

1919.
NEW ZEALAND.

KAURI-GUM INDUSTRY.

REPORT ON THE ADMINISTRATION OF THE KAURI-GUM INDUSTRY AMENDMENT ACT, 1914,
TOGETHER WITH A STATEMENT OF ACCOUNTS IN CONNECTION THEREWITH, FOR THE
YEAR ENDED 31st MARCH, 1919.

Presented to both Houses of the General Assembly pursuant to Section 5 of the Kauri-gum Industry Amendment Act, 1914.

REPORT.

SIR,—
Office of the Government Kauri-gum Superintendent,
Auckland, 22nd October, 1919.

In submitting this, the fifth annual report of this Department, it is not deemed necessary to make any reference to the special circumstances which gave rise to the setting-up of the Department, beyond saying that the work of the Department, which was begun in November, 1914, has been continued during the present year, and has been beneficial to the gum-digger and the industry generally.

For part of the year in some districts the Department, owing to the lack of demand for kauri-gum abroad, was the only buyer. After careful consideration it was decided that the best policy to adopt was to continue buying in the two main gum-producing districts, with a proviso that we should buy direct from the diggers, and only the gum dug from month to month. It may be explained that it was necessary to adopt this course as in some districts large accumulations of gum were held by diggers, chiefly Dalmatians. These accumulations we did not touch.

SALES.

During the year kauri-gum to the value of £18,847 6s. 4d. has been purchased by the Department, while the sales amount to £14,226 8s. 6d. Up to the end of March all gum sold went to America, but since that date several shipments have been made to the United Kingdom.

Negotiations are now in progress for the appointment of a Government agent in London to handle all European business. When these arrangements are completed, and with ample shipping-space available, it is probable that a big export trade with the United Kingdom will be established.

Early in the year a partial embargo was put on the importation of all fossil resins into the United States of America. As in the previous year, America constituted practically our only market, and how hard this restriction hit the kauri-gum trade may be gauged by the fact that the total export for the year was only about one-half that of the previous year, and less than one-third of the pre-war yearly export.

Owing to so many gum-diggers being absent on active service, and owing to the fact that men of Austrian nationality had been to a great extent called up for service on public works under Government supervision, the output was not large; but even under these conditions it was found necessary in the interests of the gum-digger and those dependent on the industry to purchase 80 per cent. more gum than in the previous year, although our sales were only a little more than half those of that year.

Full details of the expenditure under the various headings are given in another part of the report. The Act of 1914 authorized the Minister to raise the sum of £50,000. Up to the present time a sum of £47,000 has been so raised. On the 31st March, 1918, the cash in the Public Account to the credit to the Kauri-gum Industry Account was £20,755 8s. 7d., and at the 31st March, 1919, the amount was £3,291 18s. 5d.

DR. MACLAURIN'S SALT VACUUM PROCESS FOR CLEANING GUM.

This process was briefly described in my last annual report, when it was mentioned that tests with a miniature plant had been made in Wellington. A plant sufficient for testing the gum on a commercial scale has been set up in Auckland, and satisfactory results obtained. Up to the present time about 100 tons of gum have been treated by the process. Samples of the cleaned gum have been sent abroad, and it is hoped to make a trial shipment shortly.

So far as my experience goes, I am convinced that the Maclaurin process is the only satisfactory one for thoroughly cleaning gum, and separating dirt and foreign matter from it. With the various devices for dealing with gum-bearing soils which are now being tested, and which give a good prospect of producing gum at a very much lower cost and in larger quantities than heretofore, the scope of this process becomes much wider.

KAURI-PEAT SWAMPS.

For many years much speculation has taken place as to the value of kauri-peat and the possibility of distilling oils therefrom. Attention has been drawn to this matter in my previous reports, wherein such information as was available was published. During the last year or so much investigation has been done by private companies, and considerable sums of money have been expended. It is hoped that the extraction of oils from the kauri-peat swamps on commercial lines will very soon be an industry established on a satisfactory basis.

