

ENGINEERING DEPARTMENT.A. W. CAMPBELL,
O.L.S., C.E., M.C.S., C.E.**What Can Be Learned.**

If it were not for the unfortunate results arising from the ignorance of the principles of roadmaking, ignorance which afflicts not merely the people of Canada but of the continent, it would certainly be a "laughing matter." When the question of roadmaking is approached the first question one hears is: "What is there to learn about making roads? Anybody knows how to make a road." The person who asks the question probably forgets that at the time of statute labor last year he listened to a heated

of gravel, clay and sod in on top of the hard bed of gravel in the centre. They left the roadway nicely crowned as it should be—but what a difference when the fall rains came! Here was a hard, compact foundation covered with a layer of mud which at once absorbed the water and turned to slush. They spoiled the roads, did them an injury which will take several thousands of dollars to repair, travelled in a river of mud, but now think there is something to learn about roadmaking. Had they learned in time that these shoulders of mud should be turned outward by the machine, and the centre crowned with a little new material, they would have reduced their taxes instead of increasing them, and would have had good roads.

open drains provided at the sides. Gravel was placed in the centre, dropped from the wagons in the usual manner without spreading.

An old man who lived on the road, having little else to do, was employed by the pathmaster for a small amount to work on the road. The old man took an interest in his work, kept the drains open, year by year as a new line of gravel was added, he spread it so that traffic at once passed over it instead of turning to the roadside, ruts were made in the loose material, but with a rake the old man brought the gravel back until the wheel tracks were like a line of steel rails, hard and solid.

This work was done fifteen years ago, but the road, as has been stated, is to-day



STONE BRIDGE, PEMBROKE.

Erected in 1887 over Musk Rat River, at a cost of \$22,000. Height, 22 feet. Three spans of 60 feet each. Width of Roadway, 24 feet.

argument as to whether roads should be drained or not, whether clean or dirty gravel should be used, whether a cross-section of the road should be flat, rounded or hollowed. Every man taking part in the discussion had ideas different to those of his neighbors. If one man was right, all the rest were wrong, and yet we hear the question, "What is there to learn about roadmaking?"

There were some municipalities in Ontario which did not know how gravel roads should be repaired with a grading machine. The roads were flat with square shoulders, the centre was a hard bed of gravel, but the shoulders were a mixture of fine gravel, clay and sod. They ran the grader along the sides of the roadway, cut off the shoulders and drew the mixture

Some townships will not learn that they are wasting their gravel uselessly and that in a few years they will have to face a serious difficulty—that of finding a substitute for gravel. There are townships now not far from that difficulty. The immense hollows on many of the farms testify to the large amount of material which has been placed on the roads, without forming, in a single instance, a first-class and durable road covering. The writer has in mind a mile of road well known to him, which was first gravelled fifteen years ago, has had very little attention since then in comparison with other roads in the vicinity, and is in splendid condition to-day.

The road is on clay loam having moderately good natural drainage. The roadway was graded and the ordinary

the best in the township in spite of the fact that less gravel has been placed on it. A little extra labor has thus effected a saving of gravel; which if extended to the whole township would double the life of the gravel pits now being rapidly exhausted.

These are merely a few isolated instances. What is needed on the roads of this province is more brains, and less wasted energy and material. Before we have good roads the people of Ontario must learn that there is a great deal to learn about roadmaking.

In the Township of Essa two operators of road machines are appointed at \$1.25 per day, and the council charge \$2.50 per day additional for all work done for private parties.