# REPORT

OF

# THE JOINT COMMITTEE

UPON

# COLONIAL INDUSTRIES.

REPORT BROUGHT UP 19TH OCTOBER, 1871, AND ORDERED TO BE PRINTED.

WELLINGTON.

1871.

# REPORT OF THE JOINT COMMITTEE ON COLONIAL INDUSTRIES.

THE Joint Committee appointed to consider what steps, if any, should be taken to ascertain and develop the producing and manufacturing resources of the Colony, report that they have taken evidence on the following subjects:—

1. The Cultivation of Beetroot, and the Manufacture of Sugar therefrom;
2. The Encouragement of Coastal Fisheries and Fish Curing;
3. The Manufacture of Paper;
4. The Development of the Brunner and Mount Rochfort Coal Fields;

upon which they have agreed to make the following recommendations.

### 1. *Beetroot.*

In order to give encouragement to the cultivation of beetroot and the production of sugar on a remunerative scale, it is desirable that the Government should give all possible facilities for the acquiring, by a company to be formed for that purpose, of a block of land of about 3,000 acres in extent, to be purchased by such company at reasonable rates; that Mr. Krull, German Consul, resident in Wellington, be invited to assist the Government in introducing from Germany a sufficient number of persons, with their families, who have had practical experience, to undertake the culture of the beetroot, and should provide such persons, and their families, either with free or assisted passages to the Colony; that steps should be taken at the same time to obtain a sufficient quantity of beetroot seed of the particular varieties best adapted for this manufacture; that a bonus of £2,000 be offered for the production of the first 250 tons of sugar produced therefrom; and that for a period of four years from the date of the settlement of the people on the land, the sugar produced by them should be exempt from Excise Duty.

### 2. *Fish Curing.*

That the establishment of coast fisheries should be encouraged by means of a bonus, for a term of seven years, on cured fish, dry and pickled, exported for consumption abroad. That the bounty should be at the rate of 4s. per cwt. of 112 lbs.; the exporter to enter into a bond not to re-land in the Colony the fish on which a bounty has been paid. That such steps as may be deemed necessary should be taken for having the fish inspected; and that no bounty should be allowed on such fish as shall not be proved to be marketable, and capable of standing a three months' voyage. That, with the view of further encouraging coast fisheries, the Government be requested to reserve suitable sites along the coast for the purposes of fisheries, and for curing stations. And that in the special case of Messrs. Macleod and Perston, of Whangarei, which has been brought before the Committee, it is recommended that they should have the exclusive use of a block of land containing 500 acres at Tutukaka Harbour, Matiporou Block, thirteen miles north of Whangarei, so long as they use it as a fishing and drying station. That all articles used in the coast fisheries should be admitted free of duty, and that all boats and vessels engaged in the fishing trade be relieved from harbour, wharf, pilotage, and light dues.

### 3. *Paper.*

It appears from the evidence taken that there are within the Colony various fibres suitable for paper making. Your Committee recommend that a bonus of £2,500 be offered for the production of the first 100 tons of printing paper produced by machinery, such bonus to be in addition to any that may be offered by any Province.

### 4. *Brunner Coal Mine.*

Upon the subject of opening up this mine, your Committee observe with great satisfaction that the Government "regard this object as one of general Colonial interest;" in this view they entirely concur, and recommend that the suggestions contained in the very able and valuable Report by Messrs. Blackett and Hector, embodied in Papers presented to both Houses relating to the Construction of Railways, South Island, should be carried out with the least possible delay, and that these works should be undertaken at the cost of the Colony.

### 5. *Mount Rochfort Coal Mine.*

With regard to this mine, it appears that as yet there are not sufficiently reliable data to enable your Committee to make any definite recommendation, further than to call attention to the interesting evidence given by Mr. O'Conor on the subject, and to point out the desirability of instituting a thorough examination of the field itself, and obtaining a proper survey of the line from thence to the Buller River mouth, and that such survey and examination should be at once undertaken. In the opinion of your Committee, the speedy development of the coal fields of the Colony is so closely connected with the welfare and success of almost every industry, as to deserve at the hands of the Government the most earnest and careful attention.

Minutes of Evidence taken on the above subjects, together with a paper on the Oamaru building stone, and a letter on the manufacture of railway carriages in the Colony, are appended to this Report.

Your Committee have also had the subject of the conversion of the iron-sand into steel brought under their notice by Mr. E. Smith, who for many years, and at a considerable cost to himself, has been experimenting therein; they concur with the suggestion made by Dr. Hector, and recommend

that Mr. Smith should be asked to furnish a statement of the expenses he has incurred for the experiments at Mount Cook Barracks, properly vouched, and that these expenses should be repaid to him in consideration of the active interest he has taken in bringing the matter prominently forward; and also that a bonus should be offered in the terms proposed by Mr. Smith: namely, £1,000 for the first 100 tons of steel produced from iron-sand in New Zealand.

*Sericulture.*

Upon the subject of Sericulture they observe:—

(1.) That it appears from the evidence, that the only way in which Government aid would be useful to this industry would be in assisting the planting of mulberry trees. (2.) That good progress has already been made in this direction, especially by Mr. Batchelor, whose work was susidized by Government last year. (3.) That unless further assistance is granted, what he has done will be lost, as a period of three years is required for the propagation and distribution of the trees. They therefore recommend that the sum of £100 should be devoted to the further assistance of planting of mulberry trees; that the bonuses already offered should stand; and that the above sum should be placed at the disposal of a Committee, to consist of the Hon. Dr. Renwick, Messrs. Curtis, and Lightband, in order to secure the better carrying out of the provisions of this recommendation.

Papers and Correspondence have been submitted to your Committee on the following subjects:—

The Growth of Linseed.

The Employment of a Steam Collier in the Coal Trade at the Grey River.

The Encouragement of Hand Loom Weaving.

Upon these they do not desire to make any special recommendation.

A paper was received upon the manufacture of Soap, asking that a bonus might be offered in certain cases; but they are of opinion, that this is an industry now sufficiently well established to prosper without extraneous assistance. Some evidence was taken on the subject of petroleum, its quality, and the places where it may be found, but no further information was elicited, than is now obtainable in Reports by Dr. Hector, and other printed Papers upon this product.

Specimens were handed in of some fair building slate, but rough; and some pieces of black birch timber, said to be suitable for railway sleepers.

*Black Wattle and Cork Trees.*

That it is desirable the attention of the various Acclimatization Societies should be called to the advisability of encouraging as much as lies in their power, in their several Provinces, the culture of the black wattle, to supply the bark most suitable for tanneries, as well as of introducing, in suitable localities, a sufficient supply of cork trees.

*Trade Marks.*

They recommend that steps be taken so that, by means of trade marks or otherwise, local manufacturers may be protected from spurious imitation or conterfeits.

In conclusion, your Committee suggest that the expenditure of the various sums recommended for the promotion of certain industries be placed under the immediate control of some competent officer of the Government, with a view to their careful application; and that a report of his proceedings be presented to the General Assembly within fourteen days of the commencement of next session.

They regret that the limited time at their disposal, consequent upon the many other duties which have occupied Members' attention, has prevented them from entering upon the consideration of many other important and interesting subjects: amongst which may be mentioned the manufacture of glass—a branch of industry now just commencing in Auckland, and the question of the durability and strength of the various timbers grown in the Colony.

These, however, with many others of a like interesting character, your Committee have been compelled to pass over, trusting that, in a future session, they may receive at the hands of a similar Committee the attention they so well deserve.

A. P. Seymour,
Chairman.

# MINUTES OF EVIDENCE

TAKEN BEFORE

# THE COLONIAL INDUSTRIES COMMITTEE.

FRIDAY, 8TH SEPTEMBER, 1871.

Mr. Krull, being in attendance, was examined.

1. *The Chairman.*] I have written to Germany in reference to three kinds of seeds which are now recognised to be the best. The system of levying the duty on the raw beetroot has brought the manufacture to such perfection that no one can compete unless he uses one of those three kinds of seeds. It requires a small beet from half-pound to three pounds, otherwise it will not pay. The Government raise the duty gradually as they find the manufacture pays. The beet is white. The manufacture is never carried on alone, but always in connection with large farming operations.

2. *The Chairman.*] Are you aware whether the manufacture is confined to any particular portion of the year? Yes. It is during five months.

3. Are the manufactories closed at other times of the year?—Being in connection with farms, the hands find constant employment. A gentleman who has an estate generally establishes a sugar manufactory on it. It pays him even if there is no profit on the sugar, because the residue fattens the cattle, and it pays him in that respect. I will give you one instance of a very small farm of 575 acres, in the department of the Nore, in France. 195 acres are devoted to the cultivation of beetroot 195 acres to wheat, 57 acres to flax, 37 acres to oats, 45 acres to grass, and the remainder to houses and roads. The farm referred to purchases beetroot from peasants, in addition to what it grows. He fattens on that, out of the residue of the beetroot, 600 head of cattle, and 2,400 sheep.

4. Does he keep the refuse of the beetroot all the year through, or has it to be used within a certain time of the sugar being extracted from it? Will it keep without fermenting?—I have no doubt it must keep, because he keeps fattening the stock all the year.

5. Do you know how often they venture to grow the crop?—It can be done two or three times, because the ground only wants a fresh dressing. Out of 3,000 or 4,000 acres 500 would be sufficient to be laid out in beet. My intention was, if any concession could be got, and the idea was entertained in Germany, to grow other things besides beetroot. For instance, rape seed could be grown. That would be very beneficial, because the straw of the rape is required for the cattle. The ground which has grown beet answers exceedingly well afterwards for wheat, and is much more valuable than before. The ground has to be cultivated one foot deep. The whole cost of growing beetroot and preparing the land is estimated in Germany to be from 36s. to 39s. per acre.

6. What will that represent here?—I could not say, not knowing the time it takes. In Germany the farmer finds all the labor and machinery, and the workmen, if they came out to New Zealand, might have a certain per centage in the concern. Laborers in Germany work day and night at very low wages, and they would be in a better position if allowed to participate in the profits. If the Government of New Zealand, as they intend to encourage immigration, would give suitable land at reasonable prices, and pay the passages of the immigrants who would come out with a fair amount of capital, it would be only fair.

7. What number of immigrants?—About 200 men, besides their families. That is the reason I spoke of 3,000 acres, as each would have two or three acres to keep a cow on.

8. *Mr. Richardson.*] What is the average rate of wages in Prussia?—From nine to ten shillings a week, without board. They had a house free, and were allowed to run a cow, and perhaps a few pigs. In Germany, besides growing beetroot, they grow chicory and carroway seeds, and manufacture their own starch. I mention this to show that their operations would not be confined to beetroot. If immigrants came out, they would grow their own flax, spin it by hand, and probably manufacture it.

9. *The Chairman.*] You have not said anything as to the terms on which the land should be given?—I should think £1 an acre. The land requires to be of a light and sandy description, and where the root would go deep into the ground, without touching clay. I think Dr. Hector mentioned that land similar to that at Taranaki and Patea would be most suitable. The root sometimes grows down to a depth of two feet.

10. *Mr. Holmes.*] What protection do you think would be expected?—The Government could, as in Germany, obtain an authentic return as to the progress of the manufactures, and when they paid more than 15 per cent for a few years, raise the duty accordingly on the sugar, and gradually reduce it until it only pays 10 per cent.

11. Suppose a company were offered land at a fair and reasonable value, with the fee simple and £1,000 as bonus on 500 tons of sugar, and free of duty for seven years, would that be sufficient inducement?—I have no doubt it would be sufficient. I think if you gave it to one company, you might be obliged to give it to others too, and seven years would perhaps be rather long. In the course of three or four years they would be able to pay £1 or £2 duty, and to gradually increase it. As I said before, there should be a statement of the profits, and the moment they paid more than 15 per cent the duty should be raised accordingly. It will be in the nature of an excise duty.

12. *The Chairman.*] You say you have been in communication with some one in Germany on the subject. Did they give you any really substantial reason for believing that an offer of this kind would be responded to?—I have written to the German Government, and they take great interest in the matter. My correspondent asked me what I thought of the field for immigration in New Zealand, and I mentioned that I thought exceedingly well of it. I have not the slightest doubt that the Government would consent to the scheme with the greatest pleasure, because really the terms are exceedingly good.

13. *Mr. Peter.*] How many tons of sugar is the average yield of one acre.—One ton to an English acre.

14. *Mr. Murray.*] Have you ever seen beetroot brandy made?—If the yield is not good, the beet is made into brandy, or geneva as it is called in Germany.

15. Would it pay better to manufacture sugar instead of brandy?—If the beet contains enough saccharine that 12 cwt. produce one cwt. it certainly pays better to manufacture sugar, because at that rate potatoes would make the brandy cheaper than beetroot.

16. Would you be inclined to recommend that we should give a grant of land for the purpose in proportion to the amount of sugar produced?—I think that it would be quite immaterial whether they got the land that way or any other. I do not want the Government to be too liberal, as the Germans do not live in very good condition in their own country, and if too well used are apt to be spoiled, and require to be kept down strictly.

17. Do you think the present Customs duty upon sugar would be sufficient protection? Certainly.

18. *Mr. Bathgate.*] The great difficulty in all young industries in the Colony being wages, you suggest special settlement upon the co-operative principle?—Yes; and that removes the question of wages.

19. Have you reason to believe, if suitable encouragement were given, that a proper number of men with sufficient capital would be induced to come out and settle on a special settlement?—A company can be formed most likely in Berlin. They would be glad to embark capital to any amount that was necessary. It is not a question of capital. The machinery there being perfect, they have full confidence, and they would select their own men.

20. Would they remunerate the men they would bring by giving them an interest in the undertaking?—That is what I would propose. I was thinking that a contract might be made in Germany, in the German language, and ratified here afterwards.

21. You are not aware of that principle having been tried in New Zealand?—No. But before I could recommend it, I must satisfy myself that the saccharine contained in the beetroot is up to the standard required. That is the reason why I must get the seeds first and try them on different soil. As far as I know of the nature of the climate in the district where the beet grows, I am confident that the New Zealand climate is adapted for the purpose. The beet will not contain enough saccharine south of Paris, but only in the colder climates.

22. Have you considered whether there is any market likely to be afforded for fat stock for meat preserving?—If the company could not find a market in the Colony, and had to resort to preserving, they could then find one at home in Germany, because they would have capital to any amount; and I don't think there would be a market in the Colony for such large quantities as would be fattened, unless our population greatly increases.

23. *Mr. Lightband.*] How many acres would be required?—From 3,000 to 4,000 acres would be sufficient.

24. I suppose it would not be necessary to have that all in one block as long as it was in the same district?—It is essential to have it as compact as possible, on account of the cost of carriage of the beetroot to the manufactory. If they entertain the proposal in Germany, I have no doubt they will send out some one to choose the land.

25. *Mr. Shephard.*] Do you know any one who has grown beetroot in New Zealand, and what has been the yield per acre? I have not the slightest idea. It should yield from 12 to 18 tons, or it will not pay. It must be a small beetroot. You can raise from 50 to 60 tons cattle beet to an acre.

26. *Mr. Chamberlain.*] Is the growth of beetroot very exhausting to the soil?—Three crops running have been grown. It needs a constant manure. The residue of sugar is used, and sometimes chemical manure.

27. Then, after that the land would have to remain idle for many years?—No. Wheat could be grown the next year.

28. In what part of New Zealand would the company think of settling?—It must be left to Dr. Hector. I have no preference for any Province whatever. I do not think the beet would grow in Auckland, as the climate is too hot.

29. Would the company try the growth of the seed in different parts of the Colony?—Yes; they would experimentalize in different parts.

30. Would they manufacture spirits as well?—I don't think the Customs would allow it, nor would it be desirable. It is done at home as soon as it is found the sugar does not contain sufficient saccharine to pay the duty.

31. *The Chairman.*] How long is it since the manufacture was introduced into Germany?—It commenced in the year 1800. The Government at its own expense established a sugar manufactory, but the machinery was so imperfect that they could not compete against the sugar imported. The increase of beet sugar on the whole Continent for the year 1869-70 was 170,000 tons, and the total quantity produced was 802,500 tons. During the same year there was only 2,750 tons of sugar imported.

32. *Col. Russell.*] In Hawke's Bay the Provincial Council have been considering the subject, and it was stated that the profit to be derived from the spirit is infinitely greater than the profit to be derived from the sugar This was gathered principally from a pamphlet written by a person who is manufacturing the necessary machines, in which it is shown that this spirit enters into the composition of almost every thing that is sold in the form of spirits, such as brandy, whisky, spirits of wine, &c., and is often used for varnish making, and such things, and that the consumption is enormous. The Provincial Council of Hawke's Bay, in awarding a bonus of £1,000 for the culture of beetroot, applied £500 to sugar and £500 to spirit. Spirit could be manufactured with greater profit to the manufacturer, but I do not know whether it would be to the greater interest of New Zealand.

