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THE

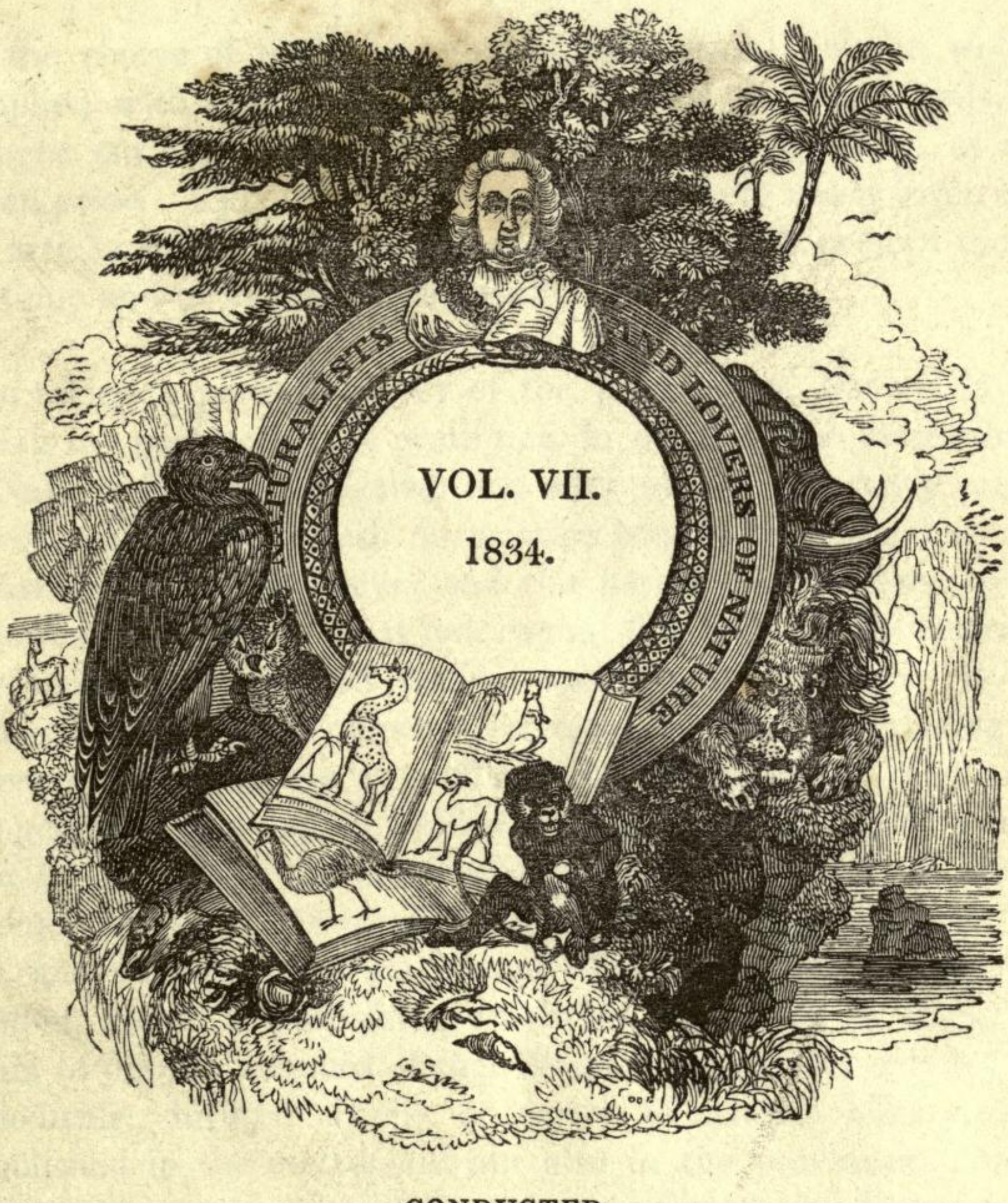
MAGAZINE OF NATURAL HISTORY,

AND

JOURNAL

OF

ZOOLOGY, BOTANY, MINERALOGY, GEOLOGY,
AND METEOROLOGY.



CONDUCTED

By J. C. LOUDON, F.L. G. & Z.S.

