third and fourth tergites rather short and inconspicuous; fringes on sternites 2 to 4 white, on fifth black.

Tanganyika Territory: Old Moshi, April 6, 1926 (*A. H. Ritchie*). Imp. Bur. Entomology.

The locality is near Mt. Kilimanjaro.

Andrena boswendica niokana, subsp. n.

♀.—Clypeus with a smooth median line on lower part, but it is punctured; hair of vertex black; hair of pleura dull whitish, of thorax above fulvous, somewhat dusky, but not black, on disc of mesothorax; hair on outer side of hind tibiæ reddish golden; all the hair before the band on third tergite pale, but on fourth the hair is black, that overlapping the band rather long; hair at apex of abdomen all black; fringes on tergites 2 to 4 white, on fifth black.

Belgian Congo: Nioka, Aug. 19, 1931 (*H. J. Brédo*). Congo Museum.

The relatively feeble differentiation of these forms may be taken to indicate that they are comparatively recent derivatives from a form of *Andrena* coming from the north, presumably in Pleistocene times. The case is closely parallel with that of *Ancistrocerus* (Bequaert, Ann. & Mag. Nat. Hist., July 1933, p. 116).

XL.—*On a new Dendrochirote Holothurian from off Timor.* By S. G. Heding, Copenhagen.

[Plate XVI.]

Psolicucumis, gen. nov.

Diagnosis.—Ten dendroid tentacles of equal size. Appendages distinctly restricted to the ambulacra and developed as cylindrical pedicels on most of the ventral surface, but towards the ends and in the dorsal ambulacra they are developed as conical papillæ and much more sparsely distributed. Retractors present; respiratory trees rudimentary or quite absent; no tentacle-ampullæ; no rete mirabile. Gonads in two tufts.

Genotype, *Psolicucumis apneumona*, sp. n.

Discussion.—In spite of the absence of respiratory trees there is no doubt at all that the genus *Psolicucumis*

is a true Dendrochirote, but to which of the known genera of this family it is most closely related it is rather difficult to say. The arrangement of the water-vascular appendages brings it rather close to *Pentacta* and *Pseudocolochirus*, but other characters, and especially those of the calcareous deposits, separate it clearly from these two genera, and the peculiar shape of the calcareous ring and the nearly total absence of respiratory trees appear to justify the establishment of a separate genus for this interesting form.

It is evident that some of the species referred to the genus *Psolidium*, e. g., Herouard's species *arcuatum* and *convergens*, resemble the present species to a rather striking degree, and it is not at all improbable that they will ultimately prove to belong to the genus *Psolicucumis*, but that is for future research.

Also Sluiter's *Cucumaria nocturna* has much resemblance to it, but the well-developed respiratory trees of *nocturna* separate it definitely from *Psolicucumis*.

Psolicucumis apneumona, sp. n.

Locality.—10° 25′ 36″ S., 123° 6′ 42″ E.; 450–600 fms., C/S 'The Cable.' The specimens were very kindly presented to the British Museum by the Eastern Telegraph Company Limited.

The nineteen specimens measure from 20–45 cm. in length, with an average size of 30·6 cm. The body is rather pear-shaped, and as the larger part of the trivium is flattened to a creeping-sole, and as both the oral disk and the anal opening are usually turned upward, the appearance of the species in some degree recalls that of a *Psolus*. The anal end, *i. e.*, that part of the body which encloses the cloaca, is very narrow and forms a distinct little "tail," which, however, in some specimens may be nearly totally retracted into the body itself.

The colour is in alcohol a pale yellow, and the thin body-wall is semitransparent, so the gonads and the intestine can be seen through it. The body-wall is rather stiff because of the calcareous deposits, and its surface quite rough to the touch.

The large oral disk is surrounded by ten bushy tentacles, which are all of the same size and in one circle. The

tube-feet are confined to the ambulacra, where they are arranged in distinct rows, one in each of the four ambulacra and two in the fifth, the mid-ventral one. The tube-feet in the four ambulacra are placed ventrally to the radial canals, and in the mid-ventral ambulacrum one row is on each side of the radial canal. Only the tube-feet of the creeping-sole are fully developed, the others towards the ends of the specimens turn into papillæ, the terminal plates gradually disappearing. Dorsally there are seemingly only papillæ, but a closer examination shows that at least the two median ones in each ambulacrum have a little terminal plate and a distinct connection with the radial canal. All the others are quite papilliform. The number of tube-feet and papillæ is ca. 130–175, as there are 30–35 in each of the ventral rows and 5–7 in each of the two dorsal ones.

