

1924.
NEW ZEALAND.

KAURI-GUM INDUSTRY

(REPORT ON THE) FOR THE YEAR ENDED 31st MARCH, 1924.

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

SIR,—
Department of Lands and Survey, Wellington, 21st July, 1924.
I have the honour to submit herewith the annual report under the Kauri-gum Industry Amendment Act, 1914, for the year ended 31st March, 1924.
I have, &c.,
J. B. THOMPSON, Under-Secretary.
The Hon. A. D. McLeod, Minister of Lands.

REPORT OF THE KAURI-GUM SUPERINTENDENT.

EXPORT OF KAURI-GUM.

FOR the year ended 31st March, 1924, the export amounted to 6,923 tons, of the value of £640,712, an average price of £92 per ton, the average price per ton last year being £85, and £98 for 1922.
Both the tonnage and value of kauri-gum exported is the largest since the war. This has been of little benefit to any particular section of the industry in New Zealand. Prices have been poor all round. The majority of the diggers barely made a living, and competition was keen enough to prevent exporters and dealers in Auckland from showing anything in the way of profit. Considering the value exported it was one of the leanest years for a long time.

Particulars of Kauri-gum exported from New Zealand from 1913 to 31st March, 1924, inclusive.

Country to which exported.	1913.		1914.		1915.		1st January to 31st March, 1916.		1st April, 1916, to 31st March, 1917.		1st April, 1917, to 31st March, 1918.	
	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£
United States of America	3,995	308,456	4,531	316,200	3,312	222,856	974	60,010	3,158	218,214	2,316	164,516
United Kingdom	3,390	187,547	3,335	148,370	1,172	48,585	336	13,548	1,484	68,378	363	13,982
Germany	833	27,880	373	21,193	..	..	..	..	..	..	..	..
Canada	62	4,618	70	2,114	56	4,550	118	8,972	133	7,718	1,929	124,271
Australia	80	3,933	19	1,720	9	594	5	314	29	1,982	18	1,577
Belgium	126	5,120	34	1,519	..	..	..	..	..	..	..	..
France	45	3,995	42	3,599	5	430	..	..	..	..	..	..
Austria-Hungary	112	2,617	14	329	..	..	..	..	..	..	..	..
Russia	53	1,725	3	225	21	2,118	..	..	50	3,440	..	..
Netherlands	60	2,495	8	664	..	..	..	..	..	..	..	..
Sweden	15	420	20	560	..	..	..	..	..	..	..	..
Italy	9	300	23	855	..	..	..	..	..	..	..	..
Japan	..	..	1	96	..	..	..	..	..	..	10	506
Hong Kong	..	..	..	..	..	..	..	..	8	539	..	..
Totals	8,730	549,106	8,473	497,444	4,575	279,133	1,433	82,844	4,862	300,271	4,636	304,852

Particulars of Kauri-gum exported from New Zealand, &c.—continued.

Country to which exported.	1st April, 1918, to 31st March, 1919.		1st April, 1919, to 31st March, 1920.		1st April, 1920, to 31st March, 1921.		1st April, 1921, to 31st March, 1922.		1st April, 1922, to 31st March, 1923.		1st April, 1923, to 31st March, 1924.	
	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£
United States of America	1,371	81,914	2,037	157,251	3,224	345,992	2,487	266,922	3,742	367,946	4,197	449,117
United Kingdom	346	19,977	1,650	90,422	2,544	149,422	1,297	104,094	1,960	129,082	2,409	170,785
Germany ..	..	..	..	..	..	..	58	3,574	70	3,363	66	2,832
Canada ..	572	45,588	1,016	61,005	314	24,481	89	9,641	109	7,462	118	7,714
Australia ..	49	4,820	23	1,936	49	4,802	37	7,073	84	6,679	7	787
Belgium ..	..	..	..	..	..	..	..	..	..	..	..	..
France ..	..	..	..	..	..	..	..	..	..	..	55	5,855
Austria-Hungary ..	..	..	..	..	..	..	..	..	..	..	..	..
Russia ..	..	..	..	..	..	..	..	..	..	..	..	..
Netherlands ..	..	..	..	..	..	..	..	..	90	4,381	38	1,582
Sweden ..	..	..	..	..	..	..	..	..	20	1,000	..	..
Italy ..	..	..	..	..	..	..	..	..	1	170	26	1,647
Japan ..	..	..	..	..	..	4	..	..	4	326	7	393
Hong Kong ..	..	..	..	..	..	..	..	..	..	..	..	..
Totals ..	2,338	152,299	4,726	310,614	6,131	524,701	3,968	391,304	6,080	520,409	6,923	640,712

NEW PROCESSES FOR TREATING KAURI-GUM.