MEMBER OF VARIOUS NATURAL HISTORY SOCIETIES ON THE CONTINENT.

LONDON:

PRINTED FOR

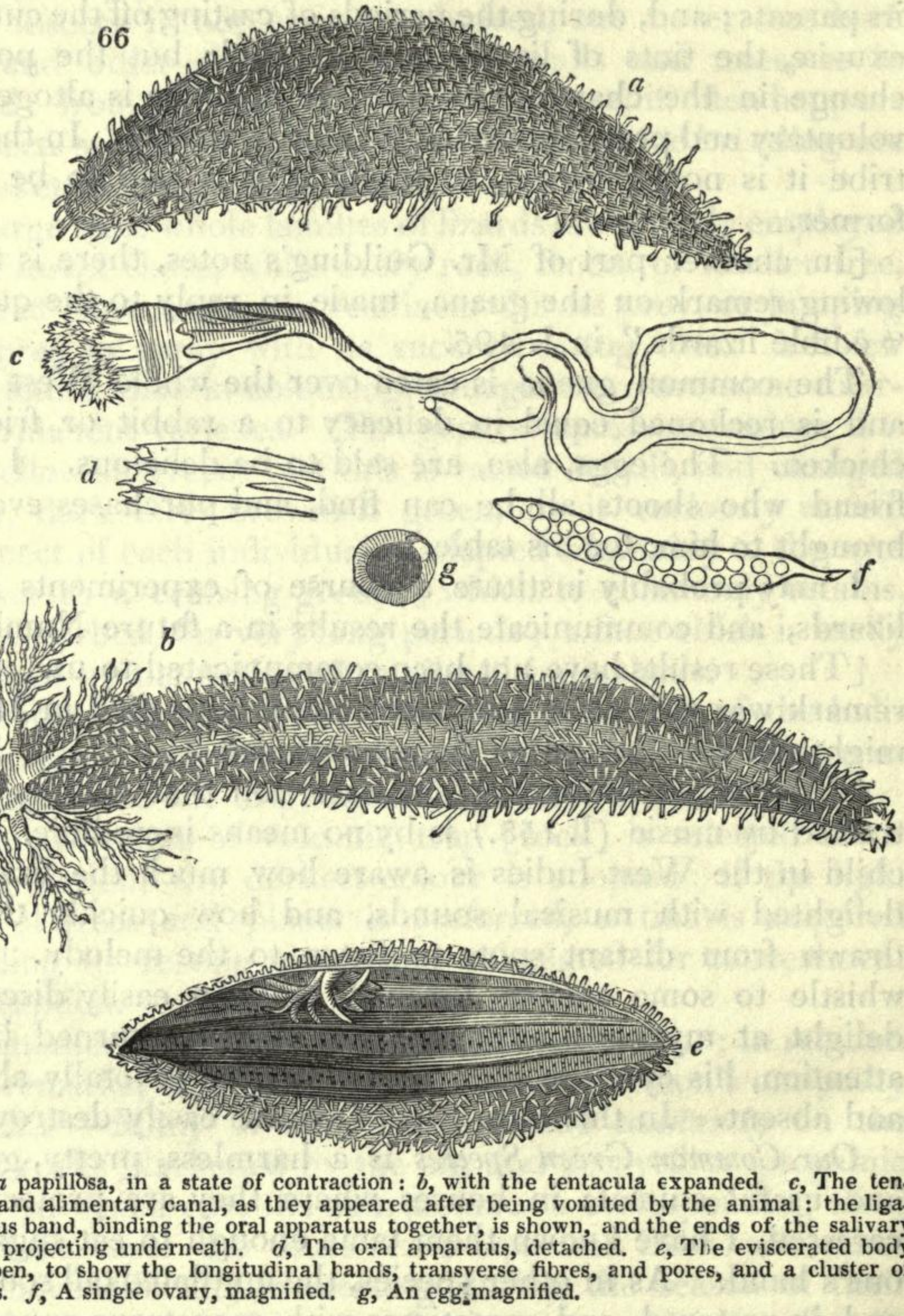
LONGMAN, REES, ORME, BROWN, GREEN, AND LONGMAN,
PATERNOSTER-ROW.

1834.