The calcareous ring (Pl. XVI. figs. 9, 10) consists of ten pieces, five radials and five interradials. Superficially seen it is rather simple, with long and pointed anterior processes and no posterior prolongations, but more thoroughly examined it proves to be very characteristic and not at all simple. The anterior processes are crest-shaped and bear on their inner side large wing-like expansions, which form a bowl-shaped cavity for the insertion of the tentacle-muscles. In the base of these cavities the openings of the tentacle-canals appear as narrow slits limited by two fine strings (muscles ?). On the exterior side of the radials which, like that of the interradials, is slightly concave, there are very distinct oval insertions for the retractor muscles, and in the top of the radials there is a furrow for the passage of the radial canal. To the sides of this furrow the tiny ends of the longitudinal muscles are fastened. The interradials are placed a little closer to the œsophagus than the radials (Pl. XVI. figs. 9, 10) ; they have a very characteristic uncalcified oval part in the crest. This oval window is not a pore connecting the lumen of two neighbouring tentacle-canals, but an uncalcified part of the tissue normally separating them. Probably this window indicates that the crests are not merely deep anterior processes but are built up of an outer and an inner process which are coalesced. Such windows are not found in the radial crests, but the structure of these

latter indicates a similar origin, for they have one or two very thin-walled parts in the same place as where the interradials have their windows.

The retractor muscles are well developed and quite free of the anterior part of the longitudinal muscle; they are rather long, one-fourth to one-third of the body-length; the mid-ventral one is much shorter than the others—it begins at the anterior edge of the creeping-sole.

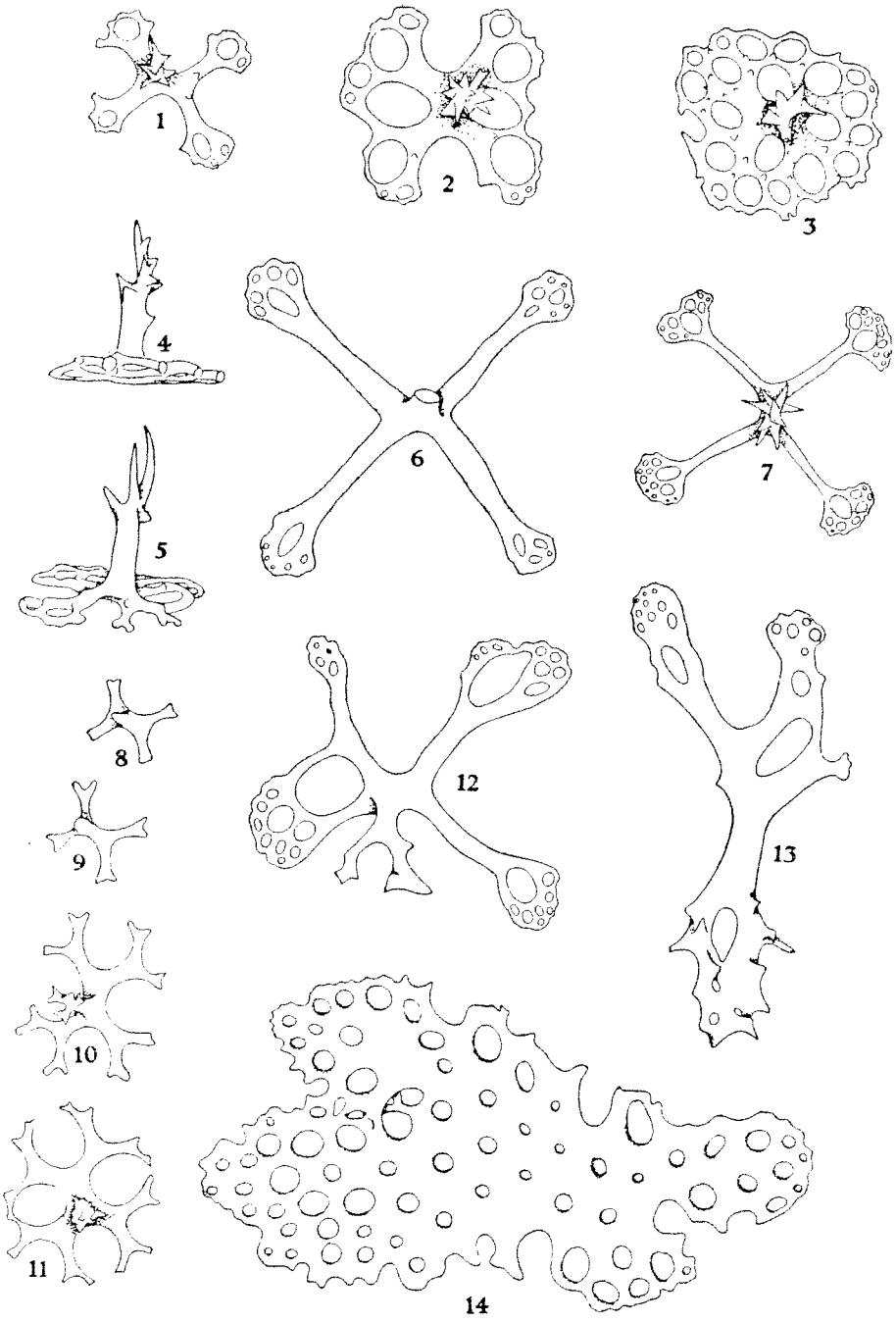
There are no tentacle-ampullæ.

