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THE PRINCIPLES OF WOOD BENDING.

The following extracts are from a lecture delivered before the class in carriage drafting and construction connected with the Metropolitan Museum of Art Technical schools, New York, by H. G. Shepard, of New Haven, Conn.

* * You may go back as far as the antediluvian race, but though the art was known and practised away back, no progress was made, and principles which underlie successful wood-bending were unknown to them. Their method undoubtedly was, simply to bend a stick while it was green and hold it in that position until dry; and the first use to which they put this bending undoubtedly was to make bows with which they shot their arrows. Coming down from that time to the present we find but very little progress in wood bending until the introduction of steam. I may add that even now wood bending is yet in its infancy, for although the principle upon which wood bending must always be done has been discovered and is in practice to-day, yet its various applications have not been made to any great extent, and there are new discoveries constantly being made. Such discoveries have been made within the past year, which I believe will increase the amount of wood bending fourfold within the next ten years.

* * The first wood bending I have any recollection of was done by my mother, who, paradoxical as it may seem, used to bend me across her knee to keep me straight. The wood she used was always badly alivered and broken after she had finished, so that it was of no further use.

* * The use of bent wood, is probably still in its infancy. In my belief, we do not use to-day one piece where in ten years from now we will use four.

* * If I wished to bend a stick and have it remain in position and keep its shape the best, I should put the heart on the outside, for the reason that the tendency of the wood is to bend from the heart; but when I have a difficult piece of bending to do, like a corner-piece, that requires a great deal of upsetting and end pressure, without giving way, wrinkling or anything of that kind. That is the way I use the heart of a stick. When I wish a piece to remain in a certain shape, then I put the heart on the outside, because the tendency of the stick will be in the direction in which it is bent.

* * As to the peculiarities of bending, after a piece of wood is bent its character is almost entirely changed. It is wonderful how it is changed, and by that change it is better fitted for any use, I claim, than it was before. Bending makes the wood heavier; it is pressed together, and the same bulk of wood weighs more after it is bent than before. Another peculiarity is that when it is thoroughly dry, it is stiffer than the same sized piece of wood,

that it is alike every other way in regard to grain. It will admit of more strain, and move less out of its position than a piece of wood that is unbent. On this account it is better fitted for carriage making than sawed pieces. I have taken two circles, one sawed out and the other bent, both of the same character of wood and as nearly alike as I could get them; I placed the concave sides together and put pressure on the ends to bring them in contact. They were subjected to equal strain. I found that the bent piece had perceptibly more influence over the sawed one, than the sawed piece over the bent one.

* * A piece of timber that has been steamed, whether it is bent or not, has its stiffness increased. It is more brittle than it was before, and, for some uses, it will not do as well; and yet there is a quality of timber that the steaming process and the kiln-drying process affect very much the same; they both cook the gum in the timber and make it brittle and stiff. There is a grade or class of hickory that is benefited by being steamed or kiln-dried for use as spokes or whiffletrees. There is a kind of hickory that never becomes stiff by a natural process of drying, and one of the desirable qualities of a spoke, rim, or whiffletree, is stiffness as well as strength; you take that hickory, and it is the very best we have, and steam it, and it is better fitted for these purposes than it was before. It is difficult to tear apart a piece of bent wood; the fibres are interwoven one with the other. We do not perceive the change on the outside, but when we come to split the stick open, we find that its character is entirely changed.

PLANTING TREES.

A few words about planting trees. It is a reasonable topic, and much might be said upon it. There are, of course, differences of opinion as to the best time for transplanting. Some maintain that spring is the proper time, and others say that better results are obtained from fall planting. Our own opinion is that it makes no difference, as long as the work is carefully done. The strong argument in favour of fall planting is, that farmers have then more leisure on their hands, and they can then afford to spend time in doing the work well. But, no man should undertake what he has not time for doing, whether in spring or fall, else he may find that time, labour and money have been spent in vain. We have all heard of Hodge, a type of man made famous in the cartoons of Punch. Hodge is not the right sort of person to be entrusted with the task of transplanting trees.

"I rains 'em in, now thick, now thin,
For what cares I if they grow or die."

