

*Prominent Characteristics of the Process.*

The sap and fermentative matter is removed, and replaced by a solid antiseptic material of which the timber has a natural craving; consequently there is no subsequent decay, such as dry-rot, &c.

No pressure of any kind is used in the Powell process to induce absorption, owing to the affinity of sugar for the wood enabling other ingredients to be conveyed into the wood to render it immune to attacks by insects.

*Seasoning.*—The wood, after being boiled, is placed in drying-chambers, and there seasoned from one week to six, depending on the size of the timber.

*Dry-rot.*—Numerous attempts have been made by experts to create dry-rot (*Merulius lacrymans*) in the processed wood; but the disease has never developed.

Mr. G. A. Julius, B.Sc., M.E., consulting engineer, Sydney, was privileged to carry out a number of comparative tests of Powellised woods and untreated wood on behalf of the Western Australian Government, and extracts from his article on the results achieved precede these notes.

*Powellising Works at Rangataua.*

The New Zealand Powell Wood Process (Limited) have erected extensive works at Rangataua, in the Waimarino, where about a dozen sawmills are located, so that supplies will be readily available. A railway-siding, 16 chains long, connects the works with the Main Trunk Railway.

Special roller-bearing trucks, 36 ft. long, and capable of accommodating 15,000 sup. ft. in one load, are provided for stacking the timber which is conveyed to the boiling-vat by a submerged electrical traverser, and the truck and contents are hauled into the vat, which is 36 ft. long, 10 ft. deep, and 10 ft. wide; an iron door, weighing 15 cwt., is then lowered, and made watertight by a number of readily adjustable wing-nuts. The saccharine solution is then run through a 5 in. pipe into the boiling-vats, after which the timber is submitted to a process of boiling for a few hours, the liquor being boiled by steam-coils placed in the bottom of the vats. The steam is "trapped," and the feed-water is returned to the boilers at a high temperature. The electric pump then redelivers the liquor into elevated tanks, to be used over again. The heavy door is unfastened, and is hoisted into the roof by a compensating weight, and the electric traverser hauls the truck out to the drying-room. The room is then hermetically sealed, and electrically driven fans deliver heated air into the room; the timber is thus robbed of its moisture, and thoroughly seasoned. The electric traverser is again requisitioned to remove the truck with its load, and every stick of timber is then branded on the end with the company's registered brand, "Powellite," and loaded direct into railway-trucks for despatch. (*Vide* photographs opposite pages 77 and 80.)

*What it does.*

1. It enables timbers to be rapidly and thoroughly seasoned without cracking, twisting, or splitting.
2. It renders all woods immune to the attacks of insects, either land or marine, such as the white ant, the borer, and the *Teredo navalis*.
3. The treated timber is absolutely immune to attack from dry-rot, and from all fungoid growths.
4. It renders wood less liable to the penetration of disease-germs, and therefore makes it hygienic.
5. Timber so treated is on the average 25 per cent. lighter and 40 per cent. stronger than the untreated green wood.
6. It renders timber more close and dense, lessening its porosity, and reducing its tendency to absorb moisture, thus eliminating the risk of subsequent twisting and warping.
7. The resilience and elasticity of timber are materially increased by the process.
8. It brings out the grain and markings of figured woods, improving their appearance, and in no way interfering with the subsequent polishing, staining, and painting.
9. The removal of sap and other matter by the process prevents the subsequent exudations which are found in practice to so frequently destroy polished timber-work.
10. In painting Powellised timber, owing to its relatively non-absorbent nature, from 20 to 40 per cent. less paint is required than is necessary to produce the same result upon untreated timber.

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(D.) MISCELLANEOUS METHODS OF UTILISATION.

(1.) THE WOOD-PULP INDUSTRY.

The fact that this industry has attained such an important position in Canada and United States of America should indicate that it is also worthy of attention in any other country that may possess the necessary raw material, the means of manufacture, and prospective available markets. As this Dominion embraces the above qualifications, and as the industry is practically unknown here, the following information may be of interest.

The method of manufacture most extensively used in Canada is what is known as the "mechanical" or "grinding" process. The kinds of woods principally used are fir, balsam, and spruce, mostly the latter, no doubt because it is the most abundant of the suitable woods. White spruce makes the whitest pulp, but the black variety makes the toughest fibre. Poplar makes a very fine-grade pulp—soft and white—but is not considered so strong as spruce. The best pulp comes from the wood having the longest and toughest fibre. Sometimes different kinds of woods are mixed for the purpose of blending toughness and whiteness. The power used for the grinding operation is