1924.

NEW ZEALAND.

PAN-PACIFIC FOOD-CONSERVATION CONFERENCE,

HELD AT HONOLULU, 31ST JULY TO 14TH AUGUST, 1924

(REPORT ON), BY HON. GEO. M. THOMSON, M.L.C.

Laid on the Table of both Houses of the General Assembly by Leave.

SIR,— Wellington, 25th September, 1924.

As stated in your telegram of the 11th June last, I was appointed as the New Zealand Government representative at the Pan-Pacific Food-conservation Conference to be held in Honolulu on the 31st July to the 14th August. The Hon. Mr. Mark Cohen, M.L.C., who was visiting Honolulu chiefly for health reasons, was also appointed a delegate, and we co-operated on all possible occasions in keeping New Zealand prominently before the Conference. We left Auckland on the 8th July in the s.s. "Niagara," reaching our destination on the 18th July.

Along with other delegates who were in Honolulu prior to the Conference dates, we met informally on several occasions, and at these preliminary gatherings arranged the order of business, so as to expedite matters when the official opening occurred.

The accompanying programme [not printed] gives a list of 142 delegates who attended the Conference. The countries and States represented were—from west to east—Japan, Korea, China, the Philippines, Macao, French Indo-China, Siam, Dutch East Indies, Australia, New Zealand, Cuba, Mexico, and the United States of America. Many of the delegates were heads of Departments of the countries represented, the delegation from the United States being especially important and numerous.

Dr. Leland O. Howard, Chief of the Bureau of Entomology, United States Department of Agriculture, was elected Chairman of the Conference, and the choice was an eminently satisfactory one.

The work of the Conference was originally divided up into seven sections. Unfortunately, it was not found possible to house all these in the same building, and this entailed a considerable loss of time and effort on the part of those delegates, of whom I was one, who wished to attend more than one section.

Section I was devoted solely to the sugar industry, and its meetings were held in the Experimental Station of the Hawaiian Sugar-planters' Association. This section did very excellent work, and Queensland, New South Wales, the Philippines, Fiji, Hawaii, and Cuba were very strongly represented.

Section II did not meet except in general session of the Conference to hear an address from the Chairman, Dr. R. Masujima, of the Middle Temple, London, and First President of the International Bar Association.

The sections in which, as New Zealand's representative, I took an active part were—III, Fisheries, Marine Biology, and Oceanography; IV, Plant Quarantine, Plant Entomology, and Plant Pathology; and V, Animal Industry.

On the 4th August I read a paper in the Fisheries Section on the "Introduction of Foreign Food Fishes into New Zealand," opening a discussion on "International Exchange of Aquatic Species of Economic Importance." Later in the day I presented and enlarged on Mr. B. C. Aston's paper on "Bush Sickness in New Zealand," in the section of Animal Industry.

The same evening, in the Army and Navy Y.M.C.A., I delivered the first of the free lectures to a large audience on "Mountain, Valley, and Lake in New Zealand," illustrated by limelight views.

On the 6th August, in the Fisheries Section, I read a paper and opened a discussion on "United Action in the Pacific for the Study of Ocean Currents in their Bearing on the Distribution of Food Fishes," and described in detail our float experiments conducted at the Portobello Marine Fish-hatchery in connection with the distribution of the imported European turbot, lobster, and crabs which have been liberated from the station.

On the 7th August, in the same section, I took part in a general discussion on the "Fishery Resources of the Pacific Region," stressing in particular the very important part which New Zealand was yet destined to play as one of the great fishery countries of the world.

On the 11th August, in the section on Animal Husbandry, I read a paper on "Live-stock in New Zealand," which was supplemented by the Hon. Mark Cohen, M.L.C. The same afternoon I presented and gave a precis of Dr. R. J. Tillyard's paper on "Insects in Relation to the New Zealand Food-supply," in Section IV. This paper was justly considered as one of the most valuable read before the Conference.

At the close of the Conference a very large series of resolutions was submitted to the Executive Committee, of which I was a member, and thirty-three of these were adopted by the Conference. I would especially draw your attention to Resolutions 9, 11, 13, 18, 19, 21, 22, 24, 25, 28, and 33, as these have a more or less direct bearing on New Zealand.