With a view to encouraging the development of the industry, legislation was passed in 1915 under which the Governor-General may from time to time, by Order in Council, set apart any area of Crown land situated in a kauri-gum district for the purpose of promoting the systematic recovery of kauri-gum and other valuable products contained therein, provided that the total area set apart under this section shall not exceed at any one time an area of 10,000 acres. The Land Board is empowered to dispose of, by way of lease, any land so set apart in areas not exceeding 3,000 acres. The period of the lease is twenty-one years. It is proposed this year to extend the term of the lease to forty-two years. Only one such lease has been granted, and that to the New Zealand Peat Oils (Limited), who have been granted an area of 3,000 acres situated near Kaimaumu, in the Mongonui County. The lessees have to pay a low rental and also a royalty on the kauri-gum, oil, and other valuable products obtained. This company has done a considerable amount of work, particulars of which have been referred to in previous reports. The work done during the past year is briefly summarized by the secretary as follows:—

“Peat and its Products.”—There has been considerable progress since the last report, and the company is well satisfied with the position as it has so far developed. Several tons of peat from the Government swamp and 250 gallons of crude oil, retorted at Kaimaumu under the supervision of Mr. F. J. Hagger, J.P., have been sent to London and have passed through experts' hands with very favourable results. 95 gallons have been fractionated there, and gave the following results: Light oil (spirit), 4½ gallons; medium oil (carbolic), 10 gallons; heavy oil (creosote), 24½ gallons; resinous tar and pitch, 22 gallons; water, 31 gallons; loss in handling, 3 gallons: total, 95 gallons.

“The percentage of water will be noticed in oil from which it had previously been run off. In this case, as in the crude oil supplied to the Northern Steamship Company, which ran one of their boats to Whakatane in record time, there were no proper appliances at Kaimaumu for completely taking out the water. The oil was fractionated by Messrs. Thos. Crow and Sons at their Barking works.

“The peat-water was found to contain methyl alcohol, acetone, acetic acid, and tar residues—lubricating-oil, paraffin, kauri-gum resins, anthracene, and pitch. Chemists further made an analysis of these fractions.

“The oils and other products from peat are approximately the same as those from coal, but the fact that kauri-gum essential oils are brought over and incorporated in the peat oils places them in a special position. The peat is picked over for marketable gum, but a considerable amount of gum-dust is present when the peat is retorted, and undoubtedly enriches the oils. There is much further research work to be done in this connection, and it may be some time before the company will receive the full benefits of refining. The by-products will be limited and primary until refining is carried out locally. In the meantime there should be a fair return for the crude and semi-crude products.

“A further treatment of kauri-peat in London has lately yielded 64½ gallons per ton of peat, this being from a sample which showed 10 per cent. of kauri-gum, from strata which will give a good number of tons of similar stuff in the 3,000-acre swamp held by the company.

“Briquettes have not hitherto been a success in this country, but those made up from the products of the company's retorts give excellent results: (1) They ignite more readily by far than coal; (2) they keep alight more persistently; (3) they burn steadily; (4) they give off a good heat. Such briquettes should have a higher value than coal on account of being good fire-lighters. Incidentally an almost ideal coke-furnace lighter has been made and used.

“The quantity of residue—charcoal or coke—amounts to about 8 cwt. per ton of dry peat, and tests are being made to ascertain the value of this as a fuel and gas-producer under different treatments. There are solid grounds for believing that this charcoal will prove a considerable asset.

“The layer of kauri timber in the Kaimaumu swamps was expected to hamper the cutting-out of peat, but a very fine tar has been made from the roots. This tar is being analysed in order to ascertain the more valuable oils that can be extracted before using it for roofing-material, caulking decks, &c., for which it is found to be a very superior article. The tree-trunks can be sawn into case-boards.

"There is every reason to believe that peat and its products will be a valuable addition to the industries of New Zealand; but there is still much work to be done both by the chemist and the engineer before it can be established on a solid basis. Test work has been going on in Auckland since the beginning of the year, and the company has now two retorts on the premises of the Auckland Gas Company under the supervision of Mr. James Lowe, A.M.I.C.E., engineer and manager. Analyses are being conducted by Professor F. P. Worley, D.Sc. (Lond.), of Auckland University College. The company is also much indebted to Dr. J. S. Maclaurin, the Dominion Analyst. Our High Commissioner, Sir Thomas Mackenzie, has kindly furnished much valuable information in regard to peat-works at Dartmoor and other places in the United Kingdom; and statistics and useful data have been obtained from the Governments of Canada and the United States, as also from savants and firms in Russia, Sweden, Denmark, and Italy."

