

LIBRARY
Division of Crustacea

Miss M. J. Reichenow

with the author's compliments.

CRUSTACEA OF SOUTHERN PATAGONIA

BY
A. E. ORTMANN

276803

PART VI.

CRUSTACEA OF SOUTHERN PATAGONIA.

BY

A. E. ORTMANN,

CARNEGIE MUSEUM, PITTSBURGH.

LETTER OF TRANSMITTAL.

Sir:

I have the honor to transmit herewith the report on the recent Crustacea collected in Patagonia by Mr. J. B. Hatcher.

The collection is a small one, and contains, of marine forms, only such as are more or less well known, adding, however, for some of them new localities on the eastern coast of Patagonia, a region that scarcely has been properly investigated.

The most valuable part of the collection consists of freshwater Crustaceans found by Mr. Hatcher in the interior of southern Patagonia: among them are several very important new and rare species.

Very respectfully, your obedient servant,

ARNOLD E. ORTMANN, PH.D

DR. W. B. SCOTT,
PROFESSOR OF GEOLOGY,
PRINCETON UNIVERSITY.

INTRODUCTION.

The collections of Crustaceans made by Mr. J. B. Hatcher in southern Patagonia are partly marine, partly freshwater. The following are localities from which marine forms have been secured: they are all close to the shore, in shallow water, and are situated—with the exception of the first—on the eastern coast of Patagonia.

1. Punta Arenas, Straits of Magellan.
2. Gallegos, at the mouth of the Gallegos River, South Patagonia.
3. Cape Fairweather, entrance of Gallegos Bay, northern side.

4. Mount of Observation, about 50 miles southwest of Santa Cruz.
5. Mouth of Santa Cruz River, situated at about 50° S.
6. San Julian, about 50 miles northeast of Santa Cruz.

Freshwater material has been collected at numerous localities in the interior. This has been numbered by Mr. Hatcher according to stations, and the character and description of each station is given in the text under each species. All these stations are situated in the region of the Rio Chico (northern tributary of the Santa Cruz River), from near the ocean up to the foothills of the Cordilleras, in 47–50° S. The localities Sierra Oveja and Sierra Ventana are on the Rio Chico. Arroyo Gio is in the foothills of the Cordilleras.¹ The highest altitude at which specimens were obtained is at about 2,000 feet.

LIST OF SPECIES REPRESENTED IN THE COLLECTION.

CIRRIPEDIA.

1. *Lepas anatifera* L.
2. *Elminius kingi* Gr.
3. *Balanus lævis* Brug.

COPEPODA.

4. *Pseudoboeckella longicauda* (Dad.).
5. *Pseudoboeckella entzi* (Dad.).

BRANCHIOPODA.

6. *Herpetocypris obliqua* Dad.
7. *Eucypris sarsi* Dad.
8. *Daphnia hastata* Sars.
9. *Lepidurus hatcheri* sp. nov.
10. *Branchinecta granulosa* Dad.

ISOPODA.

11. *Iais pubescens* (Dan.).
12. *Edotia tuberculata* (Guér.).
13. *Rocinela australis* Sch. & Mein.
14. *Exosphaeroma gigas* (Leach).
15. *Exosphaeroma lanceolatum* (Wh.).
16. *Cymodocea darwini* Cunn.
17. *Dynamene catoni* Mrs.
18. *Cassidina emarginata* M.–E.

¹See Hatcher, J. B., Rep. Princeton Exped. Patagonia, vol. 1, Narrative and Geography, map.

19. *Scrolis paradoxa* (Fabr.).

AMPHIPODA.

20. *Hyalella patagonica* sp. nov.

DECAPODA.

21. *Lithodes antarctica* Jacq.

22. *Paralomis granulosa* (Jacq.).

23. *Munida subrugosa* Dan.

24. *Munida gregaria* (Fabr.).

25. *Eurypodius latreillei* Guér.

26. *Haliparus planatus* (Fabr.).

27. *Hypopeltarium spinosulum* (Wh.).

Further, there are a few marine *Amphipoda*, and some *wood-lice* in the collection, but the material is too scanty to justify an attempt at identification.

Order CIRRIPIEDIA.

Family *LEPADIDÆ* Darwin.

LEPAS Linnæus.

LEPAS ANATIFERA Linnæus.

1851 *L. a.*, Darwin, Mon. Cirr. Lep., p. 73, pl. 1, f. 1.

