THE PRESERVATION OF WOOD BY THE POWELL PROCESS.

Archæologist reports often make mention of the various tactics employed by the ancients in their endeavors to preserve wood, and especially wood that was underground. Probably the Romans brought this art to the highest state of perfection recorded in ancient writings, and this they did by charring the wood on the surface before its interment. Some buried work of the Romans has been unearthed in England after 2,000 years and found to be unaffected. This system is very good for woodwork that is hidden, but for exposed sections is not practical; thus the many preservatives now employed have been introduced with a view of preserving woods employed in the modern arts. One of the methods now being given considerable publicity in England is known as the Powell Wood Process, and is dependent on its working to a discovery made in 1902, when it was found that saccharine matter was a very desirable wood preservative.

The process consists essentially in treating the wood in a saccharine solution, for which wood has a decided affinity. The solutions vary in composition, and to them are added certain other substances to suit the special purpose for which the wood is required. When the wood has been specially dried the process is complete, and the wood is ready for immediate use.

The requisite plant consists of open tanks of suitable dimensions, heated by steam pipes; drying chambers; ^{storage} tanks for holding the liquor; trollies, etc.

The timber is not subjected to any external pressure or vacuum at any stage of the process. The wood is immersed in a solution in open tanks. This solution is gradually raised to specific temperatures for certain periods, depending on the size and density of the wood. When the process is completed the wood is removed and placed in a drying chamber. When sufficient desiccation has taken place the wood is ready for use.

The time occupied in the whole treatment, including drying, is in general a few days, though in special cases and for large-sized timber it may be extended to three or four weeks.

The action which takes place is as follows: As the temperature of the solution in which the wood is immersed is raised, the air in the wood expands and the greater portion escapes in a series of bubbles. As a saccharine solution boils at a slightly higher temperature than water, the moisture in the wood is gradually converted into vapor and escapes along with the air. During the treatment the albuminous matter in the wood is coagulated and rendered inert. In some measure this coagulation accounts for the strength of the wood being increased by the process. During immersion, and especially while cooling, the solution is readily absorbed by the wood and penetrates to every part of it.

When the process is completed it is found that the **absorbed** saccharine matter has been thoroughly assimilated by the tissues, and is invisible either as crystals or syrup, but chemical analysis shows its presence in the tissues, and that it is held in molecular combination with the cellular fibres of the wood.

Complete impregnation of all wood with sacharine matter is effected by this process, though some woods absorb the solution more readily than others, a heavy, close-grained wood taking longer to treat than one with an open grain. The sacharine matter, however, penerates even the hardest woods without pressure of any kind.

"The question whether the timber is impregnated throughout by this process is a most important one. From records to hand it seems that it is so, especially in the case where moderate sized scantlings have been treated." The cost of treatment is low. For railway sleepers, paving blocks, pier piles and constructional timber generally Powellizing, from the viewpoint of cost, commands every consideration. The process has been used to a considerable extent in the treatment of railway timbers in India and Australia, where it has been found to preserve the sleepers from dry-rot and the attack of insects. A report was made following an examination of several Powellized sleepers, a portion of which reads as follows:—

	POWELLIZED SLEEPERS				UNTREATED	SLEEPERS
No.	No. laid down	Date of laying in open line	Present Condition	No. laid down	Date of laying in open line	Present Condition
1	10	March, 1908	10 still left: cracking a little on top.	10	I5th Apl., 1907	1 removed in July, 1910; 2 in 1911-12; 7 cracking
2	10	Do.	10 still left;	10	Do.	l removed in 1909 · 9 fair
3	10	Do.	above; good underneath. 10 still left; 1 may have to be removed this way: 9	10	Do.	cracking rather badly. I removed in July,1910;3 in 1911-12;6 gone badly under-
4	10	Do.	cracked begin- ning from ends, other- wise fair. I removed in 1911-12; 1 may have to be removed this verse 3 cracks	10	Do-	All removed in 1909. (Experi- ment closed.)
			ing from out- side: 5 fair.			
5	10	Do.	All good; slight cracking.	10	Do.	1 removed in 1911-12; 1 may have to be re- moved this year; 8 very much cracked.
6	9	Sept., 1907	1 removed in 1909 and 1 in 1911-12; 7 still serviceable.	10 1	January, 1907 Sept., 1907	4 rem'v'd in 1908 and 7 in 1909. (Experiment closed in 1909.

The Powell Wood Process Syndicate, Limited, of 718 Salisbury House, London Wall, London, E.C., hold the patent rights to the Powell Wood Process.

PULP AND PAPER MAGAZINE OF CANADA.

The New Year number of this magazine, published by the Industrial and Educational Press, Limited, Toronto, has just come off the press in its enlarged size, and will hereafter appear twice a month, instead of monthly, as formerly. This is the first number from the pen of the new editor, A. G. McIntyre, formerly chemical engineer for Price Bros. & Co., Limited. Mr. McIntyre is a graduate of Acadia University in Arts and Science, and McGill University in Chemical Engineering, and joins this magazine after a wide engineering and paper mill experience.

The year's progress and development are fully reviewed in this number, and many valuable articles are contributed.

Mr. H. S. Ross, K.C., of Montreal, writes an able and exhaustive resume of the Workmen's Compensation Act of Quebec, with references to those of other countries.

The new mills of Price Bros. & Co., Limited, are fully described in an elaborate illustrated article by the editor. The new development of utilization of wood waste for gas producers is discussed by E. B. Archibald, B.Sc., of Montreal.

The Canadian water powers, timber regulations, pulp and paper tariffs, exports and imports, and the entire condition of the trade and its many ramifications are thoroughly dealt with. All this, with the numerous specially contributed technical articles for pulp and paper mill men, combine to make the Pulp and Paper Magazine a true fulfilment of its heading, "A magazine devoted to the science and practice of the manufacture of pulp and paper, with up-to-date news of the allied trades."