In regard to the extraction of oils from kauri-peat: Work has been carried on by private enterprise at different times during the past thirty years. Probably up to the present time £25,000 has been expended in these investigations, and I think the time has come when the Government should offer a fairly substantial bonus for the encouragement of this industry. In my opinion, there has been enough preliminary work done to show a good prospect of a payable industry being established. As before pointed out, the companies which have been carrying on the work have been labouring under great disabilities owing to no research work having been done in the past; especially have they been working under great difficulties during the past five years owing to the general disorganization caused by the war.

With reference to the suggestion that the Government should offer a bonus: I have conferred from time to time with Dr. Maclaurin, Dominion Analyst, who for many years past has taken a very keen interest in the industry and the work of this Department. Dr. Maclaurin has gone into the matter very fully, and makes the following proposals as to the conditions under which the bonus should be offered:—

- A. A bonus of £1,000 for the best plant and process for the production and refining of oil from kauri-peat. No plant and process shall be considered eligible for the bonus unless the plant is capable of treating at least 5 tons of dry peat per day, and unless it has produced at least 50,000 gallons of crude oil (free from water) and 5,000 gallons of refined light oil suitable for use as a substitute for petrol in the light-oil engines of motor-cars.
- B. A bonus of 3d. per gallon of crude oil (free from water) on all oil produced by the distillation of kauri-peat: Provided that the total bonus shall not exceed £2,000, and that no bonus shall be paid to any person or company whose plant has produced less than 20,000 gallons. In the event of the total production of oil exceeding 160,000 gallons, the bonus shall be divided among the persons or companies manufacturing the oil in proportion to the amounts produced by them.
- C. A bonus of 3d. per gallon of refined light oil produced from crude kauri-peat oil, and suitable for use as a substitute for petrol in the light-oil engines of motor-cars. In the event of the total production of oil exceeding 80,000 gallons, the bonus shall be divided among the persons or companies manufacturing the oil in proportion to the amounts produced by them.
- D. No bonus shall be paid under B and C unless the Government is satisfied that the area being worked is suitably situated for the transport of products, and that it contains sufficient kauri-peat yielding not less than 25 gallons of oil per ton of dry peat to produce at least 1,000,000 gallons of crude oil free from water.

Of course, these proposals are only tentative, and in the event of the Government agreeing to the recommendation it may be deemed advisable to fix the bonus on a more liberal scale, and with probably a time-limit fixed.

Dr. Maclaurin has drawn my attention to the fact that a bonus was offered for the production of mineral oil in 1910 on the following lines: The bonus offered amounted to £10,000, and was payable on the following conditions:—

- (a.) £2,500 to be paid on proof being submitted that not less than 250,000 gallons of marketable crude oil had been won;
- (b.) £2,500 to be paid on proof being submitted that not less than 500,000 gallons of marketable crude oil had been won;
- (c.) £2,500 to be paid on proof being submitted that not less than 1,000,000 gallons of marketable crude oil had been won;
- (d.) The balance of £2,500 to be paid to the person or company who first produced by his or its refining plant 500,000 gallons of refined mineral oil.

IMPROVED PLANTS AND PROCESSES FOR GUM-DIGGING OPERATIONS.

During the last few years much time and thought have been given in the gum-producing districts to the evolving of processes and plants designed to deal with the gum-bearing soils more speedily than at present, and at the same time not only to recover a greater percentage of small gums, but also to grade gums recovered mechanically according to size and weight. This work has been carried on purely by private enterprise, and large sums of money have been expended in this direction. At present the output of kauri-gum is very much below what it was in years before the war. During the war a large number of gum-diggers left on active service, and many of those who have returned will not go back on the gumfields again, preferring some calling which gives greater scope for ambition and a more constant and certain recompense for the labour expended.

Men of Austrian nationality were called up for service by the State on various public works; and it is worthy of note that many of them, even if permitted to do so, show no disposition to return to gum-digging after having enjoyed regular hours and good wages in the place of long hours, arduous work, and uncertain prices in the gum industry.

