1890.

NEW ZEALAND.

FLAX AND OTHER INDUSTRIES COMMITTEE

(REPORT OF THE) ON THE WINE AND FRUIT INDUSTRY, TOGETHER WITH MINUTES OF EVIDENCE, AND APPENDIX.

Brought up 12th September, 1890, and ordered to be printed.

ORDERS OF REFERENCE.

Extracts from the Journals of the House of Representatives.

WEDNESDAY, THE 23RD DAY OF JULY, 1890.

Ordered, "That a Select Committee be appointed, to consist of ten members, to consider all matters pertaining to the development of the flax and dairy produce and wine-producing industries; with power to call for persons and papers. The Committee to consist of Mr. T. Mackenzie, Mr. Valentine, Mr. Dodson, Mr. Marchant, Hon. Captain Russell, Mr. Walker, Mr. Wilson, Mr. Hamlin, Major Steward, and the mover; three to be a quorum."—(Mr. BEETHAM.)

THURSDAY, THE 31ST DAY OF JULY, 1890.

Ordered, "That it be an instruction to the Select Committee appointed, on the 23rd instant, to inquire into all matters pertaining to the development of flax and dairy produce and wine-producing industries, to add the fruit industry."—(Mr. HOBBS.)

REPORT ON WINE AND FRUIT INDUSTRIES.

THE Committee to whom was referred the question of the wine-producing and fruit industries have the honour to report,—

1. That the time at their disposal has been quite insufficient to enable them to deal with these industries in the manner that their importance demands.

2. As regards the wine industry, your Committee's investigation indicates that it is capable of extensive development if attention is directed to the subject of vine-culture.

3. That large areas of land of volcanic nature which are now almost unproductive could be utilised profitably in the cultivation of vines.

4. That an area of ten acres in a suitable locality would provide an ample maintenance for a family possessing the necessary skill.

5. That before New Zealand can expect to attain any position as a wine-producing country it is absolutely necessary that steps should be taken to eradicate the *Phylloxera vastatrix* by the total destruction of all vines in infected areas: such destruction would merely be anticipating by a short period the inevitable result of the action of the pest.

6. That, as a means to assist the development of wine-making, the Bill amending the Distillation Act should be passed. This measure enables the wine-producer to make use of the by-products by distillation, the results from which would be used for the purpose of fortifying the wine produced in bad seasons, when the grapes are deficient in glucose, thereby insuring early maturity and enabling the wine when exported to resist the effects of changes in temperature during transit.

7. As regards fruit, it is only necessary for the attention of colonists to be turned to its cultivation in an intelligent and earnest manner to insure the development of a very important industry.

8. The evidence before your Committee shows that it would be possible without difficulty to secure a satisfactory trade in fresh fruit at certain seasons with San Francisco and Europe if carried in cool chambers, which Government should require to be provided in steamers under mail-contracts. It is further clear that with the requisite skill and under proper conditions the colony could export to a satisfactory market nearly all varieties of tinned, dried, and crystallized fruit.

9. The readiest means of directing the attention of colonists to these industries which are specially suited for small-settlement districts, and of disseminating the requisite knowledge, would be by the establishment of fruit-growers associations such as have been formed in various parts of the colony, and your Committee recommend that these associations should be encouraged and assisted by Government, as is done in other countries.

10. In Europe, the United States, and the Australian Colonies the closest attention is being given by the various Legislatures to all subjects connected with the produce of the soil. With a view to the development of production, comprehensive reports are published, under the authority of the several Governments, of the progress of all such industries, and are gratuitously distributed.

11. In concluding their labours, your Committee desire to express their opinion that, to enable the subjects dealt with by the Committee to receive the attention which their importance demands, a Minister of Agriculture should be appointed, whose duty should be to conserve the interests of all industries having their origin in our fruitful soils, and that the department under his control should include experts capable of directing the attention of agriculturists and others to the best means of dealing with insect and other pests, and of utilising generally the products of the soil to the best advantage.

GEO. BEETHAM,
Chairman.

12th September, 1890.

MINUTES OF EVIDENCE.

MONDAY, 18TH AUGUST, 1890.

Mr. GEORGE BEETHAM, Chairman.

M. MURPHY, F.L.S., Chairman of the Canterbury Fruit-growers' Association, examined.

1. *The Chairman.*] You are Secretary to the Canterbury Agricultural and Pastoral Association?—Yes.

2. You have considered for many years the development of the fruit industry in New Zealand?—Yes. I have prepared some notes on the subject for your consideration. [Document handed in.]

3. This is the result of your full consideration of this matter?—Yes.

4. Have you anything further to add to this written evidence?—I do not think so. I have gone very fully into the whole subject. I have been Chairman of the Canterbury Fruit-growers' Association for some time past, and have had every opportunity of gaining information on every phase of the question.

5. We may take it that this written statement of yours would represent the concentrated opinion of your association?—Yes.

6. Is it a large association?—It is not a very large one, but it is doing good work.

7. Have you extended your investigations into the wine industry?—No; our investigations have been entirely with a view to export. I have given in my notes the result of the exports, the cost, and the price obtained for Tasmanian apples, also information as to the best kind of apple-trees to plant. I have referred to the small-fruit industry. If the manufacturers of home-made wine were allowed to sell their wine in less quantities than two gallons it would give an immense impetus to the growth of small fruits. As it is now, manufacturers are prohibited by law from selling less than two gallons. With reference to getting freight, I can bear out the statements you have heard as to the difficulty in getting suitable space in the direct steamers. One of the largest apple-growers in Canterbury last spring had to give up the idea of sending fruit, for want of space.

8. Have you dealt with the question of a cool-chamber?—I do not know that I have. If we had the space the produce would go direct to the ship. Fruit cannot be carried safely except in cool-chambers.

9. It is also important, where practicable, that cool-storage should be provided at the ports?—Yes, for the same reason as it is necessary for butter. I have suggested that one of the means of promoting the industry would be for the Government to collect all the information they can possibly get from the different societies throughout New Zealand. It would be of no use getting it from any one part of the colony alone, because what would suit Canterbury would not suit Wellington, and what would suit Wellington would not suit Auckland. Papers should be obtained from all the horticultural societies, and the information embodied in the form of an essay for distribution. A Fruit Convention was held in Victoria last year, and this pamphlet [produced]—"Department of Agriculture, Bulletin No. 5, September, 1889"—contains the result of the papers read and the discussions that took place.

10. Do you consider that a Fruit Convention on the same basis as this would be of service to New Zealand?—No, I do not recommend it; I think it is premature as yet. What we do want is information, collected and published in pamphlet form for distribution, as to soil, planting, the kind of trees to be planted—practical information as to the mode of selecting the varieties that would suit different parts of New Zealand.

The following are the notes above referred to:—

The Fruit Industry.

(1.) There is a great future in store for fruit-growers in New Zealand, for the reason that the same conditions which favour the dairy industry also favour the fruit-grower. I refer to the difference in the seasons. We can land our fruit in the Home market at a time when local and other supplies are exhausted. The demand is practically limitless.

(2.) The growing of fruit for export should be encouraged as much as possible. Like the dairy industry, it is peculiarly adapted to small holdings, and, indeed, for working in conjunction with that industry. I would go so far as to say that every farmer in Canterbury should have his orchard of not less than an acre and as much more as he could pay proper attention to. Of course orchards must only be planted in suitable soils.

(3.) In view of the probable condition of things arising out of the demands of labour, it is probable that farming on a large scale will in future have to be conducted differently, probably on co-operative principles, and on small holdings, where the labour employed will for the most part be

that of the occupier's family. It is therefore what are called "the minor industries" that should be encouraged. By minor industries I mean such as dairying, fruit, fibre, and fowl farming. I do not for a moment advocate the exclusive cultivation of any one of the above-named industries—at least, to commence with. As time goes on each will take its proper position if judiciously fostered.

(4.) The question as to whether New Zealand farmers can for any lengthened period continue to grow wheat with profit is year by year forcing itself upon those most interested in that business. Wheat ere long will be poured into the Home markets from the vast plains of India at such a price that it is predicted it will tax to the utmost the endurance of New Zealand farmers. This is a matter that may seem irrelevant to the subject under debate, but a little consideration will, I think, show that such possibilities are a further reason why New Zealand farmers and others should be induced to turn their attention to such industries as that of fruit-growing and others referred to. We know that as wheat-growing became less profitable to the British farmer Mr. Gladstone saw a panacea in fruit-growing.

(5.) We also have the example of the farmers of New York State as an instance of wise forethought. Before wheat-growing had extended to the boundless prairies that industry was profitably conducted by the farmers of New York; but the cheaper lands on the prairies and the advent of labour-saving machinery completely revolutionised the business. The farmers of the older States, finding that they could no longer compete, determined to devote themselves to fruit-growing (principally apples). Thousands of acres that were once growing wheat are now covered with profitable orchards. Of course the American orchardist has the advantage of a teeming population at his door, who consume large quantities of his fruit. If this is true of the Americans, it is also true that the New Zealand fruit-grower has the advantage of the difference of the seasons already alluded to. With quick transit, the cool-chamber, and low freights, his position will not compare so unfavourably as might at first sight appear.

(6.) And now as to the best means of promoting the growth of fruit on an extended scale: It appears to me that no better system could be followed in this colony than that which has been adopted by the Department of Agriculture in Victoria. A convention of fruit-growers, invited by the Minister of Agriculture, has met in Melbourne. Delegates from twenty-five societies attended. Papers were read, and fully discussed, on important matters relating to the growing of fruit, its packing and export. Indeed, it may be said that every subject of importance was fully ventilated. These papers, and the discussions thereon, have been printed in pamphlet form, and distributed gratis to those requiring information on the subject. The pamphlet contains 169 pages.

(7.) I am not prepared to recommend that a convention of fruit-growers should be held in New Zealand. Such a step would perhaps be premature. I think, however, that much good would result from the publication of a pamphlet containing a series of papers bearing on fruit-growing in the various parts of New Zealand, which must differ materially owing to our wide range of latitude. The papers might be furnished by the various horticultural and fruit-growers' associations throughout the colony. Full and practical directions should be given as to the soils best adapted for orchards, and the varieties best suited for each district, but more especially with a view to the export trade.

(8.) Information is required on the life-history and the most efficient means of dealing with fruit-pests. This is a most important point, and one which is little understood by the great majority of fruit-growers. It is to be hoped that, sooner or later, our Government will follow the example of Victoria and of New South Wales by appointing an entomologist. There are one or two in the colony, whose services might be engaged intermittently at first and permanently if found desirable after a time.

(9.) Another and perhaps the most potent way of all to encourage the industry would be for the Government to offer a bonus of 2s. per case for parcels of not less than fifty cases which left a fair margin for profit when sold in the Home market. The Victorian Government pay a bonus of 2s. per case for all apples and oranges, &c., exported. And not only so, but they pay a bonus for every acre of trees planted (I believe the sum is £2 per acre for apples).

(10.) A bonus might also be offered for the first five tons of dried fruits, and for canned and bottled fruits as well.

(11.) Producers of fruit must look to the outside world for a market for their goods. It is quite possible that markets may be opened up in quarters of the world nearer than Britain, such as the Islands, India, and San Francisco. The manager of the Styx Apple Company sent a small trial-shipment to Rio de Janeiro a couple of years ago, which proved successful. Potatoes were also sent, which left a profit as well.

(12.) A point for consideration is as to whether an agency in London might not with advantage be established, having cool-chamber accommodation for the reception of perishable goods, such as butter and fruit, &c.

(13.) The question as to whether apples can be shipped to the English market from New Zealand has now passed the experimental stage. Several small shipments have been made, which have resulted most satisfactorily to the growers. The Styx Apple Company have during the past three years sent several small lots, which have always left a satisfactory profit, selling at from 14s. 6d. to £1 per case of 40lb. The following varieties of apples were amongst those shipped: Ribston Pippin, Cox's Orange Pippin, Emperor Alexander, Fearn's Pippin, Golden Rennet, Royal Hereford, Pearmain, Prince Bismarck. These varieties all carried well.

The following are the charges for shipment: Cases, 8d. each; paper, 6d. (apples will carry without paper, but they sell better with it); railway charges to Lyttelton, 2½d.; freight to England, 4s. 2d. (equal to 1d. per pound gross); cartage, commission, &c., in England, 1s. 6d.: total, 7s. 2½d. per case. The charges would be somewhat less for large parcels—say, 7s. per case: all over that amount is clear profit.

