

# WEEKLY INDUSTRIAL RECORD.

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## THE FRENCH SYSTEM OF TURPENTINING.

A study of the French method of turpentine demands especial interest at this time when the naval stores industry has assumed such large proportions in the South and when improved methods similar and probably more advanced than the French system are coming into such wide use.

In France, bleeding trees for turpentine has been carried on for thirty years or more, without killing the trees or diminishing their flow of resin. Here in the United States, even in the richest forests of virgin yellow pine, the productive life of a tree is only four to six years when turpentine by the old destructive box method, and fifteen to twenty years when the cup and gutter or cup and apron systems are used, and shallow chipping carefully followed.

The French method of turpentine, however, requires more labor and greater skill, and is less productive than any of the several methods in use in the United States. Owing to social and economic conditions in the United States, it is extremely doubtful if the French method will ever receive the favorable consideration of the American turpentine operator.

The rapid diminution of the supply of longleaf timber suitable for turpentine, and the immense loss that has attended former practices of turpentine in the United States, has led to a desire to inaugurate more conservative systems. A description of the French systems will furnish an example from which may possibly be drawn suggestions and ideas useful in the conservation of the longleaf pine forests of the United States.

In French practice, the pine tree is first bled at an age of about fifteen years. Trees from four to six inches in diameter, breasthigh, are commonly found to contain a single face from three to four inches wide. Before placing the face, the rough, outer bark is removed as far up the trunk as it is expected to wound the tree for that season's working. Beginning about the first of March, the face proper is started by cutting out a small chip, about four inches square and one-half inch thick, as near the ground as possible. An incision is then made in the lower part of the face, by driving a chisel-like tool into the tree at an upward angle. The edge of this tool is in the form of an arc of a circle instead of a straight line.

A strip of zinc is fitted edgewise into a groove on the back of the tool, and is then inserted in the incision by a smart blow from a wooden mallet. For the first year, the gathering cup is placed just beneath, on the ground. For the succeeding years, the gutter is raised at the beginning of the season, and the cup crowded between the gutter and a nail driven in the tree lower down.

The face is chipped about 30 times between March and the middle of October. At each chipping, a thin chip about one-

half inch deep and from one-half to one inch high is removed, so that at the end of the season the face has a length of about 26 inches. For the next four seasons, the face is lengthened about 30 inches for each, until at the end of the fifth, the streak is approximately 12 feet from the ground.

The chipping is accomplished with an ax having a peculiarly curved blade. The plane of the blade is set at a slight angle to the axis of the handle such that the operator may cut a chip from the tree by a downward stroke while standing slightly to one side and in front of the face. The edge of the blade has the form of an arc of a circle instead of that of the usual straight line. Considerable skill is required to use the ax effectually. As the face reaches a position above the convenient reach of the chipper a ladder formed of a round pole bearing triangular blocks attached at intervals along one side, is placed against the tree and the chipper climbs to the required height. The upper end bears a sharp point so arranged as to penetrate the bark and thus prevent its displacement. This iron hook is usually so formed as to furnish a sharp scraper with which, if desired, the chipper may scarify the face from the ground by a straight downward pull.

Dipping is accomplished once every two weeks in much the same manner as by the cup system in the United States, the dipper carrying a small paddle with which he cleans the gutter and scrapes out the cup. On high faces the cup is removed by means of a piece of strap iron bent so as to form a part of a circle and attached to one end of an extension pole. At the end of the season the cups, gutters and nails are removed and the scrape cleaned from the face and caught on a cloth spread on the ground at the base of the tree. Since the face is only about four inches wide the percentage of scrape to dip is small.

As the trees become larger and the first face attains to considerable length a second is started about one-third of the circumference of the tree to one side. Upon the attainment of the second nearly to full length a third is made. By the time that the third has reached full length from 11 to 14 years has elapsed since the first was started. If desired, the tree may be logged at this time although usually the bleeding continues for some time longer, more new faces being made until eight or more have been formed, but never more than a single new one each year. The fourth is placed near the first, since by that time it has nearly grown over again. In this way the tree always has sufficient bark to allow growth to continue practically unabated.

