Hemlock Lumber and Bark.

Of the sole leather made in the United States, a very large proportion is tanned in the State of Pennsylvania. Jackson S. Schultz, of New York, has been for many years largely interested in this and in the lumber business, and in the manufacture of bark extract for tanning, and he writes to the *Shoe and Leather Reporter* as follows touching the uses of hemlock lumber and how long the supply is likely to last:

Hemlock lumber is worth at the mills, when in a seasoned condition, from $6.50 to $7.50 per thousand feet. This lumber is used very extensively in all parts of Pennsylvania. In the city of Philadelphia, especially, the best frames are made from this timber, and have been so made from our earliest history. This circumstance is mentioned only to show that hemlock lumber is unexceptionally good. If used for docks under water, this timber will last an indefinite time; and if used for docks and cribbing, partly under and partly out of water, it will last as long as pine or spruce. Like all other timber, if exposed to wet and dry atmosphere alternately, where so exposed it will decay. The life of hemlock, under these conditions, is not beyond eight or ten years. But the Sunbury and Erie Railroad, which was constructed about eighteen years ago, used "sapling" hemlock very largely for its ties, and many of them still remain in the roadbed. Because this wood does not hold the spikes as well as oak and chestnut in part accounts for its non-use in modern railroads. For this reason, too, are pine and spruce rejected. It is claimed that, when this wood is kyanized with tannin, it will last as long as oak or chestnut for bridges or ties.

As a finishing wood for ceilings and flooring, hemlock is subject to this objection: It will splinter when roughly used, as in kitchen floors, but when covered with carpeting on bed rooms or parlors, it will give perfect satisfaction. Many of the best hotels and dwellings of Philadelphia and Baltimore, as well as other cities of our Central States, are floored with white hemlock flooring, and it gives general satisfaction. For "siding," when covered with paint, it answers a good purpose. When not so covered, it is unsuited, as, indeed, few woods are capable of standing our climate unprotected with paint.

Wherever hemlock is used in contrast with spruce or pine in dry structures, such as dwellings, barns, sheds, etc., it will be found in all respects as lasting as these woods, and by reason of the exemption of this wood from *black knots*, it "cuts up" to a much better advantage—that is, less waste—than either of these more pretentious and expensive woods. It is to-day the wood, in most cases, men use in all the Northern States, including Canada. Until within a short period, hemlock has not been considered suitable for "pulping," but recent experiments have demonstrated that hemlock will make good pulp for the paper makers. While it is claimed that the percentage of product is not as large as from some other woods, the quality is equally as good. Recently a sample of hemlock was taken to France, and the chemist and pulp maker has sent back, as the result of his experiment, a sample of pulp quite equal to the best that is made.

Hemlock bark is conceded the leading tanning bark of the country. It is usually worth from $5 to $6 per cord, or ton of 2,200 lb., at the nearest place of delivery, when taken from the tree. When shipped to great distances by rail it is worth the freight additional, as, for instance, at Boston and Chicago it sells from $8 to $9 per ton, or cord.

The hemlock tree does not reproduce itself. When the land is once cleared of these trees, beech, birch, maple, and chestnut come in their place. This fact has given rise to the frequently expressed opinion that very soon we must look to other sources for our tanning material. Of course, under these circumstances, it is safe to predict at *some future period* there will be no supply of hemlock bark for tanners. But when asked to say how long the supply will last at the rate we are now consuming it, it is safe to say that the child is not born that will see the end of the supply.

