

"CAMEOS from the Silver-Land," by Mr. E. W. White, F.Z.S., will shortly be issued in two volumes by Mr. Van Voorst. It relates to the author's experience in the Argentine Republic, and will be specially full on the natural history of the country.

WE regret to learn the death of Admiral La Roncière le Noury, president of the Geographical Society of Paris, who died on Saturday after a protracted illness. He was born in 1813. In 1856 he went to the Arctic Ocean in the *Reine Hortense* on a scientific exploration professedly conducted by Prince Napoleon, who was on board. On the death of M. Chasseloup Laubat the Admiral was elected president of the Paris Society of Geography, in which office he continued without opposition up to the last election. The Admiral took great interest in scientific geography, as well as in zoology and botany.

DR. GERHARD ROHLFS, who has been travelling in Abyssinia, has returned to Berlin.

THE HYPOPHYSAL GLAND IN ASCIDIANS

SINCE the publication of Kowalewsky's remarkable discovery of the course of development in Ascidiæ, and its confirmation, in all the leading features, by Kupffer and others, any morphological work on the Tunicata is naturally regarded with great interest on account of the possibility of its throwing light on the difficult problem of the relationship of that group to the Vertebrata.

Embryological investigations have clearly demonstrated that the fully-formed larval Ascidian (in most genera, at least) possesses an axis occupying the centre of the tail, and comparable with the vertebrate notochord; that the dorsal region of the body contains a neural canal—of epiblastic origin, and formed by the rising up, arching over, and coalescence of "laminæ dorsales"—expanding anteriorly as a vesicle, in the walls of which certain sense-organs are developed, and being continued posteriorly as a fine canal running along the tail on the dorsal surface of the notochord. The ventral region of the body is occupied by the alimentary canal, lying below the nerve vesicle, and, in its most posterior prolongation, below the anterior extremity of the notochord, which in this locality separates the neural and visceral canals. These developmental researches have also shown that in the adult Ascidian the branchial aperture must be regarded as homologous with the vertebrate mouth, and the branchial sac with the pharynx.

An excellent paper by M. Charles Julin¹ in the last number of the *Archives de Biologie* (tome ii. fascicule i., 1881), of which a preliminary account appeared lately in the *Bulletin* of the Académie Royale de Belgique (3^{me} ser., t. I, No. 2, Fevr. 1881), adds to this interesting list of homologous organs by showing strong grounds for the belief that the little-understood "neural gland" in the Ascidiæ represents the glandular portion of the hypophysis cerebri, or pituitary body of Vertebrates.

M. Julin gives a minute account of the structure and relations of the peripharyngeal bands, the dorsal lamina, the nerve ganglion, and that enigmatical organ generally known as the olfactory tubercle; the most important section of his paper, however, is that dealing with the neural gland. This structure was first discovered by Hancock, and more recently its glandular nature was demonstrated by Ussow, who called it the olfactory gland, and stated that it was connected with the olfactory tubercle by a narrow canal, an observation since confirmed by Nasonoff. Julin contends that the so-called olfactory tubercle is not a sense-organ at all, but merely the curiously complicated opening into the pharynx of the duct of his "hypophysis." He states that he has been unable to find any nervous connection whatever between the tubercle and the ganglion, and that the nerve which has frequently been observed and described as supplying the supposed sense-organ really passes behind it without communicating, and that therefore he cannot confirm the innervation described and figured by Ussow. The histological structure of the tubercle is also opposed to the probability of its sensory function, as no modified cells are present, the whole surface being covered by normal ciliated columnar epithelium.