Mr. York, of Woolston, shipped twenty-five cases in the s.s. "Tainui," consisting of Norfolk

Beefin, Newtown Pippin, Five Crown Pippin, and Lemon Pippin. These apples were picked, and packed direct from the tree—it is a mistake to suppose that they must be allowed to go through the sweating process before packing—and sent by the s.s. "Tainui," in April last. The apples realised £15 13s., and the expenses were £9 9s. 6d., leaving a net profit of £6 3s. 6d., or 5s. per case of 40lb., or 1½d. per pound. The expenses on small lots of fruit are proportionately greater than on larger lines, nor are the prices received so good, as buyers do not care to attend small sales. To produce the best results large parcels—say, five or six hundred cases—should be shipped.

The following returns are taken from a catalogue of a sale of Tasmanian apples sold in London on the 21st April last: Scarlet Pearmain, £1 2s. per case; Beauty of Kent, £1; Newtown Pippin, £1 3s.; Ribston Pippin, £1 1s.; Crow's Egg, £1 2s.; Cox's Orange Pippin, £1 3s.; King of the Pippins, 15s. to 16s.; Gravenstein, 18s.; Golden Russet, 16s. 6d.; Prince Bismarck, 16s. 6d.; Jonathan, 16s.; Alfriston, 15s. to 16s.; Roach Pippin, 14s. Apples sold on the 28th and 29th April: Ribston Pippin, £1 1s. to £1 2s.; King of the Pippins, 18s. 6d. to 15s. 6d.; Cox's Orange Pippin, 18s. to 14s.; Scarlet Nonpareil, 16s. 6d.; English Russett, 15s. 6d.; Roach Pippin, 15s. 6d.; Pearson's Plate, 15s. 6d. to 14s.; Golden Rennets, 16s. A comparison of the prices realised in the beginning of April and the end of that month shows that the prices fall rapidly as the season advances, and that therefore the earliest shipments pay the best.

It will be well for fruit-growers to bear in mind that only the very best fruit should be packed for shipment. The question then arises how best to dispose of the residue. This problem has been solved in Canterbury. The Styx Apple Company have erected a cider plant, and have succeeded in manufacturing an excellent article, which is highly spoken of by competent judges. There can be little doubt but that this beverage will find a ready market in this colony, and will supply a wholesome and a much-needed beverage. It is anticipated that a considerable trade will also be done in Australia.

The following information has been kindly furnished by the manager of the company referred to:—

Cider.—"The very best cider can be made from a judicious blending of different varieties of apples. The great secret is to crush the fruit when thoroughly mellow—*i.e.*, it should be allowed to remain exposed to the sun for at least one month after it has ripened on the tree. A far longer period is necessary to mature late fruit. All well-coloured and well-flavoured apples will make good cider; but large green and pale-yellow varieties must be avoided. It is absolutely incorrect to suppose that good cider can only be produced from apples of no value for any other purpose. The quantity of juice obtainable from a given weight of apples varies with the kind, and, of course, with the amount of pressure. With our machinery we get about one gallon of juice from 16lb. of apples. With the steam-power which we hope to have in use next season we shall largely increase the yield. To produce really good cider great care is necessary after crushing, to check fermentation before the drink becomes too acid for any but a Somersetshire man. Cool cellaring is, I think, almost indispensable. In an ordinary year cider could be produced at from 2s. to 2s. 6d. per gallon—*i.e.*, for first-class, bright, fairly-sweet cider, racked several times. In a plentiful year and with a large demand it could be profitably manufactured and sold at from 1s. 6d. to 2s. per gallon. I should estimate bottling at 3s. 6d. per dozen, including corks, wire, and bottles. Allowing a reasonable profit to the bottler, and for a little waste, 9s. per dozen quarts would be a fair price."

Soft Fruits (small).—(1.) A great impetus would be given to the production of small fruits for the manufacture of light wines if the manufacturers were allowed to sell it in less quantities than 2 gallons. (2.) While sulphurised fruit-pulp is admitted from Tasmania at ½d. per pound, instead of at 1½d. as formerly, there is little encouragement to the growers of small fruits. Public markets in all the large centres of population, for the sale of fruit and all other perishable goods, would be a boon to the producer as well as to the consumer. I notice that a movement is on foot for the establishment of such a market in Wellington.

According to recent statistics there are fifteen thousand seven hundred and seventy-one acres of orchard in New Zealand, of which, say, ten thousand are under apples, which, at 120 trees per acre yielding 2 bushels each, at 1d. per pound net on 80lb. = 6s. 8d. per tree = £40 per acre. Thus we may form some idea of the value of this industry if properly carried out.

FRIDAY, 29TH AUGUST, 1890.

Mr. T. KIRK, F.L.S., late Chief Conservator of Forests, examined.

11. *The Chairman.*] The Committee has been appointed for the purpose of investigating the possibilities of the fruit industry, and would be glad of such information from you as would enable us to indicate the best fruit to grow in different parts of New Zealand?—The climate offers so many advantages for fruit-growing that all the fruits of temperate climates may be readily cultivated; and there is this peculiarity, that the fruits of warm and temperate climates will come to maturity side by side, such as the apple, pear, plum, and cherry. There is another advantage which we owe chiefly to our climate, and that is, that the poorer soils of the North are available for the cultivation of apples and pears. Should this industry be undertaken on an extensive scale a large export would speedily ensue. Owing to the difference in seasons allowing us to send the choicest ripe fruits to the wealthy markets of the chief cities of Europe and America at a time when these markets are exhausted, it would not be easy to overstate the demand that would arise. The feasibility of this has been proved to a certain extent by small shipments, which, when carefully packed and properly selected, have invariably secured good prices. Oranges will ripen freely from the North Cape to the Lower Waikato. Lemons have a somewhat wider ranger. Limes will also ripen freely. The demand for this fruit is increasing all over the world, and the supply is not

equal to the demand at the present time. Olives may be cultivated in suitable situations from the North Cape to Drury. In Europe the olive requires a long period before it bears fruit; but in New Zealand two-year-old trees will fruit the fourth or fifth year from planting, but of course some years must elapse before they yield a maximum return. Trees 5ft. and 6ft. high may be seen laden with fruit now. The walnut and Spanish chestnut are valuable alike for their fruit and their timber. Both commence to fruit at a very early age in this colony, the contrary being the case in Europe and America. For small fruits, such as gooseberries, currants, and strawberries, the supply is not generally equal to the demand, although in some localities it is rather in excess. In Auckland strawberries commonly sell at from 4d. to 6d. per quart; I have never known them under 1s. in Wellington. I do not recommend the cultivation of the banana for profit.

12. For what reason?—The temperature and sunlight are not sufficient. In the Kermadec Islands, six hundred miles nearer the tropics, bananas are not of first-rate flavour. There is too much moisture in the atmosphere.

13. You have mentioned that pome fruit are suitable to New Zealand: will you give us any information as to the best variety to grow?—It depends so much on locality, and on the objects for which they are grown, that I could scarcely do that off-hand.

14. I mean chiefly for export purposes: can you give us any information on that point?—I could hardly do that off-hand. I should like to consider the question. I shall prepare a statement on that subject for the Committee.

15. Can you tell us why it is that large quantities of fruit are brought over from Australia and Tasmania to New Zealand?—We do not grow sufficient here.

16. Is it because fruit grows more readily in Tasmania than in New Zealand?—Not in any way. I can say, as a matter of fact and observation, based on long experience, that fruit grown in the Waikato, where I tasted it, is equal to any grown in any part of England. No country grows better apples than England, but I am sure we grow quite as good.

17. You have told us that the poorer soils of the Auckland Province are quite capable of producing fruit in large quantities?—Yes.

18. Do you allude to the white clays north of Auckland?—Yes.

19. Do you think the volcanic soil south of Auckland, in the Waikato and other places, is equally valuable?—Yes; the pumice soil grows splendid fruit.

20. Do you think the pumice plains of Taupo would be suitable for fruit-trees?—They are suitable for both fruit and timber, if properly treated.

21. Coming further south, do you think the yellow clays here are suitable for fruit-growing?—Some of them. They are not all alike. They vary much in tenacity. Wherever they are fairly friable they will grow fruits well. The Canterbury stiff soil is a splendid vehicle for anything you like to put in it.

22. Does your experience extend to the inland plains of Otago?—Yes. Ordinary fruit has grown very well there indeed.

23. That would be mica-schists?—Yes.

24. With respect to the olive, have you seen trees in a good state of production in Auckland?—Yes, I saw Dr. Campbell's plantation; I paid a special visit to it four years ago.

25. What is the area of that plantation?—I think it is over 20 acres.

26. Entirely devoted to olives?—Yes.

27. Can you give us any idea of the present production?—I cannot; I have not been in Auckland during the last three years.

28. What age would Dr. Campbell's trees be?—They must have been six years old when I saw them. Two years ago I was informed that they produced heavy crops, that excellent oil had been extracted, and that the pickled olives were all that could be desired.

29. Was it the common Italian olive or the Spanish olive he planted?—I think he had two or three kinds, but the fruit was not sufficiently advanced to enable me to say anything. There are a large number of olives. Some half-dozen kinds are planted on the experimental grounds at Whangarei.

30. Will you now speak of the best mode of dealing with blight in trees?—It is such a large subject that one scarcely knows where to commence. I produce to the Committee a copy of a report I prepared some time ago, "Fruit-blights, and Diseases of Fruit-trees."

31. Can you tell us whether anything has been done to lessen the evil of the codlin-moth?—A great deal has been done. I think the most efficient plan after all is the old one—fixing bands of paper or cloth around the trunks of the trees, and examining them at intervals of three or four days for the caterpillars.

32. The whole of your experience is to be found in this book?—No, not the whole of it. That was drawn up somewhat hurriedly as a report for the Government. A large number was printed, but it very soon went out of print. The Queensland Government requested permission from our Government to reprint it. That copy was printed in Queensland. Since that time the New South Wales Government has requested permission to reprint it, and it is now being sold by the Government of that colony.

33. A good deal has been already done to keep down the codlin-moth?—Yes, in applying bands and insecticides. When the caterpillar leaves the fruit it falls to the ground, and after a short interval it ascends the tree. It takes advantage of a tuft of moss, a fragment of loose bark, or the fork of a branch for a resting-place, and enters the chrysalis state, spins its cocoon, and passes the winter. By fixing the bands of which mention has been made around the tree, very loosely at the bottom and rather tightly at the upper edge, a suitable resting-place is formed for the caterpillar to pass the chrysalis state in—one from which it can be easily removed. In orchards largely infested by codlin-moths numbers of these chrysalides may be taken in this way almost daily. I think, take it all round, this is the most efficient method of keeping the codlin-moth down. There

are also washes and insecticides that can be applied with excellent effect—for instance, various preparations of arsenic, such as London purple and Paris green. These are applied with a syringe, or by means of a spray-pump, a common force-pump with a long flexible tube, and a peculiar jet which divides the fluid into the finest spray.

34. At what period should that be applied to destroy the insect?—It should be applied before the fruit is formed. The insect deposits its eggs on the ovary when the flower is expanded. By using this wash freely a large number of the insects are killed in the young state. One advantage of the bands is that the insects are prevented from depositing eggs. The washes are most effective at the time the insects are depositing eggs.

35. Is the codlin-moth now in all parts of New Zealand?—In all parts without exception. It is as abundant in Central Otago as it is in any other part of the colony—quite as abundant there as it is in Auckland.

36. No system of management, as far as the removal of trees is concerned, would prevent the evil from spreading?—No. There may be small isolated localities where it is not so bad, but I do not think there is any place that is entirely free from it.

37. *Mr. Dodson.*] When the insect leaves the tree does it deposit eggs?—On leaving the chrysalis state a perfect insect is developed, and eggs are deposited.

38. In the half-grown fruit?—No, not in the half-grown fruit. The matter is a little complicated. We have a native moth that is working considerable mischief in that direction, and it is so much like the codlin-moth that it is commonly mistaken for it.

39. The killing of the larva is to prevent the eggs being deposited the following year?—Yes.

40. Do you think the larva, going up a tree in fourteen days, will then deposit eggs on apples half-grown?—I do not think so. I do not think the codlin-moth does that, but I think the native moth does.

41. *The Chairman.*] Would the band around the tree prevent the spread of the native insect as well?—I do not know the habits of the native moth. I have not been working at that lately. There is another point worthy of notice: the codlin-moth lives very largely upon the pips of the apple. In apples affected you find the pips more or less eaten away.

42. *Mr. Dodson.*] You know of several washes that will deal with the insect when it is ascending the tree?—Yes; there are several well-known washes. Those commonly used are the washes I have mentioned. They are useful only at one stage—early in the spring.

