RESURFACING OF A TARVIA ROAD IN ST. THOMAS, ONT.

By M. H. Baker, City Engineer, St. Thomas.

In 1912 a portion of Gladstone Avenue, to the extent of 1,681 yards, was re-surfaced with Tarvia X. The portion of the street in question was one of the first macadamized streets laid in St. Thomas, having been constructed in 1894 by Mr. R. W. Campbell, then city engineer. The street provided ample material for the construction of the Tarvia pavement, with the exception of two cars of fine stone which were required for surfacing.

The Tarvia was heated in kettles and applied in the form of a spray by a small tank wagon, provided by the Paterson Manufacturing Company, steam pressure being supplied to the tank by the steam roller. This method is rather costly; the more economical method being to have the material supplied in tank cars and heated by steam.

The surface of the roadway was first swept as clean as possible with hand brooms, then spiked with the steam roller. After the roadbed was thoroughly broken up, it was found to be too dirty to apply the Tarvia, so, all the stone was screened, to remove all dust, loam and fine material. It may be of interest to note that the screenings were found to be of the following composition:—

Moisture	6%
Gravel and coarse sand	58%
Fine sand	15%
Clay and organic matter	21%

The screened stone was then graded and rolled to within two inches of the surface of the completed roadway. This surface was then given an application of Tarvia, and 1%-inch stone filled over this and rolled to approximately the surface of the completed road, and Tarvia again applied. Over this was spread stone chips to cover the Tarvia, and another application of Tarvia lightly sprayed over this. This was all covered with a coat of sand and thoroughly rolled to a smooth, hard surface. After a couple of weeks' traffic had worked the sand into the surface, the street was swept clean, and presented a smooth, hard surface.

The cost of the work was as follows :--

Tarvia	408.50
Freight and cartage on Tarvia, kettles and tank	1
wagon	111.08
Roller (a charge of \$10 per day was made on the	
street)	105.00
Crushed stone	82.20
Miscellaneous (tools, etc.)	13.79
Labor	364.19
Sand	4.00
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\$1,089.75

This makes a cost per yard of \$.648.

THE SUDBURY NICKEL FIELD.

An important purchase has been negotiated in the Sudbury nickel field during the last two weeks, and is noted in the Engineering and Mining Journal. Dr. F. S. Pearson, who has been closely identified with Sir William MacKenzie in his hydro-electric power enterprises in Canada and Mexico, has taken over the holdings of the Dominion Nickel-Copper Company. It is believed, however, that Doctor Pearson and his former associates will not be called upon to do the financing, rumor having it that the money will be put up by the Rothchilds.

BRICK PAVEMENT FOUNDATIONS.

In commenting on the relative economy of using a sand or concrete foundation under a brick pavement the chief items to consider are first cost, maintenance and life. In the following discussion of the three items of first cost, maintenance and life the experience of the Department of Public Service of the City of Cleveland was described before the American Association for the Advancement of Science by Mr. Robert Hoffman, chief engineer of the Department of Public Service.

The city of Cleveland first began to lay brick pavements in 1889 and has continued doing so ever since, until at present there are about 328 miles of streets paved with brick, subdivided as follows:

257.61 miles, 5-in. brick, sand foundation.

19.39 miles, 5-in. brick, concrete foundation.

39.17 miles, 4-in. brick, concrete foundation.

11.84 miles, 4-in. brick, sand foundation.

Since then prices paid for brick pavements have varied from \$1.18 per square yard to \$2.48, depending on the various forms of foundation and size of brick used.

The following table indicating the various paving combinations employed in Cleveland for brick pavements shows the yearly average maximum and minimum prices paid per square yard since the year 1900. The cost of excavation assumed at 50 cents per cubic yard is included as measured below the top of the paving brick.

Cost of Brick Pavement Per Square Yard Since 1900. Size of

Bri	ck.	Foundation.	Mir	imum.	Maximum.
5	in.	Natural sand		\$1.18	\$1.56
5	in.	8-in. sand or	gravel	1.40	1.97
5	in.	6-in. concrete		1.94	2.48
4	in.	6-in. concrete		1.71	2.34
4	in.	4-in. concrete		1.47	1.73

Investigation has shown that the prices paid for the various combinations seem to rise and fall in the same years, which would indicate that the variations depended upon the material and labor market and not on the difference in combination.

The earlier of the brick pavements consisted of small blocks of fireclay 4 in. in depth, laid upon a natural sand foundation. Some of these are still in use though in service on residence streets for 20 years. In other localities, partly on account of traffic conditions, brick pavements on sand foundations required relaying in less than 15 years.

No pavements of brick laid according to recent specifications and practice, nor any laid on concrete foundations, have been in existence long enough to cause any thought of re-laying.

In reference to the brick pavements that now require relaying having reached a condition where any adequate repair would prove far too expensive, it could probably be shown that other defects, such as improper filler, poor brick, or defective construction, had as great an influence in causing deterioration as did the sand foundation. An entirely different condition would probably be found in an open and poorly drained clay district.

In considering the relative economy of sand and concrete foundations for brick pavements experience will show that a properly laid pavement of 5-in. brick on a sand foundation will have a life of at least 15 years, if laid in residence or light business traffic streets. A 4-in. brick under similar conditions would probably have a life of three or four years less.

The problem, is to compare the cost of such a pavement with one laid on a concrete foundation the actual life of which has not yet been determined by experience.