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— OF —
FOREST
TREE CULTURE.

BY HON. H. G. JOLY.

*A Paper from the Report for 1882 of the Montreal Horticultural
and Fruit Growers' Association.*

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In an article written, last winter, for the Montreal Horticultural Society's Report for 1880, I attempted to awaken an interest in the culture of forest trees, and to show that it was fast becoming a necessity, and would prove a most profitable investment. The unexpected interest manifested on all sides, in that question, encourages me to lay before your readers the results of the last twelve months' experience.

First of all, I must begin by correcting a serious mistake in my paper of last year, which might have completely defeated the object I had in view, and discouraged, instead of promoted, the culture of forest trees. Speaking of the growth of the black walnut, I stated that it would take *seventy-five years to grow twenty-one inches in diameter*. Having recommended the culture of forest trees as a good investment, and laid aside every other *argument*, however powerful, in its favor, to narrow it down to a commercial issue, *the length of time before the investment could be realized became a matter of vital importance*. In fixing it last year at seventy-five years, I made it nearly double what it ought to have been ; *thirty to forty*, under fair circumstances, are sufficient.

I am indebted to Mr. George Stanton, of Simcoe, for valuable and reliable information on the growth of the black walnut. Upon his remarking that he fancied, from reading my paper, that the black walnut trees must grow a great deal faster in his neighborhood than with us, I begged of him to measure a certain number of them, ascertaining their age as correctly as possible. I will now quote part of the interesting letter he wrote in answer :—

“ You know that this Long Point country was a great black walnut district, and on the Lake Shore there are still quite a few trees left. I have measured, to-day, some five trees, and got their ages as near as I can, relying on what the owners have told me.

"The first tree that I saw, measured 5 feet 8 inches, 4 feet from the ground, and is 24 years old ; it is growing on very rich black sand loam.

"The second measures 5 feet 4 inches, 3 feet from the ground, is 30 years old, on very light sand. The third and fourth measure $23\frac{1}{2}$ and $24\frac{1}{2}$ inches respectively, 3 feet from the ground, and both are 11 years old, on good clay ground, but were transplanted when young. The age of these trees the gentleman told me he was sure of.

"Number 5 measures 7 feet 8 inches, 5 feet above the ground, is 55 years old ; this tree is on very light sand soil. I mean in all the measurements, the *circumference* of the trees.

"You see from this, that the soil has everything to do with the growth of the tree ; the richer the soil, the more rapid the advance, and, therefore, I hope that by putting my trees on rich virgin clay soil, I shall have a *return in about twenty-five years.*"

And I may add, here, that Mr. Stanton has sown, last fall, twenty-five bushels of black walnut nuts in the beautiful soil he mentions ; all the friends of forest tree culture will join me in wishing that he may be spared to reap the crop he has sown.

I will now give, in a tabular form, for the purpose of comparison, the results of Mr. Stanton's measurements :—

No.	SOIL.	Age of tree.	Diameter.	Approximate annual growths.
1	Very rich black sand loam...	24 yrs.	22 in.	11-12, or very near 1 inch.
2	Very light sand.....	30 "	21 "	About $\frac{2}{3}$ of an inch.
3	Good clay ground (transpl'ted)	11 "	8 "	Over $\frac{2}{3}$ do.
4	do do	11 "	8 "	do. do.
5	Very light sand.....	55 "	31 "	A little over $\frac{1}{2}$ inch.

With the soil and climate of Ontario, and average fair play, black walnut can be safely expected to grow at least two-thirds of an inch in diameter, annually, say, *twenty inches in thirty years.* I am speaking of that average ; under exceptionally favorable circumstances, it would, of course, grow faster. I am taking the average of Mr. Stanton's report, between the trees growing on

very light sand and those growing on rich black loam and good clay ground.

With us, so far as I can judge, I should think the growth a little slower than in Ontario, and would call it half an inch in diameter, annually, say *twenty inches in forty years*.

Last fall I measured five of my young walnuts (seven years old), at one foot from the ground; one had fourteen inches circumference (four inches and two-thirds diameter), two had twelve inches circumference, or four inches diameter, and two nine inches circumference, or three inches diameter, showing an average of annual growth of half an inch in diameter.

Those trees are growing on good soil, about one foot of black vegetable mould over thick blue, stiff clay; but I would expect them to grow faster in deep mellow alluvial soil, such as Mr. Stanton alludes to. In fact, another lot of the same age, a few miles distance, growing on an island formed by river sand and the washings of the spring freshets, are nearly as thick, though they have been seriously checked by transplanting. Whatever beneficial effect it may have in the future, the stiff blue clay does not favor the rapid development of the very young plant.

As the trees advance in age, their annual growth appears to become greater. There is no saying how far we shall be able to stimulate the rapid growth of the black walnut with proper attention and care.

I need not apologize for laying so much stress on the rate of its growth, since it is one of the first considerations that recommend the black walnut, in preference to all other trees, combined with the value of its timber and the facility and safety of its culture.

