

The above oil-recoveries were obtained by the process of a destructive distillation in special retorts. On the redistillation of the crude oil the following average results were obtained: Light spirit, 12 per cent.; medium spirit, 44 per cent.; heavy oils, 44 per cent. The heaviest product is solid at normal temperature, but can be worked up so as to recover a valuable lubricating-oil.

Promising results have been obtained from experiments in the use of these oils for mixing paints. With the heavier oils the colour is rather a disadvantage, but later experiments seem to indicate that this difficulty can be overcome.

The chief obstacle in dealing with the peats, as far as can be judged at present, is the very low average value of the peat per cubic yard owing to its high water-content and the low value of the upper layers. It is hoped by a full recovery of all the gum before distillation that a profitable industry may be established. In addition to the oils, further tests are being carried out with a view to determining what other products are contained in the liquors that come off with the oil. The presence of acetic acid, gallic acid, formaldehyde, and ammonia has been definitely determined, but it is not possible yet to say in what quantities. The presence of other products of commercial value is suspected, but the work has not sufficiently far advanced to give any definite result.

In connection with these investigations as to the value of the peat-deposits it may be mentioned that the matter was brought under the notice of the Dominion Analyst by the Kauri-gum Commission last year, and a sample of peat was sent for analysis. Dr. MacLaurin's report was as follows:—

Dominion Laboratory, Wellington, N.Z., 15th June, 1914.

Report on Specimen No. E/381, forwarded by the Chairman, Royal Commission on Gum Lands, Houhora.

KAURI-SWAMP PEAT.

THE sample when dried consisted of vegetable fibre, peat, and small fragments of gum, which from smell and appearance were undoubtedly kauri-gum. The portion was dried at 100° C., and extracted in a Soxhlet apparatus with absolute alcohol for several days. On evaporation of the alcoholic extract a powdery resin, representing 13 per cent. by weight of the sample taken, was obtained. The constants for this extracted resin, as compared with those of hard clear kauri-gum, were:—

	Extracted Resin.	Good Kauri.
Acid number	106.4	61.6
Iodine number	72.3	132.4

The constants are those of a kauri-gum that have been much altered by the action of air and water. The quality would be very poor.

The composition of the peat was: Resin, 13 per cent.; peat and other vegetable matter, 52 per cent.; ash, 35 per cent.; nitrogen in organic matter, 0.43 per cent.

It was suggested by the Commission that valuable products other than gum might be obtained from the peat. In the report of Mr. Graham Gow, Trade Commissioner, on the kauri-gum industry (parliamentary paper C.-16, 1909), mention is made of experiments made by Mr. Rosse Trevor in distilling peat. It was not stated whether the gum was extracted prior to distillation, so portions of both the original peat and the extracted sample were carefully distilled, first by heating slowly in an air-bath up to 400° C. and then, after transferring to an iron tube, to a red heat. The products obtained from first heating were—

	No. 1 (Original Sample).		No. 2 (Extracted Sample).	
	Per Cent.	Gallons per Ton.	Per Cent.	Gallons per Ton.
Light oil	4.0	10.0	1.2	3.0
At red heat, heavy oil	2.2	5.5	2.0	5.0
Pitch and tar	0.35	0.8	0.3	0.7

Some acetic acid was also given off, and a large amount of inflammable gas. It will be noticed that the percentages of oil obtained from No. 1, the original sample, are much larger than those from No. 2, the extracted sample. The light oil from No. 1 contains a small amount of creosote and tar acids equivalent to half a gallon per ton. The pitch from No. 1 is harder and of better quality than that from No. 2.

The main use for the oils obtained would be for lubrication. The quantity of ammonia obtainable by distillation is small, as the total percentage of nitrogen present, 0.43 per cent., is lower than that found in many coals. The carbonized residue left after distillation contains too large a percentage of ash for it to be of use as a fuel. Its value as a fertilizer would be very small, as the amounts of potash and phosphates present are negligible. Distillation of the extracted peat would therefore not be commercially profitable. The extraction of kauri-gum alone should, however, yield a fair profit.

Considerably more work on average samples of peat from other areas would be necessary to decide whether these conclusions would apply to all kauri-swamp peats.

J. S. MACLAURIN, D.Sc.,
Dominion Analyst.