1890.

NEW ZEALAND.

FLAX AND OTHER INDUSTRIES COMMITTEE

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

Brought up 26th August, 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 THE FLAX INDUSTRY.

YOUR Committee have the honour to report that they have taken evidence bearing on the New Zealand flax industry from manufacturers, experts, and others interested in the trade, and have carefully considered correspondence and other documentary evidence laid before them.

2. Your Committee have been much indebted to the able correspondence of the Agent-General, whose evidence, assisted by that of his correspondents, with respect to the present uses of the fibre, points to the conclusion that it is, as at present exported, chiefly used, either alone or in conjunction with manilla, for rope- or twine-making.

3. Your Committee have been much impressed with the rapid increase of the export of the New Zealand flax fibre, and are gratified to observe from the evidence before them that, notwithstanding the serious decline in prices lately experienced—a decline which was equally shared by kindred fibres—manufacturers are apparently not discouraged, but, on the contrary, are still producing largely. It must be remembered, however, that the fibre as now exported is fit only for the manufacture of rope and twine and for such purposes for which manilla and sisal are used.

4. Your Committee, being strongly of opinion that the New Zealand fibre is capable of greater possibilities, think that some steps should now be taken to further the industry; they, therefore, beg to make the following recommendations, viz.:—

5. That the Government should offer a bonus of £10,000 for the encouragement of the flax industry, to be devoted to the following purposes, viz.:—

(*a*.) For a process of flax-dressing which will reduce the cost of production:

(*b*.) For a process which will improve the quality of dressed fibre, making it suitable for textile purposes:

(*c*.) For a mode of utilising the waste products of the industry.

6. Appended will be found regulations, which the Committee recommend for adoption by the Government, under which the bonus can be earned.

7. That steps be taken to establish classification at the port of export, to be undertaken by Inspectors appointed by Government, and that the Government should confer with hemp-millers for the purpose of framing regulations.

8. That, as your Committee regret to find that there has virtually been no inquiry into, or report on, the production of New Zealand flax fibre since 1873, they recommend that the evidence now before them be printed in pamphlet form, and that Sir James Hector's pamphlet ("Phormium as a Fibrous Plant") be reprinted, together with carefully-revised information obtained during the present inquiry, and any additional information that may be procurable with respect to experiments conducted during the progress of the Indian and Colonial Exhibition, or at any other time, in connection with New Zealand flax fibre.

9. That these publications, when printed, be distributed amongst flax-millers and others interested in the industry.

10. Your Committee find that hitherto the flax in many districts has been cut in a most reckless and destructive manner; and, in order to insure a continuous supply of the raw material, it is imperative that some care should be taken in the future. Flax-owners should therefore be strongly urged to give instructions to their cutters to cut in such a manner as to leave the heart of the flax-fans uninjured.

11. Your Committee are further of opinion that, in view of the evidence laid before them, it is very desirable that attention should be given to the planting and cultivation of the best varieties of flax, with a view to the production of fibre of superior quality.

12. That your Committee find that the market-price in London is prejudicially affected by the fact that the contents of a single bale, as well as the several bales of one consignment, often vary very widely; and they desire to draw the attention of flax-millers to the expediency of exercising care in this particular.

13. Your Committee wish it generally known, and therefore embody it in this report, that, from special inquiries made as to the liability of phormium fibre to fire when shipped damp or wet, they find conclusive evidence that it is *not* liable to spontaneous combustion, but that dampness merely has the effect of rotting or so seriously discolouring the fibre as to render it almost valueless on reaching the Home market.

14. Your Committee are of opinion that the above recommendations, if carried out, will result in the flax industry becoming one of very great importance to the colony.

26th August, 1890. GEO. BEETHAM, Chairman.

MINUTES OF EVIDENCE.

FLAX.

MONDAY, 28TH JULY, 1890. (Mr. HAMLIN, Chairman.)

CHARLES CHINNERY, of Rangiora, Flax-dresser, examined.

1. *The Chairman.*] The Committee are informed, Mr. Chinnery, that you are likely to throw considerable light upon the flax question: will you state what your experience has been?—I have had twenty-five years' experience in flax now, and I have worked it all the way through. I have never stopped flax-dressing for the last twenty-five years. I started in a very small way, and worked on steadily until I got into a very large way of business in the flax trade. As to machinery, I find the machinery we have now is equal to what we want for the fibre at the present time. Ordinary machines will dress that quality of fibre for coarse use [pointing to some flax on the table]. I have supplied large firms with fibre for twenty years, and I have made fibre of different descriptions. We do not make our ordinary bales as good as the sample produced; our customers do not want it as good.

2. *Mr. Valentine.*] This is specially prepared then?—It is not specially prepared. I make a certain amount of that quality for show and experimental purposes.

3. *Mr. Wilson.*] It is not a sample of your ordinary work?—No; it is too good; they do not want it as good as that. It would cost about £3 a ton more than ordinary stuff.

4. *Mr. Mackenzie.*] Could you get £3 extra on the cost when selling it?—It is this way, sir: I dressed a bale like that at £30 for the show at Christchurch, and Mr. Donaghy came down there and asked me if I would make up samples for the Dunedin Exhibition, and I told him, as he is a large customer of mine, he could take it for that, but if he gave me any orders it would be £5 per ton more. When they got it they said it was splendid fibre, equal to manila, but they did not want it as good as that, although they allowed it was equal to manila, or better.

5. *Major Steward.*] You said your clients did not want it so good?—It is too good to mix with manila, and if used as substitute for manila the manufacturer could not get so much profit.

6. *Mr. Valentine.*] Do you ship any of the fine flax to London?—I have not shipped any to London for the last two or three years. I shipped some before that. Some fetched £42 a ton; but I have had so much experience with flax that I thought the time had arrived when prices would go down, consequently I stopped shipping and sold in my own market.

7. *Major Steward.*] In point of fact, manila rope largely consists of New Zealand flax?—Yes; and you could pick it all out.

8. *Mr. Mackenzie.*] I understand you have a machine by which you could turn out fibre worth £80 a ton?—I have not finished the machine quite. I am still working at it.

9. You hope to perfect it?—I think I shall. I see no difficulty.

10. And if it is perfected, and fibre comes from it in the state you hope to see it turned out, you think there is a demand for it at £80 a ton?—Yes.

11. For textile purposes?—Yes. I have been informed that this fibre would be worth from £80 to £100 a ton.

12. *Major Steward.*] Is it a fact that you went home some time ago in connection with flax matters?—Yes.

13. While you were there did you ascertain whether the fibre of New Zealand could be devoted to the purposes of textile fabrics successfully if properly prepared?—Yes.

14. And it was for that purpose, I presume, the large price you mention would be obtainable?—The large price would be obtainable for silk and linen adulteration and such purposes.

15. Is there any difficulty in getting rid of the gum which exists in the flax?—The gum is in the vegetable matter in which the fibre is embedded, but by putting the flax into the existing machinery and fining it down it takes it all out.

16. It is best to take the gum out without the use of chemicals?—Yes.

17. Is it not a fact that one of the difficulties of using flax for all Navy purposes—that is, for making ropes for ships, and so on—is alleged to be the circumstances under which the flax is at the present time prepared in the colony—that there is some amount of gum which prevents the tar soaking properly into the rope, and when the tar washes out, in consequence of this, it deteriorates it? is not that so?—Yes; when the fibre is not properly dressed or cleaned. If it is sold as it is sometimes dressed here it is not fibre at all: it would be vegetable matter and rope; in what we call 3in. rope, there would only be 1in. of fibre and two-thirds of vegetable matter. The vegetable matter rots and causes the rope to break.

18. Then, the fibre as turned out at present in the colony is not perfectly prepared?—No.

19. And the flax not utilised to its best possibilities?—No. All my customers have thought my fibre is of a satisfactory quality. I sent 100 tons to America last summer.

20. What was the financial result as regards the price per ton? Did it fetch a better price there than in London, or as good?—I sold it here, but it went to America. Three hundred tons went from the North Island, and I believe it was all condemned in America.

21. Do you know for what reason?—Yes. It was not suitably prepared.

22. *Mr. Mackenzie.*] Not for what?—Not suitable for the purpose it was wanted for—twining purposes.

23. In the market now they are making jute into binding-twines?—Jute is better than bad flax. That same firm said my fibre was very suitable, and they sent me back an order for 500 tons. I have 1,000 tons on order now.

24. *Major Steward.*] You have been experimenting with machinery with a view to getting rid of those difficulties you point out, and to produce flax in a better form?—I have been experimenting to bring the fibre into use for textile purposes. If my machine comes out it will make it 200 per cent. better than the sample now before you.

25. If any bonus were offered by the Government for the production of flax of a certain standard, or the invention of machinery to do this, it would have the effect of stimulating invention, and possibly result in successful processes being developed?—My opinion about it is this: If the Government would offer a substantial bonus for a machine to turn out flax for textile purposes it would be a grand thing for the country.

26. If such a bonus were offered, should it not be for the production of a given quantity of a given standard?—Of course it should. If it were made suitable for textile purposes it would be a very good thing. Fibre would be worth £80 a ton here.

27. *The Chairman.*] Have any number of your machines been in use in the colony?—Yes, my machines are what are called Anderson's machines. I have had my own patterns made, and I have given Anderson liberty to make from my patterns. My machines are equal to turning the fibre out for any purpose except for textile purposes.

28. Are any used in the North Island do you know?—I believe so.

29. Have you seen any of the North Island fibre?—I have seen some this morning on the wharf.

30. Do you consider it is the defect of the machinery here, or what?—It is not the fault of the machinery, but want of knowledge in working.

31. Have you tried dressing flax by the chemical process?—No, I have not. I do not think a chemical process would be any good.

32. Have you any reason to urge why you think that?—I have heard that chemicals always destroy it. A number of people have tried it. It was tried twenty-five years ago in Christchurch with chemicals of different sorts.

33. What was the effect of the trial?—None of the trials came to any good.

34. Does it not tend to make the vegetable matter come away more readily and leave the fibre cleaner?—Yes; but I can take all the vegetable matter off without chemicals.

35. Have they not a process of steeping the green leaf in a chemical solution for the purpose of removing the vegetable matter?—I could not say. I do not think that would pay; it would take such a large quantity of chemicals.

36. You have made no practical test of it yourself?—No; not with chemicals.

37. *Mr. Wilson.*] Have you had any experience as to the condition in which flax is shipped generally, as to its wetness, dryness, or otherwise—its fitness to be put on shipboard?—No, only my own.

38. Are you of opinion, if flax were shipped in a damp condition, that there is any danger of heating or firing?—No, none whatever. It has been tried in different places to my knowledge—damped flax being dumped as hard as it could be and stowed away as a test. I do not care how you put the flax together in a damp or bad condition it will not fire; it is not like wool.

39. You do not think it is even like hay?—No.

40. If hay is put together not sufficiently dry it will fire?—Hay will, but flax will become rotten if put together in a damp or unfit condition.

41. The danger of shipping flax in an unfit condition would not be, as regards its sufficient dryness, that it might take fire, but that the flax itself would be deteriorated?—Yes; rendered useless.

42. Is it not a fact that a great deal of flax was shipped from New Zealand during the recent boom in an improper condition?—There is no doubt about that.

43. You know that of your own knowledge?—I went to one place—it was at a mill—I saw them pressing the flax, and I took a hank, and could wring the wet out of it. I told the person at the time that the fibre would be rotten at the journey's end. He said, "It does not matter; they will give me a good advance on it."

44. *Major Steward.*] That being so, is it or is it not a fact that the arrival in London of considerable proportions of shipments in such a condition as this would tend to keep down the market-price of flax generally?—It would.

45. Would it be desirable, do you think, that some arrangement should be made whereby flax could be inspected by some Government Inspector before shipment, to grade it as it were?—I have heard different arguments about inspection. Some people think it ought to be inspected at the shipping ports, but I disapprove of that altogether. If the Government want to inspect the flax at all it ought to be done at the mills before being pressed up. I do not see how you are going to inspect the flax when it is packed up and sent to the shipping port.

46. If any system of inspection could be devised, would it be an advantage to the honest manufacturer?—It would to a great extent, because the people who did not dress it properly would not be allowed to send it away.

47. Flax certified by the Government Inspector and bearing the Government brand would command a better price in the London market than the flax which is now sent at a risk?—The buyers would have to get confidence in the Government brand before they would be satisfied with it. My flax would sell anywhere. I have worked it up for twenty years. My brand is known wherever the fibre is sent, and my trade has increased now to nearly three times what it was twelve months ago.

48. On the whole, it would not be desirable, in your opinion, to have a Government inspection?—No; but if there was an inspection it should be done at the mills.

49. You have said that flax prepared by the scraping or hand process used by the Maoris many years ago is suitable for the manufacture of linen, and would command from £80 to £100?—Yes; if dressed to a similar colour, but by different process.

50. Do you think, from your experiments in machinery, it would be possible to devise a machine which would be able to turn out fibre scraped in the way the Maoris used to do it by hand?—The way I shall construct my machinery will be to suit all purposes. I intend to bring it out suitable for any use.

51. Would there be much additional cost in preparing the flax so as to be suitable for textile fabrics?—No; I should think there would be very little additional cost. The machinery must be made suitable to begin and finish the work without any handling; and therefore it will do away with an enormous lot of expense and labour.

52. You mean to say you would put the green leaf after it is cut into the machine, and that you could turn it out, by regulating the machine, in a condition fit either for rope-making or textile fabrics?—Yes.

53. Ready for export?—Yes.

54. *Mr. Mackenzie.*] Have you ever grown flax?—I have cultivated a few knots in the garden.

55. You have never grown it to see how much it could be grown at per ton?—No.

56. All the flax you have used has been from ordinary natural growth?—Yes.

57. Do you think it would pay to grow flax?—Yes; I think it would pay. We are glad to give £1 2s. per ton for green flax down about our part.

58. I want to get at this: Could we go in for flax-growing as an industry; to cultivate it at £1 2s. per ton?—I have studied a great deal the growth of flax. I have three knots planted in my garden, and in the latter part of last August I cut one for experiment. The others were not touched, and the one cut, in four months, was as large as these not cut, and had better leaves on it.

59. *Mr. Wilson.*] How old were they?—They were small plants when I planted them three years ago, and they were cut again after four months' growth, and these were longer leaves and better than the others.

60. *Mr. Mackenzie.*] Which variety of flax do you consider the best?—I do not know the names of them; the leaf I like best to make fibre of is the long narrow leaf.

61. Your experience in flax is from taking the natural crop?—I have cut flax from the same ground about seven different times.

62. You are preserving the old plants?—Yes, on the same ground.

63. Do the present rates you are receiving from the London market for flax pay you to send it Home?—I do not send any to the London market at the present time.

64. Do you think it best to make up flax here and ship it away as twine? How would that do?—That would be right enough if we could do it. There would then be no question about quality.

65. The most of our flax just now is made into binder-twine?—Yes; that is the principal consumption.

66. If you perfect your machine, do you think you would find a market for the stuff?—That is the main difficulty in inventing anything—to find a market for it.

67. Do you think the improved flax you would then turn out would take the place of manila at Home?—No; our present machinery will dress flax equal to manila.

68. It might, apparently, take the place, but is the fibre as strong and the rope as good as the manila, that is the question?—I have tried it both in the twine and in the rope, and flax is far stronger than manila; it will bear a greater strain.

69. It will not last as long?—I think it would last longer when properly dressed.

70. You said some little time ago that the best of our flax was used for mixing with manila?—So it is.

71. And our inferior flax used for making rope?—Yes.

72. Is the flax much weaker in the fibre that they are using for New Zealand rope than that used for manila?—Yes; if the fibre is badly manufactured it must weaken it.

73. Do you think that the dressing you refer to, cleaning the flax from all its vegetable matter, would make it quite as good as manila?—Yes.

74. And will last as long as manila and take its place afterwards?—Yes.

75. Do you know to whom that flax which you say was condemned in America was sent?—I know the firm it was shipped by; a good deal of it was rotten.

76. *Mr. Wilson.*] Have you any objection to telling us what prices you pay for cutting flax, and so on?—No.

77. Will you begin at the beginning of the process of cutting the flax: what orders do you issue to the men in cutting it?—To cut just above the red.

78. You do not like any of the red in?—Not if we can help it. If cutters cut below that we dock them in the price. We should tell a person a time or two and if he persisted we should send some one to cut the butts off and charge for the time spent in doing it.

79. What do you pay for cutting the flax?—Our common price is 5s. I have paid 6s. lately.

80. More lately than previously?—Yes; and now I am offering 8s. a ton for cutting. We leave the centre leaf untouched.

81. Just the single centre leaf?—Yes; this would cost 3s. a ton extra for the cutting, but then we get a crop every year.

82. What is the cost of cartage?—That depends on where and how far away the flax is.

83. Do you divide the flax into different lengths and grades?—We always divide it into different lengths—suitable lengths—and classes.

84. You work it in different lengths as well as classes?—Yes; we divide it into three sizes and two grades.

85. Always into two grades?—Yes.

86. Supposing you have the different lengths, one, two, and three—long, medium, and short—you begin by putting all the short through first, setting the machine for that particular class?—We have three or four machines running; one length is run through one machine, and another through another.

87. They are set for the particular lengths of the flax?—Yes.

88. You can set the machinery to dress the different lengths?—Yes; if you do not, it must spoil some, and make all sorts of bungles.

89. Do you contract for the whole thing?—No; I do not contract for anything about the mills; all mine is done by day-work.

90. When it is put through the stripper boys catch it?—We have travelling tables which take it away from the strippers, and the boys take it away to be washed.

91. Does not the fibre get tangled in the process?—No; it comes down without being tangled. Everything travels at the same speed. It comes down perfectly level and straight.

92. And does not the vegetable matter get mixed up with the fibre in that way?—No; it comes away much clearer. When it is taken off the tables it is shaken out and divided into hanks.

93. What size hank is the best—small or large?—A fair-sized hank about the size of that on the table is the best. It is then handed by boys to the men and washed, and then steeped and put out into the paddock.

94. How long is it steeped?—Three or four hours as a rule.

95. You steep it in the water?—Yes.

96. In hanks?—Yes.

97. The water is constantly going through it?—Yes, steadily.

98. It is then taken into the paddock and laid out on the grass?—Yes.

99. How often do you turn it?—That depends a great deal on the weather; I like mixed showery weather, that is the best for getting on quickly.

100. The extremes both ways are bad?—Yes.

101. Do you put any on the wires?—I scarcely put any on the wires; I always stack mine in the paddock.

102. How long does it remain in the stack?—I like to let it stand a month if we can; it is all the better.

103. In what sized stacks?—We put 2 tons into a stack.

104. How do you find the flax runs? how many tons of green flax runs to a ton of the dressed?—That depends a good deal on the weather, but generally it is from 5 to 6 tons.

105. Then, after having it on the stacks, you take it back to the scutcher?—Yes.

106. How do you manage about scutching? do you contract for that?—Sometimes. If it is done by the day-time we give £1 a ton, and if taken at the night-time we give £1 5s.

107. And you have some person to look after it?—I generally look after it all myself.

108. You save a great deal in the matter of tow? You do not get much tow?—Not if it is carefully stripped. When I did all the scutching myself I never made more than half a hundredweight of tow to the ton of fibre. But now there is from 1½cwt. to 2cwt. of tow.

109. Do you use ordinary revolving scutchers?—We have had a lot of different sorts of scutchers. First we had arm scutchers, then drum scutchers, and then skeleton drums; after that closed drums, and now we have also some fine cast-iron hackles on the face of the scutcher-drum.

110. Do you think that an improvement?—Yes; it is very much improved with combs.

111. Does it not make more tow?—It depends in the way on which the fibre is handled before it goes to the scutchers. There is a great deal in the handling of it.

112. What length are the teeth?—About ½in. long.

113. And they worked very close?—You set them to suit your work, according to the fibre you are scutching. If it were fine fibre you would set them very close.

114. Having got the scutching done you have the man who takes off the hanks: what sized hanks do you make for baling?—We put three hanks to one toppet.

115. I have heard the remark made that the toppets are too large for the London market?—Many of them are much larger than mine.

116. Three times that size [pointing to flax on the table]?—Yes, just about, making each toppet weigh 2½lb.

117. Do you use any special comb for the purpose?—No.

118. You just twist it up in the hanks?—Yes.

119. There seems to be great complaints about the size of the bales?—All my buyers like good big bales. It is different to go on the market. None of mine go on the market; they go direct to the manufacturers, who would rather have large bales. In this way you save a good deal in dumping, as it is only 2s. 6d. for a good-sized bale, and you have to pay the same for a small one.

120. If you were selling in the London market, do you think you would continue to have the big bales?—As long as it suited the customers. I have heard that it would be more convenient to have smaller bales for the London market, and I should think about 2½cwt. in a bales would be sufficient; but as long as the large bales suited I should have them, as I like them best, because they are less trouble.

121. Do you bale by day-work or piece-work?—By day-work.

122. What do you put round the bales?—Nothing but a lash made of tow.

123. Can you give us an idea of the cost of turning out flax such as you have described, per ton?—The whole thing?

124. Yes?—I should think it could be done at a cost of £14 with an engine. It can be done

as cheap with engines as with the water, because one saves cartage with an engine; but with water you have to put them in where you have the water-power, which often involves extra cartage.

125. It depends on the situation of the water?—Yes.

126. You think £14 a ton is fair?—Yes.

127. Have you visited any of the mills in this district?—No.

128. You say you have only seen one sample of the flax produced in the North Island?—I saw a few samples on the wharf this morning.

129. And you thought they were inferior?—Very inferior; neither washed, bleached, nor anything else.

130. If you had visited some of the mills you would be able to form a better idea?—Yes.

131. It is not fair to say all the flax is bad if you have only seen a few samples, as you say?—I have always understood the North Island flax-leaf to be better than that of the South Island. It is not the fault of the flax nor the machinery, but the fault of the people who dress it.

132. As far as the present demand is concerned, the machines are good enough as they are at present?—Yes, they are quite up to the occasion. We do not want better machinery for the purposes for which the fibre is at present used,

133. Do you mean to say you could not, by a certain process, turn out the flax cheaper; £14 seems an enormous price to pay for turning out flax. In the Foxton district you can get it done much cheaper?—Perhaps it is not in a bad place for carting?

134. The mills are very close?—I have lately given 5s. a ton for flax, paid 6s. for cutting, and 7s. for the carting, and it costs me another 5s. for railway carriage, and then I have to make a living out of it.

135. Is that hill- or swamp-flax?—Principally hill-flax. I do not care which it is so long as it has a good green leaf. But I like a good swamp-flax very well: it is soft and works nicely.

136. Would not the hill-flax be the stronger fibre?—There is a lot of difference in the flax and the ground it grows upon. I have seen both hill- and swamp-flax brittle. Much depends upon the nature of the soil.

137. What do you think the best soil to grow flax?—You want nice gullies and hollows with deep loamy soil. In our district there is a good deep soil, the flax grows well, and has strong fibre.

138. You think your proposed new machine will turn out flax not only for the purposes it is used for at present, but for the finer purposes also?—Yes, it will do for anything.

139. What will be the cost of it?—I could not tell you the cost of the machine at the present time.

140. What will be the cost of turning out flax by such a machine as you hope to make?—It will cheapen the cost a good deal.

141. Even of the ordinary flax turned out now?—Yes; it will not cost any more per ton than it does now, only, of course, it will take another ton or so of green leaf to make a ton of the fibre, which, however, would be worth three times the money.

142. It is quite obvious to get a trade for fabric purposes would be a new trade?—Yes.

143. Would the process you hope to bring out make the ordinary flax cheaper, supposing you found that for fabric purposes we could not get a good market?—Yes; for we could alter the setting of the machine so as to dress a quality equal to that by present machines, or to any required grade up to a fineness fit for fabric purposes.

144. Do not the present beaters in the existing machines bruise the flax?—No; that is the fault of the man who is looking after it.

145. Have you seen the new machine of Bull's?—No; I wish to see it.

146. Supposing you brought out a new process for turning out a large quantity of flax for fabric purposes, and the highest price you could get was £50, would it not pay better to turn out a large quantity of the present flax?—We could not say that until we have tried it.

147. As to the inspection, you say the proper place for an inspection would be at the mills?—I should think decidedly that would be the proper place.

148. That would mean a Government Inspector for every mill in the colony?—Yes; if you wanted to inspect them all. I should not want an Inspector to inspect my mills.

149. Would it not be better to open the bales at the port?—I should be very sorry to have my bales opened up. I do not think that would be the right way at all. It would destroy the bales to pull them about. If there were to be any inspection it should be in the manufacture of the fibre. I do not see how it could be properly done without the Inspectors visiting the mills where it was manufactured.

150. *Mr. Valentine.*] Would it not be sufficient if the Government Inspector at the port inspected so many bales out of each shipment? It seems to me this would be sufficient, because, if the senders knew the Inspector could inspect any bale he chose, they would be careful?—People will stop doing this when they find it does not pay.

151. The very fact that the Government had appointed an Inspector at the port of shipment would have a deterrent effect on those who have not been carrying on their business properly?—No doubt it would have that effect.

152. It would have that moral effect on the people?—Yes.

153. *Mr. Wilson.*] Do you find that the longer the hemp is the more sale there is for it?—Most of my customers like it fairly long. Flax from 5ft. to 7ft. or 8ft. long is as good a length as is required.

154. If you could get cultivated flax, would it be of any better quality?—I do not think it would.

155. *Major Steward.*] There are a great many varieties of flax?—Yes.

156. *Mr. Mackenzie.*] Five?—I know of seven myself, and it is said there are twenty-seven or twenty-eight.

The witness here made a statement to the effect that off a small piece of land, about 3 acres, on the Ashley, he got in one year over 50 tons of flax per acre, and two years after a crop nearly as large.

157. *The Chairman.*] We understand from you that, as far as you are concerned, you do not approve of the chemical process of preparing fibre?—No.

158. You have never tried it?—I have not tried it personally, but I have heard that it cripples the fibre.

159. Could it not be used in such a way that it would not cripple the fibre?—I do not understand chemicals myself; but it is not required at all for the purposes for which flax is at present used. The defects are not the fault of the machine nor of the flax, but of the people who work it.

160. You said you stacked the fibre?—We stack it outside for a time.

161. Why do you stack it?—We find it ripens a little. It scutches far better for being in stacks for a time.

162. You cover the stacks?—No. If they are stacked properly they would not get wet.

163. You stated also to the Committee, in answer to a question, that it required 6 tons of green leaf for a ton of fibre?—Six tons is the nominal requirement to make a ton of fibre at the present time. It depends on the weather, and on the time of year.

164. Does it depend so much on the weather or more on the green leaf you use?—It does not depend so much on that as on the weather.

165. Is there not more waste in dressing the young leaves you spoke of which could be cut at four months than from one twelve months old?—In the green leaf? No; not at all. If you get a leaf more than twelve months old it begins to rot away.

166. It is firmer, and you will find there is more stuff about it?—When a leaf begins to get dry it is so far gone that it is no use for fibre whatever. It is only the green leaf which is used for making good fibre. We cannot work up dry leaves; they are no use, while they cost as much as a good leaf.

167. As to the piece of land you spoke of, you say you got 50 tons out of it the first year of cutting and two years afterwards you cut nearly as much: have you any idea of the yield of fibre then?—I got in the second crop nearly as much as I did in the first.

168. Did you get the same result as in the first year?—Not quite so much.

169. *Mr. Marchant.*] What particular variety of flax was this, do you know?—I could not say. It was a mixed lot.

170. *The Chairman.*] Do you strip the top and the edge of the flax when you are putting it through the machine?—We put the leaves through as they are.

171. Does not the machine leave the front edge on a little?—Not if the machine is kept in fair order. The machine will dress it equal to that [pointing to the specimen of flax on the table], if you require it, without any trouble.

172. So far as you are concerned, if any bonus should be offered it should be for machinery?—Yes; it should be offered for machinery. It might result in improving flax for some other valuable uses more than at the present time. No doubt there will be a machine invented at some time to turn out fibre for textile purposes.

173. *Mr. Wilson.*] In reference to the question of machinery, the cost of turning it out seems to me excessive. The thing would be to devise a means of reducing this cost by £3, £4, or £5. Is it not possible that some process might be found which would give us the same result with hemp at a much less cost?—Yes. If you could bring out a machine that you could put it into and bring it out finished.

174. *The Chairman.*] If the green leaf has been delivered at the mill, what do you consider it would cost to turn it into fibre ready to be taken away to the railway-station?—I cannot answer that question definitely. It wants some consideration. It would cost perhaps £7.

175. You think it would cost £7 to manufacture from green leaf, delivered at the mill, a ton of hemp?—I do not think it could be done under £7.

176. That is a tremendous price?—I am speaking of my own market quality.

I wish to add to the above that I have since visited the Manawatu district and examined several mills, and see no reason to alter any of the evidence I have given as to the reasons for the difference in the value of the dressed fibre in the London market; and on all sides I have been impressed with the fact that had those in charge of the mills more experience the fibre would be as good as that dressed in the South Island referred to all through my evidence. The flax-leaf is generally very good, and no bonus is required for the present system of dressing.—C. CHINNERY.
1st August, 1890.

