THE TIMBER AND PREPARATION OF TELEGRAPH POLES.

CHAPTER XLVIII.

The Size, Preparation, and Durability of Telegraph Poles, including the Red Cedar, White-Cedar, Walnut, Poplar, Pine, White-Oak, Black-Oak, Post-Oak, Chestnut, Honey Locust, Cotton Wood, Sycamore, and other Timbers.

POLES ON THE AMERICAN TELEGRAPH LINES.

I PROPOSE now to discuss the materials used for telegraph poles, and the different modes of their preparation for that service. All countries do not employ the same timbers and modes of arrangement, but this state of facts is not a matter of choice; it is owing to the existence or non-existence of the different kinds of wood in the respective countries. In America there is a much greater variety of wood, than is to be found on the continent of Europe. In the Northern States of America, there is not that variety that there is to be found in the Southwestern. In the former, telegraph poles are mostly of the white-oak, and the chestnut; and in the latter, they are of the white-oak, post-oak, red-cedar, black-walnut, honey-locust, ash, sassafras, and elm. In England, the larch is the most common. In Russia, the pine; in France, the pine, the alder, poplar, and other white woods; in Germany, the spruce and pine, and in India, the bamboo.

These timbers differ as to duration, when placed in the earth. The pine of Europe, however, does not decay as rapidly as the pine of America, and, therefore, the rejection of that wood in America, from service, in the construction of telegraph lines, must not arbitrarily cause a depreciation of the European pine, in the mind of the reader. The alder of France is not the same as the common alder of America—in the former country it is a tree, but in the latter it is a bush, seldom more than two to three inches in diameter, at its base.

The red-cedar and the black-locust decay less than any of the kinds of wood mentioned. The chestnut, the sassafras, and the post-oak, are next, as to durability.

Until within the past five years, in America, but little pains have been taken in the preparation of poles before setting them in the earth. Heretofore, the lines have been erected with such rapidity, that the timber could not be prepared for permanency. Often, they have been placed in the earth the same day, and the same hour that they were cut. In later years, the custom of stripping the bark off has been adopted, especially, by the House telegraph companies.

I have often observed the decay of different kinds of wood used for telegraph poles. Those cut in the winter, and set in the ground immediately, in the spring sprout, and considerable foliage grows upon them. This was the case in the Southern climate of America. The second year, however, there was no foliage, and the wood was not only dead, but in rapid process of decay. The sap had fermented, and, on chewing the wood, I found it quite sour. Poles which have been stripped of the bark die immediately; the sap evaporates, and the poles dry or become seasoned, and, when planted, they prove more lasting. Some years ago, I had holes bored in the pole at the surface of the earth and filled with salt, confining it in the hole with a plug or stopper. After three years, I was unable to see any benefit, except for a few inches at the place of the salt. Around other poles, freshly planted, I poured some brine, saturating the pole and the earth.

Stock running at large, so common in America, would eat the earth for the salt, and the experiment gave me some annoyance. I was compelled to place around the pole large stones, to prevent the earth and the bottom of the pole from being eaten away. This process, pickled and preserved the poles, and they have been standing for nine years. I also made an experiment with charcoal. I had placed around the pole in the earth, about three inches of pulverized charcoal. The pole decayed at the surface of the earth as soon as others not so prepared; the charcoal did not preserve the timber in any perceptible degree. A few post-oak poles, well seasoned, planted in 1849, are still standing, having but one half decayed at the surface of the earth; but in the earth, and above, they are sold. These poles were 10 inches in diameter at the base, and 5 inches at the top, and thirty feet long.

In connection with this subject, the climate in which the timber is grown must be considered. In the northern climate, timber grows slow and compact. The wood is not so porous,

