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DEPARTMENT OF AGRICULTURE.

MARINE INVESTIGATIONS
IN
SOUTH AFRICA.

VOLUME I.

WITH TWENTY-EIGHT PLATES.

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SOUTH AFRICAN CRUSTACEA.

BY THE

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When about two years ago I received from Dr. Gilchrist the first of the Crustacea which he has been sending me from South African waters, the hope entered my mind that in course of time I might be able to produce a systematic review of the whole carcinological fauna of the region over which the Government of Cape Colony is extending its scientific investigations. It has now, however, become clear to me that such a plan would not only involve very serious delay before any results could be published, but would also have little chance of securing that completeness and finality for the sake of which the delay might be justified. On the very eve of publication an inconsiderate trawl might bring up from the vasty deep a miscellaneous assortment of the unknown and the unexpected, and the symmetry of the main treatise would have to be destroyed by an appendix of odds and ends more interesting and more important perhaps than anything contained in the methodical catalogue. Forsaking, therefore, more ambitious projects, I offer the present report as an instalment in which the student may possibly find some points worthy of his notice. Should other instalments follow, the inconvenience arising from a somewhat desultory mode of publication may in the end be remedied wholly or to a great extent by a satisfactory index. In the higher groups of the Malacostraca the recent systematic labours of Dr. Ortmann and Major Alcock may be said to hold the field. Accepting their decisions as to large sections, I here confine my own comments chiefly to genera and species.

carinate. Of the latter some have the front of the head acute or sub-acute, but two, *Gaudichaudii* and *imbricata* have the front obtuse. *M. Gaudichaudii* in the ovigerous female has the sides of the head broadly rounded, the eyes sub-rotund, the inner ramus of the uropods falcate. *M. imbricata* of that sex and condition has the sides of the head emarginate, the eyes rhomboidal, the inner ramus often a little flexuous. From *M. trigonocephala* (of Schiödte and Meinert), in which the front of the head is sub-acute, *M. imbricata* is further distinguished by having the front margin of the first peraeon segment nearly straight instead of conspicuously bisinuate. But Miers, who carefully investigated the synonymy, thinks it not improbable that the original *C. trigonocephala*, Leach, ought to be regarded as a synonym of *M. imbricata*, and definitely includes in the synonymy as well the species which Heller names *Ceratothoa Banksii* (Reise der Novara, Crust., p. 148) as that which on the same page Heller describes as *C. trigonocephala*.

The female attains a length of 57 mm.

The species is recorded from the Indian Ocean, Java, New Zealand, Australia and the Cape.

Specimens sent me from the Cape were "from mouth of fish, Kalk Bay," with the note that the species is "a crustacean common in the mouth and gill cavity of the fish here."

The discussion of the mouth-organs of this species in Hansen's "Cirolanidae" will be found especially valuable.

COPEPODA PARASITICA.

GEN. : SPHYRION, Cuvier.

1830. "Les Sphyrions," Cuvier, Le Règne Animal, v. 3, p. 257.
- 1829-43. *Sphyrion*, Guérin-Méneville, Iconographie du Règne Animal, Zoophytes, p. 11.
1840. *Sphyrion*, Milne-Edwards, Hist. Nat. des Crustacés, v. 3, p. 525.
1845. *Lestes*, Krøyer, Danmarks Fiske, v. 2, p. 517.
1861. *Sphyrion*, Steenstrup and Lütken, Kong. Danske Vid. Selsk. Skrifter, Ser. 5, v. 5. Snyltekrebs og Lernaer, p. 347 (7), 432 (92).
1864. *Lesteira*, Krøyer, Naturhistorisk Tidsskrift, Ser. 3, v. 2, pt. 3, p. 402.
1868. *Lesteira*, Heller, Reise der Novara, Crust., p. 228.
1890. *Lesteira*, G. M. Thomson, Trans. New Zealand Institute, v. 22, p. 370.
1899. *Sphyrion*, Bassett-Smith, Pr. Zool. Soc. London, pp. 441, 488.