During the year very great improvements have been made in both small and large gum-washing plants in the way of producing comparatively clean chips. In most instances these improvements cannot be protected by the taking-out of patent rights. In two cases where patent rights have been applied for an examination of the gradings produced goes to show that practically all of the foreign matter can be eliminated. One of the simplest of these improvements is that devised by Mr. H. A. McMillan, of Waipu. Samples taken from consignments of chips treated by this process were tested at this office and found to have real gum contents ranging from 90 to 95 per cent. An appreciable percentage of the foreign matter consisted of light sticks that would have been blown clear had the chips been sieved in a machine with a fan. Patent rights have been applied for in the name of McMillan Bros., details as under having been supplied by Mr. J. D. McMillan, of No. 19, Palmerston Buildings, Auckland :—

“The process consists of a flume or chute with deep slats inclined away from streams of water flowing down the chute. The material from the washing-machine is fed directly into the chute. As water passes over each slat it creates a miniature waterfall. The bubbling of the water at the bottom of this waterfall provides the lift necessary to carry the gum over the next slat and leaves the heavier dirt behind. By the time six or seven slats have been negotiated little or no foreign matter remains.”

In this process the wood, being waterlogged, sinks with the dirt. Such a process as this enables the digger to give the material much less treatment in the washing-tub, with the consequent saving of time, and also a further saving as the gum is not broken up so much and more is recovered. In any such process it is obvious that a considerable amount of gum will sink with the foreign matter. So far gum-washers have been very wary of submitting samples of their residue to be tested for gum content. It is difficult to estimate the probable loss, which would vary in different fields and also according to the delay in treating the material after it had been taken from the washing-machine.

The Huff Electrostatic Process.

This process was invented in the United States of America for separating impurities from graphite and other minerals, and has been tried out by the Waipuna Kauri-gum Company (Limited). The process is understood to have been given a good trial for freeing kauri-gum from foreign matter, with satisfactory results.

The plant consists of a vertical frame some 12 ft. high, across which are fixed eight shallow metal troughs at equal distances one below the other. Within each trough is a revolving metal roller, 2 in. in diameter, and so placed that when the trough is partially filled with gum a steady thin stream of particles is carried up over the edge and dropped past the electrode to the trough below. A hinged metal plate, which is suspended just over the roller, serves to regulate the feed. On the front of each trough and parallel to the roller is an adjustable electrode, which when charged acts on the material as it drops from the roller. The gum, being a non-conductor, drops vertically into the trough below, but the wood, charcoal, and other foreign matter is conductive and is drawn out past a deflector-plate to fall clear in front of the separator. Gum is therefore cleaned in stages as it falls from trough to trough, finally dropping into a bin below the machine.

About 5-horse-power is used in generating the supply of electricity, which is transformed up to a maximum of 35,000 volts with 0.04 ampere consumption. Owing to the small amount of current used, there is no danger to the operator despite the high voltage.

The separator will only work with comparatively dry material containing not over 5 per cent. of moisture, from which all fluffy wood-fibre has been first removed by winnowing or other methods,

and a preliminary sizing by screening is also necessary, each size (seeds, chips, &c.) being treated separately.

The voltage and position of electrodes depend on the size of the particles to be treated, and an experienced operator is necessary to get the best results.

This process, while more costly to operate than one such as that of McMillan Bros., is said to save the whole of the gum content. It is also claimed that it separates the charcoal from the gum. Considering that charcoal is as non-conductive as gum, it would appear an exceedingly difficult matter to get the material through the machine with sufficient moisture in the charcoal to cause it to be drawn past the deflector and yet dry enough to allow the gum to drop clear.

SALT CLEANING OF KAURI-GUM.

