

very difficult to get sand to meet these specifications without going to greater expense than would be required by the use of more cement to fill the voids.

Mr. Parker said the committee had borne that fact in mind and had stated in their report that this specification would not be applicable to certain districts. This specification is merely a guide.

Prof. Brown said that concrete pavements may require quite a different specification than other concretes, and that a concrete that would be suitable in a street might not at all be suitable in a building. Mr. Jamieson replied that concrete is concrete, whatever its use, and varies only in the sizes and proportions of the aggregates.

Geo. A. Mountain approved of the specification as one of the best that had ever been presented to the Society and said it should not be referred back, but should be adopted and recommended to all members for general use. Prof. Haultain saw no objection to its adoption, provided that it would be made quite clear that it is for roads and pavements only, so that nobody would confuse it with specifications for similar materials for other classes of work.

Mr. Parker stated that the value of grading sand from  $\frac{1}{8}$ -inch could be determined only by much further experimental work. The work has now been done from  $\frac{1}{4}$ -inch, and the additional experiments cannot be performed in the period of the next year. The specification is intended to evoke discussion among the members and is not meant to be used unqualifiedly. No doubt it will not be a satisfactory specification ten years from now, but it can be changed any year.

J. R. W. Ambrose said that it was such a satisfaction to get so definite a specification and report from any committee of this Society that he thought it would be a shame to refer it back. The committee had made exhaustive tests and experiments and the Society should adopt the specification.

The president suggested that the specification be labeled "Tentative," but Mr. Mountain said every specification is tentative until something better is produced.

M. J. Butler, C.M.G., called attention to the use of the word "graded," which, he said, is a dangerous word in any specification if used in such a way that some may interpret it as requiring an artificial grading. It is an ambiguous word that implies that something must be done with sieves.

Mr. Parker moved that the specification be adopted and the committee continued. Carried. Moved that the remainder of the report (Appendices I. and III.) be received. Carried.

**Electro-Technical Report.**—Prof. Herdt moved that the report of the International Electro-Technical Commission Committee (summarized on page 59, January 18th issue, *The Canadian Engineer*) be adopted and the committee continued. Carried.

**Steel Bridge Specifications.**—P. B. Motley presented the report of the committee on steel bridge specifications and moved that the committee be continued for the year, but that it be reconstituted as outlined in its report (see page 59, January 18th issue, *The Canadian Engineer*), all members to be named by March 1st, the council then naming a representative for any branch that might have failed to do so by that date.

J. R. W. Ambrose expressed disappointment at the committee's report. He said this committee includes nine of the leading bridge engineers in this country and should have gotten out something better.

Geo. A. Mountain said there should soon be a standard Canadian Society specification for steel bridges. There are now three or four in use and there is no accord. The Canadian Pacific uses their own, the Grand Trunk Pacific and Canadian Northern use the Dominion Government's specification, while the Grand Trunk Railway uses the American Railway Engineering Association's specification. In some of them it is often difficult to tell whether impact is included or not, etc.

C. M. Goodrich said that a highway bridge specification is more difficult than a railway bridge specification, and intimated that the members should have patience with the committee.

Geo. A. McCarthy and Walter J. Francis both approved of the committee's work. Mr. Francis said that very fruitful discussion had been brought out at the Montreal meeting, at which the draft specification had been presented.

Mr. Motley said that a highway bridge specification is four times the size of an ordinary railroad bridge specification and could not be disposed of in one year by a committee like the present one.

F. P. Shearwood referred to a question on which the committee members had differed. The question is whether practically to design the bridge in the specification, or to leave as much latitude as possible to the engineer. He requested the annual meeting to instruct the committee to prepare a specification that would ensure safe bridges and economy of material, but that would not restrict the engineer unduly in his design. The consensus of opinion was that the meeting should not interfere in this manner in a subject that should be settled by the committee.

Geo. A. Mountain said the Dominion Government, the Ontario Railway and Municipal Board and the Alberta Government all have separate and varying specifications, and that undoubtedly other provinces will follow. He hoped that this movement toward a multiplicity of specifications would very soon be checked by the Canadian Society's issue of a standard specification, and that he would recommend its adoption by the Dominion Railway Board just as soon as it is issued.

J. S. Dennis moved that the committee be continued and be requested to submit a draft specification to the next annual meeting, and that meanwhile their existing draft be mailed to all branches for discussion. Carried.

The question of personnel of the committee arose again. M. J. Butler, C.M.G., said that the reason for naming the committee in its present form is obvious. If this committee, constituted as it is, brings in an unanimous report, its specification will at once become standard with the C.P.R., the Grand Trunk, the Railway Board and all other interests represented. He would be sorry to see one name off. J. S. Dennis said, "Absolutely so." Geo. A. Mountain asserted that no better committee could be gotten together than these nine men.

P. B. Motley replied that the committee is not representative of the branches. In each branch, if there is not a bridge engineer, there surely is at least a near bridge engineer, and the provincial officials can be consulted by that representative. Montreal is the centre, and the main work of the committee should be done there, he thought, but not one man should be left on the committee who had ceased to be active in its work.

J. S. Dennis concurred in the idea of provincial representation so as to get all the provinces interested in one specification. Each province now decides upon