JOHN HOLMES, of the Firm of Holmes and Bell, Merchants, of Blenheim and London, examined.

177. *The Chairman.*] The Committee has been appointed, Mr Holmes, to inquire into the flax industry, and to make recommendations to the Government. We understand you are able to give us some information on the question. Will you make a statement of what you know about the matter?—Well, to begin with, I did not know that I should be called upon at so short notice to give any information, because I did not come to Wellington for the specific purpose; consequently I have no data or figures to refer to. But I understand the object of the Government is (1) to place a sufficient sum upon the estimates to induce greater interest in the development of the industry by reason of improved machinery; and on that point I would say that I am certainly impressed with the idea that if there were sufficient funds and a good bonus it would no doubt attract a large number of competitors, and the country would gain the benefit of the brains of engineers and other men, flax-dressers (practical and otherwise), in developing some new machinery, for it must be patent, I think, to everybody interested in the flax industry that some improvement

in the machinery could be made. Of what form that would take it is absolutely impossible for me, and, indeed, for very few people, I should think, to say at present. But if some inducement were offered sufficiently large I have no doubt that some good machine could be obtained that would improve the dressing—and not only improve the dressing, but reduce the cost. There seems to be at present a very large proportion of cost attached to the working of it. I do not know if it is practicable, but I should certainly think that if a large sum was offered some machine would be brought forward that would, at all events, improve the present system, because the present work is tedious and laborious for the most part, especially in wet weather. The other point, as I understand it, is that the Government desire an expression of opinion in regard to the necessity or the advisableness of inspecting the fibre before shipment. All I can say on that point is this: that I can hardly conceive that there should be two opinions on so important a question. To my mind it presents various advantages, the chief one being that it would have a deterring effect. The mere appointment alone would have a deterring effect upon all persons who are now alleged to be careless in the manufacture of their fibre. And it would also have the effect of securing some absolute certainty to the honest producer. And then it would do away with the questions hereafter of arbitration cases, which are now frequent in the City of London on flax questions. In Ireland, I understand, it is customary—in fact, I know it to be absolutely the case—that butter, for instance, in the South of Ireland—in Cork—is examined by experts and branded, and the butter is sold upon a basis in that way. As an instance, every farmer sends his butter to the butter exchange, and there it is branded with the Government brand. There are two inspectors who examine the butter, and if they have any doubts about it they refer it to another, and so on to the end of the chapter with the whole lot of casks, some thousands of which are examined from time to time. That being the case, there is no uncertainty with regard to the sale of the particular produce, because it is branded, and it goes to the outer world—to London, for instance—with the Government brand upon it; and it insures for the farmer a price according to the value of the market at the time. Some of the gentlemen present would know that Russian tallow is dealt with in a similar way—it is sold on what is termed the "brack" of one season as compared with the "brack" of another season. In that way the producer is enabled to get the standard value of his article without any reference to arbitration, which unfortunately takes place in the sale of New Zealand hemp at present. We have had one or two cases in point, and there is one upon which my mind is refreshed at the moment, where we have sold at what we call the f.a.q., or fair average quality, basis, and on its arrival in the London market it was found that hemp had fallen in the interregnum, and Mr. Bell was met with the statement, "This is not f.a.q." In my opinion, if the Government brand were placed upon it before it was shipped that would have settled the question. As it was, we had to submit to arbitration on the point, and, although we maintained that our flax was equally good, it was a difficult matter to set it up, and the result was we had to suffer. Some gentlemen may reply, "You had your remedy;" but, really, when you appoint arbitrators in London, even though they are not prejudiced exactly, they are more or less guided by the state of things that exists when the produce is landed there. I think for those reasons alone it is certainly advisable that the Government should appoint Inspectors to examine the flax before shipment. As I said this morning, "A word to the wise is sufficient." I will not go into the past history of flax, for producing large quantities of which we have many mills. We have set up many mills both in this and other provinces in the colony, and are consigning from about 175 to 200 tons monthly, and therefore have some knowledge of the fibre trade. My partner, who lives on the spot in London, also points to the necessity of some system of examination and branding beforehand. That would insure some definite sale, and need no hereafter references. As to the form the bonus would take, I should think it should be a substantial bonus, with as liberal conditions as possible; and not confine it to flax-dressers alone, but make it so that the Government may have as wide a scope as possible in getting information and suggestions—and, indeed, even machinery—from other parts of the world as well as New Zealand, for the reason that engineers, to begin with, are more practical, and more able to give an opinion with regard to the usefulness of the machine, and would not stand upon the question of expense if they thought a bonus of £5,000 or £10,000, or whatever it might be, could be secured. If you keep it in the hands of flax-dressers it means that the advantages are necessarily restricted.

178. *Mr. Marchant.*] If the earning of the bonus were connected with the export of a certain quantity of flax, taking a certain price, that would debar engineers from competing?—I think it would.

179. *Mr. Wilson.*] It is quite obvious that no Government could possibly be the first to state that a machine would turn out flax of a certain quantity, and therefore some such suggestions should be made?—There are tests you might put it to. For instance, you could see if it were approved by the majority of a committee who would be appointed to see its working at a particular place. As to the cheapness by which the fibre can be turned out and placed on the market, I do not attach very much importance as to the price the fibre is going to be turned out at at all. It has been cogently remarked that you can turn out fibre in a wash-hand basin, if you take time enough to produce, at a value of £40 per ton; but that is not a merchantable commodity. There are many conditions which might be attached—first, that it shall produce equal quantities to the present output; second, that there should be a saving of labour; and third, that, above all, it shall be marketable at a given price per ton.

180. *Mr. Marchant.*] You have not much hope of the fibre being turned out in such a fine condition that it will realise excessive prices—from £50 to £60 per ton—as has been suggested?—I do not think so.

181. Not for mixing with other textile fibres?—I do not think the evidence on that point is of any value, for the reason that for the most part it is only hearsay evidence: it is really of no value: we cannot say of our own knowledge. All that I can say on the point is that my partner in London, Mr. Bell, writes to say that the majority—in fact, the whole—of the hemp is used for

rope, cordage, and binder-twine purposes, and that the statements which have been made frequently with regard to the use of New Zealand hemp for other purposes are quite mistaken ones. Of course it may be used in very small quantities. It has been suggested that it should be used for making baskets for labouring men in which to carry their food and things of that kind: in France, for instance, and other places. But then the consumption would be very small. The great bulk of the consumption would be for twine, rope, and cordage, and we must consequently look to its production in that way, and for producing it in large quantities at a time.

182. *Mr. Wilson.*] You have seen the fabrics here that have been made of the flax in New Zealand?—No, I have not myself inspected them.

183. Perfectly good stuff, which you would imagine was quite good enough for any purpose almost?—It might be possible. At present, however, the great consumption is for rope.

184. *The Chairman.*] Have you anything further to say?—I do not know that I have anything else to say.

185. *Mr. Mackenzie.*] Have you ever grown flax for cutting?—No.

186. You do not know if it would pay to grow it for that purpose?—No, I could not tell.

187. Do you think that the present prices you are getting in London for flax are good enough?—Certainly not. There is at present an absolute loss upon it.

188. What are you getting in London?—My last cable advice quoted £18 and £19 per ton, at which we have not sold.

189. Do you think that if the fibre was better dressed that it would last as long as manila, or ever take its place?—I do not think that I can answer such a question for the reason that it really requires an expert to give an opinion on the point. The reason why I suggested better cleaning of the article, and that a better fibre should be produced, is that it would insure for it a ready sale to begin with; and also—the examination might come under this heading—insure that the producer would take more care in the production of it, because he would know that if he did not send a good article it would not be saleable. The people are finding that out at the present time. In my opinion, a great deal of the fault arises from the fact that there has been no official inspection. The producer has been allowed to send what he likes, and when it gets to London it has the effect of being rejected on all sides with the objections, as I have said—received at the last moment, that it is not f.a.q., that it is not fine medium, and so on.

190. *Mr. Mackenzie.*] The reason I ask it is this: I understood from a former witness to-day that if the dressing of the flax were improved it would increase the cost, and that even the improved dressing would not be the only increase in cost, but that more gum would be taken out, and that there would be a loss in the waste. If that were so, it would raise the value of the fibre above what the present buyers at Home can afford to give for the purposes for which it is used?—I do not agree with you there, for the reason that they have already given £42 per ton for New Zealand flax, and, with all due respect to my friend Mr. Mackenzie, it it is not right to say that there would be a difficulty in getting the price. They can afford to give it.

191. *Major Steward.*] Now?—Yes; they have given £42 10s. for New Zealand flax. We have sold at £38 in London, and it is absurd to say that the price could be reduced to the level of £16, which is less than half.

192. *Mr. Mackenzie.*] I do not think you see the point quite in what I am asking you. Of course, the supply of other fibres would regulate the prices you would receive for New Zealand flax?—Not altogether, Mr. Mackenzie, for the reason that New Zealand flax will, in my opinion, come into permanent use as a fibre itself in the same way as manila has come into use, and sisal also. It was stated on good authority the other day that some of the best rope-makers in London—Mr. Levin is the authorty—were using manila and sisal for a special class of their production, and that they substituted New Zealand hemp to a considerable extent, and that they were glad to report that New Zealand hemp suited all their requirements—in fact, made a better article.

193. That is the point. What I want to bring out is this: You say they used sisal for the same purpose as New Zealand flax is used for?—I say it has been stated so.

194. If that is so, and if sisal can be produced and landed in London at a lower rate than New Zealand flax, it follows, if the sisal could be sold as such, merchants would not pay more for New Zealand flax, and unless the improved dressed flax will take the place of the higher priced article, such as manila, it seems to me the process will be thrown away, unless we can find a market for the superior-dressed article?—I do not agree with you there. If it were possible, by offering a bonus of £10,000, to get invented to-morrow a machine which would reduce the cost of producing by £2 per ton it would be well worth the Government's while to do it.

195. It would reduce the cost of producing, but one of the main features, I understand, was that it should improve the value of the fibre?—That is only the opinion of one witness who spoke on the point. He said possibly it might have the effect of reducing the cost. I do not think we should confine its conditions merely to improving the fibre, because, as I have replied already, you can improve the fibre—you can throw away £1 5s. and take up a £1. That is not economy; that is not what we want. We want to offer a bonus which would produce a result of this kind: Suppose the present machines turn out from 2½ to 3 tons of fibre a week, we should have another machine which would produce the same quantity at £3 or £4 less cost per ton. I am not prepared to say it can be done, but by the united brains of the community, if there were sufficient inducement offered to them, something could be done.

195A. What does it cost to lay the raw material at a mill before you begin to work machinery on it at all in the general way?—The average cost in some places is 10s. per ton, in others £1, and in some places £1 2s. 6d. There is no general basis for calculation.

196. That is carting and cutting?—Yes, that is carting and cutting. Take Blenheim, flax has been cut there over a very large area for many years past, as far back as twenty years ago; it has been recut at several intervals, and, necessarily, the flax is becoming scarcer, and the people have to go further afield. They get a large area and give a price for it, or take it at so much per ton. It

might cost them £1 or £1 2s. delivered at the mill. In the Foxton district, where we have some mills, it does not cost us anything like that.

197. How many tons of green flax go to a ton of fibre?—That depends on the situation of the flax and the quality. Some state that it takes from 6½ to 7, and others from 7½ to 8.

198. Say 7?—Yes, that is a fair average.

199. It costs £14 to do the dressing at the mill?—It largely depends on where the flax is produced. In some places it costs more than £14, and in other places it would cost a shade less. There are a few cases in which they might have exceptional advantages, such as nominal rent, taking several thousand acres of land, and saying, "We will pay royalty in the shape of rent." In such cases they might produce it at a less cost. When the people examine their accounts at the end of the year they find they are invariably under the cost, for the reason that they never take into consideration the interest on the capital employed and the enormous risks flax-dressers have to undergo. In some cases where I am personally interested we have a mill costing £1,500 or £1,600, with plant, machinery, buildings, &c., and perhaps £1,200 of that is uninsured. We cannot get insurance, and we may wake up in the morning and find the whole thing gone. You cannot calculate the cost on that basis.

200. A man going into a business of that sort would require to make calculations?—The people who give you a statement and say it costs so much per ton never calculate on the outside things in the shape of interest, wear-and-tear of machinery, and probable loss by fire.

201. *Major Steward.*] You have answered some questions as to the cost of flax, Mr. Holmes, probably you can inform the Committee what is the average price at which f.a.q. flax, speaking generally, can be placed on the London market, without loss, per ton?—I should say it would vary from £22 10s. to £24.

202. And do the present prices pay?—The prices obtainable do not pay the producer; there is an absolute loss.

203. Do you happen to know from your business relations with this trade the purpose to which the flax you ship to London is generally applied? Is it not for rope- and twine-making?—Principally, yes.

204. Have you ever heard any complaint as to the use of flax for this purpose, particularly for larger descriptions of rope, owing to the presence in it of gum?—None whatever.

205. Do you know whether it is capable of being applied to the manufacture of coarse fabrics, such as are now made of jute, sacking, and so on? do you know if it has ever been tried?—I think we have some correspondence on the point. I cannot tax my memory.

206. In what port have you had your experience of shipment for London? At the Port of Wellington?—Yes, Wellington and Picton.

207. Can you say anything generally as to the condition of the flax which is sent for shipment: is it generally in a fit condition for putting on shipboard?—I think the bulk of the flax is.

208. My reason for putting the question is that there are complaints that flax has been sent Home in a very unfit condition to be placed on the market?—Possibly; but they are only exceptional. You are referring more particularly to the flax being wet or damp?

209. Containing too large a proporction of inferior matter, roughly got up, and so on?—There is a good deal of very inferior-dressed fibre done up the country.

210. The effect of that has been to depreciate the character generally in the London market?—That must necessarily follow. Large proportions of the shipments go Home on consignment, and when it reaches its destination New Zealand flax, or hemp, is taken in the bulk, as it were—Jones offers us £15, the Loan and Mercantile £18, Holmes and Bell £20, and so on; and thus it has the effect of reducing the value.

211. What would be the difference in value between such a sample as you have seen here to-day and a very inferior sample? Is there a very wide range?—Yes; the quotations show that good flax sells at £27 10s., while common is selling at £15 10s. or £17 10s.

212. There is a range of £12 as between these qualities in the London market?—Well, more than £10, I should think.

213. If all the flax were prepared in the best way it would command larger prices, which would more nearly pay than at present?—Certainly; but that is not the whole point either, the mere fact of getting a better price, but it insures a more regular sale.

214. That leads up to the suggestion you approve, that flax should be inspected before shipment?—Yes.

215. You heard a witness this morning who expressed an opinion that the inspection should take place at the mills?—Yes.

216. If the inspection took place at the mills we should want such a large number of Inspectors that it would be impossible to carry it out?—Certainly.

217. Then, if not at the mills, I presume you would say the Inspector should be located at the port of shipment?—Certainly.

218. What are the principal ports of shipment for flax?—Wellington, Auckland, Lyttelton, and Dunedin.

219. As a matter of fact, the inspection at these four ports would cover the whole trade and be sufficient?—Quite sufficient.

220. Next, as to the nature of the inspection: is your idea that an Inspector located at a port be required, supposing he were called upon to pass any particular shipment of flax, that it would be his duty to open every bale or simply to take hap-hazard what appeared to be a fair sample of the bales and see what they were like?—I think that would be sufficient. In my opinion, the mere fact of appointing an Inspector would have a sufficient deterring effect on the people who are now alleged to be careless in the manufacture, and would reduce the necessity for the close examination to which you refer.

221. But supposing the Inspector did not open some of the bales the inspection would be valueless?—Certainly.

222. You would not, I presume, consider it possible to make it compulsory that flax should be examined before shipment?—Yes, I certainly would.

223. I scarcely follow you there. My idea was, of course, that the advantage obtained from the certificate of the Inspector would itself induce inspection on the part of those persons who had a first-class sample?—Then, if you are not going to make this general, and you are not going to legislate except for those who desire to obtain the benefits that may arise, you are opening the door to people to send out inferior flax, notwithstanding the precaution their neighbours are taking to send a good article.

224. Does it not follow that if you had machinery whereby a first-class article would be submitted to inspection, and would go home with a brand showing it to be first class, the article which had not been so submitted would suffer?—I am afraid the opposite effect would be experienced. Suppose, for the sake of argument, that we take 50 per cent. so examined by the Inspectors and 50 per cent. not examined, the result would be that you would have 50 per cent. of fibre, probably inferior, competing against the good article in London.

225. That would be unbranded fibre?—But nevertheless it would be New Zealand hemp, and it would be there as a substitute, in the same way as New Zealand hemp is substituted for other fibres.

226. After inspection by the Government Inspectors, you would require their certificates given to the exporter, and every bale could be branded to indicate it had been so passed, either as a first or second article?—Certainly; you could grade them as you like, but every bale should be branded.

227. You contemplate there should be some charge per bale for passing the Government Inspector, out of which some of the cost of the inspection would be provided?—Yes.

228. *Mr. Marchant.*] I gather from your evidence that, in your opinion, the matter of reducing the cost of production should not be the only consideration?—No.

229. That we should bear in mind to turn out a better article, with the object of raising the price of the whole of our hemp in London?—Yes.

230. And you consider that if we could turn out hemp of a much better uniform quality that the price would undoubtedly be raised materially in the London market?—It is shown now. Hemp is at the present time exceedingly depressed in London.

231. The present depressed state of the market is due largely to the shipment Home of considerable quantities of inferior flax?—I think it is.

232. *Hon. Captain Russell.*] I do not quite understand what process of inspection you would recommend?—It is a difficult matter to suggest how it should be carried out. As I said before, I did not come here prepared for examination, but was called upon at a moment's notice to attend. I think myself, as I have said before, that the mere effect of appointing Inspectors would be to deter people who are now alleged to be producing inferior stuff.

233. I want you to be more concise if you will?—Well, supposing a man consigned fifty bales, when it came down you might take 10 per cent. of that promiscuously, and if, on examination, they were found not to pass the standard of inspection set up, then the whole consignment should be condemned.

234. You mean by opening the bales?—Yes. I understood from Captain Rose that the Harbour Board contemplated putting up a proper place for the examination of hemp before it went out—that is to say, all doubtful hemp. If there was no doubt about it it would pass. I think the Government Inspector might examine 5 or 10 per cent. of each lot of flax that comes down at stated intervals from any particular producer. I mean that he would examine a few bales out of each heap promiscuously, and if either of those did not meet the standard the whole consignment would be rejected.

235. Why would you treat flax differently to wool, grain, or any other article exported? Why should not, in fact, a good article in the course of one or two years command its own market?—Well, wool and flax are not analogous, for wool is a permanent industry, and has established itself for many years; flax is practically, so far as its new *régime* or demand is concerned, a new enterprise, and it behoves the country from which it is exported to take every precaution necessary to make it an established article. That is one reason why we should take more than ordinary measures.

236. What I want to know is this: Say, if a flax producer is continually sending Home flax as the ships leave Wellington, is not his brand known soon as a good, bad, or indifferent one; and is there any reason why its value should not rest on the known integrity of its brand?—No; to begin with, the manufacture of flax is not like the manufacture of wool, for the reason that wool grows in good weather and bad weather almost alike, providing the sheep are properly fed; but it is not so with flax. New Zealand hemp in wet weather is subject to all kinds of difficulties of drying, bleaching, and such matters, but in the summer months it is not subject to so much difficulty. If you take all the year round you would find that there was a considerable percentage during the winter months not equal to the sample sent out in the summer months.

237. Would not the purchaser know that?—Not necessarily. There are a number of people who have set up mills and gone into the flax industry without really any knowledge of the undertaking, and so long as they can get their fibre dressed and sent away and get their advances they are content. I do not say that applies to all flax producers, but it applies to some—they are content, no matter what the effect of their being allowed to send away an inferior article has upon the industry. A lot of these people are not caring for the future at all, whereas we should all be united in the effort to produce the best fibre we can out of the country, in the same way as large sheep-farmers do, most of them having something at stake. That is where the shoe pinches in regard to the adulterated and unbleached fibre which goes out. Many of the people have nothing

to lose, they have nothing at stake, and they are unlike the sheep-farmers in that respect. On the other hand, every bale of wool is sampled.

238. *Mr. Wilson.*] Or exposed for sale?—It is really sampled. You have an opportunity of sampling the bales as they are presented in the London wool-sales.

239. *Hon. Captain Russell.*] Would not individual interest compel a man to produce a good article more than Government interference?—I hardly think so; at all events, not until some permanent injury is done to the trade. I think our duty should be to avert destruction. We should anticipate it; and that is what is being done. We have come at last to the end of the tether, for the present prices mean absolute loss not only to the people who have invested their capital, but to the country also. Their loss is twofold—they lose not only the cash out of pocket for labour and incidental expenses of production, but they are absolutely losing the fibre—literally throwing it away. That is the present state of things.

240. Do you know any one experimenting with a view to improving the present machines?—Yes, there are many.

241. What has induced them to go in for it?—Their own idea. They would attach various royalties to the introduction of the machine. There are several people in the district of Blenheim alone, and each one thinks he has the best machine, and as soon as he has it perfected will say, "My price is so much per ton for every ton you put through this flax-machine." There would be so much royalty for the use of it, but that would be done away with if the Government came in and said, "We will give you something more," because, after all, it is problematical, and they have no inducement in the shape of a bonus to look forward to now.

242. Do you think a bonus would stimulate the inventiveness of men? Do you think that at present it is the hope of getting the royalty, or the love of engineering?—I think the pounds shillings and pence are the questions of to-day. There are enthusiasts in the flax industry no doubt, but the engineers who have the time and the ability to make improvements in flax-dressing machinery will not trouble themselves if they have only a royalty in view; but they would be able to say that they had something definite before them if £5,000 or £10,000 were offered as a bonus.

243. But when once they have earned their bonus they have nothing else to look forward to, because their most successful rival would immediately be trying to improve on their machine, and would get the royalty from the remainder of the flax-dressers?—That would apply to any invention.

244. I only want to find out whether a royalty is not a better form even than a lump sum; whether, in fact, a lump sum would not terminate the desire for invention when that sum were earned, whereas a royalty is a current stimulus. I only want to get to the point as to how best to aid the industry?—I confess to you that I do not see how you could compel people to use the machine. If you offered a bonus of 1s. per ton on all the fibre produced in the Wellington Province it would be necessarily compelling all the flax producers in the district to use that machine; whereas, if the Government said, "If we get a good machine that will produce this article at a less cost than it has been produced before, and turn out better fibre, we will give the man, for the time and trouble he has devoted to it, £10,000," you might get engineers and others engaged in the various large centres of manufacture to go in for it. If you took up a royalty it might collapse in twelve months.

245. Assuming that an invention were not perpetual, but only had its season, and there were other improvements in machinery from time to time, the Government might pay their bonus of one, two, three, four, or even ten thousand pounds, and, within a month of the payment of the bonus down, the very implement for which it were paid may have gone out of use?—Well, then, the implement for which a bonus of £10,000 were paid might put an increased value of £50,000 on the fibre of the country.

246. I am supposing that if another man made a better invention he would get no bonus?—No; but the first man makes the beginning with a machine which another man might further improve upon.

247. I do not mean the improvement on the machine, but in the system of dressing?—At all events, whatever happened, the Government would put it to the test. It does not matter how much more you are going to improve if you have secured an improvement sufficient to make a difference of £2 per ton on the average output of the whole of New Zealand, because then you have saved your £10,000 well. Whatever happens as to further improvements the Government of the country would lose no money, but would really improve the position. If it were possible to reduce the cost of manufacture to-morrow, and raise at the same time the quality of the article produced, I think they would have well spent the money, although, as you suggest, there might be still further improvements a month later.

248. Have you formed any idea as to what would be a suitable bonus?—I have no idea of the amount, but I should imagine that if it were calculated on the basis of the value of the fibre to the country that would form some index of the line you would go upon, and the larger the amount the greater would be the inducement to outside people to compete. I have been in communication with Crosbie and Co., the great manufacturers of Chicago, on the subject of flax-dressing, and I have written to Belfast to people interested in the manufacture of flax, and also with persons in London, and I had specifications and plans sent out by Mr. Bell from London.

249. *Mr. Wilson.*] Supposing there were no bonus at all, would it not be more difficult for a man to bring out his process? He would have to advertise it to the people who might be sceptical?—Necessarily so.

250. The mere fact of the Government giving him a bonus would alone be sufficient to show the process was a satisfactory one, and that would be the best possible advertisement he could get for it?—Yes.

251. Do you think it would pay the Government to buy his process and charge a small royalty upon it?—That is a point in connection with which something might be done that would make it compulsory.

252. Not necessarily?—It would not perhaps.

253. There would be no compulsion at all; they would only use it if they chose?—I think the Government would recoup themselves in that way very substantially for any outlay. The Government would be more concerned in the immediate value they placed upon the article.

254. It is very obvious that if we are exporting large quantities of stuff from the colony, and that were to cease, the loss to the colony must be very great, and it is evident that it cannot continue if the prices paid at present continue?—There is an absolute loss.

255. To go back to the grading of the flax, you are strongly of opinion that it should be graded by experts at each port?—Yes.

256. You heard Mr. Chinnery suggest that an Inspector could be appointed at the mill?—It seems to me to be impracticable, unless a man were appointed permanently at each mill. The port of shipment is the proper place, I think. That is what they do with butter. As I have said before, in the South of Ireland they send it all to the butter exchange, where it is examined by paid officers, who put on it the brand according to the quality, and it goes to the outer world branded in this way, and is saleable.

257. And you think the proper way would be to examine one bale in every ten?—Approximately.

258. This expert would be paid by the Government, and some payment would have to be made towards the cost of the inspection?—Yes.

259. What would be the cost in addition to the payment of the Inspector? What would be the cost of opening and repacking these bales, do you suppose?—I think it could not possibly cost very much, probably 2s. or 3s. per bale.

260. Would it be injured in any way by being opened?—No.

261. It would be repacked in the same condition as it was before?—It frequently happens now that flax gets wet in transit on the Manawatu Railway, and we are very much interested in the way in which they deliver our flax. On several occasions we have had to return it. It gets wet in transit. I think it is from the fault of bad tarpaulin. If the engine puts a spark on the tarpaulins the rain gets into the flax, and we have to return it, to be dried and repacked.

262. Here?—No; it goes back to the mill.

263. You ought to be repaid the cost of that?—In the delivery of goods at a side station we get no receipts, and are at the mercy of the department.

264. They do not give you receipts more than the Government do?—I am afraid they all err in much the same direction.

265. Is it not a fact that the flax industry has been spoilt very much by inferior flax being sent Home and sold in the London market? Does it not spoil the sale of good flax?—Yes, unquestionably.

266. There is obviously a reason for a bonus to be given?—I say that the men who have no interest at stake send flax Home in any condition they like, and it necessarily gets into competition with the better article.

267. You know the Committee have been asked to offer suggestions as to what conditions the bonus should be offered upon, and there is a great difficulty in arriving at proper conditions to publish. Would you, when you go Home, and after thinking the matter very carefully over, give us your suggestions by letter as to the conditions you think should be laid down?—I shall be happy to do that.

268. *The Chairman.*] Do you not think that the best plan in offering a bonus would be to stipulate that there should be the production of a certain number of tons?—No, for this reason: that there would be many intending competitors, and some who, probably, would not have that opportunity at all. I think you should not confine the bonus to New Zealand, because there is no reason why English people, Americans, or even Scandinavians, should not compete for it; but they might not have the opportunity of dressing flax to send, but their machine might have a better result than others when tried.

269. You have seen the specimen of flax here to-day dressed by a machine: is it the first time you have seen flax dressed by a machine?—Is it dressed by a machine?

270. *The Chairman.*] That was a sample which Mr. Chinnery showed us this morning. It is extra fine; it was too fine, in fact, for the manufacture of rope, he said. I want to know what your opinion of that flax is generally?—I do not know the machine. But this (the flax) is not different to other flax which is represented as a sample, but I venture to say they cannot produce you 100 tons of it. All these things are produced as samples. I could produce a sample infinitely better than that, and Mr. Seymour would undertake to produce better again. You cannot do it in quantity to pay.

271. From your experience of the flax industry in Blenheim, are you aware that the flax is ever sorted before it is put into the machines?—Yes.

272. And different qualities are baled differently?—It is done in this way for the mere purpose of convenience in feeding the stripper. It sometimes happens that for the sake of convenience they put 12ft. lengths and 8ft. lengths together.

273. I mean the sorting of the various qualities: do you know anything about that from your own knowledge?—I do not think it exists.