Taking into consideration the higher cost of living on the gumfields, the more or less isolated life, and the hard work necessary to make other than a mere existence, it is not a calling that men will be attracted to. It is chiefly due to the free and independent life, and the fact that a man is his own master, that so many men are engaged in the industry at all.

All things considered, the important consideration in regard to the kauri-gum industry to-day is the necessity for an increased and regular output. Unless the alien is again given the right to return to the gumfields and to "pothole," burn, and desolate the country at will, it would appear that the chief hope of increasing production lies in the field of labour-saving devices and plants enabling the digger to turn over more ground and to recover a larger percentage of the gum than hitherto.

A BONUS RECOMMENDED.

I recommend that a substantial bonus should be offered for, say, the best three plants for dealing with kauri-gum-bearing soils and the recovery of the kauri-gum contained therein. These plants should be capable of being turned out cheap enough to be within the reach of the diggers; and special consideration would be given to plants capable of being worked by two or three men, and which could be moved about from one place to another without much expense. In this connection it has been deemed advisable to make a short summary of existing patents dealing with the matters here discussed. Complete specifications and drawings of the inventions summarized are filed at the Government Kauri-gum Office, 7 Hobson Street, Auckland, where they may be inspected free of charge by any *bona fide* inquirer. Copies of any specifications and drawings relating to patented inventions may be had on application to the Registrar of Patents, Wellington, on payment of a small fee to cover the cost of copying.

SUMMARY OF EXISTING PATENTS.

No. 36483, F. V. Raymond (23 figures, 44 claims).—Consists of the adaptation or application of buckets operated on an endless link chain, pipes in which operate the force of suction or an adjustable mouthed grab to the raising or lifting of gum soils.

No. 36431, F. V. Raymond (8 figures, 14 claims).—Relates to means of treating and separating kauri-gum-bearing soils by means of chutes.

No. 37667, F. V. Raymond (11 figures, 12 claims).—Consists of mechanical devices for separating soil and foreign matter from the gum.

No. 37947, J. S. Maclaurin (no drawings, 11 claims).—Consists of placing kauri-gum and impurities in a salt solution having a higher specific gravity than the gum, but a lower specific gravity than the impurities, and in removing the air-bubbles which would otherwise prevent the impurities from sinking.

No. 38059, F. V. Raymond (20 figures, 46 claims).—Consists of treating kauri-gum-bearing soils by passing soils over plates, screens, meshes, flumes, and the like by the action of running water, and methods of mechanically dealing with timber found therein.

No. 39091, F. V. Raymond (1 figure, 9 claims).—Relates to the application of heat for the purpose of separating kauri-gum from the impurities among which it is found, and also for drying and grading the gum.

No. 39575, F. V. Raymond (1 figure, 6 claims).—Relates to the drying of kauri-gum by compressed air.

No. 39579, F. V. Raymond (3 figures, 10 claims).—Consists of improved methods whereby kauri-gum-bearing soils may be expeditiously treated mechanically.

No. 39579, F. V. Raymond (3 figures, 10 claims).—Consists of spraying the kauri-gum-bearing soils, which softens the bulk and separates the various particles. The mass is then dried, and by use of fans of varying power particles of different specific gravities are sucked up and forced by air-currents into settling-rooms, resulting in a grading or sorting being performed.

No. 40439, V. De Vally (4 figures, 5 claims).—Consists of a pump for lifting gum slush from kauri-gum-bearing swamps, in combination with a perforated rotating cylinder provided with beaters, and a conveyor or conveyers for beating and conveying the gum through the cylinders to a receptacle.

No. 40702, H. A. Pyke (12 figures, 2 claims).—Consists of putting kauri-gum and impurities contained therein in a receptacle containing water, heated or cold, capable of withstanding internal pressure, which is applied at about 30 lb. to the square inch or more. The result of this treatment will be to precipitate the foreign matter and some of the gum. After treatment in this manner the whole is transferred to another receptacle containing water heated to a suitable temperature, with the result that the gum will float and the foreign matter sink.

No. 39580, F. V. Raymond (5 figures, 6 claims).—Relates to obtaining samples of soils by means of mechanically operated slotted hollow spear rods with a view to locating deposits of kauri-gum.

