

sixteenth of an inch, so the teeth will not mark the timber; that is all the "lead" that is needed.

For a little mill I like a thin saw about eleven or twelve gauge; it runs lighter, but is harder to keep on the line than a thicker saw. For a twenty-horse power, I like a seven and nine gauge, that is, seven at the eye and nine on the rim, with about fifty teeth. Keep the backs as full as you can without striking the log, it makes the teeth stronger. Never make one stroke too much with the file, file until the tooth is to an edge and no more, it only wears the saw; when the tooth is to an edge it cannot be any sharper.

ST. JOHN'S SPRUCE SUPPLY THREATENED.

For many years the city of St. John, New Brunswick, has been supplying New York very largely with Spruce lumber, especially with Spruce lumber of large dimensions, as the logs which come from the Aroostook, and from above the Grand Falls of the Saint John, which are the best timbered sections of that river, are of large size. When one looks at the great tree lying in the Douglas boom close to Fredericton and compares them with those lying in the Penobscot, he at once sees that the Saint John timber, in point of size, is far ahead of that now cut on the Penobscot.

There seems to be now, however, a reasonable probability that within a few years a considerable part of these large logs will be sawn elsewhere than at Saint John; that is to say, that they will be sawn on the Aroostook at Caribou; and above the Grand Falls, at Temiscouata Lake, and at or near the point where the Saint Francis joins the Saint John, which is thirty-five miles north of Edmundston, the present terminus of the New Brunswick Railway, which has lately been absorbed by and incorporated with the Canadian Pacific. The people of the County of Aroostook, wearied out with carrying freight probably more than 100 miles further than they need, were a short line built from Caribou or Fort Fairfield to the Penobscot, have concluded to build a railway direct which shall strike that river without passing through English territory, and are now taking steps to forward its construction. Against this the Canadian Pacific is fighting hard, but the short road must eventually succeed, if even if it be for a time hindered by the machinations of its gigantic adversary.

Already a large dam has been built at Caribou, on the Aroostook, where there is abundant power to saw all the logs on that river, and the people of Aroostook are even now anticipating the time when all the logs coming down the river shall be held there to be sawn into planks and boards for transport over the short line when it shall have been completed.

Ascending the Saint John to Edmundston, we find that there is a line of railway running from the Saint John River at that place to River du Loup, on the Saint Lawrence, the distance by it being from one point to the other eighty-one miles. We find that the owners of this railway (Temiscouata) are this summer building a railroad from Edmundston to the mouth of the Saint Francis, above which are situated the most extensive timber limits on the Saint John, or its branches, and where any quantity of lumber can be easily held in booms, and where, as the Saint John is the boundary between the United States and Canada, lumber can be sawn on the American side of the river and be exported either to Great Britain or to the United States, in either case free from duty.

English deal can be hauled from the Saint Francis by rail when the Saint Francis road is completed to the wharf at River du Loup for \$1.20 per M. B. M.; and freights from that place to Europe are cheaper than they are from Saint John, and Quebec deals command a higher price than those sawn in Saint John; now it costs about \$2 per M. B. M. to carry logs by water from the Saint Francis to the mills at Saint John, as the Temiscouata Railway crosses the Intercolonial at River du Loup, and as that connects with the Grand Trunk, boards, shingles, clap-boards etc., can be carried by these routes in bond to any desired place in the United States. So far as we can learn, there is no doubt but that the construction of sawmills up the Saint John River will follow on the completion of the various roads which we have named. The lumbermen at these mills

can be exported free of duty, as we have already mentioned, to both Great Britain and the United States. Not only so, but logs grown on the tributaries of the Saint John in the Province of Quebec, when they come to such mills so to be built in the State of Maine, become American lumber, and when sawn can be exported free from duty, and no power can collect any export duty on such logs, from the fact that they will by the very current of the river, and not by any act of man, run into the booms which would be built above such mills. From these facts we are led to the belief that the day is not very far distant when the mills at Saint John will have formidable rivals to contend with hundreds of miles distant from that city.—*Exchange*.

HOW TO MEASURE LOGS.

A thorough knowledge of the means by which the contents of any log or stick of timber can be accurately determined either in feet, board measure, or cubic feet, is a necessity with every one engaged in the lumber trade. Although this may seem difficult at first, in reality it is very simple, as is satisfactorily shown by an expert on the subject in a recent communication to the *Tradesman*, from which the data for this article are gathered. There are several rules and tables published for determining the contents of logs, but the Doyle rule, which is given in *Scribner's log book*, is in most universal use, and is considered the standard. If all timbers to be sawn were square to begin on, then the different tables would not vary, but every lumberman knows there is considerable good lumber in a round log outside the four lines that must be cut to bring it to a square. In a small log this amounts to very little, but in large ones it will reach as high as 30 per cent. One third of the diameter of the log is usually allowed for squaring it.

Small logs will generally cut more than the Doyle rule, mentioned above, gives, and for this reason some New York exporters have adopted other tables, the most popular of which is Gard's log book. G. F. Herring's log tables which are published by Pastoriza & Brown, Houston, Texas, are used to a considerable extent in the southwestern territory. These tables give results considerably below the Doyle rule. To illustrate: According to Doyle a log 40 inches in diameter and 10 feet long, contains 810 feet, the same log 40 feet long contains four times as much, or 3,240 feet. The Herring's rule makes a log 40 inches in diameter and 10 feet long contain 667 feet, and one 40 feet long of the same diameter, 2,734 feet, instead of 2,668 feet, as it would, if the short length were correctly calculated, and the mean diameter taken. The discrepancy is probably due to some custom of taking the diameter of long logs, that is not explained in Mr. Herring's book.