This method of bleeding is known as "bleeding alive" as in contrast to "bleeding to death" which is often practiced upon trees that are intended to be removed for lumber or other purposes. In each

## FOREST RESOURCES OF SOUTH AMERICA.

The forests of South America are principally tropical, but in the Andes Mountains and the southern end of the continent are found forests of a temperate and sub-arctic character resembling somewhat those of the United States and Canada.

The tropical forests are totally different from our north woods. There are no solid stands of single species or even of a few mixed species. Instead, hundreds of kinds of trees grow thoroughly mixed and scattered through the whole forest. This is one of several reasons that makes logging in tropical forests so expensive and often unprofitable.

Rubber hunters have explored nearly the whole tropical forest in search of that necessary article of commerce, but aside from that South American forests have only been cut into for a few miles back from the coast and the principal ports and rivers. Even in this area only the species at present most valuable for commerce have been thus far cut, for example, cedar, mahogany, rosewood, lignum-vitae, fustic and ironwood. Railroads, where they exist, charge such exorbitant freight rates that they have not much encouraged exploitations of the forests. In addition to this the sparsity of population and lack of labor have also retarded development of the forests.

Most of the woods growing in these tropical forests are very heavy, hard and rich in color. Greenheart is so hard that it nicks the axes of the choppers and will last for over one hundred years in water. It should be noted here that the style of ax used in the tropics is quite different from our common north woods ax and has a very narrow bit. The American broad-bitted axes would be very ineffective on such hard woods.

Growth is so luxuriant and rapid that ruins or abandoned farms are promptly covered with a dense young growth of trees and vines that in a few years obscures the marks of civilization. The

instances the faces are placed very close together and are continued for only about three years when the tree is cut.

The cup, or Hugue's method has been in use since 1840. The old method differed chiefly in that the gum was allowed to flow the entire length of the face into a small hollow formed in the sand at the base of the tree. This method yielded a much inferior grade of gum and is now practically unused.

The yield of gum varies from three to five pounds per face per year in the case of "bleeding alive." By "bleeding to death" a yield of from eighteen to twenty pounds per tree is obtained.

Copper stills used for distillation are usually heated with steam and equipped with thermostats so that the operation is conducted throughout upon a definite basis which guarantees uniform and high-

great forest of the Amazon basin is eleven hundred miles long east and west by seven hundred and fifty miles north and south. It covers nearly a million square miles in Brazil. But as it lacks construction timbers it cannot be looked to for relief from the approaching scarcity of that kind of wood.

This Amazon forest presents the usual features of tropical growth, a tangle of vines weaving the great trees together and obscuring the sky, and leaves hanging from the branches like ropes, while underneath is a snarl of shrubs and creeping plants in which are hidden many species of fibrous plants and cacti with their sharp stings and thorns.

The tropical American woods are peculiarly adapted to withstand the ravages of insects and climate. In Paraguay, timbers of lapacho and quebracho which were used by the Jesuits in constructing their missions, are still well preserved in the ruins. In contrast to this, our own North American woods, which are so extensively imported for construction in South America, rapidly decay and are eaten by insects.

Just as in this country, not only in the old days but even today on the frontier, so also in South America in Colombia, Chile and other states, the forests are cut down and burned, to clear land for agriculture.

The transportation difficulties in the mountainous countries are so great that the cities of the West Coast depend wholly upon imports, chiefly from the United States, for their lumber. Their own mountain forests, which are reported to be very extensive and valuable, are inaccessible.

In Colombia, all articles to or from the interior must be transported a portion of the way at least on pack animals, and packages are limited in weight to 150 pounds and in length to ten feet.

Lumber is not so extensively used in construction of homes as with us. Brick, stone, mud, and tiles are extensively used, also bamboo, palm, etc.

grade results.

Turpentine is carried on in Southwest France along the shores of the Bay of Biscay and is really only a secondary reason for planting the forests. This whole region was at one time threatened with devastation by sand dunes which were constantly moving inland, driven by ocean winds.

To fix these dunes the Maritime pine was planted in conjunction with hardy grasses primarily to form a forest cover and to protect the soil from the winds. The pine is a small tree with coarse textured wood but which is utilized for timber purposes after its life of furnishing naval stores is ended.

It yields an abundance of resin quite comparable to that of the Western yellow pine of the United States, though not in such copious amounts as does our longleaf pine of the South Atlantic States.