No. 39618, F. V. Raymond (2 figures, 7 claims).—Improvement and extension of methods and apparatus described in No. 39580 above.

No. 39463, C. Suttie (4 figures, 6 claims).—Consists of an agitating-vessel with beaters affixed to a revolving shaft, for breaking up gum-bearing soils to dissolve the soluble earth and matter therein, and for separating the solid content thereof, such as wood and gum particles, and of grading the same into different sizes.

No. 39547, C. Suttie (6 figures, 4 claims).—Consists of a revolving cylinder for screening kauri-gum and its impurities.

No. 39574, W. R. Cockburn and W. J. F. Jenkins (2 figures, 3 claims).—Relates to the mechanical extraction of kauri-gum from the soils in which it is found, by means of a horizontal or inclined cylinder in which is operated a spiral brush, in conjunction with a bowl with perforated sides, said bowl being mounted so as to be capable of rotation about its vertical axis, and being located within a non-rotary casing. Jets of water are used in the reducing treatment.

No. 39926, C. Suttie (2 figures, 5 claims).—Consists of the use of a number of loosely lying lines of chains connected to a base to move along a surface among the material to be operated on. The rubbing or disintegrating effect on the material can thus be done without seriously abrading the gum.

No. 39932, F. V. Raymond (10 figures, 15 claims).—Consists of the washing of gum-bearing soils by agitation within a vessel of reciprocating perforated plates and frames carrying cross-bars set at various angles and inclinations for the purpose of separating the gum from the impurities.

No. 39576, F. V. Raymond (4 figures, 9 claims).—Consists of mechanical means for reducing gum soils to a state that will enable them to be easily raised and delivered to a screening appliance. Jets of water are directed on the soils, which may be further pulverized and disintegrated by appliances such as a movable frame, or by the use of tines, harrows, and the like. When the soils are sufficiently reduced they are raised to the screening appliances by any suitable form of elevator.

No. 39577, F. V. Raymond (3 figures, 6 claims).—Relates to the removal by scoops of the top layers of peat over the gum-bearing soils.

No. 39732, C. Suttie (3 figures, 7 claims).—Consists of the use of a spiral chamber for the separation of solid contents, such as wood and gum particles, from the soil and the grading into different sizes.

No. 40127, F. V. Raymond (2 figures, 4 claims).—Consists of means to prevent the slime water from the screening apparatus, in the working of swamps by bucket dredge, from returning to the paddock.

No. 39927, W. R. Cockburn and F. Jenkins (3 figures, 1 claim).—Consists of a semi-cylindrical screen of fine mesh, in which is rotated a spiral wiper or brush of the same diameter as the internal diameter of the screen, said wiper or brush being mounted on a central shaft supported in bearings in or above the screen.

No. 40128, F. V. Raymond (17 figures, 19 claims).—Consists of treating the gum-bearing soils in a vessel flume or chute the bottom of which may be plain or perforated, with a frame or set of frames arranged crossways in which are slats, bars, heavy wire, or the like, the surfaces of said rifles being either plain, or roughened, or uneven.

No. 40505, V. Silich and N. Silich (2 figures, 3 claims).—Consists of a vessel container made narrower at the top than at the bottom, having a horizontal shaft mounted on bearings across its top carrying at its inner end a bevel gear-wheel set to mesh with a bevel gear-wheel carried on upper end of a central vertical shaft, said vertical shaft being centrally placed within said vessel or container and having fixed to it at its lower end two horizontal stirrers working slightly above a screen or sieve placed just off or above the perforated bottom of said vessel. In use the dirty water and fine soil passes out through the bottom, while the gum pieces and other material too large to escape are retained on the screen.

A note of warning must be sounded, however, in regard to gum cleaning and washing machines in general. Very little provision has been made so far by some of the patentees for the saving of gum-dust, which constitutes a very appreciable percentage of the gum content of the soils treated. In the case of one plant of which great things were expected the gum content of the soil treated was ascertained after very careful tests, and it was found that the residue run to waste as useless contained a gum content of almost one-third that of the original sample in other words, one-third of the gum in the shape of fine dust was entirely lost.

KAURI-GUM EXPORTS.