Return of one superficial acre planted in black walnut. The Hon. J. B. Hough, Head of the Forestry Department of the United States, in his celebrated Report on Forestry of 1877 (page 37), allows 680 trees, 51 years old, to one superficial acre, eight feet distant from one another, on every side. At that rate, one superficial acre of good soil, planted to-day in black walnuts, and carefully looked after, would yield, in about thirty or forty years, according to circumstances, the sum of \$20,400.00, allowing 30

cubic feet (at one dollar a foot) for each tree, averaging 20 inches diameter; of course no one could rely upon such a result, which could only be achieved if none of the trees failed, but even after striking off fifty per cent. the return would still be such as no other legitimate investment could secure.

At first sight, it appears impossible that so many large trees should be able to thrive on one superficial acre, but in travelling through the woods, this winter, I have made a point of finding out, whenever practicable, how near to one another large trees could grow without interfering, and have found numerous instances where they stood nearer to one another than eight feet, especially evergreens.

The European writers on Forestry do not allow quite as many trees to the acre as Mr. Hough does. I would think it pretty safe to rely on about two-thirds of his number, and, with all confidence, will endorse his statement, that: "the amount of timber grown " on a given area, in some of the governmental forests in Europe " that have been planted and managed according to the rules of " forestal science, *is very much greater* than the same soil would " grow in wood, if left to itself."

In calculating the number of years to elapse before obtaining a profit from a black walnut plantation, I have supposed that the trees would not be cut down before they were twenty inches, at least, in diameter. If you cut them when they give twelve to fourteen inch logs, the average size of spruce logs, you will get a return much sooner, but it will be a waste of timber, except what you must cut for thinning.

Many people who are seriously concerned about the rapid destruction of our forests, advocate the planting of trees in the woods, in the place of those that are cut down; all practical lumbermen will agree that it is next to impossible to do that, and it would be useless, for the young trees would do very little under the shade of their big neighbors. We can make our forests last a long time by sparing all trees under a certain size, giving a chance to the young trees, &c.; but if we want to plant forest trees with a chance of success, we must start a whole lot of them together, about the same age and size.

HOW TO CULTIVATE THE BLACK WALNUT.—*Whenever practicable, avoid transplanting*, by sowing at once the nut, where the tree is to remain, in rows, four feet apart on every side. Instead of spreading lateral branches, (very fragile in the young wood, and liable to be torn off by snow, ice, wind, &c.,) at that distance they will grow up in length, with no under branches, and can be thinned in the course of time. The nut must be sunk about a couple of inches in the ground. The rows ought to be quite straight, set out by the line, and marked from place to place with pickets, so as to know exactly where the young plants are, the first year, and avoid hurting them when hoeing and weeding.

The ground must be well prepared for permanent sowing, the richer the ground the more rapid the growth. If your ground is not ready when you receive your nuts, sow them in the nursery. We have sown about ten thousand in that way last fall, not having sufficient ground ready for permanent sowing. The rows in the nursery are three feet apart, nuts eighteen inches from one another; the ground was laid out last summer as a potatoe field, and is in very good order; there is plenty of room between the rows to pass with a horse hoe; I hope to be able to transplant them permanently next fall.

Better sow the nuts in the fall, however late, even if you must shovel away the snow. The squirrels are more apt to steal them (as I know to my cost), when you sow them in the spring, than late in the fall. If you must winter them, do not keep them in the house; the slightest heat will make them turn rancid, and kill the germ. To satisfy myself on that point, I sowed this spring a couple of thousand nuts of the butternut, wintered in a cool garret. Not one came up, while several of the same nuts, lying where they fell in the fall, and spending all the winter without shelter, sprung up well in the spring, and a number of others, dragged by the squirrels or rolled under plank roads and piles of sawn lumber, grew up beautifully, some of them sending up their stems through such small cracks between the deals of the plank roads, that the stem grew as thin as a sheet of very coarse paper and wide in proportion while in the crack, and these rounded again and sent out branches and leaves in the regular way.

Those valuable trees have not yet been regularly cultivated on a large scale ; we have a great deal to learn from experience as to the best mode of dealing with them. I have tried some of the nuts with superphosphate, others with plaster, etc., and have placed boards, at a certain depth, under others in the nursery to stop the descent of the taproot and facilitate transplanting, and shall account in due form for the result of these experiments. I must acknowledge the kindness of a number of gentlemen who have procured me last fall large quantities of black walnut nuts from the west ; the quantity I thus received, nearly twenty five bushels, allowed me to extend my plantations considerably beyond my expectations.

ELM.—The seed of the elm ripens and falls about the middle of June. Last summer I collected some and sowed it the same day ; it must have been sown too deep, for very few came up, but one of them grew fourteen inches before the autumn ; the seed ought not to be covered, but spread on a damp shady spot, as in nature. It is better to take up the little seedlings growing as thick as grass at the foot of the trees on every favorable patch of ground where the wind may take the seeds. Out of a couple of hundred, no bigger than needles, and pulled up by bundles, with the moss on which they were growing, about the middle of July, and transplanted in rows in a corner of the garden, only half a dozen died. I kept them in complete shade for a few days, and damp. At the end of September they were over six inches high, and as stout and strong as could be wished. I expect they will grow very fast.