33. *The Chairman.*] Is a moist climate unsuitable to the growth of the beet?—No. The root must never be exposed to the open air. It is considered that the beet requires two years to come to perfection. The first year sugar is produced, but the second year the seed is obtained. It would be judicious to have

a distillery in connection with the works, because the beet that would not come up to the standard required could be manufactured into brandy.

34. Do you know if in Germany they have tried any process for drying the roots, so as to enable them to carry on the manufacture all the year?—No. I have not been able to find out anything in reference to that. It is not necessary in Germany.

35. How many hands are employed there on a farm which produces about 500 tons of sugar?—Eighty laborers, and five overseers, with machinery of 76 horse-power. It is necessary to have a large quantity of water, as the beet requires constant washing to prevent sourness.

36. *Mr. Richardson.*] Have you ever seen any of the modern sugar-making apparatus?—No.

37. *Mr. Holmes.*] Is there a bonus offered for the production of sugar in Australia?—Yes, I believe so.

38. *The Chairman*] From the nature of the communications you have had do you think there would be a disposition on the part of capitalists in Germany to go into the matter?—Yes; the moment I recommend it to the Government, they are prepared.

39. *Mr. Holmes* stated:—At the request of the Committee stated, I visited Belgium within the last few years, and made enquiries respecting the culture of beetroot. I believe the quality of the root in New Zealand will be found to be quite as good as in any part of the Continent, and I think Mr. Krull may have little hesitation in assuring his correspondent of that.

40. *Mr. Richardson to Mr. Holmes:*—Has any of the root which you have grown, Mr. Holmes, been analysed?—No. You can, however, by cutting the root get some idea of its quality. I have grown beetroot and mangolds, and I have put both into the trough, and observed that the former is much preferred by the cattle.

41. *Mr. Lightband.*] I would like to get some information from Mr. Krull respecting the manufacture of starch, and he might be kind enough to give the Committee some information at the next meeting.

42. *Mr. Krull* stated:—I know that every family in Germany make their own starch, and in New Zealand splendid starch ought to be produced on account of the quantity of potatoes. It requires very little capital; in fact, I know one man (German) who thought of commencing the manufacture with a capital of £100, near Wanganui.

43. *The Chairman.*] From what part of Germany, Mr. Krull, would this emigration take place?—Mr. Krull.—I have been corresponding with Berlin, and I think the immigrants must come from the Province of Saxony.

44. *Mr. Holmes* stated:—I have raised from 20 to 25 tons to the acre of excellent beet, from Silesian beet supplied to me by the Provincial Government of Otago. I have grown it for the last three years, preserving the seed every year for my own use. I have manured very little, so that I have to take fresh soil to get a good crop.

45. *The Chairman.*] Have you ascertained to what extent the crop is exhausting?—A very good crop is exhausting. A soil being quite new and in full bearing vigour, of course would not be affected by the crop so much as it would if it had been used for a series of years.

46. Was yours entirely new soil?—In some cases it was, and in others it was grass land ploughed up again.

47. How deep do you plough?—About eight inches. The soil I used was friable soil, of limestone formation. I was so satisfied with the suitability of the soil for producing good sugar beet that I was prepared to cultivate and manufacture sufficient to entitle me to the premium proposed to be given by the Provincial Government of Otago about three or four years ago, but the Government did not carry out its original intention of giving a prize. The bonus offered was £1,500 for 100 tons. My calculation was that the £1,500 would have merely paid for the machinery, and the loss, in the event of its not proving an absolute success, would have been the loss of producing.

48. Do you know whether the beet has been cultivated in other parts of Otago?—A great many persons have grown the same kind of beet successfully.

49. Was the seed you used of the best description?—Yes. It was sent for expressly by the Provincial Government, and was procured by the Agent for Otago, in Britain. It is called Silesian beet, and is supposed to be the best sugar beet that can be procured.

50. *Colonel Russell.*] I think you said that sugar beet was more greedily eaten by the cattle?—Yes. Twenty-five tons of beet is equal in point of feeding quality to 35 tons of mangolds, because it contains more sugar. We use the beet to keep the stock in condition during the winter.

51. *Mr. Lightband.*] It might be satisfactory, if Mr. Holmes has any of that beet, for him to have some forwarded to Wellington for analysis. If he has any now it will have been kept virtually for a year.

52. *Mr. Holmes.*] There was a quantity in the ground when I left home. I don't lift the roots, as I find they keep better in the ground. I will write for a bag by the first vessel, and Mr. Krull can see them.

53. *Mr. Murray.*] How do you propose to keep up the fertility of the soil?—In a new country I would never think of repeating the same crop on the same ground from year to year. It is only in a country where there is a limited quantity of available land that that is desirable. On a regularly cultivated farm I would manure the beetroot, and put a grain crop in afterwards.

54. You think it would not be necessary to put in artificial manure?—If you give the beets an ordinary crop of manure, there is the additional culture you have to keep clean, and the working of the soil improves it; and with the manure that is used to propagate the beet the quality of the ground is improved, and it is then in a condition to produce a good wheat crop afterwards.

55. *The Chairman.*] Have you estimated what it cost you per ton?—Just the same as an ordinary crop of mangolds.

56. Then, if you get less per acre, of course it costs you more per ton?—Certainly. The mangold requires as much attention as the beet. To keep the beet covered would entail an expense of about 15s. an acre.

MONDAY, 11th SEPTEMBER, 1871.

Dr. Hector in attendance and examined.

57. *The Chairman.*] Having heard Mr. Krull's evidence, can you give the Committee any information on the subject of beetroot sugar?—I observe that Mr. Krull refers to me as being the person to select the most suitable land for the growth of beet root. I think it can only be done by experiment. The best plan would be to have seed distributed in five or six well marked varieties both of soil and climate, and discover by experiment how much saccharine matter would be produced in each locality.

58. I suppose friable soil would be desirable?—Yes. Friable soil with deep loam.

59. Stiff clay soil would not do?—Not without a great deal of working, and thorough drainage. The climate must not be too wet at the season when the saccharine matter is forming in the root.

[*Mr. R. J. Creighton submitted to the Committee some papers on the subject of fish curing, which were read.*]

60. *The Chairman to Dr. Hector.*] Has your attention been directed to this subject?—I had the papers mentioned by Mr. Creighton referred to me by the Government. Mr. M'Leod in his letter refers to paragraph seven of the report of the Committee, and states that provision was to be made for making absolute grants of land. The paragraph referred to is as follows:—"That it is desirable that the Government should, as speedily as possible, reserve suitable sites along the coast for the purpose of fisheries, and for fish curing stations." Mr. M'Leod seems to have implied that the report advised the Government to that effect. There was nothing in that report about giving a grant of land such as that asked by Messrs. Purston and M'Leod. They required an absolute grant of a very large piece of land, which would fix the experiment down to one place. After seeing the recommendation of the Committee I thought the bonus should be open to the Colony, and that it might be the means of showing which part of the Colony is adapted for fish curing. Of course if the Northern Districts are better adapted, they will secure the bonus and direct attention to their resources; and if the bonus is given in the form of an absolute grant of land in any one place, the experiment must be either made there or not at all. Therefore, as far as I remember, I suggested that although it would be advisable to give a bonus in the manner suggested by the Committee, yet it would not be advisable to make a large grant of land, which was the prayer of the letter.

61. *Mr. Creighton.*] I think Messrs. Purston and M'Leod would be content if they had undisturbed possession of a block of land they would select to carry on the experiment. They are prepared to spend between £2,000 and £3,000 in permanent buildings, stores, and the prosecution of the fisheries; and I think the value of the waste lands is a mere bagatelle compared with the benefit which would result from the experiment if successful.

62. *The Chairman.*] Why is it the Auckland Provincial Government cannot dispose of those lands?—They have power to make reserves, but under the recommendation of the Committee they could not grant the sole use and occupation of a fishery reserve to any individual. If the Provincial Government selected a block of land, and proclaimed it as a fishery reserve, any man might occupy it for the time being, and, in the meantime, those who had erected the necessary buildings to cure fish on a large scale would be disturbed in their operations. They required a large piece of land for the purpose of drying and mending their nets.

63. *Mr. Seymour.*] What would be the cost of this land if purchased under the Waste Lands Regulations?—Ten shillings an acre is the cost of the land; but no man would give sixpence an acre for it for occupation. It is absolutely worthless. It cannot be sold under 10s. an acre. I attach no value whatever to the land, except in connection with these fish curing experiments. It is because the land is bush land and has a small boat harbor that Messrs. M'Leod and Purston selected it. The block contains timber suitable for their purpose. As far as the question of the land goes, the Provincial Government of Auckland would be very glad to give twice as much to secure the object, if it were a question they could deal with.

64. *The Chairman.*] If the land is particularly valuable for fish curing purposes, it would not be desirable to give a monopoly to these parties?—If you do not give some such monopoly the experiment cannot be tried on a sufficiently large scale to render it a decided success.

65. Would it not suit if you gave them possession as long as they carried on the industry successfully, and as soon as they ceased to do that to give the land to some one else?—That would answer if you gave them permission to remove permanent buildings and improvements.

66. *Mr. Lightband.*] Would the climate of Auckland interfere with the proper curing of the fish?—No. The evidence of Mr. M'Leod on that point, given before the committee of the Provincial Council of Auckland, is as follows:—"I was engaged seventeen years in the North American fisheries, but I find that New Zealand possesses better fishing grounds than either America or Newfoundland. I consider this climate far better adapted for the process of fish curing than any other, and from my personal experience, I know that fish can be well and effectually cured in the Province. In reply to a question, he said:—Has not moisture in the atmosphere an injurious effect in the curing of fish?—Answer: In America I have known the fogs which prevail there tend to injure and render of inferior quality fish cured during the time the fogs exist; but in New Zealand, during my lengthened experience in fish curing since my arrival in the Colony, I have never known any loss to have been sustained by the effects of climate. Touching the question of curing, he says:—I am not aware of fish curing having been tried on a large scale in New Zealand; but in January last I took 1900 schnapper in one haul in a seine net, and in curing this large quantity, there was not a single loss, although the month of January is the least adapted for fish curing. When preserved fish are spoken of, only one or two kinds of fish are meant. I am not aware of any except the cod and herring kind that are preserved as an article of commerce in any part of the world. Of course, salmon, tunny, &c., are preserved in special ways."

67. *Mr. Creighton.*] The evidence before the Committee as to the kind of fish was to this effect:—Are the fish on the coast of New Zealand such as are easily cured by either the dry or moist process?—Answer: Yes. During all my experience I never found fish capable of being cured with greater ease

and facility. Those cured by the moist process do not suffer from packing. I have never found the slightest difficulty in splitting fish for moist curing. I used the same process as in North America. I think there would be no difficulty in obtaining labour for the splitting and packing of the fish. In reply to questions by myself, Mr. M'Leod stated :—Schnapper, kawhai, wapouka, mullet, yellow-tail, mackerel, herring, and barracouta, are found between North Cape and Rangitoto Island. Schnapper, kawhai, and wapouka are best for dry curing, whilst the others are more suitable for wet or barrel curing. Captain Robinson said before the Committee on Fisheries :—I have formed a very high opinion of the New Zealand fisheries. I believe them to be equal in every respect to those of America, more especially the deep sea, which I look upon as even superior. On one occasion, on a voyage to the Mauritius, I took a quantity of schnapper cured as cod, for the consumption of myself and crew, and we preferred it to cod fish, inasmuch as it kept remarkably well, and was firm when cooked, whilst the cod fish became much broken before it could be used. Captain Robinson further stated he had been for a period of three or four years engaged in fishing in North America and on the Banks, and that he had considerable experience both in deep-sea and along-shore fishing. Speaking of a market, he says :—I am convinced there would be a very good sale for cured fish in Batavia, as they are dependent on their supplies entirely on America. He also thought a good market existed at Melbourne. Mr. M'Leod gave evidence on this point. He said :—Batavia, Java, and the eastern countries would become markets for New Zealand cured fish. There is a profitable opening in Batavia. From the report of Captain M'Kenzie, of the Kenilworth, and from information I have received from other sources, I am inclined to believe there is the most profitable opening in the world. Captain M'Kenzie tried the market of Batavia with two hundredweight of cured fish of the same description of fish as those abounding in the harbors and seas of this Province, and this small quantity met with a most ready sale." There is evidence to the effect that no good fishing grounds exist in all the eastern countries. The water is deep and the fish small and not valuable. Dr. Hector : What I meant with regard to the kinds of fish cured was that a market will have to be created by curing strange fish, as they will not be received with the same confidence as known brands of preserved fish. From the evidence read by Mr. Creighton, it seems that the fish will keep, but still the market has to be tried.

68. *Mr. Creighton.*] On that point I will read another extract from the evidence given before the Select Committee of the Auckland Provincial Council. Mr. Morton Jones stated to the Committee :—"The principal markets for the fish exported from British North America are the West Indies and Medietrranean. There was a trade with the Brazils. Large shipments were made by one or two houses to the East Indies. From what I have heard, I believe that Batavia would be a good market for cured fish. Queensland and the South Sea Islands, where cotton is grown, would also become markets. I think a small bounty would not be sufficient to establish an export trade. It would require a sufficient amount to cure 50 tons as a trial, and the fish should be sent to various markets, and the returns reported. I believe it would be found to pay if a trial were thus made of fish thoroughly well cured, and a trade once established would give remunerative employment to a large number of men. The buying price by the North American merchants was 7s. 6d. to 12s. per cwt. for well cured fish. Large vessels would go out laden only with salt, and with an efficient crew of fishermen ; and the fish when taken were thoroughly well cleaned, and salted in at once, remaining in salt until landed, when they were dried, and then packed very tightly, by means of screw pressing, for exportation. The fogs that prevailed during certain seasons were found to be most prejudicial to fish curing, and great quantities of fish taken at such times were spoilt and quite unfit for export. Salt in British North America was £2 per ton, in this respect giving an advantage over New Zealand as regards fish curing, but the superior climate of New Zealand over Newfoundland would more than compensate those engaged in fisheries for the additional cost of salt." There is also a memo. by Mr. David Cruickshank appended to the report of the Committee, relative to the most suitable foreign markets, and as to the produce which could be exchanged. It is as follows :—" Large quantities of cured fish are imported into Sydney and Melbourne all the year round, but especially during the season of Lent. The value of shipments from England to the Australian Colonies for the past nine months of the present year were : To Victoria, £5,804 ; Queensland, £142 ; Sydney, £2,322 ; Adelaide, £833 ; while New Zealand only took £345 worth. Cured fish has been taken to Batavia, and a good market found for it there, while in Mauritius, and indeed in all countries where coolie labour is employed, there is a large steady consumption. If smoked fish could be landed in Sydney or Melbourne, say something like a week after shipment, I believe a good market could be found for them there, although of course there would be the difficulty to contend with of overcoming the prejudice against Colonial articles. Latest advices from Melbourne quote : Dried ling at 6d. per pound, duty paid (duty 1d. per pound). From Sydney and Adelaide : Dried ling, 5½d. per pound ; and cod, 4½d. per pound, subject to an ad valorem duty of 5 per cent. In September last dried snook was worth in Mauritius from 14s. to 17s. per 100 pounds, duty paid (duty, 1s. per 100 pounds.) Singapore, Manilla, and Batavia, although I can obtain no statistics as to prices ruling lately in these markets, would doubtless leave an equally good margin of profit. As far as Australia is concerned, the points involved under this head are seen in actual working under the existing inter-Colonial trading. To Mauritius and Batavia we could export from the Province of Auckland timber and coals, getting in return from Mauritius sugar, and from Batavia, sugar, rice, coffee, and spices, all of which return freights would invariably find a market here. In my opinion, a bounty of from three to four shillings per cwt. should form sufficient inducement for the trade to be taken up by the curer ; and the curer himself, rather than the merchant or exporter, should draw the bounty. What is wanted is the developement of our fisheries, and, although at first sight it might appear to amount to the same thing, whether the bounty be given to the curer or to the merchant who buys the fish, still I am of opinion that the curer would have a greater incentive to work if the bounty came direct to him, rather than through the channel of the merchant ; while if the merchant could only be assured that a market existed for the fish, he would readily enough undertake the exportation.