nor does it have so great quantity of sap. The bark is generally thin, and the sappy or white wood, is but a thin belt around the interior heart or dark wood. Woodmen do not consider all the dark wood beyond the sappy part the heart. For example, take an oak-tree, two feet in diameter, a size very ordinary in America, and first is the bark, then the sappy or white wood belting the tree, about three inches in diameter, then follows the dark, or red chip, until the heart is reached, which is generally in the centre of the tree. This heart is solid and tough. The dark or red wood is penetrated by sap. In some seasons of the year, I have noticed, when felling the oak, the walnut, and many other kinds of timber, the sap to run in little streams from the white and the red wood alike. The post-oak is much like white-oak, but it is a tree of slow growth, and is to be found mostly on dry and gravel uplands. It is more durable than the white-oak, in the earth. Cedar and locust have but very little sap, and the fibres are closely interwoven, so that there can be but little absorption. It is a saying, that "cedar and locust never decay." These woods can be regarded as the most durable that we have in America. Poles, ten inches in diameter at the base, will remain good, thirty or forty years in the earth. If the bark is left on the pole, it will sooner or later decay, and the solid wood is left, and weathers the storms and seasons for a lifetime. All kinds of wood will be more durable when stripped of the bark. Chestnut and sassafras will hold out from ten to fifteen years. White-oak, post-oak, honey-locust, ash, and black-walnut, about six to ten years. White-pine and poplar, about three years; black-oak, red-oak, and sycamore, about two years. All kinds of fruit-tree wood, one to two years. The pitch or yellow pine pole is quite durable in the earth. The turpentine or rosin does not ferment, but it forms a plastic throughout the timber, and prevents the absorption of moisture, and thus it is preserved from decay. Much of the rosin, when the pole is exposed to the sun, oozes out, and the exterior of the pole becomes coated with it.

The durability of the different kinds of timber mentioned, when used for telegraph poles, depends much upon the soil in which they are set. When planted in light alluvial soil, the decay is much more rapid than when placed in wet clay. In the former case, worms easily get through the earth to the pole, and, besides, the pole is more exposed, and absorbs the moisture of the earth with more rapidity; but, in the latter case, the clay serves as a plaster, filling up the cavities of the wood, so that water cannot penetrate it. In such earth,

I have frequently found the hickory wood petrified, making excellent razor hones, one of which I have had in service for twenty-five years. I have already stated that it was important to strip the pole of its bark, because if it is not taken off, worms shelter under the bark, and make rapid work eating away the wood, to reach the solubles buried in its recesses. They penetrate through the fibre in every direction, until the nourishment is exhausted, when the worm dies from starvation. The thousands of holes made by the worms aid to diffuse throughout the wood the moisture of the seasons, and in this way, in a few months, the pole decays, and yields to an ordinary strain of the wire, or to the force of the wind.

The white-cedar has been used in some sections of the United States, but it gives but little service. It is composed mostly of the sappy or white wood, differing from the red-cedar, which has not more white wood than the thickness of a knife-blade.

Some companies have had poles sawed from the large white-oak of the forest—large at one end, and tapering to the other. The poles were sawed square, and they gave promise of being very serviceable. Their cost was about five dollars each, which was at once a bar to their general use. Their durability has not been equal to the round sapling of the same locality, and of the same wood.

In 1848, the Magnetic Company constructed a new line of poles from Washington to Baltimore, in replacement of the poles erected as an experimental line in 1844. These new poles were of chestnut, stripped of their bark, and well charred at the earth end. The soil on this line is sandy, or gravel intermixed with clay. Many of these poles remain to the present time. Their diameter at the base is about eight inches.

As I have stated herein before, the telegraph lines in America have been constructed with such rapidity, that it was impossible to procure poles properly prepared, for permanency. I have known lines erected at an ordinary rate of one hundred miles per month, by one corps of workmen. While one set of workmen were digging the holes, another was cutting and hauling the poles, another was fitting the insulators, another would raise the poles, and the last would stretch the wire on them. In this way I have superintended the construction of ten miles in a day. This rapidity was occasioned by rivalry. The main object of the rival companies was to reach certain cities first, regardless of every consequence.

The House telegraph lines are more modern, and are better built. All the poles were selected with much care, of good

timber, well stripped of the bark, seasoned in the sun, at least ten inches in diameter at butt, and five inches at top, well set in the earth, and on a right line to avoid the strain of the wire on angles.

In the early days of telegraphing, especially on rival routes, when the lines traversed forests, but little care was taken in the selection of poles. The great quantity growing in proximity was an excuse for slight in the first building, the impression being "that the poles were readily replaced, in case of decay, and time should not be wasted on first construction." The people "ahead," always anxious for the completion of the telegraph, often had an influence in causing the constructors of the line to erect poles of inferior wood and size, and to use any means, however frail, to consummate an electric connection.

On many lines the forest-trees serve for posts, to which brackets or cleets are fastened, and in or on them insulators are fitted. These brackets or cleets are nailed to the body or limb of a tree. On one section of a line, embracing about sixty miles, I noticed that on more than one half of the route trees were used, and on a section of six miles there was not a post. The trees were large, from one to five feet in diameter at base, very high, and with outspread branches, shading the earth. The sun's rays could not penetrate through their foliage, to warm and vivify the small growth beneath. Weeds grown there were few, delicate, and frail. Small wood growth was seldom to be seen. There was nothing to disturb the wires thus attached to the stately oak. The telegraph wires, sometimes, in America, traverse gloomy mantled forest regions, where the foot of man never had trod before. In some of these mountain ranges, the cliffs or precipices, to ascend or descend, were difficult. The wagons were taken to pieces, and elevated or let down, as the case required, with ropes, or by strands of wire.

