

WHAT WE OWE TO THE TREES.

We continue our extracts from Mr. N. H. Egleston's paper in the April number of *Harper's Monthly Magazine*—

SCIENTIFIC MANAGEMENT.

It is pretty well settled now that for the best interests of most countries, their healthfulness, the greatest productiveness of their fields, and their general comfort and thrift, not less than a fourth part of their area should be permanently in forest. Wherever this proportion is not preserved, harmful consequences sooner or later ensue. But in Europe the forests are cherished and cared for not only on this account, but as being one of the most important industrial resources of a country. Science and art are employed not only to preserve a proper amount of woodland for the best development of other interests, sanitary and economic, but to produce the largest pecuniary returns from the forests themselves. The conditions for the best growth of the forest as a direct source of income are studied as carefully as are those for the growth of wheat or corn. By constant experiment and observation, in connection with the schools of forestry, it is ascertained what trees are best adapted to grow in particular soils or with particular exposures, which flourish best in a moist and which in a dry atmosphere, which in elevated and which in low situations. It is found, also, that trees, like human beings, are not only social in their nature, and will grow better when planted together in masses than when obliged to grow singly and apart from each other, but that they liked a varied society; that the pine, for instance, will flourish better, will develop its nature more fully, attain a grander stature and a better quality, when planted in company with the oak or other trees different in character from itself, than when it is limited to the companionship of its own kind. The same is true of other trees, and it is only as a result of a nice and protracted study that the affinities of trees or their preferences in this respect can be determined. Then, also, it has been found that trees come to their best when a rotation of crops is observed, as in the case of the grains and grasses, and so the officers in charge of the governmental and other forests have it for one of their duties to determine what class of trees shall succeed each other, and in what order.

Under this forestry management, now so well established in every country of Europe, the woodlands or forests have as constant oversight and care as the corn field has with us. The forest is not, as here, a hap-hazard and accidental growth, with which man has little to do except to notice its progress, and levy upon its resources according as they may serve his convenience or his greed, but the trees are regarded as one of the staple crops of the land. They are planted for a definite end—fuel or timber—but so planted as to conserve all other interests of the community. This planting is prepared for with due reference to the fact that the crop is not to be gathered at the end of a few months, but only at the expiration of a century or more. From the sprouting of the pine seed or the acorn in the seed bed until it has attained its growth and come to its destined harvest-time, a hundred and twenty years it may be afterward, not a year passes—we might almost say not a day—when it is not looked after with care, and everything done that will promote its best growth. What shrub or trees shall be planted near it to protect its infant feebleness, how near it they shall be planted, how soon one and another shall be removed in order to give it more light and more room in which to develop itself, what insects are preying upon it and threatening to check its growth, what symptoms of feebleness are manifest, and what may be done for their removal—these and many other things are taken into consideration; and the tree is thus watched over, not by one person, but by many, and by generation after generation, whom it outlives. Then, again, if a piece of forest is planted with a view to a yield of fuel, it will have a different treatment from that which will be given it if it is destined to produce timber or lumber for use in the constructive arts. The most economical method of cutting the trees when arrived at maturity, and the best means of getting them to market, whether by land or by water carriage, will also be carefully studied. Roads will be constructed by the most scientific engineering,

and canals will be made, or river courses will be taken advantage of, and by means of dams slack-water navigation will be obtained for the purpose of facilitating the movement of the products of the forest.

Then, furthermore, the forests will be carefully guarded against any browsing animals, which the experience of European foresters has proved are among the most destructive agencies against which they have to contend. It has been well said by Sir John Sinclair, in his *Code of Agriculture*, that "a landlord had better admit his cattle into his wheat field than among his underwood. In the one case they only injure the crop of one year, whereas in the other, by biting and mangling one year's shoots, mischief is done to the amount of at least three years' growth." Oftentimes the death of the tree ensues. In some European countries the right of pasturage, which has been entailed upon many of the forests, has been one of the greatest burdens which the proprietors of woodland have had to bear. A similar right to gather the fallen leaves, for litter or bedding, the *Streu-recht*, which attaches to some forests, is considered a great hindrance to the growth of the trees by taking away their natural constituents, and the proprietors have taken great pains to extinguish such rights, by purchase or otherwise, whenever it has been possible to do so.

SCHOOLS OF FORESTRY.

