

THE MANUFACTURE OF RESIN AND TURPENTINE.

From Wilmington, N. C., southward, and nearly all the way to Florida, the pitch-pine trees, with their blazed sides, attract the attention of the traveller. The lands for long stretches are almost worthless, and the only industry, beyond small patches for corn or cotton, is the "boxing" of the pitch-pine trees for the gum, as it is called, and the manufacture of turpentine and resin. There are several kinds of pine trees, including the white, spruce, yellow, Roumanian, and pitch pine. The latter is the only valuable one for boxing, and differs a little from the yellow pine, with which it is sometimes confounded at the North. The owners of these pine lands generally lease the "privilege" for the business, and receive about \$125 for a crop, which consists of 10,000 "boxes." The boxes are cavities cut into the tree near the ground, in such a way as to hold about a quart, and from one to four boxes are cut in each tree, the number depending upon its size. One man can attend to and gather the crop of 10,000 boxes during the season, which lasts from March to September. About three quarts of pitch or gum is the average production of each box; but to secure this amount, the bark of the tree above the box must be hacked away a little every fortnight. Doing this so often, and for successive seasons, removes the bark as high as can easily be reached, while the quality of the gum constantly decreases, in that it yields less spirit, as the turpentine is called, and then the trees are abandoned. The gum is scraped out of the boxes with a sort of wooden spoon, and at the close of the season, after the pitch on the exposed surface of the tree has become hard, it is removed by scraping, and is only good for resin, producing no spirit.

The gum sells for \$1.50 a barrel to the distillers. From 16 barrels of the crude gum, which is about the average capacity of the stills, 80 gallons of turpentine and 10 barrels of resin are made. The resin sells for from \$1.40 to \$5 per barrel, according to quality, and just about pays for cost of gum and distilling, leaving the spirit, which sells for 40 cents a gallon, as the profit of the business. Immense quantities of resin await shipment at the stations along the line, and the pleasant odor enters the car windows as you are whirled along.

After the trees are unfit for further boxing, and are not suitable for lumber, they are sometimes used to manufacture tar; but the business is not very profitable, and is only done by large companies, who can thus use their surplus labor. The trees are cut up into wood, which is piled in a hole in the ground and covered with earth, and then burned the same as charcoal is burned elsewhere. The heat sweats out the gum, which, uniting with the smoke, runs off through a spout provided for the purpose. A cord of wood will make two barrels of tar, which sells for \$1.50 per barrel, and costs 37½ cents to make. The charcoal is then sold for cooking purposes.

ANOTHER GREAT ENGINEERING WORK COMPLETED.

An English exchange gives the following account of the completion of one of the most stupendous works of engineering skill and enterprise of ancient or modern times. We have been in the habit of crediting the new world with some of the most daring and enterprising improvements, but we can boast of nothing that surpasses this. Says the exchange referred to: "Somewhere about 3,000 workmen, 600 or 700 wagons, 17 or 18 locomotive engines, 3 steam 'navvies,' and a great quantity of minor machinery of various kinds have been engaged since 1875 at the southeast end of London in a work, compared with which the building of the pyramids—with modern appliances—would have been no very signal feat. Hitherto the one entrance to the Victoria docks from the Thames had been at Blackwall point, but now there is a dock capable of receiving all vessels, no matter what they might be. Three and a half miles of walls have been built, enclosing 90 acres of water. These 'walls' are 40 ft. high, 5 ft. thick at the top and 18 ft. thick at the bottom, the whole of this enormous mass being composed of solid concrete, for which 80,000 tons of Portland cement have been used. Some 4,000,000 cubic ft. of earth have been dug out. It may assist the imagination somewhat to state that if it were filled into carts, the vehicles would form an unbroken line 7,000 miles long. The excavations have gone through submerged forests; and, among other curiosities dug out, have been a reindeer's horn, a Roman vase, and what is supposed to be an ancient British canoe, carved out of solid oak. The latter is now in the British museum. The new entrance below Woolwich will save about three and a half miles of river navigation, which, in the case of vessels of heavy draft, is, of course, a matter of very great importance."

Miscellaneous.

