

The Canadian Engineer

Established 1893

A Weekly Paper for Civil Engineers and Contractors

Terms of Subscription, postpaid to any address:
 One Year \$3.00 Six Months \$1.75 Three Months \$1.00 Single Copies 10c.

Published every Thursday by

The Monetary Times Printing Co. of Canada, Limited
 President and General Manager JAMES J. SALMOND
 Assistant General Manager ALBERT E. JENNINGS

HEAD OFFICE: 62 CHURCH STREET, TORONTO, ONT.
 Telephone, Main 7404. Cable Address, "Engineer, Toronto."
 Western Canada Office: 1206 McArthur Bldg., Winnipeg. G. W. Goodall, Mgr.

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DO CONSISTENCY AND RICHNESS DETERMINE STRENGTH OF CONCRETE MIXTURES?

FRESH impetus may soon be given to the struggle to find a satisfactory means of measuring the consistency of concrete mixtures. A prominent investigator in the United States has collected data, as the result of a number of original laboratory tests, that appear to indicate that with a given richness of mix and a given consistency, all concretes made from given materials will have the same strength regardless of the cement-water ratio or the gradation of the aggregate. In other words, using aggregate from the same source, and with any given brand of cement, he believes that a 1:2:4 mix and 1:3:3 mix, for example, would have the same strength, provided that sufficient water is used in each case to bring the two mixtures to exactly the same consistency.

Sufficient tests have not yet been made to establish this theory definitely, and the investigator recognizes that more extensive research work is required before he can make any claims for this theory that will be worthy of the attention of the technical world; nevertheless the theory is a most interesting one, and whether substantiated or not, proves once more how important it is to secure some recognized and effective standard for the measurement of the consistency of concrete. Given some dependable apparatus for measuring consistency, the theory above outlined, if further tests prove its accuracy at least within the range of workable mixes, would certainly simplify to a marvellous degree the work of concrete engineers, contractors, inspectors and laboratory men.

Unfortunately the problem of determining consistency seems far from solution. None of the methods applied to other materials are satisfactory or practical when applied to concrete mixtures, and the methods now in use in the vari-

ous laboratories are very different, and most of them are very unsatisfactory. The slump test has probably been the most popular, and is being adopted officially by some prominent committees, but the objections entered against it are serious. The flow table, tilting chute and other tests have more or less merit, but engineers do not agree in regard to their relative usefulness. They do not agree, to begin with, on the relation between consistency, flowability and slump. The so-called "flow table," devised by G. M. Williams, of the U.S. Bureau of Standards, holds forth considerable promise as an improvement on the slump test, and all engineers who are interested in concrete work, will desire to know more about the flow table, and no doubt a number of those who have laboratory facilities under their control will be interested in obtaining detailed information such as would enable them to construct experimental flow tables for their own work. We are very pleased to be able to announce that Mr. Williams has promised us an article on flow-table tests for an early issue.

ARCHITECTS AND ENGINEERS

SHOULD an architect or an engineer have charge of the design and construction of bridges and other important structures. The question was recently brought to the attention of the U.S. Engineering Council by the American Society of Civil Engineers and by the American Institute of Consulting Engineers. Each of these two organizations had adopted formal resolutions expressing its belief that engineers should have charge of design and construction of bridges and other structures in which engineering elements predominate. Occasion for these resolutions was given by the engagement not many months ago of architects to have charge of the design and construction of certain prominent bridges in Pennsylvania.

This perplexing problem has been considered by a joint committee of Engineering Council and the American Institute of Architects. After a full and frank discussion of the points at issue, the committee composed of three engineers and three architects, all of whom were present, unanimously concluded that the special conditions surrounding each case should determine whether an architect or an engineer should be selected to have charge.

Whether an engineer or an architect has the primary engagement for a project on which the services of both are needed, an important requirement, frequently neglected, is that the collaboration should date from the beginning. Each should be given fair credit for his contribution to the completed structure.

Letter to the Editor

FAILURES IN CONCRETE CONSTRUCTION

Sir,—Referring to letters published in the April 22nd and 29th issues of *The Canadian Engineer*, entitled, "Failures in Concrete Construction," that of R. E. W. Hagarty is certainly unfortunate. The opening paragraphs of his letter would indicate that he had no faith at all in concrete, however designed and constructed, but he ends up with the statement that concrete "undoubtedly constitutes one of the most permanent, economical, safe and fireproof methods of building that the world has yet produced."

The ten mistakes recited by Mr. Hagarty are not perpetrated by well-known contractors who have a reputation to sustain. Moreover, specifications cover these points and they constitute nothing more than common sense in concrete construction. They are not being generally violated, as one would be led to believe by Mr. Hagarty.

Instead of constituting "an optical illusion," and being "probably the greatest piece of engineering camouflage which