BOX ELDER OR ASH-LEAVED MAPLE (*Erable à Giguères*, *Acer Negundo*).—This autumn some of our people returning from a visit to their friends in Minnesota, brought a few seeds of a peculiar kind of maple growing there, which they called l' Erable à Giguieres. They had been told that it grew so fast that it was fit to be tapped for sugar when only six years' old. It sounded very marvellous, but it was worth while trying, and I sent for some seed, which I sowed at once. Some of it, placed in a flower-pot, came up with wonderful rapidity and vigor.

I would strongly recommend all those who feel an interest in

the matter to try the introduction of foreign trees by seed. Those experiments cost next to nothing; the price of the seed is a trifle, and they can be sent by post, and the results obtained with such small outlay may be considerable.

Lately, on looking for information respecting that new (to us) kind of maple in our American Botanical Works, I met with rather contradictory opinions on the subject.

In an old work written by D. J. Browne in 1832, and entitled *Sylva Americana*, page 103, I find the tree described under the names of Ash-Leaved Maple, Box Elder, *Acer Negundo* and *Erable à Giguieres*, as it is said to be called by the French of Illinois. "It grows," says Browne, "most abundantly in the bottoms which skirt the rivers where the soil is deep, fertile, constantly moist and often inundated with water." He adds further on: "The proportion of the sap to the heart is large, except in very old trees," but does not say that sugar has ever been extracted from it. Speaking of its growth he says: "From its luxuriant growth it would afford a profitable product as fuel."

Michaux, in his *North American Sylva*, vol. 1, page 172, says that the ash-leaved maple, to obtain its full proportions, requires a climate three or four degrees milder than that of Philadelphia, confirming Browne's opinion that it is seldom found in the Northern States. The fact of its growing so well in Minnesota, where the cold is often intense in winter, contradicts them both.

Michaux adds that it has been erroneously asserted that sugar is made from its sap. The only point on which Michaux agrees with our people is about the *rapidity of growth* of this tree when young.

Nuttall, vol 2, page 38, says that the ash-leaved maple, *Acer Negundo*, extends *much further north* than was supposed by Michaux, and that it has been found in abundance about the Red River and Saskatchewan as far north as 54°. He says Crow Indians are reported to *manufacture sugar from its sap*, but it is not nearly as saccharine as that of the sugar maple.

It is a satisfaction to find that our travellers' reports are confirmed in the main by the latter of these two authors; as to the proportion of saccharine matter in the sap, perhaps we shall know

in six years time, or a little more, how it compares with that of the sugar maple. With our superior appliances we can safely expect to extract a greater proportion of sugar from the sap than the Crow Indians do.*

AN APPEAL TO MEN OF GOOD WILL.—Many people say that Government ought to take up forest tree culture, *because man's life is too short* for such work. Very true, but, unfortunately, Governments' lives are even shorter than men's lives, and they don't appear to have much time to devote to the cultivation of forest trees.

In the meantime let intelligent men, willing to work not only for themselves, but for the next generation, let them begin. It requires a small outlay in money; their time will not be lost, and they have no idea what source of pure enjoyment they will be creating for themselves. There is a charming fable written by Lafontaine a couple of centuries ago, which is so much to the point that I must give part of it here. I don't think it has ever been translated in English before. The Rector of the Quebec High School, Mr. J. Harper, has kindly undertaken the task in one of his rare leisure hours, and I now offer the result of his work, with grateful acknowledgment:—

An old man of eighty was planting some trees,

Three lusty young neighbors drew near—

“To build would be odd, but still stranger to plant,
Our friend has grown foolish, we fear!”

“In the name of all conscience,” said they with a smile,

“What harvest for you will these bear?

Your age of four score has no future to boast,

Why cumber it thus with more care?

’Tis only for you to repent of the past,

Throw future designs to the air!”

The old man looked up and sagely replied:

“You speak of my hopes and your own;

* Since writing the above, having ascertained that Mr. Pierre Brissette, of St. Barthelemy, P. Q., had been growing the Ash Leaved for six years past, I obtained from him a report of the results, and published it in the May number of the *Journal of Agriculture* (the English version). He has sent me some of the syrup manufactured from trees five years' old; it is very fine.—H. G. J.

Life's enterprise often is left incomplete,
 Though begun on the threshold of youth.
 For fate unrelenting may sport with your hopes,
 As much as it may with my years.
 The chances of life render equal its span,
 Though unequal to youth it appears.
 And which of us, think ye, the last of the four,
 Will behold the bright rays of that sun ?
 Does this moment assure you another is yours
 To finish your labors begun ?
 The shade of this tree,
 Tho' perchance not for me,
 For others a blessing may spread,
 As under its branches they tread.
 Nor would you forbid
 The prudent provide
 For others who follow. Howe'er you deride,
Such fruit of my toil, each day I enjoy,
 As daily for others my strength I employ ;
 And who can explore,
 What Fate has in store ?
 For old though I be, with regret I may see,
 And mourn over your premature graves."

In several of the States of the Union they have got a public
 holiday known as *Arbor* or *tree-planting day*. More than one
 million of trees were planted on Arbor-day in Minnesota in 1875.
 Why should we not follow that example ?