The rules so far alluded to are for estimating logs on land; for floating logs, the one commonly used in the streams of the hardwood belt is called the Cumberland river rule, but has never been printed except in card form. It is very simple. From the dimension of the log one-third is subtracted to bring it to a square, and from the square thus formed, one-fifth is taken from one side for saw kerf. Take for example a log 10 feet long and 15 inches in diameter. One-third of this for squaring it leaves a diameter of 10 inches and one-fifth off one side for saw cut, will leave a log 8x10 inches. Multiply the two sides together and the product by the length in feet, dividing by 12, leaves 67 feet for the amount of lumber, board measure, while the same log according to Doyle rule, would produce 77 feet. For a log 10 feet in length and 40 inches in diameter, this rule gives 473 feet. The same log by Doyle's and Gard's rules contains 810 feet, and by Herring's 667. If cut with a hand saw, it would produce more lumber than any of them give, providing it be round, straight and perfectly sound. The low estimate given by the river rule is to protect the buyer of logs from natural defects hidden under the water, and from intentional fraud.

In measuring logs in the water, a stick is used called the river log rule. It consists of a hickory strip, very much like the ordinary lumber rule, only about six feet long, and has a metal hook projecting at right angles from the lower end. There are three rows of figures for six different lengths of logs. In using it, the hook end is thrust straight down into the water, and the hook brought firmly up against the bottom side of the log, and the thumb placed against the stick at the top. The figures on the stick nearest the point indicated by the thumb, in the row for that length, shows the contents of the log. Thus it will be seen that under this rule the log is measured from outside to outside of the bark, which neutralizes the apparent discrepancy between it and the Doyle rule. Those who handle rafted logs will find this rule very satisfactory as it gives uniform results and sufficiently below the actual contents of perfect logs to make up for all ordinary defective ones beneath the water.

WILL THE CIRCULAR SAW GO?

This is a question asked by Mr. J. H. Mier in a letter to the *St. Louis Lumberman*. He then proceeds to answer it as follows. The band saw mill is now an established machine for the more economical conversion of logs into timber, but it yet remains a question whether it will replace the circular as the standard mill. There are many things to be taken into consideration in determining which to buy. This question lies principally in the skill to be had to successfully operate the band saw. There are mills that are actually cutting more lumber than the circular on the train of wheels and strain of tension to maintain it, it is evident that the tooth must be precise. The amount of deviation that would hardly affect a circular saw would be sufficient to condemn the band, and put it where many are that are now in use, viz.: behind the circular.

The cracking of band saws is another serious trouble which seems inevitable, and yet there are mills that hardly have a cracked saw. This evil, which so greatly retards the introduction of the band will be overcome. This can not be entirely attributed to the tension of saw or to the filer, but remains to be overcome in the construction of the mill, that is as light an upper wheel as possible and a more sensitive straining device, which the later designs seem to be greatly overcoming. Larger wheels are being used, which greatly helps the contact of saw, and greatly overcomes that crystallizing tendency. The future mill will be a 10 to 12-foot wheel, with 12-inch saws; then the back and tooth edge of saw may be kept slack of tension and there remain enough blade to make a stiff strained saw that will lead the circular in any capacity of sawing. The circular at present has only one advantage over the well-fitted band, and that is in small timber where a great deal of heavy timbers are sawed, such as railroad stuff. In this case the band saw has but little economy, as there are but few lines run to complete the log, the gain of the band being in one-inch boards and larger timber.

The filer that realizes that the band is the coming saw, and applies himself to it, will always be in demand at the highest wages. There are many mill men that continue to vote for Andrew Jackson, through the eye of prejudice and will cling to the "old reliable."

When to Cut Timber.

Timber should be cut when ripe, like any other crop. Gentlemen foresters may as well advise letting ripened corn remain to moisten and fertilize its field as to urge the preservation of forest trees for similar reasons. Trees which fall and decay are wasted. That waste within the limits of the United States is very great. He who has lain in the camp and heard in the unnatural stillness preceding storms that strange, dull roar like distant cannons, of mighty trees laid low, and considered how hourly and yearly vast numbers of forest kings go down to death upon millions of acres now inaccessible, may be led to view the problem in variance with the philosopher wondering why this potential wealth is not appreciated, why lumber is imported when better stock is rotting here, and if the assumed necessity of water supply in districts where water runs unhindered to the sea warrants the burden of an unproductive and therefore valueless area. Much more may he marvel at the wisdom of him who hoards a wasting forest in the face of a persuasive market; that timber sold, the interest on the cash returns might foster a second crop on twice the area.—*Exchange*.

Ottawa Lumber Shipments.

THE quantity of lumber carried from Ottawa and Hull by the Canadian Pacific and Canada Atlantic Railways for 1888 and 1889 is reported as follows:—

	1888	1889
Sawn lumber, feet,		
board measure	119,304,517.	125,937,719.
Shingles.....	50,000.	

The quantity carried by the Ottawa canals for the period is as follows:—

	1888	1889
Sawn lumber, feet,		
board measure	316,923,600	368,910,600.
Shingles.....	5,028,000.	5,184,000.