In adult female cephalothorax transversely expanded, connected by a very narrow, smooth, cylindrical "neck" with a large and smooth, somewhat bulb-like genital segment, which carries behind two large clusters of tubules and two long and narrow ovisacs; the mouth very small, and apart from its obscure constituents no appendages present on the head or trunk. Male unknown. Young with eight pairs of appendages.

The generic name is obviously derived from σφύριον, a little hammer. Cuvier, founding the genus upon the "*Chondracanthe lisse*" of Quoy and Gaimard, defines Sphyrion as having "la tête élargie des deux côtés, comme un marteau, de petits crochets à la bouche, un cou mince, suivi d'un corps déprimé et en forme de coeur, qui, outre les deux longs cordons, porte de chaque côté un gros faisceau de poils." There is little fault to be found with this definition, except that the word "poils" is inappropriate to the blunt-ended, often bifid and trifid, branchlets, which in two great bunches are appended to the genital segment, probably with a branchial function.

SPHYRION LAEVIGATUM, Guérin-Méneville.

PLATE 4.

1824. *Chondracanthe lisse*, Quoy et Gaimard, in Freycinet's Voyage autour du Monde, Zoologie, Atlas, pl. 86, fig. 10.
1830. *Sphyrion lisse*, Cuvier, Le Règne Animal, Zoophytes (Intestinaux cavitaires), vol. 3, p. 257.
- 1829-43. *Sphyrion laevigatus*, Guérin-Méneville, Iconographie du Règne Animal, Zoophytes, p. 11, pl. 9, fig. 4.
1840. *Sphyrion laevigatus*, Milne-Edwards, Hist. nat. des Crustacés, vol. 3, p. 526.
- 1836-49. "*Sphyrion laevigatus*, Cuv." Le Règne Animal, Edit. illustrée, Zoophytes (Intestinaux, Cavitaires), p. 62, 63, pl. 32, fig. 4, 4a.
1869. *Sphyrion laevis*, Steenstrup, Oversigt Vidensk. selsk. Kjöbenhavn, p. 202, pl. 2, fig. 4a, 4b.
1890. *Lesteira kroyeri*, G. M. Thomson, Trans. New Zealand Institute, vol. 22, p. 370, pl. 28, f. 4, 4a.
1899. *Sphyrion laevigatum*, Bassett-Smith, Pr. Zool. Soc. London, p. 489.

The soft cephalothorax which is wholly embedded in the tissues of the host is in this species distinguished by its great width, being not as in *Sphyrion lumpi* (Krøyer) narrower, but much wider than the genital segment. It is also very nodulose and somewhat variably so, the extremities in Thomson's New Zealand specimen being simply rounded,

but in that of the Cape forming three nodules. On the front margin of the upper side are two very prominent bosses, one of which in the Cape specimen has a subsidiary nodule at its base. On the hind margin of this same side are two much smaller bosses, much closer together. Between the front points there is a shallow quadrilobate process, and just below this projects the minute mouth, consisting presumably of upper and lower lips and rudimentary mandibles. Of anything like antennae I see no trace either in Thomson's figure or in the Cape specimen.

From the middle of the under side of the great cephalothoracic expansion starts the smooth narrow chitinous "neck," which has a smaller relative length than in *Sphyrion lumpi*, but which cannot perhaps be depended upon as affording a specific character by its dimensions, there being in my opinion reason to suppose that it varies with the age and size of the specimen, becoming relatively smaller as the specimen grows larger.

In Quoy and Gaimard's figure this section of the animal is very elongate, but very short in the figure given by Guérin-Méneville.

The genital segment, which also has a firm smooth integument, is broader than long, and longer than thick. The upper and lateral margins are curved, the hinder is almost straight, with a slight median projection, explained as the rudimentary tail part. On either side of the latter are bunches of vesicles, which in the Cape specimen together exceed the size of the genital segment itself. The ovisacs are long and narrow, containing several rows of minute eggs.