In one case, at least, the necessity of establishing such a school of observation in connection with any agricultural society has been obviated by the founding of the Arnold Arboretum of Harvard University. This institution is described by its director, Professor Sargent, as being:

First, a museum of living plants, in which every tree and shrub capable of withstanding the climate of Massachusetts is to find its appropriate place, this collection being supplemented by the herbarium and various special collections illustrative of trees, their products and uses.

Second, a scientific station for investigation into the character, growth, and economic and ornamental properties of trees; into the relations of forests to climate and the flow of rivers; and into the best methods of forest reproduction and management.

Third, a school of forestry and arboriculture, in which special students may, when the demand for such instruction is felt, acquire the knowledge and training necessary to fit them for the care and increase of our forests.

This modest institution has already modified legislation in favor of tree-planting in several States, and been the direct cause of planting many million trees. It is doing a great deal in introducing and testing new plants in this country, and sending those of this country to different parts of the world. It maintains an extensive correspondence in regard to trees and arboriculture with every part of the United States and Europe, and is doing much in collecting and disseminating information in regard to trees and their culture.

A similar and unmistakably good work may be done in connection with any of our colleges or scientific schools, and there is hardly an object which more commends itself to the liberal minded lover of his country than the founding of such institutions as the Arnold Arboretum.

The national government has done something in the right direction by the passage of an Act, a few years ago, by which the public lands were made an outright gift to the settler on condition of his planting a certain portion of it with trees, and cultivating them for a definite period. It has been thought by some that a Bureau of Forestry might be established in connection with the Department of the Interior, to which might be committed the care of the so-called "timber lands" belonging to the government, and of the great parks belonging to the Rocky Mountain region, and which might do good service in collecting facts relating to the growth and uses of trees, and disseminating them throughout the country. Possibly the end desired may be attained in connection with the Smithsonian Institution, aided as occasion may demand by Congressional co-operation. Possibly there may grow up by-and-by in this way a central national arboretum, in addition to those

established as we have suggested in the several States, and perhaps a School of Forestry, or something answering the purpose of such.

RECKLESS WASTE.

While in some portions of our country there is still an ample supply of forest, the latest statistics show that in the proportion of forest area to the entire surface this country stands below Norway, Sweden, Russia and Germany. A great treeless belt from three hundred and fifty to eight hundred miles in width stretches from the Gulf of Mexico to the Arctic Ocean. Sometimes this is absolutely destitute of trees as far as the eye can see. Elsewhere there are fringes of trees along the river courses. The heavily timbered Black Hills stand out like an island in the midst of the ocean. Other similar treeless forests are occasionally found. Beyond the Rocky Mountains, again, there is another treeless region, extending from the Columbia River to Mexico, and Professor Brewer says it is possible to cross the continent from the Pacific to the Gulf of Mexico without passing through a forest five miles in extent. Persons who have traversed our newer Western States, almost all of which are deficient in forests, report the destruction of even those limited supplies of timber by fire as being sad to behold. The miners consume great quantities of timber in the prosecution of their work; but so reckless are many of the settlers and traders in the destruction of the trees that self-interest has prompted the miners in some cases to establish a system of lynch law for the protection of the forests. One saw mill on the Keweenaw cut over two million feet of "big tree" lumber in one season. But in these milling operations waste far exceeds use; for after the choice young manageable trees on any given spot have been felled, the woods are fired to clear the ground of any limbs and refuse, with reference to further operations, and of course most of the seedlings and saplings are destroyed. In the Rocky Mountain region hundreds of square miles are disfigured by the trunks of trees blackened by fire. Where one tree is cut for use, ten probably are consumed by the flames. Professor Hayden, in his report of 1871, in speaking of this subject, calls attention to the fact that these burned districts are not covered again by a subsequent growth of trees, but remain bare for evermore. He intimates also that there is reason to believe that in that mountain region, even when undisturbed by the hand of man, the forests are gradually disappearing under the influence of natural causes. In the same strain a writer in the *Virginia Enterprise*, Nevada, says: "It will be but a very short time before we shall be able to observe the effect that stripping the fine forests from the sides and summit of the Sierras will have on the climate of this State and California. In a very few years every accessible tree, even to such as are only of value as firewood, will be swept from the mountains. Even now this has been done in some places. It is to be hoped that a new growth of pines or timber trees of some kind may spring up on the ground that has been cleared, but we do not hear that any such growth has yet started." The President of the State Board of Agriculture of California reported ten years ago that within twenty years at least a third of the whole native supply of accessible timber had been cut off or destroyed, and that, judging the future by the past, it would require only about forty years to exhaust the remainder. He says, "Thousands upon thousands of the noblest and most valuable of our forest trees in the Sierra Nevada districts have been destroyed without scarcely an object or a purpose, certainly with no adequate benefit to the destroyer or anyone else."

