

tity of sap for sugar, when about twenty to twenty-five years old.

THE ASH.—It is well known, and its different varieties are found very useful, especially the white ash, which recommends itself for its elasticity, its wood is beautifully marked, and is largely employed in the making of furniture, panels, &c. It will thrive where the walnut, oak and maple refuse to grow, or only linger miserably. I remember part of a maple avenue, where, year after year, the maples had been replaced over and over and failed; at last, we had recourse to white and black ash, none failed, and they are progressing most satisfactorily.

TAMARACK will grow in damp, wet ground; we have succeeded with them where even willows had failed; the value of its timber and leaves is too well known to require any comment from me.

RUSSIAN PINE (*Pinus Sylvestris*).—In making new plantations, especially from seed, it is no more trouble to try foreign than Canadian seed, and, however strange it may appear, I find it easier to procure the seed of the Russian and the Himalaya than of the Canadian Pine. One may find among foreign trees valuable additions to our plantations, such as, I think, the Russian Pine, native of the north of Russia. Our climate suits it admirably, and it appears a more vigorous grower than our Canadian White Pine. I cannot give any opinion as to the quality of the timber, as they have only been sown in the spring of 1873. They started rather slowly, and their height and thickness are less than those of the black walnuts sown two summers later, in November, 1874, but they are now beginning to take more rapid strides. I measured the season's growth of one of them last year, on the third day of July. It showed twenty-six inches in length, gained in about thirty days, as the buds of the coniferæ do not open much before the beginning of June; the year's growth was already over, and from that moment it only thickened and hardened into wood.

Since the growing season of our trees is so short, we ought to lose no time if we wish to help them along, by thinning, removing useless branches, mellowing the ground, or otherwise, all that ought to be done before June, so as to afford them every chance during the growing month. I think the *Abies Nobilis*, or White Fir of Washington Territory, is the fastest grower among the Coniferæ.

POPLAR.—I must beg the indulgent reader to listen to my plea in favor of this tree, and not condemn it unheard. I speak of the kind known as Cotton Wood or *Populus Canadensis* (not to be confounded with the Balsam Poplar and the Aspen). Its growth is wonderfully rapid; twenty-three years ago, in November, 1858, I stuck in the ground three cuttings, it was my first trial at tree culture. They are now over sixty feet high, one is twenty five inches in diameter, the second twenty-four inches, and the third twenty-two inches, an average of one inch a year in diameter. In every new plantation, in a country completely denuded of forest trees, and especially in re-wooding our Western Prairies, I would recommend, at the start, a plentiful use of this Poplar, without neglecting, of course, more valuable trees. It strikes at once from cuttings, which can be procured and transported anywhere with the greatest ease. Thanks to its rapid growth, it will soon enliven the scenery (as it is a handsome tree), afford shade, shelter the other trees in the plantation, and supply timber, not of the first quality, but better than none, until the slower growing trees are ready with their more valuable contributions, and it can easily be cut down when the room it occupies is wanted for better trees. This poplar has been introduced from Canada into France, where it is designated as the "Peuplier du Canada," and considered as a useful and profitable tree.

I must now close this long article. The results of my experiments are nothing to boast of; practical men would have done much better. If I had chosen the soil for the different kinds of trees more judiciously, had not left them much too long without thinning them, and been able to attend to them in the proper seasons, I am convinced that, as a whole, they would be much finer. At all events, it shows that any one who will take the trouble, can begin the culture of forest trees without previous training. I do not speak of orchards here. Having no School of Forestry in Canada, we must educate ourselves, we have got books written on the subject by eminent and practical men, and we have got, always opened before our eyes, the great book of Nature.

First Lessons in Farming. (Young Man's Department)

It would puzzle me to say whence I derived the information contained in the following pages. It is the result of many years study, and though some few hints may spring from original thought on my part, I doubt not that for the greater part I am indebted to the works of Liebig, Boussingault, Lawes, Tanner, and other well known writers on agricultural subjects. In fact, I rather *make* the lessons than *compose* them. I mention this lest I be accused of plagiarism, or literary theft, a form of dishonesty much more common than is usually supposed.

As the farmer is a manufacturer, so it is necessary that he have a raw material to work upon. In his case the raw material is *the soil*, and out of it, the farmer's duty is to call into life the various finished products which he carries to market in his carts, or which walk there on their feet.

The soil is the surface of the land, and is of varied composition and of different depths. There are clays, loams, and sandy soil, in some places the parent rock is almost at the surface, in others you may dig for feet or yards, even, without reaching it. Thus, on the soils of the South of England the plough in many places brings up the *chalk*, whereas, on the neighbouring *Upper green sand* we frequently find three feet of fine loam before the rock is reached.

Below the soil, by which, in general, is meant the depth of the plough-furrow, lies the subsoil, and it is upon the quality of this that the quality of the soil depends. Now, all soils are formed from the breaking up of rocks, not necessarily of the subjacent rocks, for sometimes the materials have been transported for miles by water and other agents, but it may be taken as an axiom, that the *parent of soil is rock*. Bear in mind, please, that *clay*, when found, as in the London and Paris beds, in *couches* of great depth, is considered by geologists as *rock*.

From these rocks, of various degrees of hardness from the *Serpentine* of Cornwall to the *Rag* of Kent, soils are formed by three active workers: one visible, rain; the other two, carbonic acid and frost, invisible.

We all remember the old proverb: "Constant dropping of water will wear away a stone." As the water falls, in rain, upon a rock, it dissolves parts of it, and carrying those parts away, gives place to the action of future rain after the same fashion.

Referring to the lecture on Meteorology, in the number of this journal for Feb. 1881, you will see that the air or atmosphere contains, besides oxygen and nitrogen, a small proportion of carbonic acid. Now rain, in falling through the air, catches, as in a net, some particles of air, and carries them down in its course to the earth. The oxygen gas, finding itself in comfortable quarters, immediately makes acquaintance with its new neighbours, and finding among them some congenial friends, sets itself to work to form (chemical) combinations with them, which extremely intimate social intercourse ends in the old resident's entire transformation. Carbonic acid,