

ART. XLVIII.—*A word on the Origin of Life*; by JAMES
D. DANA.

THE notion seems to be somewhat prevalent that if such experiments as those described in the preceding paper by Mr. Child really afford examples of spontaneous generation—that is, of the production of living organisms without the intervention of germs—they exemplify the process of the *first origin of life*. The claim made by Prof. H. J. Clark in the title of his recent work—“*Mind in Nature, or the Origin of Life, and the mode of development of Animals*”—to which we objected in the last number of this Journal, and which the body of the work endeavors to sustain, rests on no other basis. And his opinion of

the firmness of the foundation is shown by his taking one long step onward from this basis, as follows:¹

The fact that the experiments² with the *sealed flasks* proved—if anything can be proved beyond the reach of change or improvement—that beings with motion, undoubted living beings, were produced when life could not possibly have existed previously, is a *sufficient* basis for the further assumption that still higher forms could arise from these. That is to say, if, under the conditions in the sealed flasks, living beings, either animals or plants,³ of the lowest degree, arise, there is nothing illogical in assuming that, from these lowly organized, *animate* bodies, somewhat higher and more complicated beings may originate.

Now in the experiments referred to, and all of similar character, the experimenter starts with organic matter, either vegetable or animal. Allowing, then, that there are no germs present to breed such low organisms, the results are only examples of life from life; and to the question, what is the origin of life, they reply—*life*. For without some *pre-existing* plant or animal to afford the hay, or flour, or muscle, etc., there could have come none of the plants or animals bred by the alleged spontaneous generation. The world of such “creationists” would therefore have ever remained lifeless. Consequently, not the first stone is laid by these and like experimenters toward bridging over the interval between the inorganic and organic world; not the first step is taken into the yet dark regions back of the existence of life on the globe.

The organic matter operated upon is in one sense dead; that is, the organism as a whole has not its living functions. But still it originated through life; and, moreover, the particles in the fibre of hay or muscle are held together, or remain as they are, in virtue of the forces which, in the processes of life, formed it; just as the particles of a drop of water are retained as they are by the forces—far inferior in kind and amount—which made the combination water. When the decomposition of the material begins, and the forces are thus disturbed, then the moving things, claimed to be a spontaneous generation, make their appearance. From the compound of *high order* in the vegetable or animal kingdom—of high order no doubt chemically as well as vitally—comes the *lowest* in the vegetable kingdom, a cellular plant consisting of one or a few cells, or perhaps an equally low animal organism.

¹ On page 26. We have already expressed our high opinion of the microscopical investigations by Prof. Clark, which constitute a large part of his work, and make it an exceedingly valuable contribution to zoological science.

² The experiments mainly of Dr. Wyman, of which an account is given in the work at some length, are here referred to.

³ Prof. Clarke speaks of the *Bacteria* as probably related to vegetable mould; and, after a microscopic study of certain *Vibrios* obtained by Dr. Wyman in his trials, pronounces them also *vegetable*.

In view of these facts, that from life has come the new life, and from the high only the *extremely low*, the assumption, cited above, which makes the second grand conclusion of Prof. Clark, "that still higher forms could therefore arise from these," is certainly without even the shadow of a foundation. Such spontaneous generation does not begin to climb the hill of life; it looks *downward* and not upward.

The best statement which we have seen of the relation of the generated organism—supposing it a real generation without germs—to the original organic matter, is that made by the chemist Fremy to the French Academy, and which we have reproduced (translated from the French) into this Journal, in vol. xxxviii, at page 439 (Nov., 1864).

But the absence of germs, although seemingly possible, is far from being proved, as Mr. Child admits. The high temperature used in the course of the experiments on spontaneous generation is sufficient, it is true, to destroy the life of ordinary plants or animals, but it does not decompose the vegetable or animal material employed in the trials. And, considering the low order of the organisms that are developed, it cannot be assumed that heat which this material stands will destroy their germs.

The following observations, communicated to the writer by Prof. W. H. Brewer, the Botanist of the Survey of California, as well as Assistant in the Geological department, show that plants of low grade may thrive in waters very near if not at the boiling point, and even when strongly acid or saline.