1. Painting with cement or plastering the inside of canal B; may be effective for a time, but seldom continues efficacious for long.

2. In some way keeping the ground water at all points higher than the water in B at that point.

3. Keeping canal B as far from A as possible; also avoiding bringing the two canals near together for short distances only at the lower end, which would concentrate the seepage from B.

Basin With Special Lining

4. Placing between A and B, parallel to B and connected with it by a short trench, a short canal or narrow basin from which the seepage can take place, thus limiting the damage to this basin, which can be given a special lining. Applicable only to short stretches.

5. The baffles in B may be made to practically dam off the canal into sections, each section being kept at the level of the water in A by ground seepage. If the hydraulic gradient of the water surface in A is kept low, the seepage around each of the dams in B will be so small as to do little or no damage. The more frequent these dams, the less the difference of water level on the two sides of each and the less the seepage around each. This plan so reduces the seepage at any one point as to make its effect negligible; and if the dams are numerous enough, the ground only slightly porous, and the hydraulic gradient in canal A is kept flat, there may be no appreciable seepage around the dams.

6. Seepage from canal B at the lower end can be largely prevented by placing numerous connecting channels between the two canals at this section, through which channels will take place the flow that keeps the two at the same level; or a channel may be carried from B directly to the power house. Each of these will probably increase the flow in B, and, while it will eliminate seepage at the lower end, it will increase that around the dams or baffles unless these can be eliminated (that is, unless all resistance in pipe joints can be eliminated, which is not practicable where the pipe is already laid.)

7. If the hydraulic gradient in A were made level there would be no seepage from B, and the flatter it is kept the less is such seepage.

8. If canal A were made watertight there would be no flow of water into B and no flow from it to A.

Drain to Carry Seepage

9. If a drain were laid near A and lower than the water in it and ample to carry the seepage from A, there would be no seepage from A into B.

10. Pumping out the ground water from a sump near the power house would serve if it kept it below B throughout its length, but otherwise might increase the damage.

11. Any method of decreasing the perviousness of the soil between A and B would lessen the amount of water seeping between them.

12. A number of drainage pipes or channels run from a reservoir at the power house and connecting with the canal at intervals would tend to reduce the fall in gradient in A, especially if the baffles furnished a considerable obstruction to the flow.

13. Locating the power house at mid-length of the canal will reduce the total fall in gradient; and increasing the number of power houses will have the same effect.

In all the above, the principal feature in which the electrical problem differs from the hydraulic is that in the former the damage to B results solely from water passing from B into the ground. In other respects the parallelism is quite close.

HUNTER STREET BRIDGE, PETERBOROUGH

AS exclusively reported last week in the Construction News Section of *The Canadian Engineer*, Frank Barber, of Toronto, has been appointed as consulting engineer in connection with the design and construction of the high level reinforced concrete arch bridge across the Otonabee River, at Hunter Street, Peterborough, Ont.

The bridge will have a roadway 56 feet wide carrying two street car lines. Distance between curbs will be 42 feet with two 6-foot sidewalks. While the total length of the bridge, including fill, will be about 1,800 feet, the bridge proper, including approaches, will be approximately 1,000 feet long.

The estimated cost of the bridge, as prepared by the city engineer, R. H. Parsons, is about $300,000.

The bridge, when completed, will connect the main part of the city with the business and residential district across the Otonabee River. The building of this bridge grows out of an agreement made with the Quaker Oats Company. The matter was voted upon by the ratepayers and was carried by a large majority. It is expected that the work will be completed by the end of 1919.

SLIDE HITS GIANT STEAM SHOVEL

"BATTERED and broken by hundreds of tons of clay that crashed down upon it from the cut, the great Bucyrus shovel in the northern end of the Hydro Canal cutting near the whirlpool is out of commission for some time to come," says a daily press despatch from Niagara Falls, Ont.

"An avalanche came down from the face of the cut and from the left bank. The great machine was driven backward about thirty feet, broken lose, and partly dismounted from the truck on which it travels. Its backward movement saved it from being buried and more seriously damaged. Several workmen had a very narrow escape. The boom of the shovel was torn off, thrown to one side, and badly fractured in two places. Yesterday's rain was probably the cause of the slide.

"The cutting is about ninety feet deep, and the stratum exposed is mostly of quicksand character. Above this is a great bed of red clay, and at the surface several feet of top soil. It will be a difficult piece of work to dig the huge shovel out of the dirt surrounding it. A revolving locomotive crane was brought up from the forebay works near Queenston to assist in the excavation."

GOVERNMENT CONTROLS STEEL INDUSTRY

THE government, through the War Trade Board, took over the control of steel production in Canada on the 3rd inst. The board is vested with full authority to give directions to the different companies as to the extent and character of their product, taking into consideration the facilities of each concern. By the order-in-Council which is being passed, the board's powers will be extensive in the supervision and direction of steel production and manufacture in Canada. It does not refer, however, to the financial or general management of the concerns. The object is to co-ordinate the producing power so as to ensure the greatest efficiency as well as the maximum of production.

The measure has become necessary owing to the shortage of steel in the United States, due to the great and constantly increasing demand for war purposes. This, it is explained, makes it imperative that the greatest possible economy in production be exercised along with co-operation by the different companies.

The War Trade Board will co-operate with producers to bring about the proper measures, and it has authority to enforce such orders as it may deem necessary. Each steel plant will be assigned a certain kind of work.

Basic as well as war industries in Canada have need of supplies, and they must, to the extent of our ability, be provided in Canada owing to the tremendous demands upon the American steel industry.—From The Monetary Times, Toronto.