

out of plant and construction details were attended to by the engineering staff of the railway.

The Bate, McMahon Maritime Co., Ltd., of which the late Col. R. S. Low was manager, were the general contractors. C. R. Fancy was the contractor's resident superintendent.

The writer had charge of the work for the railway under the direction of W. A. Duff, assistant chief engineer.

### TORONTO ENGINEERS' SMOKER

**M**EMBERS of the Toronto Branch of the Engineering Institute of Canada held a lively smoker last Thursday evening at the Engineers' Club. Before the entertainment, W. S. Harvey, the secretary, read the minutes of previous meetings and reports of committees. A report from the Employment Sub-Committee was read by E. T. Wilkie, explaining the proposed method of securing employment for engineers out of engagement. After some discussion, the report was adopted.

Willis Chipman reported on the work done by a special committee of the institute with the view to obtaining legislation for the registration or licensing of engineers. Further discussion will take place on this important subject. Mr. Chipman was tendered a hearty vote of thanks for the work he did on the committee.

L. J. Wookey opened the entertainment with a vigorous solo, "Dear Old Pal of Mine," which was followed by "When You Come Home" as an encore. E. M. Proctor related a number of amusing anecdotes. J. A. Brown sang "The Merry Cavalier," and in response to applause, "Morie, My Girl."

W. J. Blackburn entertained the members by a series of clever card tricks, after which refreshments were served. Capt. Roy Cockburn described his experiences in France and Palestine in connection with sound-ranging for the artillery, which afforded a fund of instruction and amusement. Capt. C. R. Young gave an interesting address on his work at Niagara Falls Camp with the men of the Polish regiments, of whom over 24,000 were trained there and are now on their way to Poland.

R. O. Wynne-Roberts sang the "Admiral's Broom," Mr. Brown "Tommy My Lad," and Mr. Shuttleworth one of his own patriotic songs. A. H. Harkness, the chairman of the branch, presided. The meeting terminated with "Auld Lang Syne" and "God Save the King."

In his annual report for 1918, Supt. J. W. Turner, of the Edmonton Water Works Department, says that some of the water mains are being destroyed by electrolysis. An injurious amount of electrical current is passing along the mains and is having a damaging effect, particularly upon the larger mains.

The American Association of Engineers announces that the proceedings of the Chicago conference of March 17th and the hearing at Washington of March 31st, are now ready for distribution. A copy will be mailed to any engineer who sends a request to the association's headquarters 29 South LaSalle St., Chicago.

What is claimed to be a record for obtaining new members in an engineering society has been established by the American Association of Engineers, which received 123 applications for membership in one day, April 18th. Of these applications, 62 came from Portland, Ore., where a chapter of the association is being formed.

The following cablegram, dated April 24th, has been received by the British Government Trade Commissioners in Canada:—"All subsidies and control over prices and material with regard to orders for pig iron, manufactured iron and steel and tin plates will be withdrawn April 30th subject to provisions of existing contracts and any export regulations. This means that manufacturers and merchants in the United Kingdom are free to make their own terms with regard to price and delivery from May 1st."

### PHYSICAL PROPERTIES OF MORTARS AND CONCRETES

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forms. Forms should preferably be of finished lumber as a concrete of high finish is very desirable. This hard cement skin on the outside of a concrete offers a strong resistance to the entrance of alkali waters. In our tests in the laboratory there has been practically no action observed in the cast of neat cement briquettes, or if there is any it is only confined to the skin.

Although I have previously made the statement that to choose a mixture of materials which will give a concrete of high density is not desirable, since rich mixes have in general less density than lean mixes, I should qualify this statement by saying that once the mixture of materials is decided upon, it is essential that this mixture be so mixed and placed as to secure the maximum possible density with the selected mixture. To secure such a result with the present methods of placing concrete, the quantity of water can be cut down to a minimum and especial attention can be paid to the spading and working of the mass when placed; but beyond these precautions we are limited in the degree of compacting of the material to the head of concrete on the work. Near the surface there is practically no head and to get the materials at the top as closely compacted as possible the concrete should be spaded for a considerable time to overcome the inertia of the materials and actually to push them into place.

The cement-gun has now come into extensive use for lining structures with a hard, impermeable layer of mortar. It has been used successfully in concrete ship construction and for many other purposes; the material being shot into place is very closely compacted. I have not been able to secure any figures for relative density as compared with the mortar settled naturally, but recent experiments at the United States Bureau of Standards have shown that test pieces cut from gunite have a very high strength and modulus of elasticity even for mortars as lean as 1:3. Extreme difficulty was experienced in cutting material for the test pieces. Structures such as dams can be poured with lean concrete and a 4-in. layer of gunite can be shot on, thus providing a closely compacted waterproof material. No cases are yet on record where gunite has disintegrated under alkali action, but it is not yet known whether it is entirely proof against alkali. I have recently been informed that concrete tanks lined with gunite have been used to contain a solution of sulphuric acid 15% strong. These tanks have been in use for a considerable period with no signs of deterioration through disintegration. It would appear in this case that, since the gunite is very dense, the solution cannot penetrate beyond the surface. The calcium sulphate formed at the surface, being relatively insoluble, will tend to prevent any further penetration.

Shortly before the end of the recent session of the Ontario legislature, a bill was passed to repeal the clause in the Hydro-Electric Radial Act which forbade the construction of "hydro-radials" during the war.

The nominating committee of the American Water Works Association has named the candidates for office for the ensuing year, and as there have been no additional nominations by petition, the official ballot has been issued with the following names:—Carleton E. Davis, nominee for president, chief of the Bureau of Water, Philadelphia, Pa.; M. L. Worrell, nominee for vice-president, formerly general manager of the Water Department, Meridian, Miss., and now captain in charge of utilities, Camp Hancock, Georgia; James M. Caird, nominee for treasurer, chemist, bacteriologist and supervisor of filtration plant operation, Troy, N.Y. W. H. Randall, nominee for trustee from the first district, was for many years superintendent of maintenance of the Water Department, Toronto, but recently accepted the managing-directorship of the Neptune Meter Co. of Canada, with headquarters in Toronto.