

# **Methods of Distilling Wood**

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**H**ARDWOOD, for distillation purposes, should be cut after the leaves fall, and should be permitted to dry in the sun and wind, during the spring and summer months. Under favorable conditions, the moisture content of the wood should then vary between 12 and 20 per cent. All portions of the tree can be utilized, from the trunk to the small branches. Everything above five inches in diameter should be split to admit of the easier penetration of the heat of decomposition and freer evolution of the gases. Hardwood mill slabs, edgings, etc., can be utilized and, as will be observed later, even hardwood chips and turnings are distilled. Decayed wood should be rejected, as the yields are poor and the charcoal produced from it, a source of danger, owing to its great liability to spontaneous ignition. Moisture in the wood is advantageous, but wet wood takes a longer time to carbonize, and the crude pyroligneous liquor obtained is more dilute, necessitating more evaporation, with corresponding greater consumption of fuel, although the yield of acetic acid and methyl alcohol is slightly higher in comparison.

## *Carbonizing Systems.*

The systems employed for the distillation of wood are shortly as follows:—

1. The plants erected upon the retort system and each unit holding from one to three tons of wood.

2. Mechanical plants which deal with chips, shavings and other small wood.

3. Kiln plants, of beehive type, holding from 100 to 150 tons of wood.

4. Oven, or large retort plant, in which the wood is piled upon small trucks and run into the oven upon rails. The charge averaging about 16 tons, but the capacity can be increased or decreased at will.

(a) The retorts were the early form of apparatus in use, and were formerly cylinders made of heavy cast iron of 3 to

4 feet in diameter and 8 to 9 feet in length, having a door for charging and discharging at the front and an outlet, at the other end, connected to a condenser, for conducting off the gases evolved during the carbonization process. The door sometimes constituted the whole front end, and in other instances was only an oval opening in the front, about twenty inches across, and reaching nearly from top to bottom of the cylindrical retort. The doors were luted and fastened by wedges. These retorts were loaded and drawn by hand. They were protected from the direct action of the flame, from the furnace, by a system of firebrick arches and flues. Two retorts constituted a bench and one furnace supplied the necessary heat. These cast iron retorts were superseded by cylinders made of heavy steel plates, having cast iron fronts and doors. The retorts were arranged in such a manner that, when they were burned by the action of the flame, they could be revolved and another surface exposed.

(b) The mechanical retorts are continuous in their operation and are, as a rule, horizontal. The writer saw a mechanical retort in operation at the Cam-lachie works of Messrs. Turnbull, Glasgow, which was carbonizing birch turnings from New Brunswick spool wood. This was a cylinder with an endless screw conveyor, and screw hopper into which the turnings were fed and conveyed by the hopper screw to the top of the worm screw of the retort and carried through the latter. The charcoal was discharged, at the back end, into an air-tight box. The gases given off in the process were passed to a condenser. The retort was heated from a furnace. A similar retort was at one time employed for obtaining acetic acid and methyl alcohol from exhausted tan-bark of tanneries.

The vertical mechanical retort consists of a metal cylinder having spaced horizontal plates, with slots in the latter. In