1897 *L. a.*, Weltner in: Arch. f. Naturg., v. 1, p. 244.

Locality.—Mouth of Santa Cruz River, two small colonies of young individuals upon fragments of kelp.

Distribution.—Almost cosmopolitan.

Family *BALANIDÆ* Darwin.

ELMINIUS Leach.

ELMINIUS KINGI J. E. Gray.

1854 *E. k.*, Darwin, Mon. Cirr. Bal., p. 348, pl. 11, f. 6.

1897 *E. k.*, Weltner in: Arch. f. Naturg., v. 1, p. 256.

Locality.—Punta Arenas, 1 specimen.

Distribution.—Falkland Islands; Tierra del Fuego; Chiloë; Chili. Shallow water.

BALANUS da Costa.

BALANUS LÆVIS Bruguière.

1854 *B. l.*, Darwin, Mon. Cirr. Bal., p. 227, pl. 4, f. 2.

1897 *B. l.*, Weltner in: Arch. f. Naturg., v. 1, p. 263.

Locality.—Punta Arenas, numerous specimens.

Distribution.—Tierra del Fuego and Straits of Magellan; Chili; Peru; California. On the Atlantic coast of South America northward to Rio Grande do Sul, South Brazil. 0–20 fathoms.

Remarks.—All our specimens represent the typical variety of this species.

Order COPEPODA.

Family CENTROPAGIDÆ Giesbrecht.

PSEUDOBOECKELLA Mrazek.

The original genus *Boeckella* of Guerne and Richard (1889, p. 151), created for the preoccupied *Boeckia* of Thomson (1883) was divided by Mrazek (1901) and von Daday (1902) into several genera. Of course, Mrazek's names have the priority. Unfortunately both divisions do not completely agree, and the names chosen by either author are apt to give origin to confusion. Generally, we may say that *Pseudoboeckella* of Mrazek corresponds to *Boeckella* of v. Daday, and *vice versa*, although Mrazek puts *B. bergi* Rich. into a separate genus (*Boeckellopsis*), while it is included in v. Daday's *Pseudoboeckella*; and although *B. brevicauda* Brad., which is included in v. Daday's *Boeckella*, forms the genus *Para-boeckella* of Mrazek.

The two species mentioned here have been described by v. Daday under *Boeckella* (sens. strict.), and seem to belong to *Pseudoboeckella* of Mrazek.

PSEUDOBOECKELLA LONGICAUDA (Daday).

1901 *Boeckella l.*, v. Daday in: Term. Füz., v. 24, p. 346.

1902 *B. l.*, v. Daday, *ibid.*, v. 25, p. 243, pl. 6, f. 10–14, 16.

<i>Localities.</i> —Stat. 2	2 ♂ about 25 ♀
Stat. 6	2 ♀
Stat. 34	1 ♀

Distribution.—Swamp near Amenkelt, lower Rio Santa Cruz, Patagonia (about 50° S., 69° W.).

Remarks.—Our specimens agree perfectly with v. Daday's description.

PSEUDOBOECKELLA ENTZI (Daday).

1901 *Bocckella c.*, v. Daday in: Term. Füz., v. 24, p. 345.

1902 *B. e.*, v. Daday, *ibid.*, v. 25, p. 239, pl. 6, f. 3-9.

Localities.—Stat. 4. Pool, drying up, 10 miles above Sierra Ventana. 6 ♂ 13 ♀

Stat. 26 5 ♂ 5 ♀

Distribution.—Known from swamps and pools of several localities in the region near the mouth of the Santa Cruz River, Patagonia (about 50° S., 68-69° W.).

Order BRANCHIOPODA.

Suborder OSTRACODA.

Family CYPRIDÆ.

HERPETOCYPRIS Brady.

HERPETOCYPRIS OBLIQUA Daday.

1902 *H. o.*, v. Daday in: Term. Füz., v. 25, p. 296, textf. a, b, pl. 15, f. 8-13.

Localities.—Stat. 2 27 spec.
Stat. 6 about 10 empty shells.
Stat. 34 3 spec.
Stat. 53 24 spec.

Distribution.—Swamps near Amenkelt, lower Santa Cruz River, Patagonia.

EUCYPRIS Vavra.

EUCYPRIS SARSI Daday.

1902 *E. s.*, v. Daday in: Term. Füz., v. 25, p. 294, textf. a-c, pl. 15, f. 1-7.