The polian vesicle is single and is placed in the left dorsal interambulacrum. The stone-canal is short and does not reach the body-wall. The madreporite is rather large and is finely folded.

The gonads are in all the specimens well developed and enclose nearly ripe eggs and sperm. They consist of two clusters of unbranched tubes (Pl. XVI. fig. 6), one on each side of the dorsal mesentery. The tubes are of different sizes, the anteriormost much smaller than the rest. Microscopical examination shows that the smaller ones are purely female and the larger purely male. Apparently the male and the female tubes connect with the same gonoduct, which opens without any exterior papilla between the dorsal tentacles.

The alimentary canal is divided into six easily distinguishable parts (Pl. XVI. fig. 5). The œsophagus is short and bulb-shaped, with thick muscular walls. The ventricle is glandular and consists of two parts, a narrow circular anterior, and a broad and flat posterior part. These three parts are all fastened by the mesentery in the mid-line of the mid-dorsal interambulacrum (text-fig. 2, **8**). The flat part of the ventricle is followed by a voluminous chylus-intestine which bends in a large arc first towards the right dorsal ambulacrum and then across the mid-dorsal interambulacrum and the left dorsal ambulacrum. Thereupon it bends forward and ends rather anteriorly in the left ventral interambulacrum. The rectum goes at first a little forward and across the mid-ventral ambulacrum; then it turns backward in a loop towards the middle of the right ventral interambulacrum, and then back to the mid-ventral ambulacrum. Here it goes straight to the cloaca, attached all the way close to the right side of the longitudinal muscle. The cloaca,

Text-fig. 1.



1–3. Normal small perforated plates, seen from above.
4, 5. The same, seen from the side.
6. Large four-armed table from the proximal part of the tail.
7. Large four-armed table from the body-wall.
8–11. Developmental stages of small perforated plates from body-wall.
12. Deposit from distal end of tail.
13. Deposit from the most distal circle of the tail.
14. Large perforate plate from the edge of the anal opening.

All × 95.

