application. They are a profession of associates, and this relationship should exist between them privately as well as collectively.

On a staff there is a chief in name only. He should not be the man of control, but he who directs individual initiative for the betterment of the specialties to which each is adapted. He must not forget that he has to supervise the application of scientific data governed by daily progressive inventions and appliances; that the young graduate leaving the university may perfectly well bring to him an unexpected solution of a given question. He should not impose autocratic prerogative which might impair the subordinate's effectiveness by making him regard his chief as too able or too pretentious,—a condition which might make the assistant shy or set him a bad example.

He who takes the initiative to overload himself with any question of a general character, or of too many details, makes the greatest mistake possible in an executive. He at once loses the confidence of his assistant, who sees in his chief a bad interpreter of his intentions.

Chief or assistant,—both are engineers, with common ambitions and common objectives. Any man holding the least important executive position has a right to be consulted on the principal questions relating to the administration on which he is dependent, and no coercion must be exercised which should minimize his value and authority, or undermine his initiative and resourcefulness.

Capable chiefs like to be consulted, to consult and to advise. The assistant is the same. Both should aim at companionship. The former should not look too closely at things of minor importance on which a subordinate does not want to lose a large percentage of time which he regards as more useful in other directions. And the latter should not neglect minor problems which can be considered as resting in his domain only.

How often do we see pride overruling every decent principle of partnership, especially when a narrow-minded man attains to a high grade by favor, protection, etc.? Should one be sufficiently ill-advised to check up engineers with years of experience to see how they are distributing a title, to criticize the kind of lettering or the place where they are signing their names, when he neglects completely to make any suggestion on the idea of the plan and the safety of the structure, or to enter upon the least discussion on the technical conditions of the proposed or erected work? It is the appearance of the plan,—that is all that counts with some chiefs. It often seems as if good distribution of figures and their neatness are valued more than the correct solution of the work under consideration.

What indignation then arises in the heart of the designer! How humiliating is it for a live engineer to have to endure some remarks, and how impaired and diminished in his estimation is the man of the higher grade!

These are some of the reasons why initiative and discipline are sometimes sacrificed to the selfishness and autocracy of a chief who is at his post as a commander rather than as a professional associate to other members of the engineering family.

ROMEO MORRISSETTE.

Three Rivers, P.Q., January 15th, 1919.

## TO PUBLISH QUEBEC BRIDGE REPORT

WHEN the Quebec Bridge was completed, the Board of Engineers recommended to the Dominion government that a full report be published in the interest of science. On account of the war, action on the recommendation was deferred, but it has now been decided to publish a very complete report, including all available data.

The Jamaican Government is considering the establishment of a floating dock in Kingston Harbor and the construction of a railroad along the water front, linking up the wharves.

## OTTAWA'S NEW PUMPING PLANT

BY L. MCLAREN HUNTER City Engineer's Office, Ottawa, Ont.

A CCOMPANYING is an interior view of Ottawa's newest pumping station,—the High Lift Station at Lemieux Island. This station is equipped with two units for pumping water from a sedimentation basin to a 51-inch main. Provision has been made for extensions as required.

The pumps now installed are each rated to deliver twenty million Imperial gallons in 24 hrs., against a pressure of 123 lbs. per sq. in. They can deliver 25 million gallons a day against 100 lbs. The pumps were supplied by Escher Wyss & Co., and are driven by 1,600 h.p. Westinghouse induction motors.

The normal pressure is 80 lbs., but for fire-fighting it is raised to 100 lbs.

The city waterworks department obtains all of its electrical energy direct from the power plant of the Ottawa & Hull Power Co., at an annual cost of \$14 per h.p. The rating



20 M.G.D. AGAINST 123 LBS. PRESSURE

is based on a 20-minute peak, extended over each month in the year. The power used at the Lemieux Island station is taken from the power company's Chaudiere plant at 11,000 volts and is transmitted by submarine cable to the Lemieux Island transformer station, where it is stepped down to 2,200 volts for the motors.

By means of the transformer station on Lemieux Island, a considerable saving is effected, as the power is taken direct from the generators of the power company, the latter having no expense for transforming or transmitting the power.

The plant was designed and constructed under the supervision of J. B. MacRae, consulting engineer, Ottawa. W. E. MacDonald, the city's waterworks engineer, represented the municipality during the construction of the system and is now in charge of its operation.

The Otira tunnel in New Zealand has been "holed through" and will be completed within two years. The tunnel is over five miles long and was started in May, 1908. A waterfall will be developed to provide power to electrify the tunnel.

At a recent meeting of the Manitoba Branch of the Engineering Institute of Canada, a committee of five was appointed to launch a campaign for the widest possible exploitation of Manitoba's resources. The following are members of the committee: J. G. Sullivan, consulting engineer; W. Smaill, of the engineering staff of the Greater Winnipeg Water District; J. M. Leamy, provincial electrical engineer; W. P. Brereton, city engineer; and W. J. Dick, formerly mining engineer of the Commission of Conservation.