Locality.—Stat. 4 Pool, drying up, 10 miles above Sierra Ventana, Rio Chico. 14 specimens.

Distribution.—Swamp near Amenkelt, lower Santa Cruz River, Patagonia (about 50° S., 69° W.).

Remarks.—As v. Daday states, only young individuals possess the peculiar sculpture of the shell by longitudinal ridges represented in the figures 1 and 2 on v. Daday's plate 15.

Suborder CLADOCERA.

Family *DAPHNIDÆ* Dana.

DAPHNIA O. F. Mueller.

DAPHNIA HASTATA Sars.

1896 *D. pulex* var. *hastata* Richard in: Ann. Sci. nat. Zool. ser. 8, v. 2, p. 246, pl. 24, f. 16, pl. 25, f. 12, 18.

1902 *D. hastata* v. Daday in: Term. Füz., v. 25, p. 279, pl. 11, f. 11, 12.

Localities.—Stat. 4 Pool drying up, 10 miles above Sierra Ventana.
40–50 specimens, all ♀.

Stat. 26

a few ♀.

Distribution.—*D. pulex* var. *hastata* is found, according to Richard, in Europe (Austria, Russia, Norway). The Patagonian form has been recorded by v. Daday from Misionaros on the lower Santa Cruz River (49° 59' S., 68° 33' W.).

Remarks.—Our specimens correspond to the Patagonian form described under this name by v. Daday. As v. Daday himself admits, this is not exactly the same form as that described by Richard as *D. pulex* var. *hastata*.

Suborder PHYLLOPODA.

Family *APODIDÆ* Burmeister.

LEPIDURUS Leach.

LEPIDURUS HATCHERI sp. nov.

(Plate XLVIII, Figs. 1a and 1b.)

Locality.—First water hole north of basalt ridge, 50 miles from Rio Chico. 1,950 feet. 26 Febr., 1899.—2 ♀. (Foothills of Cordilleras, about 47–48° S.)

Description.—Scutum large, suboval, emarginate behind, covering about two thirds of the body. Of the abdomen, 9 or 10 segments (including telson) are uncovered. Eyes elliptic, closely approaching one another in

front, diverging behind. First cervical furrow almost straight, second one strongly curved backward in the middle, and slightly shallower in the middle, but distinct. Median keel indistinct anteriorly, very distinct posteriorly. Lateral margins smooth, only near the posterior corners, for a short distance, very finely crenulated. Posterior emargination with small, somewhat irregular spinules, the median one (end of median keel) the largest. Supra-antennal keel slightly sinuate, apparently smooth, but under the lens there are fine and minute granulations.

Flagella of first pair of feet short, unequal, slightly depressing the margins of the scutum. Free abdominal segments spinulose, about 6-8 spinules on upper side; these are larger, straight, and arranged somewhat irregularly; those of the ventral side are smaller, numerous.

Telson (fig. 1*b*) on upper side, near base of cercopoda, on either side with a small, spinulose tubercle. Caudal flap elongate, over twice as long as wide at the base, with parallel margins, sublanceolate at the end and rounded; distal half of margin spinulose, with the strongest spinule at the end. Upper surface with a median, longitudinal keel bearing four strong spinules.

Cercopoda almost as long as the rest of the body, thickly covered with bristles.

Color deep green, lower parts pale greenish, mandibles brownish.

Size: Length of body 40 and 46 mm. Total length of larger individual (including cercopoda), 77 mm.

Remarks.—At first there seemed to be no doubt to me that our specimens ought to be referred to *L. patagonicus* Berg (1900), which comes from near the same region (Territ. of Chubut), but a careful comparison of our specimens with Berg's description reveals the following discrepancies:

1. Of the abdomen, only 10 segments are exposed in our species, while in *L. patagonicus* 15-16 are seen. Thus the abdomen of the latter appears to be longer.

2. In *L. patagonicus* the eyes are said to be suboval, and not to approach one another anteriorly, while in our species they are elliptic and distinctly convergent in front.

3. The lamina caudalis, in *L. patagonicus*, is one third longer than broad; in our species it is distinctly more than twice as long as broad. This is the most striking difference. Through the kindness of Mr. A. J.

Pendola of the museum in Buenos Aires, I possess sketches of the caudal flap of Berg's species, which show that it is only very slightly longer than broad.

