2 ORIGIN AND MODE OF OCCURRENCE OF COPPER-DEPOSITS.

The rocks south of Lake Superior have been formed in three ways: 1st, by mechanical means; 2d, by eruptive, igneous, or volcanic agencies; 3d, by chemical action.

FRAGMENTAL OR DETRITAL ROCKS.

The mechanical agencies of the Azoic time acted upon some prior-formed rocks in like manner as we see rain, winds, waves, frosts, etc., now breaking down the rocks of the present day, causing them to be deposited as soil, mud, sand and shingle, forming detrital or sedimentary deposits. Such detritus one can see upon the shores of any lake or sea, being in many localities variable in its composition, and oftentimes abruptly changing from fine mud to sand, or even to coarse shingle. At other localities upon the same lake shore one may observe a nearly uniform sand, mud or shingle stretching away as far as the eye can reach along that shore. Like uniformity and like abrupt changes are seen by the geologist in the rocks formed from the ancient muds, sands and shingle of the early seas and lakes. These deposits may have remained on the surface of the ancient beach, or may have been deeply buried under succeeding deposits; but whatever may have been their position relative to the earth's surface, they have been greatly changed or altered from their original condition, although the evidences of that original condition remain plainly visible to him who has learned to read the worn, torn and worm-eaten book of Nature. In truth it may be said that no event can take place without leaving its effects behind, and these can be interpreted with greater or less clearness until their record has been entirely obliterated.

To return: we find that these old muds, sands and shingle have been acted upon, and metamorphosed or altered, by heat from the earth's molten interior, or from contact with igneous or volcanic rocks, with their accompanying hot waters. Or, again, these deposits have been affected by hot or cold waters percolating through them, bearing materials which chemically act upon them; or, again, they may have been subjected to greater or less squeezing and pressure during the formation of the numerous wrinkles that old Mother Earth now wears upon her rugged face, deeply furrowed by her tears.

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