

the logs were seasoned for a year, as you state, they would float long enough to be driven a reasonable distance.

ONTARIO LUMBER CO., Toronto, Ont.: We have had no experience in driving hardwood sawlogs in any appreciable quantity. We have occasionally driven oak timber, which would sink very readily when put into the water after cut. We found by boring a hole with a 3 inch auger at both ends of the log, and driving in a plug, leaving a small air space between the bottom of the auger hole and the plug, that they would float successfully in this way. We have known instances where hardwood has been left on the bank to dry, and by painting the ends of the logs just before watering, they were driven successfully, but the distance must not be too great.

MACPHERSON & SCHELL, Alexandria, Ont.: Your statement about cutting logs the previous season and allowing them to stand over and season would mean, so far as maple, elm and birch are concerned, to let them become useless. Maple and elm are damaged by September considerably, birch less. Seasoned logs may float until they become saturated. Plugged logs will float if the vacuum is perfect. Frozen logs will float early in the season, but will go down when the water is warmer and the logs become fully soaked, and the sap cells filled with water. Have tried floating hardwood logs but not successfully. The specific gravity of oak, maple and birch in a large percentage of logs is greater than water, and I do not see how such logs can float after the sap cells become filled with water. A large percentage of hardwood logs will float for a short time, but will go down after a few days.

PETER NADEAU, SR., Grand Casapedia, Que.: In our district we drive very little hardwood of any description, the principal drawback in doing so being the sinking of logs coming down the river and also when in booth. The only safe and satisfactory way of driving them is by rafting them with spruce, cedar or pine. The logs are placed side by side, every second one being a spruce or cedar. Cross pieces are laid across at the ends and holes bored through the cross pieces and into the birch, then wooden pins are driven in solid. This is the only satisfactory way we know of, even if costly; otherwise there is sure to be a great deal of loss. The cutting of birch and hardwood the previous season is also a good way if the bark is taken off, giving the lumber a chance to dry; otherwise it will dry very little and in a few months will get dozy and stained.

WILLIAMSON & CROMBIE, Kingsbury, Que.: We have not had very much experience in driving hardwoods, but have got out ash, birch and basswood in small quantities, which were peeled in the summer and lay in the woods until the following spring, and then drove to our mills where they lay in the water until fall. These logs when taken into the mill and sawn were found in perfect order, and we have no hesitation in saying that logs got out in this way should turn out altogether satisfactory to the manufacturer. You, of course, understand that basswood got out in the winter is a great deal better than water-soaked timber, which becomes discolored.

J. B. SNOWBALL COMPANY, Chatham, N.B.: We have been in the habit of getting small quantities of hardwood off our small streams, and find that if peeled a season in advance, we are able to float the larger portion of them down our small brooks in the spring, but as soon as the water gets warm in the summer, they again absorb large quantities of water and sink. Our experience is that they can be handled for say three months after being put in the water in the spring. There is, however, more or less loss. Black-hearted birch will not float sufficiently at any time to pay for handling. We only have birch, maple, beech, ash, and this class of hardwood here, and our experimenting has been entirely with these, and our experience is that there is very little, if any, difference in the time we can keep the different kinds afloat. In preparing our stock in this way, we still find a few logs that will not float sufficiently, and we generally twitch these out of the brooks, and leave them over for the following year. Ours is a tidal river, and all our mills are on

salt-water sites. In bringing hardwood logs from the delivery booms to the mills, we generally raft about one-half spruce and half hardwood, so as to make the passage (which is from 20 to 50 miles) in safety, but after arriving at the boom and the rafts being broken up, we find our loss is considerable, say from 5 to 10 per cent. All things considered, we could not recommend this mode of handling hardwood, and we only do it in case of necessity, and where timber and logs are not within reach of railway or other communication.

KELLEY BROS., River Hebert, N.S.: We have had no experience in driving hardwood logs. We should say that if the logs were barked all around they would not doze or sap rot and ought to drive alright. We think they would as well as sapling pine. Of course, the longer they stay in the water the heavier they get.

THE VICTORIA HARBOR LUMBER CO., Toronto, Ont.: We have never towed hardwood logs in any quantity. We have brought a few oak logs which had been cut and left one season on the bank, from French River to our mills, and towed them mixed with pine, and as nearly as we remember, we succeeded in getting about 50 per cent. of them to our mill. We would hardly consider that a success.

GILMOUR & COMPANY, Trenton, Ont.: We have never found driving hardwood logs satisfactory. We have only driven them a short distance from the pond to the mill, and in our opinion it would be almost impossible to drive them any distance, as so many of them would sink that the expense and loss would be very great.

M. BRENNEN & SONS MFG CO., Hamilton, Ont.: We had some birch logs peeled early last summer and floated this spring, and driven down the river. They floated very satisfactorily, but the timber appeared to be a little dozed, and would not like to say what the lumber will be like until we make a shipment. They were not cut into lumber as early in the spring as might have been, which perhaps would have been advisable.