274. Do the manufacturers classify at all?—No.

275. It has been stated that flax in many cases has been shipped from the wharf in Wellington in a very damp state, and, in fact, that there has been water running out of the bales: has anything happened like that to your knowledge?—I do not know of its existence. I think it must have been in very exceptional cases indeed where it occurred. The fault with the producer is that he does not take sufficient time to dress the fibre. For instance, the examination of his drums and the fining down is not done at regular intervals, and hence the stripper sticks, and so on; but, as to the actual baling of it up in a wet condition, I do not think that is done intentionally. The

bales may become damp in transit on the railway. I do not think it is done, as has been alleged, with the view of making it weigh heavier, and of cheating in that way. My opinion is that flax-millers, as a body, are honest men, but they want more experience in dressing it.

276. Do you know if flax is liable to spontaneous combustion?—I should doubt very much that it is.

277. You have never found it heat?—No, and we have some large quantities from time to time. I think that is borne out by the fact that many millers in the winter time stack their fibre in a field, and it is never found to heat so far as my own knowledge is concerned. The rain comes down in continual showers upon it, but it goes on until it is redried. It is built up in a cock, but it is not so safe as it would be in my warehouse. If there were any probability of fire I think it would show itself in the stacks in the field.

TUESDAY, 29TH JULY, 1890. (Mr. G. BEETHAM, Chairman.)

Mr. ROBERT GARDNER examined.

279. *The Chairman.*] You are chairman of the Flax-millers' Association?—Yes; I have been engaged in the industry from the commencement of the recent boom.

280. How many years?—Two years and a half.

281. Will you give the reasons why you think a bonus should be given?—In the first place the industry itself is so important that it has special demands on the attention of Parliament, and if it dies out altogether there will be a very clear loss to the whole colony; it can be maintained by help from the Government, and I think the Government is called upon to do it. I may state that if it dies out the land now occupied by the flax will have to be cleared at a cost of from £1 10s. to £1 15s. an acre to make way for more profitable industries, such as sheep-farming and grain-growing, &c. The value to the colony of the flax industry at the present time is something like half a million. I think that I am justified in taking it at that (judging from the figures that appeared last night in the *Evening Post*), from Mr. Spurling's report. He gives for the four weeks ending the 14th June the arrivals of New Zealand flax as 10,765 bales, and I think I am fairly justified in taking these at 3½cwt. per bale. That represents 1,868 tons for the four weeks, or 24,284 tons for the year. That, taken at what I reckon as the fair cost of flax produced here—namely, £16 a ton (to that I add £2 a ton profit to the producer, and there is no profit under that; and there is no good in going on producing under that)—that represents, taking Mr. Spurling's data, £437,112 for the year. I have before me the cost of my own production, the cost of one of the largest producers in the Wairarapa, and the cost of one of the best producers in Marlborough. My own cost of the green leaf landed at the mill is equal to £4 11s. per ton on the dry fibre, and that is low. The milling alone costs £10 3s. per ton. The cartage of dry flax by railway, and steamer charges, I put down at £1 per ton (an especially low estimate) to Wellington. That is £15 14s.—£16 in round figures—as the cost. These are my own charges. Well, now I take the Wairarapa charges—one of the best mills—and the proprietor gives me, roughly, £17 1s. 6d. as his cost to Wellington. I give you the figures of Mr. Thompson, one of the best dressers and one of the oldest in Marlborough—£19 13s. The difference between the lowest figures and this now given as the highest is to be found in the additional cost on the green fibre delivered at the mill. In Marlborough the green fibre has cost £1 per ton delivered at Blenheim—that is, the green flax. To these figures you may fairly add £7 10s. per ton for expenses between leaving Wellington and sale in London; so that my own flax could not be sold at London, allowing £2 per ton profit, under £25 10s.; and the Wairarapa flax could not be sold, allowing £2 profit, under £26 10s. Mr. Thompson's flax, in the Marlborough district, could not be sold in London under £29 3s. I have allowed wear-and-tear, insurance, and other charges.

282. And you believe the other gentlemen whose names you have mentioned here have done the same?—I have taken their figures.

283. They have taken the same basis?—Yes. The present price of flax in London—the average price—is £18 10s. That is borne out by Mr. Spurling's and others reports published. Taking £18 10s. as the average will show that the industry is in a very precarious and unprofitable condition; that, in fact, it is threatened with annihilation unless there is some change. So much has the low price affected the output already, that there seems to be a rapid shrinkage in the number of machines at work. I will just give you roughly the number of machines in the Manawatu and Rangitikei districts, and I will show how the number is reducing. We have in these two districts alone 110 machines altogether in existence which have been at work. Shortly after the collapse of the price, in the month of February, the number actually working was reduced to fifty. In the month of March—the 24th—the number came down to thirty-two, and on the 12th May it came down to twenty-one. At the present, however, the number has increased, through accidental circumstances. There is now a buyer, and only one buyer, in Wellington buying for the American market, who is giving £16 a ton. Millers seize on that in the hope that they will keep going, and hope that by the time the order is executed the price will advance, and they will be able to go on—that is, £16 at Wellington, and there are at present forty-five machines at work, altogether producing equal to 3 tons a week, or 7,020 tons per annum. That can only be a matter of a little time, as the order is on execution up to the 10th September. If they have to go back to the London market with no advance in price the millers must shut up shop and go through the Bankruptcy Court, unless we can move in some other direction, and that direction I have to submit to you. At this stage, sir, I wish to state that I heard remarks made last night with regard to the cause of the depreciation in the price at Home. I think, for the satisfaction of those assembled here, it would be well to draw attention to that. Great stress was laid on the inferior quality of the flax, and I think too much has been made of that—of the uneven quality. I think, in studying the figures of the exports, we shall find the true reason of the low prices, because, in the first place, it cannot be

altogether the quality. The cost of manila has fallen more in proportion than has New Zealand flax and sisal, and it cannot be the quantity of manila that has caused the depreciation of prices. The proportion of the fall is greater in manila and sisal than in New Zealand fibre. I think it is rather through the great quantities sent Home, for if we take Dr. Hector's book as a basis of our figures we find that the output of our flax has gone on increasing at a wonderful rate since 1884. In 1880, 950 tons was the total amount; in 1885 it was 1,112 tons; in 1887, 1,617 tons; in 1888, 4,052 tons; and we know that in 1889 18,000 tons went Home; but I have already shown the figures of Mr. Spurling's, published in the *Evening Post* last night—the estimate of the monthly exports. This year already we have sent away, even under all the circumstances, at the rate of 30,000 tons per annum, so that it has risen from the figures of 1885 up to 30,000 tons. If you recollect, the Agent-General, in reply to a request sent from New Zealand, was asked to send out reports of the total amount of white fibre consumed. In reply to that he gave us the figures as 120,000 tons, being the total amount of the world's requirements for fibre—that is, sisal, manila, and New Zealand hemp. I give the figures as they are, absolutely. It shows that, if nearly one-fourth of the whole world's requirements is in one year almost unexpectedly forced on the London market, it must to a great extent paralyse the consumers of white fibre, because still the old quantities are coming in of manila and sisal. True there was a deficiency of eighty bales of manila last year against what they expected, but that is nothing comparatively. Sisal is increasing, but not to any great extent; so it is New Zealand fibre that is so largely supplying the world with white fibres.

284. *Mr. Walker.*] Are there no symptoms of expanding in flax?—I do not think so, unless there is another use for the fibre.

285. We know the farmers use it for twine?—I do not think it is increasing to any great extent. They are using it for binder-twine.

286. *Mr. Wilson.*] What is the amount used?—Sixty thousand tons for America.

287. You do not mention the amount of manila and sisal?—I have not got the figures.

288. If over 120,000 tons it would make your figures stronger?—The total output is over 120,000 tons at the present rate.

289. *The Chairman.*] You appear to think a bonus should be offered: do you think it should be for fibre of a superior quality?—No; the cheaper the fibre the better. I say the success of the output of New Zealand flax lies in three things. First, in producing a fibre from our flax for the same purposes as manila and sisal are required for—that is, rope and twine—at a less cost than they can possibly produce it for. That is the first point. The next point is that we must produce our fibre of an equal quality to manila. Then we must produce our flax, I maintain, for other purposes, for which it is admirably adapted, than simply rope-making. For proof of that I take Dr. Hector's book and experiments I have seen made. We must produce flax for other purposes than rope-making and twine, so as to enable us to obtain a very much higher price for it. We must also be able to obtain a fairer price for our flax when it reaches the English market, without the loss in discount which the buyers invariably calculate for uncertainties of quality. That, I maintain, can be done by grading. If there is to be any hope for our producing flax at a less cost it must be through some improved means of milling it, and I think the Government would be perfectly justified in granting a bonus to any one who would add £1 even to the value of New Zealand flax in the returns coming in. But we maintain that, knowing the processes that it has to go through now, we might fairly ask that, in offering a reward, the milling, which costs £10 3s. per ton, should be reduced by one-half—that is, 50 per cent. First, that the cost of production should be reduced 50 per cent., and the flax improved in quality up to manila. It is well known that our fibre, as now produced by the present machines, cannot be equal to manila, from the very fact that the machinery we have bruises the fibre at every blow of the beater, and that must work an influence in lessening the value very much. Dr. Hector's book shows the microscopic action. That points at once, not to bruising-, but to scraping-machines. That is the direction in which the improved machinery should go. That is evident to any one who looks at a piece of the dressed flax. Well, then, the third point which I think should be insisted upon is to produce flax not only for mere rope- and twine-making. That is within the possible, and I should recommend that the evidence of Dr. Hector should be taken specially on that point. I have had conversations with him, and he has got information that our flax is being wasted—that it is naturally glossy and of a beautiful character, and that it is capable of uses which at present we do not get from it. I refer you to page 41 of Dr. Hector's book on *Phormium tenax*. In conversation, he said he is of opinion that the ultimate length of the fibre can be reached by compressed steam. We think it can be used in textiles, and can be made to produce an article equal to our silk. These are the points so far as the bonus is concerned.

290. *Major Steward.*] Then, shortly, it indicates that your view with regard to the bonus is that it should have the scope of inducing the discovery of a process whereby the cost not only of preparing flax for present purposes should be reduced 50 per cent. but also for other purposes the quality may be improved, including the preparation of the fibre for its best purposes?—Yes, that is it exactly.

291. With regard to the possibility of the expansion of the demand for the fibre as at present produced, manila is used for binder-twine: does it not follow that no such expansion of the demand can be obtained unless there is a concurrent expansion of grain-growing?—I think you will recollect that I said I did not think there would be an expansion of the demand for white fibre unless there was a greater area for grain taken up, and therefore it follows that it is unlikely there will be any increase in the demand for binder-twine.

292. You mention that it is desirable, in order to command the market for the greater proportion of New Zealand flax, that the improved process should produce a fibre at a less cost than manila and sisal: from what you know of the cost of sisal, is it reasonable to suppose that we can expect to produce the *Phormium tenax* fibre as cheaply as the American fibre?—I think so. Sisal requires a

very great area, and, so far, they have never been able to get a machine to dress the fibre. All that is done by the Natives; that accounts for the cost.

293. Has it not been understood that it can be produced at something like £6 a ton?—I do not know. We have to bear in mind that we could produce New Zealand fibre at £8 a ton by the proposed improved process. Dr. Hector has gone into the cost of producing sisal.

294. Do you think it possible to make our flax available for such articles as can be manufactured from manila—our fibre is not so strong for rope as manila?—I attribute that to this: that every time the beater beats the bar it bruises the fibre. If you scrape instead of bruise you increase its tensility.

295. You think the fibre is as strong as manila?—I cannot positively say, not having made practical tests.

296. Your third point is the possibility of converting flax for other purposes: have you any information of any attention having been drawn to that recently?—No; the interest in that seems to have died out. Finer articles have been produced from it of a beautiful silky appearance.

297. You have, I suppose, seen flax that has been prepared by the Maoris?—Yes.

298. How does that appear with the flax turned out with the machinery we have?—It is altogether different in appearance. It is much softer and silkier and generally superior.

299. Then, we should rather apply our attention to scraping than bruising?—Yes.

300. *Mr. Wilson.*] Last night there was some talk of not having a bonus, but allowing the machine to take its chance with the royalty?—That is doing nothing in fact, because at the present time the maker of a machine could claim a royalty. It has been stated that by advertising a machine can be got, but I think there is nothing in that. I think no good machine would come into direct use unless something substantial was offered by the Government, to draw the attention of inventive genius, otherwise you will not get anything. The machine will come, I feel confident.

301. The only thing to do is for the Government to give a substantial bonus?—Yes, I think so. To produce flax of equal quality to manila is the second point; and the third point is to produce flax for purposes other than manila and sisal can be used for, and I think that can be done, according to Dr. Hector's opinion.

302. You are certain that you are representing the millers?—I certainly should have appeared here for them had they known. I appear here also as a practical miller and merchant.

303. Have you seen Mr. Bull's machine? What is your opinion of it?—I can hardly express an opinion; I have not seen sufficient of it.

304. *Mr. Mackenzie.*] You are of opinion that flax can be produced as cheaply as sisal?—Yes.

305. And I gather that the fibre unbruised is equal in strength to manila?—That I cannot be certain about. I have not tried the tensility, but I think it is equal if not superior.

306. *Mr. Wilson.*] You speak of a revolving beater going against a bar (that bar in your machine is stationary). Mr. Chinnery said in his case it struck against a revolving roller?—We abandoned the revolving roller, for the flax was bruised in the same way.

307. If you used scrutcher-teeth, would not that be an advantage?—No; it will produce the fibre cleaner, but the cost would be quite 20 per cent. more—that is, from the hackler.

308. *The Chairman.*] What is your opinion as to the best form of bonus, assuming that the Government should decide on offering one? Do you think it would be necessary that the machine should produce a given number of tons of flax at a given price?—Yes; under the superintendence of a committee of men appointed by the Government to see that it is genuinely done and that the proper quality is turned out.

309. Also that, as there are so many varieties of flax, that so many tons should be produced from each district?—Yes; you mean different machines? I do not think any difference would be required in the machine for different varieties of flax.

310. Is there any suggestion as to the form the bonus should take providing the Government agreed to vote the money necessary?—No; but I would be prepared to give liberal conditions. I think they are very easily given.

311. Would you draft out what you consider to be fair conditions as representing your association. The Government would be very glad to have any suggestions of the kind?—Yes, certainly.

312. As far as the amount to be proposed as a bonus, have you any suggestions to make?—I think that should be left. As I said before, we should require £10,000. When we consider that flax as it is now represents half a million of money a year it should be a substantial bonus, as it is to increase the output of flax and to improve the quality.

313. *Major Steward.*] Would not £5,000 be an inducement to any inventive engineer, coupled with the fact that he would have the patent rights in his machine?—That would be another view to take of it, but not if the Government purchased the patent rights. I do not think one patent would accomplish all that is wanted. There are three things required, and you might have to divide the bonus, which would not be very much to each.

314. *The Chairman.*] You think the amount of the bonus should be divided?—I do, to accomplish the different ends.

315. We have taken that point. Now, as to the grading of the flax?—In the first place, the advantage of grading would be this: that, with Government inspection, our flax would have a certain value that it does not possess at the present time. When they reach London the bales are not opened—it does not pay to open and inspect bales of flax the same as wool, for this reason: the cost of flax is less in value; and, in the next place, it requires almost an expert to bale it up as before, and rather than go to the trouble and expense of that the buyers discount the chances. According to the statement of the chairman of a flax-millers' meeting which took place at Raglan, in the Auckland District, he met Mr. Wood, and asked him the question, "Supposing we could guarantee the quality of every bale, what is your opinion with regard to the difference in value?"

Well, the statement was that it would make a difference of £5 or £6 a ton. If we could be certain of every bale there would be a difference of £5 or £6 a ton. There has been a great deal of uncertainty about the flax coming in. I must confess some of the bales looked very well outside, but when opened up are not good inside. Some is scutched immediately after being taken from the field; therefore damp. I do not think there is much intentional dishonesty on the part of the millers. Unless the Government or some other authorised body were to grade the flax it would be utterly impossible for private individuals to grade it with any satisfaction to the trade, because, if I grade flax in three different qualities—one, two, and three—my next door neighbour might grade his as equal to mine, and there would be, perhaps, no uniformity in the grading. The only way in which I can see an approach to uniformity would be to establish a certain number of grades, taking samples of them, and sending them all over the world—to London, New York, and Boston—as standards; also sending the same to correspondents in New Zealand; and I should insist on every bale being cut open and examined.

316. *Major Steward.*] How many grades—two or three classes, or more?—I think about five classes.

317. Where should the grading take place?—At the ports of shipment.

318. How many?—Three or four ports of shipment would be ample at present, at any rate. I believe the cost to the Government would be nothing, because the fees would pay for the guarantee that the flax had been examined, and was as represented.

319. And would the fee recoup the Government?—Well, a very small sum, about 2s. or 3s. a ton, would produce about £4,500 per annum. As to the cost of opening the bales and rebaling them and redumping them, it could be amply made up by the present Harbour Board charges, which are excessive.

320. *The Chairman.*] Would the inspection be compulsory?—No; that is quite unnecessary; from the fact of it being ungraded flax it would not be bought at all.

321. In opening the bales, which you say would have to be done, where would the inspection take place. You would have to cut the lashings and rebale too?—Yes, cut the lashings. I may say the whole cost of hanking and putting in bales at the present time is something like 10s. a ton, and we pay 10s. for dumping alone after it comes to Wellington.

322. Do you think it would be well for the flax to be classfied before being put through the machine?—Do you mean as to lengths?

323. Not only as to lengths, but as to quality?—I do not know. I have seen it done, but I have not seen any practical advantage in the way of increasing the value. Even now no one dresses the flax without cutting out the spoiled and decayed leaves. The only advantage in cutting the flax the same length is that it is scutched more regularly. I do not think there is very much in that. The Government could not interfere in any way with that. The grader would have to put his seal on the bale to say what it was.

324. In reference to the quality of the fibre, do you not consider it depends very much on the class of flax, seeing the difference in sorts?—I cannot say. I may tell you this: that in the month of December, until the beginning of March, the flax generally is much more brittle, dry, and powdery than in any other part of the year. That is rather a peculiar thing, but I can hardly tell you the reason of it.

325. Your attention has never been drawn to the difference in the various varieties of flax, and you have never made experiments?—No, never.

326. *Major Steward.*] One witness told us yesterday that he was shipping flax in 5cwt. bales: what is your size of bale?—From 3cwt. to 4cwt.

327. *Mr. Wilson.*] When we formed the deputation to the Premier about the bonus, and he asked you whether, in your opinion, the grading should not go on at the port of shipment, you said no?—I did not state that positively. I could not then see any special advantage. Since then I have thought it out, and seen the practical assistance it would be to know the quality of the bales. It is a most important thing that the grading should be done; so much so, that the association would do it themselves if the Government would not. I think that, after considering the matter.

328. *The Chairman.*] If in opening the bale it should be found of unequal quality, would it be a proper system that the whole bale should be classed as the worst, or should it be drafted by the Inspector?—I think so. I should make a special charge, and if the miller wished the bale graded and selected he should pay for it. There is an additional cost in taking out the hanks, and the miller would have to pay for that.

329. That would be a matter of cost between the grower and grader?—Yes.

330. Do you consider that the Inspector should have his own staff for baling and selecting, independent of the Harbour Board staff?—I think it might be left either way. It might be done as in the Customhouse, having a special man to look after that particular work. I think there should be two departments with special officers—one, the Inspector, who should charge 6d. per bale for inspection; and the other 2s. for repacking and dumping, which are two different things altogether. Repacking and dumping might be done almost by anybody—by the Harbour Board, or by a private company.

331. *Major Steward.*] The bales should be made a uniform size of 5cwt. instead of 2cwt., not exceeding so much?—Yes, I think so. The Harbour Board charge for anything more than 4½cwt.

332. *The Chairman.*] As a practical shipper of flax, do you not think it possible that the inspection department might be so arranged that the officials could assist one another?—Yes.

333. Such a system would be possible, but it is a question of detail to be hereafter arranged?—Yes; another advantage to the colony in having the flax graded, we should be able to sell here without any reclamations. During the last flax excitement, when the flax arrived in London it was sometimes not received as of the reputed quality in which it left New Zealand. They rejected it as

being of a lower quality, and because of the lower price in the London market they put it at a lower quality in their own estimation. All that would be done away with if we were to grade it in New Zealand.

334. What prospect is there of the raw material being kept up? Can you give any information on that point?—The present output of raw leaf, according to the late returns, is something like 210,000 tons. According to my own calculations, it is being cut so very rapidly that I do not think the supply can be kept up.

335. *Mr. Hamlin.*] How often can flax be cut? When it is cut, say, this year, when can it be cut again?—That depends on the district, or when you cut it. I have cut the same flax in two years. I have some other and I do not know whether it can be cut in three years' time. It depends a great deal on the drainage of the soil and other things.

336. And what would be the yield in these places?—About 30 tons an acre.

337. And what did you cut off originally?—We took off over 40 tons an acre.

338. You think in two years you could cut 30 tons?—Yes.

339. How much fibre is there in green flax?—That also varies a great deal. I have not been able to calculate. It depends on the time of the year. It is sometimes 9 tons and sometimes 8 tons, and, in fact, it has been as low as 7 tons. That would mean about 4 tons of dressed flax per acre at present cutting.

340. After two years, you think, 4 tons of fibre could be cut from it again?—Yes.

341. *The Chairman.*] From your knowledge, do you think it is possible that flax being sent Home damp would be in danger of burning a vessel from spontaneous combustion?—I do not think so.

342. You said in your evidence that it was dry and powdery?—I said there was a little heat. I have seen it powdery when decaying, but it cooled down.

343. In your opinion, if flax is damp, it depreciates very rapidly?—Yes, very rapidly, and the greatest care should be taken in putting it on board.

344. That it should not be damp?—Yes.

Mr. W. Pollard, Flax-miller, of Blenheim, examined.

345. *The Chairman.*] You are engaged in the flax-milling industry?—Yes.

346. You have heard the evidence given by Mr. Gardner. If there is any point in it on which you can give information, or if you have any statement to make, will you give it first?—I think, with Mr. Gardner, that it is a very important matter that the Government should offer a susbtantial bonus for the invention of a machine which will materially reduce the cost of production and improve the quality. If not, I think the industry will die out very rapidly unless there is some improvement in the London market, and, as we all know, it concerns the employment of a very large amount of labour. It is very beneficial to the country, more so in some respects than the wool industry, for with a station, although you have a large number of men employed at certain times, you can materially reduce them during the slack season, while at a flax-mill you have the same number employed throughout the year. Unless there was a large bonus offered I think no one of engineering skill at the present time would think it worth his while to employ his brains and capital to try to invent and bring out a machine to effect the requirements when he has the idea that the industry might be closed at any time.

347. *The Chairman.*] You generally agree with the evidence given by Mr. Gardner, I believe?—Yes, in many respects; not altogether with the form of inspection. I think it would be too complicated, and appears to me to be beyond what the Government would undertake. I believe in having at the ports of shipment inspection, which could be done by just drawing one or two hanks out of every bale.

348. It has been suggested by one witness that one out of five bales should be examined?—I prefer the hanks being drawn out of the bales, because it would be no loss to the producer.

349. How would you get the hanks?—They could be drawn out of the bales and put aside and afterwards baled up. There are so many shippers who could have these samples supplied to them.

350. Do you think a bale should be condemned on one hank?—One or two hanks. An average bale consists of about ninety-eight hanks, and a hank could be drawn from either end, which would be only the work of a few minutes; and I think the mere fact of millers knowing that such inspection would take place would at once cause them to discontinue sending away inferior stuff.

351. Is there any other point on which you differ from Mr. Gardner?—No, I do not think there is, except that I would make the inspection compulsory.

352. You generally approve of the evidence he has given?—I do.

353. With regard to the value and prices and other statistics he gives?—He is very much above what we are in Marlborough. This time of the year is most expensive, but with me it never exceeds a cost of £14 for production.

354. The price does not exceed £14?—Apparently it does at other mills. I was rather surprised to hear Mr. Thomson's price was so high. Mr. Chaytor is lower than I am, being nearer town. I am twenty miles from town.

355. What do you pay for your raw material?—I pay £1 per ton royalty on the dressed fibre.

356. Mr. Gardner said he gave £1 per ton royalty. The difference must be in the system of production?—They pay higher prices here than we do. I know that when the boom occurred here, in the North Island, nearly the whole of our men cleared out.

357. *Mr. Wilson.*] Does the £14 include the price of cutting?—Yes, everything. I pay about 3s. per ton royalty on the raw material, which is about £1 per ton on the dressed fibre, 5s. for cutting, and about 6s. for cartage, which brings it to about 14s. a ton for the green flax at the mill.

358. Then, £1 per ton, you think, would be sufficient to include all possible charges for delivering green flax at the mill?—Yes.

359. Then, do you consider that the difference in prices mentioned by Mr. Gardner and yours would be accounted for by the difference in wages?—Wages are higher in the North Island; and a lot of our men came over to this side, as they were able to get far better pay for the work here than we were giving.

360. *The Chairman.*] How many classes or grades do you think it would be advisable to have?—Three would be sufficient at first, at any rate, for if gone into too extensively it would be too complicated, and rather too much for the Government to undertake at present.

361. Do you think the principle of grading should be compulsory with all flax?—I think so, certainly. I quite agree with Mr. Gardner that too much has been said about inferior flax being sent to the London market. Of course I have seen a great deal of inferior flax, and heard of some which arrived in London having a deteriorating effect on the market.

362. *Mr. Hamlin.*] Do you think the bales would be sufficiently secured after two or three hanks had been drawn out?—It would not make the slightest difference; I have done it repeatedly myself—that is, before dumping. It is very hard to get them out, but it does not make any difference.

363. *Mr. Mackenzie.*] The only point of difference I can see between your view and Mr. Gardner's is that he thinks the whole bale should be opened while you think that one or two hanks would be enough?—Yes; you would not get good and bad fibre in the same bale. There are times when the machinery will not work well; when it does, the flax comes out good altogether. The same would apply when working badly. The shipper would be at the risk of having his bad hanks drawn.

364. *Mr. Wilson.*] This grading being in its infancy makes a great difference. Would it not be well to start opening every bale, in order that the people at Home would gain confidence? We acknowledge the great trouble, but would it not be advantageous?—Undoubtedly it would; but there would be no advantage in opening the bale unless you opened the hank. Just as with a fleece of wool, you have to open it out on a table.

365. *The Chairman.*] What prospect is there of the supply of raw material in Blenheim? Is there any chance of it running short?—I do not think so. In three years we can depend on getting it again. From two to three is the average: it depends on the soil.

366. You do not see any sign of the production ceasing?—Well, during the last ten years there has been no difference. The millers cut it and it grows again in three or four years. That has been going on for a very long time on many properties.

367. You do not think the output from Blenheim would be decreased on that account?—I do not think so. There would be almost the same quantity at the end of three or four years as at the time they commenced.

368. *Mr. Mackenzie.*] Assuming that a man had a patch, would it pay the owner to devote his ground to growing flax for what he gets for it?—He might do it just now, but not if the price for the raw material went lower. I know very few who would grow it, especially under present circumstances.

369. *Mr. Hamlin.*] You do not think it would pay to grow?—I do not think so. There was a large miller near my property. Although he had a large supply, he had an idea that there would be a scarcity in a few years, and went in for planting, but it did not do well.

370. He went in for transplanting, and it did not succeed?—Yes.

THURSDAY, 31ST JULY, 1890.

Mr. JOHNSTON DOUGAL, of Pokeno, examined.

371. *The Chairman.*] You were a flax-miller in the Auckland District?—Yes, at Pokeno.

372. What quantity of flax have you produced?—I used to prepare about 2 tons of flax a week.

373. At what cost did you prepare this flax?—About £15 a ton.

374. Do you take any particular flax, or do you take the flax as it comes to your hand?—All flax that comes unless it is rough. Any flax from sand-hills or sand-banks I do not take.

375. What machinery are you using?—The only machinery that I used was that made by Price.

376. Are you of opinion that any improvement can be made in flax machinery?—I cannot say, but flax might be improved a good deal in the washing.

377. Do you consider if a bonus were given by the Government it would lead to any improvement in machinery?—I could not give an opinion on that.

378. Have you taken into consideration the feasibility of improving flax by any chemical process?—No, I always thought the less chemicals used the better.

379. Have you found that flax deteriorates from the presence of too much moisture?—It stands a good deal of steeping, but once it is finished the drier it is kept the better.

380. Do you find that flax deteriorates, or is damaged by being packed when there is much moisture in it?—I should think so, most certainly; it would very soon rot.

381. You think it is necessary that the flax should be in a perfectly dry condition when shipped?—Yes, all flax should.

382. Do you think there should be any Governmental inspection and classifying of flax?—I do not know where you could get it well.

383. What would be the difficulty?—The ship's side would be the only place where it could be done. It could be taken down and examined and repacked. The merchants ought to be the judges. They ought to reject it altogether if not marketable.

384. If inspection is necessary, that inspection should take place at the chief ports?—Yes, certainly, if there is to be inspection at all.

385. Do you think that Governmental inspection would lead to a better class of fibre being produced?—Well, I could not say, unless it was to stop the sale of the bad. That is the only way in which it could be done. The merchants are, I think, greatly to blame for the purchasing of bad flax.