43. But later on you can syringe the trees with great advantage with mild water with kerosene well mixed with it?—Yes. I prefer mixing a little caustic potash with the water. It is not the common washing-soda. You do not use much of it.

44. Caustic potash is made from beach-ashes in America?—It can be largely extracted from wood-ashes. Any woods except pines contain more or less.

45. Do our New Zealand woods contain much?—Some of them; not all.

46. A liquor made of our charcoal-ashes would do?—The wood-ashes placed in a receptacle with water would form valuable wash available at any time for rough purposes.

47. *The Chairman.*] What proportion of caustic potash would you recommend?—I should say from one to two tablespoonfuls to the gallon. It would depend a good deal on the season. When trees are growing very freely you cannot use much of it; the tissues are too soft and succulent. In the winter season you can use it freely. The native moth—possibly there may be more than one—deposits eggs in the apple at a later period than the codlin-moth. I have seen apples that have been infected with the true codlin-moth that have also been visited by two other caterpillars, presumably of native moths.

48. All these insects you mention would suffer from the application of the washes you have indicated?—Yes.

49. Can you give us any information about the slug-leech which destroys the cherry?—It destroys the cherry, pear, and plum, and the walnut also. It can be attacked by sprinkling wood-ashes or fine dust over the tree, but the application needs to be repeated. The best method is to spray the affected trees with a wash of hellebore powder, which should be repeated about the tenth day.

50. What are the habits of the slug-leech?—It is the larva of a fly. After eating the cellular portion of the leaf the leech falls to the ground, and burrows somewhat under the surface, where it passes the winter in a chrysalis state. It emerges in the spring a perfect insect—about the middle of November usually—and deposits its eggs on the leaves of its favourite tree.

51. Where did it come from?—It is of American origin. I do not think there is any doubt about that.

52. *Mr. Mackenzie.*] Does it greatly injure the tree?—Yes; it destroys the leaves, so that the tree cannot make growth. The food of the tree is chiefly assimilated by the leaves. The insect is not restricted to the hawthorn.

53. Have you treated of the scale-blight in your report?—Most of the injurious insects are mentioned in the report. I consider insect pests are not so injurious as fungoid pests. I have dealt with that in the report to a certain extent. There is peculiar difficulty in working out the life-history of fungi. They are far more difficult to deal with than insects. In some cases they infest different trees at different stages of their life-history.

54. What pest do you indicate?—I may mention the so-called fire-blight, which is destroying pears, especially in the North. Entire orchards have been destroyed.

55. Is it a kind of moth?—No; it is a vegetable, and attacks the leaf. I will send specimens in different stages for the inspection of the Committee. It appears first in the form of brown or black specks on the leaf. These develop excessively minute spores to such an extent that the leaf seems covered with a black powder, which is diffused far and wide by the wind.

56. Do the spores attack other trees?—It confines its attacks chiefly to the pear. I have seen other trees slightly attacked by it, but not to any extent.

57. What do you know of the blight that destroys peaches?—That must be looked upon rather as the result of the attacks of a series of fungoid-insect enemies acting upon a weak constitution. The peach has been under cultivation for four thousand years. It is scarcely known in the native stage in any country at this time. The best remedy would be the selection of a suitable stock. In Britain, where the cultivation of the peach is carried on under great difficulties, owing to the unfavourable climate, peach-blight as we understand it is unknown, the trees all being worked on the mussel stock.

58. What is the stock generally used here?—Peaches are generally on their own roots, on or common plum stocks. I went very fully into this question some years back, and I am glad to say one result is that the best nurserymen have introduced mussel stock, and are now working their peaches on it.

59. With the desired effect?—It is rather soon to say that. No case is known where a tree worked upon the mussel stock has been affected.

60. You think the reason generally for the peach failure is that it has been grown on its own stock so long?—Yes, and that its constitution is weakened. At the same time it has many serious fungoid and insect enemies. The fungi especially are very troublesome; but would be of very little consequence if the tree had a good constitution. Just as domesticated animals or human beings when in a weak condition lose the power of resisting disease, so it is with the peach.

61. Do you think the almost continuous growth of the tree itself weakens it?—I do not think so. The wood is very well ripened. I should like to mention that when investigating this matter of peach-blight I was in an Auckland nursery where the seedling peaches 6in. high were all affected by it, all showing signs of weakness. The only trees in that nursery not affected were two which had been imported from England, and were worked on the mussel stock.

62. *Mr. Dodson.*] What about the red spider which is becoming such a nuisance?—I should recommend a weak caustic-potash wash. I never had occasion to experiment with it, but I think that would be sufficient—say a tablespoonful of soft soap thoroughly dissolved in a gallon of water, with a tablespoonful of caustic potash. The fluid should be sprayed on the tree.

63. *Mr. T. Mackenzie.*] Did you devote any attention to the cultivation of the prune?—I have not seen it carried on in New Zealand. It is a matter which might be introduced with very great advantage. It can be grown here; there is no question about that.

64. What sort of plum is a prune?—It is a narrow oval plum. It is to be procured in Melbourne. I dare say it is in cultivation in New Zealand, but have not seen it. There are several varieties cultivated in the south of France. I do not know which is the best. The information could be easily obtained. It is a common industry.

65. Have you considered the question of packing fruit for the foreign market?—Yes. When supplying information to the projected School of Forestry and Fruit-culture at Whangarei I pointed out the necessity of attention to that. It lies at the very base of successful export.

66. What is the best mode of packing?—Our ordinary plan is simplicity itself. The apples without any selection are tumbled into a rough box, nailed up, and sent off. That is considered packing. It is a complete failure for export.

67. You know the system that obtains of wrapping each apple in tissue-paper?—Yes. The choice kinds in America are sorted first, according to their sizes. All imperfect fruit are rigorously excluded. Any apple showing the slightest bruise, or the slightest discoloration, or the mark of an insect, is at once rejected. When sorted according to sizes—I am speaking only of the choicest kind—many of them are wrapped in tissue-paper, and placed in chip or cardboard boxes, the boxes being divided into compartments, so that each apple is kept separate. Usually a showy label covers the whole. Of course this plan is only adopted with choicest kinds; ordinary kinds would not pay for the extra trouble. The chief point is sorting according to size, so that the sample may be uniform. In large quantity they are then packed in barrels or boxes specially prepared, and may be separately wrapped in tissue-paper or not. The two chief points are—selection of only perfect fruit, and packing in such a way as to prevent bruising on the journey.

68. Have you ever seen any packed here on the system you have described?—A few were sent from Auckland to England last year. I heard of the shipment at the time.

69. You do not know what the result was?—I have an idea that it was good, but I do not know the particulars.

70. You think if the best mode were followed we would be able to place our fruit on the English market successfully?—It has been done on a small scale repeatedly.

71. It has not been on a general plan?—No.

72. Have you ever seen apples pitted like potatoes?—Yes.

73. Do you not think some such plan as that might be adopted for our own market?—I do not think it affords any advantage over keeping them in a dry room. Some kinds of apples could be preserved in that way; others could not.

74. Do you think that growing fruit for factories would pay as it does in Tasmania—for the manufacture of preserves?—I think so. Surely, if it pays Tasmania to send fruit to us, it should pay us to grow it ourselves. The following kind of apples are the most suitable for cultivation for export, but experience alone can decide as to which are absolutely the best: Cox's Orange Pippin, Sturmer Pippin, Ohinemuri, Royal Pearmain, Golden Russet, Cleopatra, King of the Pippins, Wyken Pippin, Ribston Pippin, Newtown Pippin.

75. Do you not think that the culture of olives in this country ought to be urged on as a special industry?—I think it ought to assume very large dimensions. It has been a great success in Australia. The demand for olive-oil is increasing from some cause. I am assured that sufficient quantities of the best Italian oil cannot be procured. The following varieties of olives are cultivated

both in France and Spain: Verdal, Boutiniene, Blanquette, Carracquena, Lucca; the three first-named specially for oil, although the fruits are often pickled. The last two are chiefly valued for pickling. Plants can be obtained in the Australian Colonies, and could be procured through any New Zealand nurseryman. In all probability the best results would be obtained by using the weaker-growing New Zealand species as stocks.

76. *The Chairman.*] Will you give us some information as to the culture of the vine?—It has been carried on in New Zealand, and successfully to a certain extent, for very many years. The chief difficulties with vine-cultivation in New Zealand now arise from the presence of minute fungi, which some seasons reduce the plants to such a condition that no fruit can be perfected.

77. That would be called a vegetable growth?—Yes; analogous to, but of a different kind from, the so-called fire-blight which attacks the pear.

78. What would be the best means of getting rid of the difficulty?—I have been experimentally using permanganate of potash as a wash.

79. Is Condy's fluid the same?—I believe it is the chief ingredient in Condy's fluid.

80. How is it applied?—As a wash, sprayed. Sulphur, if applied in the very early stages, is also of great value. It should be powdered on the young shoots, but is almost useless if the disease is allowed to get any standing.

81. You would fall back on the permanganate of potash?—Yes.

82. What is your opinion of the growth of the vine in New Zealand? Are all parts of New Zealand equally capable of growing the vine?—No. I am not so sanguine as to the growth of the vine for wine as some of my friends are. I think we have too much moisture in the atmosphere to admit of any large quantity of first-class wine, except in certain districts. I may remark that even so far north as Whangarei it has been found far more profitable to grow grapes under glass than to grow them in the open air. There are now in Whangarei numerous large glass houses for the growth of grapes for the Auckland market.

83. Is wine manufactured in that district at all?—Not that I am aware of. I have been told it was manufactured there some years back.

84. But if much larger areas were placed under vine-cultivation it would be necessary to manufacture wine to get rid of the product?—I do not know that. I think there is an immense market for preserved grapes. Grapes gathered as ripening and shipped to Europe would have a market. I advocated that some years ago before the Native Industries Committee. Wine could be manufactured in many districts, but whether it would be considered a first-class wine by critics I do not know.

85. With respect to the export of grapes, we should be glad of information on that point?—I cannot give particulars. There is a large trade done in the export of grapes from Southern Europe to the British Islands, and from Southern Europe to the colder countries of Europe.

86. *Mr. Mackenzie.*] Could we compete with Australia in that respect?—The Australians have the advantage, the climate is so much drier. We have so much moisture in the atmosphere when grapes ripen I am inclined to think the sugar does not appear to be properly elaborated. I may point out that grape-growing for wine is often very local—for instance, the Constantia vineyards in South Africa. There are two vineyards in which excellent wine is made, but plants taken from those vineyards to situations which appear very similar have always failed in giving good results.

87. *The Chairman.*] In exporting the grapes how do you recommend they should be packed?—Packed in sawdust—such sawdust as we should obtain from maire or wood of that kind.

88. Would it be necessary to keep the grapes in cool-chambers?—Yes.

89. But not in the freezing-chambers?—No; simply in a cool-chamber. We do not want freezing-chambers for any of the fruits.

90. What is the lowest temperature that would suit the grapes?—I can scarcely tell you off-hand.

91. If it went below 40° would it damage the grape?—I do not think it would be damaged by a temperature of 40°.

92. You think it would be suitably exported in a chamber generally used for butter and cheese?—Yes; I think the grape might even endure a little frost without injury.

93. What information can you give us with reference to phylloxera?—I do not think that insect is identical with the American insect of that name. That point is not exactly material. It is certainly a very serious pest; of that there can be no question.

94. Is there any comprehensive way of getting rid of the vines infected by pest?—The only effectual way would be to destroy them.

95. Has anything been done in Auckland?—Not that I am aware of. I visited Auckland when phylloxera was first reported, but found the vines had been destroyed. I did not see the insect. Very few insects had been saved, and these presented some points of difference from the American insect. It is certainly closely related.

96. Equally destructive?—Equally destructive, I should say, from its appearance.

97. Do you know the wine-growing district of Taranaki?—I do not know any district as a wine-growing district. I know wine has been made in Taranaki, Hawke's Bay, Auckland, and Wanganui.

98. Have you visited all those districts, and inspected the vines?—I have not visited the Wanganui or Hawke's Bay vineyards. The wine manufactured in Hawke's Bay is said to be particularly good.

99. You have not sampled the wines?—I have tasted wines made in New Zealand, but I should not consider them fair samples. I have been assured over and over again that the Canterbury District is an excellent district for wine-growing. I have never been able to see it. I know, at Oamaru, which would seem to be a particularly suitable locality for growing vines, you cannot get fruit to ripen unless the vine is attached to a wall.

