

DIFFERENT METHODS OF SEASONING TIMBER.

On this subject Mr. Wm. Harrower, Forester, Cahir Estate, Tipperary, Ireland, writes as follows in the *Timber Trades Journal* :—

"In countries like our own, where the supply of wood is very limited, the preservation of timber calls for serious attention, and the importance of this subject is shown by the numerous experiments which have been made to determine which system of preservation is most efficacious.

Omitting the attacks of insects, the cause most contributing to the premature decay of timber is alternation of dryness and damp. Timber, when totally immersed in water, or imbedded in any uniform and homogeneous matrix, appears to be nearly indestructible. The piles of Old London bridge, after being sunk for 600 years in the bed of the Thames, were drawn out in a state of good preservation. Some descriptive timber are remarkably long-lived (if the term may be used) in a dry situation, from which arises the saying—

"Keep me wet or keep me dry,
One thousand years good wood am I."

Unfortunately for the life of felled timber, especially when of large dimensions, it is generally exposed to successive repetitions of dampness and dryness, which speedily effect its destruction, if not protected in some artificial manner against these influences. In a few forest trees, such as oak, the wood is naturally protected against decay by the presence of an essential oil.

The first means tried as a protective was painting the timber, but in a short time this was found little better than useless, and nothing could be expected from an application so completely superficial. The least shrinking of the timber, a violent shock, an incision, or any one of numerous other causes would be sufficient to produce a crack in the paint, and allow the ingress of the destroying agent. In reality while the oil was at the core, the attempted remedy did not penetrate beneath the surface. After the futility of paint as a preservative had been clearly shown, some one hit upon the idea of impregnating the wood with a mineral solution, whose properties would be an antidote to decay. In the first application of this idea, the timber was merely soaked in the solution selected, but this operation was soon discovered to be of little service. The protective fluid was either washed out by the action of water to which it was subsequently exposed, or it did not penetrate far enough into the wood to be of any real benefit, especially when the timber was hard and of a close-grained texture. Under those circumstances it appeared necessary to force the preserving fluid into the pores of the wood by hydraulic pressure or other means known to engineers.

Having got thus far, the question practically was, "What is the best solution?" This question brought out a number of patent remedies in the shape of chemical solutions, and the public were thus enabled to form an opinion which was best. Sulphate of zinc, sulphate of copper, corrosive sublimate, sulphate of iron, and creosote have been applied. In fact, the latter has succeeded so well that "creosoting" has become a generic term applicable to the preservation of timber. The creosoting process is most esteemed in Britain, while sulphate of copper (Bouchiere's process) bears a high reputation on the Continent of Europe.

In the various experiments conducted with the view of determining the best solution, a length of time was necessarily occupied, otherwise the result would have been valueless for practical purposes. The number of years that have elapsed since these trials were made, now enables us to form a pretty clear idea as to the most successful process to adopt. No doubt in many instances creosoting and sulphate of copper have failed, but these are exceptional cases, which have probably been caused by the process being imperfectly completed, and it should be borne in mind that the variety of texture in different woods, and the nature of the ground in which they may be laid, modify very considerably the result of the process. With sulphate of copper or any other substance it is essential that the injected fluid should displace the natur-

al sap of the tree, that the antiseptic operation be applied to sound timber recently felled, and that it be subsequently permitted to dry in the open air. In 1848, some timbers which had been duly impregnated with sulphate of copper were laid down in the Ligno du Nord, France, near the station of Compiègne, and when taken up a short time ago were found in a perfect state of preservation. Under the action of the saw they proved to have an excess of hardness over non-preserved timber of the same species, and neither their strength or elasticity was impaired to any appreciable extent.

The chief modes of decay in timber are known as wet rot and dry rot, both of which are indirectly due to the action of moisture—in the former by assisting the decomposition of the tissues of the wood, particularly the albumen or aspenwood, and in the latter by aiding the growth of certain cryptogams which obtain their nutriment from the substance of the wood. The reduction of the natural moisture in the wood itself by proper seasoning, and the prevention of the access of external moisture, is to some extent accomplished by a coating of some impervious substance, such as tar. Paint sometimes prevents wet rot, but for the reasons noted above this is not always successful. The same means are generally supposed to destroy, or at least to retard dry rot, but with the same unsatisfactory results. There is this peculiarity, that an excess of moisture is unfavorable to the growth of fungus which feeds on the wood; also, when the circumstances are favorable, such as a moderate degree of moisture, which most woods possess in themselves, and the existence of a warm stagnant atmosphere, no mere coating of paint will prevent the mycelium of the dry-rot fungus from penetrating to the interior of the wood. Once this gets affected, its destruction is rapid.

