

Mr. Trevor affirms that destructive distillation is not the proper method of extracting the oils; he has found this from the tests he has made on a commercial scale. The kauri-pine yields probably more resinous matter than any other tree. The following are some results obtained by Mr. Trevor:—

Sample 1.—Total weight of sample as taken from swamp, 16 tons 12 cwt.:—

	Tons	cwt.	qr.	lb.
Loss of weight after being stacked in the open	3	2	0	0
Water extracted by machine	5	7	3	12
Ash	6	4	1	12
Oil	1	17	3	4
	16	12	0	0

Sample 2.—Weight tested, 1 ton. This was taken from about 10 tons of peat from one locality. The peat had been stacked to dry under ordinary atmospheric conditions. Results: Water, 895 lb.; ash, 1,032 lb.; oil, 313 lb.

Mr. Trevor says that altogether he has now tested over 200 tons of kauri peat. He says the crude oils obtainable by him will yield—Spirit (similar to benzine), 15 per cent.; medium oils, 40 per cent.; heavy oils, 30 per cent.; pitch, 15 per cent.

He is of opinion that the oils are not suitable for use as lubricants unless after special treatment.

VISIT TO THE FORESTS PRODUCTS LABORATORY OF UNITED STATES.

In connection with inquiries I was making relating to the utilization of kauri swamp timber and the tapping of the live trees for resin (questions referred to in another part of this report) I visited the Forest Products Laboratory at Madison, Wisconsin.*

I may explain that the Forest Products Laboratory is a laboratory of practical research conducted by the Forest Service in co-operation with the University of Wisconsin, at Madison, Wisconsin. "Its aim is to promote economy and efficiency in the utilization of wood and in the processes by which forest materials are converted into commercial products. In carrying this out the purpose is—

- "(1.) To secure authoritative information on the mechanical and physical properties of commercial woods and products secured from them.
- "(2.) To study and develop the fundamental principles underlying the seasoning and kiln-drying of wood, its preservative treatment, its use for the production of fibre products (pulp, paper, fibre-board, &c.), and its use in the manufacture of alcohol, turpentine, rosin, tar, and other chemical products.
- "(3.) To develop practical ways and means of using wood which under present conditions is being wasted.
- "(4.) To co-operate with consumers of forest products in improving present methods of use; also in formulating specifications and grading rules for commercial woods and materials secured from them, and for materials used in the preservative treatment of wood.
- "(5.) To make the information secured available to the public through publications, correspondence, and other means.

"Any one is at liberty to correspond with the laboratory about particular problems dealing with the utilization of wood, and will receive an answer based on whatever information is available on the subject. Such information is furnished free. The staff of the laboratory is also available for consultation work, provided the problem under consideration has some bearing of general interest."

Some questions relating to the utilization of timber products receiving attention at the laboratory are of interest to a timber-producing country like New Zealand, and of special interest in respect to the utilization of kauri swamp timber: these are the distillation of hardwoods and resinous woods, and the production of "naval stores"—rosin and turpentine. The investigations in regard to the hardwoods embrace—

- (1.) Determining comparative yields from various species.
- (2.) Methods of increasing the yields of valuable products.
- (3.) Improved methods of refining the products.

In the United States in 1910 the hardwood distillation industry consumed over 1,250,000 cords of wood, costing over £823,045, and producing products valued at over £1,790,524. The industry is well established, with fairly well standardized processes. Two of the main products, acetate of lime and wood-alcohol, are regularly quoted market articles. The third, charcoal, is usually sold to iron-furnaces or in other local markets for fuel. In many of the plants wood cut specially for the purpose is used, while others operate either wholly or in part on sawmill waste. Small-sized material, such as sawdust and shavings, is not suitable, because the charcoal produced from such material is too fine to be of commercial value.

The species most extensively used are birch, beech, and maple. The amount of valuable products that can be obtained from these woods (in mixture) is comparatively well known, but very little information is available for other species.

In resinous woods the investigations being made relate to—

- (1.) The efficiency of the methods applied to the various species and classes of material.
- (2.) The quality and value of the various products which may be secured.

* For full particulars of this Department see manual issued by Department of Agriculture, U.S.A., by Henry S. Graves, Forester.