100. Could you indicate the class of soil most suitable for growing vines?—I should consider the Oamaru soil very good. I think the Government should give some encouragement and assistance to fruit-growers. I understand that assistance is being given in the dairy industry by sending round a capable expert as teacher. We have many settlers who have commenced fruit-growing, but have really no knowledge of the industry. It is just the same as many small farmers who have commenced dairy work, but know but little about it. I am convinced that if a little instruction were given in this way a great deal would be done towards encouraging the fruit-growing industry. I think it might be given at a very small expense. Then, again, I think there is an actual neglect of public duty in the fact that no attention is paid by the Government towards ascertaining the life-history of fungi and insects injurious to fruit-growers, and making experiments as to the best way of overcoming them. This is the only colony in the Australasian group in which something of the kind is not being done. There should be an experimental station for the benefit of fruit-growers and agriculturists. For instance, the most important matter to which the attention of fruit-growers can be directed at the present time is the selection of suitable stocks for the different kinds of fruit. I am convinced that if a station of this kind had been formed twenty years ago we should have had large exports of many items which are scarcely known in cultivation at present.

101. As far as New Zealand timbers are concerned, it is said that tawa gives a flavour to butter: can you give the Committee any information on that point?—I think it must be a mistake. Either the timber was not properly seasoned, or some other timber was substituted.

102. Do you think the tawa timber can be safely used for butter-kegs?—Yes; it has been used for years with excellent results. The making of butter-kegs is a very important industry in Taranaki. They have a large export of butter kegs and casks to most parts of the colony.

103. From your knowledge of tawa timber, you do not consider there is anything deleterious in the sap of the timber?—Certainly not, so long as the timber is properly seasoned. Any timber would give a flavour if used unseasoned.

104. The same remark would apply to the use of totara?—Yes; I consider totara a suitable timber for that purpose. Kauri has also been used with advantage.

105. It has been said by some witnesses that totara, being a porous wood, drew the flavour out of the butter?—I do not see why it should; it is not what I should consider a porous timber.

106. But from your experience you consider that totara and tawa are the best fitted for the making of butter-casks?—Yes; I do not think you could get many better than tawa. I think that is proved by experience. The manufacture of tawa for that purpose, curiously enough, was commenced in Canterbury, where there is no tawa. They had to get their supplies from the Sounds.

107. Is there tawa timber to be found in the South Island, with the exception of the Sounds?—No; it grows a very short distance southward.

108. You also think the kauri a suitable timber?—Kauri was used very extensively in Auckland. I understood that, when thoroughly well seasoned, it was always used with advantage.

TUESDAY, 9TH SEPTEMBER, 1890.

Mr. R. HOBBS, M.H.R., examined.

109. *The Chairman.*] You have been interested, I understand, for many years in fruit-growing?—I have for the last twenty years.

110. *Mr. Walker.*] What description of fruit?—I have over thirty acres of orchard, principally apples.

111. *The Chairman.*] We shall be glad of any information you may give us on the subject of fruit-growing?—I have jotted down one or two ideas which I thought might assist the Committee. I suppose you recognise the importance of this industry?

112. We fully realise the importance of the industry, and will be glad if you can show us how it may be developed in any way—not only as regards green fruit, but by canning, evaporating, drying, crystallizing, or any other means?—These processes are all carried out upon a very large scale in the United States of America and Canada. I have taken much interest in them.

113. *Mr. Walker.*] In Australia also these processes are carried out?—Yes; but not so much in Australia. I have no doubt that we shall have to adopt all these plans to utilise our surplus fruit, which is bound to accumulate.

114. *The Chairman.*] Will you give us your own experience?—I do not think it is very important that I should give you my own experience, which is on a very limited area; but from information which I have obtained and know to be correct, I can speak with some confidence. I have been collecting information on the subject for a great many years, and on all matters also connected with fruit-growing. I think, therefore, it is only right that I should put those things which I regard as being of the greatest importance before the Committee, and, through the Committee, before the country. For instance, in Tasmania, the importance of the fruit industry is fully recognised by the Government of that colony—certainly far more than by the Government of New Zealand. For instance, as regards the codlin-moth pest, they have endeavoured to cope with the evil by more stringent legislation. The Government of Tasmania also have manifested their interest in the industry by instructing their Agent-General in London to look after all matters connected with the shipment of fruit coming from Australia—that is to say, the questions of freight, cool-chambers, and like matters. In support of these remarks of mine, I quote the following resolution passed at a meeting of the Fruit-growers' Association of Tasmania: It was resolved, "That, in consequence of increased space required next season for shipment of fruit to London, the Chairman be requested to write managers of P. and O. and Orient Companies suggesting that a hold in at least one vessel of each company calling at Hobart next season be lined

with non-conducting material and fitted with exhaust-fan and pipe from cold-air machine, so that a constant ventilation, cooled in the tropics, could be kept up in the fruit, and to ask if this can be done at a cost of 3s. per case to London if this and the Derwent Valley Association will guarantee, say, 20,000 cases for each boat so fitted." And I can furnish the Committee, if necessary, with full reports of the proceedings of these meetings and the statement of Mr. Shoobridge, with whom I am personally acquainted, and who went to England for the purpose of making inquiries into the whole subject. All these things I consider important for us, for they are facts for our guidance in this colony. I think we can very well afford to follow the example of Tasmania in these matters, and there is little doubt we would benefit largely by their experience over there. There are several very interesting facts connected with the grading, classifying, and packing of fruit which ought to be generally known: these are nearly as important as the fruit-growing itself. There is no question about it that the business of growing and exporting fruit, to be profitable, should be conducted upon a pretty large scale. Not but what I delight to see the small fruit-grower, such as the ordinary farmer, having a good orchard connected with his farm. I think every farmer ought to have a certain number of fruit-bearing trees, by means of which he could supply his family with fruit. But as a special industry it must be undertaken upon a large scale to make it pay. The markets of the world are open to us. The American market is a better market for us than even the London market. The shorter distance and shorter time occupied in crossing over to San Francisco are in favour of America: the distance and time are just half what is occupied in getting to the London market. The freight also is one-half of what it is to London.

115. *Mr. Marchant.*] Is there a duty charged on it?—No; not on green fruit.

116. *The Chairman.*] That is in contradistinction to dried fruit?—There is no duty on green fruit.

117. *Mr. Walker.*] But there is on dried fruit?—I think there is. I shipped a quantity of fruit to America, but, owing to want of attention on the part of the officers of the ship, the fruit being placed in the hold—not in a cool-chamber—it sweated, and, although only three weeks in crossing to Frisco, fifty per cent. of it was almost destroyed; but the remaining portion fetched good prices. The fruit was much admired, both for colour and flavour. Regret was expressed that it could not be sent there in larger quantities, for there is almost an unlimited market in the large cities of America, and there is plenty of money to buy it. They would be prepared to take all the fruit we could send them during three months of the year.

118. *The Chairman.*] During that three months of the year, I suppose, they have very little fruit of their own?—They have none. As I have said, the market would be almost unlimited, not only in San Francisco, but in New York and other places, and even in England, to which the fruit would find its way; and it is sent as far as Sweden, so much is fruit sought after at particular seasons of the year. I have here account sales from London, by which it will be seen that the prices obtained are very good indeed.

119. You say the prices are satisfactory?—Yes; very satisfactory: but experience will have to be brought to bear upon the practical fruit-grower to enable him to judge what kinds he should ship. It is a mistake to suppose that the late keeping kinds are those which should be shipped either to America or London. We ought to ship in March, April, and May, so as to arrive in England while the fruit is not ripe there. Cox's Orange Pippin, the Ribston Pippin, the King Pippin, the Gravenstein, the Shepherd's Perfection, the Ohinemuri, are kinds very suitable. I have not gone through the whole list. They have not arrived at full maturity in March, but they are forward enough for us to ship them so as to arrive in London in time to hit the market. After the month of May the small fruit comes in, and that checks the sale of this kind. I have seen even in Auckland American fruit fetch good prices, but when the strawberries come in the demand slackens for American fruit.

120. You say March: what time in March?—About the end of March. We are somewhat behind Tasmania—about a month behind. Tasmania can ship before we can. That circumstance, of course, is rather against us for the English market. It is not the case, however, for the American market: there we have the advantage. I wish particularly to bring before the Committee important information selected from various sources which I have here, having reference to the fruit industry as an industry, relating to the grading, classification, packing, and packing-cases—in fact, everything connected with the business. There is an excellent article in a new work on the subject entitled "California Fruits," which contains the latest information on the subject as to canning, drying, preserving, &c. This article, which is not very long, ought to be printed for the information of people in New Zealand. I think it would be interesting to all fruit-growers in this colony.

121. *Mr. Walker.*] A point I wish to direct your attention to is as to a practical means that we might recommend to the Government for adoption by which the industry might be assisted. What practical help might be given to the industry in making our report to the House?—The Government of Tasmania was requested by the fruit-growing associations there to arrange, in their contracts for mail-services with steamship companies, for a proper kind of cool-chamber, which is very minutely described in their report—a chamber with the air passing through it, and to be kept at a certain temperature; also as to the freight to be paid per bushel for carrying and landing fruit in London. Hitherto it has cost about 7s. 6d. a case on fruit. I think it could be done for 3s. if the Government could be got to interest themselves in the matter.

122. In Tasmania the fruit-growers are a very large and influential body?—They are men, we may take it for granted, who know what they are talking about. I know the extent of the industry there: it is between 400,000 and 500,000 cases.

123. We have nothing of that sort in this country?—Not yet. I have sometimes heard people say, "You have no back country to Wellington." I may say that in passing through I observed a great deal of country very suitable for fruit-growing. All the land about Shannon, in the Manawatu district, appears very fit for the purpose. I have been very much impressed with it.

My opinion is that your climate in this province, also the soil, are well suited for fruit-growing. In Auckland Province we find the sun rather too powerful during the months of February and March for some kinds of apples. I do not mean to say that we cannot produce good fruit in Auckland that will keep.

124. You have often seen American fruit in our own market?—Yes.

125. What has that fetched?—It has fetched as much as 16s. a case of 40lb. That is a high price.

126. When our own apples are not to be had?—I have got them to keep up to October. That is my experience. I have kept them to December; but I have experimented with fruit, and found it not possible to keep fruit in any large quantity beyond October or November, or, at the latest, December. But it cannot be done with profit. I should therefore prefer disposing of my fruit earlier in the season, on account of the loss and waste of apples, which would deteriorate or "spot." It pays me better to sell at a lower price earlier in the season.

127. I am speaking particularly as regards the industry itself: By the establishment of canning-works, in which large quantities of fruit would be prepared for the foreign market—is that a direction in which you would suggest that the Committee should report? What I wish you to tell us is whether that is a direction in which this industry should be developed?—Nothing will pay so well as the fruit shipped in large quantities at the proper times to suit the market. Nothing in the way of canning can approach it, if the prices given in these papers can be realised. These prices are from 15s. to £1 3s. per case.

128. *The Chairman.*] That would suit the New Zealand grower if his fruits are properly selected?—Yes, and properly graded, which is a very important thing for the English market. Each apple should be properly packed in tissue-paper—that is to say, packed in a business-like manner. Proper packing, grading, and brand of the grower has a very great effect in the profitable disposing of fruit, providing it arrives in good condition. But I am also deeply impressed with the importance of canning, evaporating, drying, and crystallizing fruit. As I pass through the towns, even in the Province of Auckland and in the country districts, I see everywhere the bright labels of American fruits, which is a crying shame, seeing what advantages we have for fruit-growing, canning, drying, and crystallizing fruit.

129. *Mr. Walker.*] Do you know a Mr. Blagrove?—Yes.

130. Are you aware that he has been drying fruit by a particular process?—Yes; there are several others who are also drying.

131. Have you seen any of his results?—I have not seen his, but I have seen the results obtained by others which have been exhibited at horticultural shows. I have seen apples, dried by the evaporator, produced and sold in Auckland, quite equal to those turned out in America. I know, as I have said, several others who are producing and evaporating apples—for instance, Mr. Wilson, of the Wairoa, Auckland; Mr. W. Webster, of Hokianga; and Mr. Gubb, of Port Albert, who is a large fruit-grower. Mr. Spawn is not a practical fruit-grower, but he is connected with the evaporating process.

132. *The Chairman.*] Have you turned your attention at all to the production of cider?—No, I have not; but people in Auckland who have done so have not been able to dispose of the cider. They found that whiskey was in much greater demand than cider. Some people appeared to think that the whiskey was better than the cider. I am of the opinion that in the colonies there is not the same demand for cider that there is at Home.