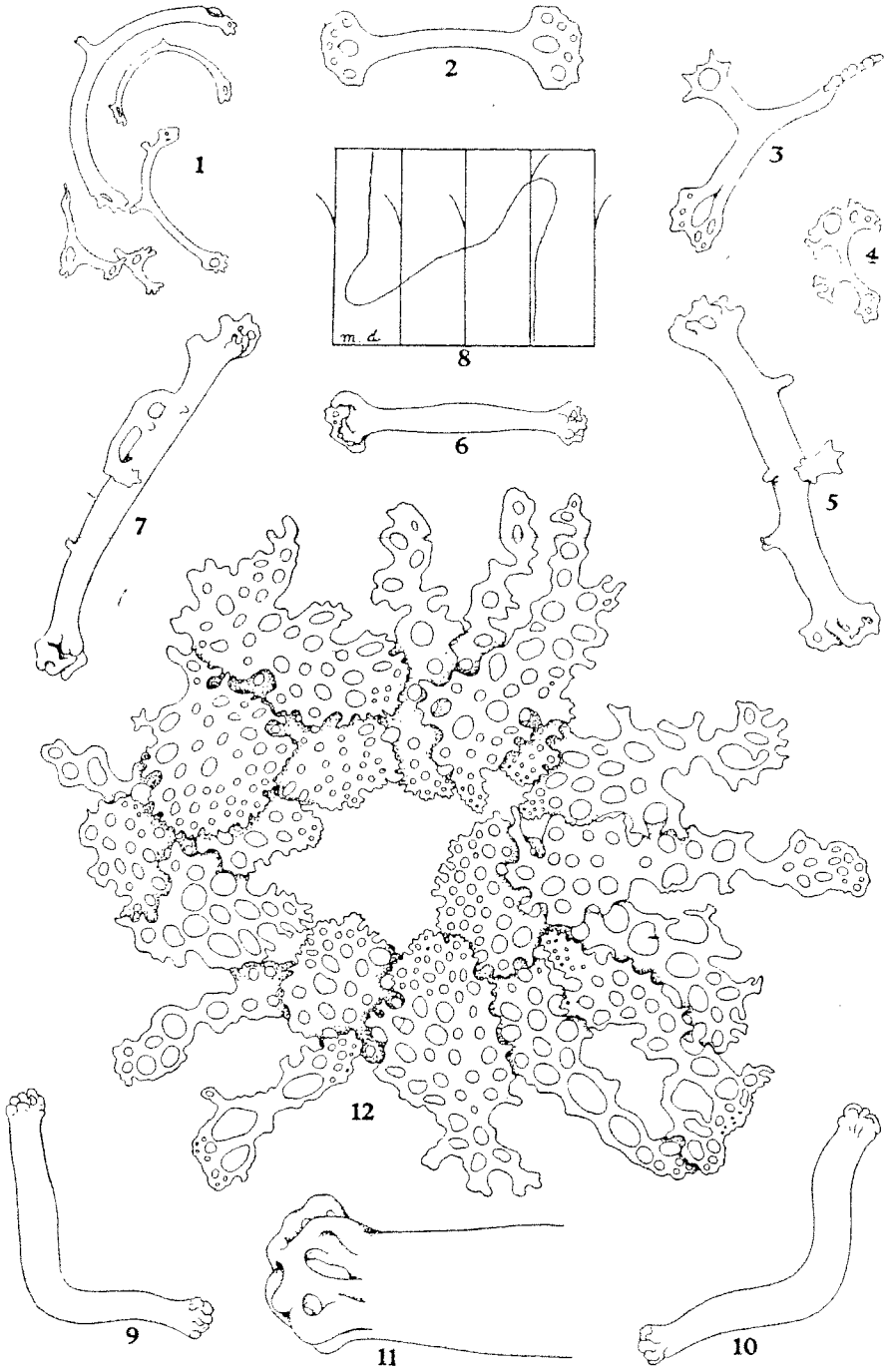
when the tail is not retracted, is long and narrow (Pl. XVI. fig. 7), and, as usual, is fastened by numerous threads to the body-wall (*i. e.*, the wall of the tail).

Respiratory trees are totally absent in all the specimens examined but one. This is of the greatest systematic interest, as the presence of the respiratory trees is one of the main characteristics of the order Dendrochirota. That this species may, however, be regarded as a true Dendrochirote is obvious from the single specimen in which there are found rudiments of respiratory trees. In all other respects this abnormal specimen agrees so closely with the others that there cannot be any doubt as to their specific identity; they only differ in this one character. The question naturally arises whether these rudiments are not simply bases of threads of mesentery which fasten the cloaca to the body-wall; indeed, such conical outdrawn bases are often found, but not only is the appearance of the two supposed rudiments very different from that of the thread-bases, but also their symmetrical arrangement definitely shows their nature as rudiments of the respiratory trees.