386. Because they purchase indiscriminately, I suppose you mean?—Yes, and at a general price. There are few of them judges of flax. There is a general price, and they take all that comes, without any difference.

387. Do you sell your flax to the merchants, or do you ship it on your own account?—I once sent a parcel to England; and Captain Ashby bought a parcel and took to London, realising £52 per ton. It was generally all sold in the colony.

388. *Major Steward.*] Do you know for what purpose it was used?—For rope-making.

389. And binder-twine?—No, there was no binder-twine made then.

390. *The Chairman.*] Have you made any attempt to get rid of the gum known to exist in the flax?—Yes, but only by steeping in water.

391. *Major Steward.*] Have you ever seen any of the flax prepared by the Maoris?—Yes.

392. Is it not superior to what is turned out by the mills?—I believe it is.

393. Very much so?—Yes.

394. Is the process used by the Maoris one of scraping?—It may be called a kind of scraping.

395. Now the process used is a process of beating in the machines?—Yes.

396. Does not that tend to break the fibre?—Yes, certainly it would break it a little.

397. If a machine could be invented for preparing the flax by a process of scraping, is it not likely it would be better, supposing it could be done?—The fibre is all through the leaf: to scrape it you must scrape one side. You must strike hard to get the vegetable matter in the leaf broken.

398. *Mr. Hamlin.*] You were engaged for a number of years in dressing flax?—Yes.

399. And, I believe, have been very successful in dressing flax?—Yes.

400. The machine, you state, is Mr. Price's manufacture: was it not a machine which was virtually introduced by yourself originally?—Yes.

401. Before any other machines were brought out?—No; there were other machines, but they did not make such good work.

402. Have you any objection to stating your mode of preparing flax right through?—I have no objection at all. When the flax comes from the field I generally keep it for two days to take the harshness out of it: it gets softer and more pliable. I do so before putting it through the machine.

403. *The Chairman.*] Would it be kept two days both in summer and winter?—Yes, at all seasons. It was kept in the dry mill to take the harshness off it after it was cut.

404. *Mr. Hamlin.*] What then did you do?—I put it through the machine, and from there to the washing. Every hank when it came from the machine was put into water.

405. *The Chairman.*] For how long?—I put the fibre into troughs as it was dressed, and left it there till the next morning.

406. You soaked it twenty-four hours?—Not exactly twenty-four hours; but there would be no harm if it were left twenty-four hours. It must all be kept in clean water, the water running through it. Then it is taken out and dried; taken in and put into a house and let lie there for two or three months, when it is scutched.

407. Did it necessitate very large buildings to house the flax for three months?—Yes, it required pretty large sheds. You could not make good work without large sheds.

408. It has been stated that in some cases flax has been taken for scutching in a damp state: is that advisable or not?—No, it is not. I never saw any taken damp. I have seen it taken dry from the field and scutched; then it is too brittle. Flax is never so good when scutched direct from the field.

409. Then, you do not store the flax for the purpose of making it dry?—Oh, no; it is dried in the field.

410. You put it together in large quantities, so that it gets moist with its own moisture?—It never gets moist at all. There is a sort of sweating after it is packed up when it comes in from the field. There is a little dampness comes over it, but it gets all right in a very short time.

411. *Mr. Hamlin.*] I think you wished the Committee to understand that your reason for stacking the flax away and allowing it to remain for a couple of months was that, when put through the scutcher, it is more readily dressed and becomes a better article?—Yes; it is more pliable and soft. When scutched from the field direct it is hard and brittle.

412. You were the manager, I believe, of a manufacturing establishment at Home for years before you came to the colony?—Yes; I was well acquainted with the work at Home.

413. *The Chairman.*] You were an expert in flax-dressing?—No, not in dressing it, but in manufacturing it.

414. *Mr. Hamlin.*] Then, from your experience, do you consider that the flax will ever be dressed so as to be used for the manufacture of textile fabrics, or not?—No.

415. Can you give any reason why you say no?—The quality of it. It is a hemp and not a flax at all.

416. Then, even supposing the machinery would turn the flax out equal to that prepared by the Natives, do you not consider that it could be used?—No, it could not.

417. *The Chairman.*] Were you a rope-maker?—No; I was a spinner of finer quality of flax. The rope-makers only use hemp and manila.

418. *Mr. Hamlin.*] Then, so far as you are personally concerned, you opinion is that no bonus should be offered for improving machinery?—I could not say; a bonus might do good.

419. Have you any idea in what way machinery could be improved, with good results to the colony generally?—No, I could not say, unless a new machine can improve the quality of flax going Home. There is so much bad flax goes Home that people get tired of it, and will not be bothered with it.

420. In that case, would you not consider that inspection at the various ports of shipment would bring about an improvement?—It is quite possible it might. The bad flax would still come for all that.

421. Supposing such a thing were established as inspection at various ports, it would be under Government control, and they would virtually say as to whether flax was of third-rate or fourth-rate quality: would that not be a check on the careless manufacture of the fibre?—I am afraid not. The merchants are the only persons who could check it. For bad flax a low price will be paid and for good flax a good price; but when bought the flax is all sent away.

422. Supposing you were sending it to the London or American market, would it not tend to improve the price?—I cannot say. They would give a good price for the good and a poor price for the bad. Bad flax is not fit to make a rope.

423. *The Chairman.*] What is the effect of too much moisture in the flax?—It will rot it, and it will get very black if it is too long exposed to wet.

424. Do you know from your own experience that it fires itself?—It heats a little.

425. But it will not fire?—I do not believe any wet would make it fire. I have seen the flax in all its stages, but never saw it fire.

426. *Mr. Walker.*] Do you know how the flax is taken out of the hold of a ship?—I have never seen it taken out.

427. Did you never hear of any reports from Home, from the docks there, as to the state in which the flax comes out of the hold?—I have heard that it sometimes comes out wet.

428. But never fired?—No, never.

429. You apparently blame the merchants, or rather the millers, for the bad flax that is shipped?—It is the merchants who ought to stop shipping bad flax. There are hundreds of millers who do not know good flax when they see it. They do not know the quality. They are not judges of the quality or value. They prefer selling a bad flax at a lower price to the merchants, as it pays them far better. There is less trouble with it in every way.

430. And if the merchants would only buy good fibre it would prevent the evil?—Yes, certainly, or else give a very low price for the bad.

431. Is not that operating now?—No, I do not think it is to a great extent.

432. *Mr. Mackenzie.*] Have you ever grown flax for cutting, or have you only cut the natural?—Just the natural.

433. You do not think it would pay to grow flax?—Well, I have never required to grow it.

434. You say that you are a spinner, and you think from your own knowledge that even the Maori-dressed flax is not fine enough to spin into fabrics?—No.

435. You do not think it is even fine enough to make canvas?—No; I do not think it is fit for ships' canvas. I once got a small parcel of New Zealand fibre in Fife. Having a small order for merchant canvas we mixed it with European flax. I think about one-sixteenth part of the New Zealand flax was mixed with European flax. It was detected in the canvas, which was of very heavy quality. It was detected by the merchant, and he would not trust it.

436. *The Chairman.*] It was condemned?—Yes.

437. *Mr. Mackenzie.*] It would be condemned before. The manila would strengthen the canvas?—It would not strengthen the canvas; it would not stand the weather like flax.

438. You think it is not good enough to make canvas, no matter what care is taken in the preparation of the fibre?—No, I do not think it is. Navy canvas should be made of the finest quality of flax.

439. Even for horse-covers and tarpaulins you would think it not suitable?—I think it would be, certainly. It would make scrim.

440. Have you any idea of the value of the raw material that is used now for scrim, canvas, and tarpaulins?—Well, I could not say what the value is now.

441. Then, do you think if the flax were used for that purpose they would get a higher price for it?—You would not get a higher price for bagging.

442. Even for horse-covers and tarpaulins made out of the strong fibre without jute?—I cannot say.

443. You do not know whether it would bring more money if used for the purposes just mentioned?—I do not think it would. I think rope and twine would be the most suitable thing you could put it to.

444. Do you think that the fibre of flax is as strong as the fibre of manila?—If it is well dressed it is as strong but not so pliable as manila, and would not last so long.

445. Do you think the dressing would improve that inherent weakness of the fibre?—I do not think any dressing would do away with the defect.

446. You say the merchant can make more money out of the poorer flax?—No, the manufacturer.

447. *The Chairman.*] Do you know the fibre you have in your hand [sample of flax handed witness by Mr. Morrison] ?— I cannot say; it appears to me to be some young leaves.

448. Do you recognise it as any flax now in use in the Old Country?—It appears very soft. You cannot speak of a sample like this. With so much handling it gets different altogether. It looks very fine.

449. *Mr. Hamlin.*] Did you find any difficulty in removing the gum from the fibre after it was dressed?—Washing is the only thing I could get to do it.

450. You find the washing removes it all?—Yes, it cleans it quite properly.

Mr. J. L. Morrison, of Wellington, examined.

451. *The Chairman.*] You are an expert in flax and textile fabrics?—Yes; in all fibres throughout the world.

452. In the Old Country?—Yes, and up to the last twelve months in Sydney. All fibres sent out for rope-spinning and weaving, of all grades, I have had under my supervision to classify them, and tell what they are suitable for.

453. You have been classifying for various merchants in Wellington since your arrival?—I have. When there have been disputes between the millers and their own people who were supposed to classify the flax it was passed over to me, and I had to settle the disputes between them if they were of a serious nature. I was paid by the people who asked me to classify it.

454. Can you give any information about the advisability of a bonus being granted by the Government for improvement in machinery?—I should strongly recommend it.

455. You think that by a system of that kind the machinery used for flax would be improved?—Without a doubt.

456. But you are not a flax-miller yourself?—I have been. I may say that I was also manager for the New Zealand Fibre Company seventeen years ago. I was brought out from Home to manage the rope-making affair in Auckland—in the Northern Wairoa—by Mr. Tinney, of the firm of Fraser and Tinney.

457. Then, you have had considerable experience in the manufacture of Phormium fibre?—I have. I have had as much as £20,000 to experimentalise upon.

458. *Major Steward.*] With regard to offering a bonus for machinery, you think that if a bonus were offered it would lead to the development of improved machinery?—Without a doubt; I am sure of it.

459. With regard to the machinery that is now used, can you state what is the reason that it does not turn out the very best possible sample of flax? What is the fault of the present machinery?—Well, in the first place the fibre is run through fluted rollers, smashing the fibre up, and then coming down on a beating-bar, with a drum set very keen, so as at times to hash the fibre up.

460. So that if that fibre were looked at through a microscope it would be seen to be much broken?—Yes, I have examined it frequently.

461. How does that compare with the fibre that used to be prepared by the Maoris by hand?—Well, the Maori-dressed fibre is superior without a doubt.

462. The Maori-dressed flax is superior to that which is turned out of the machines?—Yes.

463. Is it very much superior?—About 100 per cent. in value.

464. That is to say, double the value?—Yes.

465. Well, is the Maori process a process of scraping?—Yes, it is.

466. Then it follows, does it not, that if we could invent a machine which would prepare the flax by some process of scraping, instead of beating as now, we should turn out a fibre equal to that prepared by hand?—Without a doubt.

467. If flax at present is worth £20 or £22 a ton as turned out from the present machines, and we could turn out flax by a process of scraping that would be complete, we should command something like £40 a ton?—Well, close upon it.

468. Have you ever experimented at all as to chemical processes? There are some persons who say that flax can be prepared by chemical processes—by using solvents and so on—and get rid of the vegetable matter and gum: have you ever made experiments in that direction?—I have not; but I have spun fibre that has been prepared in that way.

469. What is the effect upon the fibre of these chemical processes?—The chemical process used to prepare the fibre I spun was potash, and the rope did not stand the salt water. We put a manila rope of the same size with it on board the vessel, and tried the two together to see how it stood.

470. Then, in point of fact, your experience comes to this: that, as far as any chemical process you have seen, the fibre is deteriorated and cannot be prepared in that way?—Yes; but you must understand that this chemical process was tried sixteen years ago. Since that time we have advanced in chemicals and science.

471. But so far as your own opinion is concerned, you think we are more likely to succeed in the direction of improved machinery?—I think so.

472. Now then, supposing we had this improved machinery as the result of a bonus, do you, or do you not, think that flax could be turned out of a quality suitable for manufacture into different kinds of fabrics?—Without a doubt; I have seen it.

473. What class of fabrics would they be—merely rough fabrics, such, for instance, as hessian?—I had a shirt on my back sixteen years ago that was manufactured from flax from our own mill. It was sent out from Manchester.

474. Then, shortly, you think that the flax can be properly prepared, and can be used for fine fabrics such as linen?—Yes, without a doubt I do.

475. Then, could it also be used for the rougher fabrics, such as hessian cloth, sacking and bagging, and so on?—Yes, I have done it. I have spun it nearly sixteen years ago.

476. So that in point of fact your opinion is that if the flax is developed to its highest capacity it is capable of being used for the whole range of fabrics, from the coarse article right up to the finer linen?—Yes, and also for all grades of rope.

477. And in that event, would or would not our fibre command a higher price in the London market?—Without a doubt.

478. How much higher do you think?—It would realise from £34 to £50 a ton.

479. *Mr. Mackenzie.*] You say that from £25 to £50 a ton could be obtained for the flax?—Yes.

480. What knowledge have you of those fabrics that are made from the flax at Home?—I have a knowledge of the common canvas used for tarpaulins, horse-covers, &c., which is made from jute and Italian flax mixed; good canvas is made from the Italian flax. This is the fibre [sample

produced] that all good canvas is made from; it is Italian flax. There is more of this particular fibre used than was mentioned in the morning paper of yesterday. It is there stated that 50,000 tons was as much as we could get rid of. I have the information from "Cassell's History" that in 1871 the imports were four times that quantity. Up to the present time the imports of Great Britain, without America, are thirty millions sterling worth.

481. What I want to ascertain from you is your own knowledge as to the uses this flax could be put to at Home if the fibre could be improved?—Canvas, in the first place, would be one of the many things the fibre could be used for if sent to England.

482. You say it could be used also for making shirting?—Yes. It is very cold for shirting, but it wears well.

483. Do you think you would get a largely increased price for the fibre if it were used for canvas at Home?—At the present time the price for rough Italian fibre is £34 a ton. That quality runs from 5¼d. to 6d. a pound in the bale in a fine-dressed state.

484. Do you think that a machine could be invented that would bring out our flax as fine as this Italian fibre?—Yes, I am positive. If we could take the gum away by scraping it would compete in the London market against the Italian fibre to-morrow.

485. *The Chairman.*] For all the purposes for which Italian fibre is used?—Yes. When the tow is taken from the Italian fibre it realises from £50 to £56 a ton to use for fine work.

486. *Mr. Mackenzie.*] And you assert that the New Zealand flax would take that position?—Yes.

487. *The Chairman.*] And an unlimited market?—Yes. I have been in the service of my father in England, under his supervision, and where he takes his knowledge from is from the Gourouck Rope-work Company, now at Port Glasgow. There are as many as two thousand hands making canvas for this particular firm from this Italian fibre, and I have received letters from him telling me that I ought to push the New Zealand fibre, and try to put it into the English market against the Italian fibre. He considers that it makes a clearer article than the Italian flax.

488. You do not know of New Zealand flax ever having been utilised for canvas?—It has been utilised after the gum is extracted. It makes splendid canvas.

489. It would require new machinery to expel the gum without destroying the fibre?—Yes, without deteriorating the fibre.

490. Now, we want information on the question of classification: do you consider it necessary that flax should be classified before leaving New Zealand?—I do; strongly I do.

491. Can you tell the Committee how many classes it should be divided into?—I think we should have only three classes, although I have seen as many as four or five classes. I have seen some deplorable stuff, as black almost as coal, in the sheds. Even to-day I could show it to you.

492. You think, practically, that three classes would be sufficient?—Yes; I would class them in this way: I should call the really good fibre superfine, the next fine, the next medium, and the next common. I should also suggest that each miller should register his brand, so that we should get to know their flax thoroughly.

493. It has been suggested that the only place where inspection could be carried out would be at the mills: do you think that practicable?—Well, my suggestion would be that the fibre should go to the Harbour Board to be put into their sheds for shipment, and be inspected there thoroughly—one bale out of each shipment from each miller. A report should be written upon it, and the miller informed where any defect was in it, so that he could try and improve it. Give him advice upon it, and not do as is now done.

494. Could you get at the fair average contents of a bale without opening it thoroughly?—Well, if you have got the miller's brand registered you could make an examination without pulling his bales to pieces. A view of it would be sufficient.

495. But, still, you wish us to understand that before you really knew what the brand was you would have to open the bales thoroughly to ascertain?—One bale, or perhaps two, in each shipment.

496. Would one out of five be sufficient?—Oh yes, less than that. The sampling of the bales in the sheds puts them out of uniform shape. Not having a scutcher to touch the hanks up again, to make them look as they ought to be, necessitates their being put into the press here ruffled to a certain extent.

497. *Major Steward.*] Proper men would be kept for inspection with proper appliances?—Yes, that would be required, to put up the flax again in a proper manner, so as to get a proper price for the miller.

498. *The Chairman.*] Is care taken at the wharf in sending distinctive parcels Home as taken from the mills?—No.

499. They are not sufficiently branded?—No. The millers alter the brand if they get the name of a bad brand.

500. You consider that all these difficulties would be met by a proper classification and registration of the brands at each mill?—I do.

501. Have you seen flax leave here in a moist or damp state?—I have seen it shipped here, and have received it in the Old Country, and in Sydney, in a damp state, and as hard as a board.

502. Was the flax much deteriorated by that moisture?—Yes. I have seen fibre, only thirty days after leaving the mill, being shipped from the Harbour Board sheds here with a musty smell. That fibre, being in the ship's hold for four months going to England, loses about 20 per cent. of its strength. It heats to a certain extent, and turns colour through the damp; it turns to a dark cast, a lead colour almost. This fibre, when taken out for rope-spinning, would fall away in the hackling process. It would turn out lumpy yarn, and not a glossy rope in any way; and the sale of it would be impaired fully 20 per cent. It would lose another 10 per cent. in the working of the fibre.

503. You are alluding to the amount procurable for the fibre for manufacturing into ropes?—Yes. When it goes into the English market in the first place there are two dumps put together. The broker then samples them. He looks over the whole line of this particular brand. Being a buyer he points out the worst one he can get. Then he shows the faults in it. This can be avoided by classifying the flax. Put two good dumps of the same brand together, then class it off, and let that shipment go as first or second class. Instead of that, the fibre leaving this port is really ruined. It is sent into the London market, or the American market, in such a state that we do not get real value for the stuff that we are manufacturing now.

504. Then, you say that sufficient care is not taken on the wharf to put the qualities together?—No, there is not.

505. That, in many cases, bales are dumped with others belonging to another shipment?—Of different quality, but the same brand.

506. The duty of the person appointed by the Government would be to classify it, and so divide it that the different qualities should go together?—Yes; everything should go in that way, instead of being jumbled up.

507. What staff would be required to classify in Wellington?—One man to classify, and a clerk to write reports out and send to the millers. That is all that would be required.

508. Then, we understand that two men, a classifier and a clerk, would be only required, in addition to the Harbour Board men?—Yes, that is all.

509. *Mr. Hamlin.*] Do you not think that flax coming into the Harbour Board sheds to be stored there would have to be opened to see what class of flax it is. Supposing there was inspection, in order to give a wholesome check, every bale would have to be opened?—No.

510. How are you going to tell the quality of the flax?—You take one bale and look at it; you open up the head of it, and, no matter how much the miller may comb it over, a man who understands the fibre thoroughly can tell the quality by feeling it; he can tell whether the flax is up to the proper standard. I could tell what sort of twine a ball would be, whether it was musty or anything else, by its odour. If you are used to the fibre you can tell the quality by squeezing it.

511. You can tell whether it is perfectly and sufficiently dressed simply by looking at the end?—Yes; if I saw any default in a hank I could detect it.

512. And that would leave the flax thoroughly fit for shipment?—Yes.

513. You are sure of that?—Yes.

514. By looking at a hank of it you could say it was properly dressed at both ends?—Yes. After I had opened one bale perhaps in ten, and found out the miller and the register of his brand, that would give me a guarantee and some confidence in the miller. After I had been watching his flax from time to time I should very soon get at the bottom of the defects.

515. You consider that would be sufficient to enable the Government Inspector to report to the Government that such and-such flax was first class and second class, and that that report would be received in the London market?—Yes, it would be received.

516. Do you think the Government would be justified in appointing an Inspector to have such an inspection as that?—Yes, and to report to the miller.

517. How could you report unless you examined the flax?—I could examine it. I would take the worst bale out of ten bales of the brand to be sent to the London or American market. You can tell the quality of the fibre in a moment by looking at it.

518. You can tell if there is too much wet?—Yes, and whether it is up to the proper standard, or whether it is sufficiently scutched or not.

519. *The Chairman.*] We understand that you consider that if an Inspector was appointed by the Government here it would be necessary that a preliminary part of his duty would be to visit the various mills and see the system of baling and the system of manufacture?—Yes.

520. And having seen the system of manufacture in the various mills, an examination of one in five of the output of the various mills would give you sufficient knowledge to enable you to classify?—Yes.

521. *Mr. Hamlin.*] Have you any knowledge of flax fifteen or sixteen years ago having been prepared by the machines at present used and sold in the London market for £51 or £52 a ton?—Yes, I am aware that that is a fact. That was done by the company I was managing—the Auckland Rope-spinning Company. The company's mill had a great run on the fibre. We shipped it Home direct in our chartered vessels.

522. If the machines in the old days were able to turn out flax at a price of over £50 a ton, what prevents them from doing so now?—Well, when the fibre went into the market at that time it was a new thing; manila had not been much used. It has not been a great lengh of time in the market, although it is a good fibre. It is a new fibre when compared with the Italian fibre. They had not found out that the gum was in the New Zealand fibre, and as soon as they found that it would not stand the salt water the prices went down.

523. In the event of the gum being extracted from the fibre it would hold its own?—Yes.

524. *Major Steward.*] It does not hold the tar?—No, it does not hold it; the tar squeezes out in manufacture.

525. *Mr. Hamlin.*] You do not think that it is from carelessness the price has been reduced?—Yes, I do think so.

526. You think the flax prepared at the present time is up to the old standard?—Yes. In some of the mills at the present time there is just as much care used as then.

527. You speak generally of your knowledge through the colony?—Yes.

528. You consider from what you saw here and elsewhere that the product is equally as good as it used to be?—At the present moment there has been such a rush in the fibre trade that there are men who have not taken the precaution such as the old millers have taken. They are a long way out; they do not know how to prepare the fibre.

529. *Mr. Walker.*] Have you sufficient confidence in the London market that it would accept our classification and give us value for the improved qualities?—Well, we could get returns in four months. The whole matter could be proved in a short time. Some could be sent Home by the mail-boats in less time.

530. Are the conditions of sale at Home satisfactory to the miller who turns out a good article?—Without a doubt they are.

531. They ought, therefore, to respond to any efforts we make to improve the article?—Yes.

532. You have sufficient knowledge of the London market to say that you are satisfied as to conditions of sale and everything being favourable to a good article?—Yes.

533. Except the method of selling two bales together that are not equal?—That is against the fibre.

534. Why cannot you prevent that?—Well, there is nobody to prevent it. The men in the sheds get instructions to take such-and-such flax away. It goes whether good or bad. It is not their business to pick out the fibre at all.

535. If you consign your fibre to the broker in London, is it not his duty to protect your interest?—Yes. The stuff is taken into the room in the dump. If you take it out of the dump the whole thing would be loose. They only undump certain bales to look at as samples.

536. But they are all numbered?—Yes.

537. And catalogued?—Yes.

538. Cannot you give instructions to the broker to see that only those numbers that ought properly to go are to be sold?—Yes, but they are not all to go together.

539. If they were all to go?—Yes.

540. Then the fault lies with the people in Wellington?—Yes.

541. Why cannot you prevent that?—It has not been prevented.

542. Wool is treated very much in the same way?—Yes, there are men to classify wool in the shearing-sheds at the stations.

543. Why cannot the same care be taken with flax?—It is not done.

544. Well, whose fault is that? Surely the miller and merchant between them ought to be able to do so?—In the first place—we will take Wellington for example, where there are four or five or six good merchants—in the Foxton district, which is a large district for flax, each one of these houses has a representative there. The miller goes into these stores and offers his flax for sale, we will say, at £20 a ton. The next-door miller—perhaps half a mile away, or less—goes into the same store and offers his fibre for sale, and he says, "I want £20 10s. a ton for mine." The storekeeper says, "I am getting the flax of so-and-so for £20 a ton." Very well, that fibre is taken as at the £20 10s. The very man who has manufactured the flax for £20 is £2 better flax than the man who asks £20 10s. The point then comes that really the flax industry, up till just of late, has been run—one merchant with a representative in the country running the other to buy the stuff so as to supply the millers with stores. A lot of the flax has been spoiled by one buying against the other.

545. Is that done without knowledge?—They have no knowledge whatever. I have known merchants here go into the market and bid for flax at a certain figure, and really they have lost £6 a ton on it; they have not known the quality of the fibre; they did not understand what they were buying.

546. Do they buy to ship on their own account, or for a firm in Wellington?—They buy for a firm in Wellington.

547. Does not the firm in Wellington object when they get these bad bargains put on their hands?—Yes, certainly; and sometimes they discharge the men immediately.

548. And you do not think that the natural course of experience will improve the trade sufficiently. It requires Government classification as the best and quickest method of correcting these evils?—Yes.

549. *The Chairman.*] With regard to the management of the flax in the field, I think I understood you to say that, for convenience of working, the flax is taken in from the field in a damp state?—Yes. A great number of mills are let by contract, to turn out the flax at so much a ton. The fibre, if it is left to be thoroughly dry, yields a great amount of tow. They take it in a little damp, so that in the scutching the tow does not depart from the fibre; and thus the fibre is not up to the proper standard for rope-spinning.

550. You say that sufficient care is not taken to insure that the flax is dry when it leaves the manufacturers?—That is so. The last witness stated that he had known fibre to be kept for two months, so as to make it "mellow;" that is the technical term used. I quite agree with him in that statement.

551. You agree with the last witness that when flax is stored in sheltered places it becomes "mellow," and capable of being worked readily?—Yes.

FRIDAY, 1ST AUGUST, 1890.

MR. A. P. SEYMOUR, M.H.R., examined.

Cultivation.

Witness: Would require first-class land, altogether too good to pay to devote to it. Draining swamps would pay better, and, I think, give better results in larger crops of flax. Planting will take many years before a crop results. Plants set in early September, 1889, have now four small meagre shoots from 2ft. 6in. to 3ft. long, with no sign of any fresh fans; truncheons of old roots did not in any case grow.

553. *Mr. Hamlin.*] What sort of land was it that you planted your flax on, Mr. Seymour?—It was old flax-land on the banks of the Manawatu River, and many years ago formed part of an old sheep-yard. I grew in it garden stuff which would have been fit to show anywhere; it was exceptionally good.

554. Had it been damp sandy soil at one time?—Yes; that moist soil which is by the side of the rivers.

555. And sandy?—Yes.

556. The roots could not strike into any clay?—No.

557. With reference to the flax at Foxton, was not that growing on sandy soil?—I should not call it sandy soil. It is the swamp flax. The flax is grown in swamps which have been partially drained.

558. Was it sandy at the bottom?—I should say rather peat than sand, but I should not call them clayey swamps. I should not say the fibre which came off the swamps was bad by any means. The fibre was good; but the objection I have to it, from my own experience in Marlborough, is that the flax in the swamps is too old to make first-class fibre.

559. *Mr. Marchant.*] I gather from you, Mr. Seymour, that you do not consider that planting flax is at all likely to be a commercial success?—I do not.

560. As to this swamp flax, would the second growth that would come on when the old flax had been cut away be of better quality than that cut first?—I think it would be a first-class quality.

561. Do you think draining the swamps will increase largely the growth of the crop, and also the quality of the leaf?—It will increase the area of flax-land available for dressing.

562. For what reason?—Because as soon as you have drained a piece of swamp it grows flax. Directly you take the superabundant moisture off the swamp the raupo dies, and the flax takes its place.

563. Do you think many large areas of swamp which exists in that district might be profitably dealt with in that way—drawing off the water by draining, and leaving them to grow flax?—I am sure many thousands of acres could be dealt with so.

564. With regard to the second growth of flax, you say that you think it will take three years from the first cutting, I understand, to give a fair crop, and four years for a good one. What weight of leaf would you consider a fair crop obtainable from the second cutting?—At three years, probably from 20 tons to 25 tons to the acre. I think the fourth year would add another 10 tons.

565. That would be from 30 to 35 tons?—Yes; I have got 40 tons off an acre, but that was exceptional.

566. In four years?—No, old flax.

567. What would be the quantity of fibre per ton obtainable from the leaf do you think?—The quantity of fibre from the leaf would not be so great as from the old flax.

568. What would you assume it to be roughly?—It would probably take 8 tons of green flax to make 1 ton of fibre by our present process, whereas 7 tons will make it now. The average of a year's work at my mill was 6 tons 18¼cwt.