133. *Mr. Walker.*] Do you say they cannot make good cider?—I cannot say that the cider was not good, but I know they could not dispose of it. The "Golden Harvey" is a first-class apple for cider, but would pay better to sell as a dessert apple.

134. *The Chairman.*] You have mentioned £1 2s. and £1 3s. a case being got for apples in London?—Yes; but that was an extreme price.

135. What would be the expense of sending the apples to the London market?—About 7s. 6d. a case.

136. Does that include all charges from the orchard?—Yes; freight and everything.

137. What is the weight of the case?—About 40lb. That would be the highest price—in the month of April. The lowest price is 15s., in May. For Cox's Orange Pippin 18s. is the highest price. These are extreme prices. Of course, we could not expect these prices would be maintained. There are one or two other things with regard to fruit-growing in this colony which I want to put on record. First is the fact that the New Zealand Railway Commissioners do not encourage the fruit industry as it was expected they would do. I think Mr. Walker was one of twenty members who waited on the Government on the subject of encouragement to be given to industries. The result was that a clause was put in the Railway Bill in which the Commissioners were requested not to regard the question of revenue only, but to encourage local industries of this kind. So far they have not done so. Then, the railage rates in New Zealand are nearly double what they are in Victoria; the rates in Sydney are about one-third what they are here. I have the tariff by me, so that I can verify what I say. "Empties" are carried free on the railways in Sydney (Mr. McKerrow has the Victorian tariff). Under the new tariff for August in New South Wales I know that "empties" are put together and sent to the country districts by rail free; they also carry milk-cans, butter-boxes, fish-baskets, and such things free. Even the shipping companies in New South Wales do the same.

138. *Mr. Walker.*] You mean empty butter-boxes, cases, and packages which are used in collecting freight?—Butter-boxes and "empties" for all kinds of produce. I think it will be a terrible blow to us if our steam-service connection with San Francisco comes to nought. I look to America as a market not only for Auckland but for people down South. It will be a better market for our fruit than even England.

139. At certain times of the year?—Yes; it is only for three months of the year that the English market would be available.

140. And the same with America?—The same with America.

141. They would pay well for fruit in America?—Yes, just as well as in London.

142. *The Chairman.*] You mentioned the charges for freight, &c., as 7s. 6d.?—Yes. Of the fruit I sent to America about half was damaged.

143. *Mr. Walker.*] Was that put in a cool-chamber?—No; that was the evil of it. Even if it had been on deck, with an awning over it, the fruit would have come out better; but it was put in the hold near the engines, and evidently without any care bestowed on it.

144. Is it the same treatment in the Direct steamers?—In the Direct boats there is a cool-chamber.

145. Therefore, if you pay double you get more care for your money?—Not merely care, but the right temperature. It takes six weeks from the time of packing the fruit until it reaches London; only three weeks to America—or half the time. The time required for going to the English market is therefore against it.

146. Could you not get some special arrangement made for carrying fruit?—No. That is just one of the things that I would wish the Government to interest themselves in.

147. So as to provide a cool-chamber?—Yes; a cool-chamber which could take your fruit from here or from the South to be shipped at Auckland for the American market.

148. I want to get from you what you would recommend to be done by the Government to encourage this industry practically?—My feeling has been that the people of New Zealand expect Government to do everything. I do not think it is so much a matter of money as of encouragement in various ways that suggest themselves. I think the fruit industry is as well worth consideration as the fishing industry. I know that in Auckland, at the Bay of Islands and in other places, people are trying to do their best, though in a small way at present.

149. *The Chairman.*] Is it that the Government should disseminate information?—As to experimental orchards, we have gone beyond that stage. We have orchardists in New Zealand who thoroughly understand what ought to be done. They can do better than any Government can do for them. Take Mr. Dobie, of Whangarei: he has gone far and away beyond anything that the Government can do. He is a practical illustration of what one man can do.

150. Do you think that means should be at their disposal for subsidies for the development of fruit-growing associations?—I would very much prefer the bonus system—a respectable sum to be given for a particular fruit. These papers will show the Committee the pains which the Government in Canada take to disseminate information. They send special reporters to the various association meetings, who take down the conversation of fruit-growers, and the information gained is distributed in pamphlet form. As an instance of the interest taken by the Canadian Government in horticultural topics, I have picked out the following list from the *Canadian Horticulturist*, showing the various subjects on which gentlemen were requested to speak at the Farmers' and Fruit-growers' Institute: viz., the varieties of apples to plant for foreign market; best time to purchase, plant, and the treatment after planting; the small-fruit garden for the farmers; action of manure on soils; drainage; agriculture as an exact science in Japan; farmers' gardens—size required for a family of eight, what to grow, fruit, vegetables; money in orchards; small fruits—what and how to grow; insect-pests, and way to subdue them; strawberry-culture for amateurs; grape-culture in Central Ontario; growing walnut-trees for shelter, ornament, and for profit; management of grounds around our public schools; horticulture and agriculture on the farm; beautifying the homes; hardiest and best varieties of apples for our northern districts; profit of fruit-growing as contrasted with ordinary farming; causes of failure in apple-growing; pruning trees; manures for the apple orchard; spraying trees; how to pack and ship fruit; importance of the home fruit-garden; small fruits for profit; fruit as food.

151. But the Government cannot do anything without the association: who is to create the association?—I think that at Christchurch there is a sufficient number of men to do something practical. I believe there is a fruit-growers' association there now, and there is a similar body in Wellington.

152. Do Canada, Victoria, and New South Wales give bonuses on exported fruit?—I am not prepared to say. Government in those places have done a great deal towards assisting the fruit industry.

153. Have you thought of the soils most suitable for fruit trees? Do you consider that the poorer soils around Auckland are suitable for growing fruit-trees?—No; not trees that will live long.

154. Would trees flourish in the "home of the kauri," for instance?—I should not like to plant an orchard on such soil. The kauri-tree grows on poor land. I do not think I would be one to take up a piece of kauri land for growing fruit on. Trees in such soil will grow for some time, but they soon become unhealthy. A good strong soil is the best. My orchard is on strong volcanic soil. A good many people in Auckland have been growing fruit-trees in a yellow-clay soil with fair results, but a strong volcanic or alluvial soil is much better. On the clay you must help the trees with stable or other manure. If you want good fruit, and plenty of it, you must have good soil.

155. The Waikato light soils you do not think suitable?—No, I am told not; but still I believe there are some good orchards there.

156. We could not depend, then, upon Taupo district as affording large areas for successful fruit-growing?—No. You see, the New Zealand soil is so patchy. You may have a good piece of land lying close to another piece of very poor land. There may be patches all through the island of suitable soil.

157. *Mr. Walker.*] Have you any experience of walnuts?—My experience of them is not satisfactory, but I believe other people have been more successful.

158. Chestnuts?—I have planted some: they are growing well.

159. Do you know anything about vines?—Not much. I have left that part of fruit-growing to other people, who grow them under glass. In Auckland they find that, taking everything into account, it is better to grow grapes under glass: they get better grapes, and the glass keeps the

birds from them. Mine are all out of doors. I have several kinds which bear well against a wall with a northern aspect. For the benefit of those who have mildew on their vines, I clip the following formula from the *Canadian Horticulturist*, as I know it to be most effective both for mildew and rot: "Sulphate of copper, 2lb.; quick-lime, ¾lb.; water, 24 gallons," applied with a sprayer.

160. *The Chairman.*] Do you know anything of the cultivation of olives?—No. Dr. Campbell has a very large plantation of them at One-tree Hill. I have seen the branches of his trees literally covered with fruit. There is no doubt that in the North, about Hokianga, olive-growing as an industry could be very largely gone into.

161. Is it necessary to have any particular soil to grow olives in?—Not that I am aware of. Dr. Campbell's is volcanic.

162. Would pumice be at all suitable?—No; there is not much in pumice-soil.

163. Did you ever try it?—No; but I have seen the effect of it on fruit-trees.

164. Do you know anything of prunes?—No; I do not. I know that large quantities are produced in Canada. The processes of drying, evaporating, and crystallizing are all described in these books which I now have before me—the *Canadian Horticulturist*. They show that this industry is of great value. It is all described here. It is out of the proper order of things to see so much pulp and small fruit coming here from Tasmania. It should not be when we have such climate and soil of our own suitable to grow all these kinds of fruits.

165. Do you think that, with proper attention, small fruit, such as the raspberrries and currants, can be grown in Auckland?—Raspberries can, but currants will not do in Auckland. I have taken a great deal of trouble, and have had bushes sent me from Tasmania, but I have not found that they would bear well. There is only one man in Auckland (Mr. Collins, of Tuakau) who has been fairly successful in growing currants. The same with apricots: they are not a certain crop in Auckland. I took the trouble of sending to Adelaide for some, but I found them not at all certain.

166. Can you tell us anything of the peach industry? Can you speak as to the loss of peach-trees from blight?—I may say that in America and Canada, where they have taken such great pains to experiment and ascertain the real cause of the blight, they are still doubtful as to the origin of the "yellows" peach-blight.

167. Is it at all analogous with the peach-blight here?—There are different kinds of blight. There is the "curl," as it is called. Some five or six years ago in Auckland the seasons seemed to alter. The spring came in very early, and the fruit-trees came out in bloom, the young buds also coming out. Then there was a sudden change of weather, coming in from the south-east, which seemed to check the sap. Just as in human beings, who become unhealthy when the circulation is impaired, so the trees became affected which up to that time had been doing well. My trees seemed to go into a decline. All the tender young shoots were just as if they had been dipped in boiling water. Since then we have had two or three seasons of the same kind. Last season was different: it was warmer—more like the spring of old times. The consequence is that peach-trees and other trees have grown well, and bear a nice lot of fruit. I have now in my ground a good lot of peach-trees. I have paid much attention to peach-trees of late years. I have been planting the peach-stones and allowing them to grow up without grafting. I believe they will produce as good fruit as grafted trees.

168. Is there not a remedy for these blights?—I recommend manuring the trees well. As to specifics, there has been no result so far as "curl" is concerned; but that is not the only blight. In the autumn some of my peach-trees were affected by a small insect, which developed into a very small fly. I have examined these insects with a powerful lens; they live on the sap of the leaf and tree. I purpose sending some of them to Mr. Hudson, of Wellington, who is writing a book on the subject of insect-pests. I have brought down to this gentleman specimens of the codlin-moth in every stage of its existence. I believe this pest can be combated by syringing with Paris green, and by bandages, which should be removed every ten days. The insects hatch out so rapidly that there are no fewer than three generations of codlin-moth in one season. We have proved that by getting the grubs and putting them in confinement. If you want to keep your trees clear of codlin-moth you must examine the bandages every ten days. They should be tied tightly at the top a foot or eighteen inches from the ground, and given plenty of room at the bottom, where the grubs can creep up and secrete themselves.

169. That pest is all over the Auckland District?—Yes, pretty well; although there are some places where they have not reached as yet. Here are a number of formulæ for preparing and using blight-curing washes, which I have extracted from this book, "California Fruits." I know them all to be effective:—

"*Winter Washes for Deciduous Trees.*—Oil-and-alkali wash: 1¼ gallons whale-oil, 25lb. sal-soda. Dissolve the sal-soda in 25 gallons of water, and heat it to boiling. When boiling pour the whale-oil in. Apply the wash when cooled to 130° Fahr. The whale-oil forms a kind of emulsion, most of the oil remaining free. After allowing this dose to act for three or four weeks apply a wash of alkali, employing either of the following caustic solutions in this proportion: 1lb. concentrated lye (American), of 80 per cent.; or ⅘lb. of Greenbank powdered caustic soda, of 98 per cent.; or 1lb. of solid caustic soda, of 76 per cent.; or 1½lb. of solid caustic soda, of 63 per cent. These varying proportions are given because the caustic soda in the markets are of different strength and purity. Whichever one is chosen, add to each amount named ½lb. of commercial potash, and dissolve in 6 gallons water. One advantage of using the potash with the soda is that the former collects moisture and keeps the compound acting, when the soda alone would dry and crystallize and cease working on the scale. The object to be obtained by using the caustics after the sal-soda and whale-oil is to saponify any oil that might have remained on the tree, and which would have a tendency to clog the pores of

the bark. If but one spraying is to be given, use the soda-and-potash wash or the whale-oil and sal-soda separately; but in badly-infested orchards a combination of the two is commended.

