

1925.
NEW ZEALAND.

KAURI-GUM INDUSTRY

(REPORT ON THE) FOR THE YEAR ENDED 31ST MARCH, 1925.

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, 10th August, 1925.

I have the honour to submit herewith the annual report under the Kauri-gum Industry Amendment Act, 1914, for the year ended 31st March, 1925.

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, 1925, the export amounted to 5,432 tons, of the value of £446,019, an average price of £82 per ton, against £92 per ton last year and £85 and £98 respectively the two previous years.

The export during the year was the smallest since 1919–20, and the average price per ton was the smallest since that year. Just over half the total export went to the United States of America and Canada, the average price being £94 per ton. The other half of the export went to nine different countries, and averaged £70 per ton, clearly showing that the best gums go to North America, where very large quantities of linoleum grades also are taken.

Particulars of Kauri-gum exported from New Zealand from 1914 to 31st March, 1925, inclusive.

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	..	..	..	..
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

Country to which exported.	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.		1st April, 1924, to 31st March, 1925.	
	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£
United States of America	2,037	157,251	3,224	345,992	2,487	266,922	3,742	367,946	4,197	449,117	2,624	250,379
United Kingdom	1,650	90,422	2,544	149,422	1,297	104,094	1,960	129,082	2,409	170,785	2,360	169,975
Germany	..	..	..	..	58	3,574	70	3,363	66	2,832	117	6,367
Canada	1,016	61,005	314	24,481	89	9,641	109	7,462	118	7,714	97	5,726
Australia	23	1,936	49	4,802	37	7,073	84	6,679	7	787	24	2,006
Belgium	..	..	..	..	..	..	..	..	..	..	..	..
France	..	..	..	..	..	..	..	..	55	5,855	79	5,121
Austria-Hungary	..	..	..	..	..	..	..	..	..	..	..	..
Russia	..	..	..	..	..	..	..	..	..	..	..	..
Netherlands	..	..	..	..	..	..	90	4,381	38	1,582	53	1,917
Sweden	..	..	..	..	..	..	20	1,000	..	..	20	820
Italy	..	..	..	..	..	..	1	170	26	1,647	55	3,546
Japan	..	..	..	4	..	..	4	326	7	393	3	162
Hong Kong	..	..	..	..	..	..	..	..	..	..	..	..
Totals	4,726	310,614	6,131	524,701	3,968	391,304	6,080	520,409	6,923	640,712	5,432	446,019

THE AUSTRALIAN LINOLEUM COMPANY (LIMITED).

A company has been formed in New South Wales to manufacture linoleum, and shares are understood to have been freely taken up by New-Zealanders. At present the building of the factory is pretty well completed, and in a short time the company will be in a position to purchase considerable quantities of kauri chip gradings. It is understood that the company is quite prepared to get into touch with the actual producers and buy direct without the intervention of middlemen. The head office of the company is situated in Post Office Chambers, 333-337 George Street, Sydney.

A representative of the company was in Auckland recently, and was good enough to supply the following details of the manufacture of linoleum. There has hitherto been very little specific information available on the subject, and the details will be of considerable interest to those engaged in the kauri-gum industry.

The Manufacture of Linoleum.

The invention of the manufacture of linoleum was made by Frederick Walton. Like many of our inventions which have led to the industrial progress of the world, that of linoleum was due to an accident. Frederick Walton, standing beside a bench in his mill, chanced to pick up a piece of the "skin" that had formed on some paint, which had been standing for several days. He was immediately struck by its tough, elastic consistency, and subsequently carried out experiments, which resulted in the production of linoleum.

Linoleum is prepared from solid linseed-oil matter, together with rosin, or kauri-gum, to which more than its own weight of ground cork has been added. Linseed-oil intended for linoleum-manufacture must be thoroughly oxidized until it forms a yellow gelatinous mass heavier than water and quite insoluble. The oxidation of the oil is one of the most important steps in the manufacture of linoleum, and there are various methods employed. One device, which is an old one, is to drip linseed-oil previously dried by boiling it with a drier, or by filtering through common salt, on a cotton fabric, hung in a room the temperature of which is kept about 38° centigrade. It takes about twenty-four hours for each layer to solidify. The dropped-off oil is collected and used again. This process continues for about six weeks, and when the solid oil is about $\frac{1}{2}$ in. thick the cloth or skin is cut down. This is known as the "sorim" oil, and the fabric has by this time completely disappeared. By the method just described the oil gains about 8 per cent. in weight, and is fairly elastic. The quick-oxidizing method consists in half-filling a steam-jacketed cylinder with linseed-oil, and driving through it a current of air, while the central shaft, provided with strong arms, rotates at a great speed, aerating the oil thoroughly. The temperature of the steam varies with the nature of the oil to be obtained. After six hours the steam is replaced by cold water, and the oil is run out into trays, in which it solidifies. If a light-coloured oil is required the heating must last twenty-four hours. In order to complete the oxidization the oil is kept in trays at a temperature of 38° centigrade for a week. By this process there is a loss of about 8 per cent., and the oil is not so elastic and liable to spontaneous ignition.

