

alternate layers of quartz and mica, or feldspar, or hornblende, or talc, which occur in the foliated rocks.

The theory of metamorphism has fewer difficulties. It supposes these rocks, originally deposited as sand, clay, pebbles, marl, etc., after consolidation, to have been converted again into a plastic state by the permeation of hot water and steam charged with powerful chemical reagents. We know that this agency is sufficient to bring the silicates into a sort of aqueo-igneous plasticity, and that is all that is necessary to produce the imperfect kind of crystallization which the azoic stratified rocks exhibit. It is not that complete crystallization which would result from thorough solution, either aqueous or igneous, but the original mechanical texture sometimes exhibits itself, and many degrees of crystallization are often manifest.

Some may be inclined to impute the hypozoic, and perhaps, in general, more highly crystalline foliated rocks, to some other agency than metamorphism. But we often find rocks of the same kind, and often as highly crystalline, so connected with fossiliferous rocks that we are compelled to regard them as metamorphic, and it seems difficult to conceive that the others have not had the same origin. All the difference between the two classes is the more complete metamorphism of the hypozoic. We seem compelled, therefore, to admit the metamorphic origin of all the azoic foliated rocks, or to deny it to them all; and we can not take the latter ground but in defiance of the plainest facts.

5. *Metamorphism may have obliterated successive systems of life.* We know it to have done this in some of the foliated rocks—in the schists, for instance—that overlie or are interstratified with fossiliferous rocks. It may have done the same with all the hypozoic, in all of which no certain examples of fossils have yet been found, though some bodies of doubtful nature have been described in them.

If this conclusion be admitted, it follows that we can not tell when life first appeared on the globe, because we know not but an indefinite number of organic systems may have been obliterated. This inference, which some eminent geologists have adopted, would be fair, were it not for certain other facts, which we will state in the words of Sir Roderick I. Murchison. "In Bohemia," says he, "as in Great Britain and North America, the lowest zone