

part of the plant's water supply came to it in a mysterious way. It reflects, however, upon the past, and shows the importance of preventing similar occurrences in the future.

May we repeat again that now, while engineering work is slack, is the most favorable time that the present generation may ever see for undertaking an accurate and detailed underground survey. If it is not done during these slack times, there is every likelihood that its remaining undone will be the cause of a good deal of unnecessary expenditure, as the size of our towns and cities increases.

INVESTIGATION OF SEA-WATER CONCRETE.

There have been in the past certain cases of failure of concretes exposed to sea water, which have become very widely known. It is probable that to no one phase of the concrete industry has so much thought and labor been devoted as to the study of the behavior of concretes in sea water and the production of a cement capable of withstanding their action. There is considerable disagreement among authorities as to the causes of such disintegration, but there seems to be concurrence in the opinion that the formation of calcium sulpho-aluminate by interaction between the sulphates of sea water and the aluminates of the cement, is in large measure responsible. This salt (calcium sulpho-aluminate) increases largely in bulk by crystallization and disrupts the concrete by the physical actions attendant thereon.

As a result of considerable research conducted in the Sibley College laboratories of Cornell University, Mr. Nathan C. Johnson has outlined a number of features of the detrimental action of sea-water on concrete in a paper read last June before the American Society of Mechanical Engineers. In it he points out that a microscopic study of the problem reveals much of importance. He indicates the likelihood of this calcium sulpho-aluminate, when formed, producing a gradual straining of the material confining the crystals until rupture occurs. He claims that in the matrix of concretes which show outward signs of disintegration are found, by microscopic study, ample interior evidence of such strains. He relates this crystalline description with similar disintegration in natural stones, containing soluble matter or lying in a locality where seepage water is charged with dissolved salts of various kinds.

There is certainly much to be learned regarding the action of sea water on concrete. By no means all engineers are in favor of the microstructure method advanced by the above writer. Many concrete enthusiasts are inclined to criticize such an investigation, and dislike the publicity that has been given to the importance of the affair. But concrete failures have occurred in sea water that are so indicative of disintegration due to the action of ingredients of the water, that there should be no question of the advisability of most careful investigation, which is readily seen to be of a constructive rather than a destructive nature.

Canada is generally recognized as one of the foremost power-producing countries of the world. Her numerous rivers have immense potentialities, and within the area of population reasonable to be anticipated in the near future is estimated to have water power possibilities aggregating 17,764,000 horse-power, while some 1,712,193 horse-power of this amount has already been developed. Comparison with other countries establishes the Canadian standing among the industrial nations; power development on such a scale is significant of corresponding industrial activity.

RAILWAY PROGRESS IN BRITISH COLUMBIA.

The Kettle Valley Railway, completed some months ago, is now running trains on regular schedule over its entire line. The Canadian Northern Pacific Railway, from the Westminster Bridge to the Yellow Head Pass, a distance of 500 miles, will be ready for operation about September next. According to Mr. F. C. Gamble, chief engineer of the British Columbia Department of Railways, the line has been completed from the bridge to mile 190. Between mile 190 and Kamloops, mile 245, twenty miles have been completed, and twenty miles of ballast have been distributed. This latter portion will be finished by the end of August. North of Kamloops, 125 miles, or mile 370 from bridge at Westminster, have been completed, with the exception of about fifteen miles north of Kamloops, which require a second lift. The ballasting was finished to Blue River, mile 384, last week. Between Blue River, mile 384, and tunnel 41, mile 413, there are twenty miles under way, but this will be completed soon.

The through cut to take the place of the collapsed tunnel at mile 413 will be completed, it is stated, in a few days, when the track will be relaid and connected up. From mile 413 to Yellow Head Pass, the line is completed.

The company is proceeding with the roundhouses, turntables, etc., at the terminal and division points. At different places where stations are to be erected, men are at work.

When the track is connected up between Yellow Head Pass and the bridge at Westminster, three temporary bridges crossing the Thompson River north of Kamloops, above mile 326, will be renewed with steel structures.

The Pacific Great Eastern Railway between the dock at Squamish and Lillooet is in running order and a mixed passenger and daily freight train is running between these two points. Over these sections men are still at work, putting on additional ballast. Beyond Lillooet the track is laid up to Bridge No. 94, which is completed, ten miles north of Lillooet. Bridges Nos. 96, 97, 99 and 100 are in course of construction. It is anticipated that Clinton will be reached with the track by the middle of September.

PROGRESS ON THE HUDSON BAY RAILWAY.

The Department of Railways and Canals, Ottawa, is hastening the completion of the Hudson Bay Railway and its terminal facilities at Port Nelson. It is expected that the line will be completed for operation in about 18 months, according to a statement made the other day by Mr. W. E. Hawco, the superintendent of construction of the terminal works at Port Nelson. The alignment of the entire road has been completed, grading has been finished over two-thirds of it and steel laid over about half of it. It is expected that grading will be completed before the end of this year, and that the steel will be in place before midsummer of 1916. At Port Nelson harbor improvements are under way, docks are being constructed and a large dry dock is almost finished. As soon as the wharves and quays are completed, a grain elevator will be built equal in capacity to any on the Great Lakes. This elevator is expected to be finished in time to store 1916 grain.

Three dredges, including the suction dredge "Port Nelson," specially built for the work by the Polson Iron Works, Limited, Toronto, are engaged in deepening the approach to the harbor. About 850 men are employed on the Port Nelson operations.