Another process for reducing linseed-oil to a thick mass suitable for mixing with the ground cork for the manufacture of linoleum is achieved by prolonged boiling alone, which causes the oil to polymerize. A considerable portion of the linoleum sold at the present day is made from oil so prepared.

After the solidified oil is obtained, the first step in the manufacture of linoleum is the production of "linoleum-cement." This is accomplished by melting the solidified oil with various gum-resins (usually kauri-gum and rosin) and mixing it with cork, flour, and various pigments and fillers. The composition thus obtained is finally rolled on to the canvas.

A good elastic cement is composed of about 8 $\frac{1}{2}$ cwt. of oxidized oil, 100 cwt. rosin, and 300 cwt. kauri. Sometimes copal is added. Each manufacturer, however, uses his own formula, and this is carefully kept a trade secret. The kauri is pulverized, but the rosin can be used in lumps, since it acts as a flux.

The mixing operation is carried out in a steam-jacketed vessel, provided with stirrers, samples being withdrawn from time to time and tested. It is of the greatest importance that no overheating takes place. When thoroughly mixed the "cement" is run into pans, and, if necessary, artificially cooled, since large masses of this (as well as the oxidized) oil have been known to heat and spontaneously

in flame. The "cement" is cut into small pieces, mixed with rather more than its weight of ground cork, passed through steam-heated mixing-rolls, more thoroughly amalgamated in a mixing-drum (various colouring-matter is here added according to the colour desired for the finished article), and then passed into a "german," an apparatus resembling a large sausage-machine, but very strongly made. At first steam heating is necessary, but, once the machine is working, heat generated by friction keeps the mass soft, and in summer it is even necessary to circulate cold water in the jacket instead of steam. From the "german" the material issues as lumps or pellets, and is forced through a mixing-roller, in which it is converted into sheets, and finally is rolled on jute canvas by means of steam-heated rollers. The canvas back is protected by varnish (backing) spread upon it by means of a special machine, the main ingredients of the backing being oxidized oil and varnish, or varnish bottom mixed with ochres and oxides. The material is fluid when hot, but solidifies on cooling. Finally, the linoleum is "seasoned" in rooms at 23.5° centigrade in horizontal racks.

MARKET CONDITIONS DURING THE YEAR.

During the year the output at all times quite equalled the demand, with the result that accumulated holdings were not offered, and, for the most part, were unsaleable at payable prices.

ACCUMULATIONS OF KAURI-GUM.

A combination of causes is responsible for this continued dullness. In the first place it must be admitted that there are in Auckland firm holders of fair quantities of kauri that cost more than current quotations. The holders will not sell at a loss, on the grounds that it has always paid to hold off until the market firmed, and that it will do so again. Whether this is good business, and for the ultimate benefit of the holder or the industry, need not be discussed here: it is sufficient to state that such gum is held, and is well held. Very few, if indeed any, of these holders can be classed as speculators. The speculator can find much safer and more profitable fields for his activities. The holders comprise storekeepers, brokers, dealers, and exporters who are continually engaged in the trade, and who invariably have more or less stocks of kauri on hand. The storekeepers take gum against stores from many of the diggers, and the brokers and exporters in turn finance the storekeepers and the remaining diggers by advancing cash or goods against gum. The exporters in some cases buy direct from diggers all the year round, taking their output whether there is any immediate demand or not. This is regarded by some exporters as the safest course, as they can offer stock which has already been graded and costed without taking the risk of having to go on the market after an order has been taken. The exporter who "carries" his clients through a dull period has also the advantage that he can always depend on receiving their gum when a strong demand sets in and when well-graded-up lines are difficult to obtain. In the case of the exporters there is also the fact that it is impossible in most cases to buy gum in form of the export gradings. The stock as purchased must be graded, sized, and blended by the exporter staff to meet his export samples. To fill an order for the "bread-and-butter" line, B2, for example, the exporter will generally have to buy up to 30 cwt. of stock to grade up 20 cwt. of B2, the remaining 10 cwt. going into sometimes as many as a dozen other export gradings. These "ullages," as they are called in the trade, constitute a very appreciable source of the exporter's accumulated stocks. A few exporters go to the other extreme and refuse to stock up under any consideration, buying only against actual orders on hand, and thus accumulating only "ullages." Probably, as in most matters, the middle course is the safest, but the fact that firms with a very lengthy experience in the trade unhesitatingly stock up during dull periods goes to show that those who are holding stock for a better market have a good deal on their side. Usually a very large proportion of the available stocks are held on the gumfields, but at present the supplies held in the City of Auckland constitute a much larger percentage of the total holdings than has been the case for some years. As has been said, these stocks are well held.

