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REPORT on a small COLLECTION of ANTARCTIC
PLANKTON from the NEIGHBOURHOOD of
the SOUTH SHETLAND ISLANDS, collected by
the STAFF of a DUNDEE WHALER in 1892-3.

By ISAAC C. THOMPSON, F.L.S.;

With NOTES on the DIATOMACEÆ,

By THOMAS COMBER, F.L.S.

With Plates XVIII. and XIX.

[Read May 13th, 1898.]

THE material forming this collection was recently placed
in my hands for examination by Professor D'Arcy W.
Thompson, C.B., by whose orders it was collected. It
was contained in eighteen small vials, and since supple-
mented by about thirty larger bottles, the latter being
mostly similar in date to the former, and simply labelled
"Antarctic," with the date of collection and in most cases
the surname of the collector.

Indeed, I have been able to obtain only the most
meagre particulars as to collection, no depths or localities
being mentioned. The dates given are from February
26th, 1892, to December 12th, 1893, and presumably the
material was all collected at the surface by tow-net. The
collection is composed of Copepoda, represented by seven
species, a few Schizopods and other Crustacea, a consider-
able number of Sagitta, a few worms, a few Peridinea,
Foraminifera represented by *Globigerina*, and masses
of floating Diatomaceæ representing several species. The
latter appeared to me of such interest that I handed them
over to my friend, Mr. Thomas Comber, F.L.S., whose

1898

report upon them, with a drawing and description of a new species, are included herewith.

The general character of the plankton obtained bears out to a considerable extent Dr. John Murray's remarks upon the pelagic life of the Antarctic Ocean.

In a paper recently read before the Royal Society upon "The Scientific Advantages of an Antarctic Expedition," he says:—

"In the surface waters of the Antarctic there is a great abundance of diatoms and other marine algae. These floating banks or meadows form primarily not only the food of pelagic animals, but also the food of the abundant deep-sea life which covers the floor of the ocean in these south polar regions. Pelagic animals, such as Copepods, Amphipods, Molluscs, and other marine organisms, are also very abundant, although species are fewer than in tropical waters. Some of these animals seem to be nearly, if not quite, identical with those found in high northern latitudes, and they have not been met with in the intervening tropical zones. The numerous species of shelled Pteropods, Foraminifera, Coccoliths and Rhabdoliths, which exist in the tropical surface waters, gradually disappear as we approach the Antarctic circle, where the shelled Pteropods are represented by a small *Limacina*, and the Foraminifera by only two species of *Globigerina*, which are apparently identical with those in the Arctic Ocean. A peculiarity of the tow-net gatherings made by the "Challenger" Expedition in high southern latitudes, is the great rarity or absence of the pelagic larvæ of benthonic organisms, and in this respect they agree with similar collections from the cold waters of the Arctic seas. The absence of these larvæ from polar waters may be accounted for by the mode of development of benthonic organisms. It must be remembered that

many of these pelagic organisms pass most of their lives in water of a temperature below 32° F., and it would be most interesting to learn more about their reproduction and general life-history.

"In the Southern and Sub-antarctic Ocean a large population of the Echinoderms develop their young after a fashion which precludes the possibility of a pelagic larval stage. The young are reared within or upon the body of the parent, and have a kind of commensal connection with her till they are large enough to take care of themselves. A similar method of direct development has been observed in eight or nine species of Echinoderms from the cold waters of the northern hemisphere. On the other hand, in temperate and tropical regions the development of a free-swimming larva is so entirely the rule that it is usually described as the normal habit of the Echinodermata. This similarity in the mode of development between Arctic and Antarctic Echinoderms (and the contrast to what takes place in the tropics) holds good also in other classes of Invertebrates, and probably accounts for the absence of free-swimming larvæ of benthonic animals in the surface gatherings in Arctic and Antarctic waters."

Of the Copepoda obtained, curiously enough the commonest species is apparently new to science. It agrees generally with Scott's genus *Paracartia*, in which I have placed it as *Paracartia antarctica*, n. sp. It occurred in eighteen of the gatherings.