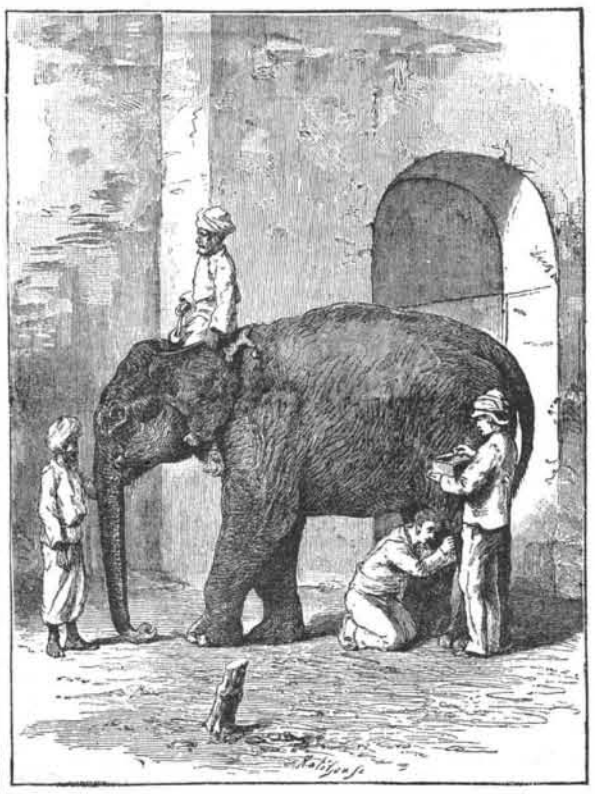
The counties of Elk, McKean, Sullivan, Warren, and Forest are substantially intact, although some forty large tanneries have been making drafts on their bark supply for sixteen years at the rate of 200,000 cords or tons per year. Except along the lines of railroads which have penetrated these counties, the hemlock forests stand to-day as they did at the beginning—covered with a dense growth of hemlock trees that will yield from 10 to 12 cords or tons per acre. When these counties were first opened up by railroads, the projectors of these roads went there for coal, but at that early day a tanner predicted that the roads built and to be built would carry out more tonnage of lumber, bark, and leather than coal. In other words, the surface would yield more tonnage than the mines. This would have been true but for the subsequent discovery of petroleum. Although that whole section is underlaid by a deposit of bituminous coal which is practically inexhaustible, the tonnage of crude petroleum, if all carried by rail, would probably far exceed all other commodities.

The final extinction of the hemlock forests will, of course, present a fruitful theme of speculation, for, as stated, it does not reproduce itself; but when we consider that other States besides Pennsylvania can be relied upon for a considerable amount of this lumber and bark, it seems quite unnecessary for us to make ourselves unhappy over the problem of final extinction.

Besides, within a few years it has been discovered that each oak and chestnut tree will yield as much tannin in its wood as its bark. This is a French discovery, and is now making practical headway in this country. If this discovery proves reliable, as there seems no doubt it will, then we may fall back on the old ground which the tanners have gone over fifty years ago, and rebuild our tanneries in the old States of New England and New York, and make leather quite independent of hemlock. But what shall we do for the serviceable and cheap hemlock lumber? Iron will take its place, as indeed it is already doing in some measure.

INOCULATING AN ELEPHANT.

Among the recent valuable discoveries of the famous French physician, M. Pasteur, is that of the vaccination of domestic animals for the prevention of the dire disease known as anthrax, or splenic fever. The marked success attending his system, in combating the rinderpest in Europe, encouraged Mr. J. H. Lamprey



INOCULATING AN ELEPHANT.

to bring the subject under the notice of the government of India, where no efficient remedy was known for this rapidly fatal illness, which annually carries off a large percentage of cattle of every kind. An order in council has been issued, after the most careful investigation of the merits of the system and of the probability of securing its favorable reception by native proprietors. In order to carry out this object, some native Indian students, who have received their education at the Cirencester Agricultural College, are now undergoing a course of instruction at the Paris laboratory of M. Pasteur, and will shortly proceed to stations in India, to dispense the vaccine, which is applied to elephants as well as to oxen and other beasts. It is confidently expected that their labors will be attended with the same success that followed the introduction of the system into those countries where it is now in full operation, with an ultimate prospect of the total extermination of the most serious maladies, working great havoc among flocks and herds throughout the world. The elephant, in a domesticated state, is liable, as well as other animals in the service of man, to certain epidemic diseases.—*Illustrated London News.*

Creosoting of Wharf Piles.

Engineer Manson's report to the harbor commissioners on the creosoting plant in San Diego and Ballona, Cal., states that the San Diego works, which were first inspected, have been in constant operation for the past six years, with the exception of a time when fire partially destroyed them in 1887. The works are located on the east shore of San Diego bay, near National City, and are accessible by rail. They cover an area of 1,000×250 feet. The plant consists of one pressure cylinder, 75×44, of 7-16 iron; two Blake air pumps, steam cylinder, 10×18; air cylinder, 12×18; three pressure pump cylinders, 8×14; one press, 5×14 feet; 75 tubular boiler and hoisting engines, pipe connections, iron trunks, etc.; storage tank, 75×4×3, 6,800 gallons.