69. *The Chairman to Mr. Creighton.*] Are steps being taken to earn the bonus offered by the Provincial Government?—Yes. Dr. Perston promised me further information in a note I received from him since the session began, and if I receive it before the Committee reports I will submit it.

70. *Mr. Murray.*] If the land is of little value would it not be better in the hands of these parties than lying idle?—That is my opinion.

71. Would a mere authority to rent such land be sufficient to induce them to invest large sums of money for the good of the country at large?—They would not have it on that condition. They would not rent it.

72. Would not salt require to be manufactured?—That question was considered by the Select Committee of the Auckland Provincial Council, and I think it is not worth taking into consideration. Probably a drawback should be allowed on salt used for fish curing. Salt obtained by evaporation from sea water is not good for the purpose, as it gives a bitter taste to the fish.

73. Do you think there would be a necessity to increase the duty on imported fish?—There is very little fish imported; and, in fact, an increase of duty would not be necessary on account of the large daily supply of fresh fish in the principal towns and settlements. A quantity of cured salmon was imported from California, but the sales hardly realised the freight. There is a portion of Mr. Cruickshanks' evidence with regard to freight, in connection with the question of export, which I would like to read. He says:—"I consider that if fish curing was established in this country, so as to enable it to become a commodity for exportation, there would be no difficulty in finding a market for the produce of our fish curing establishments, as there would undoubtedly be a large demand for it wherever Coolie labour is employed. In the Mauritius, I may mention that an inferior kind of dried fish, called snook, fetches 17s. per 100 lbs, whilst a rather better sort, known as guilbeck, is slightly dearer. China, Calcutta, and Batavia would also be found ready markets, though a difficulty would be found in a direct means of conveyance; but, as there is a continual communication between Sydney and these places, the difficulty might easily be obviated by taking advantage of the regular traders as means of transporting the fish there. The question of freight would only be nominal, as vessels returning from Sydney to Batavia are generally in ballast, and would, therefore, gladly receive anything in the shape of cargo at small rates." It appears to me that a sufficient inducement should be given to merchants to send abroad and find a market for cured fish. The plan proposed by Messrs. Perston and M'Leod to guarantee to the fishermen a fixed remunerative price for all cured fish, seems to me the necessities of the case so far as the fishermen are concerned.

74. *The Chairman to Dr. Hector.*] Have you any information which would enable you to form a pretty accurate opinion as to whether other parts of the Colony are as well adapted for curing fish on a large scale as the part of the Colony which has just been referred to?—That, of course, depends upon two things—harbor accommodation, facilities for landing and conducting operations—and also the description and quantity of the fish obtainable. At present there are large curing stations at Stewart's Island, at Port Chalmers, and also one at Island Bay, on the shore of Cook's Straits. At Island Bay the principal fish caught are moki and trumpeter, which are smoked and sent to Melbourne by the steamers, where they meet with a ready sale; and, in fact, the supply is not equal to the demand. Mr. Liardet, the manager of the company carrying on operations, could afford the Committee useful information.

75. How long has the fishing station been in existence?—About a year or eighteen months. At the Island Bay Station the fish are not salted, but simply smoked; but at Stewart's Island and Port Chalmers they preserve the yellow tail, which is of the cod kind. They preserve them in the same way that haddock are preserved at home, partly smoked. That fish would also salt very well, and last a long time.

76. Do they not salt them?—No. Because they find they can get a ready sale for them. There is an establishment recently commenced at Stewart's Island, under the management of Mr. Trail. The real sardines are occasionally seen on the coast in large quantities, but it is not yet certain whether they come every year, or whether, like pilchard in the North Pacific, they come in shore at two seasons of the year.

77. On what part of the coast have they been seen?—They have only been seen off the east coast of Otago, but I would expect them from Bank's Peninsula south to Stewart's Island. They come with the cold water currents. I have described all particulars relative to those currents in the fishery papers that have been already printed. A station at Stewart's Island has been established for the last ten years to my own knowledge.

78. Do you think there are any facilities there for proper fish salting for the Eastern markets?—There is no part of the country equal to Stewart's Island, and the sounds on the south-west coast, for general facilities.

79. And Martin's Bay?—Not so far north as that. Preservation Inlet and Stewart's Island, as there you get a greater variety of fish, and of better quality.

80. All the year round?—As far as I know. There is abundance of fish on every part of the coast of New Zealand, and there is very little difference in the quality of the same fish in several localities; but with regard to facility for fishing and obtaining shelter, between Auckland and the North Cape is probably better adapted than most other parts of the Colony. The weather there is less boisterous, the fishing could be carried on for more days each year, and there is less risk to life and property than in other parts of New Zealand; on the other hand, there are other parts where the facilites afforded are sufficient, and some fish of more value, such as the pilchard and fish of the cod kind. I never heard of those fish being in the north, but they might be.

81. What description of fish are those which are occasionally seen in large shoals in Queen Charlotte's Sound?—Small mullet. They are in the harbor all the year round, and assemble in shoals at certain seasons. They are very numerous.

82. Sufficiently numerous to be profitable for curing purposes?—I don't think that particular fish is suitable for curing. All the mullet kinds when preserved have a bitter taste, and they do not keep.

83. You don't think Queen Charlotte's Sound is well adapted for fishing purposes?—The harbor facilities are good, but it is a long way from the good fishing ground, and fish could only be procured outside of the Heads.

84. Are there any large quantities in Blind Bay?—The French Pass is a notable place for fish. That

would come within the Pelorus Sound District. The boats would have to go outside to fish. Taking everything into consideration, Stewart's Island is best adapted for the establishment of fisheries.

85. Has anything been done in consequence of the report of the Fisheries Committee made two years ago?—No.

86. There has been a Bill passed to protect fisheries to a certain extent?—Oyster fisheries.

87. Did the report make any other recommendation?—It recommended legislation for the purpose of preventing nets being used of small meshes. In using nets to catch flounders, they take all the fry in. I think it would be desirable to procure by legislation some right or protecting claim over banks at a greater distance than three miles from shore.

88. *The Chairman.*] It is questionable whether the Legislature has the power to do that?—I understand a Bill is in preparation to deal with this. I have been told that the Legislature can deal with the matter as regards anyone in New Zealand, but could not affect foreigners.

89. Mr. Creighton stated that in different parts of the Province of Auckland oysters are burnt for lime, and, in fact, the greater portion of the lime used in Auckland is made from oysters.

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THURSDAY, 14TH SEPTEMBER, 1871.

Mr. J. Macandrew, M.H.R., in attendance and examined.

90. *The Chairman.*] Can you give the Committee any evidence with regard to the efforts which have been made towards the establishment of paper manufactories?—That is a subject in which I have taken very great interest for some years, and it is now six or seven years ago when, as a member of the Provincial Council of Otago, I was successful in getting a resolution passed authorising the Government of that Province to offer a bonus. Unfortunately, the resolution did not define the amount, and the Government only offered £1,500. I have reason to believe that had they doubled that offer at that time a paper mill would have been in existence now in Otago. I am induced to believe this from correspondence which I had at the time with parties who were in a position to have gone into the manufacture. The matter has never been taken up there since, but I have no doubt if the Colonial Government were to offer a suitable bonus, perhaps £5,000 or less, the thing would be taken up at once by parties in Dunedin, as I know that Mr. M'Glashan, of Dunedin, has been, and is now, in correspondence with parties at home upon the subject; andhe shewed me the last letter he received, from which it appeared that a complete paper mill could be established for about £8,000. That is, a mill suitable for turning out printing paper. I may say that Mr. M'Glashan proposed not to use flax, but a species of grass which is very plentiful in Otago, and which is known as snow grass, and supposed to be superior to Esparto or Spanish grass. The Provincial Government is now sending home one or two tons of that grass to the Paper Makers' Association in England, for the purpose of ascertaining whether it would pay to send it home in the raw state. I have seen half-stuff manufactured from it, and it certainly seems very superior to either the Esparto or the flax. The snow grass has been manufactured into half-stuff in Dunedin on a small scale, and there is no doubt whatever as to its suitability for the purpose of paper making. Therefore, I think that with that material and the flax there is an unlimited supply of the raw material.

91. *Mr. Acland.*] Was the snow grass sent home unprepared?—It is being sent home unprepared, and merely cut and dried. It is supposed to be worth at home, according to the report, about £22 a ton.

92. *The Chairman.*] Do you know whether anything has been actually done in Otago?—Mr. M'Glashan has been endeavouring to form a Joint Stock Company. He has obtained very accurate and full information on the matter, and correct data as to the cost of everything connected with the manufacture of paper. However, he has not succeeded yet in forming a company.

93. Do you know whether he has tried any actual experiments?—He has imported a machine for converting the flax into half-stuff or pulp, which he intended to send home dried and in a pressed state, and I believe the engine has been in operation, but I have not seen it. I think he has only sent home small parcels of the half-stuff, want of funds, I believe, preventing him from entering into the thing largely.

94. Have you any information as to the cost of the machinery?—Mr. M'Glashan, who is coming to Wellington, is in possession of specifications and all particulars, and he will probably bring them with him. I have reason to believe that for the sum named, £8,000, a very fair manufactory could be erected.

95. *Mr. Lightband.*] Is there no other material in Otago, such as bags and roping, which could be used for the purpose of making a coarse article?—Nothing could be got cheaper than flax or snow grass. Of course rags could not be obtained in sufficient quantities. In Melbourne I understand they use rope to a certain extent, and you could get a larger quantity of old rags, rope, and canvas in Otago than anywhere else in New Zealand, but there would not be sufficient to keep a paper mill going.

96. *Mr. Holmes.*] With regard to the cost of the raw material, do you not think that flax cut on the spot or close at hand would be as cheap or cheaper than rags?—I decidedly think so.

97. Are you of opinion that the offering of a liberal bonus would be better than giving encouragement by way of protection, even for a limited period?—In this particular case I don't think that any amount of protection would have the effect of starting a paper mill.

98. You said a few days ago that a distillery had actually cost the country 15s. a bushel for the grain used during the year. Would it not have been better to have given a bonus for a distillery, and have done with it?—Yes, I think so.

99. Are you not of opinion that the material we have on hand would make the very finest paper?—Yes, either flax or snow grass would make the finest description of paper. Paper has been manufactured from flax which so resembled the paper in a bank note that it was impossible to tell the difference. Flax, I think, is too good for paper making, and yet it is the cheapest material we can get for the purpose, and hence the great advantage New Zealand would have in the foreign market.

100. *The Chairman.*] Is not the gum an objection?—Of course, the sheets in my possession which were manufactured from flax were much mottled and wavy owing to the gum, but I believe, if a suitable

bonus is offered, science will get over that difficulty, and the gum, instead of being disadvantageous, may be the reverse. It may form part of the sizeing material, and as such be very valuable.

101. *Mr. Murray.*] Do you think that flax would be cheaper and better than the snow grass?—No, I think the snow grass would be the cheapest and quite as good, although I don't think it would make as tough fibre.

102. How would you propose to give the bonus of £5000?—I would propose to give it to whoever produced a given quantity of paper first.

103. But in the event of two paper mills starting?—That would be a matter of detail, but I imagine it would be given to the one who first produced the quantity stated.

104. Do you not think that would lead to a scramble?—So much the better. I think there is plenty of room for two or more paper mills in the Colony, irrespective of the markets of the world.

105. And the man who won the race by a day would get the bonus?—Clearly so. It is the same in the case of a woollen manufactory in Otago. A wool factory has started there; and, of course, if it is the first to produce the stated quantity, it will receive the bonus, which is £1,500.

106. *Captain M'Pherson.*] You stated that paper of a superior kind could be manufactured from New Zealand flax. Have you any idea what price the manufacturer would be able to give for flax tow?—I should think that that would depend entirely upon the price obtained for the paper.

107. You have an idea of the price of first-class paper in New Zealand. Printing paper, for instance, ought to be sold for fivepence per pound, and on that calculation what do you think could be given for tow?—I think the manufacturer could afford to give a penny a pound for the raw flax, green; although he would not require to give that price, still I believe it would pay. That would be £9 a ton delivered at the mill. The manufacturer could give more for tow. I imagine it would not be necessary to make it into tow first. Before leaving home I had a considerable knowledge of the mercantile cost of paper making material, and rags from Germany ranged from £14 up to £22 a ton. These were used for the finest writing paper.

108. *Mr. Holmes.*] Do you not think this tow would make paper of excellent quality?—I have no doubt it would, but I can see no necessity for any such intermediate process in respect of flax.

109. *Mr. E. Richardson.*] If the Government offered a bonus would you not recommend that it should be so much per ream on the paper manufactured in a lump sum. In that case it would not be a question of one man finishing the manufacture one day before another, but it would be a question of who produced the largest practical results?—I am inclined to think that a lump sum would be better than a price per ream, although it almost amounts to the same thing. Of course if there is a given weight to be produced, that is the same thing as giving so much per ream, the exact weight of which must be defined. There must, of course be so many reams to make up the weight. You might give a bonus to whoever started a mill first. and let the question of quantity to be produced be the subject of a future bonus.

110. *Mr. Chamberlain.*] Do you not think that a bonus being offered would have the effect of confining the experiment to one or two parties, and that a protective duty would be more beneficial, as it would encourage the people in the different parts of the country to try the manufacture?—There is no doubt that nobody could start the manufacture without capital, and the possessors of capital are the few and not the many.

111. Do you not think that a protective duty would encourage the expenditure of capital on the manufacture in different parts of the country?—Practically, I don't think any mode would have the desired effect except a bonus. The great thing is to induce parties to make a start. The moment that is done the manufacture will be found so profitable that capital is sure to be invested in it without any stimulus.

112. *Mr. Steward.*] Is the snow grass that you speak of what is commonly termed the tussock grass of the plains, or is it a different variety?—I can't speak as to the variety, as I have not seen it growing. I have only seen the article itself.

113. Are you not aware that what is called tussock grass and which grows in large quantities on the plains, has also been tried for this purpose, and has been found to answer exceedingly well?—I am not aware. I have only seen a specimen, which Mr. M'Glashan will bring up with him.

114. *Mr. Acland.*] What is known as snow grass is quite different from the ordinary tussock grass of the plains.

115. *Mr. Holmes.*] Are you not of opinion that giving a bonus, say of £5,000, to whoever would produce say 1,000 reams of newspaper paper, of the one size, would be a fair plan?—I think the fairest way would be to give the bonus to whoever would produce a given weight. You might say 1,000 reams of newspaper paper say, for instance, 20 by 30 of a given weight per ream.

116. The great object is to establish a manufacture of such an extent that by the time the manufacturers would entitle themselves to the bonus their operations would be in such a forward state that they would not abandon them?—I think it would be unwise to tie down the manufacturer to any size or any weight of paper, because he would be guided by the state of the market and the demand as to the class of paper he would make. I think it would be better to give the bonus on the production of so many tons, and let the manufacturer make what class he liked of printing paper.

117. The class of paper should be specified, because a quantity of bag paper or grocers' paper might be produced, and that would not accomplish the purpose we have in view. The object of the Committee is to encourage the production of an article that is very much required, and in constant and increasing demand in the Colonies?—I should confine the bonus to the manufacture of printing paper; that is to say, I would make it the lowest quality in respect of which the bonus would be paid.

118. *Mr. Steward.*] Do you not think it would be better to offer the bonus on the production of a quantity of paper of a certain amount in value?—No. I would give it on the weight, as it is something definite, and about which there can be no dispute.

119. *The Chairman.*] Have you any information as to the quantity of snow grass that would be available?—I am told that the supply is practically unlimited.

120. In what parts of the Province?—In the northern part, I believe. My knowledge on that point is second-hand, but I understand from Mr. M'Glashan that there is an unlimited quantity of that material.

Dr. Hector in attendance and examined.

121. *The Chairman.*] Has your attention been directed to the question of the manufacture of paper?—Yes, I have collected a good deal of information upon the subject. Some of it is embodied in my evidence on the subject last year, and also in the report of the New Zealand Exhibition of 1865, at page 435. (Dr. Hector read extracts from his evidence before the Committee last year.) I will only say, in addition to that, that flax waste is a material for paper making that promises to be very valuable, and it possesses peculiar qualities.

122. Has anything, so far as you are aware, been tried with it?—We have two samples of paper which were sent out from home manufactured from New Zealand flax, and they have very singular qualities, being transparent, as tough as parchment, and very fine and smooth in the grain. They are in the Museum. I have seen the grass used by Mr. M'Glashan. It is known in Otago as snow grass, but the correct name of it is danthonia. Its seed is like an oat. It is a brown grass, and grows upon the tops of hills and upon poor wet clay soil. It is all over the Mataura plains, and over the tops of the hills in Otago, and grows sometimes about four feet high. The term snow grass is sometimes applied to a small red rush that grows in large patches when the snow lies late during the spring. The snow grass that Mr. M'Glashan used, and which I experimented upon also in Otago, is almost the same as Esparto grass, which is worth from £7 to £10 a ton in London, and of which large quantities are imported into England from Spain. The supply, however, has fallen off, and enquiries have been made as to whether there is any other grass available.