The calcareous deposits of the body-wall are small perforated plates supplied with a tiny spire (text-fig. 1, **1–5**). They measure 180 μ to 230 μ in diameter and have 10–20 holes and a few (very seldom as many as 20) teeth on the surface. They are, as usual, developed from a primary cross (text-fig. 1, **8–11**) and often the arms of the cross do not unite, in which case the plate consists of a four-armed cross with the arm-ends more or less perforated (text-fig. 1, **1**). Between the fully developed plates and those which consist of four arms all possible intermediate stages are found, and in reality these intermediate stages are the most abundant. Between these plates, and apparently placed a little deeper in the body-wall, there are found some other four-armed plates, also with a spiny spire and perforated ends (text-fig. 1, **7**). They differ very characteristically from the four-armed plates described above, as they have longer and more slender arms and up to five times as many pores in the ends. Further, they have no spines on their surface.

These two sorts of plates are found all over the body proper, and apparently there is no difference in their

Text-fig. 2.



1. Deposits from the tentacles.
2–4. Deposits from the tube-feet.
5–7. Deposits from the oral disc.
8. Diagrammatic figure of the fastening of the mesentery and the retractor-muscles to the body-wall. *m.d.* mid-dorsal inter-ambulacrum.
9–10. Rods from the tentacle-base.
11. The end of such a rod more enlarged.
12. The plates surrounding the anus.

Figs. 1–7 & 11, ×95; figs. 9, 10, ×30; fig. 12, ×50.

shape corresponding to the different places where they are found. In the tail, however, they are replaced by some large robust four-armed tables which are obviously only more robust examples of the slender armed plates (text-fig. 1, **6**). Towards the end of the tail these tables turn gradually into irregularly shaped rods or plates (text-fig. 1, **12**), till in the posteriormost circle of rods they acquire a very different shape (text-fig. 1, **13**). Here they are two-armed and the large spire is bent down in very nearly the same plane as the rest of the rod. These particular rods are arranged quite regularly in a circle, all with their spire directed towards the anal opening.

Around the anal opening, on its very edge, there are found a number of large polyporous plates. In some specimens (*e. g.*, in the type-specimen) there are only six to eight large and solid plates with rather well-formed edges (text-fig. 1, **14**), but in other specimens the number of such plates may increase to ca. 20, and then they are very variable in shape and size (text-fig. 2, **12**).

In the tube-feet there are, besides the terminal plate, three different sorts of rods. One (text-fig. 2, **2**) is only found in small numbers. It is a short nearly straight staff with enlarged and perforated ends, and it is always placed parallel to the long axis of the tube-foot. The second and by far the most abundant sort of rod (text-fig. 2, **3**) is of a very constant shape, being two-armed "tables" with flat and perforated spires. The two arms have their flat ends perforated by a number of holes and bent into a right angle to each other. The end of the spire has usually one large pore and five teeth. These rods in nearly totally expanded tube-feet are at an angle of 30°–45° to the long axis of the foot. Apparently this angle varies with the degree of contraction of the tube-feet, as it is, in fully contracted tube-feet, nearly 90°. The third form of deposits in the tube-feet is small perforated rosettes (text-fig. 2, **4**) which are placed at the margin of the terminal plate, in the very border of the tube-foot and its sucking-disk.

The tentacle-rods (text-fig. 2, **1**) are, in the larger branches of the tentacles, semicircular, and have perforated ends and a small rudimentary spire. They vary in size according to the size of the branch in which they may be found; only in the finest branches are they absent

and replaced by small, often perforated, rods or rosettes. In the tentacle-base there are some very peculiar rods, which vary in size but are all very large, measuring up to 1500 μ. The largest are found in the tentacle-base as well as in the anteriormost end of the body-wall, and lie with one end in the body-wall and with the other in the tentacle-base. The smaller ones are found in the tentacle-base itself, the smallest being the most terminal. These rods are all solid staves, usually bent into the shape of a bow (text-fig. 2, **9–11**). Some nearly straight examples may, however, be found, and a single three-armed one is seen.

In the oral disk there are some few large rods with branched ends; they often have irregular knobs and outgrowths on their sides (text-fig. 2, **5–7**).

EXPLANATION OF PLATE XVI.

