WOOD PAVEMENT.

THE new wood pavement in the Champs Elysees, which extended only half the length of the avenue, has stood the test of an entire winter, and so it is to be laid to the Arc de Triomphe. This pavement has been put down by an English company. The process of putting it down is as follows:—The ground is first excavated about a foot in depth. A layer of stones about the size of walnuts, and mixed with cement, is then laid down. On this a second coat of cement, about an inch in thickness, is carefully spread. The blocks, which are previously prepared by being saturated with some resinous compound into which tar enters largely, are set upon this cement; they are six inches thick by a foot in length and three and a-half inches in breadth. A space is left between each block, and after they are laid a thick preparation of tar is poured over them, followed by an application of fine gravel. Finally, the interstices are filled with cement.

AMERICAN FORESTRY.

We take the following from the official report of Mr. W. Brown, Professor of Agriculture, Farm Manager, and Experimental Superintendent of the Ontario Agricultural College:—

Two words meaning much—how much no one at present alive will ever realize, and this is what strikes at the *root of man's indifference* on the subject, that is, that he cannot himself personally hope to receive all the benefits from the conservation of the present trees, and particularly from replanting. American returns must be smart, strong and undoubted; the idea of permanency in the long after years does not concern us so much as *now*; we are fond enough of speculating upon cause and effect, and, in this matter, delight in big talk, that indeed does not lack for as much soundness as Europe can produce, but it is talk largely only. Let us add to this phase of our life by submitting some thoughts on such an important subject, with the hope that we are not far off from acting up to what is preached.

THE GENERAL IMPORTANCE OF FORESTRY IN NORTH AMERICA.

It is the experience of the world that more difficulty, in all its forms, is found in reclothing with trees where trees grew before, than it is to plant—not replant—a country for the first time. There is not only the practical fact of succession of cropping in its scientific and natural bearings as similiarly realized, for example, in the products of the farm, but the more serious one of the indifference of its population. It is just a piece of human nature everywhere, that what has been felt as common and everybody's property, is no one's particular business when remedies are asked for in the exigencies of public affairs.

By forestry is meant the whole science and practice of arboriculture; the conserving, the care-taking, preservation and proper management of existing trees, and the replanting of land for purposes now to be discussed. Speaking generally we are, and we are not deeply concerned, as a nation, in the more modern views of forestry. In Europe it takes a shape that may never be realized here, because of one thing—that one thing is large proprietory, the possessing within *one man's* power all the area and class of soil suitable to profitable production on a large scale, so that even that one man can employ officers and men in such numbers as make profits certain. Cultivated America meantime is so subdivided as to effectually preclude all idea of sufficient massing of woods to receive equal results with Europe—but the day may come. Though not thus situated for forest culture, we are otherwise obliged to give it a place in our rural economy. It is especially applicable to any country that has been a forest by nature, where in some things nature has been unthinkingly trampled upon, and where agricultural progress now demands the aid of her sister science—arboriculture. We are not singular in these matters, and can sympathise with

WHAT IS BEING DONE IN THE CONSERVATION AND REPLANTING OF FORESTS IN OTHER COUNTRIES.

There is no country whatever that has made its agricultural history and does not now complain of want of trees. India, Australia, Europe and the United States, all tell their story of overclearance, of the need of conserving, and of the necessity of replanting. Their greater years than ours has given experience that should encourage, and dismiss all doubts on our part. The effects of judicious re-clothing are already subjects of congratulation, and of yearly revenue in competition with agricultural so much so indeed with some that the other is not uncommon talk with proprietors. India has her standing army of foresters, trained to all cunning in sylvan matters, at European schools; Australia can already boast of its "Forest Board,"—its conservator of forests, tree nurseries, extensive enclosures planted and to be planted, and a whole system of arboriculture of the most encouraging kind, and the United States, though doing more talk than spade work, are unquestionably on the very margin of a revolution, they have not gone through the forest without "seeing some firewood."

THE OBJECTS OF CONSERVING AND REPLANTING ARE NOT A FEW.