Resolution 9 reads as follows :—

RESOLUTION 9.

Whereas the various peoples living about the borders of the Pacific Ocean use many different systems of weights and measures; whereas the various systems of weights and measures are not well understood in other than the home countries; and whereas the metric system, based on the standard metre at Paris, is a common meeting-ground:

Be it *resolved*, That the First Pan-Pacific Food-conservation Conference recommends to the Governments of the various circum-Pacific countries, and to private individuals and institutions in such countries, that statistical data be expressed in units of the metric system in addition to expressing them in units of the local system; and that when this is not done, conversion factors be given with each table or in each publication, whereby the local units may be converted into the universally understood units of the metric system.

This is of a general nature, the gist of which has frequently been brought before the notice of the various Governments concerned, and which has already received Government sanction in several countries, including New Zealand. It is, however, a matter which requires constant emphasis and reiteration in order to educate the publics of the various countries concerned, hence the unanimity with which it was passed by the Conference.

RESOLUTION 13.

Resolved, That the First Pan-Pacific Food-conservation Conference recommends to the various Governments of the countries bordering the Pacific that there be prepared and sent to the organizers of the Pan-Pacific Science Congress to be held in Japan in 1926 a comprehensive list of the individuals, institutions, and agencies engaged in research, extension work, or advanced educational work pertaining to useful products of the sea and of the soil, or those branches of science related thereto (such as ichthyology, marine biology, oceanography, economic entomology, plant pathology, agronomy, animal husbandry, genetics, agricultural geography, meteorology, agricultural chemistry, and agricultural bateriology); and that this list be supplemented by a brief *résumé* of investigations in the aforesaid branches which have been completed, are now in progress, or are contemplated.

In this connection I would draw your attention once more to the paper drawn up last year by my son, Dr. J. Allan Thomson, and myself, on "Scientific Research in New Zealand," and published in the *New Zealand Journal of Science and Technology* for December, 1923.

Copies of this paper have been forwarded to several of the gentlemen interested in the forthcoming Science Congress which is to be held in Japan in 1926, under the ægis of the International Board of Scientific Research. Something of the same sort drawn up and published in other countries would be valuable not only as general information, but especially as showing how far similar problems were receiving consideration from workers in other lands.

Resolution 33 reads as follows :—

RESOLUTION 33.

Inasmuch as legislation dealing with the adulteration and misbranding of foodstuffs in the several Pacific countries varies greatly in character and scope; and inasmuch as the definitions and standards for a given food commodity may vary in different countries; and inasmuch as, therefore, a given food commodity may be sold lawfully in one country but not in another; and inasmuch as this lack of harmony in legislation, in definitions, and in standards acts in many cases as a serious restraint upon the free interchange of commodities between nations, not infrequently causing waste of food and heavy loss to individuals:

Therefore let it be *resolved*, That the First Pan-Pacific Food-conservation Conference strongly recommends to the nations of the Pacific area the formation of an international commission for the following purposes :—

(1.) The formulation of uniform definitions and standards for food commodities entering into the trade between nations, in order that such definitions and standards may receive from the administrative officials of the several nations whatever consideration may be proper in each case.

(2.) The preparation, for the consideration of the several law-making agencies, of recommendations which would tend to minimize, so far as possible, discrepancies in existing food-control legislation.

I propose to refer to the other resolutions specified, as well as to cognate questions which arose during the Conference, in a series of supplementary notes for the consideration of those Departments of Government specially concerned.

One of the trips organized by the Pan-Pacific Union for the visitors to the Conference was to Kilauea and the Volcano House on the Island of Hawaii. There I was personally conducted over the crater and the interesting surroundings of the wonderful locality by Dr. Jaggar, the eminent resident volcanologist, and particularly was shown over the observatory, and saw the nature of the work done there. Dr. Jaggar subsequently wrote to me on the question of establishing a volcanological observatory in New Zealand, and this matter I propose to make the subject of a separate communication.