The well-known *Calanus finmarchicus*, so commonly distributed throughout our northern latitudes, appears to be equally common about the Antarctic, and occurred in sixteen of the gatherings.

Associated with *C. finmarchicus*, and fairly plentiful in some of the bottles, was the large red Arctic species

C. hyperboreus, formerly passed over as a mere Arctic variety of *C. finmarchicus*, but now separated by Giesbrecht as a distinct species. Besides being of a uniformly larger size than *C. finmarchicus*, it differs from the latter in having lateral nipple-shaped projections at the terminations to the cephalothorax, in the large square-shaped first joint of the abdomen, and in the form of the basal serratures of the fifth pair of feet.

From the peculiar brittleness of the anterior antennæ and the swimming feet, it is a rare thing to find anything approaching a complete specimen of this species.

While expressing in a previous paragraph the general extent to which this collection bears out Dr. Murray's remarks on Antarctic fauna, a considerable exception must be taken to his remark—"Some of these animals seem to be nearly, if not quite, identical with those found in high northern latitudes, and they have not been met with in the intervening tropical zones." As regards the species last alluded to—*Calanus hyperboreus*—the statement is strictly applicable, this species not having been found, so far as I am aware, between the North and South Shetland Islands, represented by 60° N. lat. and 60° S. lat. But *Calanus finmarchicus* has been reported from Australia, 37° S. lat., and I found it at the Canary Islands, 30° N. lat. So there is hardly good reason to suppose that it could not survive an extreme tropical heat, and it might easily migrate across or be carried by a vessel.

Pseudocalanus elongatus, also well-known as a northern form, was common throughout the gatherings. It has, however, even less claim than *Calanus finmarchicus* to be classed as exclusively bipolar, as I recently found it in some plankton sent to me by Staff-Surgeon P. W. Bassett Smith, collected in the Indian Ocean. *Metridia longa*

occurred in only one haul. It also is a common northern form, and I recently found it plentiful in material collected by Dr. G. H. Fowler, in H.M.S. "Research," off the Faroe Islands. It occurs about our British and French shores in fair numbers.

The two remaining species, *Oithona spinifrons* and *Ectinosoma atlanticum*, have a wide distribution, especially in northern latitudes. Both were sparingly distributed in this collection.

Paracartia antarctica, n. sp. Pl. XVIII.,
figs. 1—12.

Length (exclusive of tail setæ) 1.75 mm. Male rather smaller and more slender than the female. The female is conspicuous by the acute lateral angles of the last thoracic segment of the cephalothorax. Anterior antennæ rather shorter than the cephalothorax, 20-jointed in the female (fig. 3) and 11 in the right male antenna (fig. 2). The ninth joint in the latter is finely serrated on the under surface, a geniculation occurring between the 9th and 10th joints.

Posterior antennæ and mouth organs similar to those of *P. spinicaudata*, Scott. Outer branch of four first pair of swimming feet 3-jointed, the division between the two terminal joints in first pair (fig. 9) being almost imperceptible. Inner branch 2-jointed. Fifth pair of feet in female (fig. 12) 1-branched, each branch 2-jointed. Basal joint somewhat quadrangular, and terminating on the posterior inner side, with a strong lanceolate spine. Terminal joint bifurcates at apex forming two spines, with a small seta on inner side of outer one.

The fifth pair in the male (fig. 11) is large and conspicuous, forming a strong clasping organ. The right foot has two broad basal joints, terminating in a long sickle-shaped,

spinous joint, with a small one at apex. The left foot is composed of three stout joints and a strong apical tooth, with a short seta near apex.

Abdomen 5-jointed in the male, three in the female. Length of caudal stylets about twice the width, each bearing one lateral seta and four terminal setæ, all plumose. Both males and females were found plentifully in many of the tow-nettings, the females being much the most abundant.

It is necessary here to state that two bottles of material are, after consideration, not dealt with in this report for the following reasons:—

The first, duly labelled "Antarctic," with a date corresponding with the rest, was found to contain several specimens of the common "fresh-water flea," *Daphnia pulex*, and of the fresh-water Copepoda *Diaptomus* and *Cyclops*, but no marine forms! It is, of course, quite possible that they may have been found in a ship's tank, and put into the vial and labelled carelessly, or by someone trying to be funny, or they may have been found during a land excursion, in some inland tarn.