"HAND-TO-MOUTH" BUYING IN THE UNITED STATES OF AMERICA.

In pre-war days it was considered quite a common thing for some American manufacturers to go on the market only now and again, and to lay in very large stocks of kauri when they did buy. In addition it has been regarded as the traditional policy of the American to buy freely on a rising market and to refuse to buy on a falling market. With the "ups and downs" kauri has experienced there has been plenty of scope to follow such a policy.

The new gospel of "simplification" as preached in business circles in America since the war has undoubtedly affected the gum trade, inasmuch as manufacturers are generally conceding the manifest advantages of working on smaller stocks and of refusing to gamble in raw materials. Some varnish-manufacturers have cut down the number of sizes and styles very materially, with a very much faster stock turnover. Just how far this simplification has been carried out in the varnish trade is uncertain, but we do know that even large manufacturers are buying on a "hand-to-mouth" policy, although prices of kauri appear to have reached the lowest levels, and they give no indication that any change-over to the old style of large purchases is imminent. It seems certain that the old time "boom" buying on the part of the Americans is a thing of the past, and in the long-run the kauri-gum industry will be all the better for it.

The North American buyer is the real competitor and sets the prices, and there is no doubt that the new buying policy followed by these buyers has played its full share in the general dullness during the past year or two. In the meantime production is falling off, and the number of men engaged in the production of gum is at present smaller than for some years.

THE NEW MOTOR-CAR LACQUERS.

Probably the chief factor in prolonging the slump is the use of new lacquers in the motor-car industry. For a time it was feared that the lacquers would entirely displace varnishes in that industry. This new lacquer is a type of nitro-cellulose which is made much as gun-cotton is manufactured, by dissolving purified cotton in nitric acid and putting it through a process that prepares it for the admixture of solvents, gums and pigments, to produce an opaque enamel which dries rapidly in the air. From six to eight coatings in all are said to be necessary, air-guns being used for spraying on the lacquer. Successive coats can be put on at thirty-minute intervals. It is claimed by one manufacturer that two first-class workmen can finish the enamelling of a sedan in one and a quarter days. It is generally understood that the varnishing of a car takes from fifteen to twenty-days, so that if the lacquering can be done in less than two days it is clear that the saving in time amounts to about a fortnight. Where cars are being turned out by the thousand, as is actually the case, the savings in factory space and the savings in shortening the period of production by a fortnight must reach enormous sums, and it is obvious that if the lacquers can at all compare with varnishes preference must be given to the lacquers.

The fact that the best-known lacquer is manufactured by a division of E.I. du Pont de Nemours and Co. gives it an immediate prestige. A number of well-known American cars were turned out in 1924 and 1925 with the new lacquer finish, many of them being now in use in New Zealand. It is considered that until about the end of 1925 no definite conclusion can be arrived at in regard to the place lacquer is likely to hold in the motor-car industry, but it is already claimed that it will be necessary to give the lacquer a finishing coat of varnish to produce the requisite lustre that is demanded in a motor-car finish. If so, the lacquers are not nearly so formidable competitors of varnishes as has been thought.

BLED BUSH GUMS.

During the year there has been a shortage of all grades of bled bush gums. This is a result of few forests being bled at the present time. Most of the output is coming forward from very small forests and from odd lots of from one to two trees scattered throughout the province, with the addition of a good deal of "poached" gum from trees that are being bled without the knowledge of the owners. It is probable that one fairly large forest will be bled very shortly, and, if so, this will ease the situation and help to keep the supply nearer the demand.

The greater part of the kauri forests now remaining are the property of the State, and, as was stated in my report last year, investigation is being made by the State Forest Service as to the advisability of bleeding the trees. So far no definite pronouncement has been made, and it would appear that the owners of the largest privately-owned kauri forests remaining are awaiting a lead from the State Forest Service.

PRODUCTION OF KAURI-GUM DURING THE YEAR.