UPPER OTTAWA IMPROVEMENT CO., Ottawa, Ont.: We have had practically no experience in driving hardwoods. We drive pine, spruce, tamarac, hemlock, cedar and occasionally a few ash, so few that we are not able to venture an opinion as to the percentage of loss. We handle about 3,000,000 pieces annually, among which are not more than 300 to 500 ash logs. We draw out and rollway for a year partly sunken logs wherever practicable, and thus avoid any appreciable loss. Of course, no amount of drying will make a shaky log float for any length of time, but sappy logs, if taken out of the water and allowed to dry for a year, float well.

THOMPSON & AVERY, Sharbot Lake, Ont.: We have found that by leaving hardwood logs on the bank for a short time in the summer, they will dry out enough to float for a short period, say two or three weeks, but to leave them on the bank for a season the timber taints in the ends of logs and the lumber is not so nice, besides, the logs will sink if left long in the water. We find by leaving birch, maple and basswood on the bank all summer the timber is almost spoiled. Elm will, however, not suffer even if left the whole season, and will float.

CRAIG & AUSTIN, Kinmount, Ont.: We have been experimenting on floating hardwoods for some years, and last year (1900) we made a success of it by felling the trees during the bark peeling season, from June 1st to August, peeling off the bark, and leaving the tree lie till the fall months, then cut and skid the logs and dump on the shores until the ice goes out in the spring. We believe any hardwood will float; we have swamp elm now floating like pine. We are peeling even our basswood this year.

JONES BROS., Wiarton, Ont.: Our experience is in rafting, not river-driving, but we presume the action is the same in both cases. We raft hardwood logs at all seasons of the year. Early in the spring many of them sink, and even at this season some will sink, after lying on the shore all summer. Wherever possible we dog,

or wire sinkers to logs floating high, and this means used in this section to bring them in. To wire up logs would not be practical in the river. We never tried cutting logs the previous season, we would suppose that if they were cut very early, most of the logs would be completely ruined for use. For instance, any hardwood logs left on the shore would not be worth rolling into the water. Any wood logs cut, say last winter, and left in the sun at the end of August, would make lumber that most would not buy at more than half price. The lumber would be dozy.

MAITLAND, RIXON & CO., Owen Sound, Ont.: cannot speak with any authority whether the hardwood can be driven successfully or not down streams, as we have never had any experience in driving hardwood logs, as all our logs are drawn to the shore and rafted from there. But one part of your letter struck us as something peculiar, that is the holding of hardwood logs for a year to dry them out to run them down stream. Hardwood logs in our part of the country held for a year, are spoiled. Hardwood in the east states must be different to what ours is. Our opinion of running hardwood logs is that it cannot be done successfully.

PITTS & CHARLTON, Victoria Harbor, Ont.: We had no practical experience in the driving of hardwood logs. We have heard that cutting the previous season and allowing them to remain over a season, would produce the desired results, that is, to prevent sinking. We would give it as an opinion that if hardwood stands timber were girdled, say during the winter season when the sap is down, and in effect killed, and then cut in sawlogs the following season, as we are informed the practice with cypress, this would be found advantageous.

J. MCBURNEY & SONS, Callender, Ont.: We have never tried driving hardwood logs with the exception of basswood, which we find sink if left in the water long. It is claimed by our men that if bored four or five inches in the end and plugged basswood logs will float, but we have never tried it.

THE PEMBROKE LUMBER CO., Pembroke, Ont.: We have had no experience in handling hardwoods in the manner you state. Any hardwoods we have taken down were loaded or banded to other floatable logs. The writer is of the opinion that hardwood logs left over in the woods for a season will float the following April and May, or for such time as the water is bearable.

REID BROS., Hepworth Station, Ont.: Cutting hardwood logs and leaving them over for a season, we find them entirely for first-class lumber, as there is at least two feet on each end spoiled. We have not had much experience driving hardwood logs, but keep our logs in mill pond at one of our mills, and find they are easily kept afloat. They are usually wired to soft logs and can be floated on the lake without any loss in good weather. Driving on the river has not been accomplished successfully here.

H. CARGILL & SON, Cargill, Ont.: We have driven some hardwood logs without any special preparation but not successfully. They might be driven successfully as you suggest, but we find they spoil very quickly and think a good deal of timber would be wasted cut the previous season. We find hardwood logs cut along in September will spoil or rot to some extent in the ends before it can be sawn in the winter. Come through Windsor on the train a few days since the writer noticed hardwood logs being unloaded off the train and made up into rafts in the river.

R. WATT, Wiarton, Ont.: My experience has been that if hardwood logs are held over more than one season they doze at the ends and sap-rot and become practically useless. I raft my logs here, but do not commence before about the first of June, and between that time and the middle of July they should all be watered, otherwise they commence to doze. The majority of them will float, but when we get what we call sinkers we usually wire them to a softwood log. If the spring happens to be late and cloudy the logs do not spoil so soon.