"Whale-oil soap and caustic: To this mixture of soda and potash for deciduous trees perfectly dormant ¼lb. of whale-oil soap can be added to each gallon of the solution with advantage.

"Salt-and-lime wash: The following was first commended by growers in the San Joaquin Valley, and has recently been widely used: 25lb. of unslaked lime, 20lb. of sulphur, 15lb. of salt, 60 gallons of water. To mix the above, take 10lb. of lime, 20lb. of sulphur, and 20 gallons of water. Boil until the sulphur is thoroughly dissolved. Take the remainder, 15lb. of lime and 15lb. of salt; slake, and add enough of water to make the whole 60 gallons. Strain and spray on the trees milk-warm or warmer. This can be applied when the foliage is off the tree, and will have no injurious effect on the fruit-buds or tree whatever.

"*Summer Washes for Deciduous Trees.*—Sulphide-of-soda wash: Dissolve 30lb. of whale-oil soap in 60 gallons water by heating the two together thoroughly. Then boil 3lb. of American concentrated lye with 6lb. sulphur and a couple of gallons of water. When thoroughly dissolved it is a dark-brown liquid, chemically called sulphide of soda. Mix the two—the soap and the sulphide—well, and allow them to boil for half an hour. Then add about 90 gallons of water to the mixture, and it is ready for use. Apply it warm, by means of a spray-pump. Used warm its effect is better, and less material is required, than when cold.

"Resin soap: Ingredients for one barrel of 50 gallons (measure). Weight, about 450lb. to 500lb. Ten pounds caustic soda, 98 per cent; 10lb. potash, 40lb. tallow, 40lb. resin. First, dissolve the potash and soda in 10 gallons water. When dissolved place the whole amount in the barrel to be used. Second, dissolve the tallow and resin together. When dissolved, add the same to the potash and soda in the barrel, and stir well for five minutes or so. Leave standing for about two hours, then fill up with water, stirring well as every bucket of water goes in. Use, the following day, 1lb. to the gallon of water. Apply warm.

"Kerosene emulsion: Five gallons best kerosene oil, 150° test; 1½lb. good common soap, or bar and half of soap usually sold as pound packages, 2½ gallons water. This makes the emulsion. When using, dilute 6½ to 7 gallons of water for each gallon of oil, and to this mixture add 2½lb. of good home-made soap dissolved in boiling water. All this mixing is done with hot water, and applied at a temperature of 140° Fahr. Care must be taken to use best kerosene."

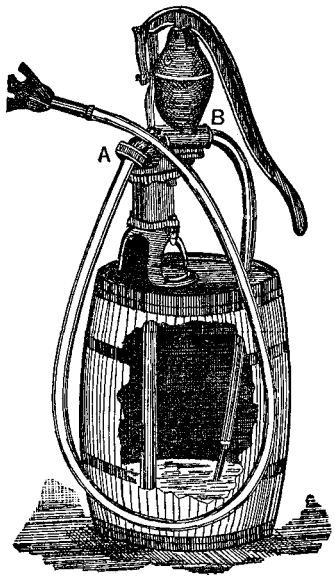
170. Is not the use of poisonous washes, such as Paris green, very dangerous?—I am convinced there is no danger whatever if ordinary care is used. Very exhaustive experiments have been made in America, and the results show there is no danger.

171. Is there any method of quarantine that would be advisable?—That is one of the things that the Government could assist us in. They could pass a short Act as an amendment to the Codlin-moth Act. There is no reason why such an Act should not be as strict in dealing with this evil as you are with your sheep. Any one having infected fruit should not be allowed to remove it off their premises. I have seen the effect of the negligence in this respect: these grubs come out from the towns in boxes of every kind, being by this means brought into all the country districts. It is clear to me there should be some regulations to meet it.

172. What regulations?—A penalty for anybody disposing of or removing off their premises infected fruit or anything containing infected fruit.

173. But you spoke of empty boxes?—All kinds of boxes; not only empty boxes. The boxes are in the first instance taken into Auckland to the auction marts and handed over to the dealers. If they are infected the maggots creep out into other boxes. In this way the pest is distributed all over the country. Recognising the importance of the fruit industry in Tasmania, they have very stringent regulations, and a Board to see that they are carried out.

Witness: In answer to a correspondent inquiring as to spraying outfits, the following cut, with explanation, is given by the *Canadian Horticulturist*:—



In reply to a good many inquiries about outfits for spraying trees, we here give a cut furnished us by Messrs. Johnson and Stokes, of Philadelphia, representing the perfection outfit, which is recommended as being the best hand-power for the purpose, and capable of spraying one hundred trees per hour. This pump is fitted with 10ft. of discharge-hose and a graduating spray-nozzle, the above being attached to the pump at the spout "A." At the aperture "B" is attached 3ft. of return-hose, at the lower end of which is connected a discharge-pipe, so that at every stroke of the pump a small part of the liquid is redischarged into the tank near the bottom of the suction-pipe, which keeps the water and poison well mixed. The pump has a 3in. cylinder, and is furnished with an iron suction-pipe, ready to mount on a barrel. This outfit complete, without the barrel, can be had for $10.

TUESDAY, 2ND SEPTEMBER, 1890.

Mr. JOSEPH SOLER examined.

174. *The Chairman.*] You are very much interested in the vine-culture?—Yes.

175. You have been accustomed to grow vines for many years?—I have been growing vines for a period of twenty-five years in Wanganui, and I have been growing vines in Tarragona, Spain, before coming to this colony.

176. Will you give us a short description of your vineyard and your process of vine-growing?—I first went to Victoria, and them came to New Zealand. When I arrived at Wanganui I saw that the climate was more suitable than that of Victoria. I returned to Victoria and obtained some vine-cuttings that I thought would be suitable for the climate of New Zealand. I came back with them to Wanganui, and have been there ever since. After the lapse of three years I began to make wines—not in large quantities—and I have been making wines ever since. The first time I sent wines to the Melbourne Exhibition I got six prizes. I next sent wines to the International Exhibition at Christchurch: I obtained the fourth-class medal. I sent wines to the Wellington Industrial Exhibition, and got another first-prize medal. I also forwarded wines to the London and Indian Exhibition, and got another medal. At the last Melbourne Exhibition I got another medal. I did not get any prize at the Dunedin Exhibition, as my exhibits were too late. What I have said will show what can be done with this industry in New Zealand. With our climate and soil the industry can be carried out on a large scale if the Government would only encourage it and place it on the same footing as in other colonies. We do not want any bonus. If the Government will only give us no more or no less than the other colonies receive we will be satisfied. All we want is for the Government to allow us to distil our own spirits of wine, to fortify our wines, so as to ship them away to other parts of New Zealand. At the present time we have to pay too heavy a duty on the spirits of wine. It will not pay to use it with a duty of £1 4s. a gallon upon it. The following are the best kinds of grapes for wine-making in New Zealand: (1) The Black Hamburg, as one of the finest table-grapes, and very good for mixing with other grapes in the manufacture of wine; (2) the Black July, as an early table-wine; (3) the White Frontignan, as an early table, and good for wine; (4) the Muscat of Alexandria, as a table-grape, and for preserving; (5) the Guzzly Frontignan for table use and for wine; (6) the Chasselas de Fontainebleau, as a table-grape, and for wine; (7) the Traminer Fromentean, as a wine-grape; (8) Black Frontignan, as a wine-grape; (9) the Dutch Sweetwater, good for wine; (10) the Black Burgundy, excellent for wine; (11) Black Morillon, as an early, and excellent for wine; (12) Muscat Hamber, good for wine; (13) Madespill Cort Black, good wine-grape. I guarantee that these are the best description of vines for the purpose stated.

177. What is the character of your soil?—It is a kind of volcanic soil—a white decomposed pumice. The best soil for the industry is pumice-stone. Some condemn it, but I recommend it as being as good as any soil in the world for the wine industry. It is a loose soil, and the vines grow deep down into it.

178. During the first two years do you require a great quantity of manure?—No. In Spain we plant vines in the rocks without any manure. You do not require any manure here for many years.

179. Have you any knowledge of the volcanic rocks of New Zealand?—Yes; I have been in the Province of Auckland, and have seen different vineyards there. Pumice soil is just as good as volcanic soil. The next best soil is sandy soil. Light stony soil and sandy soil are the best for vine-growing. The latter is the better of the two, as the insects have no shelter. There are no holes for them to breed in. The phylloxera, mildew, and black-rot are the three worst pests for the vine. I am not afraid of them myself. We have all sorts of insects in New Zealand. The phylloxera in Auckland is not the real phylloxera, which is a kind of worm, and eats up the roots of the vines. The use of lime and sulphur destroys all insects. By sprinkling a solution all round the vine-roots, the germs are destroyed, and there is no chance of phylloxera forming.

180. Have you any insect-pests in your vineyard?—I built a house with 14,000 square feet of glass in it, about three years ago. The vines were infested with the mealy-bug insect, but they are now free from that pest. I destroyed it with a solution of lime and sulphur, mixed with a little turpentine. Flour of sulphur applied to the vines with a pair of bellows destroys mildew. The first time to apply it is when the vines begin to blossom, the second when the grapes are half-grown or little more, and the third time when they are just colouring. If you use sulphur in the open air and rain falls the same day, you have to apply the sulphur again; but if you have a couple of dry days you do not require to do so. I have over two acres of vines in the open air, and the grapes ripen all right.

181. What yield do you get?—I grow 20 tons of grapes from the 2½ acres.

182. *Mr. Walker.*] You run them out on frames?—Yes.

183. How do you raise your cuttings?—I take cuttings from my own vines.

184. Is it possible to get any sort required?—Yes. If I receive twelve months' previous notice I prune so as to make cuttings. In the summer-time I cut the tender shoots, but if I receive notice I save them for cuttings.

185. *The Chairman.*] Do you make any charge for your cuttings?—Just enough to pay expenses.

186. *Mr. Walker.*] You have not got the phylloxera?—No.

187. *The Chairman.*] If you had a market it would pay you better to grow grapes for the table than for making wine?—In one way it would pay better, because you get ready cash, but it pays better making wine in the long-run. In the latter case you have to wait eight or nine years before you get your money back.

188. What did it cost you to put in an acre of vines?—I cannot say exactly: so much depends on how you train the vines. The best way to train vines is against wire fences 4ft. high, with two wires 2ft. apart. The vine is planted near the post, and shoots are led along the wires. They thus get the full benefit of the sun, and ripen better than in any other way.

189. What would it cost you per acre to plant vines and arrange the frames?—It would be impossible to tell you exactly now. I have got tons and tons of wire in the 2½ acres.

190. What wire do you use?—Galvanised fencing-wire is the best.

191. Do you find the wines strong enough without fortifying?—Yes, if allowed time to mature. I have to wait seven years before I introduce the wines to the public. It requires age to create a body. There is considerable loss from evaporation when in the casks. I have often wine nine years old, and have to pay property-tax every year upon it. The wine industry is not encouraged in this country—it is too heavily taxed.

192. If you wanted to sell your wine within two years from production you would have to fortify it?—Yes, because a sufficient body of alcohol is not naturally created in that time.

193. Were the wines for which you took prizes kept eight years?—Yes, of course. I keep the wine to create the alcohol naturally.

194. *Mr. Walker.*] What class of wines do you find pays best?—Port, Constantia, Moselle, sherry, Verdillo, and Muscat. I have discontinued making sparkling wines for the present, as it takes all my time to make the still wines.

195. If the Distillation Act Amendment Bill were passed you would fortify the wines by the spirits you produce from your own wines to put them in the market so much earlier?—Yes; that is the position.

196. You would save in that way the six years' property-tax?—Yes.

197. *The Chairman.*] You have examined this Bill?—Yes. I agree with the Bill, except, I think, 40 per cent. alcohol is too high.

198. You think that 40 per cent. is a large proportion of alcohol to put in the wine?—Yes, it is too large a proportion.

199. What would be the percentage of alcohol in the wines you sent to the Exhibition?—Between 18 and 20 per cent. The alcohol was created by age.

200. Do you put sugar in the wines?—I use no sugar except in sparkling wines, because for them I have to pick the grapes when half-ripe; but sugar is not used in the still wines. The alcohol varies according to the dryness and warmth of the summer. Last year and the year before were the two worst years I have experienced since I have been in New Zealand. The weather was too cold, and there was not much sun.

201. What was the lowest percentage you had of alcohol?—The year before last there was about 8 per cent., and last year 11 per cent. Some years it ranges from 18 to 20 per cent.