123. What is your impression as to the quantity of snow grass that is available?—It grows very rapidly, but it is a sparse crop in the ground.

124. As to other materials besides flax and snow grass, are you aware whether the tussock has been tried?—I think the only difference would be in the quantity to be obtained off the land. I don't think there would be any essential difference in the quality, as the common tussock or any grass will make pulp. It is a question of quantity.

125. Then how is it there is a scarcity of material at home?—The grass there is much more valuable for feeding purposes, and besides they have no such thing as our tussock grass—it is peculiar to the sub-alpine districts of the Southern Hemisphere, and is abundant, I believe, on the Auckland Islands.

126. *Colonel Russell.*] Is the tussock grass of which you speak as being in the Middle Island the same as that found in the Taupo country?—I have seen a little of it in the desert, but it is not the general tussock grass.

127. Would it be available for paper making?—It would be liable to the same objection as the common tussock grass of the Canterbury Plains; it is exceedingly short, and comparatively slow growing, and you would have to go over such an enormous area of land to get any quantity.

128. Are there not places in the North Island in which tussock grass is to be found in great profusion?—Only in the country south-east of Ruapeka and the Kaimanawa Range, and not in very great quantities even there.

129. Would the short tussock grass in the North Island be available for paper making?—It would not pay. I think the material is suitable for the purpose, but I don't think it is equal to the coarser grasses. I don't think it has been tried.

130. *Mr. Holmes.*] Do you think a bonus of £5,000 would be sufficient inducement to capitalists to enter into the manufacture of paper extensively, irrespective of the duty?—I have considered the subject, but have not arrived at anything definite. The papers on the subject have been before the Committee, including the entire cost of the machinery required. I think the Government did not propose a bonus because they could not determine the proportion the bonus should bear to the capital required to establish the industry. My own impression is that £5,000 to one person would be needlessly large.

131. *Mr. Acland.*] Do you think, from the way you have seen the snow grass growing, that the cost and labor of collecting it and taking it to the manufactory would be an objection?—I don't think there would be much difficulty in collecting it in a place like the Mataura Plains, where it is in very considerable quantities; still I do not know that it would do to establish a manufacture and depend wholly upon that. I do not think it would be safe unless with several other sources of raw material in prospect.

132. Are you aware whether it is a fact that snow grass is being destroyed in many parts of the country?—It is very easily exterminated by fire, and it does not recover, like many other grasses. In crossing the mountains lately from the West Coast I noticed places where snow grass had disappeared, and where very fair pasture had grown in its place, since my previous visit in 1864, and the change was solely owing to the successive burnings.

133. *Captain M'Pherson.*] In flax making there is always a large quantity of refuse dust. Could that be utilised for paper making?—It is not of such a nature as could be used; in fact, there would be a great objection to use the refuse from flax mills, owing to the present mode of preparing the fibre. If the broken ends of the flax were to be used, it would be necessary to take measures to prevent that dust and refuse being mixed with the tow.

134. Supposing it were well washed and cleaned up, what would the manufacturer be able to give for it?—It would be worth £6 or £7 a ton in London at the lowest.

135. *Mr. Chamberlain.*] Do you know whether the nikau would be available for paper making?—It is too rare, and only grows in quantities in inaccessible places.

136. What in your opinion would be the best means of encouraging the industry—a bonus or a protective duty?—A bonus. I don't think the imposition of a duty would have a direct action.

137. Do you not think a protective duty would have the effect of encouraging some people to start a manufactory?—I am afraid it would increase the cost of paper, and render the consumption less. The less consumption there is the less is the necessity for establishing an industry.

138. *Mr Steward.*] Is it not a rule that plants which yield fibres suitable for rope making are also available for paper making?—Yes; but the better adapted those fibres are for rope making, the more difficult it is to break them up into a pulp. Their longitudinal adherence prevents their being broken up.

139. Are you aware that the tussock grass has been used for the manufacture of rope with success. Perhaps the ordinary tussock of Canterbury Plains might be useful for paper making?—I was not aware that the tussock would make any but straw rope.

140. You mentioned that when the snow grass is once burnt off it does not readily grow again. That, I believe, is not the case with the tussock grass?—No, not unless the burning is followed by stocking. All grasses will run into tussocks if the country is under-stocked.

141. *The Chairman.*] Have you considered the question of utilising what is commonly called the spear grass?—The spear grass contains very valuable fibre for stuffing, and possesses the same qualities as horsehair; the fibre is springy, and does not break. It would do for paper, but I fancy it would be very difficult to prepare.

142. *Mr. E. Richardson*] stated that he had enquiries made of almost all the principal paper manufacturers in Great Britain with regard to the preparation of flax, and the answers he got were to the effect that £8 a ton was the highest price they could afford to give for the first-class description of flax tow. It would not pay to send that material home under £14.

143. *The Chairman.*] Have you prepared a memorandum on the subject of the Taranaki iron sand? I will read to the Committee what I stated last year. [Read from Minutes of Evidence, 1870.]

144. Since then has nothing taken place to throw fresh light upon the subject?—Not that I am aware of. I have procured all the information I could obtain, and have made some notes which I will read:—"Iron sand was first worked in 1742 by Mr. Horne, a steelmaker and cutler in London, who extracted 60 per cent. of malleable iron from iron sand obtained in America, and which he converted into steel. The Japanese and natives of India have also long used iron sand as ore for the production of a fine quality of malleable iron for conversion into steel. Patents were granted for producing cast steel direct from these sands in crucibles, being in fact an extension of the ordinary method used in the laboratory; but it was not found possible to produce uniform results on a large scale. In 1845 Heath proposed to reduce ores such as ironsand by the addition of a small proportion of charcoal, and thus produce a spongy mass of malleable iron, which was then plunged in a bath of molten cast iron, in a proper proportion to make steel of the compound. A modification of this process is now in use in Sweden, but requires the use of crucibles. In 1868 Leckie, of Montreal, proposed to mix the iron sand up into a lump with charcoal, and place it in a hearth at the back of a bath of molten cast iron in a reverberatory furnace. After the reduction the lump was to be tipped into this bath. This was an attempt to work with a single furnace without crucibles, and by a continuous process. It does not yet, however, appear to have been a success. In 1868 Ellerschausen proposed to decarbonise pig iron by the addition of oxides, such as iron sand, while the metal was flowing from the furnace. This process, which requires very peculiar machinery, is now in use at Pittsburg, in the United States. In 1851, Stenson obtained a patent for working the iron sands of New Zealand by means of a blast furnace, the sand being worked up with clay containing a small proportion of lime, ground in a pug mill and formed into bricks. These bricks were then treated as common earthy iron ores, the result being a pure cast iron, which might be converted into steel by a second process. Many patents have been taken out relative to the New Zealand iron sand, which have all relation to some supposed virtue which they possess from their containing titanium, and which would give them such extra value for the production of steel as to warrant the employment of expensive processes of manufacture. None of these have been a practical success. We thus have four processes for the conversion of their iron sand ores. (1.) By cementation with charcoal, the result being malleable iron. (2.) Being mixed with clay, they are reduced by a flux in an open blast, the result being cast iron. (3.) The cement spunge, obtained by a process like No. 1, is plunged in a bath of cast iron, the result being steel. (4.) The decarbonisation of cast iron by the addition of the iron sand, the result being malleable iron of a fine quality. There is no necessity for experimental research being undertaken, as the iron sand is the same in New Zealand as that which has been, and is being tried on a large scale in other countries.

145. *The Chairman*] It would be useful if you could give the Committee some information about the experiment Mr. Smith has been making?—I can give the Committee a summary of the correspondence which has taken place. The first letter is from Mr. Smith, Government Armorer, dated New Plymouth, 4th October, 1870. He states he has discovered a method by which he can make steel by a single process from the iron sand, and asks the assistance of the Government, referring to previous experiments he had made at the Government expense. That application was referred to me, and I suggested that before the application for further assistance should be granted, Mr. Smith should be called upon to state what expense he had already incurred in testing his process, and the results he had obtained, and also to explain the rationale of the particular part of the process he claimed to be new. Then I pointed out that Mr. Davis, who had come out specially with a view to investigate the iron sand question, was of opinion that it would require £5,000 to test that process thoroughly; and I expressed doubt as to whether Mr. Smith was fully aware of the difficulties that had to be contended with, and that, therefore, it was doubtful whether he was the proper person to make the experiment, if the Government determined to proceed in the matter. Mr. Smith being called on to state the reasons why he should be assisted, sent a very long account of what he considered to be the rationale of his process, and he enclosed also a report which had been obtained upon the principal specimen of the iron from a metallurgist in Melbourne, Mr. Ford, but that report only bears upon the value of the particular specimen that was submitted. There is also a demurrer from Mr. Atkinson, who is in partnership with Mr. Smith, objecting to the latter using the process at all. Upon those letters I reported that I found no novelty in Mr. Smith's process

that required to be established by experiment, and that I could not recommend the Government to subsidise the experiment on the large scale proposed, to test a process that had already cost £5,800, according to Mr. Smith's account, without useful results. There are 21 different localities in New Zealand, from Taranaki down to Stewart's Island, where iron sand has been obtained and examined. Besides these there are several of the poorer iron ores in abundance. Bog iron, at Waugarei, in Auckland, and also in the Wainui-o-mata Valley, Wellington. Other ores are generally present with the brown coal. I would recommend the Committee to obtain information from Canada and the Eastern States of America, where they have been paying great attention to the subject of iron sand since 1868, and obtained a great many processes. A report from some person there, giving the actual results arrived at, would be the best guide for our making any efforts to utilise the iron.

146. *The Chairman.*] Would it be a good plan to send four or five tons to New York, a similar quantity to Canada and to England, and to advertise a premium to any person who would satisfy the New Zealand Government that he has discovered a process by which the iron sand could be reduced to steel at a fixed cost?—They are using it in those places for making malleable iron, and converting that into steel, but not for making steel direct. There is a great quantity of iron sand sent there at present. There is no practical difference between our iron sands and those of other countries.

147. Our present knowledge shows us that we can make the sand into common cast iron, have you considered the question whether that could be done at a price which would make it useful. We will want large quantities of iron for rails, &c.?—The rails are made of rolled iron. That would require a different process, and the one which I have indicated in my memorandum as the first process would be the easiest method of procuring the iron from the sand. I have made some notes of the cost of charcoal, which is essential to that process. I find it costs about 6s. a ton in measurement, or about 2d. a bushel of 20 lbs. weight. We would have to make charcoal at that price to compete in the market.

148. Have you considered the question whether we could not use the Taranaki iron sand profitably, at any rate, for ordinary iron?—You will have to find out the cost of charcoal, determine the process you will employ, and ascertain many other things. If it is to be the cementation, there is hardly any machinery necessary at all.

149. Could you not employ the brown coal?—I do not think you could make bloom iron with brown coal, as it would introduce sulphur, which it is necessary should be kept out.

150. *Mr. Holmes.*] Do you not think a bonus would be better than giving assistance in the way we have been?—I don't think there is anything we require to determine by experiment. It would be far better to give a bonus to anybody that would do the thing. There is nothing that we can discover. I do not know anyone here with sufficient skill to make the researches, and there is an insufficiency of the material required to make the experiments. The best metallurgists at home have been trying the experiment for 30 years without success—of making steel by a single process.

151. *Mr. E. Richardson.*] You were doubtful whether the presence of titanium was an advantage or not. When I was at home in 1863, I was engaged in going into the question of the highest class manufactures of steel, and in a conversation I had with one of the greatest toolmakers in England, I was told that the only additional value of the Taranaki steel was for mixing purposes on account of the presence of titanium in it. There is no alloy of the metal titanium with steel or malleable iron. I think the question has been fully investigated by Dr. Percy and other authorities, and it is considered by some that the extra quality of the iron made from titanium ore is on account of the extreme difficulty there is to get rid of the titanium, as it compels them to employ processes so expensive that the iron produced is of an extremely fine quality.

152. *Mr. Steward.*] Is it true there is a special quality in the steel manufactured from Taranaki sand which renders it capable of bearing a much finer edge for surgical instruments?—It is extremely pure.

153. *Colonel Russell.*] Of course the manufacture of iron could only be carried on where fuel is obtainable?—Fuel is of course the most expensive material in the manufacture, and limestone, if cast iron is required.

154. Are they to be found in abundance?—At Waugarei, the fuel and limestone are exceedingly good, and at the Kawa Kawa, also there is both coal and limestone.

155. *The Chairman.*] The only suggestion I can make is that the Committee should find out what practical result attended the experiments in America, which have been made on a large scale. I don't think it would be necessary to send 10 tons of iron sand home, as they know the quality well, having had some before, and they get it from other parts of the world.

156. *The Chairman.*] There being such great difficulty in making the sand into steel, the question might be considered whether it would not be worth while to make it into common cast iron that would make a brand of malleable iron that would be sought after for conversion into steel in other countries,

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FRIDAY, 22ND SEPTEMBER, 1871.

Mr. Liardet in attendance and examined.

157. *The Witness*] stated, I am at present engaged in fish curing, at Island Bay, in Cook's Strait, about a mile and a half in the direction of Terawiti, and have been so engaged for about twelve months. I discovered one day that a very fine fish—the moki—existed there in very large quantities, and knowing the enormous demand for cured fish in the Australian Colonies, I was induced to purchase some nets, and test the quantity and quality of the fish, and to ascertain what kinds were curable, and what would be suitable for the market. During last year, with only a small dingy, two others and myself caught 2,800 fish, and had to contend with very bad weather. We caught that quantity in about five or six months with seine nets and hand lines. Since that time Mr. Hunter has allowed me to erect a whare on his property. The fish procurable along the coast and in the Straits are whariau, moki, butter-fish (which are very good curing fish), hapuka, ling, kingfish, and rock cod. The latter is a splendid fish for curing. There is also the pink cod, which is the same as the fish they are curing at Dunedin, and which they call

the finnon haddock. In the winter time, during the heavy south-west winds, it would require a vessel of from 25 to 30 tons. The large fish are on the weather shore, about the mouth of the Pelorus and the French Pass, between Cloudy Bay and Picton Heads. It is only a few hours run across in a vessel. South-west winds prevail nearly all the winter. I pickle the fish, salt, smoke, and dry them and cure them in various ways. When I first commenced to cure the fish and send them to Wellington, the people would not buy them, and I discovered that the fishermen had been in the habit of only salting the fish, and they did not keep. However, I forwarded samples of my fish curing to my friends in Wellington, and they were highly approved of.

158. *The Chairman.*] Since then, have you found a market for your fish in Wellington?—Yes; I have made a name or the fish in Wellington, and they will sell faster than I can supply them. I get 15s. and 16s. a dozen for them. I have also discovered a fish, called the trumpeter, about the Kaikoras.

159. I suppose your principal market has been Melbourne?—No. I have only sent samples to Melbourne. I have not had the appliances necessary to export them to Melbourne. Mr. Hunter has been assisting me, and Captain Gleadow has joined me, and we have a little cutter and one or two boats. The season has just set in, and will last from the end of this month until June next. The fish will be on this side of the Straits during the winter. They can be obtained all the year round with a good-sized vessel to go across the Straits.

160. How have you ascertained that the fish remain on the other side of the Straits during this time of the year?—I lived at Picton for five or six years, and noticed that the Maoris there set their nets and catch moki in the winter. I have seen fish washed up on the beach at Island Bay by a heavy south-west gale.

161. *Mr. Peter.*] Have you had any experience in fish curing?—Yes. Mr. Lowell, the Inspector of Water Police at Williamstown, who had many years' experience in fishing in England, and was superintendent of a very large fishing station, taught me how to make nets, &c. I took some fish to Dr. Hector cured by a process which had been given to me by Mr. Lowell, and Dr. Hector spoke very highly of the fish cured.

162. *The Chairman.*] Have you got any information from Melbourne as to the samples you sent there?—I received a letter from a very large fish buyer there, asking me to send him a supply, and offering 15s. a dozen for dried fish. The fish would have to be packed in supplejack baskets.

163. Do you think the price offered would pay you?—I am sure it would pay handsomely. Captain Stafford, of a collier, took three bundles of the fish to Sydney, where they were much liked, and he also kept some on board his ship for two months, at the expiration of which time they were as good as when first packed. At present, I am supplying the principal hotels in Wellington with fish.