The second bottle is uniform with the others, but labelled simply "Tow-net, 16/4/93." It contains a large number of tropical species of Copepoda, including *Calanus vulgaris*, *Pontella*, *Monops*, *Euchata*, *Corycaeus*, *Copilia*, *Miraceæ*, *Oncaea*, &c., so entirely differing from those found in cold Antarctic waters that in the absence of any more reliable information than the label gives, or I have been able to elicit, it would be unwise to include them as Antarctic species.

In concluding this fragmentary report, I should like to join in the hearty expression of the advantages to science to be derived from a well-equipped expedition to the

Antarctic, as recently advocated by Dr. John Murray, F.R.S. For, as he well puts it:—

"Every department of natural knowledge would be enriched by systematic observations as to the order in which phenomena coexist and follow each other, in regions of the earth's surface about which we know very little or are wholly ignorant. It is one of the great objects of science to collect observations of the kind here indicated, and it may be safely said that without them we can never arrive at a right understanding of the phenomena by which we are surrounded, even in the habitable parts of the globe."

NOTES on the DIATOMACEÆ COLLECTED.

By THOMAS COMBER, F.L.S.

The following is a list of Diatomaceæ which I observed in the material from South Shetland Islands, Antarctic, sent by Mr. I. C. Thompson:—

- Thalassiosira antarctica*, n. sp., frequent.
- Nitzschia seriata*, Cleve, rare.
- Rhizosolenia sima*, Cstr., rare.
- R. setigera*, Brtw., frequent.
- R. inermis*, Cstr., rare.
- Chatoceros boreale*, Bailey, occasional.
- C. incurvum*, rare.
- Corethron criophilum*, Cstr., rare.
- C. cometa*, Brun., one specimen observed.
- C. unguiculatum*, n. sp.
- Hemiaulus balaustium* (= *Eucampia*, Cstr.)
- Biddulphia membranacea*, Cleve, new variety.
- Biddulphia*, n. sp.
- Fragilaria linearis*, Cstr., rare.
- Asterionella glacialis*, Cstr.

Count Castracane, in his report on the Diatoms collected by H.M.S. "Challenger," established (p. 813) a new genus, *CORETHRON*, for certain forms collected in the Antarctic Ocean. They are allied to *Bacteriastrum*, and the author characterises his genus as having frustules cylindrical, free (?); valves convex, surrounded by a corona of radiating awns.

He divides it into two sections, one with smooth, the other with echinated awns. A form which occurs rather sparingly in Mr. Thompson's gathering seems to be intermediate between the two; for the awns of one valve are flat, and their margin distinctly dentate; the awns of the other valve appear smooth. But the main feature of the form is the presence of peculiar appendages round the upper valve, intermingled with the awns. They are flexuose, flattened and expanded at base and apex, the latter bearing a double claw, set at right angles to its pedicel. The specific name has reference to these.

Corethron unguiculatum, n. sp. Pl. XIX.

Frustule lenticular to spherical; valve varying from convex to hemispherical, smooth; awns erect, spreading, or recurved. Those of one valve flattened, dentate, and intermingled with flexuose clawed appendages; those of the other valve smooth.

Antarctic plankton, near South Shetland Islands.

For list of Diatoms observed at the surface, station 157, in the Antarctic, see—

Report on the Scientific results of the Voyage of H.M.S. "Challenger." (Summary of Results.) Part I. (published 1895), p. 517.

Besides verifying (and correcting) the list originally compiled by Rattray, about 30 species, I was able to add thereto about 18 species.

EXPLANATION OF PLATES.

PLATE XVIII.

Paracartia antarctica, n. sp.

