

which no person, one would have thought, could mistake for anything but immature. No doubt this is partly to be explained by the unfortunate circumstance that in the case of the females of this group of spiders—this being the sex which most frequently comes to hand—it is very hard to tell the adults from the immature. Consequently the generic status of every species, referred to sections *a*, *a*, or *b* of the above table, that rests solely upon a female specimen, must be regarded as of questionable validity, unless the maturity of the type specimen is beyond dispute. With the males the case is different. As a rule generic characters in this sex are pretty obvious; and it may safely be stated that, until we know the males of the different species of Neotropical Theraphosidæ, the classification of this family will remain more or less chaotic.

So far, however, as I can judge from the material at my disposal, the Homæommateæ, Eurypelmateæ, Theraphoseæ, Aviculariæ, Crypsidromeæ, Chætopelmateæ, and Ischnocoleæ form a compact and natural assemblage which may be called Theraphosidæ *sensu stricto*. But touching the Ischnocoleæ, I must speak with some caution, since the genus *Ischnocolus*, from the Mediterranean, is unknown to me.

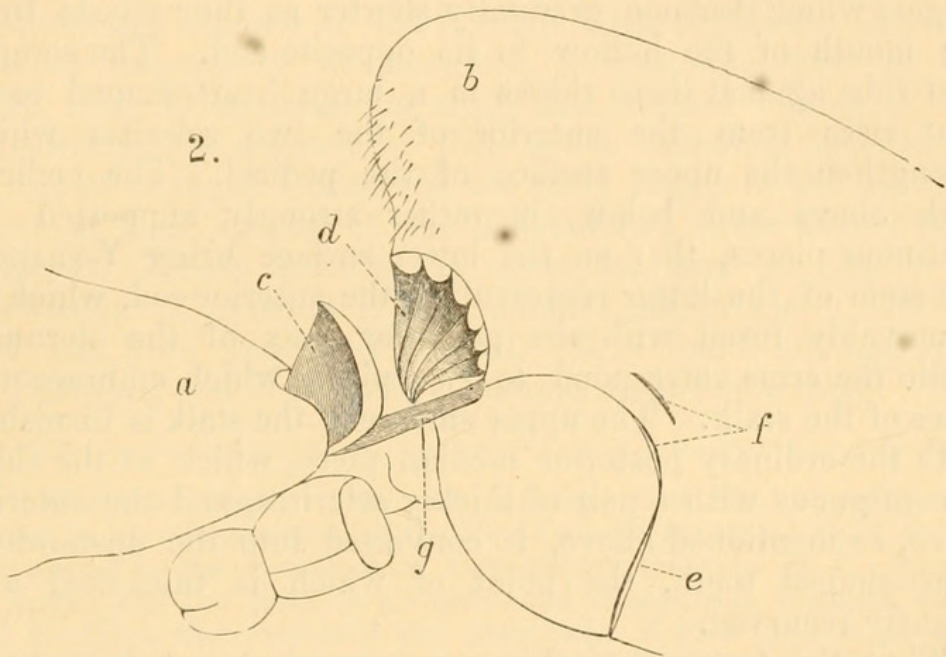
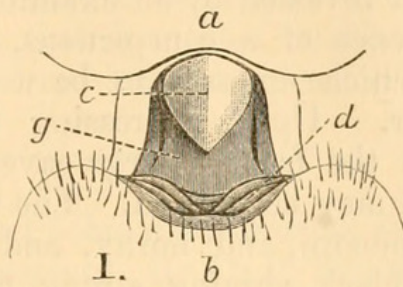
### XXXIII.—On a new Sound-producing Organ in a Spider.

By R. I. POCK, of the British Museum of Natural History.

IN January of the current year I published in 'Natural Science' a brief summary of the present state of our knowledge of the structure, position, mechanism, and function of the various kinds of stridulating-organs that occur in spiders, and I suggested that the available evidence seems to point to the conclusion that these organs have been evolved within the group in response to two needs, which, although totally different in their nature, are, in their way, alike of vital importance to the welfare of the species. In one set of species the sound is attractive and in the other repellent, the sense of attraction lying between members of opposite sexes of the same species and that of repulsion being experienced by enemies that might otherwise with intent or by accident destroy the spider if not warned of its presence and formidable nature. In connexion with the stridulating-organs that belong to the first category and are of sexual significance, it was pointed out that they are either absent or imperfectly developed in the females, and are perfected only in the males; whereas



when their significance is protective they are equally well developed in both sexes, and appear at a very early age in the life-history of the individual\*.



Stridulating-organ in the male of *Cambridgea antipodiana* (White).

Fig. 1.—Dorsal view of the organ and adjacent parts. *a*, posterior region of carapace; *b*, anterior region of abdomen; *c*, heart-shaped horny tooth; *d*, cavity with arched ridges; *g*, horny plate of pedicel.

Fig. 2.—Partially diagrammatic side view of the organ and adjacent parts, the cavity with its arched ridges being represented as seen in section. Lettering as in fig. 1, with the addition of *e*, stigma of pulmonary sac, and *f*, muscular scars.

