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writer in 1874 (Chemical and Geological Essays, pp. 298, 299). It may be conveniently designated as the *crenitic* hypothesis (from the Greek *κρηνίτης*, pertaining to springs or fountains). All veinstones and deposits from mineral springs are of crenitic origin.

It was farther shown that the upward lixiviation of the primitive mass, and the deposition over it of an acidic granite-like rock would leave below a highly basic material, and that the division of the mass thus established would correspond to that of the trachytic and doleritic magmas which have been conjectured to be the sources of two great types of eruptive rocks. Inasmuch, however, as according to the present hypothesis these two layers of basic and acidic matters are the results of aqueous action, and not of an original separation in a plutonic mass, as imagined by Phillips and Durocher, their composition would be subject to many local variations. The secondary origin of the materials of eruptive rocks has long been maintained by the writer, who finds the source of certain of them in the underlying basic layer left by the partial solution of the primitive mass; which now forms, it is believed, a plastic stratum between the solid anhydrous nucleus and the solid crust.

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## EDITORS' TABLE.

EDITORS A. S. PACKARD, JR., AND E. D. COPE.

— Professor A. Weisman, who has recently published a brochure on inheritance, and another on the duration of life, has now attacked from the biological, *i.e.* inductive point of view, those ultimate problems which so often arise in the minds of thoughtful men, What is life and death? His tract was when first read as an academic programme, entitled "On the Perpetuity of Life." It is claimed by the author that in the protozoa, or one-celled animals, we cannot speak of a natural death in connection with these lowest organisms, for there is no observable end to their phases of development which is comparable to the death of the higher, many-celled animals. In the protozoa there is no origin of new individuals resulting in the death of the parent, but as seen in the self-division of any infusorian, neither of the new individuals is the older or younger. Thus there arises an unending series of individuals, each one of which is as old as the species itself, each

one having the capacity of an unlimitable existence and of undergoing an indefinite number of fresh acts of self-division.

That the higher organisms, or the many-celled animals have not this power, Weismann thinks, is owing to their multicellular structure, and to the division of labor between the cells of their bodies.

The essay is certainly a very suggestive one, as is indeed nearly all of Weismann's work. The space at our command only permits us to give the author's conclusions:

1. Natural death alone occurs in many-celled organisms, the one-celled forms do not possess it; the process of encysting of the latter is in no wise comparable to death.

2. Natural death appears to first occur in the lowest Metazoa, *i.e.* the Orthonectides, through the adjustment (normirung) of the cells collectively in one generation, and of the somatic or peculiarly body-cells in a limited existence; then also in the higher Metazoa the somatic cells adjust themselves first to several, and then many generations, and thus are correlated with or adjusted to an extended existence.

3. This adjustment goes hand in hand with the differentiation of the cells of the organism according to the principle of division of labor in reproductive and in body-cells, and was accomplished by a process of selection.

4. The biogenetic fundamental law applies only to the many-celled beings, but has no application to the unicellular forms; this also bears a relation on the one hand to reproduction through division in the monoplastids (one-celled forms), on the other on the necessity through sexual reproduction of the relation of a one-celled developmental stage in the polyplastids (many celled).

5. As in death itself, so also the shorter or longer duration of life is solely a matter of adaptation; death is not dependent on a primitive quality of living matter; it also is not especially connected with reproduction, nor is it indeed a necessary consequence of the same.

Finally, our author maintains that life is a perennial, not a periodically interrupted state. When first introduced on the earth it went on without interruption; only its forms changed, and the individuals of all, even the highest forms, which are living to-day, have descended in unbroken continuity from the oldest primæval forms; there is a complete continuity of life.

— The study of these problems, we would add, will tend to throw light on the life and death of species, of genera, families and orders of plants and animals.

At present the causes of the extinction of the life of species and higher categories are interwoven with those of the origin of species. To say that species like individuals have their appointed time is a mere platitude. It is now beginning to be understood that geological extinction was due mainly to changes of land and water in the growing continents, and to consequent lack of adaptation to the new conditions on the part of those organisms which were unsuccessful in the struggle for existence. Thus the apparent lack of continuity in a part of the life which stocked the earth in former ages was due to the lack of adaptation. But life as a whole has always been continuous, perennial; the breaks were the result of more or less local breaches of continuity in the continent-making processes. The youth, maturity and senility of individuals is, as Hyatt has shown, paralled by the youth, maturity and decline of the types to which they belong; and we can now begin to see how correlated and continuous are the phases of what we call life and death in the material world, and throughout all time, and all forms of life.

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### RECENT LITERATURE.

BRAUER'S STUDIES ON DIPTEROUS LARVÆ.<sup>1</sup>—This is a most valuable addition to our knowledge of the early stages of the Diptera, and is the result of a large acquaintance with the early forms of this order, by one who has for over twenty years devoted special attention to these insects. In his "Monographie der (Estriden," 1865, but more especially in his "Kurze Charakteristik der Dipteren-larven," 1869, wide gaps in our knowledge of the transformations of the Diptera were filled. And now with the present work, in addition to the observations of the earlier entomologists, and the recent writings of Fritz Müller, Dewitz and Wierzejski on the transformations of the Blepharoceridæ, and of Handlirsch on the Nemestrinidæ, we are in possession of a knowledge of the larval stages of one or more species of all the natural families of Diptera. After lengthy remarks on the systematic relations of different groups of Diptera, based on the larval characters, Brauer states that the typical, inherited feature in the entire group of Dipterous larvæ appears to be the position of the brain (kopfganglien), whether it is contained in a head-capsule, or free, *i. e.*, far behind the mouth or immediately behind the chitinous cap-

<sup>1</sup> *Die Zweiflügler des Kaiserlichen Museums zu Wien.* III. Systematische studien auf Grundlage der Dipteren-larven nebst einer zusammenstellung von Beispielen aus der Literatur über dieselben und beschreibung neuer Formen. Von Prof. Dr. Friedrich Brauer. Mit 5 Tafeln. Besonders abgedruckt aus dem XLVII Bande de Bande. Math.-Naturw. Cl. k. Akad. der Wissensch. Wien, 1883. 4to, pp. 100.