Where two layers are used, they sometimes separate or crack, which is due, no doubt, to the method of construction.

With machine work, the contractor usually puts down several square yards of foundation concrete, and then in an hour or more, returns and puts on the surface layer. In the meantime the initial set has commenced in the foundation layer, the sun has dried its surface, it has been disturbed by the laborers walking on it, and the surface has been damaged to a certain extent from the dirt adhering to the men's boots. What chance has a top layer of concrete to adhere properly to a surface like this? Yet a great many jobs are carried on in that manner. I have noticed cases, where on a hot day, the surface layer would expand and lift up and separate from the bottom layer. Otherwise the walks seemed like excellent samples of sidewalk construction. A walk constructed in one solid mass must be stronger than one with two layers, unless the two layers adhere perfectly.

In regard to the cinders for foundation I may say that we have excellent samples of concrete walks, about 700,000 square feet, and the majority of the work has only one inch of cinders. The soil is blue or yellow clay and water cannot penetrate it. We have no walks heaved from frost. Standard practice calls for 6 or 8 inches of gravel or cinders, but that is, in my opinion, absolutely unnecessary, as it has so proved here. To prevent the walks from expanding and breaking our curbs, a one inch space is left between the walk and the curb, and another one inch space about fifteen or twenty feet distant.

I do not think that the surface of a walk should be richer than 1:2, because the surface when troweled becomes too glassy and slippery.

I would suggest that if the mixture 1:2:4 seems objectionable, then a mixture of 1:2:3, four inches thick, would finish without any difficulty. The same number of men, with a machine, will construct nearly double the amount of walk in a day, as they do not have to move back to put on any top layer. One or two extra finishers are necessary to keep up with the work.

Yours,

George S. Hanes,

Windsor, March 23rd, 1908. City Engineer.

SOCIETY NOTES.

American Society of Mechanical Engineers.

The next monthly meeting of the American Society of Mechanical Engineers will be held in the Auditorium of the Engineering Societies Building, New York, on the evening of April 14th. The general subject of the meeting is "The Conservation of Our Natural Resources."

Dr. Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching, will be one of the speakers, and will discuss the "Relation of the Engineer to the Body Politic."

The Dominion Forestry Association.

At the annual meeting held at Montreal last week the following officers were elected for 1908-9. W. B. Snowball, of New Brunswick, president; Thomas Southworth, Deputy Minister of Crown Lands for Ontario, vice-president; and A. H. D. Ross, Ottawa, secretary.

Architectural Institute.

The Private Bills Committee to-day reported Mr. J. Walsh's bill to incorporate the Institute of Architects of Canada in an amended form. The name was changed to Architectural Institute of Canada. Clauses giving the Institute power to hold examinations and grant certificates of efficiency and to establish classes of membership were struck out, along with clauses providing that any person who ceased to be a member should not have any interest in or claim upon the funds and property of the Institute.

Applied Science Undergraduates, McGill.

A special meeting of the Undergraduate Society of Applied Science was convened on Friday evening, March 20, to hear an address by Mr. J. G. G. Kerry, M.C. Soc. C.E., and one of the Commissioners appointed by the Government to investigate into the causes of failure of the Quebec Bridge.

From his previous connection with the University an enthusiastic reception was assured, both from the students and from a number of outside engineers who were present.

His address, delivered in his free and easy style of oratory, dwelt with the method of construction of the bridge other than with the findings of the Commission. Mr. Kerry outlined some of the difficulties which the Phoenix Bridge Company had to surmount first in the design of a structure absolutely without precedent, and secondly in the training of an army of men to operate machines specially designed for the manufacture of the individual members. He also mentioned some of the difficulties experienced from our climatic conditions and lack of rail connection in the early stage of construction. One expression used by the speaker and worthy of note was, "The history of the Quebec Bridge is that of a good army and a poor general."

He quoted an eminent engineer as saying that a school boy can calculate stresses in a member, but it takes an engineer to design details, and followed up his statement by showing lantern slides of the elaborate system of connections which he termed unique in bridge design.

The appreciation of Mr. Kerry's address was enhanced by the fact that this was the first time that one of the members of the Commission had appeared before an engineering society in this connection since the report was given to the Government.

Manchester Association of Engineers.

Before a recent meeting of the Society Mr. S. L. Pearce read a paper on Steam Turbine Engineering. The author said that the modern turbine owed its rapid development very largely to its association with electrical engineering. The simple impulse turbine was naturally associated with the name of De Laval, and in small units from 300 horse-power downwards it was in far more extensive use than any other type. The principal losses in the De Laval turbine occurred at the nozzles. The steam consumption for any rated output from 10 to 200 k.w. with absolute pressure of 160 pound 27½ in vacuum and no superheat varied from 23 pounds to 37 pounds per kilowatt hour. Compound impulse turbines were represented by the Rateau and the Zoelly. For the former few independent steam consumption tests were available, but manufacturers' figures showed for 1,000 k.w. Rateau 22 pounds of steam per kilowatt hour, and for a 475 k.w. 19.8. The Zoelly turbine has been recently built in units of 5,000 k.w. each. A feature of this type of turbine was the very low steam consumption at the lower loads, and its steady running, important points for electrical work. The Curtis turbine had been largely utilized in the United States, where there were at present installed or under construction for electrical work alone one million k.w. Tests made on a Curtis turbine showed in a striking manner the importance of a high vacuum and high degree of superheat for this type. Dealing with the Parsons' turbine, he would point out that the guaranteed steam consumption of the new 6,000 k.w. Willans-Parsons set at the Stuart Street Station, Manchester, with 190 pounds steam pressure, 27 in. vacuum and a superheat of 100 degrees F., was 15.85 pounds per kilowatt hour on full load, corresponding to 10.75 pounds per i.h.p. hour. At three-quarter load the figure was 16 pounds and at half-load 16¾ pounds. Messrs. Brown Boveri were now building two sets of 8,000 k.w. capacity on the Parsons principle for Buenos Ayres. The Westinghouse Company were adhering to the double-flow Parsons type.

STEEL RAILS.

Since the manufacture of steel rails has been commenced in Canada the total imports of rails have heavily declined. In 1901 we imported 3,472,509 dollars worth of rails, in 1906 1,197,170 dollars worth, and in the first nine months of 1907 1,867,865 dollars worth.