out of print.</i>	
E.M.B.3.	REPORT ON DEVELOPMENT OF AGRICULTURE IN TRINIDAD. By H. C. Sampson, C.I.E., Royal Botanic Gardens, Kew	3d.	(3½d.)
E.M.B.4.	REPORT ON DEVELOPMENT OF AGRICULTURE IN BRITISH GUIANA. By H. C. Sampson, C.I.E., Royal Botanic Gardens, Kew	<i>Out of print.</i>	
E.M.B.5.	REPORT ON DEVELOPMENT OF AGRICULTURE IN LEEWARD AND WINDWARD ISLANDS AND BARBADOS. By H. C. Sampson, C.I.E., Royal Botanic Gardens, Kew	6d.	(7d.)