Reports like these might be multiplied to any extent, and it is only when we bring such reports together that we are able to get a proper notion of the work of sylvan destruction that is going on, and which is threatening us with such danger—danger not only of a scarcity of lumber and fire wood, and the enhancement of the cost of a multitude of articles of comfort and convenience, but danger of a deterioration of climate, carrying with it a diminished productiveness of our fields, and influences detrimental to health. This danger can hardly be overstated. Nor can we be too prompt or energetic in our efforts to avert it.

ENDURANCE OF WOODEN BRIDGES.

Some interesting literature was presented recently before the London and Middlesex Archaeological Society concerning "Old Fulham bridge," in which the history of this venerable structure was reviewed and particularized to show its almost wonderful endurance and longevity, as demonstrating that the superior character of bridges constructed of other material than wood, over the latter, is by no means an established fact, and that much may be accomplished to outwear a strong and well built bridge of wood. The bridge referred to, which is located at London, between Putney and Fulham, is a timber structure, and the oldest existing bridge over the Thames in the Metropolis, though it was erected in the year 1729, to supply an immediate and temporary want until its place could be occupied by a more permanent structure. Instead of being a comparatively ephemeral affair it has survived and done good service all those years, while two ponderous stone bridges over the Thames have become ruins, and have been supplanted by more modern structures.

The *Grantsburg Sentinel* says—We hear that several saw mills will be put up along the line of the North Wisconsin railroad this year. The Eau Claire Lumber Co. will build one above Cable, one will be built at Hayward, and another between Veazio and Stewart; Walker, Judd & Veazio, of Marine, being interested in the latter. Other mills will probably be built. We understand that the railroad company will not sell timber intended to be cut and driven down any of the streams; it's their policy to have mills put in to manufacture it into lumber. The mill at Shell Lake will be completed and in full running order by the middle of May, when it is expected to cut 200,000 feet per day, employing 200 men.

A MAN named L. Grunnell, operating on Klockidy creek, Ogemaw county, Mich., had a peculiar experience on April 5. He started a log with a cant hook which had become lodged on the chute over the dam. The log dragged him over the chute under water, and shook him up generally among the moving logs, but he bobbed up somewhat serenely a short distance below all right, except that he had temporarily lost his sensibilities. He still hung to the hook, and when rescued had it firmly gripped in his hand. The adventurer is now convinced that if he can't hook a log successfully, he can, at least, hang on to the cant hook.

A FEWLIAR feat was accomplished by a chopper named John E. Brownell, at Arlington, Vt. He felled a huge spruce on the mountain side, which was over sixty feet in height, and some twenty inches in diameter, intending it should shoot down the deep descent, which it did with great velocity. About 40 rods from the starting point up the mountain the novel projectile encountered an obstacle in the shape of a birch tree, two and a half feet through the trunk. This the speeding spruce struck with as much force as if it had been shot from a catapult, piercing the birch trunk and protruding six feet through it.

A FEW days since the two largest rafts of square timber ever known to have come down the Susquehanna river for years were brought in at Loch Haven, Pa., on the late flood, and taken down stream by Mr. Thomas Christie and crew. The larger of the two was 341½ feet in length, and was top loaded with 25 sticks, and contained 13,000 feet, whereas, ordinarily, the general run of rafts contain about 6,000 feet. The second raft was over 300 feet long, and contained some 10,000 feet. It is not believed any pilot therabouts has run a larger fleet of square timber rafts than this.

HOW TO GET RID OF AN UNWELCOME VISITOR. "Rheumatism" says Mr. A. McFaul, proprietor of the City Hotel, Kingston, "used to hold its own pretty well, but the days of that here are o'er. St. Jacobs Oil, the Great German Remedy has completely conquered the rheumatism, and no man need suffer from it longer. I had it badly until a short time ago, but I used St. Jacobs Oil and was cured, and so can any one be cured in a similar manner."