On my return to Honolulu I had a lengthened conversation with Rear-Admiral John McDonald, commanding the United States Naval Station at Pearl Harbour, who presented to me the charts used by him in a paper read before Section II of the Conference, on the "Hydrographic Work of the United States Navy." We discussed the question of obtaining an extensive series of soundings in the Pacific by means of the new sonic sounding-apparatus, especially in its bearings on two points—(1) round the coast of New Zealand as far as the 100-fathom line, as a valuable contribution to the development of our fishing industry, and (2) on the deep-sea line of volcanic activity between the thermal region of New Zealand and the Hawaiian Islands. This line passes nearly through the Samoan Group, and is closely associated with the volcanic and seismic activity of the whole region. An observatory at each end of this line, in touch with the geo-physical observatory at Apia, would be greatly aided by the establishment of a complete chain of deep-sea soundings. It was suggested that perhaps New Zealand might undertake to obtain soundings between the Dominion and Samoa, and that the United States Navy might complete the line from Samoa to Hawaii. I wrote the Admiral on the subject, and he has forwarded my letter to the Hydrographic Office of the United States Navy in Washington, with the request that the Chief Hydrographer would reply to me directly.

After the Conference closed I spent a week on the beautiful Island of Maui. I am satisfied as a result of that visit that it would be worth while for our Agricultural Department to make a trial of pineapple-growing in the North Auckland district. Grape-fruit (a variety of the shaddock) could also probably be cultivated there profitably. I refer in my supplementary report to these matters.

In conclusion, I desire to express my appreciation of the unbounded hospitality of the people of Honolulu, from His Excellency the Hon. Wallace R. Farrington, Governor of Hawaii, downwards; also to Mr. Alexander Hume Ford and his staff for their self-sacrificing labour in the interest of all the visitors. Nothing could exceed the kindness and attention shown both to the Hon. Mr. Cohen and myself. We did our best to uphold the credit and prestige of New Zealand, and trust that as a result of our stay in Hawaii some good work has been done in drawing closer the bonds of friendship and goodwill between the peoples bordering the Pacific Ocean. We believe, as a further result, that many Americans will be induced to visit our Dominion.

I am, &c.,

Hon. R. F. Bollard, Minister of Internal Affairs. GEO. M. THOMSON.

APPENDIX I.

MEMORANDUM FOR DEPARTMENT OF MARINE.

SECTION III, Fisheries, Marine Biology, and Oceanography, under the presidency of Dr. Barton W. Evermann, Director of the Steinhart Aquarium, San Francisco, was one of the most active sections of the Conference, both in regard to the subjects discussed and the large attendance of delegates. The following resolutions were submitted and passed by the General Conference :—

RESOLUTION 11.

Whereas meteorology occupies an important position in the safeguarding of commerce and navigation through the dissemination of warnings of typhoons, hurricanes, storms, and general weather conditions; and whereas, for the preparation of forecasts and warnings of adverse weather conditions, it is essential that weather reports be received by radio-telegraph from as many ships at sea as possible :

Be it *resolved*, That this Conference recommends to the various Pacific nations that all ships, while at sea, transmit regular observations of the weather by radio-telegraph to those national agencies already established for the purpose of issuing forecasts of the weather and warnings of storms; and that the sending of such reports from ships to the nearest land radio-telegraph stations be free of tolls, and handled as ships' business.

This resolution, while of a general character, is one which should commend itself to the Minister. If carried into effect it would tend to reduce risks and losses at sea.

RESOLUTION 18.

Whereas the pollution of many coastal waters, bays, estuaries, harbours, and rivers, resulting from the discharge into said waters of oil, ashes, and other contaminating substances by oil-tankers, oil-consuming motor-boats, and other craft, and of waste from shore plants of oil companies and industrial plants of various kinds, has become a serious menace

to sea-birds, surface-swimming fish, eggs, and larvæ, and the plankton upon which useful species feed, and to the bottom and shore life of our bays and harbours, at the same time rendering our beaches filthy, insanitary, and unsightly:

Therefore be it *resolved*, That the First Pan-Pacific Food-conservation Conference expresses the wish and the hope that the properly constituted authorities in the countries of the Pacific enter into correspondence for the purpose of bringing about an international treaty or agreement under which such pollution may be prohibited.