The Cape specimen is rather less than two inches long, 47 mm., the head 30 mm. wide. Thomson's New Zealand specimen "taken from the abdomen of a ling (*Genypterus blacodes*)" was about 70 mm. long, with the head 59 mm. wide. In both specimens the neck measured 12 mm. Krøyer's *Sphyrion lumpi* was found burrowing in the tail fin of a *Cyclopterus lumpus* from Iceland. It was two inches long. The difference in the proportional sizes of its parts, the much less nodulose head, the very "elongate neck," and the northern habitat, make it at least possible that it may be a distinct species.

In 1871 (Tr. Linn. Soc. London, v. 27, p. 501, t. 59, fig. 12), a third species was described by Dr. R. O. Cunningham, M.D., F.L.S., under the name *Sphyrion Kingi*. The specimens were taken from the gills of fish, on the East Coast of Patagonia. The head is very distinctly nodulose and the "neck" extremely short. But it is still an open question whether either this or Krøyer's species should be upheld as specifically distinct from *laevigatum*.

It may be noted that Quoy and Gaimard and Cuvier only give the specific name "*lisse*" in French, Guérin-Méneville being the first to give the the Latin *laevigatus*, so that to him the name of the species must be attributed. Milne-Edwards in 1840 refers to the part of the "Iconographie" here in question, thus showing that that work antedates his own.

CIRRIPEDIA.

FAM. : BALANIDAE.

GEN. : TUBICINELLA, Lamarck.

1802. *Tubicinella*, Lamarck, Annales du Museum, vol. 1.
 1824. *Coronula*, de Blainville, Dict. Sciences Nat., vol. 32.
 1854. *Tubicinella*, Darwin, Monograph of the Cirripedia (Ray Soc.), vol. 2, p. 430.

"Compartments six, of equal size; shell sub-cylindrical, wider at the top than at the basis, belted by several large transverse ridges" (Darwin).

TUBICINELLA TRACHEALIS (Shaw).

1802. *Tubicinella major et minor*, Lamarck, Ann. Mus., vol. 1, pl. 30, f. 1-2.
 1806? *Lepas trachealis*, Shaw, Nat. Miscell. (1789-1813), vol. 17, pl. 726.
 1815. *Lepas tracheaeformis*, Wood, General Conchology, pl. 4, f. 1-3.
 1818. *Tubicinella balaenarum*, Lamarck, Anim. sans Vertèbres.
 1824. *Tubicinella Lamarckii*, Leach, Encycl. Brit., Suppl., v. 3, pl. 57.
 1824. *Coronula tubicinella*, de Blainville, Dict. Sciences Nat., vol. 32, pl. 117, f. 5.
 1825. *Tubicinella trachealis*, Gray, Annals of Philosophy, vol. 10.
 1836? *Tubicinella balaenarum*, Guérin-Méneville, Iconographie du Règne Animal, Mollusques, p. 58, pl. 38, f. 14.
 1854. *Tubicinella trachealis*, Darwin, Mon. Cirripedia, vol. 2, p. 431, pl. 17, f. 3a-c.
 1873. *Tubicinella trachealis*, Steenstrup (in Lütken), Vidensk. Selsk. Skr., Ser. 5, Naturv. Afd., vol. 10, No. 3, p. 244 (16).

Darwin, from whose work I have taken most of the synonymy, rightly observes that Lamarck's alternative name for a single species cannot be retained, and that Shaw's *trachealis*, being next in priority, ought to be adopted.

The skin of the whale with a large group of these cirripedes burrowing into it to the depth of an inch and three-quarters presents an extraordinary spectacle. In some cases the

ADDENDA ET CORRIGENDA.

South African Crustacea.

On p. 30 in the reference to "*Limnaphis*, White, 1847," the generic name should be *Limnapharus*. Attention was called to this by Dr. Woodward in the Geological Magazine, vol. 7, p. 394, where, however, the error is not traced back to its source in the report on the Challenger Macrura.

P. 33. To the list of those who have used *Astacus* as the generic name of the lobster may be added Westwood, in the Entomologist's Text-book, p. 101, 1836.