The cleaning of the material from the washing-tub by immersion in salt-vats has made good headway in some quarters. So far as the individual diggers are concerned this process received a set-back when the majority of the Auckland exporters refused to buy it. The difficulty was that, owing to either negligence or lack of sufficient water, the diggers failed to wash out all the salt from the chips, with the result that in wet weather or in the holds of the overseas steamers the salt attracted moisture and rotted the sacks: this, of course, quite apart from the fact that the exporter has no desire to purchase common salt at chip prices. Some of the larger companies with a good supply of water have marketed good lines of salt-cleaned chips and seeds quite free from salt and containing a high gum content.

There is no doubt that a number of plants are able to turn out chips containing from 85 to 95 per cent. real gum. As stated in this report in previous years, such chips apparently are not good enough for the varnish trade and are too dear for the linoleum-makers. The latter appear to be satisfied with a grading containing up to 70 per cent. gum. Large quantities of chips, seeds, and dust gradings are still exported with a very low gum content. At the present time the diggers and plants turning out gradings from 60 to 65 per cent. gum appear to be getting much the best of it. The higher gradings can command prices to meet the difference in gum content, but the difficulty seems to be to get sufficiently high prices to recoup the gum-washer for the extra cost of producing the good gradings.

SHRINKAGE IN WEIGHT OF "CHALK" GRADINGS.

A point of very great importance to the exporter and the dealer or user abroad is the shrinkage of weight in some gradings through the partial evaporation of the moisture content.

The following tabulation of weighings of a sack of chalk gum under test for shrinkage at this store illustrates one of the many risks incidental to holding stocks of gum during a depression. This grading certainly loses more weight than any other, but there is a comparatively large shrinkage of weight in most gradings if kept on hand for any length of time. This especially applies to gum in sacks. When piled in good quantities so that the air cannot circulate through, the shrinkage is not nearly so large.

The chalk selected for this test had been purchased in the country, had been worked over a sieve before being sacked, and was quite dry from a commercial point of view. The sack was stored in a warm sunny room with a good draught of air passing through, and the shrinkage is probably the limit without using heat or spreading the gum in thin layers out in the sun. As will be seen by the last weighing, the shrinkage is still going on.

Date of Weighing.	Weight.	Percentage of Loss to Date.	Date of Weighing.	Weight.	Percentage of Loss to Date.
	Cwt. qr. lb.			Cwt. qr. lb.	
1922—Feb. 1 ..	1 1 14	..	1922—Dec. 1 ..	1 0 14	18-18
Mar. 1 ..	1 1 5	5-84	1923—Jan. 3 ..	1 0 12	19-48
April 1 ..	1 1 0	9-09	Feb. 1 ..	1 0 11	20-13
May 1 ..	1 0 25	11-04	Mar. 1 ..	1 0 9	21-43
June 1 ..	1 0 23	12-33	April 4 ..	1 0 7	22-73
July 1 ..	1 0 21	13-63	May 1 ..	1 0 6	23-38
Aug. 10 ..	1 0 19	14-93	June 1 ..	1 0 6	23-38
Sept. 1 ..	1 0 19	14-93	Aug. 1 ..	1 0 5	24-03
Oct. 6 ..	1 0 17	16-23	1924—Feb. 1 ..	1 0 0	27-27
Nov. 1 ..	1 0 16	16-88	July 1 ..	0 3 24	29-87

BLED BUSH GUM.

For several years past the demand for "bled" bush gradings has been very poor. It has been possible to get orders for the chip grading, but there has been very little demand for the bold gum. The Auckland exporters are unable to buy the chips without the bolder portion, and are therefore usually compelled to ask their agents to take both gradings, which is not always feasible.

The quantity of bush gum coming forward during recent years has not been large, and it is understood here that, with no certainty of supplies being available when required, manufacturers abroad are not prepared to use bush gum to any extent.

No large forests are being bled for bush gum at present. The greater acreage of kauri forest now remaining forms part of the Government kauri reserves. These reserves are under the control of the State Forest Service, and that Department is carrying out extensive experiments with a view to determining the results bleeding or partial bleeding has on the trees. In the meantime no great increase in the production of bled bush gums can be expected.

ESTIMATED LIFE OF KAURI-GUM INDUSTRY.

