

Was not this a fit period for the first appearance of life? should we not expect it to appear, independently of the evidence of the fact, so soon at least as the temperature of the ocean falls sufficiently low to permit its existence? ¹ I do not propose to enter here into that evidence. This we shall have occasion to consider in the sequel. I would merely say here that we should bear in mind that in this latter half of the Lower Laurentian, or if we so choose to style it, Middle Laurentian period, we have the conditions required for life in the sea and on the land; and since in other periods we know that life was always present when its conditions were present, it is not unreasonable to look for the earliest traces of life in this formation, in which we find, for the first time, the completion of those physical arrangements which make life, in such forms of it as exist in the sea, possible.

This is also a proper place to say something of the disputed doctrine of what is termed metamorphism, or the chemical and molecular changes which old rocks have undergone.

The Laurentian rocks are undoubtedly greatly changed from their original state, more especially in the matters of crystallization and the formation of disseminated minerals, by the action of heat and heated water. Sandstones have thus passed into quartzites, clays into slates and schists, limestones into marbles. So far, metamorphism is not a doubtful question; but when theories of metamorphism go so far as to suppose an actual change of one element for another, they go beyond the bounds of chemical credibility; yet such theories of metamorphism are often boldly advanced and made the basis of important conclusions. Dr. Hunt has happily given the name "metasomatosis" to this imaginary and improbable kind of

and the acceptance of the conclusions of Nicol and Lapworth has served to bring even the rocks of the Highlands of Scotland more into line with those of Canada.

¹ Dana states this at 180° F. for plants and 120° for animals.