No; Hodge will never do, unless master is beside him and directs every movement. Strength is by no means the best recommendation, either

in taking up or setting out trees. Skill pays; so does patience. Two men are needed, and three are better. The holes should be roomy; deeper and wider than the roots require, for, with a margin of loose earth, the rootlets will speedily stretch out in search of food supplies. With a bushel or so of muck for each hole, to form a bed for the tree and a partial covering for the roots, the chances will be greatly improved. Place the roots naturally on the ground, and pack the earth firmly around the tree, at least as high as it was before removal. If the work is well done in this way, and with occasional watering, if the season is dry, the loss need not exceed one in a hundred. But, of course much depends on the condition of trees at the time they are set out. If they have been carried a long distance, and have been roughly handled, it is just possible that no kind of care can save them. In the case of a mutilated tree, it is far better to stand it aside and lose it at once.—*Rural Canadian*.

A RAFT IN THE RAPIDS.

The *Kingston Whig* says:—Probably the most miraculous escape from death by drowning ever experienced by the hardiest voyager, says the *Montreal Star*, took place Saturday morning, May 12, at Lachine. It seems the tug boat John MacDonald had towed a valuable raft of timber from Chateauguay to the head of the Lachine Rapids, with the intention of leaving it in the South Channel. However, just as the raft had neared the channel in question the current, which here takes a sharp bend, swept it around with terrible velocity towards the more dangerous and rocky South Channel, whence escape is rarely made. The strain was so great that the hawser parted and the raft was dashed down the tortuous rapids at lightning speed. The men on board, 13 in number, assembled on the front of the raft perfectly powerless to save themselves from their imminent peril. They had not proceeded far, however, before a terrible shock was felt, the raft having struck a reef and parted in two pieces. The men still escaped unhurt and managed to raise a sail with the intention of steering the raft through the rocks, which rose on every side. The wave swept over the hardy raftsmen, threatening them with destruction every moment, and finally the whole number took refuge by climbing to the top of the top of the mast. The raft struck a rock the second time, smashing it into fragments, and the men were precipitated into the water, but still held on to the mast for dear life. They had nearly reached the foot of the rapids by this time, and soon drifted out into still water. An Indian passing in a large boat, seeing their perilous position, came to their assistance and rescued them in a half-drowning condition, several of the men having nearly succumbed from exposure to the icy water. The raft, which is of oak, is the

property of Calvin & Son, of Garden Island, and is valued at \$6,000.

ARBOR DAY.

The *London Daily Telegraph* mentions with approval the custom of tree planting on "Arbor Day," favored in the United States, and recommends it to the notice of landlords in the British Isles. The growth of timber has a twofold advantage. It is always a profitable crop, and besides, the presence of trees tends to equalize the rainfall, preventing sudden floods on the one hand and prolonged droughts on the other. With the abundance of timber still growing in Canada, we are apt to be careless on this important economic question. But the axe of the speculator is exerting its power, more perhaps in the destruction of saplings than in the removal of full grown trees. It has been urged on the Dominion Government that some encouragement should be offered to tree planting. The advantages arising from the presence of trees ought to prevent the farmer from entirely denuding his land; but the desire for quick gains frequently makes the farmer careless for the future and indifferent to difficulties that he is laying up for posterity.—*Mail*.

A Magnificent Fir.

One of the finest conifers in Germany, known as the Royal Fir, stands near the village of Albornhau, in the Erzgebirge mountains. Its diameter, forty inches above ground, is six feet ten inches, sufficient to conceal a horse and rider placed lengthwise behind the trunk. It begins ramifying at a height of thirty-four feet, and the full elevation to top of crown measures 154 feet. It is thought to be the tallest and strongest representative of the species, not only in Germany, but in the whole of Europe. This noble tree, which is supposed to be 500 years old, now shows signs of decay, having died out on the apex of the crown since the year 1874. The enormous dimensions of the tree may be better realized by cordwood measure. The shaft is estimated at 51½ cords; limbs and brushwood, 12½ cords, making in all 64½ cords.

Premier and Axeman.

In an article on the institution of "Arbor Day" on this continent, the *London Standard* says:—"It has long been an accepted tradition with Americans that no axe is worth wielding unless it has been made at Pittsburg, or at one of the many Sheffields or Birminghams scattered over the United States. Even Mr. Gladstone is said to prefer an American to an English axe, although it is on record that a Canadian lumberman, who once saw him ply the weapon at Hawarden castle, declared that our vigorous Prime Minister has still much to learn before he can pretend to possess such proficiency with the axe as is common in the backwoods of Canada."