A few years in the Western States of America, makes a wonderful change in the appearance of the country, as to its settlement. Through many of the dense forests and widespread prairies, where ten years ago the wire was run for miles, without passing a habitation, now the rail-trains are hourly sweeping through villages, and the wire is no longer the solitary evidence of civilization. Farms have sprung up as with magic. To these railways have been transferred the telegraphs, and the meanderings from tree to tree are done away with, and the iron strand is stretched on methodically-set poles of the

best of timber. On many of these railways much care has been taken to procure durable wood. On the routes through Illinois I have recently noticed that the lines were nearly entirely built of red-cedar, brought by water and rail from some section, hundreds of miles distant. Such poles are durable, and will need no replacement in the present generation. They cost from three to five dollars, according to expense of transportation. In 1849, I had cut two thousand cedar poles in middle Tennessee. I paid for them standing, 50 cents each. When cut they were placed on rafts, and floated to the mouth of the Ohio river, where they were transferred to a steamer, and carried to St. Louis, as cargo. From there they were carried by wagon, and delivered on the route of the line. They were from thirty to thirty-five feet long, and about eight inches diameter at base, and at least five inches diameter at top. The average cost was five dollars each. These poles are at this time as solid as they were the day they were set in the earth.

The cost of telegraph poles depends upon the kind of timber, the size, and the quantity growing on the given section of the country. An average may be considered at one dollar and fifty cents, Spanish, delivered on the route. The cost of stripping the poles of bark from ten to twenty cents each, depending upon the kind of timber. A rough post-oak is more difficult to unbark and neatly dress, than the walnut, the cedar, chestnut, and other kinds of wood.

Early in 1848, I constructed a section of the great New-Orleans line in the West, and being pressed for posts, I purchased a large number of oar poles, used on the flat boats which had descended the Ohio river with coal, corn, or other things of trade. The poles were of pine and white poplar, but generally well seasoned. The poplar of America is a porous wood, and absorbs a large quantity of water, which causes its early decay. I purchased some coal-tar from a gas establishment, and had it spread upon the butt end of each pole about six feet high. It required about a half gallon of the tar, per pole. The coating, and all the expense accompanying the operation, cost about thirty cents for each pole. In 1853, those poles, thus coated with coal tar, were solid, and scarcely any decay could be seen. Poles of the same wood, and set at the same time, not coated, had to be replaced in 1852. Had the poles been green, and freshly cut, they would not have lasted more than two or three years.

The telegraph poles in America are not so well prepared as

they are in Europe, although there is no reason why they should not be, and of better timber, and more substantial. The sorts of timber are more general and abundant. There is every facility necessary for their proper preparation, and there is no country demanding permanency of structure more than the telegraphs of America.

Along the ordinary roads the length of the pole is from twenty-five to thirty feet, size at base ten to twelve inches in diameter, and at top five to six inches in diameter. They are placed from eighty to one hundred yards apart, and set with the windings of the road. On some lines an effort has been made to set the poles on a straight line as much as possible, and at curves or angles in the road, the poles are set so as to divide the strain on as many of them as possible; more ordinarily, however, a good substantial pole is selected for the angle, and set at about fifteen degrees from a perpendicular, so that the strain of the wire will bring the pole to an upright position.

In good soft ground the poles are set about four and a half to five feet; in hard gravel about four feet; in rocky places about three feet. I never knew of holes drilled in the rock for telegraph poles, except perhaps in Nashville, Tennessee, where many of the streets are natural rock beds. In loose rocky places, a hole some one or two feet is opened with a crow-bar, and when the pole is set in it, rocks are piled up around it some three or four feet high. This requires less time than blasting a hole through the rocks, and it fully serves the purposes. Where the soil is marshy, braces are framed around the pole, but of these more particular descriptions will be found in the chapter on the construction of telegraph lines in America.

Along the Western and Southern rivers, the cotton-wood sapling abounds in great quantities, but the wood very soon decays, and on that account it has never been employed for telegraph poles. I am of the opinion that if they were injected with the sulphate of copper, as hereinafter described, they might be made of very great service, and prove economical to many companies throughout the southwestern country of the United States.