ART. VIII. *Illustrations in British Zoology.* By GEORGE JOHNSTON, M.D., Fellow of the Royal College of Surgeons of Edinburgh.

24. MULLE'R*IA* PAPILLO'SA (*fig.* 66.). *H*olothùria papillòsa *Müller*, Turt. Lin. iv. 110.

66



a, Mullèr*ia* papillòsa, in a state of contraction: *b*, with the tentacula expanded. *c*, The tentacula and alimentary canal, as they appeared after being vomited by the animal: the ligamentous band, binding the oral apparatus together, is shown, and the ends of the salivary glands projecting underneath. *d*, The oral apparatus, detached. *e*, The eviscerated body laid open, to show the longitudinal bands, transverse fibres, and pores, and a cluster of ovaries. *f*, A single ovary, magnified. *g*, An egg magnified.

THIS Mullèr*ia* is cylindrical or pear-shaped, according to its degree of extension; generally bellied in the middle, and tapered towards the posterior extremity; of an earthy or cinereous colour. The skin thick, coriaceous, and rough; with numerous small tubular papillæ, which clothe the whole surface, and follow no pattern in their arrangement. When contracted, nothing more is to be seen than a small circular

orifice at both ends; but, if the creature is carefully watched for some time, it may be observed to shorten and dimple the anterior by an involution of the skin, and again protrude it; and then it may, perchance, to your amazement, suddenly evolve and display its circle of tentacula (*b*). Of these there are eight large and equal, and two very small ones placed together: they originate in the circumference of the circular lip, by a thick round stalk, which sends off numerous divided branchlets, so that each assumes an arborescent form, of a brown colour, speckled with darker dots. In the centre of these beautiful organs we find the mouth, an aperture of considerable size, and armed with an apparatus of bones somewhat similar to that of those of the *Echìnus*: it consists of ten pieces, five of which seem divisible into halves by a fine scarcely visible longitudinal suture, and are prolonged below into two slender prongs; but the other five which alternate with them, are truncate below, being pointed above with a tooth; the first pieces having two similar teeth in close apposition. The margins of the pieces are minutely serrulate to favour their firmer union, which is principally effected by ligaments; and the whole are bound together by a strong broad ligamentous band, which completely encircles them; tendons passing on the inner surface of it to the roots of the tentacula, and others to and between the upper extremities of the osseous pieces, for the purpose, undoubtedly, of moving and contracting them. Between this band and the osseous apparatus, there are five oblong compressed fleshy glands, free beneath, but with a narrow pedicel at their origins, probably a canal leading to the gullet, for these are presumed to be the salivary organs, although their size and number would seem to indicate a function more important to the animal's welfare than the salivary glands are deemed to be in higher organisms.* The stomach is placed immediately under the oral apparatus: it is about half an inch in length, and very little wider than the intestine, but of a whiter colour, and with much stronger coats, the inner surface being strongly plaited and puckered in a longitudinal direction. The intestinal canal is about twice the length of the body, and must consequently have a tortuous course; it is furnished with a narrow mesentery, is of a brown colour, equal in calibre throughout, or only slightly dilated towards its termination, which is circular and plain, with a stricture immediately above it. The coats are smooth on both surfaces, but, under a mag-

* [The whole assemblage of the organs which consist in any being is an organism.]

nifier, circular fibres become very visible, and numerous minute dots are sprinkled among them.

The surface of the body was at first partially covered with fragments of shells and corallines, which were evidently retained by the suctorial property of the papillæ; and the animal, on being kept a day in sea water, threw them off. It had a slow progressive motion, slower than the shadow on the dial, which was effected by elongating the papillæ of one part, fixing them to the plate, and then drawing itself forward by again contracting these elongated parts; but the papillæ were much oftener used for the purpose of anchors than of feet, the creature being of an indolent and immovable character. When stationary, it was ever slowly changing its outward form: it was now shortened, and swollen in the centre; then it would relax itself, and become cylindrical; again, one part would be blown out and another drawn in, with a deep stricture, as if a thread had been tied round; or, again, the contraction would begin near the head, which is then made very narrow, and would spread backwards, the anterior portion recovering its original diameter as the wane of constriction passed away; and sometimes the contraction will spread in the opposite direction. It often raised the posterior extremity a little from the surface of the plate, and to one side, but I never saw any current to flow from this aperture. To effect these varied motions, we must suppose the existence of muscular bands or fibres in the coriaceous skin, both in a longitudinal and circular direction; and, on opening the body, we find such to be the case (*e*): five strong white raised bands run from one end to the other, radiating from the circular apertures; and numerous fibres pass between them transversely, among which minute pores open everywhere, which are the inner orifices of the cuticular papillæ.