4. There seems to be more of a ferruginous color on the lower side of the body in *L. patagonicus*.

5. The size of *L. patagonicus* is smaller, body 30–35 mm., and including cercopoda, 43–46 mm., while our species, without cercopoda, reaches 46 mm.

Berg describes a male, while our specimens are females, but I hardly believe that the above differences are due to sex, since it is characteristic in this family that ♂ and ♀ hardly differ, except for the smaller size of the ♂, and the larger caudal flap of the ♂. While the first character would apply to this case, the second does not, the caudal flap being much larger in our ♀. On the other hand, the longer abdomen in the ♂ would agree with the same condition found in the ♂ of *L. bilobatus*.

For the rest, our species resembles *L. angasi* Baird (1866, p. 122, pl. 12, f. 1) from South Australia (Adelaide). Here the general form of the body and the characters of the various parts are almost identical, and I find only the following differences:

1. *L. angasi* is much smaller (1 inch = 25 mm.).
2. The body is of horn-color instead of green.
3. The spinules of the abdomen are curved downward in *L. angasi*, while they are straight in our species.

In all other respects, both species are closely allied, especially the following important characters agree:

1. Number of exposed abdominal segments: 12 in *L. angasi* (according to figure), 10 in our species.
2. Eyes of the same size and shape (according to figure of *L. angasi*).
3. Keel of scutum, and fine dentations on posterior part of lateral margins similar in both.
4. Cervical furrows identical (according to figure of *L. angasi*).
5. Caudal flap absolutely identical in form, but it seems that the margins are denticulated all around in *L. angasi*.

The apparently close affinity of our species with the South Australian *L. angasi* demands an investigation of the relationship of it with the other known species of the genus, and we may state the following:

1. *L. glacialis* (Kr.) (see Simon, 1886). Arctic regions.

For a comparison with our species this is out of the question, on account of the short flagella of the first legs, and the very short caudal flap.

2. *L. lubbocki* (Brauer), from Sicily and Algiers, and *L. macrurus* Lilj. from Archangel, Russia (see Simon, 1886), have a carina of the scutum that is sharp from its beginning at the second cervical furrow down to the hind margin. These two species are closely allied to *L. apus* (L.) from Europe (see below), which is in some degree related to our species, but just in the character mentioned here they deviate more considerably from *L. hatcheri*, than *L. apus* does.

3. Of the North American species (see Packard, 1883), *L. bilobatus* Pack. from Colorado is entirely different in the bilobate caudal flap and the longer abdomen (12 segments exposed in the ♂, 16 in the ♀). *L. couesi* Pack. from Montana and Utah differs in the much shorter abdomen, and the longer and distinctly spatulate caudal flap. *L. packardi* Simon (1886, p. 448) from California differs at once in the very short abdomen, in the second cervical furrow, which is interrupted in the middle, and in the median keel of the caudal flap, which has 7-8 spines.

4. Of the other Australian species (aside from *L. angasi*), *L. viridis* Baird (1850, p. 254, pl. 17, f. 1) from Tasmania has a distinct carina of the scutum, and the caudal flap is oval (narrower at the base). *L. viridulus* Tate (1876, p. 136, and Brady, 1886, page 88, textfig. E) from Adelaide has the abdomen very short, and the caudal flap is distinctly spatulate.

5. The two New Zealand species, *L. kirki* and *compressus* Thomson (1879, p. 260, pl. 11, f. 4, 5) are also distinctly different: in *L. kirki* a much larger part of the abdomen is covered, and, although the caudal flap resembles somewhat that of *L. hatcheri*, it is shorter. *L. compressus* is entirely different in the shape of the scutum, which is oval and narrow, keeled only posteriorly; the caudal flap is much shorter and the margin of the scutum is smooth.

Thus there only remain for comparison *L. apus* from central and northern Europe, and *L. angasi* from South Australia. Of these, *L. apus* (L.) resembles our species in general form, length of abdomen (8 exposed segments), in the character of the carina of the scutum; but it differs:

1. In the second cervical furrow, which is interrupted in the middle.
2. In the caudal flap, which is oval, narrower at the base, and about twice as long as wide.

3. In the eyes, which are said to be reniform.

L. angasi is still more closely allied to *L. hatcheri*, as has been demonstrated above, especially the caudal flap is almost identical. This close relation of these two species is especially interesting from a zoögeographical point of view.

Family *BRANCHIPODIDÆ* Baird.

BRANCHINECTA Verrill.

