water supply, before it has the opportunity to settle. The precipitate thus formed in a large part settles before it is carried to the filters.

The sedimentation basin was drawn off and cleaned after five years' operation of the filtration plant, and it was found that large masses of precipitated organic matter and aluminum hydrate had settled in the upper portions of the basin. This deposit covered the entire basin, varying from three to four feet in depth near the inlet to a few inches in proportion to the distance from the point of entry to the basin of the raw water.

The average length of filter runs during the four years described in this paper of the use of this process were as follows :---

-	Filter Runs after Scraping			Filter Runs after Raking		
Year	Number	Average in Mill ons of Gallons per 2-acre Bed	Maximum Kuns in Millions of Gallons	Number	Average in Millions of Gailons per 1-acre Bed	Maximum Runs in Millions of Gallons
1912	22	76	90	26	76	84
1913 1914 1915	22 26 29	95 85 89	115 152 229	23 24 21	79 77 42	91 157 104

In conclusion, it may be said that the use of intermittent coagulation results in a saving in expense, uniform results of satisfactory quality, coagulation without exhausting alkalinities in soft waters, and coagulation without excessive overloading of the precipitated hydrate on the filter beds.

LABOR DEAR IN MONTREAL.

Montreal's Board of Control is discussing a proposition made informally by the Cook.Construction Co. to discontinue all work on the Montreal Aqueduct owing to the scarcity of labor and the price of material. A proposition is also being discussed of returning to the city treasury all available money needed for public works, pooling the proceeds and dividing them among the aldermen to be applied to the various improvements that each alderman desires in his ward, so far as the money will reach.

SAYS NEW CAPITAL UNNECESSARY.

W. M. Acworth, one of the three members of the Royal Commission to Enquire into Railways and Transportation in Canada, wrote to the London (Eng.) Times on June 20th, stating that a cable message received recently from Ottawa by that paper "will, I fear, give rise to misunderstandings here among persons interested in Canadian railways."

The correspondent wrote :---

"Complete nationalization of the railways of the Dominion along the lines of the Acworth-Drayton report is impossible owing to the fact that Canada is shut out for the time being from the financial markets of London and New York."

Mr. Acworth writes :---

"Personally I do not accept that the plan as put forward by Sir Henry Drayton and myself is impossible. It is not impossible for reasons given. The course we recommend was expressly based on current war conditions, and was carefully planned to minimize the necessity for provision of new capital by the Canadian government."

MODERN ROADMAKING MACHINERY; ITS SELECTION, USE AND CARE.*

By W. Huber, A.M.Can.Soc.C.E.,

Assistant Engineer, Ontario Dept. of Public Highways.

R OAD construction is carried on under widely varying conditions, and the selection of machinery for any operation involves a careful study of these conditions. The capacity of the machines to be purchased, the power required, the most desirable weights for rollers, etc., should be carefully determined in advance. Equipment once used and found unsuitable cannot be sold or exchanged except at a heavy discount, and it therefore behoves the purchaser to make no initial mistakes.

The progress of the work and the interests of the machinery itself demand the very best class of operators. No machine is endowed with human intelligence, nor is any roadmaking machine automatic in action; success depends on human guidance and control, the efficiency of which is reflected in the results. While the various operations included in the construction of county roads may be classed as rough work, they require much skill and intelligence of a certain kind, and the lack of these two great essentials is sufficient to prevent results otherwise obtainable with even the best equipment.

The ordinary operations in the construction of country roads are grading, quarrying, crushing, hauling, rolling and watering. Each of these operations is now performed by up-to-date machinery as against more or less primitive methods formerly in use. For ordinary grading operations, work far superior to that done under the old method of shovel and scraper is now obtained from the use of grading machines, and in a fraction of the former time. The steam or compressed air drill has superseded hand drilling.

Efficiency demands that the stone be rolled and finished immediately after being placed on the road. If left only half-rolled, it is certain to be disturbed by traffic, and much of the roller's work is undone. The spreading and partial rolling of long stretches of stone is the cause of much unnecessary expense. Economical practice also requires that both crusher and roller be working to capacity, but that the roller is not rushed to such an extent as to encourage inferior or half-finished work. Exactly as much stone must be furnished the roller as it can properly consolidate, and no more.

A common source of loss in crushing road material is the attempt to operate a crusher with too limited capacity. In an attempt to compete in price there is a tendency on the part of some manufacturers to overstate the capacities of their machines. Selection of a suitable size should be based on more than the maker's or salesman's statements. The daily output of crushers with jaw openings less than 9 ins. x 16 ins. or 10 ins. x 18 ins. has been found too limited to satisfactorily supply the average roadmaking outfit, and the smaller machines should not be considered. Similarly the motive power should be sufficient to drive the machine at full speed under a full load. The time lost in a day's run due to slowing down when the load becomes heavy amounts to a considerable total. Frequently the boiler supplying steam to run the crusher also furnishes steam for a rock drill, under which conditions ample capacity is necessary. Experience has shown that where a portable or traction engine is used it should not be less than 20 horse-power.

*Abstract of paper read before the Fourth Canadian and International Good Roads Congress.