164. *Mr. E. Richardson.*] Are not the fish on the New Zealand Coast much better than those in the Australian Colonies?—There is not a third of the quantity of fish in Hobson's Bay that there is here. I should have gone to Victoria long ago had it not been for the fishing grounds at Island Bay. I smoke the fish with saw-dust, which I obtain from the saw-mill in Wellington. One bag of saw-dust will smoke 1,000 fish.

165. *The Chairman.*] Have you tried any other parts of the Coast of New Zealand?—I have only fished in Queen Charlotte's Sound, at the Pelorus Heads, and in the Straits as far as Porirua.

166. Do you think it would pay to establish a fishery in those localities?—I don't think it would pay to establish a fishery out of Wellington. It would be better to have a vessel of about 30 or 40 tons to cross over the Straits, and have the fish cured in Wellington.

167. Supposing the vessel was kept away for two or three days owing to contrary winds?—The fish will always keep for two or three days.

168. *Mr. E. Richardson.*] Could you not have an establishment for drying and curing them over at Island Bay?—I think it would be better to have a curing establishment in Wellington.

169. *Mr. Peter.*] What is your objection to curing them over on the other side of the Straits?—In the first place a great quantity of fish would be sold in Wellington to people who would come and purchase small quantities at a time, and another difficulty is to procure competent fishermen.

170. *The Chairman.*] Do you think it would materially assist the matter if the Government, in the conduct of its immigration, were to bring out some experienced fishermen from say Deal or Yarmouth?—You can get first-class fishermen in Melbourne, and as good as any in England.

171. Do you know whether the Chinese have prosecuted fishing in Hobson's Bay?—They do not catch the fish, but buy them from the fishermen, and salt and dry them for sale.

172. Would they be useful people about a fishery?—They cure fish very well in their own way, but they prepare the fish in a peculiar way, which is very obnoxious to Europeans. I think they use Cayenne pepper.

173. *Dr. Renwick.*] Do the fish cure better in one season of the year than in another?—When they are spawning they are not so good. They have done spawning now.

174. *The Chairman.*] The most useful assistance that could be afforded would be to furnish a larger vessel?—Yes. With a vessel of about 30 or 40 tons a smoking-house could be constructed on board, and the fish cured at once.

175. In what way do you think the Government could fairly encourage the enterprise?—By furnishing a vessel such as I have decribed, and procuring three or four practical deep sea fishermen, to whom I could point out the fishing grounds.

176. Have you tried to make the nets out of New Zealand flax?—No. I use English twine.

177. *Mr. Pearce.*] Is there any protection from south-east gales at Island Bay?—Yes. A vessel of 150 or 200 tons can remain there with safety in all weathers, and it is impossible to lose a vessel.

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TUESDAY, 26TH SEPTEMBER, 1871.

Dr. Hector in attendance and examined.

178. *Witness.*] I produce a plan of the Brunner Coal Mine, showing the extent of coal

that is won. The extent of coal, before reaching the fault and level free, may be estimated at between 3,000,000 or 4,000,000 tons at the lowest. The average thickness of the seam is 16 feet of good clean coal. In addition to the coal that is level free, the seam dips down at the same angle, and we are perfectly justified in supposing it could be obtained by sinking. I believe 600 feet depth might be taken as the limit of working, and that gives as much again on the north side of the river, and about an equal area on the south side, where the coal is again cut off by another fault. It is not determined what the "drop" of the fault on the north side is, but from observations made for three or four miles on the coast, the faults vary from 90 to 100 feet, and I suppose this fault will be of the same character. It has only been sunk on for 50 feet as yet. The coal beyond the fault would not be level free without advancing beyond the level in the direction of the rise. The easiest way to explore the fault would be to drive nearly level along the line of fault in an easterly direction. Such drive would be in soft rock, and drain itself. The Brunner coal is one of the purest bituminous coals ever known.

179. *The Chairman.*] Have you surveyed the line of tramway?—The line we recommended, as being the best upon all grounds, was the line upon the south side, with a bridge across of a light character, in order to convey the coal direct from the mine, and screen it on the south side of the river, where there are greater facilities for erecting screens, the hill being very steep on the north side. The chief reason that led us to select the south side was the peculiar structure of the mouth of the river. Any works that are to be constructed for the purpose of shipping coal should, if possible, be combined with works for preserving the banks of the river, and improving the bar at the mouth. At the present time there is a minimum depth of about seven feet on the bar at low water, but I have no doubt that, with very slight engineering works, the depth could be considerably increased. The rise and fall is about four or five feet. The river, as compared with other bar rivers, is unusually favourable for engineering works, on account of the influence exercised by Point Elizabeth, as described in our report.

180. Supposing the works were completed, at what price could the coal be put on board ship?—From experience in other parts of New Zealand, Dunedin for instance, I believe the coal would cost about 5s. or 6s. at the pit mouth, including all expenses, and the carriage for five miles would not be very much. I am sure it could be shipped for 8s. a ton screened, and including an allowance for the cost of the wharf and railway.

181. Suppose the works were carried out, what would be the depth of water at which it would be safe for a loaded vessel to enter?—From experience of other bar harbours improved by engineering works, there would be a very fair prospect, provided the works were carried out to the full extent, to secure 12 feet at low water.

182. Have you anything further to state?—I think it would be well worthy the consideration of any company to ascertain how far Ruthven's hydraulic boats have been successful at home, because they would be better adapted for bar work. The machinery occupies little space, and the vessel could be steered with great facility and altogether independent of a rudder. The machinery is out of water, and therefore is not affected by being either in the trough of the sea or on the dip. The vessel is also a perfect sailing vessel, and there is no screw or anything to get foul, and after crossing the bar the steam might be stopped. Then the vessel may also be of an extremely light draft of water, and at the same time great carrying power. The motive power is a centrifugal pump of a most powerful description, and, in case of accident, instead of taking the water from the grating in the bottom of the ship, the water could be taken from the leak, so the vessel could be kept afloat without any damage. My opinion is, however, that if any money is spent by the Government it should be spent in harbour works.

183. *Mr. Bathgate.*] Could a Harbour Trust be created to make the harbour works and the railway?—I think they should be combined, and that it would be best to keep the harbour works and railway apart from the mine. I believe the borough of Greymouth would undertake the work, but whether it would be desirable I cannot say.

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FRIDAY, 6TH OCTOBER, 1871.

Eugene J. O'Conor, Esq., M.H.R., in attendance, and examined.

184. *The Chairman.*] Will you be so good as to give the Committee any information which you possess on the subject of coal?—The coal with which I am best acquainted is that of the district of which I am the representative—the Buller District. The mine has not yet been worked, although several attempts have been made to explore the country. A few years ago, I think in 1867, an attempt was made to explore the coal mine at Mount Rochfort, and some workings were carried on under the auspices of the Provincial Government, in order to ascertain if the mine could be tapped at some part nearer the port than was then known. That exploration, however, was very badly managed, and entirely failed to produce any satisfactory result, A party was brought from home in order to guide the exploring operations, but owing to his utter unfitness, the work entirely failed; and, after employing a number of men, at an expense of something like £2,000, it was found that the men had only succeeded in doing a great deal of preliminary work, without in a single instance putting in a bore, which would verify whether or not coal could be got nearer the port than the known place. Since then a number of persons, of their own enterprise, have explored the country, and various portions of the coal mine have been found to crop out nearer the Buller River; but, owing to the want of a scientific survey, or of proper apparatus for boring, nothing beyond a mere outcrop has been discovered. About six months ago, a party which I had initiated left Westport for the purpose of searching for coal between Mount Rochfort and the Buller River, and it ascertained the existence of a coal seam, four feet thick, within a mile of the Buller River, and in a place which offered no great difficulty in the way of working. It was then proposed to get a geological survey made of the country between the Buller River and Mount Rochfort, because it was quite plain that if coal existed within so short a distance of the Buller River, the mine could be worked at a small outlay, and at a less current expense than any other mine on the West Coast. Up to the present time, however, nothing has been done, and our knowledge of the mine remains in the same state as it has been in for years. I believe the General

Government intend to pursue the inquiry a little further, and I have not the slightest doubt that it will result in the mine being opened, and coal found within a very easy distance of the Buller River, in sufficient quantity to supply all requirements for a number of years. The Buller River has a better entrance and is much more navigable than any other river on the West Coast; and it is evident that if the Government succeed in getting the Mount Rochfort mine into working order, it will be a great benefit to the whole country. At the present time the supplies for miners in that district are chiefly derived from Melbourne, because the freights on goods from Melbourne are lower than the freights from any other port in New Zealand except Nelson; and the people in that part of the country look with interest to the opening of this coal mine, because they consider it will have the effect of very much reducing the price of provisions, and will assist in developing the country by bringing into the market provisions produced nearer home. I need scarcely trouble the Committee with remarks on the value of the coal, because that has been so frequently shown that anything I can say would be quite unnecessary; but understanding that there is some misapprehension as to the navigability of the Buller, or the improvement that could be made in that river towards fitting it to become a port for vessels of all kinds, I think the Committee will not object to hear what I have to say on that subject. The river is not much larger, and discharges a greater body of water, than any other river on the West Coast; but it has the further advantage of its mouth being very much sheltered by rocks, commonly known as the Steeples, which lie to the south-west of the port, and shelter it from the prevailing winds. The body of water which it discharges always keeps the channel much deeper and the bar much clearer than is the case with the other West Coast ports; but since a settlement has been founded at Westport, the banks have very much wasted away. Parties have built on the bank, and the Government has put jetties there, loosening the soil, and causing it to be washed away. The river has thus been widened, and the wear has been carried down to the mouth of the river, and has widened the bar very much. Whatever other effect the widening of the river may have had, it is quite clear that, in consequence of the wearing away of the bank, a great quantity of stuff has been deposited on the bar. At the present time, Nature is beginning to reassert herself in the Buller, and the south bank of the river is now growing. A vast amount of shingle is being deposited on it, and every year it increases, more especially since groins have been put up by the Provincial Government in order to protect that bank of the river on which the town is laid out. If the construction of these groins is continued, or they are assisted by some artificial construction, such as that suggested by Mr. Blackett, C.E., in his report, there is not the slightest doubt that the river would return to its old state, and we would again have, as formerly, from 16 feet to 18 feet of water upon the bar; in that case, the great obstacle that exists to the proper working of the coal mines on the West Coast of the Middle Island would be done away with, because to a great extent the river would become accessible to colliers that could be employed in the trade. The Buller bar is very safe. I do not remember ever hearing of any accident happening there except such as could be traced to neglect or ignorance. The other bars on the coast are constantly exposed to accidents, in consequence of violent gales, and to the rivers being subject to obstruction. Therefore, I look upon the opening of this coal mine, and the making of the river return to its old state, as a cure for many of the evils of which the population on the West Coast complain. I think the construction of a good harbour, and the development of such a coal mine as we have at the Buller River, to be the most important things we could do in the Middle Island, and I should be most happy to give any information I can on the subject, which my local knowledge will enable me to afford.

185. *The Chairman.*] You spoke of some groins having been constructed by the Nelson Government: have they stood their work well?—Excellently. These groins contain neither masonry nor woodwork, but consist merely of large rough stones.

186. *Mr. Holmes.*] But have they not had the effect of altering the course of the current, and of washing away the bank on the west side?—There are three groins, one succeeding the other, and they are put at such an angle as to direct the force of the current to the middle of the river, but not so as to cause it to wash away the west side. I think it has had a contrary effect, and has made the shingle bank on the west side.

187. *The Chairman.*] How far is the mine of which you speak from the sea?—By the survey line, Coalbrook Dale is 12 miles from the sea; but the outcrop of which I have spoken is, by way of the river, 10 miles from the sea, but only 5 miles in a straight line.

188. Is the river not navigable for vessels after they have got over the bar?—Yes, for about four and a half miles.

189. Then it would be necessary to construct a tramway in order to bring the coal down?—The coal mine could be worked by a self-acting incline, and the coal could then be brought down in vessels to the port. Myself and an officer of the Provincial Government sounded the shallows in the river, and the least depth we found for 40 miles up was two feet six inches. That is ample depth for the vessels that would be required.

190. *Mr. Holmes.*] Is the proposed tramway to be made on the north or on the south side of the river?—The line of railway is laid down on the north side; in fact, all lines must be laid out on that side.

191. *Mr. Acland.*] What depth of water is there on the bar?—Three or four feet at low water; twelve to fourteen feet at high; but the bar is much shallower than it need be. By a very small expenditure the stream could be concentrated, and kept so. In other rivers on the coast this would be impossible. With us the ground is solid, but at the Grey and Hokitika, notably at the latter place, it is sand throughout, and the slightest breeze of wind shifts the bar.

If the Committee have not had their attention directed to the matter, I would point out that there is a great quantity of clay, suitable for the manufacture of fire bricks, in the Buller Districts.

Edward McGlashan, Esq., M.H.R., in attendance and examined.

192. *The Chairman.*] Would you give the Committee such information as you possess on the subject of the Waikawa coal field?—I was not prepared for examination on this subject, but I may state

that at the last session of the Provincial Council I made a motion that £1,000 should be put on the estimates for the purpose of boring for coal in that locality, for the reason that seams of coal appear in places there, and in the true coal formation—in sandstone. Along with the engineer of a small steamer, called the Taiaroa, I visited the spot, and obtained some specimens of the coal in order to try it. It burns very well; and Dr. Hector says it is true coal. Dr. Menzies, who knows the locality, also describes the country as being of the true coal-bearing formation. There is a good harbor not far distant, where vessels of considerable tonnage can enter at all times, and it is very desirable that the coal field should be developed. A sum of money would be well expended in testing the field. From enquiries which I made of some parties who are engaged in coal mining in Otago, it seems they are prepared to test the field if a sufficient allowance is made to them to provide themselves with food for the time being. There being a good harbor at all times accessible, and on a seaboard, where a large amount of coal is required for the use of steamers, it is very desirable that the Committee should recommend that a sum of money be set aside for boring. It is a very large field, extending a long way into the interior. The land is still open for sale, but comes under the provisions of an Act relating to class settlements.

193. What amount of money do you consider it would be necessary to devote to this purpose?—The sandstone in which the coal is situated extends from Catlin's River to Waikava, and the formation seems to lie very regularly, there being no hard stone; but it would be very difficult to say what sum of money would be required in order to prove it. Mr. Brunton, who resides near the Mataura, has been boring for coal, and has reached a seam 18 inches thick, but finding that his men did not like to work in the foul air, and with the wall coming in upon them, he ceased sinking. He has gone about 150 feet.

194. Will you give us some information on the subject of paper, on which you were summoned to give evidence?—I may state that my attention was first directed to this subject from the circumstance of many of my friends being engaged in paper making, and, while living with one of them in England, seeing a large quantity of stuff, resembling grass, ready for manufacture, I enquired of my friend what the material was, and he informed me that it was Esparto grass, and that he used it for making paper. I produce a specimen of this grass, together with specimens of New Zealand tussock grass and flax which I have prepared myself. [Specimens produced.] I sent some of this prepared tussock grass home to my friend, Mr. T. Routledge, a gentleman who has taken out a patent for the manufacture of Esparto grass, and who is in a large way of business at Sunderland. I have been in correspondence with him, and will read extracts from his letters, showing what he thinks of this grass. [Extracts read.] There is another grass, the coarse tussock grass—the snow grass of the mountain, a specimen of which, I am sorry to say, I have not brought with me, and also some stuff made from wood, manuka bark, &c., which produces similar material; but, of course, these are scarce articles, and it is only to those which are abundant in the country that we must look for manufacturing purposes. I find that the expense of sending home material in the coarse state suggested by Mr. Routledge, would hardly pay. On enquiry I find that the freight will be £2 10s a ton measurement, and the material being light, the freight would come very expensive; and in my opinion it would pay better to manufacture the stuff in the country. The packing and freight would altogether come to £7 or £8 a ton, which would be in itself a large profit. Stuff of this character would not require so much handling as rags, and the saving in freight and packing would more than counterbalance the difference between the cost of labor here and in the home country. In order to show the importance which the use of Esparto grass in paper manufacture is acquiring in the home country, I will quote some figures from the Board of Trade returns, as given in the *Paper Makers' Journal*. From these it appears that during the month of May, 1869, 10,788 tons of Esparto grass were introduced into England; during May, 1870, 12,703 tons; and during May, 1871, 5,439 tons. The value of the latter was £51,149. You will see that the quantity introduced in May, 1871, was considerably less than in the May of the two preceding years, but during the four months ending the 31st of May, 1871, the quantity of Esparto grass and certain other fibres introduced into England was 53,846 tons. From this quantity we may deduct about 2,000 tons for other fibres than Esparto, and we may reckon the value of the Esparto grass imported during that period at £496,000. That shows the immense trade that is being carried on in this material; and if the material produced from tussock grass is, as my friend says it is, a better material, we may expect a large market for it. With reference to this tussock grass, the question occurs to me, would not the cost of collecting it prove a considerable bar to its use? No. Of course it could not be got without some expense; but I do not anticipate the cost would be very great.