The trouble arising from pollution by oil is practically almost unknown up to the present time in New Zealand harbours. The number of oil-burning steamers is increasing, however, and it is advisable to be forearmed against any future trouble which may arise from this source. In the North Pacific it has already become a serious menace to coastal fisheries, which in some harbours have been completely destroyed, and steps have been taken by the leading oil corporations to reduce the nuisance as far as possible. As, however, the use of oil in steamers is increasing, and as many firms and individuals have no public conscience in such matters, it is advisable that the Dominion authorities should watch the position closely, and should be ready to co-operate in any international action or agreement which would abolish this danger.

RESOLUTION 19.

Resolved, That this Conference recommends to the National Research Councils of America, Australia, and Japan, through their Governments, as well as to the Governments of British Malaya, China, Indo-China, the Netherlands Indies, New Zealand, and Siam, that there be initiated as early as possible co-ordinated investigations into the question of the occurrence and distribution of marine borers, as well as into means of combating such organisms.

Very little damage has been recorded in New Zealand waters by marine borers, but in Australia the menace is somewhat serious. Information as to the occurrence of these animals and the destruction wrought by them in Dominion waters is to be found in an article by Mr. Charles Hedley in the Report of the Australasian Association for 1900, Vol. 8, p. 237, and one by Dr. Chilton in the *New Zealand Journal of Science and Technology*, Vol. 2, p. 3 (1919).

RESOLUTION 21.

Whereas it is known that many valuable species of marine mammals, such as fur-seals, sea-otters, elephant-seals, and whales, and many species of important food fishes, such as salmon and halibut, formerly occurred in the Pacific in such vast numbers as to constitute the objects of fisheries whose annual products were worth more than one hundred million dollars; and whereas nearly all of those great natural resources have been seriously depleted, many of them even to commercial extinction, through greed, short-sightedness, and ill-considered fishery methods; and whereas it is known that small remnants of fur-seal and sea-otter herds, and small numbers of whales and of other commercially valuable species, still remain in certain places; and whereas the rapid recovery of the Alaska fur-seal herd in the short period of ten years from complete commercial ruin to an annual production of more than a million and a half dollars, as a result of the international fur-seal treaty of 1911, demonstrates conclusively the wonderful recuperative power of such depleted natural resources of the sea under international co-operation, and justifies the belief that other depleted fur-seal herds and fisheries can be rehabilitated through similar co-operation among the nations concerned; and whereas it is conservatively estimated that these resources when rehabilitated will yield to the world a regular product of more than half a billion dollars value annually:

Therefore be it *resolved*, That the First Pan-Pacific Food-conservation Conference strongly urges that the various maritime countries of the world, particularly those bordering on or interested in the Pacific, be invited to send delegates to a convention for the purpose of negotiating an international treaty for the restoration, proper utilization, and conservation of the vanishing fur-seal and sea-otter herds and other natural fishery resources of the Pacific; and be it further *resolved*, That this Conference recommends that the Governments of the countries bordering on the Pacific enter into correspondence for the purpose of establishing an International Commission for the scientific study of the biology, physics, and chemistry of the Pacific in the interest of the restoration, proper utilization, and conservation of its vanishing natural resources.

The subject of this long resolution is an important one to all the Pacific countries. In regard to the extreme North Pacific, an agreement come to by Britain, the United States, Russia, and Japan to protect seals on their respective coast-lines has resulted in the restocking of the Pribilyoff Islands, and other places in the Alaskan seas, by seals and other fur-bearing animals. But this agreement only extends to the three-mile limit from the shore: there is no law by which any of these animals can be protected on the high seas.

In southern California a company working from San Diego is at present depleting the seas of whales, and there is no protection, nor any means of stopping the wholesale slaughter which is going on. The destruction of the New Zealand seal-fisheries, and the enormous reduction in the whales in our southern seas, are matters of history. The laws regulating the protection of seals in New Zealand are drastic enough wherever they can be enforced; but there is no legislation whatever controlling the whale-fishery. If an international agreement could be come to by which the destruction of these valuable marine animals could be scientifically controlled, and their protection assured within reasonable limits, there is considerable ground for hoping that the herds of whales in the South Pacific and Antarctic Oceans could be greatly increased. This is a question in which the aid of the League of Nations might be enlisted.

RESOLUTION 22.