202. Have you turned your attention to growing raisins from your crops?—Yes. I can make very good raisins in dry seasons. As good raisins can be made in New Zealand as in any other country, but the season must be dry to do so.

203. Have you made any quantity?—I have tried the experiment, but never grew raisins specially for the market in New Zealand; I made large quantities in Spain.

204. How many gallons of wine would 20 tons of grapes produce?—Every 500lb. of grapes produces about 30 gallons of wine.

205. You have travelled over New Zealand and have seen different vineries?—Yes: I have been to Nelson, I have travelled from Wanganui to Auckland, up the Wanganui River to Jerusalem, and other places. Along the Wanganui River is the best part of New Zealand for growing vines. It is exactly the climate we require for this industry. Some years ago I bought seven canoe-loads of grapes from the Maoris. They came from Jerusalem, where vines had been planted by the French missionaries. These were as good grapes as are grown in any part of the world for wine-making. They cost me 2d. a pound. The Auckland climate is also very good.

206. You consider that if this Bill is passed you can make wine-producing at Wanganui a profitable industry?—Yes; if we are allowed to fortify the wine the industry will extend. The Government will lose nothing by it.

207. If stills were allowed would there not be some illicit distillation?—They would have to be very strict; there is a hundred-pound fine provided for. It would not pay any one to do anything wrong.

208. I suppose it would be a great advantage to settlers in the districts you mention if there was one large factory for manufacturing wine?—Yes. Several gentlemen have spoken to me, and I believe if this Bill were passed a company would be formed which will buy all the grapes produced in the country. We cannot put the industry into a company until this Bill is passed.

209. Would not vines grown in different soils and different climates make a difference in the flavour of the wines produced?—Yes; it is the soil that makes the quality of the grape.

210. In making a certain class of wine you would buy grapes only from a certain district?—If the soil and grapes are of the same quality you can buy from any district.

211. *Mr. Walker.*] Do you know anything about olive-cultivation?—Yes; there are millions of acres of olives at home (Spain).

212. Have you ever tried growing olives in New Zealand?—My father sent me two hundred trees three years ago, and they are now about 3ft. high. They should bear in about two or three years from now.

213. Do you know anything of the locust-tree?—The locust-tree is a great thing in Spain, where we call it a "garob" or "garoba," and use the fruit for horse- and cattle-food. They would be a great thing in this country.

214. How old are the olives before they bear?—It is according to their quality. Some about six years, some eight years old.

215. *Mr. Mackenzie.*] Are you in favour of growing prunes?—Yes; this is the best country in the world for growing prunes. I never saw better prunes in Spain, France, or Italy than I have grown myself in New Zealand for the market. I rented an orchard from Mr. W. Paterson, and there are tons of prunes growing there now.

216. Can you get a market for all you grow?—Yes, if you have dry weather; but wet weather spoils the fruit for the market.

217. How much wine do you sell in the year?—It depends upon the season. I make about a hundred casks of wine every year, each cask containing 30 gallons.

218. Does it really pay to produce wine?—It does not pay at present. Should the Bill referred to pass, it will pay.

219. It only pays to make wine for New Zealand?—It would pay well to send wine to France or any part of the world.

220. Could you compete with Australia and California?—Yes.

221. You say you pay 2d. or 3d. a pound for grapes?—Yes.

222. In California grapes are sold at £1 5s. or £1 10s. a ton. If you have to pay so much more for your grapes how can you compete with such countries?—Of course we have to sell the wines at a higher price. We have to pay more wages here. When more grapes are grown we shall pay less for them, and be able to sell the wine at a cheaper rate.

223. If the Government encourage the industry by the passing of this Bill, you think it will be a success?—Yes, of course. I speak from practical knowledge. I have been making wine for twenty-one years in Wanganui, and for many years before that in Spain. In fact, I have been at it all my life.

Mr. W. H. BEETHAM examined.

224. *The Chairman.*] You have had some experience in growing vines?—Yes; for the last seven years I have been growing vines. I planted a vineyard seven years ago—a very small plot, the eighth of an acre—and the success that attended my efforts makes me believe that over a very large area of New Zealand the vine can be cultivated profitably, and an excellent wine could be made. I think that the average strength of New Zealand wines, if the right kind of grape were planted and the right situation chosen, to judge from the little knowledge that I have gathered during my sojourn in France, would be about from 10 to 12 per cent. of alcohol. In an exceptional season it might reach 14 per cent. In Bordeaux, where there are the best vineyards, the grapes in an exceptional season produce up to 15 per cent. of alcohol. These are the light natural wines. The strong wines, such as port and sherry, are not grown so far north as Bordeaux, or in any country where the light wines can be produced. The stronger wines, port, sherry, and liqueur wines, are grown in the south of France and in Spain. Even in those countries, where the heat is much greater, and the maturity of the grapes is superior to what it would be in the other countries, it is very rarely they get natural wine that comes up to 20, 22, or 23 per cent. of alcohol. The process of making these strong wines is by evaporating a portion of the juice, adding it to the remainder, and then fermenting it. The quantity of sugar required in the juice of the grape to give 1 per cent. of alcohol would be about 2½oz. per gallon. A little more than 1½lb. of grape-sugar per gallon would give a wine containing 10 per cent. of alcohol. These are approximate figures; I do not say they are exactly accurate. A wine containing 10 per cent. of alcohol is an excellent wine to drink with your dinner, when you can drink a bottle without doing you any harm. You will have absorbed in your system a small wineglassful of spirits. Now, I think the wine to encourage in New Zealand—and I think it could be grown upon a very large area—is a wine ranging from, say, 8 to 12 or 14 per cent. It would require technical knowledge how to cultivate the grapes, how to prune, and how to train them. I have tried experiments in my little vineyard, and I find that if a bunch of grapes is 4ft. from the ground it will not ripen, or, if it ripens, it does so very imperfectly; but if, instead of 4ft., it is within 4in. of the ground, it would be a very bad season indeed if it did not arrive at perfect maturity. By growing grapes close to the ground the ground acts as a wall to an espalier. In my opinion every grape of the vine should be certainly within 10in. from the ground. They will then always ripen, they can be kept perfectly clean, and are easily managed. They are perfectly protected from wind; no amount of wind will hurt them. If the grape-culture is to be a success in New Zealand, I believe that is the mode of training them.

225. How do you train them in that position—is it by wires?—I have made a little sketch that will explain my method of training. I plant the vines in lines about 5ft. apart. I allow two branches to shoot up. These are tied to stakes 4ft. high. One of these branches is cut off in the early spring, leaving the two lowest buds. These two buds throw up two branches for the following year, while the other branch is trained horizontally within 4in. of the ground. Half-way between the 4ft. stakes I plant short stakes protruding from the ground from 12in. to 14in. On the top of these a small No. 12 galvanised wire is stretched. To this wire the short bearing-shoots are tied, each shoot producing two bunches of grapes. These shoots are broken off two leaves above the highest bunch. In this way the fruit is kept close to the ground; it ripens, and is easily attended to, and kept free from blight, and from fungus, and insect-pests. I have found dusting the vines with sulphur to be beneficial. In any variety prone to mildew or fungus, about ½oz. per plant of finely-powdered sulphate of iron spread about the roots keeps them perfectly free from mildew. My experience in wine-making is very small. I have seen the process in France, and for two or three years have made some wine; but I should be very sorry, having recommended the vine-culture in New Zealand, to give my wine as a sample of the wine that could and ought to be produced in this country. Firstly, when I planted my vineyard I had no knowledge of the variety of grapes that I was planting. I put in cuttings that I obtained from here and there, and I find that I have twelve different varieties in my little vineyard of four hundred vines. Unfortunately, there is a very small proportion of the grapes that ought to be cultivated in New Zealand. The Black Burgundy grape is a very early and excellent grape. It is the one Mr. Soler recommends. I have very few plants of that kind. If my vineyard had been planted of that kind, my wine would have been infinitely better. The white-wine and the red-wine [samples produced] are from the same grapes, picked at the same time—a mixture of a dozen different sorts. I would represent that the soil of my vineyard is not soil that one would choose to grow good wine. It is a very strong rich

clay, that would grow sixty bushels of wheat to the acre, and not soil suitable to grow good wine. I quite indorse Mr. Soler's remark, that a light pumice country would grow infinitely richer and better grapes for wine-making. A pumice country would grow more saccharine in the grape. A pumice-soil would produce excellent claret. There is one point I would like to impress upon the Committee, and it is this: It would be of great advantage to this country, if the wine-growing industry is to be established, to grow largely a light wine. There would be a hundred times as much of it drunk if once it were established. Where one bottle of a heavy strong wine like port or sherry, containing some 23 to 25 per cent. of alcohol, is drunk, twenty or a hundred bottles of claret would be drunk. Therefore it would in the end pay the wine-grower far better to grow a light table-wine that would be drunk by the gallon, instead of growing and making a wine that would be drunk by the glass. On my small vineyard I saw 1,700lb. weight of grapes—on the eighth of an acre. That is not the crop of grapes per acre that one would expect to grow by planting the vines on the soil they should be planted on. If a third of that quantity were grown it would be an excellent crop, and would pay remarkably well. I think it would be folly to plant vines on land that would grow sixty bushels of wheat to the acre. The value of the wine industry, if it is ever established in New Zealand, will be that it will add a value to land not adapted for grain-growing purposes or pasturage. It would add very much to the value of the poorer and secondary classes of land. The pumice country, which is in many instances very poor, would, I believe, grow an excellent wine. I believe that on a very large area at Napier, the limestone country, over which a mixture of pumice-sand is blown, would grow an excellent wine. Not only is the soil admirably adapted to the growth of the vine, but the climate of Napier is in nine seasons out of ten admirably adapted to the ripening of the grape. It is not only necessary to study the soil, but it is necessary to study the climate. The climate of New Zealand differs, as it does in all countries, but more especially, I may say, in an island like New Zealand, where one side may be cloudy and wet, and on the other coast dry and almost perpetual sunshine. Therefore it would be very necessary not only to choose the right soil, but the right climate. So convinced am I that the culture of the vine, and wine-making, may be made to pay, that I have distributed my cuttings, and given advice as to how to plant and how to attend to the cultivation of the vine, to many people. The process of wine-making is remarkably simple—to make simply a natural wine by fermenting the juice; but it is a process that I would not recommend any man with a few acres to go into. It requires care and attention.

226. And special knowledge?—I do not think there is much special knowledge required, but care and attention; and unless a man had a large area of not less than 50 acres he had better sell his wine into a central wine-making establishment.

227. You gave us to understand that from 8 to 14 per cent. is a good proportion of alcohol in New Zealand wines or continental wines?—Champagne is supposed to contain 12 per cent.; hock, 12 per cent.; Bordeaux up to 15 per cent.; and Burgundy about 14 per cent. I think there must be some mistake in introducing 40 per cent. in the proposed Bill, as it is rather misleading. I have seen the Bill now before the House.

228. Do you consider that a measure of this kind would be of advantage to the wine industry, enabling the wine producer to fortify his wine?—I think that there are many seasons in New Zealand—dull, cloudy summers as there are in France—when the natural juices of wine are very poor in sugar, and a pure wine which would not keep could be made from the juice—from the glucose which forms the alcohol. I think it would be advisable under these circumstances to enable the wine-grower to fortify his wine to the extent of several degrees—from 2° to 4°. If the natural juice would only indicate 6 per cent. he might elevate it to 9, if 8 per cent. by 2, if 10 per cent. by 1, by the addition of the alcohol distilled from the lees. But if an undue proportion of spirits is added to wine it makes a very unpleasant drink—unwholesome, intoxicating, and not a drink to be encouraged. The alcohol in wine should be present without being tasted, in the same manner as garlic should be in all soup, though no one should be able to suspect its presence.

229. Mr. Soler states that some of the wine for which he took prizes at different Exhibitions was as high as 18 per cent.; that would be a good result for naturally produced wine?—I think it is a wonderful result. Australian wines have so astonished the French wine merchants that a wine has been sent Home from Australia, I believe, up to 28 per cent. of alcohol—a natural wine. They simply would not believe it. They said it was a fraud; that it was impossible that natural wine, pressed from the grape and fermented, should produce that amount of alcohol. But it was proved to them to be the case—that the soil and climate were so good, and the grapes were so matured, that this was the actual product of the glucose in the grapes. Australian wines of that quality are never drunk as table-wine; they are too strong; but they are matured in France, and used to augment the strength of inferior wine—wine made from grapes that are very productive but very poor in saccharine. These wines are very valuable for the amount of colouring-matter and alcohol they contain.