195. Have you any idea what it would cost per ton to cut it?—No; I have not tried it on a large scale, but no doubt children could cut it; in fact, I think it might be gathered like rags, and could be got very cheap.

196. *Mr. E. Richardson.*] In collecting the grass, there would be no necessity to keep it straight, and it might be cut just like hay?—Just cut and dried. I now produce some stuff made from New Zealand flax. It was half-stuff, and I cut it in pieces with a chaff cutter, but, unfortunately, I cut it too short. However, I sent a sample home; and I also sent some to Ramsden's Mill, in Melbourne, where it was made into paper, samples of which I now produce. [Specimens produced.] I also produce a plan of a paper mill [plan produced], and an estimate of the cost from Mr. Bertram, of Edinburgh. Including buildings and provision for supplying the mill with water, I estimate that the cost of a mill, capable of turning out from 10 to 12 tons of brown and grey paper a week, at between £6,000 and £7,000. I sent samples of the materials which I have exhibited to the Paper Makers' Club, in London, and I have received a letter in reply from the Secretary to that body, which I will read. [Letter read.] I did not wish to lay out any money, and I therefore applied to the Provincial Government of Otago to see if they would send home a few tons of the raw fibre to the Paper Makers' Club for trial, and with great generosity they proposed to allow me £1 a ton, which I declined.

197. In reply to a question from a member of the Committee, Mr. M'Glashan said he had not been personally engaged in paper making at home.

198. *Mr. Murray.*] Was the flax from which you prepared this fibre in a dry or green state?—It was the ordinary dried fibre.

199. If a quantity of tussock grass were cut, would not the supply be likely to soon become exhausted?—No. I think the grass would be improved by frequent cutting.

200. Have you any idea of what it would cost per pound to make printing paper from tussock grass?—To make printing paper, it would require much more machinery than appears in the plan.

201. What inducements would you like the Government to offer?—As you are aware, no duty is charged upon printing paper, and a large quantity of printing paper comes into the Colony for use in grocery purposes, the revenue thus being defrauded. I do not, however, suggest that any duty should be imposed on paper; but I think a very good bonus should be offered, because a great expense must be incurred at first, and a year or two might elapse before any return was obtained. I know that such was the case with Mr. Ramsden, in consequence of a large quantity of paper coming into the market just when his mill was started. I am prepared, in conjunction with some friends, to go into the undertaking, if we see a reasonable bonus offered.

202. *The Chairman.*] Do you mean a bonus for the manufacture of a certain quantity of paper?—Yes; or it might be done in a different way. A portion of the bonus might be paid as soon as the machinery arrived, and the balance when so much paper had been made.

203. *Mr. E. Richardson.*] Have you seen the resolution passed by the Committee of last year in reference to a bonus?—Yes.

204. Is your proposal the same?—I wrote in reply to the Colonial Secretary that the bonus was not sufficient, and that no one would be induced to go into the matter by the offer of such a bonus. What I would suggest is, that a fair bonus should be offered. The present bonus is altogether absurd; and, in order to show you what other Colonies do in the way of encouraging this manufacture, I will read an extract from a lecture, by Mr. Simmons, on paper making materials, wherein he alludes to New Zealand flax as one of those materials. [Extract read.] I believe the material alluded to in the extract is something like this specimen of snow grass fibre.

205. In reply to a question from Mr. Murray, Mr. M'Glashan said he believed that cartridge paper made from New Zealand flax could be shipped home at a considerable profit.

206. *Mr. Steward.*] Might not the bonus be given in another way—the Government to contribute so much towards the erection of a mill with suitable working machinery, on condition that it should be kept in full working order for a certain period?—Yes. I think that something should be given at first, to enable the mill to be started. I believe that if the mill were once in full working order, printing paper could be produced cheaper than it could be imported from the old country.

# APPENDIX.

## FISHERIES.

### Memorandum on Coast Fisheries by Mr. Creighton.

The resolutions of the General Assembly last year with regard to local industries attracted considerable attention in Auckland, and a Select Committee of the Auckland Provincial Council was appointed to report on the subject generally.

2. Mr. Murdoch McLeod, a Member of the Council, obtained a Select Committee "to consider the best means of promoting and developing fisheries in this Province." The Committee reported on the 26th December, 1870; and the Council appropriated £400 "to meet the recommendations of the Fisheries Committee."

3. Acting on the general recommendations of the Report, which the Council adopted, Messrs. McLeod and Perston, of Wangarei, applied to the Superintendent of Auckland for the exclusive use of two blocks of waste land on the east coast of the Province, north of Wangarei Harbour, possessing bush suitable for house and boat building, barrel staves, &c., for the purpose of establishing fish-curing stations on an extensive scale. The Provincial Government was unable to comply with the request, and Messrs. Perston and McLeod wrote to the Hon. Colonial Secretary making a similar request. They likewise wrote to Dr. Pollen, General Government Agent at Auckland, and had an interview with him on the subject of their letter.

4. The reply of Dr. Pollen was so favourable that Messrs. McLeod and Perston bought a vessel to be employed on the coast fishery, and built a store at the site selected as the curing station. The land on which the store is built belongs to the General Government. The settlers of Wangarei Heads and Waipu, many of whom are experienced Nova Scotian fishermen, took up the project, and a letter from the district, published several weeks since in an Auckland newspaper, stated that twelve fishing boats were being built in various parts of the settlement.

5. The plan on which Messrs. McLeod and Perston propose carrying on operations is similar to that pursued in the North American provinces,—namely, they guarantee to buy all cured fish brought to them at a fixed rate per cental. The fishermen understand this system; and as it secures them a steady home market, without fluctuation in price, it appears to be the very best that could be adopted. The buyers incur the risk of finding an outlet for the cured fish; and it was with the view of lessening that risk and encouraging capitalists to go into the business, that the Auckland Provincial Council appropriated £400 as a bonus for the current year.

6. From the evidence of Mr. David Cruickshank and Mr. Morton Jones, merchants, of Auckland, and the concurrent testimony of other gentlemen examined before the Select Committee on Fisheries, it appears that, in addition to the Australian demand, the Eastern countries generally are open to exporters of cured fish from New Zealand. Batavia and Mauritius were specially mentioned; but wherever Coolie labour is employed there is a demand for cured fish.

7. The only point on which the Select Committee on Fisheries had any doubt was with regard to the bonus. The question was, should the bonus be paid to the fishermen or to the exporters? As, however, the main consideration was the creation of an export trade in cured fish, it was thought that this object would more readily be attained by paying a bounty on all fish cured in the Province, and entered outwards at the Custom House. The Commercial Club of Nova Scotia pays a bounty of 20s. per ton per annum on all vessels engaged in the Newfoundland fisheries; the United States Government pays a similar bounty; and a premium of twelve francs per cwt. is paid by the French Government for all fish caught on the Banks by French subjects, and landed in good condition at Martinique and Guadaloupe. In Nova Scotia and Canada all goods used at the fisheries are free of duty. These points were considered by the Select Committee, and it was thought the advantages of climate in the curing of fish were so greatly in favour of New Zealand as to counterbalance some of the concessions in favour of the fisheries by the North American Government.

8. Having informed Messrs. McLeod and Perston that an Act to encourage Coast Fisheries would in all probability be passed this Session, I received a memorandum from Mr. Perston containing valuable suggestions which might be embodied in the Bill in course of preparation by the Government. (See Memorandum B attached.) In his note, concerning the memorandum, Mr. Perston says:—"It would be desirable, if it could be so arranged by the Fisheries Bill, that any parties commencing the fisheries on the coast, and inducing a number of men to locate there, should be protected against other parties coming to the same harbours and engaging in the same business. This, of course, to apply only to such small harbours as are common along the East Coast of the Auckland Province. Harbours such as Kaipara, Manukau, &c., could not be so bound." These suggestions deserve consideration, as they come from a gentleman practically acquainted with the subject.

9. In connection with this subject of encouraging coast fisheries, other branches of domestic industry should not be forgotten. Care might be taken to attach conditions to any bounty or concession in favour of fisheries, to the effect that all nets, boats, and fishing gear, as far as practicable, should be manufactured in the country, of New Zealand material.

10. The number of men employed in the harbour fishery at Auckland is considerable. Several boats are regularly engaged at the work; and one fisherman recently imported a set of nets at a cost of £500 in England. The fishermen sell the fresh fish to dealers, who hawk them about the town. A small trade is also done in dried fish, but it is not sufficient for the local demand. Occasionally cured fish is sent to Auckland from the Bay of Islands and other Northern ports. A similar trade is carried on at the Thames. The Natives do comparatively little at it.

11th September, 1871. Robert J. Creighton.

Mr. McLeod to the Hon. W. Gisborne.

Sir,— Waipu, Whangarei, 2nd June, 1871.

I have the honor to enclose for your information copy of Report of Select Committee on Fisheries, Auckland Provincial Council, Session XXVI., 1870, of which I was chairman. This Report contains several valuable suggestions, based on the evidence of gentlemen practically acquainted with curing and exporting fish in the North American Colony of Newfoundland; and I have no doubt these suggestions would be of material service in leading to the establishing of fisheries along the coasts of New Zealand, if generally carried into effect. Should the General Government take this matter up, and make any proposals to the Colonial Parliament during the coming Session, I would respectfully suggest that a bounty of £2,000 be offered for the first fifty tons of dried or cured fish, the produce of New Zealand, exported by any individual or firm, on producing account sale from the foreign agent.

But whatever course the General Government may deem it expedient to adopt in respect to this particular industry, I am prepared to embark in it on the faith of the resolution of the Provincial Council respecting bounty, provided suitable grants of land be made, as recommended in paragraph 7 of the Report, herewith appended.

For this purpose I applied (with Dr. Perston, of Wangarei, who is prepared to join me in the enterprise) to His Honor the Superintendent of Auckland for a grant of 500 acres of land at the mouth of the Tutukaka River, Matipoura Block; and of 500 acres of land at the mouth of the Whananaki River, both north of Wangarei Harbour; the grants to include growing timber suitable for boat and ship building, house timber, barrel staves, &c., also harbour and coast frontage. Should these sites not contain the requisite growing timber, authority to be given to select a bush with a convenient road, free of charge. His Honor, in conversation with Dr. Perston and myself, informed us that the Matipoura Block was in the hands of the General Government, and that he could not do anything in respect of it. He likewise informed us that the Whananaka Block, being waste land of the Province, he could not legally comply with our request; and intimated that, were it proclaimed a fishery reserve and curing station, any person engaged in fishing could have access to it.

I have the honor to submit, however, that in this case a special grant should be made, inasmuch as Dr. Perston and myself are prepared to go into the fishery business on a scale involving large outlay of capital. To render our venture a success, we should have security that the buildings erected by us would belong to us exclusively. This would not be the case were we to build on a public reserve, common to all who might temporarily engage in fishing. We contemplate erecting fishermen's cottages, and there should be garden ground to each. Paddocks would be needed for cattle and sheep, to render the condition of the fishermen and their families comfortable. And a lesser acreage than that for which we applied would not be sufficient for the maintenance of a fishing community, such as we propose locating at each of the little harbours named.

We propose sawing the timber and building houses, boats, and fishing vessels on the ground we also contemplate establishing a cooperage, and making barrels of New Zealand staves, and, as far as practicable also to manufacture fishing gear of New Zealand fibre. To enable us to do this with a chance of success, and to establish a new industry in the Colony, an absolute grant of sufficient land having harbour and coast frontage for drying and curing purposes, and safe anchorage for our vessels, together with the requisite timber, is a prime condition.

I am induced to bring this subject prominently before the Government in the hope that they will aid me to establish a local industry which would provide profitable employment for hundreds of men and their families, if vigorously prosecuted, seeing that the Superintendent of Auckland is powerless in the matter. I do so all the more readily because of the action taken by your Government last year, in regard to "local industries" generally.

I have the honor to request that you will cause a reserve to be made, in favour of William Augustus Perston, of Wangarei, and Murdoch McLeod, of Waipu, Justices of the Peace of the Colony, of 500 acres of land at the mouth of the Tutukaka River, Matipoura Block, with harbour and coast frontage, and all growing timber &c. thereon, to be by them held and used free of rent or other charge, as a site for fish curing. This land being under the control of the General Government, I apprehend that there will be no legal difficulty in the way. With this grant in our favour, we would commence operations forthwith, in the belief that the Auckland Provincial Council, would next Session make provision for our legal occupation of the Whananaki Block.

I have, &c.,

The Hon. the Colonial Secretary, Wellington. Murdoch McLeod.

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(Memorandum B.)

*Proposals for Fisheries Bill, by Dr. Perston.*

1. Blocks of land contiguous to bays and harbours to be set aside for those purposing to engage in the business of curing and exporting fish, and allotted to them after a *bonâ fide* occupation of three years, twenty acres of land being allowed to the promoters for every adult male they have settled on the contiguous land, being engaged in the fisheries.

2. Blocks of land contiguous to the above to be set aside and allotted by the promoters among fishermen engaging in the fisheries at the rate of 100 acres for each adult male.

3. A bounty of 10s. per cental on all fish sound and of good quality cleared for exportation.

4. Bushes of growing timber, suitable for use in house and boat building, barrel staves, &c., to be included in grants.

5. A bonus of £5,000 to be given to the parties who pass the first 100 tons of New Zealand cured fish through the Customs for export.

6. The Customs duty to be remitted on all goods supplied to fishermen, and on all appliances required in the fisheries.

7. Experienced fishermen from Scotland, Sweden, Newfoundland, and Nova Scotia, to be introduced under the Immigration Act.

### Further Memorandum on Fisheries.

I received the accompanying Memorandum on Fisheries from Dr. Perston, of Wangarei, by the last Auckland mail, which I beg to submit for the information of the Committee. The statistics, collected from reliable sources by Dr. Perston, serve to show what may reasonably be anticipated from the successful establishment of fisheries on the New Zealand coast, with the Eastern countries open to us a market. At the same time, I desire to supplement what I have already stated relative to the establishment of coast fisheries in Auckland.

Messrs. McLeod and Perston inform me by letter, dated 5th September, 1871, that in consequence of the favourable reception of their application by Dr. Pollen, Government Agent at Auckland, for a fishery reserve of 500 acres at Tutukaka, in the Matiporou Block, thirteen miles north of Wangarei Harbour, they erected a station, and procured all the appliances for making a start; but they now find, through some unexplained cause, that their application is not favourably entertained. This is to be regretted, inasmuch as the land is of no intrinsic value for settlement purposes. It is, however, well adapted for a fishing station, and was selected for their head station by Messrs. McLeod and Perston, because it possessed timber suitable for boat-building and other purposes, adjacent to the harbour, which is land-locked, and safe in all weather.

I am likewise informed by them that, contrary to expectation, the Provincial Government of Auckland has made a reserve in their favour of the block of land for which they applied at Wharenaka; but this reserve is only suited for an out-station, being unsafe in easterly weather.

I would suggest, with the view of encouraging coast fishing in New Zealand, that the Government be authorized to make concessions of land along the coast to individuals or associations who may engage in that enterprise; and that in the special case referred to, the application of Messrs. McLeod and Perston for the Tutukaka Block, be recommended to the favourable consideration of the Government. The land, although still in the hands of the General Government, is in reality part of the public estate of the Province; and the intention of the Auckland Provincial Council and Government in regard to this matter is shown by the resolutions and appropriation referred to in my first memorandum, and the more recent concession of the Wharenaka Reserve. This is a case in which liberal views should be entertained, the vast importance to the Colony at large from the establishment of coast fisheries, and the creation of an export trade in dry and cured fish, being so apparent. I may remark in this place, that the French Government, besides paying a bounty for all fish brought from Newfoundland in French bottoms, and landed in good condition at their West Indian Colonies, rate all Frenchmen engaged in the fisheries as if serving in the navy, and they are entitled to the same scale of pensions as if they had served in the navy.

Dr. Perston says in his letter (and I agree with him), that "it is indispensable to the success of the scheme that land should be available for the settlement of fisherman. As a class, they are very much attached to their little holdings."