Resolved, That it be a recommendation from the First Pan-Pacific Food-conservation Conference to the various maritime countries of the Pacific area that urgent attention be directed to the study of ocean and coastal currents, and to the working-up of data already available, with a view to the elucidation of important problems in navigation and commercial fisheries concerning the countries mentioned.

This resolution, which is of too general a nature to be effective, is of importance from the point of view of fish-distribution. It was suggested after the reading of my paper on "Ocean Currents and their Bearing on the Distribution of Food Fishes," in which I pointed out that apparently the great majority of swimming-forms liberated at the Portobello Marine Fish-hatchery are carried either northwards along the east coast of the South Island of New Zealand or in a north-easterly direction towards the Chatham Islands.

APPENDIX II.

MEMORANDUM FOR DEPARTMENT OF AGRICULTURE.

SECTION IV, dealing with Plant Quarantine, Plant Entomology, and Plant Pathology, was ably presided over by Dr. Charles L. Marlatt, of Washington, Chairman of the Federal Horticultural Board of the United States Department of Entomology. This section dealt with important problems of special interest to the fruit, rice, and sugar producers of the Pacific, and the meetings were well attended, and its discussions were animated.

The following resolutions, Nos. 24 and 25, are of a general character, and are recommended to the notice of the Department:—

RESOLUTION 24.

Whereas it is of great importance to guard against the losses due to insects and other animal depredators, to plant-diseases, and to pest plants or weeds, which in all countries greatly diminish the yields of food crops; and whereas the risk of transfer of plant-pests from one country to another is increasing vastly under the conditions of modern commerce; and whereas the information as to the occurrence and distribution of such pests within the Pacific area is far from being adequate to form the basis for appropriate restrictions on movement of products necessary to prevent the spread of such enemies:

Therefore be it *resolved*, That this Conference, to meet these emergencies and needs, recommends and approves the appointment of an International Crop-protection Committee or Board to promote and co-ordinate the investigations of such crop enemies and related subjects throughout the Pacific region, and when necessary in other regions, such as the West Indies, which have close commercial relations with Pacific countries; and that, on recommendation of the Crop-protection Section of the Conference, the following provisional committee be designated to organize such work and provide for its support by the countries concerned, and for the selection of the said International Crop-protection Committee, on nominations of one or more members for each country, to be made by the proper agencies of such countries: O. H. Swezey, E. M. Ehrhorn, H. A. Lee, H. L. Lyon, D. T. Fullaway.

The duties of such International Crop-protection Committee shall be—

(*a.*) To promote surveys throughout the Pacific area for the purpose of acquiring information as promptly as possible concerning both the known and the probable enemies of crops, and also concerning the parasites and other agencies which may be useful in the control of such crop enemies:

(*b.*) To encourage research work necessary for the local control of such enemies, to determine what quarantine action may be warranted, and to develop better methods of inspecting and disinfecting plants and plant products:

(*c.*) To promote the development by each country of larger numbers of trained workers in the general field of plant-pest survey and control:

(*d.*) To obtain agreements and understandings between countries as to giving prompt notification of the appearance of any new and destructive pests, and to secure the co-operation of such countries in the prevention of spread of such pests.

RESOLUTION 25.

Whereas the excellent economic results that have been gained by the transportation of parasites and other natural enemies of injurious insects from one country to another, as in Hawaii, on the mainland of the United States, in Italy, France, New Zealand, Uruguay, Chile, South Africa, the Island of Mauritius, and other places, have fully justified continued and broader work in this direction, and therefore larger expenditures of funds by Governments and smaller organizations; and whereas the transportation and introduction of such beneficial insects, to be successful and free from danger, usually involves technical studies of an enormously complicated chain of interactions of organisms:

Resolved, That this Conference urges all Governments and organizations undertaking work of this character to provide the most expert scientific supervision for such work, to include skilled biologists trained in the study of parasitic and predatory forms of life, and to assist, so far as possible, in the creation of a much larger number of such trained men by encouraging the study in the higher educational institutions of the very numerous problems of natural control.

Resolved, further, That Governments and institutions be advised to arrange their permanent stations intended for phyto-pathological and entomological investigations in such a way as to facilitate international exchange of parasites in every possible manner, and to afford to the experts of other countries who may be engaged in exploration work of this character all possible facilities and assistance.

