

bicolor, 27th ; *Urinator imber*, 28th ; *Bonasa umbellus*, 28th ; *Halicæetus leucocephalus*, 29th ; *Arden herodias*, 29th ; *Grus americana*, 29th ; *Trochilus colubris*, 30th.

FRESH WATER FOUND BY BORING IN GRANITE AND OTHER HARD CRYSTALLINE ROCKS.

Sir Clements Markham, K.C.B., President of the Royal Geographical Society of London, draws attention* to a remarkable discovery recently made by Baron Nordenskjöld, viz :— that fresh water will be found by boring through hard crystalline rocks to a depth of from 30 to 35 metres, *i.e.*, from 100 to 120 feet.

The practical utility of this fact becomes very apparent in a country like Canada, where Archæan rocks are so extensively developed, and especially so on islands or isolated areas where fresh water does not readily flow at the surface.

As early as 1867, in his "Sketch of the Geology of Spitzbergen Island," Stockholm, Baron Nordenskjöld gave the results of a series of observations from borings in rocks of Carboniferous Age capped by others of Tertiary Age, the latter being quite folded and disturbed, the former having alternating bands of plutonic rocks interstratified with them. In attempting to account for the crumpling of the Tertiary rocks by means of an almost imperceptible but nevertheless continually operating force, he points out that differences of temperature at different times of the year are sufficient to cause dislocation of the strata, and "it should not surprise us," he goes on to say, "to find even the newest formations greatly folded, while older formations in the vicinity may be quite undisturbed." These facts taken into consideration with the general occurrence of cracks and fissures in all rock formations, he argued that in all solid rocks at an insignificant depth below the surface a horizontal crack would generally exist.

A series of borings was carried on in Scandinavia under the Baron's supervision, with results that have more than fully justified the hypothesis and stand he took, and warranted the expenditure of moneys in boring in the hard solid granite rocks on isolated areas and islands off the coast of Norway, leading to the discovery of fresh water at depths from 30 to 35 metres from the surface.

He had ascertained on enquiry, that the water and springs from mines and openings below or near the sea coast, was fresh rather than salt or brackish.

*The Geographical Journal, Vol. X, pp. 465.469, Nov., 1897.