Fig. 1. A specimen seen from the side.
Fig. 2. The same specimen seen from below.
Fig. 3. The same seen from above.
Fig. 4. A specimen showing the expanded tail.
Fig. 5. An opened specimen showing the anatomy.
Fig. 6. The paired gonad, showing the anterior female and the posterior male part.
Fig. 7. A normal cloaca from an expanded tail. There is no trace of respiratory trees.
Fig. 8. The cloaca of a specimen (the same as figured in fig. 5) with rudimentary respiratory trees.
Fig. 9. Four pieces of the calcareous ring.
Fig. 10. The mid-ventral radial with the two adjoining interradials. *m.v.*, mid-ventral radial.

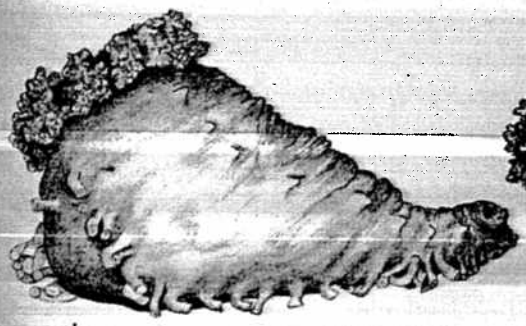
Figs. 1–5, $\times 1{\cdot}5$; figs. 6–10, $\times 6$.

XLI.—*The Dates of Publication of ' Yarrell, W., A History of British Fishes,'* 1835–1836.

By Francis J. Griffin, A.L.A., Registrar, Royal Entomological Society of London.

It has long been known that Yarrell's ' History of British Fishes ' was published in nineteen parts " between Ap. 1835 and Sept. 1836 " (Sherborn, ' Index Animalium,' *teste* Woodward, B. B.), but the actual dates and contents of the parts had not been recovered until now.

I have recently acquired a complete copy, in its original state, from the sale of the " North Library " at Wroxton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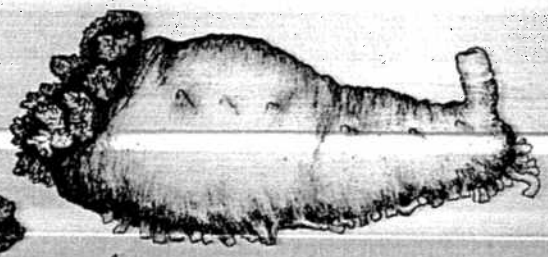
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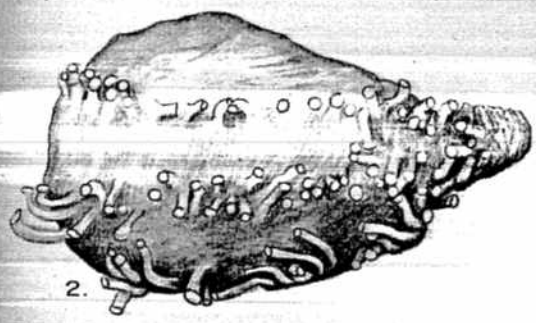
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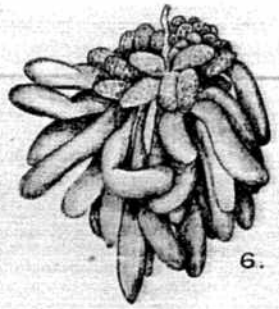
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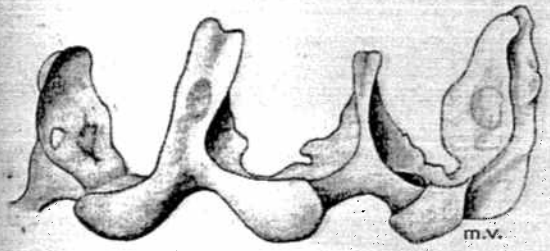

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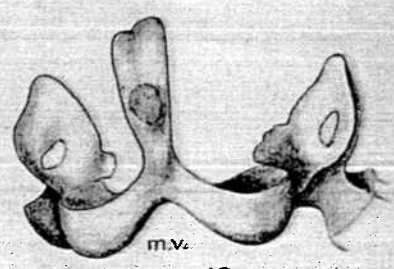

10.

S.G. Heding, del.

PSOLICUCUMIS APNEUMONA. sp.n.