BRANCHINECTA GRANULOSA Daday.

(Plate XLVIII, Fig. 2.)

1902 *B. g.* von Daday in: Term. Füz., v. 25, p. 288, pl. 13, f. 3-14, pl. 14, f. 1, 2.

Localities. — Pools near Sierra Ventana, 1898. — 5 ♂. Stat. 4, Pool drying up, 10 miles above Sierra Ventana. — 6 ♂, 11 ♀. 5 miles above Sierra Oveja. — Numerous ♂ and ♀, poorly preserved. Pool, 25 miles above Sierra Oveja, Febr. 21, 1899. — 5 ♂, 14 ♀.

(All these localities are in the region of the Rio Chico, in about 49° S., and 70-71° W.)

Distribution. — Swamp near Amenkelt (lower Santa Cruz River), Patagonia (50° S., 69° W.).

Description. — Allied to *B. coloradense* Packard (1883, p. 338, textfig. 19) from Colorado and (according to Lilljeborg) Fresno, California, and still more closely to *B. iheringi* Lilljeborg (1891, p. 424, and v. Ihering, 1895, p. 178) from Rio Grande do Sul, Brazil.

The chief differences are found in the male claspers (second antennæ) (fig. 2), which are very robust and long (extended, almost as long as the anterior portion of the body). Basal joint subcylindrical, slightly curved, with a distinct tubercle (knob) at the base on inner side. Inner margin in the distal half with a prominent crest, the edge of which is finely dentate. The inner margin of first joint, between this crest and the basal knob, is concave. Second joint almost as long as the first, compressed and lamelliform, and a little narrower than the first joint, with nearly parallel margins; slightly concave on under side (if this joint is stretched out, the concave side is the outer side), curved, and near apex strongly bent, where the margins form a distinct lobe on each side, rendering the end of the second joint trilobate, the middle lobe being strongly deflected from the general plane.

In the female the claspers are very short, stout, straight, slightly tapering and suddenly truncated at the end, with the outer margin produced into a short spine. Ovisac very long, two thirds as long as the abdomen, reaching to the penultimate abdominal segment; its end pointed.

Caudal appendages, in both sexes, rather long, about twice as long as the terminal segment.

Length of body (in male and female), about 15 mm.

Remarks. — I had drawn up the above description, before I became acquainted with von Daday's paper. After having seen the latter, I was at once convinced that our specimens belong to this species, although my description does not agree completely with that given by von Daday, But this seems to be due to a different interpretation we have given to the microscopic image, and after a renewed examination, I do not see any reason why I should alter my original account.

The description of *B. iheringi*, given by Lilljeborg, applies in some degree, as far as it goes, to our species. Lilljeborg says that there are a few small spinules on the inner side of the first joint of the male claspers, and that the second joint has, at the apex, a tubercle on the posterior margin, and a tuberosity on the anterior side. While this structure appears to be similar to that found in our species, the spinules of the first joint are, in the latter, represented rather by a denticulate crest, and, further, Lilljeborg does not mention the peculiar laminate form of the second joint, which, in our species, has no tubercles or tuberosities at the apex, but rather lamelliform lobes. (The peculiar shape of this joint is, in my opinion, not quite correctly understood by von Daday.) Finally *B. iheringi* is smaller than our species, only 8 mm. the ♀, 11 mm. the ♂, while *B. granulosa* attains, according to our material, 15 mm., and according to von Daday 15–18 mm. Thus *B. granulosa* seems to be different from *B. iheringi*, although closely allied to it.

Order ISOPODA.

Family *JAVERIDÆ* Sars.

IAIS Bovallius.

IAIS PUBESCENS (Dana).

1891 *I. p.*, Dollfus, in: Miss. Cap Horn, v. 6, p. 70, pl. 8, f. 13.

1900 *I. p.*, Stebbing in: Pr. Zool. Soc., p. 549, pl. 38.

Locality. — Punta Arenas, 29 specimens (parasitic on *Exosphæroma gigas*).

Distribution. — Falkland Islands; Tierra del Fuego; Straits of Magellan; South Georgia; New Zealand, Tasmania; Kerguelen Islands.

Family *EDOTIIDÆ* Dana.

EDOTIA Guérin-Ménéville.

EDOTIA TUBERCULATA Guérin-Ménéville.

1883 *E. t.*, Miers in: Journ. Linn. Soc. v. 16, p. 72, pl. 3, f. 3–6.

