GOVERNMENT ELEVATOR AT CALGARY.

By C. D. Howe,
Chief Engineer, Board of Grain Commissioners of Canada.

THE Canadian Government elevator at Calgary is a reinforced concrete terminal elevator of 2,500,000 bushels capacity. This interior elevator, together with similar elevators of 3,500,000 bushels capacity each at Moose Jaw, Sask., and Saskatoon, Sask., were constructed by the Board of Grain Commissioners for Canada to operate in connection with the Board's lake terminal elevator at Port Arthur, Ont., and with the Board's ocean terminals at Vancouver, B.C., and at Port Nelson, Hudson Bay, the two last-mentioned elevators being now under construction. The purpose of the Calgary elevator is to provide storage and cleaning and drying facilities for grain grown in Alberta, and to act as a reservoir for shipments eastward via the Great Lakes, but more especially for shipments westward to Vancouver.

The Calgary elevator is of fireproof construction throughout and consists of a working house of 500,000 bushels capacity, and a storage annex of 2,000,000 bushels capacity. The receiving capacity is 18 cars of grain per hour, and the loading out capacity 36 cars per hour. The drying plant has ample capacity for drying 24 cars of grain per day, and the sacking plant, a capacity of 20 cars per day.

The elevator is electrically operated, power being supplied by the city of Calgary at 12,000 volts, and stepped down in the elevator substation to 550 volts for power purposes, and 110 volts for lighting. A separate motor drives each machine. A Cyclone dust collector system and a compressed air system are included in the equipment.

The elevator is especially well equipped for cleaning grain, its cleaning equipment consisting of ten receiving separators, two flax separators, two wheat and oat separators, and a screenings separator. These machines are all of large capacity, and the equipment provides for all ordinary grain separations, as well as for cleaning seed grain. A screenings grinder of large capacity is installed to chop elevator screenings for feed purposes. All grain is weighed on hopper scales located in the working house cupola, six scales of 2,000 bushels capacity each being installed. Two automatic sacking scales are included in the elevator equipment. A boiler house containing two 100-h.p. marine type boilers furnishes steam for drying grain.

The elevator is connected by direct spur trackage to the Canadian Pacific and the Canadian Northern railroads, and by a transfer connection to the Grand Trunk Pacific Railroad. Ample trackage for loading and unloading and sorting cars is provided at the elevator site. The total cost of the Calgary elevator was approximately $1,000,000. Janse Bros., Boomer, Hughes and Crain were the general contractors, and the engineering staff of the grain comissioners were the engineers.

WINTER ROAD CONVENTION.

The American Road Builders' Association has decided to hold its next convention and exhibition during the month of either January or February next. No decision has yet been reached as to the place of meeting, but it is expected that either Cleveland, Ohio, or Pittsburgh, Pa., will be chosen.

"RELATIVE STABILITIES" IN POLLUTED WATERS CARRYING COLLOIDS.*

By Arthur Lederer,
Sanitary District of Chicago.

AS a rule, all river waters contain more or less colloidal matter in the form of very finely divided silt. Polluted waters also carry colloids of sewage origin mainly derived from the fecal matter. Only recently has the importance of colloids been recognized in sewage disposal and water purification. We know that the colloidal matter in sewage affects the putrescibility of the liquid more than the heavier, coarse, suspended matter. The removal of the colloids by simple filtration—not biologic filtration—results in an improvement which is, however, much less than the one effected by biologic treatment, but far more than by settling. The study of colloids has given the science of chemistry a new aspect. Colloidal chemistry has explained some phenomena in nature as well as technology, heretofore not clearly understood. We differentiate between crystalloidal and colloidal state of matter. A very large number of inorganic substances, heretofore known only in the crystalloidal state, have been prepared in the colloidal. Some substances, such as proteins, starch, gum and glue, are known in the colloidal form only. Suspensions of colloidal clay remain suspended in the water for days and weeks. The addition of electrolytes, such as common salt, sodium sulphate, calcium sulphate, or sodium nitrate, accelerates sedimentation. The reason for this is (1) the electrostatic attraction between the colloids and the ions carrying the opposite electrical charge; (2) the removal of the water of the colloid. Hygroscopic electrolytes are, therefore, particularly efficient. Colloidal clay absorbs aniline dyes such as methylene blue. By absorption we understand the concentration of a dissolved salt on a surface due to difference in surface tension or electric potential. Clays also absorb and retail other substances, such as oils, fats, starch, proteins, certain inorganic dyes, all aniline and plant coloring matter, urine and fecal matter, putrid odors, and a large number of other substances. This property of absorption has led Professor Rohland, of Germany, to develop his clay treatment of sewage and industrial waste waters. Absorption is selective. An interesting study on this point has recently been made by Parker.

When applying methylene blue to waters carrying colloidal suspensions of clay, the dye is absorbed by the clay and sedimentation occurs, leaving the liquid colorless. The sediment is blue. This absorption may be only partial; it may take place quickly or slowly, all depending upon the quality and the character of the colloidal matter present. The absorption interferes seriously with the quantitative determination desired on the degree of putrescibility of the liquid. In other words, "relative stabilities" obtained in such waters by the methylene blue method cannot be correct. Spitta and Weldert, in their original communication, advise the observation of decolorization of the sediment after absorption takes place, though their observations are more of a qualitative nature and in such cases the exact time element is of less importance. In obtaining Phelps' "relative stabilities," the time element is all important.

*Read before the Laboratory Section American Public Health Association, Jacksonville, Fla.