

The first boring undertaken in hard crystalline rocks was on the little island of Svangen, in 1891, south of Kosterfjorden. This was abandoned "because a long crack was arrived at extending from the sea to the boring-hole."

Baron Ruuth, General Director for Pilots, caused a second boring to be tried. It was at Arko, beyond Braviken in May, 1894, under the direction and supervision of Gustav Nordenskjold, the geologist Svenonius, and Director Casselli. "The rock consisted of hornblende, gneiss and diorite. As soon as a depth of 35 metres was reached they came to excellent water, yielding 450 litres an hour. The boring had a diameter of 64 millimetres." The water obtained was "perfectly clear."

At forty-four different stations water was thus obtained since the successful trial at Arko, and at Stockholm the temperature of the water reached in the bore-hole varies from 6° to 7° C. (about 43° to 75° Fahrenheit); Gelliavaara water, 13° C., or 55° Fahr.

"Baron Nordenskjold is convinced," says Sir Clements Markham, "that water will be found in the same way as in Sweden wherever hard close rock exists, with variations in temperature and not permeable."

In Canada where the Archæan gneisses, granites and diorites are so abundant, we find that the whole Archæan area is fairly teeming with flowing springs, even on the crests and brows of our Laurentide Hills. These springs or streams supply an innumerable quantity of fresh water for the numerous lakes which abound everywhere throughout our Archæan country as may be readily seen on examining the geological maps of Canada which include part of the Archæan complex.

I venture to throw out the suggestion, that, the presence of these cracks or fissures in the hard crystalline rocks of Canada is probably due to the variations in temperature to which the Archæan areas are subjected in coldest winter and warmest summer, or in the rapid and pronounced variations in temperature of alternating day and night.

Such an hypothesis appears to be in keeping with the views and facts advanced Baron Nordenskjold in Scandinavia, and the presence of such streams (many of them intensely cold in summer, indicating that they come from considerable depths) as issue from the cracks and crevices everywhere present, would account for the supply of a great deal of the fresh water in our great and small lakes. H.M.A.