Many opinions are given regarding the season in which timber ought to be felled. Practically the question is settled. The period usually chosen for hardwood, with the exception of oak which is to be peeled, is from October to March, and confers all the year round. Objections to felling timber during summer are based on the belief that the wood is full of sap. This, in our opinion, is an error, as in summer the sap lies more on the outside, including the young bark, for the formation of the annual increment of timber. We subjoin a table giving the results of an experiment made in 1867, showing the amount of sap in timber at various seasons of the year :—

January.....	340 lbs.
February.....	328 "
March.....	331 "
April.....	311 "
May.....	319 "
June.....	297 "
July.....	297 "
August.....	314 "
September.....	306 "
October.....	328 "
November.....	331 "
December.....	340 "

REMARKS.—In this experiment there were 25 pieces of timber of equal size cut each month and weighed. The figures show that in the months of November, December, and January there is most sap in the wood, as the blocks are heaviest; while in the months of June and July the weight of the blocks indicate little sap. This can be easily tested, and is worth trying.

There is considerable loss in heavy timber when allowed to split and crack with the brought, and care ought always to be taken to prevent damage of this sort. One great cause of splitting is from allowing the timber to dry too rapidly. In some parts of England the standing oak is peeled, and after it has stood for some time is cut down under the impression that it is a saving to the wood. This may be the means of preventing cracks, but it involves unnecessary expense. Splitting of wood necessarily occurs where the shrinkage is not uniform throughout, and as the heartwood contains less moisture than the sapwood, the latter shrinks more rapidly. Hardwoods contain about 40, conifers 45, per cent. of moisture.

There are two methods employed in seasoning timber—the natural and the artificial. The natural, as with everything else is the simplest, if not the best, being to allow the sap to evap-

orate of its own accord. The natural can be assisted by carting the timber as soon as felled into sheds, and having it cut into logs and stored within shelter for eight or ten months; after which it should be sawn into planks. Great care should be taken not to allow the planks to lie too close when ricked, but to have a passage of air freely circulating through them. This artificial system consists of the application of heat or liquid. One plan is to place the timber in a tank having an air pump attached, which is supposed to drive the fluid from the interior of the timber. To increase the tendency of the sap outwards, a higher temperature than that of the atmosphere may be applied with less risk of rending. By this process the timber can be seasoned in a few weeks. Of course there is considerable extra expense incurred, as an engine is required to work the pump, and it frequently happens that the wood is imperfectly dried. We advocate the natural process above all we have yet seen and tested. In both cases casting or twisting ought always to be guarded against. Some kinds of wood are more liable to cast than others, and we have seen the same kind grown on different places very different in the grain. The best examples of well-preserved timber are found in the roofs of churches. The roof of Westminster Abbey is set down at over a thousand years old, yet the timber is quite sound. Hence it at once appears that the best method is to keep it as permanently exposed to the free action of the air as possible. No doubt in this department science has done much to save time and expense.

The decay of timber, in our opinion, arises from internal moisture, as already stated, therefore the work of greatest importance is to expel the sap and keep the wood permanently dry. There are several paints recommended for this purpose. An oil taken from tar is much sought after as an unequalled preservative for outside timber, such as railway sleepers, fence posts, bridge piers, &c. The usual way of applying it is to fill a tank with well-seasoned timber, and to the tank is attached pump worked by steam. The oil is pumped into the tank, and a high pressure of oil is supposed to find its way into the pores of the timber. Force is the power required in this system, without which the process is unavailing. Green wood placed in the tank and treated in this manner receives little or no benefit; we are inclined to say it does more harm than good, as the internal moisture is pressed into the centre, and the pores being filled with the oil, it cannot escape; hence internal decay ensues. When the wood is thoroughly seasoned and placed in the tank, hot air ought to be first employed to open the cells; then under high pressure oil will penetrate into the centre, as we have seen railway sleepers saturated completely through. A plug in the bottom of the tank, with a connecting pipe to the reservoirs where the oil is pumped from, can be opened to drain off the oil, and by the application of hot air the wood is rendered dry, and can be handled comparatively clear. We have seen this method wrought with beneficial effect, though often with the opposite result, according to the amount of previous seasoning.