There is very little statistical information available as to the tonnage of kauri-gum per acre in gum-bearing fields. The fields have been worked first for one class and then for another class, and so on. In probably not one single instance has the gum content of the soil been removed at one digging, or even by the same diggers. Estimates therefore vary, and the matter is made more difficult by the fact that gum is found mostly in patches and that some areas are richer than others.

The rubbing of gum lands has, however, given some data to work on. It has been found that it takes two men a year to rubble one acre of shallow ground. By taking the total number of diggers employed of late years, and the area available for rubbing, an estimate, near enough for all practical purposes, can be obtained.

For the year ended the 31st March, 1923, the gum-digging licenses issued to diggers amounted to only 1,716, this being a large increase on the number issued in the two previous years. Of course, many men dig without a license, and sell through others who have licenses; but, comparing the number of licenses issued with other information available, it can be safely taken that the number of diggers on the gumfields at any time during the past few years did not reach 3,000 in all.

Taking the total acreage of gum-bearing land, both private and Government, that could be profitably rubbled as 300,000 acres, which is a low estimate, it would take 600,000 men one year to rubble the whole of the 300,000 acres, on the basis of two men rubbing one acre in a year. Since the users under present conditions cannot absorb the output of 3,000 diggers, it would take that number of diggers 200 years to rubble the 300,000 acres. On a very conservative basis, and making due allowance for a considerable increase in demand in the future, it can be taken that the kauri-gum-bearing lands will provide medium- and low-grade gum to meet the overseas demand for well over a hundred years.

PRODUCTION OF KAURI-GUM.

The gum received at Auckland for the past four years is shown, month by month, in the following table. As stated in my report last year, there is a great wastage on the picking-out of foreign matter and the shrinkage of moisture on gum received before being shipped. Inward gum is also reckoned at twelve sacks to the ton, which is a little high. To compare weights received at Auckland with those exported, a reduction of at least 10 per cent. should be made on the inward weights.

Kauri-gum received in Auckland.

	1920-21.	1921-22.	1922-23.	1923-24.
	Tons.	Tons.	Tons.	Tons.
April	612	191	543	480
May	532	331	514	613
June	370	358	654	459
July	434	404	548	352
August	376	368	689	522
September	577	508	781	450
October	447	420	610	490
November	371	482	601	612
December	339	285	667	576
January	289	331	590	506
February	301	466	658	475
March	359	608	700	537
	5,007	4,752	7,546	6,072

The gum received at Auckland during the last two years is probably the high-water mark unless another "boom" sets in. It included the balance of pretty well all the known accumulations other than chalk gradings, and the number of diggers on the gumfields was greater than for some years past. The winter weather set in very early in 1924, April having a rainfall of 11 in. against an average for April of 3.3 in., this constituting a record for April since measurements were first taken over half a century ago. The rainfall for May was also a record for that month, being 10.63 in. against an average for May of 4.48 in. The rainfall for June last, at time of writing, passed the average for the month. The deep swamps are therefore full of water, and production is almost at a standstill. The output for some time will be very small, and no large output from the deeper swamps can be expected before the end of 1924.

THE WAIPUNA KAURI-GUM COMPANY (LIMITED).

Rather an innovation in the trade is the formation of this English company, which has purchased an area of gum-bearing land, and proposes to dig and export kauri-gum on its own account. The area purchased is a valuable one, consisting of some 1,100 acres near Lake Ohia, in the Mongonui County. The project is understood to have been given most thorough investigation, both in New Zealand and abroad, by people well qualified to speak with authority. In addition to digging gum, the company will also probably purchase gum from diggers and others.

Previously it has been thought almost impossible to go past the middlemen abroad, especially in London, and make any great progress. Apparently the shareholders in this company think otherwise. They certainly have the good wishes of the producers and those depending on them for a livelihood in the gum-digging areas. If this company can establish direct relations with the users abroad and make good, it will possibly open the way for large companies working chip areas, and may result in inestimable value to the country at large.

GUM-WASHING COMPANIES AND LARGE-SCALE PRODUCTION.