It would be impolitic to grant a tonnage bounty on vessels employed in the fisheries. Many English vessels obtained the fishery bounty without catching fish. A bounty on every cental of fish, properly cured, and entered for export at the Customs, is not open to this objection, The industry once thoroughly established, the bounty might be gradually withdrawn. As a protection to the revenue, by discouraging smuggling, there should be a remission of Customs duties on all stores, &c., used by fishermen in their calling. If this were refused, from the nature of their business they would obtain these stores duty free, and, in all likelihood, be tempted to evade the revenue laws for other purpose.

Touching the progress made by Messrs. Perston and McLeod, I may add that everything was ready for a successful start early this month, and that they only waited for favourable weather to commence fishing in earnest. They have negotiated for a site at Whangaruru from the Natives besides the stations at Tutukaka and Wharenaka already taken up. Their enterprise has attracted another settler to Tutukaka, Sir Robert Douglas, of Wangarei, having purchased a section of land from the Natives in a sheltered bay in Tukukaka Harbour.

September, 1871. Robert J. Creighton.

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### Memorandum on Fisheries by Dr. Perston.

Fisheries have claimed extensively the attention of maritime Governments for many and varied reasons. They form nurseries for sailors and pilots; they give profitable employment to large communities; their product forms not only a cheap and wholesome article of food for home consumption, but also a very valuable export. It is a very healthy occupation, and, if largely followed in a small community like this, would materially tend to foster the growth of a hardy, stalwart race of men, who, with a little training, would form a formidable flotilla against any invading force.

#### *Statistics of Fisheries.*

At an average of the three years ending with 1789, Great Britain had 402 ships, 1,911 boats, and 16,856 men engaged in the American fisheries. The total value of the Newfoundland fishery in 1814 exceeded £2,800,000.

The average annual produce of the fisheries exported from Newfoundland during the three years ending 1832 is stated by Mr. McGregor at £516,417. There is also a considerable fishery from the ports and harbours of Nova Scotia, Cape Breton, New Brunswick, &c. But next to that of Newfoundland, the principal British fishery is carried on along the coast of Labrador, its produce being estimated at from £300,000 to £350,000 a year.

The exportation of fish from Newfoundland was as follows:—1832, £319,265; 1833, £455,672; 1834, £443,577.

In 1836 the number of British vessels engaged in the Newfoundland and Labrador fisheries amounted to ninety-four, with 721 men; the boats employed were 11,427; fishermen and boys, 49,720; coopers, 1,916; fish-curers, 1,916; persons employed in cleansing, drying, and packing the fish, 26,038;

labourers, 7,235; barrels of herrings, 497,615; quantity of cod cured and dried, 38,040 cwt.; pickled, 6,276 barrels.

The Dutch have at present fisheries on the Doggerbank and at Feröe. During the year 1845 187 sloops left Ostend for the fishery at Doggerbank, and twelve for Feröe. They brought back 9,432 tons from the former ground, and 1,215 from the latter—total, 10,647 tons, being less by 1,105 tons than in the year 1844.

During the Protectorate a remission of salt duties and Excise duties on naval necessaries in favour of private parties engaged in fisheries was granted.

In 1677 Charles II. appointed a Council of Royal Fishery, in order to the establishment of laws and regulations; and for the encouragement of those engaged in this branch of commerce "a lottery was granted for three years, a collection was made in churches, and an exemption granted for seven years from Customs, both inward and outwards; besides this, all victuallers and coffeehouse-keepers were compelled each to take a certain number of barrels of herrings yearly, at 30s. per barrel. Beyond this, a duty of 2s. 6d. was imposed upon foreign herring imported, and a promise was made of all such other advantages as experience should discover to be necessary. In 1756 a bounty of 80s. per ton on all decked vessels employed in the fisheries, and a grant of 2s. 8d. per barrel upon all fish exported.

In the reign of George III. (1786), a bounty of 4s. per barrel was given on fish, the tonnage bounty being reduced to 20s. On an average of ten years, 54,394 barrels were annually taken, at a cost to the Government of 7s. 6d. per barrel.

In 1808, the bounty was again raised to 60s. per ton on decked vessels, with an additional bounty of 20s. per ton to the first thirty vessels which should be entered the first year; besides this, a sum of £3,000 was granted in premiums for boats of not less than 15 tons. The bounty of 4s. per barrel was continued up to 1826, ceasing altogether in 1830.

In 1837, there were cured in Scotland 397,737 barrels herrings. The Yarmouth fishing fleet consists of 100 sail, averaging from 40 to 50 tons each; capital employed, £250,000.

Sir John Barrow in an article on Fisheries in the *Encyclopædia Britannica*, estimates their total value, foreign and domestic, at £8,300,000; McCulloch, however, calls it as £3,000,000 to £3,500,000.

In May, 1807, the first Brighton boat load of mackerel sold at Billingsgate for 40 guineas per hundred, 7s. each; next boat load but 13 guineas. Mackerel were so plentiful at Dover in 1808 that they sold for sixty for 1s.

In 1821 the value of the catch of sixteen boats from Lowestoft on June 30th amounted to £5,252, and it is supposed that there was no less an amount than £14,000 altogether realized by the owners and men concerned in the fishery of the Suffolk coast.

In February, 1834, one boat's crew from Hastings cleared £100 in a night.

In 1827, the cost of seines and boats used in the pilchard fishery in Cornwall was £209,840; and of drift boats and nets, £61,400. An instance has been known where 10,000 hogsheads of pilchards have been taken on shore in one port in a single day, thus providing the enormous multitude of 25,000,000 of living creatures drawn at once from the ocean for human sustenance.

At present the produce of British fisheries is not less than 5,000,000 per annum.

The importance of fisheries as bearing on the food supplies of nations, inland as well as maritime, and as forming a remunerative outlet for labour, can scarcely be over-estimated, more especially as fish has ever been in the greatest demand by all classes of the people, and has been in use for human food from the most remote periods.

In the year 1860, 12,721 boats, manned by 42,430 fishermen and boys, were engaged in the herring, cod, and ling fisheries of Scotland and the Isle of Man; estimated value of boats, nets, and lines, £750,196. 681,193¼ barrels of herring cured in Scotland in 1860, against 4 barrels cured in 1759, which 4 barrels cost the Government in bounties each £113 15s., and each barrel of these mercantile herrings cost £159 7s. 6d.

In Paris the annual consumption of fish for each individual gives a mean estimate of 27 lbs. sea fish, and ⅞ lb. fresh-water fish.

*Laws regarding Fisheries.*

1. Statutes have been passed both in England and Scotland for the purpose of protecting the breeding of fish and preventing the destruction of their fry or spawn; of these, the first is 13 Edward I. st. c. 47, the latest 14 and 15 Vict. c. 26.

2. A feeling of the interest which the whole community has in the development of the fisheries has led to a system of advancing public moneys for their encouragement; for this purpose Commissioners have been appointed through whom money is advanced on loan. The last Act having this object in view is 19 and 20 Vict. c. 17.

3. Bounties were formerly paid upon the taking and curing of fish of various descriptions, and on the vessels employed in various branches of the fisheries; the last statute is 7 George IV. c. 34.

4. Treaty between England and France concerning the fisheries between British Isles and France, 6 and 7 Vict. c. 79, amended by 18 and 19 Vict. c. 101.

5. Similar treaty with United States, 18 and 19 Vict. c. 3.

6. Regulating trade in fish in London and Westminister: first Act, 22 George II. c. 49; last, 4 and and 5 William IV. c. 20.

7. Fresh fish of British taking, imported in British bottoms, may be landed without report or entry: 16 and 17 Vict. c. 107, s. 49.

8. Persons employed in the fisheries are exempted from impressment: 50 George III. c. 108.

9. Fisheries of Ireland regulated by recent Acts; the earliest, 6 and 7 Vict. c. 108; latest, 13 and 14 Vict. c. 88.

Mr. Saunders, the extensive salesman of lobsters in Lower Thames Street, estimates the lobsters consumed daily at 40,000. The Whitstable Oyster Company received for oysters in 1859 £62,000. —£50,000 for native oysters, and £12,000 for other kinds of oysters.

No note is taken in these tables of fresh-water fish, as salmon, eels, trout, pike, &c. &c., as they could have no bearing on New Zealand fisheries.

*Annual Supply of Fish to London Market ten years ago.*

| | |
|---|---|
| 300,000 | barrels fresh herrings, 700 fish to barrel. |
| 265,000 | baskets bloaters, 150 fish per basket. |
| 60,000,000 | red herrings. |
| £100,000 | worth of sprats and pilchards. |
| 3,000,000 | haddocks. |
| 18,500,000 | whitings. |
| 100,000,000 | soles. |
| 500,000 | cod. |
| 35,000,000 | plaice. |
| 25,000,000 | mackerel. |
| 495,896,000 | oysters. |
| 1,200,000 | lobsters, averaging 1 lb. each. |
| 600,000 | crabs, averaging 1 lb. each. |
| 498,428,648 | shrimps, 324 to a pint. |
| 4,943,200 | whelks, 227 to half-bushel. |
| 50,400,000 | mussels, 1,000 to half-bushel. |
| 67,392,000 | cockles, 2,000 to half-bushel. |
| 304,000,000 | periwinkles, 4,000 to half-bushel. |
| £300,000 | annual value of shell fish. |

British fisheries have attained to their present very large proportions within the present century; before that they were comparatively insignificant. According to Smith's "Wealth of Nations," from the commencement of the winter's fishing 1771, to the end of the winter's fishing 1781, the whole number of barrels caught by the herring buss fishery of Scotland amounted to 378,347. With tonnage bounty, fish bounty, and remission of salt duty, he calculates each barrel cured with Scotch salt, when exported, cost Government 17s. 11¾d., and when cured with foreign salt it cost £1 7s. 5¾d., the former for home consumption costing Government 14s. 3¾d, the latter £1 3s. 9¾d.

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MEMORANDUM on COAST FISHERIES by Mr. JOHN MUNRO.

IN compliance with your request for any information I can give to the Committee on Local Industries, in reference to the description and quality of fish suitable for curing to be found on the east coast of the North Island, I have the honor to submit, in the first place, that the snapper is in abundance on the coast of the North Island, and is next in quality to the North American codfish, and it does not require much skill to cure and make it a good article of export to any foreign market. Then come the kingfish and yellowtail, and various other fishes of the same class in abundance on the coast, that can be cured with equal facility with the snapper, and also suitable for exportation. The mullet is a fish of another class, abundant in the harbours and on the coast north of Auckland at a certain season of the year, and can only be cured by salting in barrels of about 200 lbs. weight. I can say from my own experience with that excellent fish, it can be preserved, in the manner said, to keep sound to go to any part of the world; smoked mullet is only fit for home consumption, and would not keep to be sent abroad.

Everybody has heard of the voracious shark, which is most abundant in the harbours and on the coast about three months in the year; and I do not know anything in the fishing way to pay the fisherman better than catching that monster, for the sake of the oil of its liver; besides also, I am told that, if cured, which is easily done, the fish would sell well in China—thus paying the fisherman in two ways. The hapuka, a very large fish, some parts of which has the dryness of the codfish, and other parts of it the richness of the salmon,—this fish is swarming in abundance around islands on the coast not far from the main, and around sunken rocks. I do not feel warranted (although I am not sure) to say that this valuable fish can be dried safely for exportation to foreign countries, owing to the oily fatness of some parts of it, although I have an idea it can be smoked, and made a good article of commerce abroad; but, like the mullet, it can be cured in casks fit to send anywhere. I had some little experience with the hapuka. For the first two years and a half after I came to the country, I was lying idle, sojourning at Wangarei Heads, waiting to get land for myself and passengers, and opening the way for others to follow; and during those two years and a half I made nineteen voyages, in a small boat I took with me from Nova Scotia, to the Hen and Chickens, fishing hapuka for family use, as well as to kill time, or for pleasure if you like, and seldom, unless interrupted by storms, missed making fine hauls of that superior fish; and on one trip particularly I took fifty-two hapukas home, and caught one with my own hands that weighed 90 lbs., and I met with persons who had seen larger still. I merely mention the above to show, that when a person like myself, going out when fancy led me, without any experience of the tides, appetite or habits of the fish, would catch such large lots from time to time, what would experienced fishermen catch, who would be for months stationed at the place.

I made the trips mentioned in all seasons of the year, and had ample chance of observation; and I can say that, notwithstanding my long connection with fisheries in Nova Scotia for a series of years, in a position I will now slip over, that I never saw in that country the sea more alive with fish than I saw around the Hen and Chickens; in fine weather, around the islands, constant shoals of fish, and as far off as the eye could see in every direction,—and in a calm day myriads of fish of various sorts passing and repassing under my boat. I often said then, were it not for my time of life, that I did not know a better project in New Zealand than a fishing station, if judiciously managed; and were it not the interest I had in the people who came with me to the country, seeing them, with myself, adrift and astray in a new and distracted colony, without land to settle on—old as I was, were it not for the reasons stated, in all probability I would have set a fishery a-going. For I do not only believe, but I know, that there is an inexhaustible source of national wealth around the shores of New Zealand, as far as I have seen of it, swarming unmolested round our shores and the islands, and on sunken rocks not yet discovered, that will yet be a profitable resort to the laborious fisherman, and contribute largely to the

aggregate prosperity of the country. In my own humble view of that, our present mineral wealth is nothing now to what it will be in the time to come, yet I believe that the fisheries of this country will surpass it in wealth, permanency, and stability. But allow me at the same time submissively to submit that New Zealand must and will assume a different political aspect in its present *régime* ere that prosperous day will come about.

In reference to your second query about the suitability of the climate for the preparation of fish for export, my humble view of that case is, that in the sunny and balmy climate of the Province of Auckland, fish can be cured and dried fit for export with more facility than in North America, with the exception of the rainy season here, when drying fish would be almost out of the question, without it were an exceptionally dry winter.

As regards your third question—In what manner the Government could most advantageously promote the establishment of this industry? I feel more perplexity in answering this question than any of the preceding ones, not that I have not ideas of my own on the subject, but I fear your honorable Committee will not be inclined to coincide with them. I fear the permanency of the fishing establishments, from the immature state of the country for such, and its yet internal elements and habits of the people in general. But as you will see by my answers to the two first questions that I have ample faith in the quantity and quality of the fishes of New Zealand, especially the delicious mullet and the royal hapuka, without any disrespect to the snapper and that class, that I must have more faith in the men of the country than in its fish will be but a matter of course and of decency; I must therefore, for the future, pin my faith on the Government, in connection with the collective wisdom of the Legislature. That wisdom is shown in the appointment of the honorable Committee, and you yourself ornamenting it as chairman, for a lantern to clear the road and illume the way for the Government to promote the local industry now in view, as well as many other industries throughout the country at large.

For my part I do not know any other industry in the country that requires more the fostering care of the Government of the country, without which it will only languish and die out. People investing in it will have many obstacles in their way to surmount. In the first place, should experience of that industry in other countries be useful to them here, still, they will have to serve an apprenticeship to catching the New Zealand fish, before they will be experts. As I said before, about the habits of the fish, I will, as briefly as I can, give one instance of my own experience in this matter. When I went to Wangarei Heads, seeing shoals of mullet in the harbour, I turned to and made a seine, a net on the Nova Scotian principle of catching mackerel and similar fish, which cost me about £30, and which was about 90 fathoms long. What fish was I not to catch with this net! not only enough for myself, but for my neighbours, and to spare. But after spending a season with it in every way, I could not catch enough mullet with it to keep a small family supplied with fresh fish. I gave it up in disgust, and ordered a net from London to suit my purpose; I got that net seven years ago. About its success I will only say now, that I went out only one night with it since I was here last year, and took 700 mullet home in the morning.

Another obstacle is the scarcity and consequently high value of salt—only imported in dribs and drabs in bags, and therefore to be used as penuriously as the old croon would her "scroggag of Irish blackguard snisen" (snuff). Another drawback is the scarcity of settlers on the coast, more especially people adapted to fishing. A man can fit himself out with a few dollars for digging kauri gum, and will soon become an expert at it; not so with fishing. There is no industry anywhere—and it will be so here also—more subject to making bad debts than what is called a long-shore fishery, as it cannot be carried on without large advances, all depending on "fisherman's luck." Another drawback here, also, but one a wise Government can easily obviate, is the heavy duty on necessary articles consumed by the fishermen—such as tobacco 2s. 6d. duty per pound, while the Nova Scotian fisherman paid only (1½d.) three-halfpence per pound.

