

Frontenac County. He advocated the use of a traction engine and also of a scarifier, as these had been found very useful in his county. He said hind wheels running in the track of the front wheels, did great damage to the road; hind axles should be longer than front by twice the width of the tires.

#### Views of Improved Roads.

A number of views of New York State roads were shown, being explained by Mr. James Sheppard, of Queenston, who recently attended a good roads convention in that State. Mr. Sheppard was in charge of the good roads train which a few years ago built several miles of model roads in the twelve eastern counties of the Province.

#### Massachusetts and Autos.

The Massachusetts highway system was the subject of a paper in the afternoon by Mr. Harold Parker, of Boston, Chairman of the State Highway Commission. The automobile problem, said Mr. Parker, had become very important to Massachusetts, the number of registered autos having increased from 3,500 in 1903 to nearly 25,000 last year. These machines are under the direction and control of the Highway Commission, which issues licenses to operate them or revokes them, and keeps a register. A tax is placed on each machine, based upon its horse-power, of 50 cents per horse-power. This tax produced \$350,000 a year, which was spent by the commission in maintaining the roads. A force of inspectors or detectives is kept, and the commission exercises the functions of a court. When a person is killed by an automobile, the operator's license is suspended, and not restored until it is shown that the death was not due to serious fault of his.

#### Counties Pay One-fourth.

Mr. Parker said that the State pays the entire first cost of road building, and the counties are charged up with one-fourth of it. The whole maintenance of the State roads is met by the commonwealth by a direct tax. From \$500,000 to \$700,000 a year is spent for construction, 30-year bonds being issued.

#### County Control of Bridges.

Mr. W. H. Hoyle, M.P.P., for North Ontario, outlined the salient features of his bill to amend the municipal act, giving the County Councils exclusive jurisdiction over county roads and bridges; to have disputes settled by the County Judge, with appeal to the Ontario Railway or Municipal Board; to have every bridge constructed under standard specifications furnished by the Department of Public Works, and to provide for the issue of twenty-year debentures to pay for constructing or reconstructing the county bridges.

#### The Motorists' Claims.

A paper defending the automobile's place in modern highway traffic was read by Mr. W. G. Trethewey, of Toronto, representing the Ontario Motor League. The league, he said, desired good fellowship between its members and other users of the roads. Under a competent driver the auto was the safest vehicle on the road, because always under control, which the horse was not. Motorists would not object to paying a tax for the maintenance of roads, as is done in some States. Horses would grow accustomed to the automobiles, and roads could be built of material of greater specific gravity, and oiled. The motor-car could be very useful on the farm, one car doing the work of six teams. It had come to stay.

#### Narrow Tires Expensive.

Wide tires were strongly advocated from the manufacturers' point of view by Mr. Oliver Hezzlewood, of Tor-

onto. A narrow tire on an old wagon with a heavy load, he said, would cost more in harm to the road in one trip to market than would buy a new wagon. Speaking also on behalf of the Ontario Motor League, he said its aim was to secure scientifically constructed roadways for the reasonable use of all vehicular traffic. The league impressed upon its members their obligation, as gentlemen, not to stand upon their legal rights, but to do to others as they would have others do to them, and would "read the riot act" to any offenders who were reported to the Executive.

#### Cost of Road-making.

"The Cost Data of Road Building" was the subject of a paper by Mr. C. R. Wheelock, C.E., of Orangeville, Peel County Engineer. The ordinary outfit for road-making would cost about \$3,800. If stone-crushing machinery were needed, it would cost about \$1,300 more. The cost of road building depended on several items, labor, material, etc., for which Mr. Wheelock gave a mass of figures.

#### Keep off the Water.

"Keeping the water off the roadbed and good drainage are the fundamental principles of good road building," said Mr. H. G. Bleecker, of Belleville, Superintendent of Hastings County Roads, in his address before the Ontario Good Roads Association yesterday morning.

In the discussion of this paper it was brought out that the underdraining of a road was more important than the putting of "metal" on it.

#### Concrete Highway Bridges.

Every bridge should be made strong enough to bear a 15-ton roller, said Mr. James A. Bell, C.E., of St. Thomas, City and County Engineer. Iron bridges had first replaced wood, then came steel, pin-connected, with wooden floors, and later riveted steel, with concrete floors, this being a model of excellence of its kind. The latest and best kind of bridge is that of concrete reinforced with steel rods.

Up to a length of 40 feet, beam bridges could be built more cheaply than arch bridges, because there is less strength of abutments needed, as the strain is all downwards, with no back push. Some people objected to the beam bridges as not having such graceful lines, but they could be made decorative by panelling and balustrades, but there was more strength in the rods than in the beams. Bridges under sixteen feet could best be made of a single slab of concrete. Steel was at its strongest when made, while concrete became harder with age.

#### Inspection Is Important.

Good inspection was of the utmost importance. Along with the durability, strength and utility, beauty should not be overlooked. The best inspectors he found were third-year School of Practical Science men, as a young man starting out in life was on his honor and felt his reputation was at stake.

#### Economic Benefits.

That no good road could be built for less than \$1,000 a mile was the assertion of Mr. C. J. Foy, K.C., of Perth, ex-Warden of Lanark County. A road built for \$2,500 a mile would inure more to the benefit of the community, as the maintenance account would be much less. The economic value of the time saved by the farmer through having good roads was an important thing to be considered.

#### How to Deal With Quicksand.

In the course of an address on "Road Machinery," Mr. Jas. L. Taylor, Hamilton, Superintendent of Wentworth County Roads, said the best way to deal with quicksand was to sink a well just over the shoulder of the road down to the