LIGHTING ROOMS.—M. Javal, in a paper on public and private lighting, considered from the aspect of ocular hygiene (*Revue Scientifique*, Oct. 18, 1879, p. 361), treats of artificial lighting. He says that a chandelier carrying a million of wax lights would not give an amount of light equal to sunlight. Even in a room lit up in an unusually brilliant manner the pupils are much more dilated than in full daylight; and this dilatation explains the fatigue to the eyes produced by artificial light. Therefore, there is never too much, in fact never enough, artificial light, and prejudices without any just foundation are prevalent on this point. M. Javal recommends to persons suffering from certain optic defects, and who cannot work in the evening, two large lamps, which would obviate the fatigue of reading. Artificial light, also, excepting the electric and magnesium lights, contain much fewer chemical rays than daylight. All artificial spectra are very dull on the most refracted side; the chemical rays, the violets and the blues, there show a very low intensity. M. Bouchardat (*Revue Scientifique*, August 16, 1879, p. 148) has shown the dangers of violet and deep violet rays, on the authority of M. Regnaud's important work on the fluorescence of the media of the eye. The conclusion to be derived is that the flame light being poorer in chemical rays than sunlight, should be preferred by workers. In fact M. Javal quotes the instance of a member of the Institute, whose fatigued vision would scarcely tolerate daylight, and who shut his shutters, and lighted his lamp, in order to work. M. Javal recommended him to work in daylight with yellow spectacles to destroy the chemical rays. Artificial light, on the other hand considerably dilates the pupil, and renders the chromatism of the eye more sensitive, which is the reason that the light of day is to be preferred. The electric light is injurious, in a certain point of view; it contains a large quantity of chemical rays, which it would be easy to neutralize by giving a yellow tint to the globes. Nevertheless, neither the public, nor the experts, have complained up to the present time, of the electric light; inconveniences only arise when the eyes are too long a time on a too powerful electric light. It is, therefore, advisable not to look too long at electric lights, and when this becomes a habit, the opacity of the globes now in use can be diminished. In fine all our systems of artificial light are insufficient; there is, then, no necessity to fear excess of light, since, on the contrary, artificial light is less penetrating than daylight. Gas, therefore, does not destroy the eyesight, it is the wavering and flickering of the flame, when there is neither globe nor chimney, which fatigues the sight; gaslight, with a burner protected by a globe, is excellent for it. M. Javal may well, then, say, with dying Goethe—"Light more Light!"—*Sanitary Record*.

EUCALYPTUS TREE AND FEVER.—In a late number of *Nature* some very positive statements are made as to the value of the eucalyptus or blue-gum trees of Tasmania in destroying fevers in marshy districts. The testimony in support of this power, it says, is most convincing. In marshy districts near eucalyptus forests, fever seems to be unknown, and in parts of Corsica and Algeria, where the tree has been planted for the sake of its reputed virtues, endemic fevers have been stamped out. M. Gimbert, in a report to the French Academy, instanced the case of a farm situated in a pestilential district about twenty miles from Algiers, where by planting a number of trees the character of the atmosphere was entirely changed. Similar testimony comes from Holland, the south of France, Italy, California, and many other parts of the world as to the febrifugal attributes of this tree. In no case is the evidence more convincing than in that of Algeria, as related by Dr. Santra, and, quite recently, by Consul Playfair. Large tracts of land have been transformed by the agency of the "fever-destroying tree," as it has come to be called, and wherever it is cultivated fevers are found to decrease in frequency and intensity. Fewer districts in Europe have a more evil reputation than the Campagna as a veritable hot-bed of pestilential fever, and people who know the country around Rome may remember the monastery at Tre Fontane, on the spot, as tradition tells, that St. Paul met his death. Life in this monastery meant death to the monks, but since the eucalyptus has been planted in the cloisters, fever has disappeared and the place has become inhabitable.

RE-BRONZING ORNAMENTS.—The common method of imitating bronze on plaster casts, wood, metal, etc., is to paint first with one coat of greenish brown, let it quite dry, and then varnish with bronze powder that has been ground on a marble slab, with gum water or honey. This gives the metallic appearance sought