As is stated in another part of this report, the quantity of gum held in the City of Auckland is a much larger percentage of the total holdings than has been the case for some years. A great deal of gum received in Auckland during the past year had been dug in previous years, and was brought to town by diggers who were leaving the fields to take up other work. Last year most of the large country accumulations of gum, except "chalk" gradings, were sent into Auckland, so that the total holdings on the gumfields are comparatively small.

During the latter end of the year the continued dullness resulted in many diggers leaving the fields, and at the present time (July, 1925) there are fewer diggers on the fields than for a long time past. Several more of the gum-washing companies, including Parenga Kauri Oils (Limited), the largest and pioneer gum-washing concern, have gone into liquidation. The English company referred to in my report last year as having purchased a gum-bearing property and commenced operations with a paid-up capital of £95,000 has closed down for the present. Production on a large scale is therefore out of the question during 1925, and there can be little doubt that the output in all gradings must be comparatively small.

The gum received at Auckland from the gumfields is shown, month by month, for the past five years, in the following table:—

Kauri-gum received in Auckland.

	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.
	Tons.	Tons.	Tons.	Tons.	Tons.
April	612	191	543	480	439
May	532	331	514	613	501
June	370	358	654	459	344
July	434	404	548	352	363
August	376	368	689	522	407
September	577	508	781	450	373
October	447	420	610	490	471
November	371	482	601	612	427
December	339	285	667	576	591
January	289	331	590	506	525
February	301	466	658	475	492
March	359	608	700	537	520
	5,007	4,752	7,546	6,072	5,453

SELLING LINOLEUM GRADES ON A GUM-CONTENT BASIS.

During the past year a number of manufacturers abroad refused to buy linoleum grades unless a specified gum content was guaranteed. As a result the testing of low grades for gum content has been given more attention than previously. The exporters are now freely making tests of the soluble-resin content of purchases and shipments. The tests are usually made with acetone or alcohol, although the Maclaurin salt-vacuum test is also used. Since linoleum grades are exported with resin contents ranging from 30 or 40 per cent. to as high as 90 per cent. or more, it is difficult to understand why sales have not been made on a gum-content basis all along. At all events it seems quite safe to assume that for the future the exporter will both buy and sell using the gum content as a basis when fixing prices, and it is equally certain that it will be for the good of all concerned.

THE ALLOCATION OF GOVERNMENT GRANTS FOR THE PURCHASE OF GUM.

During the year all Government purchases of gum have been in the way of relieving distress on the gumfields, and gum has only been taken when no other buyers were operating and the diggers found it impossible to make a sale elsewhere. It was out of the question for the Government to attempt to buy all the gum offering, and it was not always possible to find sufficient funds to buy some gum from each digger wishing to make a sale. It therefore remained for the Department to try and allocate the money to the best advantage.

At all times there has existed a difficulty of deciding which diggers are most pressed and should receive preference. Early in the year in several districts the committees formed to go into the question of a board of control asked that a favourable recommendation should be received from the local committee before any particular digger participated in the funds available for the purchase of gum. It was suggested that the members of the committees and their wives and friends were in a much better position to know the financial position of the diggers than the Government buyer. There was also the fact that in many cases the more independent of the diggers would not unduly press their claims to the Government buyer, whereas they would, in the case of a committee of fellow-diggers, go into their financial position and make the best of their cases.

The various committees, in offering their services, quite understood the extremely unpleasant and unpopular task they were undertaking. It is, of course, quite impossible to please every one, and the disappointed diggers at times offer their opinions on the subject very freely.

This method of allocating the funds was put into effect. The procedure is for the district committees to be advised of the amount available in any particular month. Diggers who wish to make sales send in their names to the committee, and, so far as funds permit, the money available is allotted to the most deserving cases on the basis of the number of dependents. The list is then handed to the Government buyer, who purchases gum to the amount shown on the list from each person named. Of course, the allocation of the money by the committee is not binding on the Department, and the digger, if he so chooses, can refuse to accept the prices offered by the Government buyer. This method of making purchases of gum has been given a good trial and has been found very satisfactory. Very few complaints have been received, and in no case has it been found necessary to interfere with the recommendations of the various committees. The activities of the committee for the Houhora-Waihopo district call for special mention. A very large number of diggers are still working on the fields in that district, and outside buyers have been operating to only a very slight extent. At all times during the year the diggers have only been able to sell small lots of gum, and in allotting the various grants the committee has had an exceedingly difficult task and one which has been carried out in a very satisfactory and businesslike manner.

GENERAL.