569. That is of old flax?—Yes.

570. We had figures given to us by Mr. Gardner, flax-miller, a few days ago, to the effect that in two and a half years he would get 30 tons of leaf as a second crop, and that that would yield 7½ tons—that is to say, he would get 1 ton of fibre from 7½ tons of leaf, making, in other words, 4 tons of fibre to the acre after an interval of two and a half years?—I should think that rather exceptional. Such experience as I have had would not warrant me in coming to such a conclusion.

Quality of Flax, Foxton District.

Witness: Is chiefly coarse and long, only can be classed as medium hemp when dressed. Cause: age and length; most of the flax is far too old, the leaves are past their prime. First-class sample may be made when the beds are cut again; single leaves will grow 7ft. in a few spring and summer months, but three years required for a fair crop, and four years for a good crop; at six years old leaves, though fair, are getting past their prime, many being badly spotted with black blight.

Grading.

Witness: Should if possible be arranged and made compulsory, must be by bale, and not by the hank. One Inspector in each principal port, with power to open any bales he may choose, could do all the work. Any hank can be pulled out of a bale, examined, and placed between two of the same brand before dumping. Cost of their inspection would be very trifling, and could be charged with the storage and dumping, and all this should be paid by shipper, not as now by ship in the first instance. Present cost of dumping, being now paid by ship, is charged at most extravagant rates. Inspection by hank would be far too costly, and could only be done successfully by a company buying up the flax at low rates and repacking, and company probably would not secure the best and evenest brands, because they would not give as much as the merchants.

571. *The Chairman.*] What we understand from you is that the work is done by the ship in the first instance?—Yes.

572. Will you explain that?—The ship pays for the dumping; that is the point. We pay for it in the end. The producer has to pay for all these things, and we pay at an exorbitant rate for it.

573. What you suggest, Mr. Seymour, is that a contract should be made by the producer with the Harbour Board authorities?—Yes. The producer should, in all cases, first pay these charges and get a rebate from the ship.

574. *Mr. Hamlin.*] Do I understand you to desire that all the bales should be opened here?—No, I say "with power to open." One Inspector in each port with power to open any bales he might choose could do all the work. I do not expect that he would open probably more than one in twenty.

575. Do you think that sufficient to warrant a Government Inspector in affixing his brand of first, second, or third class to the flax?—I think quite so. He could pull open the hanks and see

the inside without opening the bale, or, if he had any doubt, he could pull the hank right out of the bale. If he put a hook into it it would come out.

576. As a rule it is the butt where there is a large quantity of gum remaining, and also on the tips of the flax and edges, and in that case you could not see unless you drew the hanks out or opened the bale?—Most is left on the edges that you do see. Those who make up their hanks carefully for show work it so that those are hidden inside, but if you get hold of a hank at the doubled part and pull that part open you would see if there was much of the edges left without opening the bale. It might be necessary occasionally to open a bale and see if there was much on the tips, but I think in a very short time the Inspector would know what brands he could trust to being packed uniformly, and very often it would not be necessary for him to open, perhaps, more than one of a parcel of a certain freight that came to him. Inspection, as a matter of course, will make people a little more careful in packing than they have been.

577. *The Chairman.*] Do you think it necessary that an Inspector appointed in any of the ports should make it his duty to visit the different mills and see the system adopted by the millers in the manufacture of their flax?—I do not think he would gain anything by it except a great deal of trouble. He would not know much about it. What I say is this: The flax will vary a good deal according to where it is cut.

578. *Mr. Marchant.*] Do you think, with the examination of such a small percentage of bales, there would be no risk of unscrupulous manufacturers getting bales branded as first class which had been unfairly packed by design?—Well, of course it would be very difficult to say whether you could take such precautions as to prevent the possibility of any wilful misrepresentation being made; but I think, on the whole, it would not be attempted.

579. It seems to me to be rather a serious matter that the Government should undertake the responsibility of branding an article as first class, making as it were a representation upon which the buyer at Home would purchase the article, unless the Government servant takes every precaution to satisfy himself that the article he brands as first class is really so. Does not that occur to you also, Mr. Seymour?—I do not think there would be any great difficulty in it.

580. You think the knowledge of the existence of the Inspector, and the probability of detection of unfair packing, would be sufficient to deter unscrupulous manufacturers from packing unfairly?—I think, if I could get at every bale in the shed, I could tell without any difficulty whether any of them ought to be opened and further inspected.

581. *Mr. Hamlin.*] Do not you think, Mr. Seymour, that, supposing the Government go in for grading and appointing Inspectors, it would be absolutely necessary to open the bales and make a very drastic system of inspection at the start?—You may leave that to the Inspector—you would certainly give him the power to open—and he would probably open more at first than he would afterwards, and in a very short time he would get to know people's brand. He would know those whom he could trust, who packed honestly, and those who did not. But the very fact of inspection would lead to more honest packing than now obtains.

582. *Mr. Walker.*] Do you not think it would cure itself in a very short time without inspection? Look at our wool trade; the matter has righted itself there pretty well. People who do not pack fairly inevitably suffer?—Yes.

583. And the result is that that staple is got up with as great skill and care as possible?—Yes.

584. The results always reward proper care and attention, and do not you think this industry will right itself naturally?—Undoubtedly, in time, but it differs from the wool rather. There is not so much wool, I should say, purchased by the local merchant, but the greater proportion is sent Home by the owner, who becomes then directly responsible for it, and directly feels any loss that may be entailed by bad packing or bad sorting.

585. But do you not think that would be in favour of flax righting itself? Suppose a Wellington merchant buys a parcel of flax on certain representations, or on his own judgment, and it turns out to be a fraud, he undoubtedly loses by it; but he is within a few miles of the perpetrator of the fraud, and he could get at him in a way that a London broker could not. I should think myself the moral effect, and, indeed, the commercial effect, would be so much the more conclusive and rapid in its operations, because the thunderbolt is so much nearer the vendor?—I think you are taking an extreme case to call it fraud. A great deal of this does not apply to fraud.

586. Call it ignorance?—It applies partly to ignorance and partly to carelessness. Undoubtedly it must right itself in time, but we want it righted at once, and we hope to do it by inspection.

587. *The Chairman.*] Is it not the case, as far as wool is concerned, that the purchasers of wool buy from information received from old account sales which have been in existence, as far as possible, but that with the flax there is no such basis to go upon at the present time?—Yes, I would say that, and also that the two cannot be compared, because the wool of the flock will only vary from year to year in a very small degree according to the season; but, as I said before, the fibre varies with every different bed of flax you are cutting, and it varies somewhat with every different season of the year.

Bonus or Reward.

Witness: Would it be of any use? I think so. A reward of £20,000 produced Harrison's chronometer, and made long voyages practicable, for lunar observations were always very precarious. Conditions: (1.) Cost of production of fibre, after delivery of raw flax at mill, ought not to exceed £5 a ton. (2.) On the number of flax-machines used after a certain date from application for bonus. (3.) If chemical, on the number of mills adopting the new process. (4.) On certificate of flax-millers' associations that the problem of cheap manufacture of good fibre has been solved. Any of these separately or combined might be adopted. Inventor receiving bonus not to patent, or, if patented, must abandon. Wet fibre will not fire. Wet tow heats a little like stable-dung and then rots down quickly.

588. *Mr. Hamlin.*] Have you, Mr. Seymour, any idea of what bonus, if any, should be offered?

—I think it should be as substantial as the colony can afford. Ten thousand pounds has been mentioned, and that would not, I think, be excessive, when you look at the annual output and what would be saved to the colony if the cost of production were made £5 a ton.

589. *Mr. Marchant.*] You did not touch upon the enhanced value of any superior method of dressing, in your suggestions as to the conditions for the bonus. You do not appear to think that there is any hope of the fibre fetching greatly increased prices at Home through any greatly improved method?—I will come to that presently.

Mr. Marchant: I thought that would be included in the evidence as to the bonus.

590. *Mr. Walker.*] Are there any complaints from Home of fibre having heated?—There are instances where it has rotted. Mr. Chaytor had a lot returned rotten, ex "Tainui," and on inquiry into the reason of it, when he went Home, he found it was on account of a port-hole of the ship having been left open negligently. The fibre was rotten.

591. You have no doubts in your own mind that it will not fire?—Not the slightest; it will not fire.

592. There was the case of a Fr'isco steamer which put back with its cargo on fire, and it was hinted, at all events, if not definitely stated, that it was the flax?—It was said to have been accidentally lighted by a match.

593. *Mr. Hamlin.*] I think it must have been a match, as Mr. Seymour suggests, or tobacco dropped from a pipe into one of the bales?—Of course it is highly inflammable.

Bad Fibre sent Home.

Witness: Many mills were set up by persons who knew nothing of the business, nor realised the necessity of keeping their strippers in good going order. Also, from various causes, the monthly output did not equal their calculations; but wages had to be paid, and hemp was brought in and packed in a semi-manufactured state in order to receive advances on delivery. Merchants bought most recklessly, without any inspection, and thus contributed largely to the evil.

Freights and Charges.

Witness: Are very high, and do not appear likely to give way. A few years back frozen meat could not be profitably shipped owing to these charges being excessive. Shipowners, rather than see trade collapse, met the grazier halfway, the result being a grand permanent industry.

General Remarks.

Witness: This business requires and deserves a substantial profit, because (1) no company will insure mill or plant; (2) all damage at sea is held to be at shippers' risk, even if caused by negligence; (3) wear-and-tear (ordinary) is very heavy, but, in addition, extraordinary expenses are often incurred by running machinery at so high a speed and with the peculiar jerking strain which feeding the leaves causes; (4) losses by fire in the flax-beds last summer. I had a fine block of flax, which I had just begun cutting, destroyed, together with many chains of tramway leading to it, and not less than 1,000 tons of flax. I have no faith in the production of a spinning-fibre from Phormium with anything like our machinery at present in use. If it is ever produced it will be probably by chemistry, and only out of young small leaves. Maoris always selected their leaves carefully, and, I think, never used them 12ft. long as we do, and only took out of each leaf about half of the best ripened and finest fibre which lay on the surface.

594. *Mr. Hamlin.*] Is it not possible for you to so press your bales at the mill that any dumping that may be done at the Harbour Board or on the ship becomes useless?—We could not do that without each of us purchasing hydraulic machinery, and that is too expensive.

ROBERT BROWN, of Pitone, examined.

595. *The Chairman.*] What are you, Mr. Brown?—I am a flax-miller, and was engaged in flax-milling many years, but I am now engaged in rope-making.

596. *Mr. Walker.*] What part of the colony are you most acquainted with?—All about here. I was dressing flax at a mill in Wainui-o-mata. I am now engaged in rope-making at Pitone.

597. *The Chairman.*] You have heard the evidence given by Mr. Seymour, Mr. Brown?—Yes.

598. Do you generally agree with what he has said?—I do.

599. Do you remember what he said about the cultivation of flax?—Yes.

600. Have you had any experience in its cultivation?—None whatever; but I thoroughly believe if flax was cultivated in good land that it might be brought to something very good.

601. *Mr. Walker.*] It would pay for cultivation?—I believe it would if properly cultivated—the young offshoots taken and transplanted in good soil.

602. Still, you have no experience in growing; it is a matter of opinion on your part?—That is all, sir.

603. *The Chairman.*] Can you tell us how often you cut the flax at Wainui-o-mata?—Once in three and sometimes in three and a half years—that was, not destroying the heart and blade. We had to be very careful in watching the cutters that the young blades were not cut, and in three years we would have a good crop again. It was good flax.

604. Was it equal in weight to the first crop?—I could not say. I did not note that at the time.

605. Was the new flax capable of producing as much fibre as the old flax?—I could not say. I did not note that at the time; but the flax was far better.

606. Did you find the flax cut in certain months of the year of better quality than that cut at others?—Yes.

607. What months of the year do you say it is best to cut flax in?—Before it commences to flower.

608. What months would that be in? A little after midsummer, is it not?—A little later on; well into the autumn.

609. Do you say the best time to cut flax is about two months before it flowers?—And after the flowering is done the young blades come up, and it is fit to cut.

610. But after flowering you would wish us to understand that the old leaves become too ripe?—Too ripe, yes.

611. And a little tough?—Yes.

612. *Mr. Hamlin.*] How often does it flower as a crop?—Yearly.

613. Do you think so? You will find it only flowers in three years, and you will get a tremendous crop then. You will get every year one, or perhaps two, in a bunch of flax; but as a crop you do not have it under three years?—Not with the young flax. I thought it was leaving the flax. We know it flowers every year.

614. If you want to see proper flax-sticks you will have to wait three years?—I do not mean to cut flax, and then have a flower next year. It was leaving the standing flax without cutting that it flowers every year.

615. I have the idea, and many others with me, that it takes three years for a leaf to come to maturity, and our contention is that it only flowers, as a rule, every three years. I grant you that you would get an ordinary flower here and there, but in three years you would have an immense growth of flower?—Yes. What I go by is we expect bees to make honey well in the fall.

616. *The Chairman.*] The next point is grading: what is your opinion about that? Do you think it should be compulsory?—Yes, I believe it should.

617. Do you think from your knowledge that it would be necessary to open each bale, or would an inspection by the hank be sufficient?—It would not be necessary for every bale to be opened. I agree with Mr. Seymour that at first there should be a thorough test. It would act as a caution on the mill-owners, but as the time went on it would not be necessary for it to be so severely tested. I should say one in five bales would be sufficient, as Mr. Seymour suggested.

618. We may consider that you agree with Mr. Seymour's evidence on that point generally?—Yes.

619. Do you think, if a bonus were advertised, that the result would warrant the Government in finding a sum of money for the purpose?—For the present I should confine it to local inventors. I do not think there would be any good in going out of the colony, because the people outside this country could not test the machines. If the Americans, for instance, invented machines they would have no flax to test them with. If you sent Home flax from here it would not be in a fit state to test a machine with when it got there.

620. And, generally speaking, you agree with Mr. Seymour's evidence on that point?—Yes.

621. *Mr. Hamlin.*] Have not Americans been planting New Zealand flax largely?—I never heard of it; and if they have not started now it would take a long time to grow it.

622. What bonus do you think it would be necessary to offer for improved machinery?—If it is to be confined locally I should say half what Mr. Seymour suggested; but if it were open to America and England and other places it would require £10,000.

623. *The Chairman.*] Have you had any experience in any chemical process?—None whatever.

624. You told us privately a little time ago that you tried at Mr. Pownall's mill the scraping-machines?—Yes.

625. Do you think that would be the best system which could be adopted?—By far the best if we could get up scrapers.

626. If any scheme could be invented in which that process could be used?—Yes. That would be the thing for the fibre, because it does not break the fibre as the beaters do; it chews it up. Another system which could be adopted with advantage would be pressure—taking the gum out by pressure—and I think it could be done.

627. In what way do you think it possible?—To put it between two rollers, to crush all the gum out of it in its green state. In this way the fibre would not be broken or injured in any way. For example, I tried it with a timber-wagon. I laid some flax on a bridge at Wainui, and the wheels of the timber-wagon went over it and turned it out splendidly, leaving nothing but white fibre. A heavy load of timber went over it.

628. *Mr. Walker.*] Not one load only going over it?—Yes, just the one load.

629. *The Chairman.*] One load singly?—One heavy load of timber.

630. You have heard what Mr. Seymour said about the inferior quality of some fibre sent Home: is it your opinion that it has been owing to carelessness on the part of shippers?—Yes, that is it.

631. In the endeavour to push the flax into the market to realise?—Mr. Seymour was quite right there. I have known instances myself where it was just simply rushed over. People I have known myself in Wellington, having no experience of flax-dressing, have gone into the business, and it has been a failure.

632. *Mr. Walker.*] We have heard that a very large proportion of the mills are shut up: are those who shut up mostly "new chums," while the experienced men still carry on their business, or is it just some of both who shut up?—No, it is as you suggest; the inexperienced shut up.

633. They burn their fingers and give it up?—Yes; they spend their money on it and find they have no return.

634. *Mr. Marchant.*] Are the wants of the Australian Colonies for cordage and twine supplied at all from New Zealand, say, with New Zealand locally-manufactured cordage?—I could not speak for Auckland, Dunedin, and Christchurch; they have good machinery down there, and there might be some sent from those places to Australia.

635. What is the ordinary process? Does the raw material go from here to England, and is it then shipped back in its manufactured state to Australia?—There is a great deal of it sent in that way—even what comes to Wellington as manila.

636. Does not the hope suggest itself to you of the fibre being manufactured into cordage and twine here in New Zealand to supply the wants of Australia for those articles?—Yes, I do not see why it should not be so.

637. And is there no chance of the fibre being manufactured here and sent to Australia as a commercial success, or must it go home in its raw state and there be worked up by cheaper labour, and be re-exported to Australia? It seems a very clumsy roundabout process?—They are sending some from Auckland, Christchurch, and Dunedin, as I have said before, and some from Home as well. A fibre company was carried on in Auckland, but I think it was a failure. I do not know how. Probably the wages were too high for them to be able to compete with the Home manufacturers.

638. *The Chairman.*] Do you think it possible, Mr. Brown, that improved machinery would manufacture our flax so that it might compete with Italian flax or the English flax for textile purposes?—That is a question. It will never compete with the Russian hemp, and unless it is done by chemical means we shall never get it so fine as the Italian. It will never be done by machinery.

639. *Mr. Marchant.*] You do not seem to have very pronounced views on the subject?—No, on account of the failure in Auckland. They could not carry it on there. They have started again, but it is nothing to what it was.

640. *Major Steward.*] Is the New Zealand flax, as at present prepared, suitable for the purposes of navy rope?—Yes.

641. It has been asserted that by the present mode of preparation the gum is left in the fibre, and the presence of that gum prevents the rope taking the tar—that is to say, it cannot be tarred. One witness said, "It spews out the tar." Is that so?—No, it is not; it takes the tar just the same as manila.

642. Even as now prepared?—Even as now prepared.

643. That is a matter of importance for this reason: that if New Zealand flax could be used for navy purposes, cordage, and so on, there would be a demand for it which does not now appear to exist, owing to the alleged reason I have stated to you?—It takes the tar. I was working at Lloyd's, and we tarred immensely there. Mr. Lloyd made rope for running-gear for a vessel which went to San Francisco and Home and out again, and the captain told Mr. Lloyd he had never had better gear aboard the vessel. It appeared then, after that time, to be just like catgut, and had a smooth surface upon it.

644. Who is the Mr. Lloyd you refer to?—Mr. Neil Lloyd, who came out from Greenock, and was a rope-maker by trade in Auckland.

645. *Mr. Marchant.*] Have you any suggestion to make, Mr. Brown, as to the encouragement of the rope-making industry in New Zealand?—I do not know if the Government could have anything to do with that. It would be simply merchants who would take that up. There was a Mr. Gibson who went into it on a large scale, and we were going to take it up, but he was called Home.

646. The cost of labour is a serious drawback?—Yes, the wages are so high you cannot compete with the Home manufacturers.

647. Is the difference in wages so great as to compensate for the large extra expense of sending Home the raw material to be made up there and shipped out again a manufactured product to Australia?—No, I do not think it is.

648. *The Chairman.*] As to the vessel which you state was rigged in Auckland, was it rigged in consequence of damage sustained, or was the vessel built in Auckland? Was it merely a question of refitting?—It was simply a test.

649. It was refitted for a test?—Yes.

650. *Mr. Walker.*] I should like to know if you can explain why, if this test came out satisfactorily, the matter was not established there and then, and why we should have witnesses coming and telling us it would not take tar? If it was established so conclusively as you believe it to have been the people would know better than to say it would not take tar?—I have often wondered why people do not go into the tar more. I have said that if I had capital here I would start it and send it Home. I was judge at the Exhibition here of the fibres and ropes, and a person came up from Christchurch with some, and it was horrid to look at. It was the same as coal-tar. Of the Stockholm and Archangel tars the Stockholm is the best, and it requires a little oil in boiling.

651. *The Chairman.*] Can you give the Committee any information about the cost of refitting this vessel? Was it done at as cheap a rate as it could be done in the Old Country?—Yes, cheaper.

652. It was refitted more cheaply than could have been done in Great Britain?—Yes. I should like to make some suggestions. I think the Government, if they took it up, should be careful about cutting the green flax, and to have all the best dumped by itself, not to have first, second, and third class dumped together.

653. *Major Steward.*] That is to say, each bale should be made up of the same kind?—Yes.

654. *Mr. Walker.*] In dumping you would have two bales to be always of the same quality?—Yes, and it would be better if it could be done without dumping. If we had a hydraulic machine the bales would go Home far tighter; but here when it is dumped it sometimes breaks loose, and when it reaches home the bands are gone.

655. *Major Steward.*] Would it make much difference as to the bale? Could they reduce it very much?—I cannot say what the reduction would be. To my mind it would require six grades to start with, and this could be afterwards reduced to about three. If a man got the fifth grade he would try to improve until he got the fourth and third, and so on. I have not come across any wet bales—bales which have been wet in the heart. There were two or three cases where I thought the bales had been on fire: they were wet; but, as Mr. Seymour says, it might not have ignited but rotted away. And in hanking I should suggest that great care should be used in putting

the ends of the hanks together. In some cases there is one down here [indicating] and another up there, and when you come to hackle it it is all topsy-turvy. The hanks are not kept even together. I should suggest that in drying the finishing should be done inside, under shelter. The fibre takes oil splendidly.

656. *Mr. Hamlin.*] Have you ever known flax after having been put through the strippers to be soaked in clear running water for twenty-four hours, then taken out and passed through two indiarubber rollers similar to mangles, and then dried?—No, I have never seen it done like that.

MONDAY, 4TH AUGUST, 1890.

THOMAS JOHN WILLIAM GALE, Manager to Messrs. Johnston and Co., Wellington, examined.

657. *The Chairman.*] Your firm, Mr. Gale, has purchased a considerable quantity of flax?—Yes.

658. It has been stated by witnesses we have had examined before us that the merchants have been very careless in purchasing flax; that they have not sufficiently examined it. Is that so?—No; I am not prepared to admit that.

659. Is it your opinion, Mr. Gale, that a system of Government inspection would assist in the development of the industry?—Yes. We have been inspecting for the last twelve months.

660. A system of private inspection?—Yes, the Inspector giving us a certificate as to the quality. We have had to make very considerable rejections; hence my reason for not admitting that we had been careless.

661. Has the inspection been made in conjunction with other firms?—No; wholly and solely on our own account. We sold flax of a certain quality, and we supported our judgment of the quality by an independent expert's certificate.

662. This independent expert would not be a man known in commercial circles at Home?—Oh, no; he is a what we consider a capable man, who knows flax here as well as anybody can know it.

663. Merely an arrangement in making your own purchases?—Yes.

664. And do we understand you to say that a Governmental inspection would be far superior to such a system as you mention?—Very much.

665. *Major Steward.*] Because it would be a general system?—Yes; an Inspector using a Government stamp would materially assist the trade.

666. *The Chairman.*] Can you give the Committee any idea of how many classes you would recommend?—I recommend three classes.

667. Generally speaking, to your knowledge, is the flax shipped in a sound, dry condition?—Yes; but we have had to throw out flax on several occasions in consequence of its being wet.

668. Have the underwriters objected to take flax in a wet condition?—Oh, certainly. The surveyor looks at it; he objects, and calls the owner's attention to it.

669. Do you find flax is damaged by being made wet?—Yes; it makes the flax black on its arrival Home.

670. Do the underwriters object to any danger of fire owing to the dampness?—I do not know. I cannot answer that question.

671. Not to your knowledge?—Not to my knowledge. There are different opinions on that subject. Experiments have been made in the colony, and a bale has been saturated with water and pressed for a considerable time, and no fire or combustion has resulted.

672. It has merely damaged it in quality?—Yes.

673. Then, I would ask you, why do the underwriters object? They do not pay anything for partial damage, do they?—I do not think they insure flax from New Zealand to America or London with average. But the Americans do it. They can insure their flax against all risks.

674. Would that include discolouration from moisture?—Yes, if shipped under a clean bill of lading—that is, if the bill of lading did not indicate that the bales of flax were wet or damaged.

675. I think it was stated to the Committee that a quantity of flax was shipped on board one of the vessels, and, owing to a port-hole being open, it was damaged in transit?

676. But the Committee was informed no claim was allowed?—No; that would be the negligence of the ship. A ship has no right to keep a port-hole open.

677. Have you formed any opinion about the advisability of offering a bonus?—I have.

678. Do you consider the Government would be justified in offering a bonus for a new class of machine to improve the fibre?—That would depend on circumstances. If the improvement of the fibre would mean its application to another manufacture, such as linen, then I should recommend a bonus, but if it is to improve the fibre for binder-twine the Government would be wasting their money.

679. *Mr. Hamlin.*] In inspecting the flax before you send it Home, have you been in the habit of opening all the bales?—No; we take a percentage of the number of bales which arrive. We sample it by taking a hank out of several bales, say five bales out of twenty or thirty; and if those hanks pass we pass the shipment; but if they do not pass in quality we cause several bales to be opened, and make a very critical examination. Sometimes we discover dampness in this way.

680. Do you think that percentage would be sufficient if the Government were to have an inspection?—I think that percentage would be quite sufficient.

681. Sufficient to warrant the Government in having their stamp affixed?—Yes.

682. *Major Steward.*] The reason you think the percentage would be sufficient, I presume, is that that percentage would be opened at hap-hazard?—Yes.

683. And it would follow that the chance would be that the other bales would be similar to those that had been selected. If the percentage comes out all right there is no necessity to go to

the expense of opening the bales, but if you wanted to be critical you could take a hank without much trouble out of each bale?—Yes.

684. If a Government Inspector were appointed you would impose some small charge per bale to recoup the cost of inspection?—Yes; that is what we are doing now.

685. Would it be necessary that an Inspector should be assisted by a staff of men for the purpose of rebaling—putting up in proper form such bales as it would be necessary to open?—That is already done on the wharf by the Harbour Board. They have all the facilities for that.

686. Have you any idea of what amount per bale would recoup the cost of inspection at the port?—Well, that would depend on the volume of the business.

687. The number of Inspectors?—Yes. I should say an Inspector for each port would be sufficient; and the remuneration for an Inspector would greatly depend on the volume of the trade.

688. Exactly; but, at the present rate of export, would it not appear that an Inspector at anything like a reasonable salary would be recouped by a very small charge per bale? For instance, how many thousand bales go from Wellington?—I have not the figures with me. I intended to bring them had you allowed me to come to-morrow morning.

689. *The Chairman.*] We have that in the Chamber of Commerce report, I think?—I do not think you have, from Wellington. I should say, if the business does not increase on its present ratio, about 6d. a ton.

690. *Major Steward.*] That is, a mere nominal charge per bale?—Yes, 1d. per bale. I am basing my calculation on the assumption that the Inspector might receive £300 a year.

691. There is no doubt whatever that a charge of 1s. per bale would more than cover the cost. The reason I put the question is because a witness named 2s.?—When you consider that is 12s. per ton, I should say yes; but I think 1s. a ton might do it.

692. *Mr. Walker.*] I suppose it is quite true, as has been stated frequently, that a great deal of inferior flax has been shipped Home?—Oh yes. There are the rejections; they must find a market. If we are buying for America, and we reject fifty or a hundred bales, what is to become of that? It must go to London.

693. *The Chairman.*] What percentage would that fifty or one hundred bales be of the amount you ship?—I could not answer that question.

694. *Mr. Walker.*] Do you think the proportion of inferior fibre is decreasing in consequence of greater care on the part of the shippers?—Yes. Our rejections during the last three months—the worst time in the year for the production of flax—have not been nearly so large in proportion as last year.

695. And therefore you hope that with a Government inspection that difficulty would entirely disappear?—Yes.

696. You do not agree with some of the witnesses that the bad condition of flax arriving at Home has materially affected the price in London? I mean bad quality, badly prepared?—No; I cannot see that the bad quality of our flax would reduce the price of manila and sisal.

697. *The Chairman.*] You consider that the present low prices come of the fact of there being low prices for fibre generally?—Yes.

698. We understand you to say that, in your opinion, all flax should be inspected before leaving the port?—Yes.

699. I asked you the question because it has been stated by a witness that the flax purchased here need not be inspected, but only that which is consigned to England for sale?—I think, as to the flax purchased, that it would materially strengthen the hands of buyers if they had the certificate of a Government Inspector that the flax, in his opinion, was of a certain quality.

JOHN DUNCAN, of the Firm of Levin and Co., Wellington, examined.

700. *The Chairman.*] Your firm has purchased a considerable quantity of flax, Mr. Duncan, during the last few years?—Yes.

701. You have heard what Mr. Gale has said?—I have heard in a great measure what he has said.

702. Do you substantially agree with him on the points he has mentioned?—On a good many points, but in some minor details I disagree with his view. For instance, he would propose to grade the flax into three classes, but I think it is necessary to have four. I think you ought to have fine flax, fair average, ordinary, and coarse. The ordinary is average flax; but I think it is necessary to have the fine quality distinguished from the others, because it has a market by itself in London. I also disagree with him on the point as to the price being affected in London by the badness of the quality. I think it has been affected.