Most people think of trees, first of all, as means of shelter—under several *forms*. We like shelter for buildings, shade for ourselves, shelter and shade for animals in the field, and shelter for farm crops. These alone would make up a large value in any district where required, and would justify all the cost and subsequent attendance. Yet, we have another aspect of the question that takes an equally strong place in our regard: *Climate* is not alone a matter of great outside causes, but one intimately related to local influences, among which trees are preeminent. We have no time to show how temperature, rain-fall, moisture, and evaporation are directly influenced by a small or large surface of trees—how therefore water in every form is in the hands of trees for local distribution. This second duty of forestry as a science and practice would even seem to swallow up the previous question, and are consequently inducements alone to its prosecution on our part. Were neither of these sufficient, however, to convince, the third great reason for tree cultivation will surely convert even the most stiff-necked among us. It is no matter of doubt, under average conditions, in any country, that tree culture is more profitable as a crop than its own agriculture, year by year, This position is not open to question, but clear and marked in all experience where age has given time for proof. And lastly, some men are satisfied when large expenditure secures what to them is all in all ornament; and assuredly ornament is value. Who would not give $500 more for a farm where the buildings are set off by just the kind, number and proper position of trees and tree clumps?

THE AREA OF LAND IN NORTH AMERICA

is not an unknown thing. There is no case in Europe as regards *small proprietory*, having recently occupied a forest country, and where extensive clearings took place for agricultural development. But it is not true that the American continent is now poorly wooded in comparison with other countries; the United States can show twenty-five, and Canada fifty per cent. of the cultivated districts, as still under trees. This is possibly larger than any other continent, if we except the northern part of Europe, where agriculture is necessarily at a discount, and where forest is practically untouched. What then is the cause of our discontent? if on an average, one-third of populated North America is still under forest, why do we advocate conserving and re-planting? or, in other words, what are

THE REQUISITE PROPORTIONS OF TREE SURFACE TO THAT UNDER AGRICULTURAL CROPS?

This is just one of the things that we do not know, and that we are not likely ever to know as a point for general practical guidance. The conditions affecting climate are so various as affected by latitude, altitude, aspect, soil, sea or lake neighborhood, and vegetation, that no possible number of observations, in any length of time, could say how much for one district is so much for another. However, men do come to realize through science and practice—practice especially—that a farm, or a district, needs the protection in certain places, and thus by such a simple guidance alone, a country could easily be reclothed to the extent required, at least for shelter, if not for regulation of climate, or of sufficient area as a cropping investment; this point of immediate shelter is, therefore, within everybody's knowledge, and needs no scientific recognition, and should not require any governmental spurring. But the greater field of climate, as an unknown one practically in this relation, is more a national problem, and still very much a scientific enquiry, and what it will have to say in regard to the proportion of trees to farm crops no one can tell. Of course, if we disregard everything but the direct profits from trees as a crop upon land, then we shall likely override all other deductions, and possibly bring back the days of laziness and unhealth. Viewing trees in all their relations, I am of the opinion that upon an average of conditions in Ontario—one-fourth of the land should be under trees, as this is just double what we have at present, there rests the apparent inconsistency of wanting to conserve and replant, all the while that we have double what is needed. This brings out the fact that it is the *irregular distribution* of tree surface in our case which gives trouble, that some parts have more than required, and others have been over-cleared. So then

THE EXISTING CONDITION OF OUR FORESTS

is the very first consideration in this enquiry. What is the condition of all our woodlands, both in the older and newer townships at the present moment, and what should be done with them in order to their best maintenance—such a maintenance as shall secure annual revenue, shelter, and climatic amelioration along with the due agricultural development?

Outside the lumbering interests there is no enclosing, preserving, caretaking, or conserving in any *sense*, except the right of individual ownership, some of whom do act the forester, but nationally there is nothing recognized, and hence waste. The average bush of North America is a beautiful sight and yet a sad one. The artist must revel in its variety of form, and foliage, but the fighting for place, the scraggy monarch of three hundred years, smothering even as he dies, scores of plants that but for him would attain to value; the general want of light and air, and otherwise a decay and loss, recognized only by those who are scientifically and practically foresters. I do not mean that our forests in every case should be managed similiarly to those in Europe, because much of our best timber requires very different conditions, but similar principles ought to guide our management. While then, we owe a steady eye to progressive judicious replanting, it is above all others our first duty to manage well what we do possess. It will be the cheapest, the most rapid, and the most sure method of readjusting matters—along, no doubt with a certain replanting of cleared land. No fear need exist in regard to