230. Do you think it would be advisable for the Government to take this matter in hand and educate the people in the culture of the vine?—I think it is a very important industry, and would add value to a large area of land in New Zealand that is not of very great value at the present time. Anything that adds to the value of land, and to the prosperity of the country and the people, might well be taken in hand by the Government.

231. What variety of grape would you recommend should be cultivated?—I should say the Pineaux Noir or Black Burgundy.

232. Would you recommend any beginner making a vineyard to try a variety of vines, so that he could tell what quality would suit the soil best?—The white-wine and red-wine and champagne can all be made out of the same grape. The best brand of champagne is made from the Pineaux Noir. The difference between the white-wine and the red-wine is this: The red-wine is bruised and fermented in a large vat with the stalk and the skin, which contain the colouring-matter; the white-wine is made by pressing the juice from the grapes directly they are picked; the juice is fermented

in the cask. The champagne is bottled before all the sugar is turned into alcohol. If the sugar is turned into alcohol it is necessary to add a syrup made of the best sugar. If all the sugar had turned into alcohol it would be necessary to put in half an ounce per bottle. If you put in less the wine would not have the proper amount of effervescence; if you put in more it would smash the bottle.

233. *Mr. Mackenzie.*] Do you think we could produce wine here to compete with that of other countries?—I believe that on a very large area of New Zealand the grape could be profitably cultivated for wine-making, either for home consumption or for export.

234. *Mr. Dodson.*] What kind of sugar do yo use for bringing the wine into condition—glucose or grape-sugar?—The ordinary cane-sugar is used for making champagne. If you made champagne of beetroot-sugar it would be most distasteful stuff. Beetroot-sugar is most abominable stuff in wine. You can bring wine up to any strength you like by adding 2½oz. of sugar per gallon to the juice. If it is a bad season, and the juice is very poor with little glucose in it, by adding 2½oz. per gallon you would elevate it 1 per cent. of alcohol up to a certain limit. If you put too much in you make it an unpleasant drink. There should be that harmony between the natural taste of the grape and the amount of alcohol that makes wine a pleasant drink. If you exceed that you have an intoxicating, unpleasant drink.

235. *The Chairman.*] You have made a considerable quantity of cider?—I have made 200 gallons of cider every year for some years.

236. Is this a fair sample of your cider?—It is some I made last year. It was drawn out of the cask and put into the bottle yesterday. It will make beautiful sparkling cider if bottled now.

Mr. W. M. Maskell to G. Beetham, Esq., M.H.R., Chairman of Flax and other Industries Committee.

Sir,— Wellington, 11th September, 1890.

In accordance with your desire, I send you the following on the matters of which we conversed in your Committee-room yesterday:—

1. *The General Question.*

I very strongly urge upon the Committee the necessity of establishing in New Zealand a properly-equipped Department of Agriculture. In saying this I do not at all mean the appointment of a Minister of Agriculture or the creation of a parliamentary department. On the contrary, the thing required is a branch of the public service, in which the head officer should be specially selected for ability and capacity, and should be entirely, or, at least, as far as possible, removed from the interference of members of Parliament, or persons with political objects in view.

New Zealand is not in the least likely to differ from other countries in the introduction and ravages of animal and vegetable enemies to agriculture. It is even probably more likely than many other lands to be subject to such pests on account of the absence of extremes in its climate. Now, if it pays—and certainly the people of those countries think that it does pay—England, France, Germany, the United States, the Cape of Good Hope, Australia, and India to establish fully-equipped agricultural bureaux, common-sense would seem to show that it would likewise pay New Zealand to do so. I very strongly urge, also, that the head officer of the department which I propose should be obtained from some other country. We have not, I am sure, in New Zealand anybody properly qualified for the position. We have several specialists amongst us, but I have no hesitation in saying that no resident in this country has sufficient knowledge of all branches of agricultural science to take charge of an Agricultural Department. An acquaintance with entomolgy, or with botany, or with horticultural or field work, taken alone, is not enough. Here in New Zealand are many insect-pests, many fungoid pests, many enemies to orchards, and gardens, and field-crops, and stove or greenhouse plants, the attacks of which have to be met in a number of various ways. And I repeat that I believe there is no one now in the colony qualified for the position of head officer in an Agricultural Department.

The question whether such a department as that which I propose might not be made to pay, at least, its own current expenses, in the same way as, I believe, the Stock Department does, is one quite within the scope of parliamentary discussion. But your Committee, sir, is not by any means the first which has sat on the question of "enemies to industries;" probably a similar inquiry to yours has been held every year in the last decade. And it may be safely affirmed that, if a proper Agricultural Department had been in existence, no Committees would have been necessary, and many scores of thousands of pounds would have been saved to the colony in the way of improved methods of agriculture.

2. *The Phylloxera.*

I venture to enforce very strongly the recommendation contained in a memorandum of mine on this question, dated, I think, in January last, and which is amongst the papers laid before the Committee. At the time that memorandum was written I knew of the existence of phylloxera only in the Town of Auckland and its suburbs. Since then I know that it exists largely about Whangarei, and I have reason to believe that it has spread to the Bay of Islands, to the Bay of Plenty, and to Napier, if not, indeed, still further south.

I take it for granted that, in the mind of your Committee, the vine industry in New Zealand will be considered as of considerable importance. I remarked to you yesterday that if the growing of grapes in this country is a thing merely on a par with the growing of roses, or camellias, or pansies—that is, merely a luxury—then there is not the least necessity for troubling about phylloxera at all. If this insect spreads and flourishes, then we shall merely lose a good deal of nice dessert fruit, and there will be an end of it. But if, on the contrary, vine-growing is looked on as a probable colonial industry for purposes of making wine, or raisins, or even vinegar, then the recommendation made in my former memorandum is entirely necessary and urgent.

I go still further, and affirm that, if phylloxera has spread throughout, or in many parts of, the Auckland Provincial District, the proper course to be adopted now (and it ought to have been adopted months ago) is to root out and destroy every single vine-plant in that district, and to absolutely forbid the planting of another vine therein for at least four years. This recommendation will not be palatable to many people, and other ideas will, as they have already been, be proposed. Some will advocate delay; some the gradual introduction of what are called "phylloxera-proof," or "phylloxera-resisting" vines; some will cry out about the liberty of the subject; some will make one excuse, some another. It is not for me, here, to argue at length on the point. Let me merely put before you the following very brief considerations: (1.) Phylloxera is more destructive to vines than scab is to sheep. If, in the case of scab, the most thoroughly repressive measures are cheerfully acquiesced in, why should not the same hold good with phylloxera? (2.) There is not in reality any such thing as a vine which is proof against, or even certainly resistant to, phylloxera. I am aware that there is a prevalent notion that some American stocks are valuable in this respect; but there is no certainty on the point, and, as I read the latest authorities, the weight of evidence inclines rather in the other direction. (3.) But, even supposing that some vine-stocks might be fairly relied on, it is imperative that their introduction and use should be a matter of proper system and supervision, and the circumstances in New Zealand are not at all favourable to this. In countries like France, Germany, Italy, the Government is powerful and active: in New Zealand it is neither the one nor the other. In California, again, the people themselves are intelligent enough to band together and take combined action against the enemy. Moreover, the various State authorities give cordial and practical assistance to the people. In New Zealand nobody combines with his neighbour for any useful purpose; all pull different ways, except those who do not pull at all. And, although we have two or three journals ostensibly devoted to agricultural matters, the influence of these is, where not actually mischievous, simply paralysing. Therefore, even if some benefit might be derived from a properly-worked "resistance" system, there appears to be not the least chance of success with it in a country like New Zealand. (4.) Repressive measures, such as inundation, treatment with bicarbonate of potash, &c., are no doubt excellent in their way. But these, again, require to be systematically administered, and some of them are even dangerous to life unless in proper hands. In the absence of such an Agricultural Department as is referred to above, measures such as these would simply be a waste of time and money.

This matter is one of no personal moment to myself. Whatever advice I give is the result of, I think, some fair knowledge of the subject, and apart from any personal interest or selfish aim. Assuming, as said just now, that your Committee will consider the vine-growing industry as one possessing more than a luxurious value to the country, I have felt it as a duty to put the foregoing views before them, and to recommend—(1.) That, in order to deal with the phylloxera, no time should be lost in absolutely destroying, to the last fraction of a root, every vine in the districts where the insect has appeared: and the word "district" here means a sufficiently large area to insure that no infected vine shall escape. (2.) That no person should be permitted to plant any vine in these districts for a period of, say, four years. (3.) That, as soon as possible, in order to deal with the whole question of plant-enemies, an Agricultural Department should be established, under a head officer to be obtained from some older country; and that this officer should have a competent knowledge of entomology, of cryptogamic botany, and of practical field- and garden-work. (4.) That the department so established should be furnished with large powers and considerable freedom of action.

I remain, &c.,
W. M. MASKELL.

MR. SAMUEL H. WEBB, of Auckland, writes, through the Chamber of Commerce of that city, under date 28th July, 1890, relating the difficulties placed in the way of selling New Zealand wine with profit; states that the law at present in force suppresses the industry, which should be one of great importance to the colony, as the climate is most favourable for the manufacture of all classes of wine; and suggests that the law should be amended so as to allow wine manufactured in New Zealand to be sold by the bottle.

MR. L. L. KINGDON, of Omata, Taranaki, writes, under date 25th August, through Mr. Samuel, M.H.R., stating that he is a producer of wine, but finds that the restrictions prevent him from doing so with profit. He forwarded samples of his Taranaki port, which the Committee had analysed, the result being as follows:—

Character: Clear, colour red, full-bodied, pleasant flavoured and sweet. Contains 12·2 per cent. of alcohol by volume. No noxious matters present. An excellent colonial wine: would keep well if allowed to improve with age.

JAMES S. WILSON, of Clevedon, Wairoa South, writes, through Major Hamlin, M.H.R., under date 17th August, calling attention to his process of fruit-drying (Patent No. 3836, New Zealand), and states he finds a ready sale for dried apples at 7½d. per pound; also, that apples infested with codlin-moth, provided they are well grown, can be prepared by his process as well as sound fruit.

VALENTINE BLAGROVE, of Auckland, writes, through Major Hamlin, calling attention to his process of drying and preserving all fruits, vegetables, and fish. States he has a process whereby mussels may be prepared to insure a profitable sale.

COPY of LETTER from CHARLES HOLDAWAY, of Masterton, to M. MURPHY, F.L.S., of Christchurch.

SIR,— Masterton.

I have noticed through reading the *Canterbury Times* that you have taken very great interest in the cure of all blights, &c., affecting fruit-culture. I take the liberty, therefore, of writing to you, giving you my experience of scale-blight, codlin-moth, and currant-moth. I got some valuable hints from letters written by Mr. Geo. Remnant, of Ngatimoti, Nelson, and published in the papers there. I have experimented with his cure, with the best results. I have completely eradicated the scale from my apple-trees, and have had fair success against codlin-moth. My neighbours have allowed their gardens abutting mine to become a hotbed for breeding codlin-moth, but, in spite of that, I have succeeded in entirely saving more than half of my fruit, and the whole has been fit for use, whilst the whole of theirs has fallen off completely useless. Had I an orchard isolated from others I firmly believe that I could have saved the greater part quite free from damage.

My plan is to boil 5 gallons of water, stir in 6lb. of best lime and 4lb. sulphur, boil for half an hour, keeping it gently stirred; then add 2lb. soft-soap and half-pint of kerosene, and boil for a few minutes longer, until the kerosene is mixed with the other ingredients; strain the mixture, washing the thick sediment, and mix with 70 or 80 gallons of water. Spray the trees once in October, after the fruit is well set, and again in November. For codlin-moth add one teaspoonful of Paris green to each 4 gallons of liquid, and spray the fruit once or twice in December, and once in January. For currant-moth spray the bushes at the same time as the apple-trees; the spraying should be done while the trees are dry, because a fine film is formed on the bark by the solution drying; this firmly adheres for months. The liquid is quite harmless to either fruit, bark, or leaves. I have had no experience of *Icerya purchasi*, but if its life-history is anything like the common scale, then by attacking it in its earliest stage, just as it hatches out in the spring, it ought to be killed easily.

Will you please make full use of the above information. I shall feel amply repaid by knowing that it is getting widely disseminated by you and others who take an interest in fruit-culture.

CHARLES HOLDAWAY.

P.S.—My apple-trees were infested badly with red spider, but after spraying with the sulphur and lime they soon disappeared.

[*Approximate Cost of Paper.*—Preparation, nil; printing (2,700 copies), £18].

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