Quite a number of companies and syndicates have been formed during the past few years to work gum-bearing areas, principally "chip" fields, on a large scale. Few gum-diggers, and scarcely any dealers or exporters in the City of Auckland, took part in the formation of these ventures, owners of gum-bearing land and speculators comprising the most prominent shareholders. So far no great success has been achieved. Some of the largest companies have dropped out altogether; those that are still in existence play but a small part in the production of saleable gum.

A great deal of pioneer work has been done by these companies, and many types of machines have been evolved and tried out to deal with the gum-bearing soil and separate the gum from the earth and other foreign matter. They are mostly screens of varying size, and placed in different positions in all shapes, sizes, and classes of tubs and cylinders, with a variety of means of agitating the soils when passing over the sieves. In theory the earth crushes up and passes through the sieving with the water. The difficulty is that much of the earth and the "mud-balls" formed by the rotary movement of the plants is too large to pass through the sieving and is far harder than the gum. To break up this foreign matter would mean breaking up most of the gum. So far no plant has attained any general use, and it is very questionable if any great improvement has been made on the digger's hand-tub, except that a greater quantity of material can be put through at a time.

Although the companies are able to wash, clean, and grade gum much cheaper than the digger, the latter seems to have such an advantage in the digging of the soil and the delivering of the material into the tub that he is more than able to hold his own. The chief endeavour of companies has been to work up washing and cleaning plants—the digging and handling, which constitutes the chief cost of production, being mostly done with the spade in the same fashion as the single-handed digger works. Under present methods of "rubbling" the small parties of diggers can clean and grade the yield in about one-fourth the time it takes to dig and pass through the washing-tub. Much of the cleaning is done in broken time and on Sundays, and it is obvious that hired men will not work such long hours or so hard as a digger on his own account, especially when prices are high and the demand good. The digger has also an advantage inasmuch as he can dig on Government reserves on the payment of an annual license fee of 5s., whereas a company must purchase or lease freehold land.

Apart from the question of production, the companies have also found difficulty in disposing of their yield. They invariably attempted to produce a better chip than the market demanded, and there was an undue disposition, for a commencement at any rate, to try and do business direct with the dealer or user abroad. Unless low-grade kauri-gum is sold on a guaranteed gum content, and some standards established, the larger producers will probably always experience difficulty in making sales fit in with production.

Until better mechanical methods are devised that will enable the digging and conveying of the gum-bearing soil to the washing plant at a much lower cost than digging by hand, large-scale production of cheap chip gradings is exceedingly unlikely.

THE LATE REGINALD PALMER GREVILLE.

It is with extreme regret I have to record the death of the late Mr. Greville, which took place on the 6th September, 1923. He had served in the Lands and Survey and Geological Departments for many years, and was appointed Chairman of the Royal Commission which was set up in 1914 to inspect and classify the Government kauri-gum reserves. A great deal of administrative work was necessary in the way of giving effect to the findings of the Commission and opening up for settlement the land from which the reservation had been uplifted. This was entrusted to Mr. Greville. Before it was completed the war broke out and the bottom fell out of the kauri-gum trade. Immediate action had to be taken by the Government to protect the gum-diggers from serious want caused by a lack of sales. The result was the setting-up of the Kauri-gum Branch of the Lands and Survey Department, Mr. Greville being placed in charge as Kauri-gum Superintendent, which position he held until the time of his death. In addition to being a licensed surveyor, Mr. Greville was also a fully qualified solicitor and a land-valuer of high standing.

Although there was at one time some objection to the Kauri-gum Branch by a certain section of the trading community, it is pleasing to record that this feeling has almost entirely disappeared, and harmonious relations prevail at the present time. Much of the credit for this must be given to the late Mr. Greville, a far-seeing man of affairs, conscientious to a degree in the carrying-out of his official duties, and of the utmost integrity. When the Royal Commission of 1921 was set up to inquire into the kauri-gum industry generally, and particularly into the burning questions as to the advisability of instituting an export tax and standard gradings of gum, Mr. Greville, although the head of an export business, was selected Chairman with the unanimous consent of the whole industry.

Owing to Mr. Greville's illness and subsequent death the control for a considerable period of 1923-24 was practically in the hands of Mr. G. Anderson, and the thanks of the Department are due to him for the energetic, loyal, and businesslike way he carried on.

H. J. LOWE,

The Under-Secretary for Lands.