The question of the best method of control of the kauri-gum industry has received a good deal of attention during the year, and legislation is pending having for its object the improvement of conditions in certain respects. There is no intention of interfering in any way with the established exporters, or of restricting output, or altering the gradings of gum as now exported; but it will probably be found possible to effect improvements in the marketing of the gum by the diggers, and generally to stabilize the industry.

H. J. LOWE,
Kauri-gum Superintendent.

KAURI-GUM INDUSTRY ACCOUNT.

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1925.

<i>Receipts.</i>			<i>Payments.</i>		
	£	s. d.		£	s. d.
Cash in Public Account, 1st April, 1924 ..	6,968	0 7	Wages to workmen and gum-buyers ..	1,830	6 1
Sales of gum	15,335	19 1	Plant, machinery, stores, &c. ..	571	2 8
Miscellaneous receipts	265	0 11	Purchases of gum	11,101	5 8
			Freight, cartage, &c.	2,160	14 6
			General expenses	1,062	4 11
			Interest on debentures	3,275	0 0
			Sinking fund	133	12 11
			Cash in Public Account, 31st March, 1925	2,434	13 10
	<u>£22,569</u>	<u>0 7</u>		<u>£22,569</u>	<u>0 7</u>

TRADING ACCOUNT.

		£	s.	d.			£	s.	d.
To Gum on hand, 1st April, 1924	..	53,663	14	10	By Gum on hand, 31st March, 1925	..	54,633	12	11
Purchases of gum	..	11,096	18	0	Sales of gum	..	15,335	19	1
Wages	..	1,811	17	0					
Freights inward	..	993	10	9					
Gross profit carried down	..	2,403	11	5					
		<u>£69,969</u>	<u>12</u>	<u>0</u>			<u>£69,969</u>	<u>12</u>	<u>0</u>

PROFIT AND LOSS ACCOUNT.

		£	s.	d.			£	s.	d.
Freight outward	..	1,358	9	6	Gross profit from Trading Account	..	2,403	11	5
General expenses	..	138	5	5	Profit from sales of stores, &c.	..	170	11	11
Cables, &c.	..	49	14	11	Balance carried down	..	4,075	13	1
Sacks, cases, &c.	..	592	8	3					
Fire insurance	..	133	10	10					
Printing and stationery	..	32	0	10					
Depreciation	..	58	12	6					
Salaries	..	569	14	9					
Travelling-expenses	..	17	5	11					
Rent	..	300	0	0					
Interest on debentures	..	3,266	0	7					
Sinking fund	..	133	12	11					
		<u>£6,649</u>	<u>16</u>	<u>5</u>			<u>£6,649</u>	<u>16</u>	<u>5</u>
		£	s.	d.			£	s.	d.
Balance from previous years	..	6,475	18	3	Balance at 31st March, 1925	..	11,035	12	3
Sinking fund provided in previous years	..	484	0	11					
Balance carried down	..	4,075	13	1					
		<u>£11,035</u>	<u>12</u>	<u>3</u>			<u>£11,035</u>	<u>12</u>	<u>3</u>

BALANCE-SHEET AS AT 31ST MARCH, 1925.

<i>Liabilities.</i>		£	s.	d.	<i>Assets.</i>		£	s.	d.
Loan Account—Debentures issued	..	75,000	0	0	Land at face-works and elsewhere, with buildings, fences, and improvements..	..	5,085	10	0
Crown Lands Account	..	500	0	0	Vacuum-tank, fittings, and plant, and royalties, short workings	..	2,900	6	10
Sundry creditors, for supplies	..	557	10	10	Plant and store fittings	..	191	18	4
Sundry creditors, for gum purchases	..	280	5	2	Tools, Auckland and depots	..	35	18	4
Interest on debentures	..	1,345	17	10	Live and dead stock	..	42	16	9
Sinking Fund Reserve Account	..	617	13	10	Furniture and office fittings	..	91	14	5
					Sacks, gum-cases, &c.	..	283	10	6
					Charges paid in advance	..	101	9	10
					Gum on hand	..	54,633	12	11
					Gum on consignment	..	782	17	2
					Sundry debtors—Miscellaneous	..	64	2	8
					Sinking Fund Reserve	..	617	13	10
					Profit and Loss Account	..	11,035	12	3
					Cash in Public Account at 31st March, 1925	..	2,434	13	10
		<u>£78,301</u>	<u>7</u>	<u>8</u>			<u>£78,301</u>	<u>7</u>	<u>8</u>

H. J. LOWE,
Kauri-gum Superintendent.

Approximate Cost of Paper.—Preparation, not given; printing (775 copies), £8 12s. 6d.

By Authority: W. A. G. SKINNER, Government Printer, Wellington.—1925.

Price 6d.]