For the year ended 31st March, 1919, the export was 2,338 tons, of the value of £152,299. During the last four years the average yearly output has been 4,198 tons, of the value of £263,388; whilst for the previous four years the average annual export was 8,187 tons, of the value of £460,890.

It was only to be expected that there should be a great falling-off in the export so long as the war continued, but it is doubtful whether the old figures will be again attained unless better methods of production are introduced. But this subject I deal with more fully in another portion of this report.

The following table gives particulars of the exports for the last twelve years:—

Particulars of Kauri-gum exported from New Zealand from 1908 to 31st March, 1919, inclusive.

| Country to which exported. | 1908. | | 1909. | | 1910. | | 1911. | | 1912. | | 1913. | |
|----------------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
| | Tons. | £ | Tons. | £ | Tons. | £ | Tons. | £ | Tons. | £ | Tons. | £ |
| United States of America | 2,855 | 215,291 | 5,127 | 375,126 | 4,149 | 263,375 | 3,514 | 209,216 | 3,894 | 232,566 | 3,995 | 308,456 |
| United Kingdom | 1,799 | 123,011 | 2,290 | 140,235 | 3,253 | 151,319 | 2,378 | 130,767 | 2,468 | 114,640 | 3,390 | 187,547 |
| Germany .. | 667 | 23,841 | 639 | 24,111 | 913 | 28,016 | 1,442 | 34,062 | 1,053 | 32,964 | 833 | 27,880 |
| Canada .. | 21 | 1,646 | 24 | 2,555 | 66 | 7,687 | 9 | 1,061 | 40 | 3,370 | 62 | 4,618 |
| Australia .. | 155 | 6,458 | 149 | 8,576 | 66 | 4,465 | 75 | 2,559 | 39 | 2,487 | 80 | 3,933 |
| Belgium .. | 22 | 1,572 | 17 | 1,770 | 29 | 1,899 | 78 | 3,990 | 123 | 5,088 | 126 | 5,120 |
| France .. | 10 | 875 | 1 | 85 | 19 | 1,656 | 75 | 5,774 | 37 | 3,037 | 45 | 3,995 |
| Austria-Hungary | 1 | 104 | 1 | 68 | 124 | 3,011 | 131 | 3,968 | 159 | 4,611 | 112 | 2,617 |
| Russia .. | .. | .. | .. | .. | 15 | 1,976 | 80 | 1,859 | 2 | 184 | 53 | 1,725 |
| Netherlands .. | .. | .. | .. | .. | 6 | 133 | 55 | 1,206 | 42 | 974 | 60 | 2,495 |
| Sweden .. | .. | .. | 2 | 172 | 30 | 720 | 35 | 803 | 35 | 952 | 15 | 420 |
| Italy .. | .. | .. | .. | .. | 23 | 779 | 15 | 417 | 15 | 410 | 9 | 300 |
| Japan .. | .. | .. | .. | .. | .. | .. | .. | 25 | 1 | 22 | .. | .. |
| Hong Kong .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Argentina .. | .. | .. | .. | .. | .. | 8 | .. | .. | .. | .. | .. | .. |
| Totals .. | 5,530 | 372,798 | 8,250 | 552,698 | 8,693 | 465,044 | 7,587 | 395,707 | 7,908 | 401,305 | 8,780 | 549,106 |