In presenting Dr. Tillyard's valuable paper on "Insects in Relation to the New Zealand Food-supply," and in the course of my comments upon it, I made the following statement, which I desire here to emphasize: "In the control of insect pests the introduction of parasites should not be left to the judgment of private individuals, however highly qualified, or even of any scientific society. It is a matter affecting the whole community, and no action should be permitted in any case until full discussion leads to a consensus of expert opinion on the subject. The whole history of introduction of animal-life in New Zealand teems with examples of well-meant but misguided activity in this direction."

Previous to my departure from Wellington in the beginning of July I asked Dr. Reakes to specify any points on which I might seek special information at the Conference. Some of these matters I was able to look into to some extent.

In regard to the questions contained in the memorandum submitted to the Director of the Fields Division, on the 3rd July, by Mr. R. Waters, Officer in Charge of the Biological Laboratory, I regret to say that not one of these questions arose in the Conference. Entomologists were strongly represented, but neither bacteriologists nor fungologists were represented.

Mr. J. A. Campbell, Director of the Horticulture Division, drew my especial attention to the attitude of the United States in connection with fruit-fly, mealy bug, and plant quarantine, as affecting the Dominion of New Zealand.

I gather that the position in regard to fruit-fly is as follows: The United States authorities, both in Honolulu and California, are apparently now quite satisfied that there is no danger whatever from this pest from New Zealand. I was not able to ascertain whether any definite communication had been received by the authorities in Honolulu from the Head Office in Washington, but Mr. E. M. Ehrhorn, Chief of Division of Plant Inspection in Hawaii, stated that they had the assurance from the New Zealand Government that as far as apple shipments were concerned there was no fear of any fruit-flies.

In regard to mealy bug, I have a letter from Mr. Ehrhorn, dated 20th August, in which he says: "In our letter to the Pan-Pacific traders, dated 27th May, we called their attention to the insufficient certificate issued by the Inspector, Mr. N. J. Adamson, Ettrick, Otago, as it only certifies that the contents of a shipment of 250 cases of apples are 'free from disease.' No mention is made of insect pests. I am glad to know that the Department of Agriculture in New Zealand has refused to accept any fruit for shipment to Honolulu from orchard districts where mealy bug occurs. . . . As the mealy bug gets into the blossom-end of the apples and pears, you can see that its spread is easily accomplished, as nobody eats the core of the fruit, and wherever this is thrown the mealy bug has a chance to get on to grass or shrubs, and in this way get established. We have a record of twenty-four plants on which the mealy bug (*Pseudococcus maritimus*) will thrive. The other species—*P. comstocki*—has a record of infesting some seventeen plants. You can therefore understand why we are so particular about not allowing fruit infested with mealy bugs to enter our territory."

The subject of plant quarantine received a very considerable amount of attention in the Conference, and I was able to place the New Zealand position before interested members. The opinion was expressed and was voiced by Mr. Ehrhorn that the able officer in Auckland who was responsible for the proper inspection of fruit, imported plants, &c., required more efficient support. I was informed that while a very strong and efficient staff was employed at Wellington, that at Auckland was undermanned. I give the opinion for what it is worth. The Honolulu authorities, at any rate, consider that the position at the northern port wants strengthening.

Preservation of Fruit for Transportation.—A very interesting statement on this subject was made by Dr. P. J. S. Cramer, Director of the Experiment Station of Buitenzorg, Java. The method is merely that of dipping the fruit in rubber latex, allowing the rubber film to harden, and then shipping the fruit as ordinary freight without cold storage. Dr. Cramer has shipped fresh strawberries treated in this way, the fruit holding its flavour, form, aroma, and practically the same stage of ripeness from ten to fourteen days. He has shipped latex-dipped ripe mangos and the mangosteen, which is considered the most delicate of all tropical fruits, from Buitenzorg to L'Acclimatisation Société, in Paris, where the members proclaimed their arrival in perfect condition. In the course of his experiments he took green bananas and dipped them half their length in the rubber latex. The untreated half of the fruit ripened while the "rubberized" half of the bananas remained green.