Kauri-gum Superintendent.

STATEMENT OF ACCOUNTS FOR YEAR ENDED 31ST MARCH, 1924.

KAURI-GUM INDUSTRY ACCOUNT.

Receipts and Payments.

<i>Receipts.</i>			<i>Payments.</i>		
	£	s. d.		£	s. d.
Cash in hand, 1st April, 1923	2,088	11 1	Wages to workmen and gum-buyers ..	2,656	5 11
Sales of kauri-gum	22,091	12 10	Plant, machinery, stores, &c. ..	636	17 3
Miscellaneous receipts and proceeds from consignments	885	10 2	Purchases of gum	6,569	0 3
			Freights, &c.	3,361	8 7
			General and office expenses, administration, &c.	1,462	8 7
			Interest on loan debentures and sinking fund	3,411	12 11
			Cash in hand at Treasury, 31st March, 1924	6,968	0 7
	<u>£25,065</u>	<u>14 1</u>		<u>£25,065</u>	<u>14 1</u>

TRADING ACCOUNT.

	£	s. d.		£	s. d.
To Gum on hand, 1st April, 1923 ..	60,753	9 9	By Gum on hand, 31st March, 1924 ..	53,663	14 10
Purchases of gum	6,344	4 10	Sales of gum	22,091	12 16
Wages	2,509	10 11			
Freights inward	788	10 7			
Balance, being gross profit, to Profit and Loss Account	5,359	11 7			
	<u>£75,755</u>	<u>7 8</u>		<u>£75,755</u>	<u>7 8</u>

PROFIT AND LOSS ACCOUNT.

	£	s. d.		£	s. d.
To Freights outward	1,919	7 6	By Trading Account	5,359	11 7
General expenses	134	1 11	Profit from sale of plant, stores, commission, &c.	487	14 5
Cables, &c.	68	6 9			
Sacks, gum-cases, and consumable stores	596	6 0			
Fire insurance	205	0 10			
Printing and stationery	39	18 4			
Depreciation	61	12 0			
Rent	300	0 0			
Salaries	534	6 0			
Balance carried down	1,988	6 8			
	<u>£5,847</u>	<u>6 0</u>		<u>£5,847</u>	<u>6 0</u>
	£	s. d.		£	s. d.
To Balance on 1st April, 1923 ..	5,176	19 11	By Balance brought down ..	1,988	6 8
Interest on debentures	3,287	5 0	Balance as per balance-sheet ..	6,475	18 3
	<u>£8,464</u>	<u>4 11</u>		<u>£8,464</u>	<u>4 11</u>

BALANCE-SHEET.

<i>Liabilities.</i>				<i>Assets.</i>			
	£	s. d.	£	s. d.		£	s. d.
Loan Account—Debentures issued under Kauri-gum Industry Act, 1914 ..	75,000	0 0			Land at face-works and elsewhere, with buildings, fences, and improvements ..	5,106	2 6
Less sinking fund in hands of Treasury	484	0 11			Vacuum-tank, fittings and plant, and royalties, short-workings	2,900	6 10
	<u>74,515</u>	<u>19 1</u>			Plant and store fittings	256	6 8
Crown Land Account	500	0 0			Live and dead stock	47	9 3
Sundry creditors, for supplies	85	8 9			Furniture and office fittings	99	4 5
Sundry creditors, for gum purchases	275	5 3			Sacks, gum-cases, and consumable stores ..	275	2 6
Interest on debentures	1,354	17 3			Charges paid in advance	92	4 8
					Gum on hand	53,663	14 10
					Gum on consignment	782	17 2
					Sundry debtors	64	2 8
					Cash on hand	6,968	0 7
					Profit and Loss Account	6,475	18 3
	<u>£76,731</u>	<u>10 4</u>				<u>£76,731</u>	<u>10 4</u>

H. J. LOWE,

Kauri-gum Superintendent.

I hereby certify that the balance-sheet and supporting statements have been duly examined and compared with the relative books and documents submitted for audit, and correctly state the position as thereby disclosed; also that the value of the stocks on hand has been accepted on the certificate of the Kauri-gum Superintendent.—G. F. C. CAMPBELL, Controller and Auditor-General.

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