703. What reason have you for thinking so?—My reason is quite apart from the fact that a bad quality of flax will always sell much lower in the market than fine of the same make—that is to say, you find the more ordinary flax is selling just now at £15 and the fine at £22. It is not in regard to that point that I differ from Mr. Gale, but the difficulty we have had has been in our selling flax supposed to be of one quality—fair average, or fine, as the case may be. It is sent directly into consumption without further examination at port of delivery until it reaches the rope-maker, and he discovers that instead of getting fair average he may be getting coarse. He can in no way depend, as things have been going on here, that he is getting what he supposes he has bought. In that way, I think, rope-makers have been afraid of what they may get; and consequently they are not willing to pay the full price. That, I think, is the only reasonable inference to draw from what has happened in the past.

704. Does not that indicate, Mr. Duncan, that there has been a certain amount of carelessness on the part of merchants purchasing here—that they have not classified sufficiently?—I would not like to call it carelessness. It is just in this way: A good many of the buyers, I think, were ignorant of what was required in London; and many of the buyers in London were ignorant of what

they should have bought. It was not absolute carelessness, but doubt as to what was required. I am right in this, I believe, because our own correspondent sent us out at the beginning of the trade (or early in it) sample bales, of which they were prepared to accept shipments, to be classified as "fair average." About nine months afterwards they wrote to say that these bales could not be allowed then to pass as fair average—their own sample—consequently there was a little ignorance at both ends. There was also a great rush to get hold of flax, and people who had committed themselves to contracts, say, at £15, £16, or £17, could not afford to reject what seemed inferior on the chance of replacing in the market, the price having gone up to £21; and perforce they were obliged to ship without the careful inspection they would have otherwise given to the stuff.

705. Do the Committee understand that you are in favour of a Governmental inspection?—I am thoroughly in favour of it, and I should make it compulsory. Unless it is made compulsory you could not carry on the work.

706. You have heard what Mr. Gale said about the charge necessary per ton: What is your view of the matter?—I think he has underestimated the figure altogether. If you take the shipments here in Wellington—of course, this year they are going to be rather less from Wellington than last year—suppose you ship forty thousand or fifty thousand bales, that would be only £200 at 6d. per ton, or 1d. per bale. I should say that at the very least 1s. per ton should be charged; but you might try 3d. per bale, perhaps, as a start. The only difficulty in charging by the bale is that some bales are put up in two-hundredweights and some in four, and it would be better to have a charge per ton.

707. The price, you think, should range from 1s. to 2s.?—From 1s. to 1s. 6d. per ton. But you must bear in mind that in other parts of the colony the shipments are smaller, and that it would never pay in such cases to fix the rate I have named. I fancy each port would have to get a rate fixed.

708. *Mr. Walker.*] It is small in Dunedin?—Yes, very small; and in Napier the shipments are small.

709. *Major Steward.*] The principal ports of shipment are Auckland and Wellington?—Yes. A fair quantity goes from Christchurch and Lyttelton. I fancy they exported about one thousand bales a month last year; so that, if you take twelve thousand bales, you would require 6d. a bale to pay an Inspector in a case like that.

710. *The Chairman.*] Have you had any experience of the effect of moisture in flax?—None. We have always rejected any damp bales, or got them redried before shipment.

711. It has been stated that the "Merope" was lost by fire owing to having flax on board?—I do not think that is likely. The experiments that have been tried with flax have always resulted in getting it up to a certain degree of heat, when it might be calculated it ought to have taken fire, instead of which it decayed.

712. Do you think, Mr. Duncan, that the offer of a bonus by the Government would lead to favourable results in developing the industry—say, a bonus for improved machinery?—Yes; I think it would be a good thing to give a bonus for an improved machine, or machine and method of dressing.

713. From your correspondents in the Old Country, have you any indication that it is possible that our flax may be used for other purposes than those for which it is now used—for textile fabrics?—No; we have no indication of that. It is impossible to say what they might think on that head, if properly-dressed flax were sent Home. But all our machinery is of the very crudest nature at present; and every one will agree, I think, that the present system is based on a wrong principle. The beating that is necessary to remove the green from the flax must, more or less, destroy the fibre; and that is one reason why I think the Government would be wise to offer a bonus for a proper machine.

714. *Mr. Hamlin.*] Have you any idea how the grading could be carried out practically or sytematically?—I think what Mr. Gale gives you as his view would answer our purpose.

715. And you think that would be sufficient to warrant the Government Inspector, suppose one to be appointed, in affixing the Government brand upon it, after passing inspection here?—Yes; I think so. If we had twenty bales to examine we would draw four or five hanks from different bales, and if they all looked well, and there was nothing wrong with them, we would open one in five, and if the average was right we would pass the lot.

716. Is it not a fact that flax when cut is mixed, and when dressed you may have two or three different kinds of fibre in one ton?—That is so.

717. Then, how are you going to guarantee that it is of the fine quality or ordinary?—The classification and grading now is, more or less, by the colour and cleanness from the vegetable matter on the tips; and the great objection taken at Home is where the stripper has not been working properly, and runners with dried vegetable matter adhering go through the whole length. The classification that I suggest would be to secure as fair average hemp like this (pointing to flax on the table)—clean, well finished off at the tip. Where there are strawey runners you would class it as coarse.

718. Possibly you might get one of the hanks in a bale with vegetable matter left on the edge, and all the bale might be clean otherwise?—Then the Inspector would classify it as fair average.

719. I was speaking of fine?—If you come to fine, that is a totally different matter; the miller himself must be the judge, and place it before the Inspector as fine.

720. You must classify at the mill?—Every miller would do that if he could.

721. Provided he knows the different classes of flax? Unless he knows them it is impossible for him to do it at the mill?—I do not think we go into such nicety as regards the classification just now. We might do so hereafter; but practically all the different classes of flax grown in the colony are taken and packed up together. But at the mill, there is no doubt, half the damage takes place owing to the strippers getting out of order; and then the miller, if he is an honest man, knows his flax is going through badly, and he will work that up by itself and sell it as coarse and

not quite up to the mark. I think if you drew at random samples from the average number of bales, you could get a fair estimate of what they should be classed.

722. It would warrant the Government in putting on the brand—first, second, third, or fourth, as the case might be?—Yes.

723. *Major Steward.*] Is it the duty of the Harbour Board staff to interfere in a matter of that sort? Would it not be necessary, if this special labour was going to be placed upon them, that they should make some further charge, or as an alternative, that the Inspector should have two or three men at his beck and call. Do you think, under the circumstances, that the inspection could be carried out simply by the Inspector, without any provision for labour?—What I now recommend would be suitable to our own port.

724. Yes?—If any members of the Committee would step down to the wharf they would see that the Harbour Board have provided a shed, the upper floor of which has been set apart entirely for the purpose of examining flax. The Harbour Board's charge for opening and allowing inspection and rebaling at present is 2s. per bale, and I think all shippers will agree that is a moderate and reasonable charge.

725. *The Chairman.*] Does that include dumping?—They re-dump it.

726. That includes dumping?—Yes. I mean that they make it exactly as it was before they opened it.

727. *Major Steward.*] It would be inspected and rebaled before the dumping process in any case?—Yes. So far, the Harbour Board have made no charge for giving assistance in pulling out the individual hanks, and I think that system might go on.

728. So far as this port is concerned, where there are facilities?—There is every facility here for the purpose.

729. But where there are no facilities there would be labour provided for the rebaling, if necessary?—I do not think a staff would be necessary. I think where the bales are opened, the present charge should be in addition to what we have named as the inspection charge. Some of the Boards might put it cheaper; but 2s. seems not an unreasonable rate, because you get the whole laid down on a floor, and you can examine every hank.

730. That would mean a general charge of 6d. for each inspection?—You would not open every bale. On the average it might be 7d. per bale.

731. *The Chairman.*] You think the Harbour Board charges reasonable on the whole?—Yes, for that work, because they have had to provide special accommodation for the purpose, and special presses, and they give the labour. I dare say it pays them very well, but it has given a deal of trouble.

732. *Mr. Walker.*] Are you aware of any fibre or similar product which is subject to an inspection of the kind that is now proposed, in other parts of the world?—I believe manila is. They have a grade they start from, and it is then worked upon percentage off. You sell manila at 5 per cent. off, or 7 per cent. off.

733. *Major Steward.*] Off a given standard?—Yes.

734. *Mr. Walker.*] Who fixes those grades, do you know?—I am not certain if it is a Government matter. But I understand it is a very rare thing to find the quality turn out different from the guarantee.

735. *The Chairman.*] You do not know anything about sisal in the same way?—No; but I have a sample which was sent to me, and I will send it up to the Committee, of New Zealand phormium grown in St. Michael's, prepared there, and sent to London for sale. I do not know what machine they can be using, or whether the dressing is done by chemicals. The Committee will be able to form an opinion on that: it is of a beautiful colour and nice-looking flax, and it was sold at £3 per ton above the highest price going for New Zealand at the time. It was not a large shipment, only about forty or fifty bales, and was the first that had gone.

736. *Mr. Mackenzie.*] As far as you know, our flax is used for no other purpose than for rope and binder twine?—Not to my knowledge. I do not think it could be while the present process of manufacture obtains, because, as I have said before, it injures the whole fibre. But this phormium is capable of being subdivided into most minute threads, and if we could get some means of dressing it, I do not know that it is not possible for it to be used for other purposes.

737. From your experience is it suitable for canvas?—I cannot say it is, in its present state.

738. *The Chairman.*] Who is the expert you have had examining your flax?—I chiefly examined our own myself, because it was a matter requiring great care.

739. Then, as an expert I would ask you, is that a good sample before you?—Yes, a very nice sample; it is very clean, but it has not got the bright colour one would like to see. It looks almost as if it had been chemically prepared, it is so white. There is more of a golden hue about the ordinary prepared flax.

740. *Mr. Walker.*] That would be called pale?—Well it is of a palish hue, but this is well cleaned at the ends. Is it cleaned by machinery?

The Chairman: By Chinnery's machine, at Christchurch.

Captain Edwin Babot, examined.

741. *The Chairman.*] You are Marine Superintendent for the Shaw, Savill and Albion Company?—Yes.

742. We want information from you as to the general state of the fibre as received from the mills for shipment?—Well, it has been improved very much of late.

743. It has been improved of late; but some time ago the shipments were very inferior?—Yes.

744. Have you found that there was much moisture in the samples as sent down from the mills?—Occasionally we have had a few bales.

745. Did your stevedores at any time refuse to take flax because of its dampness?—It is the surveyor from the Underwriters' Association who examines the bales, and he has, of course, a proper machine for testing them.

746. Can you tell the Committee how it is tested?—He has a board with a thermometer upon it, this he forces into the bale, and can tell if there is any moisture by the temperature.

747. From your experience, do you think that flax would fire if it were shipped damp?—I could not say that; but I have seen it here in such a condition that you could not hold your hand inside the bale, and it has been sent down for shipment in that way. Almost anything is possible, if it is shipped in that state: for instance, if there was any friction with a wooden beam, or anything near flax shipped in that condition, I should not like to say positively, but I think the possibility is it would fire.

748. It has been stated—not in evidence before the Committee—that water has been seen running out of the bales when under the dumping press: have you had any case of that kind?—Oh, yes; we have heard of it.

749. I suppose the underwriters inspecting it would refuse to take flax if they could?—Oh, yes; if they could.

750. When does the Underwriters' Inspector examine the flax, before it is dumped?—Not always; some comes here dumped, so that we would not have so good a chance of inspection as we would before it were dumped.

751. Assuming that the dumping were done here at the wharf, and water was seen running out of the bales under the influence of the dumping, would it not indicate that there must have been some carelessness in the inspection?—That is, if it is inspected before. That bale might have been passed over. The outside does not show you anything to indicate that the inside is damp.

752. *Mr. Walker.*] Are these running bales put on one side for further inspection?—They are supposed to be sent away for drying.

753. They are not allowed to be shipped when they are seen?—Not when they are seen.

754. *The Chairman.*] You would not accept them on board your ships?—No.

755. *Mr. Walker.*] There are only the Harbour Board men dumping?—The Harbour Board men dump; but they have instructions, if they see anything, to point it out at once. And the Harbour Board are very particular; they take more care even than the Underwriter's Surveyor.

756. You have reason to think they are more careful?—They are very careful indeed, as far as they can be.

757. Because every bale comes under their hands?—Yes, they do the dumping; but a little of it comes here dumped. If there was moisture, it would lie on the floor a long time before it would show anything of it. In my experience I have known flax rejected by one steamer, supposed to be sent away and dried; but it has been accepted for the next steamer, and found to be as bad as ever, so that it is very difficult to get at it.

TUESDAY, 5TH AUGUST, 1890.

Sir JAMES HECTOR examined.

758. *The Chairman.*] What is your official position?—Director of the Geological Survey Department.

759. You have taken a great interest in all questions relating to the flax industry?—Yes, I have for many years—since 1863.

760. And, generally speaking, the results of your investigations will be found in this book: *Phormium tenax* as a Fibrous Plant"?—That is a collection of all the information I was able to obtain up to the beginning of last year—January, 1889. I was the Chairman of a Commission appointed in 1870–71 to investigate this subject. After that time it did not occupy my attention much until last year, when an application was made to the Government to appoint a Commission to investigate the subject. I then pointed out that a great deal of information had been got together which was difficult of access, and that it was better to republish such information before undertaking a new investigation, especially as hardly any of the suggestions seemed to have received the attention they deserved, through the trade, during the interval, having fallen off or declined. That was the origin of Ministers then instructing me to give all the information desired, and I produced this pamphlet.

761. Generally speaking, this is the result of your experience?—Yes, it is the result of the evidence I took, the experiments I made myself, and a digest of all the experiments and researches made by other persons which bear on the subject.

762. Is there any new point that has arisen since the publication of this work which you think would interest the Committee?—I would like to call attention to the introductory part of the work as containing the newest information on the subject of the chemical applications for treating the fibre. It will be observed, in the preface to the second edition, I described how the fibre has been used for various purposes, and mentioned the reaper- and binding-twine as a special application. And on the following page, after the diagram, I pointed out that there is reason to believe that the fibre may be, and perhaps is, applied to other purposes. All the latest information I derived upon that subject was obtained from this work, entitled, "Reports on the Colonial Sections of the Colonial and Indian Exhibition, London, 1886," which contains the most valuable information relating to all the natural productions of these colonies. In the report on "Miscellaneous Fibres," Mr. Cross, the writer of the report, who is a very well-known authority on the subject, goes into the matter very fully and describes the new process of cleaning fibre by the use of "basic alkaline sulphites." It was following up the treatment suggested by myself and Mr. Skey in 1865; but we did not then use any such sulphites. We employed soap, with the addition of a certain quantity of bi-carbonate of soda, the result of which was to produce very much the same chemical effect.

This appears to have been taken up and patented at Home and rather extensively applied to a great variety of fibres. Mr. Cross pointed out that he obtained a quantity of the fibre and submitted it to Mr. Strangman. It was put through this process and converted into the highest quality of twine-making fibre. He indicates that the results of these experiments will be reported; but no report of them has yet reached the colony, so far as I am aware. Again, he states that Mr. Barlow has undertaken further experiments to reduce the fibre so as to make it into staple—like raw cotton—a treatment which he states has been successfully applied to the spinning of yarn from various waste fibre products. The reduction is effected in a special machine and produces a substance called "wool," and which is afterwards taken through the carding and spinning process and converted into weft-yarn. He states that the result of the trial of this process will be duly reported. Again, he states that experiments have been undertaken under the auspices of the Executive Commission (the Commission of the Exhibition of 1886), starting with machine-dressed fibre, to test the various treatments with different alkaline sulphites, which in more recent times have been successfully applied to other raw fibre. And he implies, from the context, that the result of these experiments will be also reported. These are the three points to which I wish to call special attention, as it is important to procure these reports if they were ever made. I applied Mr. Cross's process to a considerable sample of the green leaves of the *Phormium tenax* and produced a fibre of which I produce this sample. I am sorry to say it is rather shabby, as it has been handled a great deal. It has been much admired, but through the handling its colour has been impaired. An examination of this sample will show that the fibre is quite as strong as the Maori fibre, and it is perfectly clean. The fine fibres that are intermixed with the long fibres are simply what would be called the tow in any other process. The great interest of that specimen is that it contains 26·41 per cent. of the weight of the green leaf before it was treated. Now, the highest production, so far as I know, under any ordinary process of preparing fibre from the leaves, is only about 12 per cent., so that here we have double the quantity produced, and I think, on the whole, it is of much superior quality. There is, therefore, a very sufficient margin for covering any increased cost of this process of preparation. These remarks are only meant to illustrate your question, for this book contains all the information I possess on the subject. I think these are the chief points that are not fully touched on in the book.

763. Can you give us any idea as to the expense of this process you speak of?—It is stated that the cost of the sodic-sulphite, when manufactured, is one-third the cost of soap. I have not been able to ascertain the exact process that is employed for making it, but it has been reduced enormously in cost of late years. I am aware that since I described the process a number of persons have tried to experiment with it in different ways in the colony; but the probability is that they would fail, because the sulphite is very prone to change its nature. It is difficult to keep except in bulk. If a package is opened and a small parcel taken out, and not kept carefully from the atmosphere, it passes rapidly into a sulphate of soda. The action of that would be injurious upon the fibre instead of beneficial, and would fail to effect any cleansing process. I think it is very likely that many of the failures that have taken place in trying this sulphite process have arisen from that circumstance. Of course the cost would depend upon the cost at which the sulphite could be got. At page 12 I have described all the necessary processes through which the fibre would need to be put. There is no doubt it would be more expensive than merely running the flax-fibre through the stripping machine. But I have always been of opinion that, at the present, the object in dealing with the flax-plant is merely to produce an article that will compete with manila, and this has led to very wasteful and misdirected efforts on the part of flaxmillers.

764. Do you consider that flax could be produced to meet your view in that respect?—It would be more useful for binder-twine, I think.

765. But not for the purposes for which Italian flax is used?—Phormium could never be used for the same purpose as Italian flax; it is fundamentally a different fibre altogether. What I mean is that the process adopted in treating the leaves of the phormium so as to produce a fibre that will compete with manila does not exhaust the whole valuable properties of the leaf.

766. *Mr. Walker.*] If there was a large demand for this sulphite could it be supplied at a reasonable price?—It could be manufactured in the colony.

767. If there was a demand it could be easily produced at a low cost?—Yes; I think so.

768. *The Chairman.*] From our own natural products?—Yes; but if it is obtained as a by-product from some other manufacture at Home they might be able to produce it cheaper on that account, and it might be better to import it.

769. Do I understand that by the process indicated here you could produce a flax that would merely enable it to compete against manila?—Oh, not at all! You get the whole of the cellulose in the plant separated from it—what I might call the fibre-cellulose matter from the pulpy matter. You get the fibre in the plant absolutely pure. The pure fibre contains 67½ per cent. of that cellulose, which is the element that renders it valuable. The value of the manufactured article so far as durability is concerned depends upon the quantity of cellulose in the fibre. This, of course, can be divided up into various fibres by mechanical process.

770. *Major Steward.*] With chemical preparations?—Yes, having been produced in that condition by chemical process, and the process of heckling and scutching. The whole of the waste from that could be converted into very valuable material by what is known as the hydrolytic process—boiling with caustic potash or soda. It then passes into a state of pulp. It is perfectly non-tenacious or soft when it is wet, but when it is dry it has great tenacity. This sample of cloth is quite strong. I produce it to illustrate the nature of the stuff that can be made. It is quite strong like ribbon; if you damp it, it will not bear its own weight. That is a very valuable quality, because you can work it up into any form of article; and then you can fix it by adding something of the nature of a size, such as gelatine, and many other things. That is the essential feature of the art of converting fibres by hydrolytic action. Another important point is that the New Zealand flax has ultimate fibres of considerable length

as compared with other competing fibres. The ultimate fibre is the third of an inch in length. When thus reduced to the ultimate fibre it passes into stuff like what I have just shown the Committee—a sort of paper pulp. When it is in that state, and even when it has become partially dry, it can be so treated mechanically that it passes from a state of pulp into a state of felt. It is really a vegetable fibre which can be subjected to the application of a felting process like certain animal fibres. When it has undergone that process it can be fixed with size and passed over hot rollers, or by several other processes that might be mentioned so altered as to prevent its returning again to its soft state by absorbing water and so losing its strength. That is the process which is alluded to in the book at page 54, but not fully worked out. That points to one particular application of what might be called the waste from any process to which the fibre has yet been applied. There is always a certain amount of waste, either of first or second quality of tow, which is never applied to a profitable purpose. It can be applied profitably to the manufacture of stout paper that could have a texture and strength more resembling calico than any paper known, and which might be used for many purposes.

771. You say that the first and second-class quality of tow could be used for that purpose?—Yes; there should be no waste in a properly conducted manufactory. If attended to at the proper time a ready sale for it could be obtained. My opinion has ever clearly been that there never would be any proper trade in flax, or the flax industry will never be properly established in the country, until the flax used is cultivated—until there are flax-farms, where the very best kinds are cultivated under the most favourable conditions for collecting it. At the present time the use of wild flax is attended with great waste of time and money, and the process of gathering it is most rude and barbarous.

772. *Major Steward.*] You know the *tihore* flax?—The *tihore* is the sort cultivated by the Natives up the Wanganui River. It was carried a great distance and planted out in good land up the Wanganui River, for supplying the fibre for beautifully-worked silky mats the Maoris used to make.

773. *The Chairman.*] Is that all the evidence you can give us on this point beyond what is given in this book?—Yes, the evidence in support is arranged in that work.

774. *Mr. Walker.*] Does it relate to *tihore* and other kinds of flax?—Yes; you will see a catalogue at the end of the book on *Phormium tenax*. At page 76 there is a list of the names of the varieties. We had the whole of these varieties gathered together, and we had nearly the whole of them grown, first from shoots in the gardens and afterwards from seeds from the same plant, in order to see whether the seed would bring up the true variety. The result was that we found that it did not.

775. You think it is a mistake to dress our flax in order to compete with manila?—I do not say it is a mistake, but it is not exhausting the whole of the useful qualities of the flax. It may not pay at the present time to do anything else. Perhaps it is the most profitable application of the wild flax, because whenever flax is cultivated under proper conditions and treated in a proper manner, then every part of the cellulose in the flax-leaf should be saved and applied to the purpose for which it is fitted by its nature.

776. Can it be produced at such a price as to compete with other raw material in the market?—Yes: the reason for that is that the phormium plant is valued for the quantity of fibre it contains. It contains four or five times as much fibre for the weight of green leaf as any other plant of the same class. I think the manila plant yields only about 5 per cent. fibre as against 25 per cent. of the yield in *Phormium tenax*.

777. The increased cost of producing phormium fibre would be great as compared with manila?—I do not think it would be so costly. The reason of the very low cost of producing manila is on account of the cheapness of labour. At page 35 of the book it will be seen that two persons produce 25lb. of clean manila a day.

778. Then the sulphite process does not destroy the strength of the fibre in the least?—No; that is its peculiarity. The process has been carefully worked out by Mr. Cross. Singularly enough the action of the soda compound is very slight upon the phormium fibre, slighter than upon most fibres. Mr. Cross distinctly states, page 374 of his report: "The results obtained with the basic alkaline sulphites are such as to give a complete range of treatments down to the isolation of the ultimate fibres, with the minimum of chemical modification of the fibre constituents, and therefore alteration of the natural colour of the fibre." He means that by altering the temperature and strength of the solution you can so modify the action upon the fibre that you can do whatever you like. Thus, you can simply free the major fibre bundles, or by simply modifying the process you can carry it to such an extent that you can actually dissolve the flax down to ultimate fibres without changing their chemical nature, or decomposing the valuable cellulose.

779. You could not destroy them?—You could destroy them by great excess; but you do not need to destroy them.

780. Many of the chemical processes by which the flax is scoured require great care, otherwise the fibre is destroyed, and still at the same time it is scoured?—Well, of course, the moment you attempt the chemical process it presumes you are going to employ skill. It is not simple, and not to be done by persons utterly ignorant of what they are dealing with.

781. But is the chemical process a safe and dependable process?—Yes; it is perfectly safe. This sample of fibre is strong; it is the best dressed fibre that can be had. I believe its strength would be about 10 per cent. to 12 per cent. above that of manila. I have dressed flax ranging as high as 20 per cent. above manila.

782. *The Chairman.*] Has this flax to undergo a chemical process?—Yes. The whole thing is described at page 12 of the book. You must select the leaves. Those leaves must be bruised—that is, simply to break the hard shiny epidermis so as to allow the chemical to act without undue waste of time, otherwise you may have too much chemical action set up on one side—the exposed side of the leaf—before it had dissolved the hard shiny side of the leaf; then maceration of the fibre in the

hot chemical solution. Then, the scutching and drying, which, to procure a pure colour, must be done in sheds, drying in the sun being absolutely hurtful to the fibre in every case. The only object of drying in the sun is to produce the straw colour of the manila. That brownish colour is produced entirely at the expense of the strength and keeping qualities of the fibre. They could not sell it unless they browned it; they could not sell it to people who were going to pass it off as manila. We are playing into the hands at the present time of those who desire to sell it as manila. Then, it is evident that, after selecting the leaves, you must have a great deal of rough leaf left. These damaged leaves could be put through the same process, and the same solution could be used again, and by the addition of caustic potash or soda you could produce a material for paper-making, which is stated to be a saleable article. Except in exceptional conditions it would not pay to attempt to apply this process to all the flax gathered off the hills and in the swamps, when all varieties and lengths are used indiscriminately, as the cost of collecting it, sorting it, and treating it in a thoroughly productive way would be too great, and would kill the thing; but that is what will be the ultimate use of the phormium plant in New Zealand when the wild flax is exterminated, and we have to depend on systematic cultivation.

783. *Major Steward.*] The utilization of the phormium to the highest possible purpose depends first upon its cultivation?—Yes. Clearly the cultivation of the best kinds, and under the most favourable conditions for collecting it. At page 13 of the preface I give a sketch of such a cultivation, taking as an example the Manawatu Swamp, and suggesting how it could be converted into a paying flax-farm: A limited area properly laid out, and arranged in the manner I suggest, with narrow canals cut all over it to act as drains, and to serve instead of roads for collecting the produce by barges, so as to prevent any trampling by stock; the soil from the drains would raise the level, and a slow motion of the water would be kept up towards the outflow, where the mill would be situated; all the best varieties carefully put in, and the worst thinned out. Gradually a property of that kind could be developed into one of the most magnificent-paying estates in the world.

784. With regard to the sample which has been prepared by the process you have described, all the flax turned out would not be exactly like this specimen; there would be several possible intermediary stages?—Certainly; this sample contains a great many grades.

785. With regard to these intermediary stages, the product might be made available for different purposes?—Yes.

786. Then the only reason why you think the flax cannot be used in these various intermediary stages and for these different purposes now, is because there is no care taken with regard to the selection of the kinds of fibre?—Yes, that is the primary cause.

787. The proper course is to grow the plant for the purpose?—Yes, and under conditions that afford facility of selection.

788. Would you mind stating as to whether you have had any experience of the utilisation of flax when properly prepared for the valuable kinds of textile fabrics?—We have a large series of samples in the Museum of all the grades, from wool-packs up to the finest linen—all made by different admixtures of the phormium fibre with other fibres.

789. Do I understand that the phormium fibre alone could not be used?—No; I think not for finest fabrics, unless by this new process I have alluded to, the process of Professor Barlow.

790. But, by admixture with other fibres of a suitable kind, by this particular process of manufacture *Phormium tenax* could be applied to all classes of fabrics, from the finest to the coarsest?—Yes; it has been applied for the last sixty or seventy years.

791. Could you say in what proportion the fibre is mixed with other fibres?—All the proportions are given on the cards in the Museum. They vary. The proportion would be about 25 per cent., more or less. I could not say from memory; they are all described in the Appendices to the Journals of the House.

792. I do not find anything in your book referring to a competing fibre called ramee. Do you know anything of the ramee fibre?—It is a kind of nettle, or hemp. I think it is used for finer purposes than rope, very much finer; it is used for making imitation-silk materials, and grass cloth for making special dress material.

793. How does it compare with Italian flax?—It could not be applied to the same purposes. It is applied to purposes similar, but finer than jute.

794. If ramee were subjected to the same process of manufacture, would it be a rival to *Phormium tenax* in any of these ways?—No, I think not. Ramee derives its value from the great length and silky fineness of its ultimate fibre.

795. Do you know whether the French Government has offered a bonus for improved machinery for the preparation of ramee?—Yes, there are voluminous papers on the subject.

796. It has also been taken up in the United States. I have recently seen that samples have been sent out to one of the Australian colonies, with a view to its cultivation there?—Yes, the Government have received various documents on the subject. I do not know in what state of development the business is.

