

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 role as a repertory of facts, has become a strong partisan, 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," certainly most wonderful results, and greater than those of any machine man has yet been able to construct. But why "vital?" If there is no such thing as life, surely they are merely physical results. Can mechanical causes produce other than physical effects? To Aristotle, life was "the cause of form in organisms." Is not this quite as likely to be true as the converse proposition? If the vital phenomena depend on the "construction" of the machine, and the "energy supplied to it," whence this construction and whence this energy? The illustration of the clock does not help us to answer this question. The construction of the clock depends on its maker, and its energy is derived from the hand that winds it up. If we can think of a clock which no one has made and which no one winds, a clock constructed by chance, set in harmony with the universe by chance, wound up periodically by chance, we shall then have an idea parallel to that of an organism living yet without any vital energy or creative law, but in such a case we should certainly have to assume some antecedent cause, whether we call it "horology" or by some other name. Perhaps the term evolution would serve

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