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ON THE PRESERVATION OF WOOD.

The use of wood as a constructive material for dwelling houses, mills, bridges, railway sleepers, and even roads, is of almost universal application in Canada. The constant exposure of this perishable substance to atmospheric changes, and the rapid decay to which it is liable, renders a cheap and durable preservative a great desideratum.

Much attention has been devoted to this subject in England and on the European continent, where wood is comparatively dear. Numerous processes have been patented from time to time to effect the object in view, but all of these are either too expensive, or otherwise unsuitable for general adoption in Canada.

In considering the causes which lead to the decay of wood, it is essential to know something about its composition, and the nature of the substances it contains, which are most liable to decomposition. It is well known that the durability of different kinds of wood depends upon the compactness, the state of induration, and the quantity of such stable substances, as resin and tannin, which they contain. The liability to decay is produced by the presence of an albuminous substance which acts as a ferment, when wood is exposed to heat, air and moisture; in some countries the attacks of insects are very prejudicial, and in all countries the growth of fungi contribute materially to the decomposition and final destruction of wood. Alternations of temperature with damp, are also sufficient to produce decay, even if the albuminous substance is rendered neutral. The question which at once suggests itself is this—How may the substance which acts as a ferment and induces decomposition be rendered inert, or the texture of the wood be made proof against the decay it induces. The processes hitherto adopted have consisted in simply imbuing the substance of the wood with certain salts, oxides of metals, tar and oils; the compounds which are recommended are alum, pyrolignite of iron, corrosive sublimate, blue vitriol, chloride of zinc, &c., which possess the property of coagulating albumen and combining with the substance of the wood, and thus rendering the action of the ferment incapable of communicating its destructive powers to the fibre of the wood. This has been usually effected by causing a solution to permeate the pores of the material so as to act upon its internal portions as well as to protect it externally. A difficulty has always arisen in causing the antiseptic liquid to find its way to the heart of large pieces of timber—a necessary result—otherwise decay would commence internally, and gradually be propagated outwards, following the reverse course of ordinary decomposition. There is no difficulty in effecting the thorough permeation of even large timbers, by placing them in an exhausting chamber, containing the solution with which it is intended they should be impregnated, and, removing the air contained in the pores of the wood, allow the fluid to take its place. Wood is generally about one-half as heavy as water: that is to say, its specific gravity is about 1.5, but it usually floats on water, in consequence of the air contained within its pores. When this interstitial air is removed by the exhaustion process, above described, the solution easily finds its way to the interior, upon exposure to ordinary atmospheric pressure. It is evident that this process is too costly to be employed on a large scale in Canada.

Another mode, which has been practiced in France, is to take advantage of the natural functions of the leaves of a tree. If a tree, for instance, in full leaf, be cut down, and its extremity immersed in a solution of blue vitriol, or any other metallic solution, the natural function of the leaves will, by exhalation, cause it to be carried upwards, and diffused through every part of the tree, even to the extremities of the smallest branches. Liquids can also be absorbed by boring a hole into the trunk of a tree, and establishing a connection with a supply of prepared fluid, contained in an appropriate vessel. Various colours have been introduced into trees by this process, and different kinds of wood have been not only tinted with any desirable colour, but even perfumed with essential oils. A solution of soluble glass, similar to that used for the purpose of lining petroleum vats, has been introduced by these means, and found available not only as a preservative against decay, but also as a protection from fire.

Mr. Bethell's process is much employed in England: it consists in impregnating wood throughout with tar oil, or any solution containing creosote, and particularly with a solution of pyrolignite of iron and tar oil, which holds more creosote, in a dissolved state, than water. The wood is put into a close iron tank; the air is then exhausted, and tar oil and pyrolignite of iron forced in by means of hydrostatic pressure, equal to 150 pounds to the square inch. The wood becomes very much heavier, and thoroughly impregnated with the