The reasons which M. Julin advances in support of the homology of the neural gland with the pituitary body are its structure, its position on the ventral surface of the ganglion, and its rela-

¹ "Recherches sur l'Organisation des Ascidiæ simples—sur l'hypophyse et quelques organes qui s'y rattachent dans les genres *Corella*, *Phallusia*, et *Ascidia*." Par Charles Julin, Assistant du Cours d'Embryologie à l'Université de Liège.

tion with the pharynx. The glandular nature of this body was first shown by Ussow, and its minute structure has been investigated by Julin. It consists of branching glandular tubules surrounded by connective tissue richly supplied with blood-sinuses, while the excretory duct in its posterior part has a complete dorsal wall only, as ventrally it communicates freely with the ends of the tubules, just as is the case with the duct during the development of the pituitary body.

Julin points out that in the Ascidiæ the duct, in running anteriorly towards the olfactory tubercle, is in direct relation with the ventral surface of the nerve ganglion, no layer of connective tissue intervening; and this he states is also the case in Vertebrates.

The position of the neural gland, or "hypophysary gland," as Julin proposes it should be called, is constant. Wherever the nerve-ganglion may be,—and it varies considerably in its position in different species,—the gland is always situated on its ventral surface.

The excretory duct arising from the dorsal surface of the gland, runs anteriorly, directly below the nerve-ganglion, to the olfactory or hypophysary tubercle, where it communicates with the pharynx, probably within the region formed by the epiblast involved in the oral invagination.

It is evident that Julin's observations throw the gravest doubts on the always somewhat questionable olfactory nature of the dorsal tubercle. A ciliated pit having no apparent nervous relations, and connected by a duct with a body having a well-marked glandular structure, has no claim to be regarded as a sense organ. Its function, and that of the gland, remain a mystery; Julin states that he is unable to throw any light upon this question. From the large size of the gland and the constant presence and usually extraordinary complication of the tubercle one would imagine that they performed an important function in the economy of the Ascidian; but what that function is, and why the duct of a gland should have so elaborate an opening into the pharynx, are at present totally unknown.

Julin gives us no information as to the development of these organs. In 1871 Kowalewsky¹ described, in the course of the development of *Ascidia mammillata*, the formation of an aperture connecting the anterior end of the nerve vesicle with the region of the epiblast which was being invaginated to form the oral funnel, and he declared that this aperture of communication between the neural and visceral canals persisted in the adult as the ciliated tubercle. Kupffer,² in the following year, while referring to Kowalewsky's statement, declared that he had been unable to discover any such aperture in the larva of *Ascidia mentula*. If Kowalewsky's observation is confirmed, and if the canal is found to remain as the duct of the neural gland, the course of its development would seem to differ considerably from that of the hypophysis cerebri as described by Mihalkovics, Balfour, and Kölliker, which are the views approved of by Julin and confirmed from his own observations.

In conclusion, the arguments in favour of the homology of the Ascidian's neural gland with the glandular portion of the pituitary body are very strong. The structure, position, and relations of the two organs are, in a certain stage of development, identical—admitting, of course, that the branchial sac is a modified pharynx, and that the nerve-ganglion is homologous with the vertebrate brain—and the only point required for the proof of the hypothesis is the demonstration that the neural gland and its duct are epiblastic in formation, and that their development corresponds with that of the pituitary body.

W. A. HERDMAN

STORING OF ELECTRICITY

SECONDARY batteries to store up currents of electricity in the form of chemical work promise to play so important a part in the ultimate adoption of the electric light, that improvements in their construction are of peculiar interest. The latest innovation is due to M. Faure, who has modified with great success the secondary battery of Gaston Planté by covering the surfaces of the lead plates with a coating of minium, thereby increasing their capacity manifold. This device possesses the additional advantage that it obviates the necessity of "forming" the cells by the tedious process of charging and discharging them for many days, as in Planté's batteries. Two sheets of lead are separately coated with minium and are rolled together in a spiral, being kept apart by a layer of felt, and are then placed in a

¹ "Weitere Studien über die Entwicklung der einfachen Ascidiæ" (*Arch. f. microsc. Anat.*, vol. vii.).

² "Zur Entwicklung der einfachen Ascidiæ" (*Arch. f. microsc. Anat.*, vol. viii. 1872).