| Country to which exported. | 1914. | | 1915. | | 1st January to 31st March, 1916. | | 1st April, 1916, to 31st March, 1917. | | 1st April, 1917, to 31st March, 1918. | | 1st April, 1918, to 31st March, 1919. | |
|----------------------------|-------|---------|-------|---------|----------------------------------|--------|---------------------------------------|---------|---------------------------------------|---------|---------------------------------------|---------|
| | Tons. | £ | Tons. | £ | Tons. | £ | Tons. | £ | Tons. | £ | Tons. | £ |
| United States of America | 4,531 | 316,200 | 3,312 | 222,856 | 974 | 60,010 | 3,158 | 218,214 | 2,316 | 164,516 | 1,371 | 81,914 |
| United Kingdom | 3,335 | 148,370 | 1,172 | 48,585 | 336 | 13,548 | 1,484 | 68,378 | 363 | 13,982 | 346 | 19,977 |
| Germany .. | 373 | 21,193 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Canada .. | 70 | 2,114 | 56 | 4,550 | 118 | 8,972 | 133 | 7,718 | 1,929 | 124,271 | 572 | 45,588 |
| Australia .. | 19 | 1,720 | 9 | 594 | 5 | 314 | 29 | 1,982 | 18 | 1,577 | 49 | 4,820 |
| Belgium .. | 34 | 1,519 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| France .. | 42 | 3,599 | 5 | 430 | .. | .. | .. | .. | .. | .. | .. | .. |
| Austria-Hungary | 14 | 329 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Russia .. | 3 | 225 | 21 | 2,118 | .. | .. | 50 | 3,440 | .. | .. | .. | .. |
| Netherlands .. | 8 | 664 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Sweden .. | 20 | 560 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Italy .. | 23 | 855 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Japan .. | 1 | 96 | .. | .. | .. | .. | .. | .. | 10 | 506 | .. | .. |
| Hong Kong .. | .. | .. | .. | .. | .. | .. | 8 | 539 | .. | .. | .. | .. |
| Argentina .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Totals .. | 8,473 | 497,444 | 4,575 | 279,133 | 1,433 | 82,844 | 4,862 | 300,271 | 4,636 | 304,852 | 2,338 | 152,299 |

SHRINKAGE IN WEIGHT OF KAURI-GUM.

The question of moisture contained in kauri-gum, and the consequent shrinkage in weight, is one concerning which considerable difference of opinion exists.

Gum as bought on the fields is liable to varying shrinkages according to the condition in which it is marketed. This shrinkage is easily tested by air-drying the gum and comparing the weights before and after drying. In the case of some gums, however, no matter how well they may be dried, there is an almost continual loss of weight, and it is this class of gum that I refer to. Samples of different grades were cased up in the store at Auckland and subsequently tested for shrinkage. The following tabulation shows the result of these tests. Each sample was well air-dried before being cased up.

| Grade. | Dates of Weighings. | Net Weights. | Percentage of Loss at Last Weighing. | Remarks. |
|----------------|---------------------|--------------|--------------------------------------|---|
| | | Cwt. qr. lb. | | |
| Swamp chips .. | 7/3/1916 | 1 3 16 | .. | It will be noticed that during the first seventeen months there was a loss of 5 lb. and during the next twelve months the loss was 3 lb., making a total shrinkage of 3·7 per cent. for the whole period. |
| | 3/8/1917 | 1 3 11 | .. | |
| | 19/8/1919 | 1 3 8 | 3·7 | |
| Swamp 3 .. | 30/3/1915 | 1 2 15 | .. | This sample was weighed once only and showed a loss of 49 lb. in about four years and a half, or 26·7 per cent. |
| | 19/8/1919 | 1 0 22 | 26·7 | |
| Swamp nuts .. | 7/3/1916 | 1 2 13½ | .. | This grade was also weighed once only, the loss being 14½ lb., or 8·1 per cent. in three years and a half. |
| | 19/8/1919 | 1 1 27 | 8·1 | |
| Swamp 1 .. | 30/3/1915 | 1 3 13 | .. | During the first two years and a half this sample lost 20½ lb., and during the next two years lost another 14½ lb., a total loss of 16·8 per cent. for the period. |
| | 3/8/1917 | 1 2 20½ | .. | |
| | 19/8/1919 | 1 2 5½ | 16·8 | |
| Black nuts .. | 7/3/1916 | 2 0 2 | .. | For the first seventeen months a loss of 5½ lb. was shown, whilst for the next two years the loss was only 1½ lb., making a total shrinkage of 3·1 per cent. for the three years and a half. |
| | 3/8/1917 | 1 3 24½ | .. | |
| | 19/8/1919 | 1 3 23 | 3·1 | |
| Black chips .. | 7/3/1916 | 1 2 20 | .. | During the three years and a half between weighings this grade lost 7 lb. weight, or 3·7 per cent. It is interesting to note that the loss on these black chips and on the swamp chips was identical. |
| | 19/8/1919 | 1 2 13 | 3·7 | |

FRENCH MISSION.

