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On the vitality of the germs of *Artemia salina* and *Blepharisma lateritia*

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are similarly situated; and the products of the latter are poured directly into the body-cavity. The existence of a mesentery and the mode of development of the buds and of the embryo in the ovum demonstrate very clearly the Enterocœlous type of the Ascidia. The author confirms the opinion that the endostyle is a gland, and states that the circulation of the blood takes place exclusively by lacunæ.

The reproductive apparatus of the Ascidia was almost entirely unknown. The author has paid particular attention to it, and has obtained truly important results from his careful observations. Particularly noteworthy are the formation of a special oviduct in the Botryllidæ analogous to that of the Salpæ, and the peculiar form of the testis in the Aplidia, which induced Milne-Edwards and Giard to regard the postabdomen of those animals as a true ovary. He also gives a very exact description of the structure of the postabdomen, in which are recognized all the elements of the fundamental lamellæ of the animal, namely ectoderm, endoderm, and peritoneal sacs.

In a young Botryllid the author has seen the nervous ganglion in direct continuity with the prolongation of the vibratile fossa. The muscular system is composed of smooth fibres situated beneath the ectoderm, between this and the parietal lamella of the peritoneum.

Finally, the author confirms the discovery of Metschnikoff of the origin of the buds of the Botryllidæ from the parietal lamella to the right and left, and describes minutely their various stages, and especially the formation of the enterocœle. In connexion with this he refers to the memoir of Kowalevsky upon the development of the simple Ascidia, and demonstrates that in these also the peritoneal sacs are not developed from the ectoderm, as maintained by the Russian naturalist, but are rather derived directly from the intestine. Hence he draws the final conclusion that the Ascidia certainly belong to the Enterocœlous type.—*Atti R. Accad. dei Lincei, Transunti*, vol. vi., 1881, p. 14.

On the Vitality of the Germs of Artemia salina and Blepharisma lateritia. By M. A. CERTES.

After inundations or heavy rains the sudden appearance of certain lower Crustaceans (*Ayus*, *Branchipus*) has frequently been noticed; and it has been justly concluded that the ova of these Crustaceans had the property of remaining uninjured under very different conditions of medium. An experiment that I have recently made upon *Artemia salina* leaves no doubt upon this point, and proves that the alternations of desiccation and moisture to which the ova of this Crustacean are subjected may be prolonged with impunity during several years.

In March 1878 I collected salt water from the Chott Timrit, near Boutinelli (Province of Constantine, Algeria). A rapid examination (all that was possible at the moment) enabled me to ascer-

tain the existence of Algæ, Infusoria, and even larvæ of which I could not then determine the species. I evaporated the water in the sun, and carefully collected the sediments, with the view of making experiments in revivification, which it seemed to me would be of more validity in the case of water having a quite peculiar chemical composition, than with fresh or simply brackish water.

On the 9th of April, 1881 (that is to say, after more than three years of complete desiccation), these sediments were placed in boiled and filtered rain-water, which quickly became strongly saline. The next day, although every precaution had been taken to protect this infusion from germs, I ascertained the presence in it of Flagellata, and soon afterwards of ciliated Infusoria, which, I must say, from the species recognized, did not give any special character to the fauna. It was only at the beginning of June that I perceived the presence of Nauplian larvæ, which were at first microscopic. The number of these larvæ has since greatly increased. They grew larger, and became transformed into a little animal about 0.01 metre in length, provided with a tail, and moving very actively by means of its branchial feet. I still (October 31) possess many living specimens.

M. Vayssière, who has kindly determined the species of these animals, recognized them as *Artemia salina*. As long since as 1875 Schmankevitch indicated the curious modifications undergone by the organization of this little Crustacean according to the degree of saltiness of the water in which it lives. For my part, even before I had ascertained the species with which I had to do, I had transferred a certain number of *Artemia* into sea-water; and they are still living in it. Up to the present time I have not observed any modification except their extreme transparency, due, no doubt, to a change of food.

