

have originated in the north, some of them within the arctic circle, and this in periods of exceptional warmth, when the perpetual summer sunshine of the arctic regions coëxisted with a warm temperature. The testimony of the rocks thus is that not struggle but expansion furnished the requisite conditions for new forms of life, and that the periods of struggle were characterized by depauperation and extinction.

But we are sometimes told that organisms are merely mechanical, and that the discussions respecting their origin have no significance any more than if they related to rocks or crystals, because they relate merely to the organism considered as a machine, and not to that which may be supposed to be more important, namely, the great determining power of mind and will. That this is a mere evasion by which we really gain nothing, will appear from a characteristic extract of an article by an eminent biologist in the new edition of the Encyclopedia Britannica, a publication which, I am sorry to say, instead of its proper *rôle* as a repertory of facts, has admitted partisan papers, stating extreme and unproved speculations as if they were conclusions of science. The statement referred to is as follows :—“ A mass of living protoplasm is simply a molecular machine of great complexity, the total results of the working of which, or its vital phenomena, depend on the one hand on its construction, and on the other, on the energy supplied to it ; and to speak of vitality as anything but the name for a series of operations is as if one should talk of the horology of a clock.” It would, I think, scarcely be possible to put into the same number of words a greater amount of unscientific assumption and unproved statement than in this sentence. Is “living protoplasm” different in any way from dead protoplasm, and if so, what causes the difference ? What is a “machine” ? Can we conceive of a self-produced or uncaused machine, or one not intended to work out some definite results ? The results of the machine in question are said to be “vital phenomena” ;