appears, therefore, that the design is overbalanced with an excess of steel. At the highest applied load of 717 lb. per sq. ft. the ratio of the steel and concrete stresses remains practically unchanged.

Column Bending.—The eccentric action of the test load was most marked on the corner columns of the loaded area, and was sufficient to produce a tension in the steel of 4,980 lb. per sq. in.

With respect to the strength of the structure, it may be said that a nominal load of 624 lb. per sq. ft. of panel, which actually was 717 lb. per sq. ft. of loaded surface, was applied without producing any permanent damage to the building. At this load the highest observed average total dead- and live-load stresses were less than 12,000 lb. per sq. in. in the steel and less than 1,700 lb. per sq. in. on the concrete.

IRON AND STEEL PRODUCTION IN CANADA.

The American Iron and Steel Association has compiled from returns furnished direct by makers the following statistics of the output of finished iron and steel in the Dominion:—

Finished Rolled Iron and Steel.—The production of all kinds of finished rolled iron and steel in Canada in 1911 amounted to 775,424 tons, as compared with 739,811 tons in 1910, an increase of 35,613 tons, or over 4.8 per cent. Of the total production in 1911, 86,383 tons were iron and 689,041 tons were steel, against 83,918 tons of iron and 655,893 tons of steel in 1910. The following table gives the production of leading articles of finished rolled iron and finished rolled steel in Canada in the last three years in tons (2,240 lbs.). The production of one plant has been estimated for 1910 and 1911:—

	1909. Tons.	1910. Tons.	1911. Tons.
Rails	344,830	366,465	360,547
Struct. shapes and wire rods	74,136	80,993	76,617
Plates and sheets	36,241	26,642	14,833
Nail plate, bars, etc.	207,534	265,711	323,427
Total	662,741	739,811	775,424

Forged Iron and Steel.—The total production of forged iron and steel by rolling mills and steel works in Canada in 1911 amounted to about 18,832 tons, of which about 787 tons were iron and about 18,045 tons were steel. In 1910 the production of forgings amounted to about 18,165 tons, of which about 1,258 tons were iron and about 16,907 were steel.

Cut Nails and Wire Nails.—In 1911 the rolling mills and steel works in Canada which operated cut nail or wire nail factories produced about 652,861 kegs of steel cut nails and steel wire nails of 100 lbs. each, as compared with about 327,580 kegs in 1910, about 374,100 kegs in 1909, and about 298,000 kegs in 1908.

Active Rolling Mills and Steel Works.—In 1911 there were 27 works in six provinces which made steel ingots or castings, or rolled iron or steel into finished forms, against 24 works in six provinces in 1910, a gain of three works. Of the total in 1911 there were 21 works which rolled iron or steel into finished forms and six which made steel ingots or castings but not finished forms of rolled iron or steel, while in 1910 the number of works which rolled iron or steel into finished forms was 20 and the number of works which did not roll finished forms was four. In 1911 there were four idle rolling mills and steel works, against three in 1910.

Of the 27 active rolling mills and steel works in Canada in 1911, six were located in Nova Scotia, six in Quebec, 11 in Ontario, two in Manitoba, and one each in New Brunswick and British Columbia. On December 31st two plants were being built in the province of Quebec.

ELEMENTARY THEORY AND PRINCIPLES OF STREET CLEANING.*

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The cleaning of city streets is necessary for reasons which may be summarized as the preservation of the public health, the physical comfort and convenience of the people, and a regard for decent cleanliness and good appearance. Of these, the preservation of the public health must be considered of first importance.

Filthy streets have long been held by sanitary authorities to be a prolific cause of disease, but our views as to the exact way in which street filth causes or propagates disease have, in the light of more recent investigations and conclusions, undergone a notable change. The prevailing idea in the past among sanitarians and physicians, as well as in the public mind, has been that filth and organic matter in the process of decay give off poisonous gases or exhalations capable of conveying, if not of creating, various diseases in the bodies of those exposed to them. Thus, it was held that the effluvia from sewers entering dwellings through untrapped pipes and fixtures was the direct cause of much sickness.

More recent investigations and the development of the germ theory of diseases lead to the conclusion that a large number, if not all, of the infectious or contagious diseases that affect mankind are caused, directly or indirectly, by specific organisms which propagate and multiply in the blood, and that these organisms or their germs are carried into the body not by gaseous exhalations, but only by solid or fluid matter with which the germs are incorporated or to which they are attached. These conclusions have an important bearing upon the theory and practice of street cleaning.

From the sanitary point of view street dirt may be divided into two physical classes or forms: first, the comparatively fresh, coarse and recently deposited material, such as animal excrement and the usual refuse matter and rubbish that reaches the streets; and second, the finely comminuted matter, which, when dry, is called street dust.

The first, especially when damp, possesses sufficient ponderability to prevent its being taken up and carried by ordinary currents of the air. In the second form named, that of dust, street dirt is, from the sanitary standpoint, wholly different from the first.

When the coarse material reaching the street is not removed with reasonable promptness it is subjected to the drying effect of the sun and air and to the pulverizing action of travel, and is thereby reduced to a condition of powder so fine and light that it readily floats in the air when disturbed, and may be carried by winds or breezes to considerable distances. While thus suspended in the air it may be breathed into the lungs or deposited upon the bodies of those in the vicinity. Assuming that this street dust is infected with disease germs, it is obvious that the conditions could not be better for disseminating them and conveying them into susceptible human bodies.

If the views here outlined are accepted as true, they indicate that important changes should be made in the present practice of street cleaning. Efforts should be more particularly directed, first, to preventing the formation of street dust; and second, to the removal by efficient methods and in a manner that will prevent unnecessary dissemination of such dust as may be unavoidably formed.

Heretofore in American cities the principal object has been to remove the coarse street dirt at such intervals of time as convenience or necessity might dictate by methods

* Abstract of a paper read before the American Public Health Association, September, 1912.