water consolidation when the traffic is fairly heavy. When Portland cement is to be used as a binder, it is found advisable in many cases to screen and mix, as the aggregate varies greatly even in limited sections.

Large boulders of glacial origin are found on the terrace between the old Lake Iroquois beach line and the present shores of Lake Ontario. These deposits are not in close enough proximity to existing and projected roads to be of great economic value at the present time.

The outside sources of supply represent excellent factors as a solution in building projected roads. The trap deposit on the north shore of Lake Huron and at Havelock, as well as the limestone largely quarried at Hagersville, Dundas and other adjacent sections, and the granite at Gananoque, merit consideration in this connection. The limestone deposits referred to are well-known. Those at Hagersville contain from 10 to 25 per cent. chert which, Mr. Reinecke believes, improves the quality of the road material.

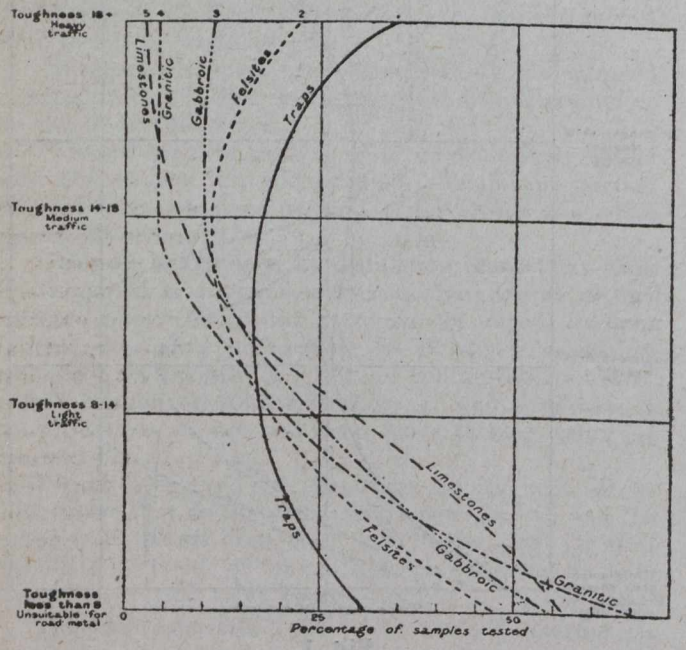

Fig. 2.

Curves showing the relative toughness and consequent behavior under traffic of such rocks as have a cementing value high enough to permit of their use on macadam roads (based upon tests made in the laboratory of the Office of Public Roads, U.S. Department of Agriculture, Washington, D.C.

The accompanying diagrams, together with their respective interpretations, will prove interesting. It is readily seen that trap as a whole furnishes the best road metal. In general, the remaining order of merit is as follows: Felsites, gabbroic, granite, and limestone.

From a careful study of curves such as these, the important part which the quality of metal plays in the success with which a road will withstand traffic can be readily seen. It further serves to illustrate a very important truth, namely, that in selecting the most economical type of road to withstand a given amount of traffic a cheap type such as water-bound macadam should not always be overlooked. While this type of road may fail and consequently prove unsatisfactory if constructed with limestone or granite, were it built with good felsite or trap, its merits might be unquestioned. If the yearly charges against a water-bound macadam road, to provide adequate maintenance and interest and sinking fund charges, do not exceed the combined amount of these charges against a more expensive road, the water-bound macadam should be selected, assuming that it will give as efficient service while in use as will the more expensive road.

It is encouraging to know that our government is doing its share in furnishing data to aid materially in the scientific solution of road problems.

ENGINEERS WILL OFFER SERVICES.

Wills Maclachlan, secretary of the Canadian Electrical Association, was in Ottawa recently, and in conversation with F. T. C. O'Hara, Deputy Minister of Trade and Commerce, Mr. Maclachlan said that engineers who could not enlist are desirous of doing something to aid the government in prosecuting the war. Mr. O'Hara intimated that the government does not understand clearly just how engineers might like to help, and he suggested to Mr. Maclachlan that the engineers should get together and present some definite plan of action to the government.

Upon his return home, Wills Maclachlan wrote to the executives and officials of various engineering societies centred at Toronto and invited them to meet at the Engineers' Club last Tuesday evening. The following gentlemen accepted the invitation: Chester B. Hamilton, R. B. Wolsey, W. A. Bucke, B. G. Buchanan, W. H. Thom, Ernest V. Pannell, R. K. Shepard, Childes C. Clark, S. L. B. Lines, Walter Carr, T. W. Gibson, J. F. Neild, L. N. Arkley, S. B. Chadsey, J. C. Armer, A. H. Hull, W. E. Segsworth, E. P. Mathewson, E. M. Ashworth, E. J. T. Brandon, Alfred Burton and Wills Maclachlan.

The above gentlemen belong to one or another of various societies, including the American Society of Mechanical Engineers, the Engineers' Club of Toronto, the Society of Chemical Industry, the Toronto Section of the American Institute of Electrical Engineers, the Toronto Chapter of the Ontario Association of Architects, the Institute of Electrical Engineers of England, the Canadian Mining Institute and the Canadian Society of Civil Engineers. While they were not officially representing any of the above societies at the meeting last Thursday evening, it is thought that they will no doubt be able to interest officially the various societies to which they belong, and to secure their co-operation in the movement if they can evolve any practical plans for assistance by engineers other than enlisting or volunteering for munition work under the direction of the National Service Board.

Discussion at the meeting last Thursday evening brought out a wide range of suggestions and a committee was appointed to consider them. Canadian engineers and scientists are invited by Wills Maclachlan to send him any suggestions they would like to make, regarding ways in which engineers can be of use at home in furthering the war.

SHIPBUILDING IN SWEDEN.

The Finnboda yard, near Stockholm, has decided to construct a new slip, capable of accommodating vessels 375 ft. long and of 5,000 to 6,000 tons. The necessary blasting operations will be commenced shortly, and the work is expected to be so expedited that the first keel can be laid in the summer of 1917. The first boat to be built will, it is stated, be only 250 ft. long.