The capacity of the plant is sixteen seventy-five foot piles each twenty-four hours. The working force is two foremen, two engineers, two firemen, and twelve laborers. The consumption of the creosote is for 3,318 feet of piling 3,169 gallons of creosote, or about nine-tenths of a gallon to each linear foot.

The cost of creosote delivered at 14c. a gallon, including labor, is 18⅛ c. a linear foot.

This does not include the cost of loading or shipping, but includes handling in the yard. A second batch cost as follows: Landing 100 piles from deep water to the beach, four men half a day, $4; fourteen men full day, $28; labor to engineer and fireman, $5; seven days' creosoting, fourteen charges night and day, $168; rafting to deep water, $8; 4,000 gallons creosote, at 14 cents, $560; total, $773, or $7.73 a pile, or 19½ cents per linear foot. The piling costs, delivered at San Diego, 26 cents per linear foot. These figures do not include interest or cost of fuel, which would amount to about one-half a cent more per linear foot.

The National City wharf was rebuilt in 1883 of creosoted piles. It consists of round piles, 12×12 feet piles, and 3×4 feet braces. The penetration of the creosote at this plant is from ¼ to 1¾. The square piling is generally in bad condition, but the round piles are in good form. The shrinkage in these piles was generally due to a split in driving the pile, injury of the piles after being driven, and imperfect and slight impregnation. In many instances the inside of a pile had been hollowed out by rot, while a shell of creosoted material was left untouched.

San Diego bay is not infested by the teredo as much as is the bay of San Francisco, but the limnoria is here, and much more destructive.

There was no indication that any of the piles at San Diego had been attacked by the teredo in National City wharf.

The oil used for creosote can be obtained at St. Louis at 7 cents a gallon, the freight to this city being 7 cents. It is a mixture of tar. Mr. Manson recommends that a sample of this oil be analyzed to fully determine its quality.

The amount of creosote oil used in the two cases cited is less than long practice has determined to be best. The results are, however, reported very satisfactory. The works are being operated night and day. These works are small and the machinery used is not of the best. Cheaper work and a more thorough penetration of creosote can be obtained. The oil can be laid down in bulk in this city at 10 cents a gallon. The cost of the San Diego works has been $12,000. The works could be duplicated in San Francisco for $5,000 or $6,000.

The Ballona plant cost $16,000, and is located near Santa Monica, Los Angeles County. The works have not yet been in operation very long, so that no data as to cost, etc., can be procured, but the better machinery at this plant lessens the consumption of creosote surprisingly.—*Pacific Lumberman.*

Coppered Carbons.

Probably nearly every electric arc lighting company owning a system (?) now electroplates its carbons. There was, in the dark ages of 1879, an interference in our much abused patent office between the two well-known inventors, Charles F. Brush and Moses G. Farmer, in relation to the coppering of electric light carbons, and it was held by Paine, commissioner, that Farmer had invented the process in controversy before Brush, but had also abandoned it, so that while priority was therefore awarded to Brush *pro forma*, the invention was thrown open to the public by Farmer's prior invention and failure to patent.

But as a matter of fact Jablochkoff had, as early as 1876, plated the carbons of his candles with copper; and though the invention had prior to that time been patented in France by Reynier, Jablochkoff disdained to recognize the Reynier patent, depending upon prior patents and publications; and it appears that Jablochkoff was right, since the Reynier patent was subsequently voided by the French courts, and held to be anticipated by a prior Carré patent and by Van Malderen's work in 1868. Bouliguine and Tchikoleff, also in Russia, plated their carbons, and published accounts of their practice.

The history of this feature of electric lighting is closely paralleled by many other features; and all other branches of applied electricity likewise disclose similar instances of anticipation. Electric lighting, however, is so old an art in itself, although commercially young, that inventors in this field cannot go far without running foul of something which had been invented (though very likely not much employed) years before.

And they acquire a decided impression, which they may voice, as others have done before them, in the complaint that "the people of *former times* had little honesty, they have stolen all my inventions."—*Electrical Engineer.*

Spectrum of "R" Cygnis.

A cable message has been received from Lord Crawford, at Dunecht, Scotland, saying that on August 13 and 22 the variable star "R" Cygnis was observed by Espin at Walsingham, and that the spectrum was found to contain bright lines. The observation was confirmed at the Dunecht Observatory.