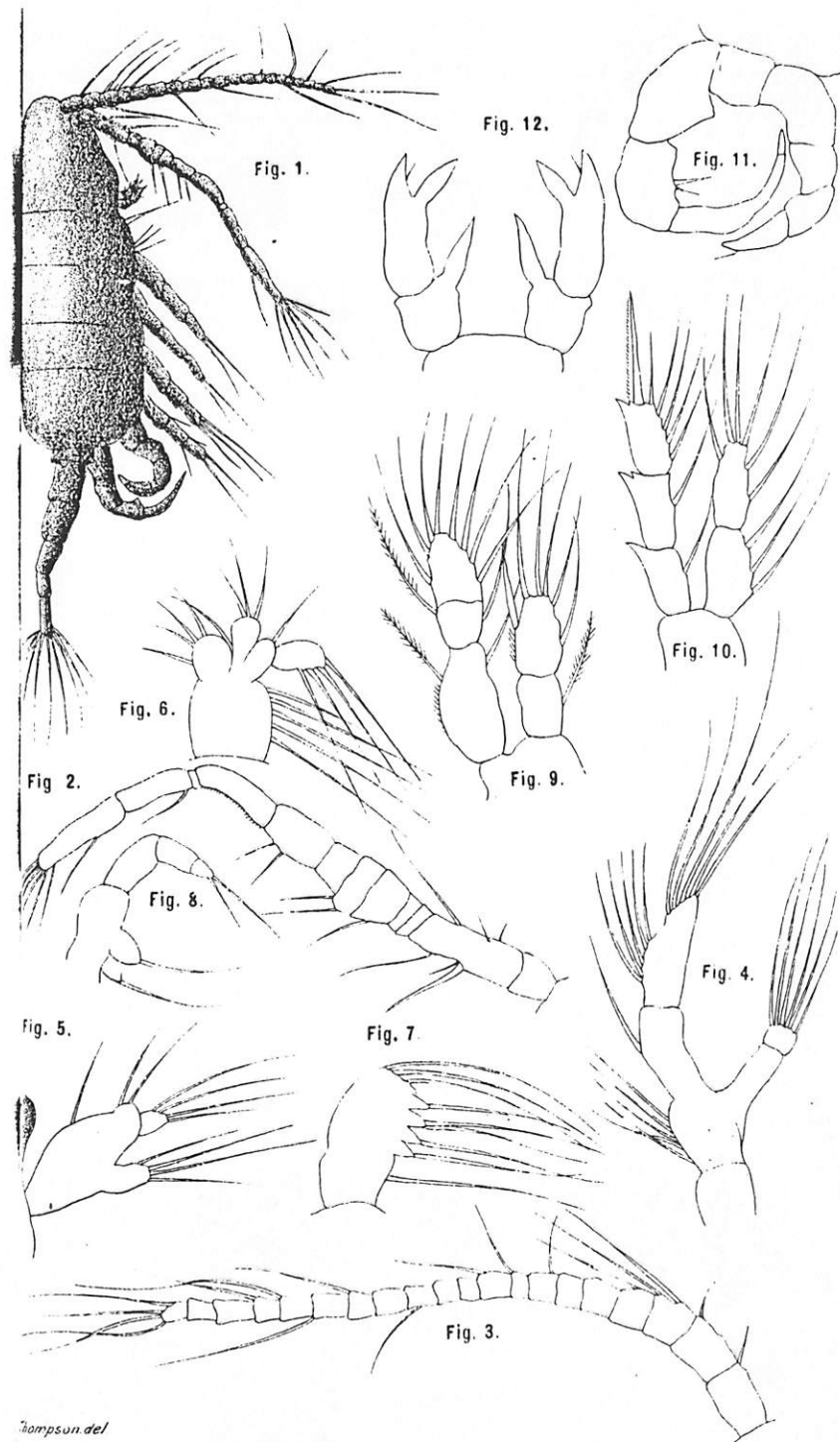
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| Fig. 1. | Male, lateral view ... | 1 in. | Ross. obj. |
| Fig. 2. | ,, right anterior antenna $\frac{1}{4}$.. | Gundlach ,, | |
| Fig. 3. | Female ,, ,, $\frac{1}{4}$.. | ,, ,, | |
| Fig. 4. | Posterior antenna ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 5. | Mandible and palp ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 6. | Maxilla ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 7. | Anterior footjaw ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 8. | Posterior ,, ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 9. | Foot of first pair ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 10. | ,, fourth pair... .. | $\frac{1}{4}$.. | ,, ,, |
| Fig. 11. | Fifth pair of feet, male ... | $\frac{1}{4}$.. | ,, ,, |
| Fig. 12. | Fifth pair of feet, female ... | $\frac{1}{4}$.. | ,, ,, |

PLATE XIX.