797. Are you aware whether a bonus has been offered in connection with ramee; if so, we should have a precedent for doing the best we can with our own fibre?—Ramee is not a competing fibre. At the same time it might be a very valuable auxiliary fibre in the manufacture of certain classes of fabrics.

798. *Mr. Walker.*] Those samples in the Museum are all experimental?—Most of them certainly are experimental trials. For many years it has been impossible to get manufacturers to use phormium. The whole of the phormium fibre sent to Europe has been sent in a state to imitate manila. It has been dried and reduced to such a condition that it is impossible to redevelop its more valuable properties. But in the early years there must have been a great deal of phormium fibre used for textile purposes, because the price was very high indeed—from £90 to £100 a ton. Of the considerable quantity sent Home, it is not at all likely that it was used entirely for the making of ropes. There is one peculiarity of the clean phormium fibre—that it takes dyes with

the same tints and lustres as silk, and it is likely to be used for the purpose of admixture with silk.

799. You state that a peculiarity of the *Phormium tenax* is that it takes a brilliant dye. I have seen within the last year or two great objection taken to the bales used for our wool, that in the case of the more valuable wool the manufacturers complain that the loose ends of the jute get inextricably mixed up with the wool, and when it comes to be manufactured and dyed the cloth presents all sorts of little points that will not take the dye?—I understand that jute will not take dye in the same way as phormium.

800. Therefore if we found it profitable to make our bales of phormium, that evil would disappear?—It might to a very large extent.

801. With the more valuable wools it was even insisted on that we should line our bales with paper or linen, so that it is really a matter of practical moment?—The woollen mills have had great trouble in regard to the stubble ends of the fibre, a difficulty sometimes to know what they were or how they were to be got rid of; it refuses to take the dye, or takes a pale brown dye generally, and ruins the cloth.

802. So that in the case of valuable wool it is really a very important matter?—Yes.

803. *The Chairman.*] With respect to the question of bonus, do you think that a bonus should be given by the Government to improve the production of the flax fibre?—You put it abstractly, as to whether a bonus should be offered?

804. Do you think a bonus would be attended with any good?—Well, taking my experience of all past bonuses offered, and they all came through my hands,—I keep the bonus records,—I think they have not led to any solid advantage. In some few cases the bonus has been earned; but, as a rule, in many cases industries have been developed without a bonus at all. The bonus system in this colony, in my opinion, has not had a very encouraging result.

805. *Mr. Walker.*] Are our bonuses advertised in England generally?—I do not think so, as a rule, except in the *Gazettes*, which are to be seen in the Agent-General's office.

806. Suppose a bonus was advertised in a scientific journal?—Some of them have been very largely advertised, and the conditions stated. In some cases bonuses have been offered in order to attract outside skill and capital. As a rule a bonus has been offered in order to start some particular industry in the colony, and, of course, in that case, it is not so advantageous to seek outside assistance directly.

807. *The Chairman.*] Do we understand you to say that it is not necessary?—I think the question is put in such a general form that it is difficult to answer. If it were a question as to offering a specific bonus for improved machines, or improved processes of preparation of the fibre, it might be answered; but to put an abstract question as to offering a bonus for the improvement of flax is, in my opinion, too wide a question for any one to answer.

808. I will put it in a different form. Can you suggest any form of offering a bonus that would be productive of good results—say, for a number of bales produced of a certain value, or by improved machinery, or by improved chemical process? Can you suggest any form?—Do you mean the flax such as now exported—the utilisation of the wild flax of the country?

809. That is the way I should put it: a bonus for improving and utilising the wild flax.—I can see some advantages that might arise from a bonus, but I should like to think over that question. To answer the question really means the consideration of the forms and conditions that would surround a bonus.

810. Will you assist the Committee by sketching out some conditions?—I will. If well made the flax pays remarkably well now. I do not know whether as to the quality of the flax it would be necessary to give it any special encouragement. You would find all the better mills able to take a bonus at once, unless you look for some very much larger production than is at present being achieved.

811. I think in your report generally you state that the present system of beating destroys the fibre to a certain extent?—Yes, for any other purpose than manila, or white, ropemaking. If the machines in present use are properly adjusted, and sufficient time given to overcome the difference of thickness of leaf prior to the feeding; if the leaves are selected, and put through not in double thickness; if the whole process is kept under water and the fibre is never allowed to dry until its final handling. I think any improvement in the process does not depend so much upon the machines as upon the care and skill with which the whole process is conducted. The best course would be to take, as an instance, some of the processes described in the book. Take the working of the mill of Nelson Brothers, Napier, 29th May, 1871, page 90. They took every precaution, and produced a thoroughly good article that is suited to the market. There is no possibility by a rapid process to produce a great quantity in a given time of a yellow fibre from phormium, and of making it absolutely equal in strength and lasting quality with manila. That form of fibre, for that purpose, must always grade below manila in the market, simply because it has a greater power of absorbing water, and especially sea-water, in the raw state. The experiments made in former years show that, by applying oil to the fibre, a fibre can be made equally resisting with manila; but, unfortunately, we cannot oil the phormium fibre and put it on board a ship; the risk is too great.

812. *Mr. T. Mackenzie.*] You are of opinion that, if we dressed the flax carefully with the machinery we have at the present time, it will take as high a stand as is required in the market?—Yes, to compete with manila. I believe that, by thorough adjustment, and thorough attention to the careful carrying out of every matter of detail, we can do as well as it is possible to do.

813. Then, so far as that is concerned, a bonus is not required?—No, not for that purpose.

814. *The Chairman.*] There are other forms of machines—scraping machines. There is Pownall's machine?—I like Pownall's machine.

815. Would it be worth while to offer a bonus for improvement of machines of that kind?—

They do the work better, but they reduce the quantity done in the time. If it were not for that drawback, Pownall's machine and Bull's machine would be valuable in the market.

816. *Major Steward.*] Is Bull's machine a scraping machine?—I think it is; I have not seen it. Any machine that would do the work better, or produce a more valuable article. The bonus offered by the Government would be a mere drop in the bucket when compared with the profit to the inventor.

817. *The Chairman.*] Assuming that a certain amount of money was set apart for a bonus, would you devote a portion for improved machines and a portion for development by a chemical process such as you have indicated?—Well, it is not so much the process that you want in either case; it is the application of the process you want.

818. The production of a certain number of bales up to a certain standard?—I think the principles of the processes are very well understood; it would be impossible to patent them further than they are—I mean the chemical processes. It is, therefore, the successful commercial application of the thing the Government should aim at. In the case of the utilisation of the waste fibre, I question if it would be possible to make it commercially successful, dealing with the wild flax. The present wild flax supply is an ephemeral thing; it will soon be done, except in a very few localities. As to giving a bonus for an improved machine, there could be no harm in that if the conditions were well defined. It may occur to some one to turn out a machine that would be really a great mechanical improvement. Such things are always occurring.

819. *Mr. Walker.*] There is one point which Mr. Seymour was very strong upon—that a new machine, an ideal machine, should reduce the cost by at least one-half the cost of production. Apparently you complain that the present machines do not get fair-play, by the process being hurried on too carelessly?—I think that is the cause of most of the bad flax sent out of the country, and the use of too little or of bad water; in fact, want of knowledge in the preparation. The principle of each machine that was known to me at the time is described in page 94. That does not include anything beyond 1872. From 1872 up to Mr. Bull's machine I do not think any new machine has been put in the market at all.

820. *The Chairman.*] I think you state in this book that phormium is not likely to fire on board ship by the presence of any moisture?—When the fire broke out in the "Mariposa" a number of communications were addressed to the Government, and they were referred to me. I then gave my opinion, which I shall read:—

Memorandum re *Spontaneous Combustion of Phormium Fibre.*

5th June, 1889.

THERE is no record of any conflagration that was clearly proved to have originated from spontaneous combustion of phormium fibre in bales. Flaxmills have in some instances taken fire owing to the light dust and boon that is produced in the manufacture having ignited in contact with oily and hot machinery; also the green refuse lying in heaps has been known to ignite, in the same way as any other damp vegetable matter does when undergoing putrefactive fermentation. It is possible that if the fibre is baled up in a rotting condition, or so damp as to supply the oxygen required to promote such fermentation, that the rotting would go on, but the rise in the temperature would be controlled by the compression that had been applied to the bales, as in the case of the manufacture of ensilage from green fodder, in which the temperature is kept to 135° Fahr. simply by pressure. If the fibre were in an oily state, and either accidentally or intentionally mixed with oily or fatty substances, there would be danger of spontaneous combustion from another and purely chemical process, it being well known that the temperature of vegetable matter, if soaked or mixed with oil, grease, varnish or such hydrocarbons, will rise sufficiently to ignite the bulk. The danger from this cause is so great that railway companies and shippers have refused to take the risk of certain mixed silken goods in the manufacture of which vegetable fibre and oils are used; and it is the same chemical action which causes the spontaneous conflagration of cotton when the bales are imperfectly isolated from other goods of an oily nature on board ship. In the case of the fire on board the "Mariposa" there does not appear to be the slightest evidence that it originated from heat generated in the centre of the bale. If the outsides of the bales had been smeared with grease and moisture it is just possible that heat might have been generated between bales tightly packed together in the hold, but the heat required to ignite the flax could not, in my opinion, have been generated in the short time that had elapsed between the taking in of the flax and the outbreak of the fire. It seems unfortunate that the question should have been raised, as there is nothing to show that *Phormium tenax* fibre is more prone to take fire than such articles as coal, greasy wool, cotton, manila, sisal, jute, kauri-gum, and many other articles of commerce that are carried without question. If the matter is to be made the subject of an experimental investigation I think that in fairness to New Zealand other flax substances should also be tested, and the results made comparative. The experiments will be costly, and will extend over at least three months. It will be necessary to build strong brick or timber sheds, in which the conditions in the hold of a ship can be imitated, and several bales of each sample to be tested would be required. Special thermometers must be contrived, and a special machine for applying graduated pressure; and, as there is no record of similar experiments having been previously made, so far as I can find, there might be many trials before a satisfactory method is arrived at and reliable results obtained. Under these conditions I think a special authority for the necessary expenditure should be given, and perhaps it would even be desirable to appoint a commission of experts to superintendent the experiments.

JAMES HECTOR.

Hon. Mr. Richardson.] —That answers all I know about spontaneous combustion.

821. You said in your book that the flax is very much damaged by the mode of packing?—Yes, that was the evidence we got. The object at that time was to get bales of flax in such a state that they could be sold to the same persons who purchased the bales of manila. The baling that

was adopted at that time—I do not know how far it is still the case—was very irregular. The shape, and the weight, and the mean bulk, was different from different mills, and the result was that it was very difficult to classify. Of course, when the flax gets to London everything is looked upon as New Zealand if it comes from New Zealand. We get a general credit founded on samples of the worst quality in the market; and if the bales are not made similar to those bales competed with, it creates a great difficulty. That was the evidence we got from the brokers in London. Intrinsically I do not see any great difference between baling in one shape or another, or in one weight or another, but the value was affected by our bales not being in accordance with the bales of other substances. To remedy this we got out a complete set of bales—of competing fibres. These were exhibited and described, so that the mill-owners and the shippers could see exactly what they were going to compete with in London. It would be a very useful thing to have that done again. That was done in 1871. There was another action taken at that time which should be again revived: that is, to have a set of samples of our own flax classified by the London brokers into what they considered to be first, second, and third quality; and that is the basis upon which the millers should be induced to prepare their flax and brand it. I still have some of the original samples that we got at that date, but they have now got so old and dry that they would not give a fair indication of what is at present considered in London as first-, second-, or third-class flax.

822. Do you consider the time has arrived in the flax development when it is necessary to have proper Government clsssification?—The classification is done in London. There is no classification that we could impose which would have any weight with the buyer in London, unless it was founded on his dictum.

823. That is, buying the standards of flax available here?—I do not see that you want to classify beyond those standards.

824. *Mr. Walker.*] We want to ascertain that the flax goes Home according to those standards?—Of course it is the interest of every mill-owner to make his flax equal to the best standard he can attain. It is difficult to guard against a mill-owner, through indifference or otherwise, classifying his flax as first standard when he knows it to be second.

825. *The Chairman.*] What has been stated in evidence before the Committee is this: That classification here and governmental inspection here would give great confidence to buyers in the Old Country?—Well, that is a matter on which I could not give any opinion. It would surprise me if it did; but I do not know sufficient to speak upon it. The classification could best be done by the mill-owners saying what is the first class, and what is the second class, and being able to say how far they can work under the conditions at their particular mills—which class they could work the stuff up to. It might be a useful thing for a Government Inspector to go round the mills and see what kind of stuff they were baling up. We may assist them, because it is so obviously for the advantage of the producer to classify his material correctly. It would be of no use whatever if bales were sent Home with the miller's name on them and marked first-class, and that the broker found they were but second-class. That would create a suspicion in the mind of the broker ever afterwards. However, that seems a matter in trade which usually rectifies itself.

826. *Major Steward.*] It appears that when flax goes Home there is no indication that it belongs to any particular class; it is simply shipped as New Zealand flax?—Well, that should be forbidden, not only in regard to flax but other produce also. It should go by the brands, and the seller should take the responsibility of selling an inferior article.

827. *Mr. Hamlin.*] Should not the Inspector have the power of stopping flax going Home if bad, and making the miller take it back?—I do not know; there would be compensation then, I suppose.

828. *Mr. Walker.*] You are aware that certain products in the Old Country are guaranteed by means of Government inspection—that packages of butter, and herrings, are branded as having passed Government inspection?—I did not know that butter was so inspected, but I think herrings are; but that is for a different purpose than trade classification.

829. I believe it preserves the quality of the manufactured article?—I am quite in favour of branding. I hope I was not misunderstood in that respect.

830. I mean to say branding by a Government stamp, to show that the article inspected is what it professes to be?—I do not think it would be applicable to flax. There would be a great practical difficulty in applying it to flax.

831. *The Chairman.*] The evidence generally is quite in favour of it. May we understand that you will make some suggestions about offering a bonus, and regulating the trade in flax?—Well, I will endeavour to do so. I will either make suggestions or say I cannot. It is a much more difficult subject than appears on the surface.

832. *Mr. Hamlin.*] Was there not a bonus offered in 1865?—There was a bonus offered for a new machine sent out from England, and a great many of them were used in Nelson. With reference to the question of branding, when I say I am in favour of branding, it must be done according to the London standard, and it must be done by the people who sell the flax. It may be a Government brand or anything else, but I do not think the responsibility of classifying the flax, putting the brand upon it, and standing the brunt of any disagreement between the classifiers of the flax and the buyers in London should fall upon the Government, and not upon the producers. I dislike the idea of allowing the Government to be put between, so as to save the producers of the flax from the ordinary commercial pressure that is brought to bear on him if he offers for sale an inferior article—an article inferior to what he professes it to be. It is the case with wool. According to law the wool has to be branded with the name of the producer. In the same manner the flax should be branded, and it should be classified for the convenience of the purchasers in London.

833. *The Chairman.*] It has been given in evidence that the purchasers in London would know they were buying flax up to a certain standard when vouched for by a Government Inspector who had no interest in the production. That has been stated here in evidence very strongly?—Do you mean at the Government expense?

834. Oh, no. The classification would be made and the brand put on by the Government Inspector, at the cost of the producer.—I am quite in favour of that.

835. The Government would not take any responsibility. The Inspector would act as an arbitrator: he would fix the standard, which would be provided for him, and he would say that the flax produced should be up to that standard.—I believe that could be done. It would be found in practice that it could be done most easily by inspecting the flax at the mills, because it would be to the interest of the flax-producers to be quite fair, and always to have their returns of flax agreeing with the classification that they had adopted. Of course it might in some cases be necessary to examine the flax at the port of shipment, but that would be only where there was reason to suspect that there was any unfairness or any irregularity in the branding—anything purposely or intentionally irregular.

836. *Mr. Walker.*] With regard to cultivated flax, are the climates of both islands equally suitable for the growth of profitable fibre; would there be a great deal of change in the character of the fibre produced from the extreme south and that produced from the extreme north of New Zealand?—I should expect a difference between the east and the west almost more than between the north and south, because the sudden alternations of frost and sunshine are really more unfavourable than the conditions of moisture or dryness. I think we should expect a greater difference, perhaps, between the flax grown at Inglewood, one of the moistest climates in the whole of New Zealand, or, in fact, flax grown along the Taranaki side, and that grown on the Napier side. I should expect a greater difference in the fibre grown at these two places than you would get in fibre grown in dry and wet situations in the extreme south or the extreme north.

837. *The Chairman.*] What would be the character of the climate at the Bluff?—It is not so wet as Inglewood.

838. We heard in evidence yesterday of a shipment of twenty or thirty bales of *Phormium tenax* having been shipped to London from St. Michaels. [Letter from Mr. Duncan read.] Is there any other country that could produce flax that would be a rival to our own phormium?—I always thought the produce of phormium would be greater in New Zealand than in any other country. I can find out how the sample produced has been prepared.

839. Does it appear to have been dried in the open air, or dried in the shed?—It has very little colour.

840. Have there been any chemicals applied in its preparation?—I shall examine a portion of the sample.

Mr. Frederick Bull examined.

841. *The Chairman.*] You are a flax-miller?—I have been a flax-miller in Canterbury.

842. Have you had a great deal of experience?—As a practical miller, about two years.

843. You now have invented a flax stripper?—Yes, a scraping machine; it is an improvement on the strippers in use.

844. Is it on the same principle as Pownall's machine?—No, it is not an adaptation of his. My object was to produce a simple scraping-machine which would not be elaborate in construction, but which would be a commercial success.

845. Have you a drawing of your machine?—I have not a drawing here. It is very simple. Following up Dr. Hector's remarks as to the improvement of machines, it is evident that a machine which had a very great number of scraping-bars close together would produce the nearest practical approach to scraping.

846. Can you tell the Committee what is the cost of passing flax through your process?—I think, in favourable circumstances, about £10 to £11 a ton. Of course, the winter season makes a great difference. I have been trying to get a quantity put through in Canterbury by a gentleman who has my machine, but he has had such weather that he has not been able to get it through with complete results. It was tried at Johnston and Co.'s Mill, Rangitikei, and I have here the report upon that trial. It took about a little over 6 tons of green flax to make a ton of fibre, as against nearly 8 tons that were stripped by other machines from the same locality. There was a saving of about 1½ tons of green flax.

847. Do we understand that the cost of preparing the flax by your machine would be £11 a ton as against the usual cost of £14?—Yes, the cost by my machine would be £10 to £11, as against £14 to £15.

848. How much has been produced by your machine?—Some two or three tons of fibre.

849. It has not been used much as yet?—No; it has had only experimental trials. There are so many small improvements suggested, as is the case with all new machinery. It is still being improved upon, not in principle but in small matters. They are all quite satisfied as to the principle, and as to the saving in green flax. [Witness produced copy of report of first trial, written by the manager of Messrs. Johnston's mill.]

850. Is it an expensive machine?—It will cost about £27 10s., as against £20 the cost of the ordinary machine.

851. This sample of flax was provided by your machine?—Yes; the first day's work. It is crude in comparison with the flax turned out now by the machine.

852. Have any chemicals been applied to this?—None whatever.

853. Nothing but the process that follows the ordinary use of a flax-machine?—That is all; it is finished by the ordinary process.

854. *Mr. Mackenzie.*] You claim for your machine that flax can be produced by it at £3 per ton less cost than by the ordinary machine, and that you can obtain from £2 to £3 more for fibre?—Well, that was the cabled result of the experts' report obtained by the Agent-General—that the prepared flax was worth from £22 to £23 per ton, as against £19.

855. If your machine will turn out fibre at a lower rate, you are of opinion that it will compete with sisal?—That is so.

856. Are you aware that sisal is likely to be produced at a lower rate than we can produce our flax?—Yes, I believe so.

857. *The Chairman.*] You have laid before this Committee the following telegram: "London, 23rd July, 1890.—Premier, New Zealand.—Bull's flax good, long, fresh, strong, well cleaned, bright yellow, should be whiter; here there a little strawy; value, 22–23." Does this telegram refer to the flax prepared by your machine?—Yes.

858. And that produced is a specimen of the flax made by your machine?—Yes, it was taken out of the same flax, from the first day's stripping.

Report on an Improved Flax-dressing Machine, known as Bull's Patent Scraping Machine.

SIR,— Wellington, 5th August, 1890.

In compliance with request, I have the honour to report as follows:—

My experience has shown me that what is required to improve the present condition of our hemp manufacture is a better form of separating the fibre from the covering, by which the fibre bundles will be less injured and a greater proportion of fibre saved than has been possible by the use of the usual strippers. My machine effects both of these objects in a simple, practical manner, by a process more closely resembling scraping than the action of the strippers, which is that of percussion. By this means a fibre is produced free from any maceration, evenly defined from butt to tip, the colour bright, with the lustre well brought out; and, although at first sight many would not think it superior or perhaps equal to fine-dressed samples by some strippers, there can be no question of its intrinsic superiority. I am borne out in this statement by the result of the inspection of the fibre by the experts at Home, whose report, cabled to the Premier, is in evidence before you.

The machine is similar in many respects to others, and the flax is fed in the usual manner through two grooved rollers. The difference is in the drums, of which there are two, one much larger than the other, the large drum being about 15½in. diameter and the lesser drum only 6in. The large drum is provided with about fifty-five bars or scrapers placed parallel to each other, but at an angle to the line of axis. The small drum has a number of bars placed parallel to the line of axis. Both drums revolve at considerable speed, the speed of the large drum being much greater, however, than that of the other, which acts in the double capacity of a beater-bar and a scraper. Both sides of the leaf are thus operated upon at one time. There is no "towing up" of the flax round the drums, thereby saving much time commonly lost in having to stop for clearing the obstruction. This is due to the action of the two drums, and is a great consideration.

The results of trials up to the present time go to show that a saving is made in green flax of about one ton and a half to the ton of dressed fibre, and the consequent saving of the machinery, and cutting, &c., of that quantity. The time taken in bleaching is considerably lessened; less tow is made in scutching; the value of the fibre is increased; finally a superior fibre is produced and at a materially lessened cost. FREDERICK BULL.

WEDNESDAY, 13TH AUGUST, 1890.

Mr. W. FERGUSON examined.

Witness: I am Secretary of the Wellington Harbour Board. I understand from Mr. Beetham that the Committee have under consideration the proposal that there should be an examination of flax—of, say, one bale in five. I am strongly of opinion that, with the accommodation at present possessed by the Board, it would be impossible to carry out such an examination. Mr. Scales has pointed out to me that during the last two days he has dealt with 350 bales, so that, examining one bale in five, no less than seventy bales would be required to be examined for one merchant alone. I think all that would be required would be to examine one bale out of every line; and it is quite possible that, with additional accommodation, that may be accomplished. It would certainly be impossible to carry out such a proposal with the present accommodation, quite apart from the cost.

859. *The Chairman.*] We are told in evidence that you are enlarging your accommodation very much?—We have enlarged the storage-accommodation, but not the floor-area to a similar extent, and the examination of flax would, of course, require a very large floor-area. At the present time, the examination that is now being carried out keeps two presses constantly going, we charge 2s. per bale, and make little or nothing out of it. Two shillings only covers the expenses. It seems to me to be a very heavy tax on the flax to make a charge of 2s. on every five bales. I think that power should be reserved to open every bale; but I think it would answer the purpose to simply draw a hank here and there, or to open one bale out of every line.

860. You mean to say 2s. per bale is charged for every bale that is opened?—Yes. For every bale that is opened and has to be repacked a charge of 2s. is made. The bale is thrown down on the floor, opened, and cut adrift, the merchant makes his examination, and then it is repacked in the press and the hanks readjusted.

861. What is the charge for storage of the flax?—Sixpence per bale for the first two weeks, and 3d. per bale thereafter. These rates came into force on the 1st July.

862. Is there any charge for dumping?—One shilling and eightpence per bale. That is paid by the ship. The storage is paid by the ship, and the dumping is paid by the ship, except in cases where the flax has been sent to America direct, when the charge was, I believe, thrown upon the merchant. In the case, however, of the stuff going to London the shipping companies pay the storage. I may state there is a committee of the Board now sitting, and one of the matters they are dealing with is the storage of flax and wool; and I think, sir, I am justified in saying that they are disposed to recommend to the Board a very considerable reduction. I cannot say positively, because their deliberations are not concluded, but I am quite sure there will be a considerable reduction made.

863. The Committee understand that if a few hanks were merely drawn out of a line—say, one in ten or one in fifty bales—there would be no additional charge?—No additional charge, except in the case of flax in the stack, when it would have to be broken out of the stack, and in that case we charge just the bare cost of labour. No charge is made for drawing a single hank out. I may say I think that hank is apt to get wasted.

864. It has been stated in evidence that bales of different quality are often dumped together by the Harbour Board men?—Not recently. At first that practice was pursued, but when my attention was drawn to the matter I gave orders that it should not be continued, and these orders were carried out, and I am quite certain it is not done now. I do not think there is any case recently where bales with different marks have been dumped together. I am quite clear it is not done, unless by direction of the flax-owners, or under instructions from the ship. The instructions are that all bales with similar marks shall be dumped together, and not bales with separate marks. That is carried out. I am quite clear about that.

865. Can you give the Committee any information as to the possibilities of moist flax firing?—I am very doubtful myself about it. We took a bale of tow, which had been disowned, a couple of years ago, and I tried an experiment with it. I put it in a 400-gallon tank and let it lie there for some time, and on examination we found there was no heat; the flax was simply rotten. I do not think there is much chance of moist flax firing. We have had bales brought to us which have been very wet, and we have had to throw them on one side.

866. In cases where wet flax is sent down from the mills you do not ship it?—No. We call the attention of the Marine Surveyor, Captain Bendall, to it, and, as the men who are engaged on the work are very careful, I have no reason at all to doubt that this wet flax is stopped.

867. *Mr. Walker.*] Do you consider 2s. per bale a fair charge for opening the flax?—We tried an experiment to find out how many bales we opened in the day, and we thereon concluded to adopt that charge, and it has been proved that the charge is not too high. We make very little out of it. The stuff is very much scattered about in examination, and it has to be readjusted and carried to the press.

868. Are the men who bale baling all day?—Recently they have been, because so much has passed through. I do not say the men have been engaged the whole day, because they have other work to perform, but they are pretty well occupied at the work all the day.

869. Compared with the wool charge it is a high charge?—With wool there are no individual hanks. You must not compare baling with dumping. In the case of flax, the hanks which have been strewn about have to be collected and all laid out in order in the box and pressed down by hand. It is then taken afterwards and dumped, if it is to be dumped, in the hydraulic press. I do not see how the work could be done more cheaply. There is one other point I would like to call attention to. I think that a great deal of the flax is wetted unnecessarily in coming down by rail. A very large quantity of wet flax comes down by the railways. There seems to be great carelessness somewhere. It may be that the stuff is loaded wet at the other end. I do not know that it is the fault of the railways. When the stuff has arrived here it has had to be opened out; and you can see all along the fences near the railway the flax hanging and strewn about for the purpose of drying it. We have to rebale that, and we charge the railway people for doing it.

870. Is that owing to insufficient storage-accommodation at the various railway-stations?—It is either that or carelessness on the part of the millers, or some of the people connected with the transmission of it; possibly they have not tarpaulins provided and do not cover it up. I think it is unfair to the industry, because all damaged stuff, when rebaled like that, is not the same as when it is baled at the mill. For instance, our sized bales are not the same size as the bales used by some of the millers. I consider that there should be a standard-sized box amongst the millers up country.

871. *The Chairman.*] If the trade were developed there is no doubt you would have bale-accommodation the same size as is in use in the country?—We took what was a mean size when we had our first press made. Subsequently, finding it was slightly different from most of the bales, I ordered the second press, so as to better average the size of the millers' bales. The bales vary very much in weight, width, and height. No two millers send the same class of stuff down.

872. It is important to the industry that the bales should be of uniform size?—I think so, undoubtedly. I do not think there is any question about that.

873. What sized bale, as regards weight, do you recommend—from 2½cwt. to 4cwt.?—I do not see any from this district as low as 2½cwt. We have a penal clause that if a bale exceeds 4½cwt. it is charged one and a half rates.

874. *Mr. Walker.*] Are your charges by the bale?—All by the bale. I do not see how we could make a tonnage charge.

875. Are the railway charges by the bale?—They charge 1s. 6d. per ton haulage—five bales to the ton.

876. Have they got a penal clause as to weight?—I do not know.

877. They have in the case of wool?—Yes.

878. They charge double?—I am not aware. We found it necessary to make such a penal clause: it was principally through wool it was enacted. Some of the wool bales became enormous —7¾cwt.—and we had to stop it. I do not see my way to make a tonnage rate, because of the difficulty and great extra work it would entail in the way of clerical work and everything else. A bale charge seems to me to be the simplest plan. About five weeks ago I had all the flax in the shed examined, and an average weight taken, and the weight exceeded 3¾cwt. I do not say that was a true average, but it was sufficiently approximate for the purposes for which I wanted it.

879. What was the weight?—Over 3cwt. It was 3¾cwt. 3qr. 18lb.

880. *Major Steward.*] The average weight of a bale should be really 3cwt. or 4cwt.?—Yes.

