

logged, and both freely dropped in a salt solution which floated the gum. Credit for having originated the idea is understood to be due to Messrs. McGrath Brothers, of Ruakaka, who, at Mangawai, some years ago, were amongst the first diggers to put the rubbling process into use.

This process gives much promise, as the whole operation can be carried out with practically no plant. One digger has made a very good job of it by simply using a butter-box to float and sink in. It is not only the low cost of handling that interests the digger, but the fact that the "cleaning up" of his gum is made so much easier and can be done in a very much shorter time, and there is not the loss of gum in the "winding." By this process the digger dries and handles only the actual gum and a small percentage of fibre and wood that float with it and which constitute a very small bulk compared with the amount dried and handled under the old process. Gum is not soluble in water and will drain almost dry, whereas the dirt and wood recovered with the chips in the ordinary way are saturated and have to be dried right through to make even a passable job of cleaning and winding. The cost of the salt, which cannot be recovered, and the work entailed in washing out and recovering as much of it as possible, offset the advantages somewhat. Very little gum treated in this way has reached us, but there seems to be no doubt that the process is a very practical solution of the "cleaning" difficulty, in some localities at least. Careful tests made from sack lots sent in showed a gum content of about 90 per cent. real gum after allowing for moisture.

In considering this process of cleaning there are two very important facts to be reviewed. In the first place there is an undoubted demand for chips and dust that are anything but free from foreign matter. Grades having a gum content ranging from 40 to 65 per cent. are in much more demand than very clean grades at a correspondingly higher price. The Department had gradings produced by the Maclaurin process, having a gum content of about 98 per cent. real gum less a small moisture content, on spot in New York for a considerable period. Very satisfactory reports were received from users as to quality, but the prices were the stumbling-block. The chips and dust gradings were not good enough for the varnish-maker, and were priced too high for the linoleum firms. Quite recently a sample was submitted to an American manufacturer which ran about one-half gum, and after a test he openly stated that the sample was too good, and asked for another sample showing a considerably lower gum content. Germany can go better than this, and can apparently use low grades that the American and British firms cannot touch. Perhaps it is put to some use other than linoleum-making, but there is no information available on the point. At all events, the demand for grades that contain a varying and large dirt content is very firm, and must be met by the exporter at this end. No matter what processes are worked up in New Zealand a "dirty" chip and dust will still sell, and sell well, so long as the user at the other end is as willing and anxious for it as he is to-day. It must not be thought, however, that because the manufacturers call for low gradings that they are not willing to buy better classes. This Department has freely sold American varnish and linoleum firms gums of the highest gradings in large quantities, and at the present time the demand for the best grades is greater than the supply. The position as regards the British firms is just the same. Still, there seems to be a large and increasing demand for cheap linoleum, and the manufacturer, to meet this demand, has in the main to turn to cheaper raw materials, even though this involves the production of an inferior article.

The second viewpoint to be considered is that a salt solution will not recover all the gum found in some districts. Most of the chips and dust purchased by the Department, and also samples from many lines not purchased, are tested out for the real gum content. Chips from some districts can be treated in a moderately strong salt solution and all the gum floated off. Other chips will contain a very appreciable percentage of gum that will sink in the strongest salt solution (sodium chloride). Usually chips found in one district will average much the same specific gravity, but this cannot be taken for granted, as at times variations occur in results obtained from chips dug in different parts of very small areas. It is a fact that chips and dust from Ruakaka, where this new process commenced, float off in salt solutions as weak as or weaker than those from almost any other district. In testing samples from Ruakaka a salt solution of 35° Twaddell (specific gravity 1.175) will float practically all the gum. In testing chips from another particular field, where a good supply is being turned out, it is necessary, to float practically all the chips, to use a solution of 54° Twaddell (specific gravity 1.27). By using the salt process about 10 per cent. of the $\frac{1}{4}$ in. chips and dust would probably be lost on this field.

Some hundreds of samples have been tested by the Department, with the result that solutions of strengths varying from 34° to 54° Twaddell are necessary, other solutions being used instead of salt for strengths above 38° Twaddell. Gum from each district required a careful examination to ascertain the strength necessary. In the ordinary way a digger would find it difficult, if not impossible, to keep up a salt solution as strong as 38° Twaddell, so that all gum that did not float at that strength would be lost. The stronger the salt used the more foreign matter is floated off with the gum, so that the digger using this process must find the strength which will give the most return, and he may find it best to be willing to lose a certain percentage of chips and dust, if necessary, to avoid floating off too much fibre and wood, which would cost more to "wind" out of the gum after drying than the extra gum saved would be worth. The fact also remains that the higher the strength of a salt solution the more difficult it is to keep up to that strength, and more salt would be used. These are matters which will only right themselves as a result of experience. To that end the services of this Department are freely at the disposal of any *bona fide* inquirer. Twaddell hydrometers to register from 24° to 48°, and which will cover all requirements of gum-diggers using this process, can be purchased in Auckland for about 5s. 6d. Diggers are strongly urged in their own interests to use a hydrometer instead of the usual potato, which is not nearly exact enough. If the solution is too strong the digger is wasting time and money, and if too weak he is losing more chips by sinking than reckoned on.