ENGINEERING DEPARTMENT.

A. W. CAMPBELL,
O.L.S., C.E., M.C.S., C.E.

Reforestation.

There has recently been issued the preliminary report of the Forestry Commission appointed by the Ontario Government to investigate the restoring and preserving of white pine and other timber trees upon lands in the Province not adapted for agricultural purposes or for settlement. The report is brief, but is replete with information. The subject is an important one, inasmuch as a considerable portion of the revenue of the Province is derived from this source.

What could be done by a system of forestry preservation is indicated to some extent by the experience of Prussia, in which country the annual profit derived from the forests is six millions, in spite of the fact that the annual cost of caring for the forests amounts to eight millions. Timber, however, in Europe is much more valuable than in America, in view of the expense of transportation. An interesting portion of the report refers as follows to a theory very commonly believed:

"The widely entertained theory that the white pine on being cut away is invariably and permanently succeeded by a crop of inferior varieties was completely disproved by the frequent instances observed in which tracts of flourishing young pine trees are growing up on cut-over land, and the prevalence of the idea can only be accounted for on the ground that fire has in so many cases completely exterminated the pine in all stages of growth. In most of the burned-over territory examined, pine was found intermixed with other trees, and gradually, as was no doubt the case with the original forest, asserting its supremacy and dominating the surrounding trees of the young generation.

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If a forest fire has completely bared the ground, the presence of the young, broad leaved trees is essential for the successful growth of a pine forest. The young pine plants, particularly Pinus Strobus or white pine, are extremely sensitive to strong sunlight and if exposed to sun, are almost certain to be killed in the first ten days of growth. Hence the cover afforded by the poplar affords the shade conditions needed by the young pines. If there were no fires, however, the cover afforded by the trees left by the lumbermen would doubtless provide the shade required for the successful propagation of the pines, but after the forest fire, the quick growth of poplar is a favorable condition for restocking the burned area with the original and most valuable trees.

In looking casually at a young forest on one of these devastated tracts the first impression conveyed is that poplar and other deciduous trees form the sole vegetation, but a closer inspection will reveal the presence of a large stock of young conifers growing in the shade of the poplars. The young pines shoot up straight and slim, reaching for the source of the light, that filters through the leaves of the poplar. In the course of time the pines, which develop slowly at first, overtake and outgrow their competitors. The growth of the pine during the first two or three years is slow, but after that time the rate of growth increases in a very marked manner. The poplars being gradually crowded out by the sturdier evergreens, die and decay, adding to the soil nutriment for the now dominant pines. The dense shade furnished by the poplars has in the meantime killed the lower branches of the pines, which consequently rise straight and free of limbs to the height of the crowns of the deciduous trees. The next and final stage reveals the forest as it originally stood, displaying a mixed growth, with the tops of the giant pines visible from a distance, reaching above the level of the leafy canopy of the forest.

Concrete.

We are entering the age of concrete. A sixteen-story warehouse is being erected in Detroit composed almost entirely of concrete, except for the steel skeleton that forms the frame work, and the necessary doors, windows and office furniture of woodwork. The station of the New York Central Railroad in New York city is being remodeled and concrete is being used because of its strength, durability and beauty. The cement, sand and broken stone composing the concrete is moulded into blocks on the premises, colored and put directly in place, being allowed to set and form a solid structure. Both on this continent and in Europe large bridges are built of concrete surrounding a steel framework. The concrete may be used either in the form of blocks, cemented together as in ordinary masonry, or it may be put in place as a solid mass, forming in effect a structure hewn out of a single stone. In Ontario the Trent Valley and other canals exhibit some excellent work in concrete.

The hydraulic-electric works of Chambly and Lachine are also good examples of the use of concrete. In the city of Reading, Pa., concrete has been used to replace brick in sewer construction with excellent results. While used by municipalities in Ontario to but a limited extent for culverts, it is steadily growing in favor.

Concrete, it has been stated, consists of a mixture of sand, broken stone or gravel, and cement. Cement is a near relative of lime, the binding constituent of ordinary mortar, and is made by burning certain kinds of limestone with clay, and then regrinding. Cement may be of two kinds: Rosendale, otherwise known as natural or hydraulic, and Portland. The former of these, Rosendale, is made by burning limestone containing large proportions of clay and magnesia and regrinding to a fine powder. The latter, Portland cement, is a more exact chemical mixture. It is made by first grinding a limestone containing little magnesia and a fixed proportion of clay. Clay and gypsum are added to form the precise proportions required. This is then burnt under intense heat and is reground to a fine powder.

Although cement was used by the ancient Romans, a great many people still have very indistinct ideas regarding it. Structures of cement concrete are stronger and more durable than those of stone or brick. The Roman cement was made of a mixture of lava and lime, and some of their bridges are still standing, although in military operations efforts have been made to destroy them. The charges of explosives have merely shot out almost as though from the barrel of a rifle, having little effect upon the concrete.

Cement-concrete is frequently confused with asphalt. Asphalt is a material generally used for paving roadways, concrete being used commonly in sidewalks. Asphalt is a mineral pitch. In Ontario there are a few small deposits in Lambton County, formed, it is believed, from an overflow of petroleum, petroleum being the mineral pitch from which coal oil is extracted. The watery parts of petroleum having evaporated, the hardened deposits remaining are known as asphalt. A large part of the asphalt used in paving is brought from the Island of Trinidad. With this pure asphalt is mixed sand and stone dust before placing on the roadway, so that, as the concrete of our sidewalks, bridges, etc., is termed "cement-concrete," to the compound of asphalt, sand and stone dust used in the roadway, may be applied the parallel term "asphalt-concrete." A concrete used for sidewalks is sometimes formed from coal tar, sand and broken stone or gravel, and is usually known as tar-concrete. A natural asphalt, ready for paving without adding sand and stone dust, is obtained by grinding up certain limestones and sandstones naturally cemented together by a mineral pitch. There is a term commonly used by the uninitiated—"ash-felt." There is no such material, the word being a corruption, no doubt, of "asphalt."

Agitation is the avenue by which the masses must be reached if they are to be awakened to the necessity for better roads; organization is the highway on which those who are aroused must travel in order to accomplish effective work and attain success.

It is said that 27,000 tons of water fall every year on each mile of road. This water does its best to run off and join some water course, but it is generally so hampered in its efforts that much of it soaks directly into the surface, so that dirt roads become mud, and stone roads are ruined. Proper drainage alone would go far toward improving all our highways.