According to Claus the existence of *Artemia salina* has already been ascertained in the salt-marshes in the neighbourhood of Montpellier, Cagliari, Lymington, and in the Crimea. M. Vayssière has found it near Marseilles. It had not previously been noticed in the Chotts of Algeria, where the periods of desiccation are certainly hotter, of longer duration, and more frequent than in the localities just mentioned.

Whether we have to do with germs, eggs, or animals said to be reviviscent, the phenomena of latent life are fundamentally the same. In the different cases death is only apparent. The phenomena of organic combustion and the nutritive exchanges never cease completely in the living creature, egg, seed, or animal. I therefore do not wander much from my subject in recording another fact which I had the opportunity of observing in Algeria in *Blepharisma lateritia*, a rather rare ciliated Infusorian.

The Sahel of Algeria is commanded by a small mountain, the Bouzaréah, on the summit of which exist the ditches of an ancient Turkish fort. In 1877 the drought was exceptional, even in the Sahel. As soon as the first rains came I ascended to the Bouzaréah; and in the same ditch where I had collected them eight months

before I found abundant specimens of *Blepharisma*, very distinctly characterized by their form and their rose-colour. Here again, and during a torrid heat, there had been life latent for several months, whether of animalcules, or of their germs, or of their cysts. — *Comptes Rendus*, November 7, 1881, p. 750.

The Tertiary Lake-basin of Florissant, Colorado.

By S. H. SCUDDER*.

Mr. Scudder describes in this paper the position, characters, palæontology, and age of the remarkable lacustrine deposits of Florissant, Colorado, and illustrates the subject with a map. His observations in the region were made in 1877, along with Mr. A. Lakes, whose geological notes are incorporated, and also Mr. F. C. Bowditch. The lake-basin, nearly nine miles long, according to the map, occupies a low depression among the mountains at the southern extremity of the Front Range of Colorado, "at no great distance from Pike's Peak," and sends its arms up the valleys on either side. The beds are whitish, drab, and brownish shales below, with fine and coarse sandstone above; and, besides, trachyte occurs in the adjoining promontories and along the margin of the basin. The material of the coarser beds directly above the shales, from a locality visited by Mr. Scudder (south of the house of Mr. A. Hill), according to microscopic investigations by Mr. M. E. Wadsworth, is tufaceous; and the shales are "simply the finer material of the tufas laid down in laminæ of various thickness and coarseness." The shales at this place are about $22\frac{1}{4}$ feet thick. The fossils from the Florissant shales include:—of Hymenopterous insects, several species of Apidæ and Andrenidæ, about 30 of Vespidæ or wasp-like Hymenoptera, 50 species or more of ants (mostly Formicidæ, with some Myrmicidæ and Poneridæ) represented by about 4000 specimens, about 80 species of Ichneumonidæ, over 100 other species of Hymenoptera; of Lepidoptera perhaps a dozen species; of Diptera, some thousands of specimens and a large number of species, among them 1000 specimens of Bibionidæ, and "a vast host of Muscidæ and allied kinds;" of Coleoptera, over 300 species of the normal series, and about 120 of the Rhynchophorous section; of Hemiptera, more than 100 species of the Heteroptera and 65 of Homoptera; of Orthoptera, many species; of Neuroptera, largely the Phryganidæ, of which there are 15 or 20 species, 6 species of the Termites family, and others; of spiders, 30 species, all Aranææ; one Myriopod, an *Iulus*; of mollusks, only one species, that a *Planorbis*; of fishes, 8 species, all described by Cope, except one by Osborn, Scott, and Speir; of birds, several feathers, a single tolerably perfect Passerine bird, described by J. A. Allen, under the name *Palæospiza bella*, and a plover, *Charedinus Sheppardianus*, described by Cope.

* Pp. 279–300 of the Bulletin, vol. vi. no. 2, of the U.S. Geol. and Geogr. Survey, under Dr. F. V. Hayden (Dept. of the Interior).