In ordinary circumstances, tar is the most economical preserving paint for estate purposes. Wire fence posts are frequently coated with tar previous to being set in the earth. Here we would recommend two tanks or wooden troughs about 20 ft. long, 3 ft. broad, and 2 ft. deep, to be filled nearly to the top, so that the liquid may not be lost by running over the sides when the posts are put in; the posts are set on end as close as possible, and the tanks emptied alternately, thus allowing some time for the fluid to penetrate the wood, a process requiring no skilled labor. A scaffold is erected close to the tanks upon which the posts are laid out to drip, and the fluid runs into the tanks again. The advantage of this system over the charring method used for the same purpose is that one laborer can easily smear from one to two thousand posts per day. Our own system is to cut the wood into posts as soon as felled, and stack it until perfectly dry; to allow ample time we always have it prepared a year beforehand. If larch is thus treated, it is exceedingly hard and durable, and capable of resisting the encroachments of damp for a long period.

TIMBER IN ALBERTA.

Although the district of Alberta, N. W. T., is largely a prairie region, and rich in grazing and agricultural lands, the rivers are fringed with a considerable quantity of timber. The *Northwestern Lumberman* says that the Eau Claire and Chippewa Falls, Wis., syndicate own a large body of timber on Bow river and was to begin lumbering operations there a year or more ago, but nothing has been learned of the enterprise as of late. Mills are, however, in existence in the vicinity of Calgary, cutting for the local demand. Since there is a prairie country in that region, of vast extent, the increase of population will call for an immense quantity of lumber in the years to come. The *Calgary Herald* speaks of the timber resources of the country as follows: "The quantity of timber in Alberta has been much underestimated. It is only lately that explorers, having gone pretty well through the country, off the beaten routes, found that there are thousands of millions of good clear spruce and cypress pine, which will be easily available for the supply of the whole North-West. This timber lies principally along the valleys of the innumerable streams which, flowing eastward from the mountains and foothills, gradually join one another until they form the great Saskatchewan rivers. These streams and rivers provide abundant water power and numerous good mill sites. The timber consists principally of spruce and cypress pine, making fair common lumber; red fir, a hard, close-grained wood, excellent for inside finish; tamarack in small quantities, and plenty of cottonwood and poplar, which make good firewood."

TIMBER IN MEXICO.

"From the frontiers of Guatemala to those of the United States," says the *Mexican Financier*, "we have a vast domain whose growth of precious wood is truly enormous. Along almost the entire length of the coasts, both of the Pacific Ocean and Gulf of California, a variety of woods abound that are remarkable for their perfumes, as well as such valuable cabinet timbers as the rosewood, mahogany, ebony and the cedar. The Mexican cedar is especially prized in foreign markets, for overlooking its rich aroma, it possesses such a lightness of weight and a grain so fine that it is considered superior to the ordinary walnut now so largely used in the manufacture of rich furniture. While the interior states rival the coast states of Mexico in valuable timber resources, it is a noteworthy fact that the woods which command good prices in many foreign markets are here almost everywhere burned as carelessly as the cheapest fuel. The coming exhibits in Boston and New Orleans should attract to the neglected regions of Mexico, so rich in wooded wealth, their deserved attention."

FOUNDATIONS FOR BUILDINGS.

In many sections where stone is scarce and brick not easily obtained, wood is from necessity employed in foundations for houses and other buildings. The wooden supports usually consists of sections of a log one or two feet in length, set upon end at the corners and other parts of the building. Blocks thus placed decay in a few years, especially where the sills rest upon them. There are two plans whereby this trouble is in a great measure overcome. Two well seasoned and oiled blocks, four inches wide, two inches thick and ten inches long are placed edgewise on the top of the foundation blocks. This ensures a free circulation of air, and rapid evaporation after a rain. The lower block is cut in the form of a triangle, and laid upon the ground, thus shedding rain and quickly drying out when wet. Another form of wooden support for small buildings consists of pieces of sawed stuff, two feet long, two inches thick, and six inches wide, laid up like open brickwork. This makes a very neat foundation, and dispenses with the building lattice work. If the outer face is planed and painted, this adds to the good appearance and utility as well as durability of the foundation.—*American Agriculturist*.

J. A. LUNNEY & Co.'s mill, near Ewart, Mich., was burned Sept. 15, and about \$4,000 worth of hardwood lumber. The loss is about \$15,000; insurance, \$9,000.