How to Build a Good Ice House.

This plan to build an ice house, I published first in 1880. I have sent out hundreds of them by request and have taken care to find out if they were good and made a satisfactory house. No fault has been found, and they are evidently complete. I am so well satisfied that I have not changed them in the least since the ones first issued. As the plans are gratis to everyone and given with the greatest pleasure, I ask this: If you build after my plan use it all through; do not make any changes, but do as the plan says. If not, have the kindness to not use it at all. I want people to have a good ice house, and know it will be good if it is built according to directions.

I have been at a good deal of pains to get from one of the best informed ice men in the United States, his ideas, and give them as the best general information that can be had.

In regard to location, have it, when possible, by itself—not in a hollow, or where water can run into it from a bank. Having selected this, prepare the bottom. If the soil is sandy or of a porous nature, it will need no drain; but if not, great care should be taken to arrange for drainage. In an ordinary house, dig a trench through the centre thirty inches wide and twelve inches deep. Fill this with loose stone to within three inches of the top, and slope all parts of the bottom to this drain. Then fill to the top with shavings and straw, covering over with loose boards. You will then have a perfect drain that will carry off all water and let in no air. The foundation is better of stone or brick; if not, set posts in the ground to build on. Set posts 6x6 at the corners and every ten or twelve feet between, filling between these with 2x4 studding set flush with the outside. Put boarding on this; on the boarding nail 2x4's, putting the outside boarding on them. This makes an air space of four inches. Now set inside another set of 2x4 studding; which will leave a space of ten inches for filling; ceil between this and fill with sawdust or shavings. Be sure it is filled solid and dry. You now have the body of the ice house. With an air space of four inches, and inside ten inches of filling, making a perfect house that will not warm through. Have the inside smooth so that the ice will settle and not catch. Make an ordinary true roof. The roof should project at least two feet, and can be of shingles or boards. The loft inside, it is well to board over, as it stops all heat from the roof. Openings to the air should be as few as possible and made to close tight.

If you follow these directions you will have a perfect house that will keep ice with a small percentage of loss. If a cheaper or poorer house is wanted, you can leave out the air space and fill solid with shavings or sawdust, but filling should be 10 to 14 inches thick. Whitewash the house; it costs but little, and will make it last a great deal longer.

In regard to filling: The usual way is to cut ice in blocks 22 inches square. If of even size, commence putting it on the edge, keeping three or four inches from the edge of the house. Set in your course. Use an ice adz and level the top, filling in the spaces. Now fill in between the house and the ice with sawdust, putting on other courses and doing the same. If the ice is cut in bad or irregular shape, lay flat, filling with pieces so as to make solid courses. The idea is to have the ice as compact as it can be put in. When done, fill on top with eight or ten inches of sawdust, and it is complete.

In regard to the care of ice, do not neglect it. Be careful that the top is always covered. See that you do not get air holes through the sawdust, as that lets in the hot air and melts the ice fast. In regard to filling for houses: When sawdust cannot be had you can use straw, rye or oat straw being the best; but there is hardly any place but with a little care through the summer, plenty of sawdust can be had. In regard to the size and capacity of houses: They will hold the following for every foot in height, packed fairly solid and to be well frozen 14x20, five tons; 14x25, six tons; 14x30, seven tons; 20x25, nine tons; 20x30, eleven tons; 20x40, fifteen tons. This is about the capacity of houses of this size for every foot in height. The waste for a small house is greater in proportion than for a large one.

