

THE CREIGHTON OREBODY.*

By C. W. Knight.

The Creighton is the largest nickel mine which is being worked in the world, and, at the same time, one of the greatest metalliferous mines of any kind. There are said to be 10,000,000 tons of ore in the mine, estimated by actual workings and diamond drill.

The oldest rock in the vicinity of the Creighton is what has been called greenstone. It is generally coarse-grained and looks like a gabbro or diorite; there are also fine-grained facies of the rock. The coarse-grained greenstone resembles somewhat the norite, but it appears to be more decomposed than the norite and has a greener shade, the norite having a grey tint.

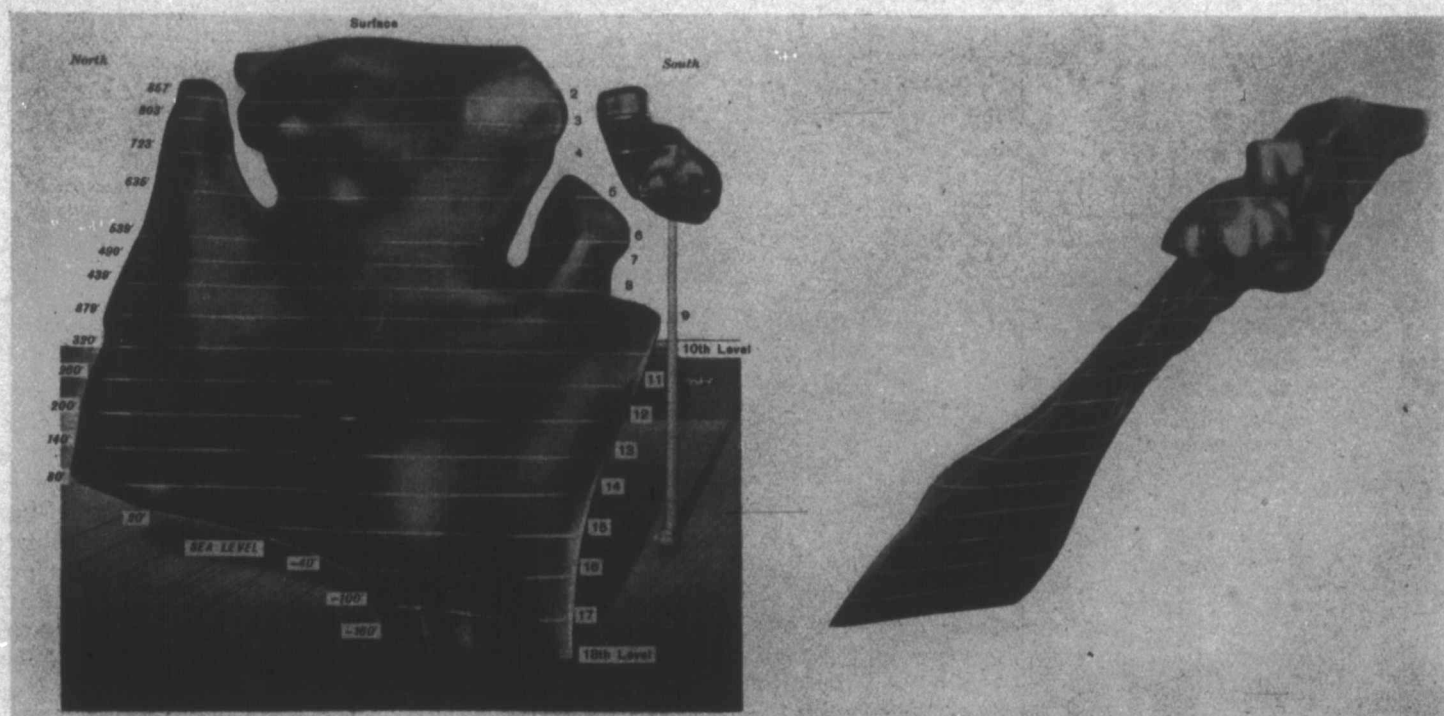
The eruption of the greenstone was followed by the great norite intrusion. That the norite is younger than the greenstone is shown by the fact that it has chilled against the latter. It also holds inclusions of the greenstone, one of these larger masses being shown on the map about 1,000 feet to the north of the open pit. Mineralogically and chemically, the composition of

the latter to some extent. Thus was the Creighton orebody formed.

After the formation of the orebody, fissures were formed in all of the rocks in the vicinity of the deposit, including the deposit itself, and dikes of trap were intruded into greenstone, norite, granite, and the orebody. Ore deposition had practically ceased before this took place, for the trap dikes are free from ore except for small veinlets along the edges. The dikes do not cut entirely across the ore-body, but appear to have penetrated it only a relatively short distance.

The final chapter in the history of this marvellous orebody was closed by the formation of another series of fissures through which were erupted coarse-grained olivine diabase dikes. These dikes cut the orebody and the trap dikes described in the previous paragraph. C. H. Hitchcock, of the Canadian Copper Company, first recognized these trap dikes as distinct in age from the later olivine diabase dikes.

The shape of the Creighton orebody is shown by a model constructed by officials of the Canadian Copper Company. The white, horizontal lines represent the



MODEL OF THE CREIGHTON OREBODY.

View of West Side.

View of South End.

the norite is very uniform for a distance of at least 3,250 feet northwestward from the Creighton pit.

After the norite had solidified, the granite mass, which occupies parts of Graham, Waters and Snider townships, was intruded. It broke its way through the crust of the earth along the norite-greenstone contact.

The next event, and the one which immediately preceded the formation of the Creighton orebody, was that which was represented by a period of tremendous crushing and brecciation along the norite-granite contact. A great crush-breccia and crush-conglomerate, of granite, greenstone and norite fragments, were formed.

A period of ore deposition closely followed the crushing and brecciation; and magmatic solutions, carrying sulphides, circulated upwards through the crushed rocks and deposited nickel, copper and iron sulphides in the spaces between the rock fragments, replacing

various levels, and the altitude of these levels above or below sea level are noted.

The upper part of the model was constructed from information obtained mainly from actual workings, while the lower part was outlined by means of information derived from diamond-drill cores. In July, 1916, there were but two crosscuts and no stopes in the orebody on the twelfth level. Three months later there were five crosscuts on this level and stoping had already begun. On the tenth and higher levels, however, the shape and extent of the deposit had been ascertained mostly from workings which consisted of crosscuts, drifts, and stopes.

From the model it is seen that the central part of the deposit is lenticular; that is to say, its length is much greater than its width, so that the ends "pinch" or taper out gradually. The upper and lower parts, on the other hand, are roughly oval in outline. It is further seen that its known depth is about twice its maxi-

* Extracts from a report to the Ontario Nickel Commission.