881. *Mr. Walker.*] Do you not think that the method of charging by the bale has rather induced them to pack as heavily as they can?—I think that is desirable if you can get the bales

a uniform weight. If all the bales exported were of a uniform weight within certain limits I think that would be a desirable thing for everybody—desirable for the merchant, for he knows how many bales go to the ton; and desirable for us, because there is no doubt we can handle 4cwt. bales just as cheaply as we can 2½cwt. bales.

882. I am not acquainted with the manner in which they make up shipping-notes, and all the rest of it. I presume each bale is entered with its weight attached?—As far as the Board are concerned, they simply deal with so many bales.

883. I mean the shipper?—As far as the shipper is concerned, he gets his weight. We make a charge for weighing of 2d. per bale. We are very often asked to weigh on behalf of the merchants, because the mill weights are generally wrong. There is a very considerable loss in weight if the stuff is packed whilst wet. Mr. Gardner, who gave evidence before you, has made representations on that matter. His agents complained that the weights as given by us were totally different to the weights taken at the mills. I went into the matter very carefully, and I came to the conclusion—and I believe I satisfied them—that it was entirely the fault of the mills, and that their weights were correct, but there had been a large loss of weight. It was promised that Mr. Gardner should make an experiment to test the truth of the assertion, and I presume it must have been satisfactory because the question never cropped up again.

884. *The Chairman.*] We gather, then, that the moisture which appears in the bales is rather the effect of indifferent drying at the mills than the fault of the railways?—Yes. It might have been decreased by the stuff being left some considerable time in store with us, and the moisture thus going off.

885. *Mr. Walker.*] Supposing the merchants in America wished lighter bales, you are not encouraging the millers to produce that size of bale, because you give him every inducement to make his bales up to the maximum weight of 4½cwt.?—Yes.

886. If you charge by weight you would allow the miller to send bales to the market to which he wished them to go?—That is so to a certain extent. Then, of course, we could reduce our maximum to 2½cwt., and charge a corresponding tonnage rate. From our point of view, the objections to a tonnage rate are very great. It entails a very large amount of work.

887. I have had a great deal of experience in wool. I have always felt that the only rough and ready means of getting at the future is to take most care to pack to suit the market?—Of course, that is perfectly true. After all is said and done, the Board's charges for wharfage and storage certainly affect such an industry. As far as haulage is concerned, between our sheds and the ship's side they charge 1s. 6d. per ton, five bales going to the ton.

888. Supposing there were seven bales?—Over five they would have to pay more for haulage. As to the charge for the stuff coming down country, I do not know what that is. Our charge is simply wharfage, including the labour which is used in connection with the work. The haulage charge of 1s. 6d. per ton is charged by the railway if loaded at the Queen's Wharf or the jetty. The dumping charge is paid by the ship, and the storage is paid by the ship. The labour is the same whether the bales be 2½cwt. or 4½cwt.

889. *The Chairman.*] Are there any cases in which flax-millers dump their own produce?—I have not heard of any.

890. If they did so they would send it straight on board?—No, I do not think so. I do not think any miller sends direct. I do not think there has been a case in which flax has been sent direct. Wool is sometimes, but not flax.

891. Would there be a substantial charge saved over it?—I cannot tell you.

APPENDIX.

RESULT of ANALYSIS of SPECIMEN No. 5,632, forwarded by the Flax Committee for Mr. Bull. Received, August, 1890. Reported on, 30th August, 1890.

Machine-dressed flax (*Phormium tenax*): This is a very bright looking sample, well prepared, being clean and soft, without having suffered any notable abrasions. Subjected to chemical treatment, the following results were obtained:—

Matter extracted therefrom by contact with a 1-per-cent. solution of soda, five minutes	8·10
Matter extracted therefrom by contact with a 1-per-cent. solution of soda, one hour	16·20
Cellulose	68·80

The strength of this fibre as compared with that of a good specimen of hand-dressed New Zealand flax (not chemically treated) is about 97 to 100.

WM. SKEY, Government Analyst.

RESULT of ANALYSIS of SPECIMEN No. 5,647, forwarded by Flax and Other Industries Committee. Locality, St. Michael's, Azores. Received, 12th September, 1890. Reported on, 24th September, 1890.

Phormium tenax fibre, grown at the Azores, for report: This is one of the cleanest machine-dressed samples of this fibre that has yet come under my notice. Yet it is of full strength, very soft to the touch, and not at all stained except at the butt. Subjected to a partial chemical analysis, it gave results as follows:—

Matter extracted therefrom by contact with a 1-per-cent. solution of soda, five minutes	7.3
Matter extracted therefrom by contact with same solution, one hour ...	15·1
Cellulose	69·8
Balance not determined	7·8
	100

WM. SKEY, Government Analyst.

MESSRS. MONAHAN and YONNIE, of Temuka, write under date of 30th July, 1890, claiming to have a process whereby the *Phormium tenax* is rendered fit for coarse canvas, parcelling and binder twines, as well as for spinning-ropes; they also claim that the tow from their process is capable of being spun into yarn for use in similar purposes as above.

MR. ALBERT POTTER, of Auckland, under date 30th July, writes calling attention to the process of Mr. E. H. Potter for preparing Phormium fibre, called "Potter's Flax Mucilage Dissociator." The principle of the machine is to take the flax immediately it leaves the strippers and pass it under a pair of wooden stampers, while water is being sprayed on it. The machine is of strong and powerful construction, made in two bays or sections, running parallel, to work separately or conjointly, thereby passing the fibre through from either one or two strippers as fast as it can be stripped. It is of a novel and simple construction, its principal object being to manufacture the fibre soft, white, and flexible. This is accomplished by a main shaft, driven in the usual manner with single belt and pulley, two cams, each acting twice every revolution upon revolving discs that lift coupled stamper-rods, to which are attached specially-constructed stampers. Upon the stamper-rods are tappits, which set in motion levers and connections that cause an endless band to bring continuously under the stampers the fibre, which receives successive blows, causing it to open longitudinally, thus setting free and disuniting the sap and other substances held in the fibre after being stripped. To prevent the deleterious matters from settling and discolouring the fibre when under operation, small jets of water constantly play in the troughs. The fibre is then rinsed in water, and hung up to dry under cover from the sun's rays, and the usual bleaching is dispensed with, there being only the pure fibre to dry—and five or six days completes the whole operation.

SIR,— Nelson Street, Auckland, 31st July, 1890.

Having been for many years engaged in the Home flax industry, and having daily experience for the last twelve months in an Auckland flax-mill, and thoroughly understanding the dressing and preparing New Zealand flax for the Home market, may be a sufficient apology for writing you the following observations, which at present may interest you:—

The flax is at present in its wild and natural state, and from analogy it is certain that cultivation and propagation in a suitable soil would improve the quality of it, and get rid of some of the gum or bituminous matter that makes it so difficult to dress.

I have seen nearly if not all the different machines for stripping, and two of the latest inventions are complete failures. One of them proposed putting in the green flax and taking it out dressed ready for sale. Any of the strippers at present in use, if kept in order and properly adjusted, will suit the present growth of flax.

There is a patent taken out (16th January, 1890,) for washing and bleaching, by which process the "oil or fatty matter" is preserved, and the flax made of a more uniform colour, requiring less time and less expense than the present roasting system, and making it adaptable for fabrics.

I have seen here a trial of a new band-scutcher, but it is no better than the old. All these having iron bars or beaters are injurious to the flax, making too much tow by reason of fouling, the top and tail of the flax getting double the scutching of the middle, the part requiring most getting least, and *vice versâ;* whereas an arm-scutcher strikes the middle of the handful first lengthwise, not fouling, making less tow, and, having hard wood beaters, improves the flax, also requiring less driving-power. After bleaching, the flax should be packed at full length, 4ft. or 5ft. deep, with some pressure on top, at least a month before scutching.

In baling, if intended for fabrics the bales should be made longer, having only the top and tail of the flax doubled, so as to make the handful of a uniform thickness. There is a very easy way of doing this.

If the Government really wish to encourage the flax industry I would suggest something more tangible than offering a reward to follow after a myth.

There is here in the Domain a plot of land occupied by Chinamen, which could be enlarged to about twenty-five or thirty acres, suitable for growing flax. There is plenty of flax of a superior quality growing close by, which could be raised and planted the same day.

There is here at the freezing-works reclamation the best site in the province for a paying flax-mill. This ground has never been occupied, and there is ample room, mill-site, and bleaching to turn out seven or eight tons per week, and more if necessary. Labour is much cheaper here than at country mills—boys and men 5s. and 10s. per week respectively. Steam-power at a nominal cost, as there are two saw-mills on the allotment. Water-communication from all parts, together with road and rail, and city water at 10d. per thousand gallons. And what could be done can be done in other places, and if the Government take the lead or give a start private enterprise is sure to follow.

The Chairman, I am, &c.,
Flax and other Industries Committee, Wellington. JOSEPH FLEMING.

MR. CHINNERY, of Rangiora, writes under date 2nd August, suggesting that all fibre already sold to private parties or firms should be exempt from any inspection whatever.

EXTRACT from LETTER of Mr. GEORGE BOOTH, of Christchurch, dated 3rd August, 1890.

. . . . I am somewhat interested in flax, and have taken the liberty of urging the necessity of Government inspection before the Chamber of Commerce, Christchurch; the Commercial Conference, Dunedin; the Industrial Association of Canterbury, and elsewhere. . . . . I may state now that I have very little sympathy with the proposal to place a sum of £10,000 on the estimates as a bonus for the production of an improved machine. The machinery now in use is quite capable of producing fibre suitable for cordage, and improved machinery is not required unless—First, it will produce the quality required for the purpose at considerably less cost than at present; or, second, it will produce a quality suitable for textile purposes, and capable of commanding a higher price than cordage-fibre.

If these conditions are insisted upon there cannot be much harm done. But, on the other hand, I am strongly in favour of having all fibre for export inspected by duly-qualified officials, and graded and marked to fixed and uniform standards. I urged this eighteen months ago, and feel convinced that, had such a course been adopted, our fibre would never have experienced so severe a drop in price as has been the case. . . . . GEO. BOOTH.

DEAR SIR,— Wellington, 4th August, 1890.

I send you the sample of fibre referred to in my evidence, and would be glad to have it returned when the Committee have done with it. Our friends write: "We send you a sample of Phormium grown at St. Michael's from the seed of your *Phormium tenax*. This is a very good specimen, and comes nearest to manila hemp we have ever seen. There were only 35 bales—about 5 tons—and we bought them at £23 5s. per ton, which we consider very cheap. It is not so long as the New Zealand fibre, but its cleanness is the attraction."

You will see I made a mistake in naming St. Helena as the place at which it was grown, the proper place being St. Michael's, which lies north of Madeira.

I send you a table showing the shipments of flax from the colony for the first five months of this year. June gave 8,250 bales; but July is comparatively small, probably 4,000 bales.

Yours truly,

Geo. Beetham, Esq., M.H.R. JOHN DUNCAN.

Shipments of New Zealand Hemp from 1st January to 31st May, 1890.

——	Wellington.	Auckland.	Canterbury.	Otago.	Total.
To London—	Bales.	Bales.	Bales.	Bales.	Bales.
January	6,611	401	1,571	873	9,456
February	4,269	416	887	295	5,867
March	8,395	...	875	701	9,971
April	8,706	1,878	803	559	11,946
May	4,001	1,927	979	742	7,649
	31,982	4,622	5,115	3,170	44,889
To America—					
January	1,272	3,745	1,533	...	6,550
February	3,084	1,719	...	...	4,803
March	5,071	1,980	...	...	7,051
April	...	3,822	...	...	3,822
May	239	2,852	..	...	3,091
	9,666	14,118	1,533	...	25,317

Total shipments—			Bales.
To London			44,889
To America—			
San Francisco	6,784		
New York and Boston	18,533		
		25,317	
			70,206

DEAR SIR,— Brandon Hall Hemp-mill, Bull's, 4th August, 1890.

Re flax or hemp: I wish to bring before your notice the fact that there is existing number of fabric samples, manufactured many years ago, and now in the possession of L. Nattrass, of Bull's. The samples range from "China silk," so called, brown hollands, and down to No. 1 canvas. There is ample documentary evidence of the canvas, having been submitted to Her Majesty's Royal Navy for four years' test, the result being that the canvas beat everything in the market for durability. It is not easy to here enter into all the details, as there is a large number of printed forms, circulars, and a pamphlet bearing on this process, and now stained with age; but the possessor is willing to submit the same for inspection and verification, but being only a workingman, with a large family, would require his expenses paid. I may say that the process was a combined one, mechanical and chemical. The patent was secured at the London office between 1830 and 1840, otherwise the secret died with the inventor, named Donaldson, who, it seems, was treated as

an enthusiast by the trade and others. The present owner has no interest in the specimens, except as curios; he received them from his father, who was one of Donaldson's employés. The samples were examined recently, with the documents, by the *Advocate*, and an article published in refutation to the assertion of the Agent-General that New Zealand flax was not suitable for fabrics. There is one particular specimen which resembles raw silk for fineness.

From my own experience both here and at Home in the producing of fibres, I feel certain that, if all the natural virtues were developed that exist in *Phormium tenax*, it is at least equal to manila in every way; the Taranaki flax is pre-eminent for fabric purposes. But there is not a practical machine or process in use capable of bringing out these qualities. They are all extremely crude; in fact, more or less an adaptation of the original principle of Messrs. Price, of the Thames—that is, the mechanical portion. We cannot compete with sisal for want of a uniform colour and freedom from straws; nor with manila, as the fibres are not sufficiently defined from end to end without maceration, and a percentage of the chemical components of the original leaf is lost; but Bull's machine is a step in this direction.

I notice Mr. Gardner asserts that the hemp now produced is uniform in colour. It is totally a mistake; it is anything but that (see salesmen's and buyers' reports). We can never attain to a uniform colour as long as the process requires outdoor exposure for the purpose of bleaching. The reasons are obvious.

I should be very glad to make a few suggestions as to what we desire the future process to attain, &c., if you thought them worth your consideration.

In conclusion, I may say my reason for bringing forward the fact of the existence of samples of fabrics manufactured from *Phormium tenax* is to establish the fact that it is suitable; and the Government would not be taking a leap in the dark by offering a valuable bonus for developing *Phormium tenax*. What has been done surely can be repeated again.

Yours faithfully,

The Chairman, ALFRED HARRIS.
Flax and other Industries Committee, Wellington.

DEAR SIR,— Brandon Hall Hemp-mill, Bull's, 7th August, 1890.

Re flax: It is acknowledged by manufacturers that there are three objections now existing to placing New Zealand hemp in the market as equal to sisal or manila. First, uniformity in colour or shade. I feel assured from observation this can be attained by a complete mechanical separation of the fibres from the vegetable and liquid matter of which the original leaf is composed. The profitable result would be untold. It would not require washing (a work which breaks down the most robust constitution when followed for any long period). It would save paddocking for the purpose of bleaching, at a cost from £1 10s. to £2 per ton. The quantity of green leaf to the ton of fibre would be reduced at least one-fifth. The exposure to bad weather, with all its attendant risk of being totally destroyed, would be overcome, and the durability of the fibre would be largely enhanced. There are machines that can be set up so as to foreshadow all this, but at the expense of severe maceration of fibres. Second, we desire a process that will make the separation of the fibre in a defined manner from end to end without maceration, a thing impossible where there is percussion in process of separation, as we have now. Third, it is most desirable to produce fibre perfectly free of selvage or straws. Now, Bull's machine, when here, produced a sample containing beautifully-defined fibres and lustrous, but very strawy; of course, this may be encompassed in attaining the uniform colour. An embodiment of the results would also reduce the amount of classifying now desired.

I hope you will recommend that a bonus be offered for a better method of producing fibre, open to the world; and I would suggest that it should be advertised in such papers as the *Scientific American, Builder* and *Engineer*, of London, &c. Small parcels of the green leaf could be sent to applicants, but, as there may be a large number who would apply just for curios, a small charge should be made just to defray postage. A competitive trial of processes entered for the bonus should be made at a suitable place in this country. The best result would no doubt be arrived at by classifying the details desired, allotting points to each object; and, as there may be chemical and mechanical processes offered, competitors should not be hedged in this direction. There should be two separate bonuses—one for twine and rope fibre, the other for fabric purposes—as it seems impossible for the one treatment to answer for both, the fibre so required as well as the species of green leaf differing so much in different districts.

A general feeling of uncertainty exists amongst flax-millers, as they know it cannot with present treatment be produced any cheaper, and, in addition to a fluctuating market, they have great risk, such as fire (there being no means of insuring), bad weather (for it is practically making hay in midwinter), and heavy wear-and-tear. The velocity of machines now worked is 2,000 revolutions per minute, and with the sudden and variable nature of the work nothing more can be safely done to increase the quantity put through per day, with a view to lessen the cost of production.

Whenever the flax industry can be established by the previous suggestions or other means the settlers will take steps to cultivate *Phormium tenax*, through which the market-value would be still increased.

The Chairman, I am, &c.,
Flax and other Industries Committee, Wellington. ALFRED HARRIS.

MR. BARLEYMAN, of Blenheim, writes, under date 12th August, suggesting that more information should be circulated as to the relative quality, quantity, and prices realised of all fibres competing with New Zealand hemp, so that hemp-millers may regulate their annual production.

Mr. M. Murphy, F.L.S., secretary of the Canterbury Agricultural and Pastoral Association, Christchurch, writes, under date 22nd August, enclosing a paper on the ramee, or China grass, a fibrous plant which could be successfully and profitably grown in the northern portion of New Zealand.

Notes by Mr. J. C. Chaytor.

Machinery.—During my late visit to England, I went to Manchester especially to see the Lanksheer machine, for dressing ramee, as it had been suggested that it might answer for flax-dressing purposes. I did not see it at work, but I do not think it could be adapted to our needs. I also saw machines for dressing aloe leaves. They are on the same principle as Price's flax-machines, but very different in size and details. From the shape of the flax-leaf, with its thick butt and thin edges and point, I have great doubt about any machine being invented to dress it perfectly. I think that some modification of the machines we have now, combined with retting, and perhaps some improvement in the scutching, will be found near perfection for the production of hemp for rope- and twine-making, for which alone our hemp seems to be used. I was told the fibre we send is not suitable for spinning. We have it on record that fine fabrics have been made of New Zealand flax. Some years ago I saw various articles of clothing that were said to be made of it. It is to be hoped that some method of turning it to profitable account as a weaving material may be discovered.

Sea-damage.—Sea-damage is a cause of some anxiety to flax-millers, as it has not been covered by insurance. Generally I have not found the loss heavy, but just before I left New Zealand last October I had advice of a shipment of fifty-two bales of hemp ex "Tainui" being badly sea-damaged. Only thirteen bales were landed sound. Some sold for £2 1s. and £1 15s. per bale, which would barely cover freight and expenses. I made particular inquiries about this in London, and was told that a port had been burst in, and we had no claim against the ship. The shipping company has only to get a certificate from the dock company that the hemp has been properly stowed, or that it is sea-damaged, to hold it harmless for loss by chafing or sea-damage. From what I could learn I believe some damage is caused by "sweat," which might be avoided by having proper ventilation. The carrying trade of New Zealand is too much of a monopoly at present, and bills of lading are prepared to guard shipowners against nearly every possible risk. We might reasonably expect the shipowners to keep our goods dry while in their charge or pay the damage. We must look to combination amongst the shippers to bring about some improvement in this respect, together with general reduction of freights and charges. Underwriters in London would insure against sea-damage, but they would first have to study the subject, to see what the risk was worth. They would stipulate for the right to sort damaged bales and sell the sound portions separately. This might be worth doing now on account of the shippers.

Condition.—The hemp I saw in warehouses seemed to have been landed clean and in good order.

Dumping.—Before I left New Zealand reports were current that hemp was being damaged by dumping. I made inquiries and saw for myself that the hemp that was well cleaned and dry when packed came out in perfect condition. Some I saw caked together, but it seemed to have been gummy and damp when packed. Some inconvenience and delay in giving delivery had been caused by dumping bales of two different brands together. I was told that this should be particularly avoided.

Sampling.—Some bales from each shipment are taken to the show-rooms, where they are laid out in rows and the ties cut. The buyers take out hanks as they please, open them and see how the flax is dressed; and no slovenly work or dishonest packing in likely to escape them. I saw Mauritius hemp packed in wrappers. It was not thought that it would be any advantage to us to cover our hemp.

Sales.—The sales are held every Wednesday afternoon. The business, both selling and buying, is chiefly done by the brokers, and I understand manufacturers seldom, if ever, attend. The discount of 3¾ per cent. will only be got rid of by steady combination on the part of the producers. Buyers are said to take the discount into account in making their bids. It would be better to simplify the matter, and sell on cash terms like wool. Till lately sheepskins were subject to 2½ per cent. discount, they are now sold on the same terms as wool.

Bales.—Small bales about 3½cwt. and small hanks are preferred by manufacturers. Bales are better tied with hemp or rope than wire. Labels of calico, with brand, &c., marked on them and sewn to two ties, answer well. The hemp should be as like manila as possible—*i.e.*, free from straw and of a uniform pale yellow. Our hemp now seems to have got a firm hold on the market, and I was told by a large consumer that for a first-class sample there would be a constant demand. The whole of our production is a mere trifle in the fibre markets of the world, as may be seen by the receipts of manila alone in the London market, which were: For 1888, 658,000 bales, and for 1889, 566,000. The prices of the various fibres per hundredweight we have to compete with were quoted on 18th January, 1890, as follows: Russian hemp, from 19s. 6d. to £1 11s. 6d; manila hemp, from £2 9s. to £2 17s.; sisal hemp, from £2 3s. to £2 4s.; Mauritius hemp, from £1 8s. to £1 18s.; New Zealand hemp, from £1 4s. to £1 14s.; Bombay hemp, from 8s. 6d. to £1 0s. 6d.; Sunn hemp, from 12s. to £1; Italian hemp, from £1 12s. to £2 16s.; jute, 18s. to £1 2s. 6d. We may expect the present depression will be only temporary. Prices must depend on fluctuations in supply and demand of the fibre markets of the world, which are beyond our control; but it will depend very much on the flax-millers themselves to make our hemp take a high place in the list of fibres, and keep up the demand, by shipping only hemp of thoroughly good quality. With this object in view, I think it would be very desirable to form an association of all flax-millers, who should contribute a small sum per ton on the hemp they produce to cover expenses; that a committee should collect and circulate amongst members any information likely to be useful; buy any patent rights for the use of members that might be found desirable; establish standards of hemp if practicable

with an association trade-mark for the use of members; keep a list of members and their brands in the London sale-rooms; expel any member guilty of false packing or making a bad article; publish a price-list of the hemp sold like the wool catalogues circulated by the New Zealand Loan and Mercantile Agency Company. The power of such a body would be great, both to check the production of a bad article and to protect the interests of members in many ways.

Mr. James Robinson and others in this district may share with Mr. Chinnery the credit of having successfully bridged the interval between the two flax periods. I cordially agree with all that can be said as to the policy of making only a first-rate article, but there can be no doubt that the few thousand bales of badly-dressed hemp that may have been sent Home have not been the cause of the very heavy decline in the values of all fibres. The cause will probably be found in the increased production of manila, sisal, &c. In 1889, the year of high prices for New Zealand hemp, the supply of manila in the London market was about 12,000 tons short of the supply in 1888. The receipts of manila in London in 1888 were 658,000 bales, and in 1889, 566,000. When Mr. Gardner mentioned 120,000 tons he must have referred to the quantity in the London market, and not to the world's consumption, and he certainly overestimated New Zealand hemp at 50,000 tons. According to the Customs returns the total export for 1889 was 17,084 tons. I find 7,233 tons reported as having been landed in London in 1889. The quantity afloat and shipped to America, Antwerp, and other markets must, I suppose, account for the rest. For the first six months of this year the export was a little over 14,000 tons. The following returns of the quantities and values of New Zealand hemp exported in different years since 1853 may be of interest:—

Year.	Tons.	Value per Ton. £ s. d.	Year.	Tons.	Value per Ton. £ s. d.
1853	46	22 14 0	1871	4,100	23 3 5
1855	150	31 3 2	1872	4,100	23 3 5
1856	22	25 1 9	1873	6,454	22 5 7
1859	77	20 11 2	1874	2,038	18 9 10
1861	2	21 10 0	1875	639	18 7 6
1865	3	25 0 0	1877	1,053	17 17 6
1866	40	24 18 0	1879	445	17 13 10
1867	126	33 15 1	1882	2,040	20 11 3
1868	534	15 4 5	1886	1,112	14 6 4
1869	2,028	22 6 2	1888	4,042	18 12 5
1870	5,471	24 4 8	1889	17,084	21 2 9

I may say that I have not much faith in the proposed inspection by Government officers; we do very well without it in the case of wool. The quantity of hemp is now so large that a thorough examination would be very costly if practicable, and the advantage would chiefly be for parcels sold to arrive. That sold in London after arrival would probably still be inspected by the buyers there. I think it would be well if manufacturers would put their names and addresses as well as brands on each bale. I mean to adopt that course.

I am, &c.,

Tuamarina, Marlborough, 7th August.

J. C. Chaytor.

Cultivation of *Phormium Tenax* (Native Flax).

The following information relating to the cultivation of *Phormium tenax* was supplied by Mr. T. Waugh, Corporation gardener, Invercargill, to the *Southland News*, in 1889:—

Mr. Waugh says there are some Phormium plants growing in the Corporation nursery which were raised from seed, and are now eight or nine years old. They might have been cut two years ago, which would make the time from the seed-sowing to the cutting at least six years. The seed would have to be sown in nursery rows, in the same way as tree-seeds, July or August being the time. Light soil is best for it, as for other seeds, and rows are better than beds, because they can be more easily weeded. The young plants would stand two years in the seed rows, and the quantity required to plant an acre would, for these two years, accupy a very small piece of ground. When taken up they would be too small to plant out permanently, but should be transplanted into other nursery rows, and a few inches between each plant allowed. The plants would occupy these rows during the third and fourth seasons, and would then be ready to plant out in their permanent stations. Allowing other two years for the plants to reach maturity would make them six years old, as before stated, at the first cutting. Sowing Phormium where it was intended to grow permanently would never do at all; the expense of keeping the ground clean was so great, and if the weeds were not kept down they would choke the plants. During the time the young plants were in the nursery rows, the land ultimately to be occupied by them could be cropped and thus made fit to receive the plants, and, if the permanent rows were made 5ft. or 6ft. apart, some kind of root-crop could be grown between them so as to pay for keeping the land tilled and free from weeds. Even at the end of six years the crop would not be a large one—certainly not two tons of dressed flax to the acre, as some people say they get; but even one ton at present prices makes it worth considering whether Phormium could not be grown as a farm crop. Thirty pounds per acre would pay a good many years' rent, and during the first four years the plants, as shown above, would not occupy much ground. Of course the second cutting would be greater, the plants by that time having stooled out and taken up the whole of the ground, and completely suppressed the weeds. The second cutting would be got in two, three, or four years, according to circumstances; but very little is known how the plants would act in a cultivated state. One

cannot judge by Phormium growing in a wild state. Some old-established plants growing by the side of a creek might produce a second crop within two years, but it is not likely that a whole paddock would, unless it was manured or irrigated. Old flax-roots could be chopped up like rhubarb, and planted to form a new plantation, but that system of planting would be very uncertain—a great many of the pieces would not grow, and the expense of planting and replanting would be far greater than by plants raised from seed. There is no difficulty about sowing the seed—any one could do it, and the expense of looking after the young plants for four years would be very little for the quantity required for an acre, if a clean piece of ground is chosen for the nursery rows. Seed could easily be got; every one knows what it is like and when it is ripe—that is, just when the pods are beginning to open. The land devoted to Phormium would have to be well fenced, for the plants will not stand the treading of cattle, and that is the very reason that much of the flax growing in a wild state will never yield a second crop. The cost of the planting of an acre is not very easily estimated. The ground would, of course, have to be well ploughed and harrowed to begin with, but the intermediate root-crop ought to nearly pay for that. Then the furrows in which to put the plants would be made by the single-furrow plough and a marker. Two boys would then put in the plants, one laying them down and the other covering them with a spade or hoe. The number of plants per acre, at rows 6ft. apart and plants 2ft. apart in the rows, would be 3,630, and two boys would put in that number in less than two days. The cost of the four-year old once-transplanted plants would be considerably under £1 a thousand. It altogether depends on the quantity grown and the sort of ground chosen for the nursery rows. If dressed flax should be £30 per ton in six years' time after this there is no doubt it would pay to raise it from the seed. If the industry has to be kept going something must be done, for the flax which is accessible will soon get cut, and much of it will never produce a second crop, or, if it does, too many years will elapse between the first and second cuttings to make it worth while to protect the plants. Much of the land on our river-flats which is subject to occasional flooding would be suitable for flax-growing.

[*Approximate Cost of Paper.*—Preparation, nil; printing (2,700 copies), £45.]

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