When the French Mission was in Auckland opportunity was taken to invite the commercial representatives of the Mission to visit the Government kauri-gum store, and a full inspection was made of the stocks of gum and of Dr. Maclaurin's salt vacuum process for cleaning kauri-gum. The representatives of the Mission were very much interested in the work of this Department and in the Government operations in connection with the industry. Samples of the various commercial grades of gum were despatched to France through the High Commissioner, and we have since been notified of their safe arrival by letter from General Pau.

NEW LEGISLATION.

It is suggested during the present session of Parliament to make certain amendments to the Kauri-gum Industry Act, dealing principally with the issue of gum-brokers' and gum-diggers' licenses, and the extension of leases granted under section 3 of the Amendment Act of 1915. Full particulars of these have already been submitted to you.

The license fees are proposed to be altered as follows: In respect of every special license the fee shall be 5s., as at present; in respect of every ordinary license the fee shall be £5; gum-buyer's license, £1; and gum-broker's license, £5. It is proposed that a gum-broker's license shall authorize the holder thereof, acting as the agent of the purchaser or the seller, or both, to buy and sell kauri-gum.

OPERATIONS OF THE DEPARTMENT.

In another part of this report it is stated that probably £25,000 has been expended by private individuals and companies in the investigation of the kauri-peat-oil industry. I think that I am well within the mark in stating that probably another £25,000 has been expended in connection with gum producing and cleaning devices; but it was not until this Department was set up in 1914 that the Government showed any practical sympathy with such matters or with the kauri-gum industry generally. In spite of anything that may be said to the contrary by men in the trade in Auckland, the work of the Department has been highly beneficial to the industry and the workers engaged in it; and although the Department owes its existence in a measure to the exigencies of circumstances arising out of the war, it should be remembered that it was one of the recommendations of the Royal Commission which reported on the kauri-gum industry in June, 1914, that a special Department should be set up to take charge of the industry. Whatever good work may have been done in the past, now that the war is over and conditions are getting back to normal there is great scope for the Department extending its operations with benefit to the State and to the large body of men supported by the industry.

I have, &c.,

R. P. GREVILLE,

Kauri-gum Superintendent.

The Hon. the Minister of Lands, Wellington.

STATEMENT OF ACCOUNTS (AS REQUIRED BY SECTION 5 OF THE KAURI-GUM INDUSTRY AMENDMENT ACT, 1914) FOR THE YEAR ENDED 31ST MARCH, 1919.

| <i>Receipts.</i> | | | | <i>Payments.</i> | | | |
|------------------|--------------------------|----------------|------------|------------------|---|----------------|------------|
| 1918. | | £ | s. d. | 1919. | | £ | s. d. |
| April 1. | Balance | 20,755 | 8 7 | March 31. | | | |
| 1919. | | | | | Wages and bonuses to workmen, overseers, and gum-buyers | 2,045 | 16 3 |
| March 31. | Sales of kauri-gum | 16,803 | 13 10 | | Machinery, plant, &c. | 2,147 | 5 4 |
| | | | | | Final payments to gum-diggers and purchases of kauri-gum | 18,227 | 17 5 |
| | | | | | Travelling-expenses of Superintendent, staff, gum-buyers, and overseers | 170 | 0 6 |
| | | | | | Interest on debentures | 5,679 | 1 0 |
| | | | | | Freights, &c. | 4,477 | 5 11 |
| | | | | | Office expenses, administration, &c. .. | 1,519 | 17 7 |
| | | | | | Balance : Cash in Public Account .. | 3,291 | 18 5 |
| | | <u>£37,559</u> | <u>2 5</u> | | | <u>£37,559</u> | <u>2 5</u> |

| <i>Loan Account.</i> | | | | | | | |
|----------------------|------------------|----------------|------------|-----------|---|----------------|------------|
| 1919. | | £ | s. d. | 1919. | | £ | s. d. |
| March 31. | To Balance | 47,000 | 0 0 | March 31. | By Debentures issued under the Kauri-gum Industry Amendment Act, 1914 | 47,000 | 0 0 |
| | | <u>£47,000</u> | <u>0 0</u> | | | <u>£47,000</u> | <u>0 0</u> |

Examined and found correct.

ROBERT J. COLLINS,
Controller and Auditor-General.

R. P. GREVILLE,
Kauri-gum Superintendent.

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