

PLATE X.

Fig. 7. Rectal branchiæ of *Æshna grandis*, after M. Léon Dufour: C, *a*, orifices in the rectum of the branchial folds (A); *a*, dilated extremities of the tracheæ.

Fig. 8. Head, tail, digestive system (*d*), tracheal (*h*) and branchial (*g*) systems, hepatic vessel (*e*), of *Agrion Puella*, after M. Dufour.

Fig. 9. A small piece from the parietes of the intestine of the Cockroach, showing the extreme distribution of the trachea (*a*). The blood-current accompanies the tube only as far as *i*. The trachea then describes a true network (*e*, *c*, *d*) of membranous tubes. In the meshes the glandular cells (*f*, *g*) are placed. A clear space intervenes between the trachea and glandular cells in which the nutritive fluids, without the corpuscles, may probably move.

Fig. 10. A small piece of the wing of the Cricket drawn under a high power: *a*, a large trachea in the centre of the nervure or channel, surrounded by two opposed currents of blood (*b*, *c*); *i*, larger branches; *d*, *e*, *f*, small terminal tracheæ, entering alone, without coincident, blood-currents into the scaly interval; *j*, long, slender, wavy tracheæ floating in the fluid; *g*, blood-corpuscles, travelling in the channel *b*.

Fig. 11. One of the tracheæ from the scaly intervals between the nervures of the wing of the Cricket, showing the mode in which it terminates (*b*) between the scales *d*.

Fig. 12. A minute portion of walls of the stomach of the Cockroach, showing the wavy manner (*c*, *f*) in which the membranous capillary tracheæ are distributed around and between the ultimate glandular elements; at *e*, the current of the blood, as traced through the blood-corpuscles, turns back: *a*, large spiral tracheæ.

Fig. 13. A small portion of a spiral trachea, exhibiting the coats under the action of acetic acid: *a*, outer coat raised, indented like the spiral (*b*); *c*, the internal or mucous coat.

Fig. 14. A piece of voluntary muscle, representing the manner in which the tracheæ enter the substance of the muscle.

Fig. 15. One of the above tracheæ traced into the substance of the muscle; *a*, *b*, *c*, network of ultimate membranous tracheæ as they are distributed between the ultimate muscle-fibres—the latter being omitted.

[To be continued.]

XIX.—Description of a new genus and species of Seal (*Heliophoca Atlantica*) from Madeira. By Dr. J. E. GRAY, F.R.S., V.P.Z.S. &c.

SOME months ago Mr. MacAndrew most kindly procured for me the skin of a Seal from the island of Madeira. A careful examination of it convinced me that it was a new species, most allied to *Phoca barbata* of the North Sea, but yet quite distinct from it. Mr. MacAndrew after considerable trouble at length obtained for me another skin of an older animal with its skull, which proves that it is not only a new species, but presents a new combination of characters such as I believe entitle it to be

considered a new genus. It is the only species of Seal which I believe has yet been found so near the tropic on the African coast.

Both the specimens in the Museum came from the same cave in the *Deserta Grande Island*; the larger skin is full-grown, the other younger. Knight, in his 'Once on a Time,' speaks of the seals as common near Funchal; he observes, "A multitude of seals rush out from that hollow with a sudden cry and plunge into the waves; that point shall be *Camara das Lobos*, the cave of seals." (i. 60.)

Mr. MacAndrew observes, that there is an island called *Isle Lobos* near the Canaries, on account of the number of seals formerly found there. It is very difficult of access, and Mr. MacAndrew could not hear of any existing there now, nor of any remains of them.

The following are the characters of the genus:—

HELIOPHOCA.

Muzzle rather elongate, broad, hairy, with a slight groove between the nostrils; whiskers small, quite smooth, flat, tapering. Fore-feet short; fingers gradually shorter to the inner one; claws 5, flat, truncate. Hind-feet hairy between the toes; claws very small; hair short, adpressed, with very little or no under fur. Skull depressed; nose rather depressed, rather elongate, longer than the length of the zygomatic arch; palate angularly notched behind. Cutting teeth $\frac{6}{4}$, large, notched within, the middle upper much smaller, placed behind the intermediate ones. Canines large, conical, sharp-edged. Grinders $\frac{5 \cdot 5}{5 \cdot 5}$, large, crowded, placed obliquely with regard to the central palatine line, crown large, conical, with several small conic rhombic tubercles. Lower jaw angulated in front below with diverging branches, the lower edge of the branches rounded, simple.

The feet, palate and teeth resemble those of the genus *Callocephalus* (*communis*), but the grinders are larger and less deeply lobed; but it has the smooth whiskers of the restricted genus *Phoca* (*P. barbata*). It differs from the latter genus in the depressed form of the skull, the large tubercular grinders, and the angular termination to the palate.

As the other subtropical Seal, *Phoca tropicalis* (Gray, Cat. Seals B.M. 28), from Jamaica, described from an imperfect skin without a skull, has similar small smooth whiskers, it may very probably when its skull has been examined belong to this genus, and the genus thus prove a subtropical form of the family.

Heliophoca Atlantica.

Fur short, adpressed, olive-gray, very obscurely grised at the tips of the hairs. Chin and under parts of the body rather paler.

Length 5 feet 5 inches.

Hab. Madeira. R. MacAndrew, F.R.S. &c.

While on the subject of Seals, I may draw the attention of naturalists on the coast of the Pacific to the account of the *Sea Horses* said to be found in abundance on the seaward part of the island of St. Lorenza near Callao, mentioned in M. Bonelli's Travels in Bolivia, i. 90 & 128.

I have never heard of that genus living out of the Arctic Ocean, and should have believed that the author had mistaken the *Sea Bear* (*Otaria Leonina*) for the *Sea Horse*, if he did not describe "the two great white tusks projecting from the mouth on either side," and further observe, that "the tusks are of great value and form an important article of commerce" (see i. 90), which cannot apply to the tusks of the Sea Bear.

It is to be observed that the Peruvian continuation of the Antarctic current runs up the shores of Chili and Peru (see Journ. Roy. Geog. Soc. 1853) and chills that coast. This may explain why seals are found so near the tropics in those seas. I fear that M. Bonelli is not to be relied on for his natural-history observations, for he states that the cedar, mahogany and banyan tree (i. 79), and the date-palm (i. 146) grow on the coast of Peru.

XX.—*Monograph of the British Graphideæ.*

By the Rev. W. A. LEIGHTON, B.A., F.B.S.E.

[Continued from p. 97.]

8. *Opegrapha Turneri*. Thallus very thin, pale dirty-yellow, bordered with black; lirellæ very prominent, sessile, mostly simple, slender and linear; disk very narrow, uniform; proper margins plump, rounded and incurved; sporidia in asci, eight, linear-obovate, 3-septate, pale yellow.

Opegrapha betulina, Sm. E. Bot. t. 2281. excl. syn. (1811) (good, the magnified figure excellent); Hook. Br. Fl. 2. 145. excl. syn.

On birch. Hurst Pierpoint, Sussex! Bradwell! Burgh! Suffolk! Mr. Borrer. New Forest, Hants! Mr. Lyell in herb. Borrer. Ireland! Miss Hutchins in herb. Borrer. Loppington! Shropshire.

Thallus very thin, membranous, pale dirty-yellow, more or less



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