Rubber latex is common and cheap in most tropical countries. It can be preserved almost indefinitely by adding ammonium sulphate, which retards coagulation. In fact, tanks of preserved rubber latex have been shipped from the tropics to London and New York for the experimental production of various commercial articles, and it has been suggested that there is a wide field for its utilization in various textile-manufacturing lines. Its utilization as a preservative in the shipment of fruits opens up fascinating possibilities for the fruit-farmer. The thin film of rubber on the surface of the fresh fruit strips off as easily as a glove from the fingers, allowing the normal ripening process to continue.

The theory of the new method is that the ripening of fruits is an oxidation process depending on free absorption of oxygen and the exhalation of carbon dioxide. The rubber latex coagulates into an airtight envelope which checks both. It also prevents the growth of mould spores and the bacteria of fermentation, so that the ripening fruit is held in a sort of trance, without any change whatever.

It looks as though this method of preserving fruit might get us over our quarantine difficulties. The airtight rubber "skin" asphyxiates insect pests as well as keeping out rot spores and retarding the ripening process. It may become of commercial importance in the shipment of pears, peaches, nectarines, and plums.

I suggest that your Horticulture Department should obtain some of the prepared rubber latex, and institute experiments with perishable New Zealand fruits. Dr. Cramer would, I am sure, give all necessary information on the subject.

Cultivation of Pineapples and Grape-fruit in New Zealand.—During my stay in Maui I was surprised to find that pineapples were cultivated on a vast scale up to as much as 2,000 ft. elevation. The season at the time of my visit was the hottest of the year, the thermometer in Honolulu (Oahu) and in Hilo (Hawaii) not falling below 73° F., and reaching a maximum of 83°. At an elevation of 1,500 ft. in Maui the mercury fell to 65° at night, but did not rise above 76° during the day; at 2,000 ft. the air was fully a degree or more cooler.

The pineapples grow for three years. In planting them the ground is covered with broad bands—about a yard wide—of thick felted paper, in which holes are made, and through which the crowns (or shoots) of the pineapples are placed. The paper prevents the growth of weeds most effectively, and also conserves the moisture of the soil.

I would strongly recommend to your Horticulture Division to experiment with the growth of pineapples in the warmer parts of the North Island. In the territory of Hawaii the summer temperature is not nearly so high as it reaches in North Auckland, Bay of Plenty, or Gisborne. It is, however, remarkably uniform, the difference between the summer and winter temperatures being comparatively very little. There is also a complete immunity from frost. It may be that this is the chief factor in the success of the Hawaiian pineapples. Therefore, in making experiments in New Zealand, it would be necessary to select localities where frost is never experienced. The pineapples in the Hawaiian Islands are all grown on soils rich in iron, of comparatively recent volcanic origin; such soils are common in New Zealand. The plants do not require a great deal of moisture, and are not dependent on irrigation, as sugar-cane is. I cannot help thinking that it will be found feasible to grow and ripen pineapples in the North Island if suitable localities are selected, and at any rate the experiment is worth trying. Information as to the hardiest varieties could be obtained from Mr. Nicoll, of Paia, Maui; while the felted paper could be got from Pan-Pacific Traders (Limited), of Honolulu.

Grape-fruit.—This citrus fruit, which is apparently a cultivated form of *Citrus decumana* (the shaddock), is very extensively grown in California, from whence it is largely imported into Honolulu. The small quantities which come into New Zealand sell at a prohibitive price. There is no reason why this fruit should not be cultivated in the North Island. There is an excellent market for it, and I recommend experimental work with this species also.

Section V of the Conference, dealing with Animal Industry, was presided over by Mr. Louis A. Henke, Professor of Agriculture in the University of Hawaii. Though not so numerously attended as some of the other sections, it did very good work, and submitted the following resolution to the General Conference:—

Resolution 28.

Whereas the lack of uniformity in the quarantine regulations of the countries of the Pacific region, and the lack of any quarantine regulations regarding the movement of live-stock and live-stock products in some countries, greatly interfere with the freedom of commerce in these commodities:

Be it *resolved*, That this Conference suggest to the several Governments concerned that quarantine regulations relating to live-stock be established in all Pacific countries, and that a joint commission be appointed to promote uniformity in the quarantine regulations of the countries of the Pacific region.