The ovaries (*f*), which are of a flesh colour, lie towards the centre of the body, attached to the sides in a large cluster, or, at least, there was one cluster only left in the specimen before us, for it had ejected many ovaries before dissection. Each ovary (*f*) is half an inch long, cylindrical, with a short narrow pedicel at the end of attachment; and the ova are very visible through the thin membranous coat. They lie without any order, are somewhat globular, and enveloped in a transparent pellicle of nutritive jelly; and on one side there was a drop of an amber-coloured and apparently oily fluid.

Towards the posterior end, and reaching from the anus about one third up the body, there was a thin membrane laid

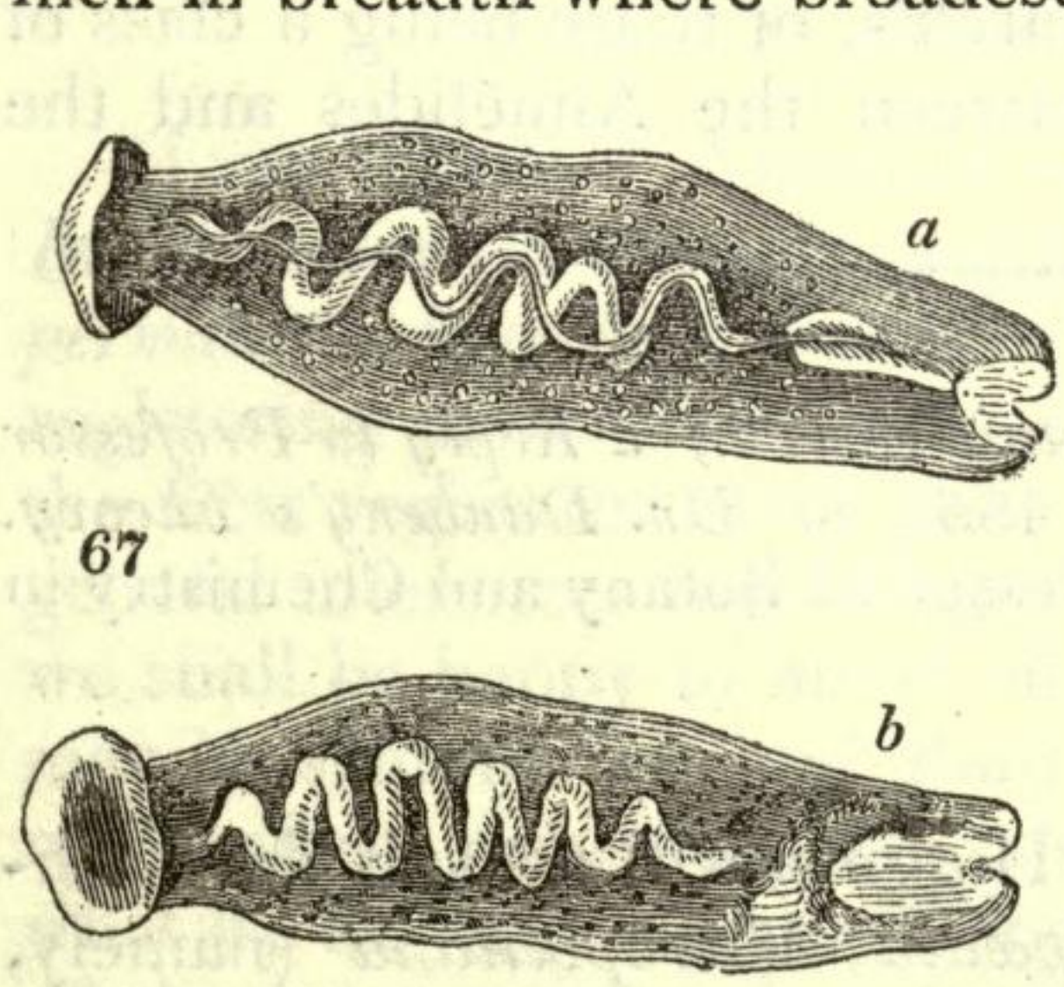
over, and, of course, internal to the muscular bands, which was spread over with a small quantity of brown grumous matter; but I saw no organs which could be supposed subservient to the office of respiration there.

