improvements, on the machines already in use. In Paris, France, there are four hundred and fifty registered automobile carriages in use, with the factories running full of orders for more. The European roads are much more suitable for this method of transport than the average American road, but the advent of these carriages in large numbers, which, like the bicycle, will surely swiftly come, will necessitate an immediate improvement in our roads to take full advantage of this new system of locomotion.

Mechanics and inventors have been spurred on to extraordinary exertions by the contests that are to be held for prizes all over this continent and in Europe. This must lead in the near future to the appearance of a thoroughly practical and simple road wagon. Already the motors are being simplified in every detail, and the amount of gasoline or coal oil fuel for a given power reduced to a great extent in proportion to the power utilized. It is found in some of the motors experimented on that the amount of oil consumed does not increase with the increase of power. This is a very important discovery. It is the opinion of practical mechanics of high standing that the intricate and clumsy mechanism for the conveyance of the power to the wheels seriously operates against commercial success. Another important matter is having the driving wheels so attached to the shafts that on going around corners and taking sudden turns the wheels will accommodate themselves to the altered circumstances. In France, where so many carriages of this kind have been built, they do not attempt to make the bodies of the carriage as light as they do here. Greater strength is required in a motor vehicle than in a bicycle, as in one case a man power is the most required, while in the other the motors will realize from 3 to 5 or 6 h.p., perhaps equal to that of 20 men, together with the weight of the machinery and passengers. Wheels constructed on the bicycle principle are therefore not suitable for these machines, as is evidenced by the fact that the French and German builders have not adopted them, but continue to use ordinary wooden wheels, sometimes with rubber tires. It is claimed by the French builders that improper construction of the carriage frames and wheels has been largely responsible for many of the failures of the carriages to give satisfaction. So far as can be judged, both steam and electricity are unsuitable for automobile carriages, the only successful motors being some form of vapor gas engine, and gasoline seems to be the favorite.

It may be reasonably expected, considering a large number of the most skillful mechanics in the world are engaged in perfecting these carriages, that by the year 1900 they will have come into general use. The praise and profit will come to those who can place on the market the best and most serviceable machine. It is possible that the automobile carriage of the future is not in sight yet, but it is at no great distance from view. They will soon be made in as large numbers as bicycles are at present, and will be a large, and, for the initiators of it, a profitable industry, as they can be made at comparatively little cost with special tools; all the parts of each size being like the parts of a sewing machine, each a counterpart of the other and interchangeable. Furthermore, no heavy or very expensive tools would be required to build them.

A number of large factories in the United States are now being fitted out for the manufacture of these vehicles. Capitalists in Canada are also organizing for this purpose and will commence operations as soon as a thoroughly suitable carriage and motor is selected; this one of our best Canadian mechanical engineers is endeavoring to do for a company, and he may go to Europe for this purpose. At present mechanical engineers of reputation allow that the gasoline and coal oil motors are taking the lead. Every improvement now being made simplifies the construction, increases the power, lessens the dead weight, and does away with annoyance from odors. Thus everything goes to show that before the 19th century passes into history horseless vehicles will be common in all civilized communities, establishing factories for their manufacture, employing many thousands of men, just as the steam engine now does, but on a very much more extensive scale, as the carriage will become a necessity.

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*For* THE CANADIAN ENGINEER.

## CANADIAN TIMBERS.*

(*Concluded.*)

*Red Pine.*—This tree ranges a little further north than the white pine, especially to the westward. It is easily distinguished from the latter by its smooth, scaly and reddish bark, and its long coarse leaves in the form of tufts on the ends of the twigs. It grows in clumps and groves, sometimes of considerable extent, but seldom singly, and the ground among these trees is almost always open and free from underbrush. It has been sometimes erroneously called "Norway pine." Its average size is less than that of the white pine. It is more resinous and less durable than the latter, and does not command so high a price. It is used for piles, wharves and cribs, dams, railway ties, in building boats and decked vessels, for frames of wooden buildings, flooring, and many purposes for which Scotch fir is employed in Great Britain.

*White Pine.*—This is the largest and most valuable of our trees. Heretofore, it was an abundant timber in the southern part of the eastern half of the Dominion; but it has been cut away so rapidly and indiscriminately for both export and home consumption that the supply is becoming limited, and the average quality of a lower grade. Before much was known about the geographical distribution of our timber trees, there was a popular impression that the white pine had a much greater range than it actually possesses, and it is now necessary for us to husband carefully what remains. Westward it does not extend to Lake Winnipeg or Red River, and only occasional trees are found north of Lake Superior. It occurs only on the most southern of the head branches of the Moose and Noddawai Rivers. Eastward the northern limit strikes the Lower St. Lawrence near Mingan; but it is found of good quality in Gaspe and all the Maritime Provinces and Newfoundland. It is probably our longest lived tree and old specimens may have attained the age of 500 years. White pine is used in larger quantities, and for a greater variety of purposes than any of our other woods, and its properties are so well known that they scarcely require to be described to a Canadian.

*Hemlock or Hemlock Spruce.*—This is one of our largest coniferous trees, but the timber is of inferior value. It is hard and coarse grained, and liable to shakes, but is a durable wood. It holds spikes and nails well, and is used for railway ties, mine timber, wharves, barn floors, sheeting for shingling upon, etc.

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