

OBITUARY.

WILLIAM NORTHGRAVE, a municipal employee of St. Marys, Ont., for the past fifteen years and latterly road commissioner, died recently after a lingering illness, at the age of 53 years.

LORNE MARSHALL died recently at Gravenhurst, Ont., after a long illness, at the age of 33 years. He was born near Bracebridge, Ont., and was engaged in the contracting business with his brother in Toronto.

JOHN H. ALLEN, who for the last fifteen years was president of the John F. Allen Co., of 370-372 Gerard Avenue, New York City, widely known as the makers of the original "Allen" riveting machines, died at his summer home, Kattskill Bay, Lake George, N.Y., on July 22nd at the age of 58. Mr. Allen succeeded his father, who founded the business some forty-five years ago.

ROAD DRAINAGE AND FOUNDATIONS.

(Continued from page 86.)

distribute widely stresses coming through it is very high, so high in fact that it will often carry stresses like a beam. Little has actually been determined as to its distributing power and as to its abilities in pavement foundation to carry indefinitely these beam-like strains. There is great need for investigation on these points. The cement concrete slab, however, has proven its ability to aid weak sub-grades to carry satisfactorily continuous heavy traffic; to aid good sub-grades to support the heaviest traffic; and, within limits, to insure permanency for these effects or results. "Within limits" is used in this statement because of the rather recently developed agreement among at least engineers advanced in the study of the matter, to the effect that cement concrete slabs used as pavement foundations are not the rigid masses they were commonly supposed to be, nor is their elastic limit in any case coincident by any means with their ultimate strength. On the contrary, they have a limited amount of resiliency or elasticity, and they have what is perhaps fully as important, the ability to become permanently deformed. That is, the cement concrete under continuously repeated stresses flows and the slab takes a different position from that which it formerly occupied. This theory explains the deformation of the surface of some pavements which has occurred in numerous cases, and which cannot be explained by any shifting of the pavement surfacing or of any intermediate sand layer. In such cases, the surface of the concrete foundation is found to be deformed and yet no deterioration of the concrete itself is evident. Admitting this to be true shows again the necessity of proper consideration of the sub-grade even when it is to be reinforced or supplemented by a concrete layer above it. Too often the practice has been to consider no care necessary in the selection or preparation of the sub-grade where a concrete slab was to be interposed between it and the pavement surface. The contrary should be the real practice, and not only should the decision as to the use of the concrete slab be based on careful consideration of the possibilities with the natural material of the sub-grade, or of other materials brought in for its improvement, but also when the concrete slab shall be decided upon for use, careful consideration of the possibilities of the natural material for the sub-grade, and even of other materials brought in for its reinforcement, should be had, so that the utmost use of the concrete slab may be developed, as well as economy had in its introduction.

The standard concrete pavement foundation in America is 6 ins. in thickness. A greater thickness has been advocated, as desirable and even necessary under certain extreme traffic conditions. It is a fact that the pavement on a 6-inch slab seems to have given way under such traffic conditions in certain cases, but it is equally the fact that even in these cases, the fracture of the slab or the actual failure of the slab itself as such has seldom been found to take place. What did occur was the subsidence or deformation of the slab without fracture and without destruction and this deformation appears to have been permitted by a failure of the supporting foundation. It would seem to the writer that a remedy such as preparing and providing better sub-grades should be considered in these cases along with the provision of a thicker slab, and that the decision might be for one or the other according to the demands of economy in the case.

On the other hand, the necessity for a minimum of 6 ins. to the concrete slab in all cases may be questioned, and why even 3 ins. of good concrete would not answer the purpose under many local conditions and where proper regard is to be shown the preparation of the sub-grade and the provision of a permanent and fairly substantial natural foundation, is not apparent.

It is impossible in the limited time assigned the writer to discuss exhaustively, or even perhaps to mention all the points of interest in connection with foundations, but if he has indicated to you a majority of the important ones and done so intelligibly and in a manner which will permanently impress them on your minds as well as inspire discussion at this meeting, he is repaid for his effort.

An artesian well to float dredges for digging a drainage canal near Crawfordsville, Ark., is to be put down by the Canal Construction Co., of Memphis. Instead of waiting for the fall rain to fill the ditches, a centrifugal pump will be used to lift the water. Seven dredges will be used in digging the canal. The latter will drain 90,000 acres. The contract price for the canal is \$47,000.

The use of national funds for road improvements was urged early in the history of this continent by Alexander Hamilton. A little later Albert Gallatin succeeded in securing the passage by the United States Congress of an act setting aside one-twentieth of the proceeds of the sale of public land in Ohio for building a highway from tidewater to the Ohio River. In 1806, President Jefferson appointed three commissioners to locate this route, which ran through Maryland, Pennsylvania and Virginia. The first contract for construction was placed in 1810 and in 1818 part of the road was opened to travel. It was called the National Road and was built with national funds exclusively, says a bulletin issued by the American Highway Association. The United States Government did not have the same views then that it has now of the importance of maintaining highways. The National Road was the main thoroughfare for the heavy travel between the seaboard and the Ohio Valley, and lack of maintenance resulted in the road becoming very poor. In 1831 Pennsylvania asked Congress to turn over to her care the portion of the road within her boundaries, and Maryland and Virginia also made a similar request somewhat later. Unfortunately, State control did not result in any marked improvement. The counties which had charge of the portions within their boundaries did not pay much attention to highway improvements, and it was not until the comparatively recent organization of state highway departments that the old National Road was given any real care. In the last ten years, however, reconstruction has been going on steadily. In about two years the entire length in Pennsylvania will be in good condition and the portion in Maryland is also very nearly reconstructed. Farther west the old highway is not in such good condition, although sections of it have been rebuilt there. So this early venture in national roadbuilding, successful until the railroad took its place, is again in a prominent place among the highways of the United States.