The worm, having been kept in sea water unchanged for two or three days, sickened, and, by the more frequent involutions and evolutions of its oral end, evidenced its uneasiness. Being left unobserved in this state for an hour or so, I found, on my return, that it had vomited up its tentacula, its oral apparatus, its intestinal tube entire and as exhibited in our figure (*c*), and a large cluster of ovaries, which lay about the plate! The muscular convulsion must have been very great that thus so completely embowelled the creature; and yet life was not extinct, for the tentacula contracted themselves on being touched; and the empty skin appeared, by its motions, to have lost little of its irritability. It is true, as the poet has long since sung, that

——"Nature's store
Of majesty appeareth more
In waters, than in all the rest
Of elements."

25. PHY'LLINE GRO'SSA. (*fig.* 67.) *Hirùdo* gróssa *Müller*, Turt. Lin. iv. 70.

Description. — Body $1\frac{6}{10}$ in. long, about six tenths of an inch in breadth where broadest; oblong, flat, soft, exannulose, roughish, with little granulations, and of a uniform flesh colour. On the upper side a small vessel is seen distinctly, running down the middle of the body, having a tortuous course, and terminating near the sucker; and it lies over a much larger intestine, following the same direction, and alone visible on the ventral aspect. The anterior extremity is rounded, somewhat raised above the mouth, which is placed in a sinus here, and opens chiefly on the under side; it is wide, edentulous; but, when opened, the inner surface appears flocculent, being clothed with longish papillæ, which are arranged in close longitudinal series, and cover the whole intestinal canal. This organ is nearly of uniform width and structure throughout; but the papillæ appear to be longer towards its termination, which is by a small aperture on the



67

Phýlline grósa: *a*, upper side; *b*, under side.

back, just above the sucker. The dorsal vessel begins in a sort of swelling above the mouth; and, after it has passed beyond the middle of the body, it becomes sensibly attenuated. It is not fibrous, and, indeed, exhibits no marked structure beyond a very fine and faint reticulation of the surface when exposed under a high magnifier. The space between the intestine and margins of the body is compactly filled with myriads of oviform bodies, which seem to lie, without any particular order, in a gelatinous fluid: they are roundish, opaque, and encircled with a rim or pellicle of transparent jelly.

I have twice found this leech in specimens of Cýpr*ina* islándica dredged up in Berwick Bay. They were lurking between the cloak and branchiæ, and doubtless had sought out the site for a less harmless purpose than shelter from foes; but, so far as I could judge from external appearances, the oyster had not suffered any material injury.

On the suggestion of Lamarck, it has been here considered a species of Phýlline; but it will not correspond with the character of the genus, for the large terminal disk or sucker is not armed with hooks, as Lamarck's definition expresses, but is quite smooth. Nor has the skin the slightest appearance of circular rings, or rugæ, even when contracted and hardened by spirits; and its whole anatomy is so unlike that of Annélides, and more especially of the true leeches, that it strengthens an opinion of Lamarck's, of there being a class of animals, yet unestablished, between the Annélides and the worms.

ART. IX. *On the Cause of Volcanic Action; a Reply to Professor Higgins's Review, in* p. 434, 435., *of Dr. Daubeny's Theory.* By Dr. DAUBENY, King's Professor of Botany and Chemistry in the University of Oxford.

Sir,

IF your correspondent, Mr. Higgins, will consult the forthcoming Part of the *Encyclopædia Metropolitana* (namely, Part xxxix.) when it appears, I flatter myself he will find, in the course of the article on Geology, which it is to contain, an answer to most of the objections brought forward, as applicable to that theory, by which I have attempted to explain the phenomena alluded to. He will at least see discussed at considerable length the question, whether the bases of the ordinary constituents of lava are likely to be so acted upon by water, as to produce the requisite degree of heat in consequence of its presence.

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