Corethron unguiculatum, n. sp.

× 1,500.

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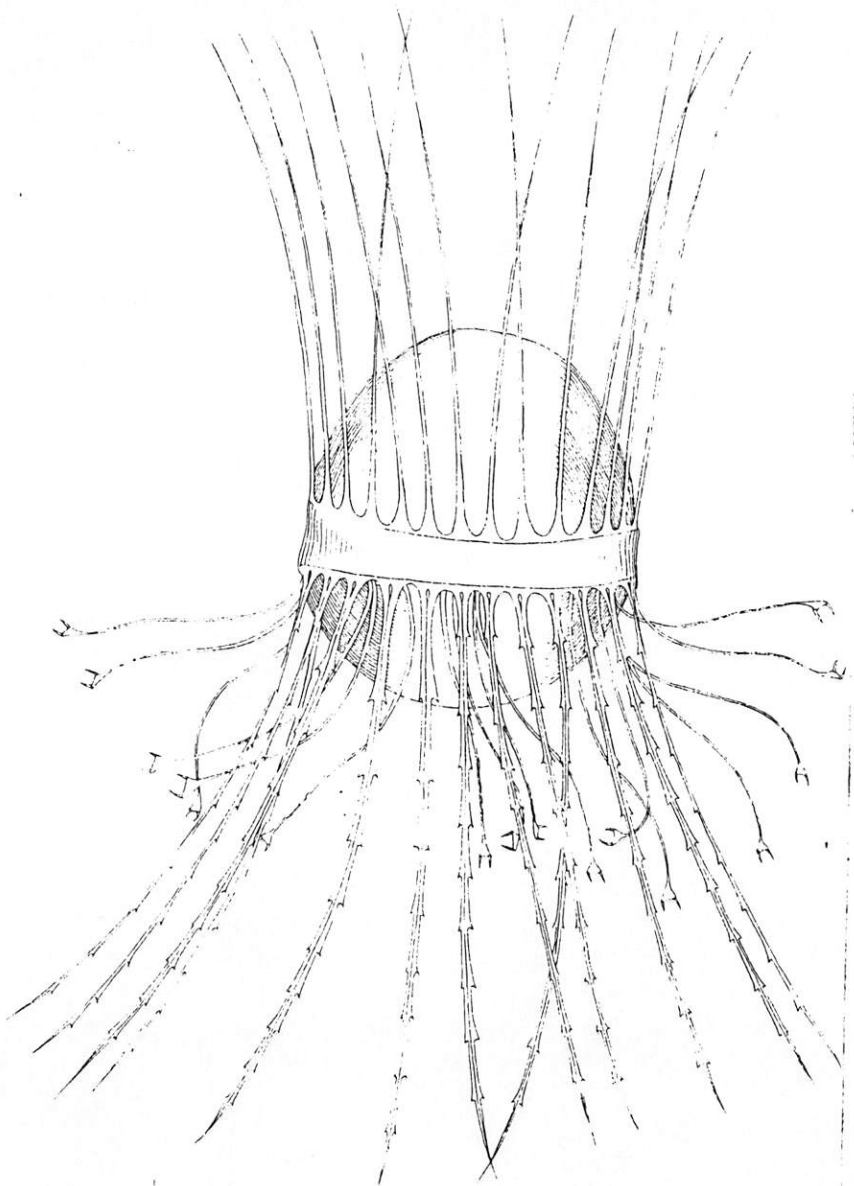


Tompson del

PARACARTIA ANTARCTICA, n. sp.

CORETHRON UNGUICULATUM, n. sp.

Boer del.



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