Dr. Reakes, in his communication of the 3rd July, asked for information on several matters in which his Department was specially concerned, and I have endeavoured to obtain such for him. The following were the matters specified:—

(1.) "What view is now held regarding the actual degree of risk to human health involved by the ingestion of milk contaminated by the presence of the bovine tubercle bacillus as compared with the risk of infection from the tubercular human subject?"

As far as I could ascertain from Professor Henke and others, the majority of opinion on this disputed matter is to the effect that when a cow has tuberculosis of the udder there is a strong probability that bacilli will be found in her milk, and that in this way human beings, and especially children with less resistant power than adults, would be infected. Dr. Henke stated that "whether there is any danger from milk of cows which have tuberculosis but whose udder is apparently free from the disease is an unsettled question, for it is always hard to tell definitely if the udder is entirely free. Certainly it is wholly impossible to tell before a post-mortem is performed, and the tuberculine test does not reveal what part of the body is affected."

The following statistics, taken from the United States Department of Agriculture publication on "Diseases of Cattle," 1923, may be known to Dr. Reakes; they refer to figures supplied by various hospitals:—

"Of 63 children dying of tuberculosis at the Babies' Hospital, 59 cases proved to be human infection and 4 bovine—a percentage of 6·3 for the latter. Of 9 children dying of tuberculosis at the

Foundling Hospital, 4 proved to have derived their infection from human sources and 5 from bovine, or 55 per cent. Of a total of 88 children under 5 years of age who died of tuberculosis, 77 proved to have derived their infection from human sources and 11 from bovine, a percentage of 12·5. Of 787 adult cases, 777 were human and 10 bovine; 153 cases of children from 5 to 16 years—117 were human and 36 bovine; 280 cases of children under 5 years—215 were human and 65 bovine infection."

(2.) "Is there any new information as to an efficient method of treatment of contagious abortion in dairy cows?"

This is dealt with at some length in the publication referred to. No doubt this report is in the hands of your Department.

(3.) "What is the latest information as to the outbreak of foot-and-mouth disease in California? Is the opinion still held that it originated among pigs fed upon garbage removed from a transport? If not, what is the opinion as to its origin?"

The authorities in California are still of the opinion that the disease was introduced into the State from an army transport, the garbage of which was fed to some pigs, and from there the disease spread.

As late as the 28th August a request was received by Governor Farrington, of Hawaii, from Governor Richardson, of California, that the quarantine regulations be readjusted because of the improvement of epidemic conditions on the Pacific coast. At the same date a telegram was received from Secretary Wallace, of the United States Department of Agriculture, stating that he would apppreciate any action that would afford relief to Californian agricultural interests.

In regard to these communications, Mr. A. L. C. Atkinson, President of the Commission of Agriculture and Forestry, stated that Hawaii will not risk the introduction of foot-and-mouth disease in the territory by taking hasty or ill-considered action towards a modification of the embargo against California. He said that while reports from the mainland indicate that the general situation is greatly improved, it is also true that serious outbreaks have been reported, and that the disease has spread to the deer herds in the mountains. Reports show that on the 4th August there was one herd in Los Angeles County in which 178 cattle were infected, and on the 23rd August another herd was found there with twenty cattle, eleven hogs, and five goats infected. In Tuolumne County an infected herd of 800 cattle was reported on the 16th August. Experiments are being made by placing susceptible animals on areas that were formerly infected, and results from the bringing-back of cattle that have been on summer range among the deer are being closely watched. In face of all these facts the Hawaiian authorities are waiting to see how disastrous this phase of the epidemic is going to prove before any radical changes are made in the regulations.

(4.) "What is found to be the best form of treatment for parasitic gastritis in calves?"

I regret that I was unable to obtain any definite information on this subject.

Section VI of the Conference, under the presidency of Dr. P. J. S. Cramer, was very actively employed, but it was chiefly occupied with matters dealing with the growth, harvesting, and distribution of rice in the Orient.

Subsection VIa, dealing with Forestry in Relation to Agriculture, did not meet, but I distributed among interested delegates a quantity of literature supplied to me by the Forestry Department of New Zealand.

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