Handling ice after it is cut: When it is possible, it is the better way to build an incline from the highest point the ice is wanted in the house, to the water or ground; if to the water the lower end runs into the water. The incline should never be over 45°, as it would be too steep to work with safety, The run-way should be about 25 inches wide in the clear and 10 inches deep, the bottom made of slats so that small pieces can drop through. On one side build a foot walk with railing for the use of the one handling the ice grapple. Have openings in the incline large enough to let the cakes of ice through, and inclines from these on different levels into the house. Build all this fairly strong; brace it well so that it will stay to place. Fasten a "Top Gin" block in the upper part of the ice house far enough inside so that the ice will be pulled clear in; on the ground fasten a "Lower Gin" block, use rope $\frac{7}{8}$ to 1 inch in diameter, attach to one end a team of horses, run the other end through the block on the ground, from there through the upper block and down the incline and fasten it to the Jack Grapple. In operating this, from one to five cakes, or whatever the horses can pull, are started from the bottom with the Jack Grapple. The man in charge of the Grapple going up the walk to steady it. When it has delivered its load he walks back carrying the Grapple with him, the man on the ground backing up the horses and bringing with him the slack rope. The ice is let through the first opening in the incline and run into the house. When the house is full to this opening, close it and run the ice in on the next.

If no incline is used, raise the ice with a pair of hoisting tongs. When ice is loaded from a pond onto a wagon, many build platforms the height of the wagon bed, making an incline from this to the water and hoisting the ice to it the same as in the ice house. When there is nothing of this kind to get the ice from the water, take a hard wood board 10 to 12 inches wide, $1\frac{1}{2}$ to 2 inches thick and 10 to 12 feet long, at the bottom end put on each side an angle iron $\frac{1}{2}$x2 inches. Let this stick up ten to twelve inches. About two feet from the centre bolt a six foot 2x3 piece directly across, this is for handles for each side. Place the lower end under the ice in the water and two men to operate it will draw out ice very fast.—[B. A. Stevens.

Forestry at the Dominion Experimental Farms.

BY JOHN CRAIG.

Considering that the Dominion experimental farm system, as an institution, has only been in operation a little more than three years, including the work of organization, it would probably be more appropriate to speak of the beginnings in forestry rather than adopt the title laid down in the heading.

The plan of the farms is familiar, no doubt, with the majority of the farmers, but an allusion to their various locations and arrangement will not be out of place. The farms are five in number, including the Central one at Ottawa. Beginning with the Lower Provinces, one is located at Nappan, N. S. The Central, as already stated, at Ottawa. From this one the reports of the others are disseminated, in the same manner as those of the agricultural experimental stations of the United States. Going west, the next one is located at Brandon, Man.; another at Indian Head, N. W. T., and the last one at Agassiz, B. C. Brandon and Indian Head have each a section of land, British Columbia and Nova Scotia, each 300 acres; while the Ottawa farm, serving for Ontario and Quebec, has 467 acres.

The Central Farm, only beginning operations in the spring of '87, Nappan, Brandon and Indian Head following in '88, while Agassiz was not organized till '89, limits us so much on time that I cannot do more than outline experiments commenced, trusting that there may be an element of usefulness in the mere delineation.

It is evident, with such an expanse of territory, the needs are exceedingly varied, and, therefore, the range of useful knowledge to be obtained much widened. The needs of the Maritime Provinces, in forestry, are very different from those of British Columbia, while the requirements of Brandon, Man., though not distant from Indian Head, N. W. T., are by no means identical.

So far it has been the aim of the management of the Central Farm to supply such trees as are, in the judgment of competent men, best suited to the conditions of soil and climate at these different points. Reliable reports from the superintendents of the branch farms will facilitate the speedy introduction of suitable trees to different portions of the Dominion, especially to the wind swept prairie regions of Manitoba and the Northwest.

One of the permanent features in forestry on the farm at Ottawa is the planting of a belt of trees on the north and west sides, made up of different varieties grouped in blocks for comparison. Many of these clumps are planted in irregular forms, so arranged as to overlap each other which overcomes the stiff appearance given by planting in square blocks. The belt is about 150 feet wide, the first 10 rows on the west being 5 feet apart and the remainder 10 feet apart each way. This has been done to ascertain the relative advantage of close or wide planting. Careful record of the age of planting, the annual growth thereafter and such other particulars as are necessary are taken and will be reported as soon as practicable.

There are in this belt about 8,000 trees, made up of the following varieties:—Conifers, Scotch Pine, White Pine, Riga Pine, and Austrian Pine, Norway, White and Blue Spruce, Hemlock and