In the French Colony of St. Pierre and Miquilon, in the entrance of the Gulf of St. Lawrence, the fishermen had everything they consumed free of duty, to encourage the fisheries. But that was not all; but every quintal of fish caught and cured by a French subject got fourteen francs bounty (if my memory do not betray me at this distance of time), besides the current price of fish in the surrounding colonies. By this wise provision of the French Government, hundreds of brigs came out yearly from France, besides several thousands of men came yearly to fish in boats around the islands mentioned, returning home in autumn. By that bounteous policy of the French Government an enormous quantity of fish was cured; and I think the Government of New Zealand must adopt the same principle, although I would not say to the same extent, before any life or animation is put into our fisheries, which are well worthy of the consideration and study of our Government; and, if properly attended to, I have no doubt will come at last to a favourable issue, and prove a source of wealth to the country unthought of.

I had no experience with whale fishery, but I think it would be wisdom to encourage it by giving all the materials and ship stores free of duty, and at the same time giving a bounty of from 20s. to 40s. per ton register, or a certain bounty on every ton of oil made. This would encourage a number of people of moderate means to join in clubs to fit out vessels for the purpose of whaling. Ships and crews can be obtained here on the same lay as in other countries; and I do not see any obstacle in the way of its successful prosecution, like the shore fisheries, if only encouraged by the Government, to give our merchants a taste of its benefits.

Wellington, 19th September, 1871. JOHN MUNRO.

## PAPER MAKING.

MEMORANDUM by Mr. E. McGLASHAN, M.H.R.

YOUR Committee having requested me to place on record any information I could furnish in regard to the department of paper making, I have the honor to submit the following remarks:—

As regards the *Phormium tenax*, this fibre is admirably adapted for paper making purposes, as will be seen from the specimens of pulp and paper exhibited by me to the Committee. The specimen of paper made at Kate's Mill, near Edinburgh, was from half a ton of green flax sent home in 1863. The report of the maker, however, was not favourable, the flax having become so dry and hard that it could not be well worked up in the state in which it arrived, and, owing to the great difficulty in bleaching it was pronounced not adapted to the better class of papers. The sample made in Melbourne was from green flax chopped up small in a chaff-cutter, but owing to the pieces being cut too small the breaking engine could not properly act on it, and hence the roughness of the sample.

The following remarks in reference to this fibre is from Mr. Thomas Routledge, of the Ford Works Company, near Sunderland, a gentleman of large experience in the paper trade, and who with great perseverance introduced the manufacture into England of the Esparto grass into paper. In a letter to me, he says, "If you put down a half-stuff plant you would, as a matter of course, work up all the flax tow, losing as it will do 40 to 45 per cent. in the boiling and washing. Reduced thus in bulk, I should think it would pay well to send home in that condition, although, owing to the yellow shelly outside which I found difficult to bleach without injuring the fibre, it will not fetch so much, I fancy, (1) as the fibre you have sent me. It is just possible, however, that if you can obtain the tow freshly treated, you will not find this skin or shelly exterior so difficult to treat as I have done. Should this turn out so, a better material for paper making cannot well be found. I believe also that the under pulpose, apparently, matter of the leaf or blade will produce a quantity of fibrous material which it would pay to treat and export; but it is some years since I treated the *Phormium tenax*, and I am not quite certain about this."

Mr. Simmonds, in a paper on paper-making materials read before the Society of Arts London, in January of this year, says, "Forty years ago, paper was made of the New Zealand flax, to print an edition of a work by Mr. John Murray, of Edinburgh, on the plant and its uses. The peculiarity of this paper is its tenacity, which property would make it valuable for documents and printings to stand a great deal of tear and wear. No better paper could be used for bank notes, or for the printing of valuable standard works. The paper obtained from it is the strongest of all."

So far as my own experiments have gone in manipulating the tow into paper stock or pulp, I think, with Mr. Routledge, that there will not be a great difficulty in the bleaching, as my sample exhibited shows; at all events in coloured papers any specks would not be seen, and for paperhangings and cartridge papers it would not be any serious defect.

The sample of grasses exhibited in half-stuff and pulp, bleached and unbleached, were prepared by me from two varieties of grasses which grow abundantly in the Middle Island; samples of these I forwarded to Mr. Routledge, and I now give extracts from his letters to me, showing the value he places on them. He says, "I duly received your letter of 11th February, also that covering samples of prepared fibre, which is very good, and as you state bleaches very fairly; until made into a sheet of paper, it will be difficult to say that it is superior to Esparto. It appears to be somewhat stronger, but strength is not the only characteristic of a good sheet of paper. I do not doubt that fibre prepared equal to your sample will be worth £20 a ton laid down in England, and I shall be happy to receive all you can send, up to 500 tons, at that price. I believe, should Esparto keep up in price, that your fibre would fetch £2 to £4 more; but it must first be tried on a working scale, and introduced to some unprejudiced makers, and then a regular and assured supply guaranteed before makers would use it. If you can assure yourself a regular supply, I believe any quantity you can manufacture would sell, as paper materials are daily becoming scarcer and dearer. I wish you had sent me some of the raw material, as I could have judged better of its amenity to treatment—I mean how it would go under the lye in boiling. I imagine, however, this material you send is what produced the small sample of bleached pulp you call Tussack grass, and, if so, it will not be so stiff or harsh in its treatment as Esparto. . . . Your fibre bleaches far better than you think, for see the enclosed.(2) You must not, however, think of bleaching, but confine yourself merely to boiling, washing, pressing, &c."

In a subsequent letter Mr. Routledge says,—"I have now to acknowledge yours of the 24th February, with other samples of fibre in half-stuff, (3) which appears to me almost identical with Esparto, although, in wetting your sample down, I judge you have given it very active chemical treatment, and, in other words, boiled it too much. I enclose some Esparto, boiled and washed, and a raw stalk, for information (4). I do not think so well of this fibre as of that previously sent, which appears to me much stronger, and therefore that last sent not worth so much, although, should Esparto keep up in price, it might realize £20 a ton; I do not say would, but might."

The testimony of Mr. Routledge and my own experiments lead me to believe that here we have most valuable products, adapted to make the finest class of papers, and, from the fact of their abundance, must prove a great source of wealth to the Colony.

In addition to the *Phormium tenax* and the two species of grasses alluded to, there are many other vegetable productions indigenous to the country adapted for paper making. It is unnecessary to allude to these at present, further than to say that I have prepared samples from them, which are very good, but being not so abundant, I take no notice of them. The great abundance of the flax and the grasses, as materials so well adapted for the making of paper, is what more immediately concerns the Colony, and I hold that there should be great inducements held out for the encouragement of the manufacture within the Colony itself; the more so as I find that, so far as the shipping of the pulp or half-stuff is concerned, it will not pay freight, cost of packing, and price of chemicals being too formidable an item of expense.

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(1) Fibre prepared by me from the *Poa Australis*.
(2) Sample exhibited.
(3) From the coarse Tussack grass of the interior.
(4) Samples exhibited.

The necessary plant for a paper mill is, however, very costly. Mr. Routledge writes you could hardly put down a paper mill, with one machine, under £10,000. All, of course, would depend upon locality, and much on the cost of building materials, and in foundation wall, &c. Very few will risk the outlay of so much capital, more particularly as there is nothing in the shape of protective duties, printing paper being admitted duty free; and therefore, to give the start to this industry, it would well repay the Colony to offer a handsome bonus, the miserable amount of bonus now offered being totally inadequate to carry out the object in view. I would only quote what the South Australian Government in this direction have done: A Select Committee of the House of Assembly of South Australia reported in August last that thousands of tons of fibre, equal to any demand, and suitable to the manufacture of paper, &c., is growing extensively in various parts of the Colony, and a large proportion on the Crown lands. The Committee report their opinion that a new and valuable industry might be opened up, and therefore recommend that a bonus of £2,000 be offered for the first 500 tons produced in the Colony. The Provincial Government of Otago have also agreed to give a bonus of £1,500 to start a woollen manufactory, the machinery for which and ultimate cost is not nearly so heavy as that required for paper making. The Committee are no doubt aware also that the Indian Government offered, I think, the sum of £5,000 as a premium to any one who would produce machinery for the preparation and dressing of Rhea grass. The Government of New South Wales have also proposed placing a duty on paper of 1d. per lb. as a protection to the paper mill erected at Liverpool.

It is not for me to suggest what the amount of bonus should be. I may, however, be allowed to state my view of the shape in which it should be paid, and would recommend that one-half of it be payable on shipment of the machinery, and the other half on the production of so many cwts. or reams of paper. I believe a party is ready to proceed at once to Britain to procure machinery on some such terms, depending, of course, on the amount of bonus offered. Another mode has been suggested to me, and that is to give a bonus of £1000 for every 100 tons of paper manufactured up to 500 tons; and I really do not think this would be too large a bonus, seeing that at the first start there will be the home competition to contend with, and the prejudice towards a colonial manufacture to overcome. In concluding my remarks on this most important industry, I have only to say that I will gladly impart any further information I possess to any party who may be desirous to take up the manufacture of paper stock or pulp for exportation, as until the payable nature of the manufacture of paper is proved it would not be prudent or desirable to start more than one mill in the Colony.

Before closing I may as well submit the following facts as to the great and increasing demand in Great Britain for paper-making material:—According to the Board of Trade Returns the imports of Esparto grass alone amounted to the enormous quantity of 88,943 tons, valued at £597,656, for the eleven months of 1870 ending 30th November, and for the same period the value of paper imported from the Continent of Europe amounted to the sum of £526,569. The imports of printing paper, wrapping paper, paper hangings, and stationery into the Colony of New Zealand, in the year 1870, amounted to the sum of £94,198, the declared value.

From the foregoing statement of facts I do hope the Committee will see their way to strongly recommend a liberal bonus, as the starting of this manufacture must necessarily encourage others, such as the manufacture of the chemicals used in the trade; also that of paper-hangings, papier-maché, and many other articles of utility to which paper pulp can be applied. Our American cousins know well how to treat this industry in many forms, from the paper collar to the building of boats and houses. For the manfacture of paper we have in the Colony all that is needful in the raw material, and abundance of pure water for the preparation of it in all its forms, and for driving the necessary machinery.

I have, &c.,
Ed. McGlashan.

## RAILWAY CARRIAGES AND TRUCKS.

Some time ago I directed the attention of His Excellency's Government to the importance of having the railway carriages and trucks to be used on Government railways constructed in the Colony. The Victorian Government has created a most extensive colonial industry by having their carriages and trucks made in Melbourne of colonial timber. I may state that there are carriage builders in Dunedin (and doubtless in other parts of New Zealand also) who are quite capable of producing as good an article as any that can be imported, and at a cost very little, if any, in excess. I therefore take the liberty of submitting the matter to your Committee, as one which is well worthy of attention.

Of course the iron work would require to be imported.

J. Macandrew,
Superintendent of Otago.

Wellington, 9th October, 1371.

## OAMARU BUILDING STONE.

Memorandum on the Building Stone of the District of Oamaru, in the Province of Otago, known as "Oamaru Limestone."

I have the honor to submit for the consideration of the Committee, the desirability of steps being taken to bring into better note, and consequently into more extensive use, the valuable building stone, of which such vast quantities exist in that portion of the Province of Otago, lying between the Otepopo (or Waianakarua) and Waitaki Rivers.

The stone in question is a true limestone, easily workable (is sawn as easily as wood, indeed it can be turned with a lathe), and is therefore admirably adapted for ornamental work, while, possessing, as it does, the quality of hardening on exposure to the atmosphere, it proves a durable and at the same time a very inexpensive building material.

It is beautifully white; in this as in other respects being fully equal if not superior to the freestone obtained near Box, in England, and used so largely at Bath, Cheltenham, and other towns

whose attractive appearance is almost wholly due to the beauty of the material of which their buildings are composed. The quantity obtainable in the neighbourhood of Oamaru and Kakanui is practically unlimited—for miles and miles of country there being but a few inches of soil superposed upon a bed or mass of limestone of immense depth; indeed, the stone in many cases crops out above the surface.

With the construction of the Waitaki-Moeraki Railway, and the branches to the port of Kakanui, and from Cave Valley to Oamaru, the stone can be brought to a place of shipment at a minimum expense; and in view of the early construction of these works, which may now be regarded as a certainty, it is desirable that means be taken to open up a market for what must eventually prove a very large and valuable export.

The Bank of New South Wales, Christchurch; the Bank of Otago and Masonic Hall, Oamaru; the Bank of New South Wales, and the buildings known as the New Post Office (now used by the Otago University), and the first Church, Dunedin; may be pointed to as a few of many examples of the suitability of the material for buildings of the highest order of architecture.

It is to be regretted that I cannot also adduce as an additional instance the New Town Hall, Melbourne (which I believe cost upwards of £100,000), the Committee which selected the stone used for that building having chosen stone procured from Tasmania, in preference to the Oamaru and other stone inspected by them, under the belief that the Oamaru stone was less durable than that adopted. They were guided by the appearance of certain stone procured from Oamaru and used for some buildings in Melbourne, and which showed symptoms of decay; but I may be allowed to point out that among the numerous quarries already opened up in the neighbourhood of Oamaru, there is a wide difference as to the quality of the stone; and that had the stone sent to Victoria been of the best procurable and sent in "dry bottoms" (the fact being that there is every reason to believe that much of that sent was damaged *in transitu* or during shipment by salt water), there can be no doubt that Oamaru stone would have been already in high repute and extensive demand in that Colony.

I may add that the stone (Tasmanian) actually used for the Melbourne Town Hall appears by no means to have realized expectations, but already to have shown symptoms of decay.

With the improved shipping facilities which will shortly be provided at the Port of Oamaru, the stone could be supplied at from 10d. to 1s. per cubic foot, free on board; and, taking into consideration the minimum cost of working, it would pay Victoria to import it for building purposes.

With a large demand for this commodity would of course follow the payment to this Colony of a large sum of money in exchange for the same, and the employment of a large number of persons in quarrying, &c. Under these circumstances I venture to submit, for the consideration of the Committee, the desirability, in order to the promotion of the end in view, that the Government should send samples of the best quality of the stone, in the rough and worked, to Melbourne and other places where building stone is in demand, to be deposited at some place or places where they might be inspected by builders, contractors, and others, accompanied by information as to first cost, freight, &c. Similar samples might with advantage be sent to England, as the agents or charterers of vessels homeward bound from this Colony, and requiring deadweight, might be glad, if a sale could be obtained for it at home, to ship the stone either free of cost or at a minimum charge. I may point out, in this connection, that there is an institution in London known as "The Museum of Economic Geology" (Jermyn Street), of which Sir Roderick Murchison was the late and Sir Henry Rawlinson is the present President; whereat, among a large quantity of specimens of materials available for manufacturing, building, and other purposes, are exhibited small blocks of stone of all the kinds found in the United Kingdom, and I believe specimens from elsewhere, and information is given as to the locality where each is found, the cost of the material, freight, &c.; so that it is easy to ascertain what is the best and cheapest material for any proposed work. I would suggest the forwarding of specimens of the Oamaru stone to this institution, accompanied by such information as might be necessary.

Lastly, I venture to suggest that from time to time samples of the stone, in the rough and worked, should be forwarded to the various Exhibitions of Industry, Products, and Art now so frequently held, as I have reason to believe that when its qualities are known a large demand will arise in hitherto unexpected directions.

I have, &c.,

Wellington, 7th October, 1871. WM. J. STEWARD.

P.S.—I append, for the information of the Committee, the followiug copy of a certificate by the Colonial Architect as to the qualities of the stone referred to, addressed by him to Mr. D. Hunter, of the firm of Hunter and Goodfellow, Dunedin:—

Colonial Architect's Office, New Zealand, 12th December, 1870.

THIS is to certify that I have introduced a large quantity of Oamaru stone into public and private buildings; and, all things considered, I have no hesitation in saying that the stone from the best Kakanui quarries is superior to any other building stone I have met with in the Colonies during a practice of twenty years.

W. H. CLAYTON,
Colonial Architect.

Mr. D. Hunter, Dunedin.

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MEMORANDUM No. II.

SINCE laying before the Committee the memorandum which I had the honor to submit this day with reference to the Oamaru limestone, I have received the telegram appended, which shows that the stone can be delivered free on board in the roadstead at even a lower price per cubic foot than that stated in the memorandum.

10th October, 1871. WM. J. STEWARD.

[Telegram.]

Oamaru, 10th October, 1871, 11.30 a.m.

Cannot ship stone now under 1s. 6d. per foot, in blocks not exceeding 5 cwt. With harbour works 9d., and railway 7d. per foot. S. GIBBS.