THE ADAPTABILITY OF SOILS AND CLIMATE TO RAPID RESULTS,

for nature herself has already shown us what to do both in repeating the same kind of crops, and in the proper rotation of trees, by sections of the country. But that nature has been the best guide in most things is not admitted. We cannot follow her in mode of thinning out so many annually, in making branchless stems, and therefore leafless and shelterless trees, comparatively. It is sound in practice, though not in theory, that ten trees, of certain kinds, standing within a given area, will afford less shelter, less wind break, than three trees of exactly the same sort, properly managed on the like area. We have soils and climates wherewith to do almost anything in tree life—from the pine of the north, which luxuriates in apparently bare rock cleft, to the walnut of the south, that must send its carroty root several feet into a rich soil. European forest revenue begins, as an average, fifteen years after planting; that of America ten years afterwards.

As the subject grows upon our attention, we are next concerned with

WHAT PARTS OF THE COUNTRY SHOULD BE CONSERVED OR REPLANTED.

And in this part of the study it is obvious that our views cannot be confined to single farms, or even special sections. Referring, as we must, to the great over-ruling influences, as previously indicated, we have to deal with geographical features that may embrace thousands of acres that have to be subserved by one, or more, massing of trees. Just where to conserve or replant, how much on the spot, or spots, in what particular form—belt, clump, or block—and with what kinds of trees, so as to gather and dispense all the virtues that trees are known to possess, is the great problem of the future. To say that we should replant only our less valuable soils is nonsense, though sensible enough from the *cultivated standpoint*; that high lands should be conserved or reclad as against lower parts is largely true, though not generally applicable, and that conserving and replanting must go hand in hand, and take place anywhere as found necessary through experience, is correct in every sense.

Following this view of the subject there is naturally that of

SUITABILITY OF CERTAIN KINDS AND FORMS OF TREES FOR SPECIAL PURPOSES,

whether for neighborhood of dwelling, roadside shade, shelter-belts, field clumps, or for more extensive planting, efficiency and permanency in every example are the primary considerations. It is not difficult, because experience is extensive, to decide on those species of trees for roadside, and house shelter, but much has not been done for the others, and so some advice will not be out of place.

To attain all the objects desired in replanting it is obvious that many varieties together in one clump or plantation would be indispensible; early shelter and rapid returns for the money invested would be best secured by certain kinds of trees more than others; such trees would also serve as nurses to others, and permanency in their case would not be wanted, but we would desire in their character a full and spreading foliage coming early and remaining late in the season, or even throughout the winter, to attain size in ten or fifteen years, and to be of a quality that would fetch a handsome revenue per acre for the period since planting. The removal of these gradually from the plantation as required by the progress of the other sorts would form, as it does now in other countries, a nice scientific and practical study. The second class of trees in such a plantation should be of a less spreading habit and more of upright growth so as not to interfere too early with the first and third classes; they should also begin to offer some revenue at thirty years, because the most of them would have to give place to the third or standard class, in about fifty years from the date of planting. In all well regulated planting one set of trees is held as those to remain as long as good management, their own natural habits, and a proper time to harvest without loss, will allow. These are the third class referred to, and necessarily we desire a slower growth, a habit that will not spoil by close neighborhood—a sociable plant therefore, giving high value when cut, maturing late, holding its maturity long, giving low branches and many leaves, a gatherer and holder of atmospheric moisture, a wind sifter, and holding electric communication with cloud and other trees at a distance. We have such trees of several varieties.

The preparation of the land, detailed method of planting, distance apart of trees, including fencing, drainage, knowledge of enemies and friends in nature, and all the management throughout in order to attain the highest results are too much for my time on this occasion.

The farmer's view of a wood, is grazing. Modern arboriculture does not recommend it in Europe at any stage of growth, yet, with us in the more difficult maintenance of permanent pasture, I see no objection to the admission of sheep during the second, and cattle during the late cropping periods.

The duty of legislatures, in regard to existing woodlands, and replanting, is being pressed upon our attention from various quarters, and unquestionably ere long every progressive country must take some action. How much to do, and what not to interfere with, will make the bill. That the Ontario Government has a warm side to trees is well known, and it is to be hoped that whatever they do it will be early, full, good, rapid and permanent.

American Forestry will have no place in all its scientific and practical value until one of two things be accomplished: one is the conviction on the part of our farmers, of the necessity of conserving and replanting, therefore their