

appeared to be absent also in the ancient bowldery rapids next below Pimisi bay and at the Rapide des Rochers below Lac des Aiguilles. At all these places the current issued directly from a lake and was probably clear and free of gravelly sediments.

So far as seen the best place to observe bowlders being scoured by the work of the modern Mattawa river is at the Chute des Parasseux, fourteen miles above Mattawa.

Descriptive Details of Varieties.

Pierced and *basined* bowlders are in reality merely two stages of the same process. When the current begins to cause pebbles and sand to spin round and round on one particular spot on the surface of a bowlder, the process of wearing out a basin is begun. Given only time enough, with constancy of the conditions on which the whirl depends, and the basin will sink deeper and deeper into the solid bowlder until the bottom is cut through and the basin becomes a hole. The bowlder is then pierced through and becomes a ring-bowlder. The hole is usually nearly circular on cross section, but sometimes tapers towards the bottom. The periphery or outer surface of the stone generally shows considerable irregularity, for the hole is seldom symmetrically placed. Otherwise these bowlders have the common sub-angular form. Pierced or ring-bowlders are the highest type or variety of the several forms produced by scour. They are scarce, even where other lower varieties are abundant. Only one was found on the course of the ancient outlet river within the Mattawa valley, and this lies in such a position and at so low a level with reference to the modern river that it probably was made by it. This ring-bowlder lies in a side channel at Parasseux Chute. A dam was constructed across the head of the rapids several years ago and this left a side channel east of the present rapids dry. In the bottom of this channel about opposite the middle of the present rapids below the dam lies the ring-bowlder. It is broken in two pieces, but they are separated only a few inches and their former solidity as an unbroken ring is at once obvious. The hole is not perfectly circular, but has a large diameter compared with the diameter of the bowlder itself. The hole is about eighteen inches across, while for about one-third of the circumference the ring of rock is only six or seven inches thick.

But the most magnificent specimen of this variety that the writer has seen is on the bank of the Ottawa river near Klock's, ten miles below Mattawa. This bowlder is large—about seven feet long, five wide and four thick. The hole is