P. 37. In the last line the epithet "perplexing" is quite inappropriate to the statement quoted from Huxley, and the comment upon it with which the paragraph ends on p. 38 is quite beside the purpose. The mistake arose from a confusion of the eighth somite of the body with what is sometimes called the eighth thoracic somite. As my friend Dr. W. T. Calman promptly pointed out, there is only an infinitesimal difference between Huxley's observation that the second maxilliped in the lobster is without an arthrobranchia, and the explanation by Boas that this arthrobranchia is reduced to a pimple.

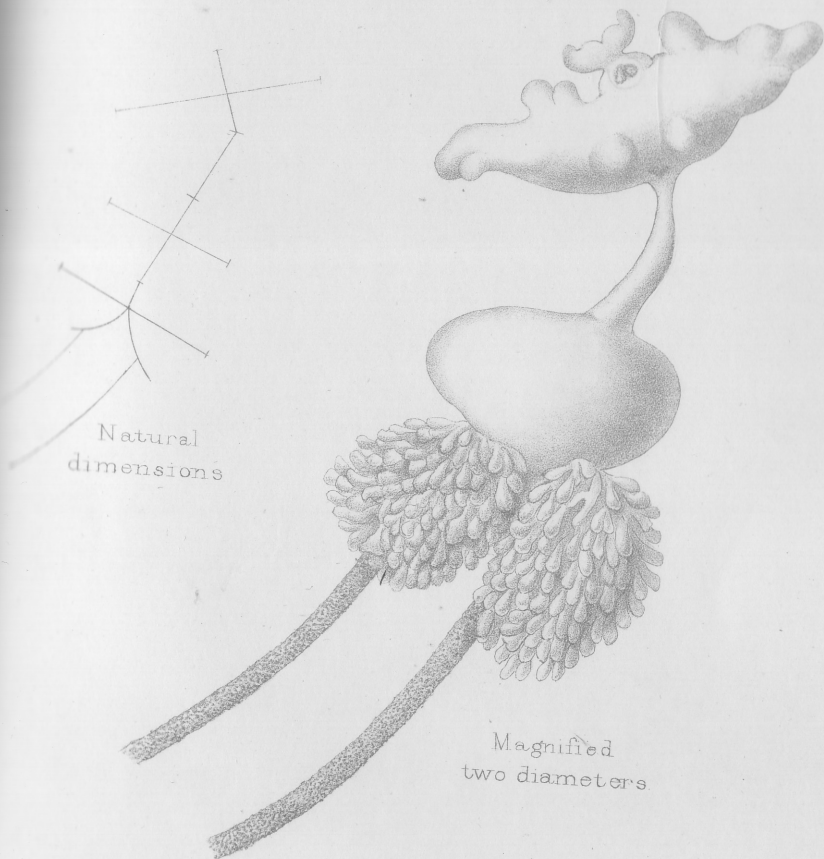
P. 49. In the synonymy of *AEgeon* should have been included a reference to Faxon's Stalk-eyed Crustacea of the Albatross, Mem. Mus. Comp. Zoöl. Harvard, vol. 18, 1895, where an important footnote to p. 134 discusses that genus (with the changed spelling *AEgaeon*), and expresses the opinion that Bate's *Pontocaris* is to be identified with it.

Pp. 54, 55. Some modifications in the description of the first maxillæ and maxillipeds of *Paridotea unguolata* are supplied in the account now given of the family *Idoteidae*.

P. 60. It should have been mentioned that the specimen of *Sphyrion laevigatum* was taken from a *Genypterus capensis*, locally known as the "King-Klipfish."

Alcyonaria and Hydrocorallinae.

- P. 71, line 15 from bottom, for *H. rigida* read *Xenia rigida*.
- P. 73, line 15 from top, add "these" before three specimens.
- P. 74, line 4 from bottom, for Marzeller read Marenzeller.
- P. 78, line 18 from top, for Alcyonarian read Alcyonaria.
- P. 84, line 11 from bottom, for principal read principal.
- P. 94, in 8 of list, for Alcyonides read Alcyonider.



TBRB del.

SPHYRION LAEVIGATUM, (*Quoy & Gaimard.*)

West, Newman imp.