

carrying out the process comprising sand-hoppers and blast-jets, trays for receiving the gum-pieces, a conveyer for moving the trays through a cabinet containing the blast-jets for cleaning the gum, and exhaust fan and pipes for withdrawing the gum-dust from the cabinet and passing it to a settling room, a sand-elevator for collecting used sand from the bottom of the cabinet and transferring it to the sand-hoppers for use again.

Not only is it important that all gum should be exported in the best condition, but it is also equally important that the grades of gum should be standardized. One of the largest exporters of kauri-gum in Auckland recently expressed himself most emphatically on this point. He said there was nothing in his opinion more calculated to put the export trade on a sound basis than the establishing of standard grades by the Government. He thought that about thirty grades would be sufficient to fill all requirements, and the introduction of Government grading would put an end to the existing unsatisfactory conditions, under which each merchant graded his gum according to his own particular fancy, having recourse to a grading which would be most profitable to himself.

It may be here pointed out that provision was made for the Government grading of gum in the Kauri-gum Industry Amendment Act of 1910 (*vide* schedule of Act referred to, amendment to section 30). Probably before long it may be found necessary to make provision for bringing the above section of the Act into operation.

KAURI-GUM, ITS USES, QUALITIES, AND PARTICULARS OF EXPORT.

Kauri-gum is found only in that portion of New Zealand lying between latitude $34^{\circ} 20'$ and $38^{\circ} 20'$. This region comprises all that area of the North Island to the north of a line drawn approximately from Kawhia on the west coast to Tauranga on the east. It is found in irregular-shaped pieces of much larger size than any of the other fossil resins, and in colours ranging from the clear-white range to the dark-brown and almost black swamp. It is externally dull in appearance, and in the best class of gum, known as "dial," the transparency varies in different parts of the same piece, striated, smoky, and cloudy portions being often seen in the same lump. Kauri-gum breaks with a conchoidal fracture, and the broken pieces have a fragrant odour which is characteristic of the gum. The specific gravity ranges from 1.70 to 1.80, and the melting-point from 380° to 460° . In destructive distillation the loss in weight is from 15 per cent. to 25 per cent.

Kauri-gum can be recognized from the true copals by its greater brittleness and resinous odour, but it is often very difficult to distinguish at sight between certain samples of Manila copal and some of the lower grades of kauri-gum.

Kauri-gum does not withstand the action of the atmosphere as well as the best of the copals or the Zanzibar animi, but makes a very good varnish of the best grade. Writing in 1880 on the subject of varnishes and fossil resins, Mr. R. Ingram Clark, F.L.S., said: "Kauri is extensively employed by the leading manufacturers in every country where varnish is made. The universal favour we by no means attribute to the superior results to be obtained by its use, but rather to the fact that it is easier to manipulate—that is, it unites with linseed-oil quicker, and at a lower temperature, than any other resin. It is probable that the essential oil it contains acts in the fusing process as a solvent; hence, less heat being necessary, carbonization is minimized, and a relatively paler varnish is the product."

Mr. H. Hurst, another recognized authority on the subject of varnish-making materials, and one-time lecturer on the technology of paints, colours, and varnishes at the Municipal Technical College, Manchester, in a recent work says, "Kauri does not make as good a varnish as copal, but being easier to melt, and the melted resin being much more soluble in oil, kauri varnishes are much easier to manipulate."

Bennett Blacker, Ph.D., in Allen's Analysis (Vol. iv), in discussing various resins, states, "Speaking generally, the greater the hardness the more valuable the copal. This generalization does not hold good for gum kauri. This resin has been extensively used in the varnish-making industry, not only because of the good results obtained, but also for the ease with which it can be manipulated by the varnish-manufacturers. There are other resins which melt at a lower temperature, but they have peculiar properties, and are not so easy to work."

It is thus evident that, besides possessing a general all-round excellence as an oil-varnish ingredient of high value, kauri has qualities absent in the other fossil resins, which make it easily soluble in oil and simple to manipulate, and these facts no doubt account for its universal use wherever high-grade varnishes are made. Assertions are frequently made by those interested in the export of kauri-gum that the kauri-resin as a varnish material will soon become a thing of the past and that the demand for it will steadily decrease. There seems little warrant, however, for such a conclusion, and the authorities quoted above make manifest why it is that kauri has so firmly held its own for so many years against all other fossil resins. In spite of all such assertions it may be declared with some confidence that the kauri-gum trade will continue to maintain itself as one of the important industries of the Dominion, certainly for another quarter of a century and probably longer. True there is no second crop coming in, and every shipment lessens the available supply, but the same may be said of all the fossil resins on the market. Consideration of these points suggest that it may be advisable before long to regulate the export of kauri-gum.

It is often stated by men in the gum trade that some varnish-manufacturers are using less kauri than formerly, and that others, having found a substitute, have dispensed with the use of kauri altogether. These statements may be more or less correct, and the explanation is probably that the manufacturers referred to are turning out an inferior varnish. The steady demand for kauri which is shown by a study of the export returns for many years should remove any misgivings there may be in some minds as to the future of the industry.