

from Europe and America, are land birds, while all from the Cretaceous are aquatic forms. The four oldest known birds, moreover, differ more widely from each other than do any two recent birds. These facts show that we may hope for most important discoveries in the future, especially from the Triassic, which has as yet furnished no authentic trace of birds. For the primitive forms of this class we must evidently look to the Palæozoic.—*Amer. Journ. Science*, Nov. 1881, pp. 337-340.

Contributions to the Natural History of the Compound Ascidia of the Bay of Naples. By Dr. A. DELLA VALLE.

The author in the first place carefully describes his genus *Distaplia*. In this genus the colony is pedunculate or sessile; the individuals, arranged in branched cœnobias, have the form of *Didemnidæ* with an ectodermic process. The branchial sac is furnished with four series of fissures; the stomach has smooth walls; the heart is placed at the level of the intestinal loop; the sexual glands are situated on the right side and rather above the heart. The testis is developed before the ovary, and in all the individuals of the colony at the same time, so that the colonies are always formed entirely of male or of female individuals. The mature ova are collected in the cloaca, whence they fall into a peculiar diverticulum, which is developed for this purpose and afterwards separates from the animal. The larvæ are gigantic, and already produce buds. The formation of a new bud commences by eversion of the parietal lamella of the peritoneal sac at a short distance from the end of the endostyle. The bud very soon separates from the maternal individual, and migrates towards the peripheral parts, dividing by scission, and thus giving origin to new individuals, which increase the colony.

In connexion with the structure of the tail of this large larva the author gives an account of the observations of other writers on the axial cord which is seen in the tail of these larvæ, and shows, by means of transverse sections, that this cord, considered by Kowalevsky, Kupffer, &c. to be formed of solid gelatinous material, is, instead, merely a cylindrical canal full of a transparent and colourless liquid, which is perhaps the same liquid that bathes the surrounding cellular elements.

The author then proceeds to the exposition of his anatomical researches. He has observed that in the living ectoderm amœboid cells move about in the common mantle, thus confirming a previous observation of Hertwig's. He describes very carefully the general structure of an ascidiozoid, which he finds to be formed of an internal endodermic sac and of a bilobed peritoneal sac, interposed between the two primary sacs. The peritoneal sac communicates on the one hand with the endoderm by means of the branchial fissures, and on the other with the exterior by the cloacal siphon. The muscular fibres are situated between the parietal lamella of the peritoneum and the ectoderm. The heart and the sexual glands

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 (*Apus*, *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-



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