Upon working through some of the spider material contained in the collection of the British Museum, I chanced

\* I am not aware whether the stridulating-organs of the Theridiidæ and Linyphiidæ are present in immature members of the male sex or whether they are developed only at the period of the last moult, when sexual maturity is attained. If, as in the case of the Mygalomorphæ, they are practically as perfect in the young as in the adult, it seems to me that the evidence of their being solely of a sexual function will be considerably weakened. But if, on the other hand, they appear, like typical sexual characters, either only just before or simultaneously with the attainment of maturity, there will, I think, be no reasonable grounds for doubting that they are exclusively of sexual significance.



upon the type of *Tegenaria antipodiana* described by White nearly half a century ago. A glance showed me that this spider belongs to the genus *Cambridgea* of L. Koch; but the most interesting fact revealed by an examination of the specimen was the presence of a conspicuous, although hitherto unnoticed, organ, which appears to be a sound-producer of considerable power. Upon depressing the abdomen and looking at it from the front a large cave-like hollow overhanging the pedicel may be noticed. The roof of this excavation is hairless, smooth, and horny, and is sculptured out into a series of six black, shining, strong, transverse arches or ridges, which become gradually shorter as they recede from the mouth of the hollow to its opposite end. The scraper that rubs against these ridges is a large heart-shaped tooth that rises from the anterior of the two sclerites which strengthen the upper surface of the pedicel. The pedicel, both above and below, is rather strongly supported by chitinous pieces, that on the lower surface being Y-shaped, the stem of the letter representing the anterior rod, which is immovably fused with the posterior apex of the sternum, while the arms correspond to two pieces which embrace the sides of the stalk. The upper surface of the stalk is furnished with the ordinary posterior median piece, which at the sides is contiguous with a pair of thicker sclerites, and the anterior piece, as mentioned above, is converted into the upstanding heart-shaped tooth, the point of which is thickened and slightly recurved.

That the function of this new organ is to produce sound can, I think, hardly be disputed. In its position and in some of the details of its structure it resembles that of the stridulating Theridiidæ (*Steatoda*) \*. In the latter there is, at the base of the abdomen, a circular depression, the edge of which, in the males at least, is armed with re-entering teeth. By the movements of the abdomen these teeth are scraped against a series of ridges and grooves upon the posterior area of the carapace, and give rise to a sound. Similarly I conceive that in the case of *Cambridgea* sound must result from the rubbing of the arched ridges backwards and forwards across the upstanding tooth upon the pedicel.

But a further resemblance between this new organ and that of *Steatoda* consists in its being confined to the male sex †.

\* *Vide* F. M. Campbell, Journ. Linn. Soc., Zool. xv. p. 152 (1880).

† For an opportunity to establish this fact I am indebted to the Rev. O. P. Cambridge, who kindly sent to me for examination three specimens of the genus which he has in his collection. The first of these,



In both the adult females that I have examined there is no trace of the ridged hollow on the abdomen, and the only trace of the tooth on the pedicel is a slight angulation of the dorsal sclerites. The absence of the organ in the female and the high development that it attains in the male permit us to conclude that the sound emitted is used as a sexual call.

XXXIV.—*The Pholadidæ : Note on the Early Stages of Development.* By C. P. SIGERFOOS\*.

DURING the summer of 1894, while with the Johns Hopkins Marine Laboratory at Beaufort, I was employed by the U.S. Fish Commission to study the natural history of the ship-worms on account of their great economic importance. While so engaged I observed the early stages in the development of four species of the Pholadidæ; these were *Pholas truncata*, *Teredo navalis*, *T. norvegica*, and *T. (Xylotrya) fimbriata*. *T. navalis* is the common ship-worm of Europe, and has been frequently studied. It is found but sparingly at Beaufort, and is of little economic importance there. The

from Chatham Island, is the male example that Mr. Cambridge has figured in the 'Transactions of the New Zealand Institute,' 1873, p. 202; the second is the female from Canterbury, the type of *C. fasciata*, L. Koch; and the third is an additional female from Waikato, which Dr. L. Koch also examined and identified. Koch's type is an adult female; but since its carapace measures only a little over 3 millim. in length, I find it hard to believe, without further evidence, that the male from Chatham Island, which has the carapace 10·5 millim. long, is co-specific with it. It appears to me too that the second female, the one from Waikato, is also distinct from *fasciata*, since it is of considerably larger size (carapace 6·5 millim. long), and the impressions on the vulva have a different form. I may add that in both of them there is a very distinct tubercular tooth (omitted from Koch's figure) at the anterior end of the median groove of the vulva; that the anterior lateral eyes in *C. fasciata* are round, and only oval, as Koch has figured them, when seen in perspective; that the posterior spiracles are in front of the *colulus*, and are not placed in the integumental fold that Koch mentions and compares with that of *Anyphæna*; and that the additional stigma that Mr. Cambridge figured and described is a muscular scar.

Two species, then, of the genus have been described, namely *Cambridgea antipodiæna* (White) (P. Z. S. 1849, p. 5), with which *C. fasciata*, Cambr. (Tr. N. Z. Inst. 1873, p. 202), is synonymous, and *C. fasciata*, L. Koch ('Die Arachn. Australiens,' i. p. 358, pl. xxviii. fig. 2, 1871). These two must, I think, be provisionally regarded as distinct, on account of the enormous disparity in size between the two sexes, the male being so very much larger than the female.

\* From the 'Johns Hopkins University Circulars,' vol. xiv. no. 119, pp. 78, 79.



Pocock, R. I. 1895. "XXXIII.—On a new sound-producing organ in a spider." *The Annals and magazine of natural history; zoology, botany, and geology* 16, 230–233. <https://doi.org/10.1080/00222939508680263>.

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