1891 *E. t.*, Dollfus in: Miss. Cap Horn. v. 6, p. 69, pl. 8*a*, f. 12.

Localities. — Punta Arenas, 7 sp.; Mouth of Santa Cruz River, 3 sp.; San Julian, 18 sp. (most of the latter young).

Distribution. — Falkland Islands; Tierra del Fuego; Straits of Magellan.

Family *CYMOTHEIDÆ* Hansen.¹

ROCINELA Leach.

ROCINELA AUSTRALIS Schioedte & Meinert.

1879 *R. a.*, Schioedte & Meinert in: Naturh. Tidsskr. (3), v. 12, p. 397, pl. 12, f. 13–16.

1898 *R. a.*, Richardson in: Pr. Amer. Philos. Soc., v. 37, p. 11.

Locality. — Gallegos, 1 ♀ adult.

Distribution. — Straits of Magellan.

Family *SPHÆROMIDÆ* White.

EXOSPHÆROMA Stebbing.

EXOSPHÆROMA GIGAS (Leach).

1891 *Sphæroma g.*, Dollfus in: Miss. Cap Horn, v. 6, p. 62, pl. 8*a*, f. 6.

1900 *Exosphæroma g.*, Stebbing in: Pr. Zool. Soc., p. 553, pl. 39 (and synonyma, excl. *lanceolatum* White).²

¹Subfamily: *Æginæ*, compare Hansen, H. J., Isopoden, Cumaceen und Stomatopoden der Plankton Exped. in: Ergebn. Plankton Exp., v. 2, G. c, 1895.

²*Sphæroma lanceolatum* of Dana, Cunningham, Miers, belongs to this species. Studer (1884), who had specimens from Kerguelen and New Zealand, as well as from the Straits of Magellan, keeps both sets separate, and calls the first by the name of *S. gigas*, the second by that of *S. lanceolatum*, but he does not give any characters, so that it is impossible to decide, whether his *S. lanceolatum* is really that of White.

Locality.—Punta Arenas, several hundred specimens, young and adult.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan. Shallow water. This species also has been reported from New Zealand, Auckland Islands, Australia, and Kerguelen Islands.

Remarks.—Our largest individuals attain the length of about 25 mm., by a width of about 15 mm. They all agree in the essential characters, and represent the typical form of *E. gigas*, as described and figured by Stebbing, with the only exception that in Stebbing's figure of the whole animal (pl. 39) the outer ramus of the uropods is broader than in our individuals, in which it is distinctly narrower, the end being sometimes subacute, sometimes rounded. In this respect, our specimens correspond better with the figure given by Dollfus, yet Dollfus says that there are variations in this respect.

EXOSPHEROMA LANCEOLATUM (White).

1843 *Spheroma gigas* var. *lanceolata* White in: Ann. Nat. Hist., ser. 1, v. 12, p. 345.

1891 *S. calcarea* Dollfus in: Miss. Cap Horn, v. 6, p. 64, pl. 8a, f. 7.

1900 *Exospheroma gigas* (pro parte) Stebbing in: Pr. Zool. Soc. (only single individual described on p. 557).

Localities.—Mouth of Santa Cruz River, 1 smooth, 14 sculptured specimens; San Julian, 3 smooth, 2 sculptured specimens.

Distribution.—Falkland Islands and Tierra del Fuego (region of Cape Horn). Shallow water to 95 m.

Description.—This species differs from the foregoing in the following particulars:

1. In the smaller size. While *E. gigas* attains 25 mm., Dollfus gives, for this species, only 12 mm., and our largest is 14 mm. White gives $\frac{3}{4}$ to 1 inch (18–25 mm.), but these measurements apparently include *E. gigas*.

2. In the epimera of the pereon-segments, which are abruptly bent down, so as to form a sharp angle with the middle of the back, which is sometimes cariniform. This character is very important, and never found in *E. gigas*.

3. In the sculpture of the posterior pereon-segments, of the pleon and telson. This sculpture varies considerably, but in *E. gigas* there is no sculpture at all.

4. In the more narrowed apex of the telson, which may be called sub-acute, and which is a little more produced than in *E. gigas*.

Remarks.—As regards the third character, given above, the original description of White says that the last joint of the abdomen has, near the base, a slight elevation, grooved in the middle. Stebbing says that there is, on the telson of the specimen he is inclined to refer to this form, a longitudinal groove between two elevations, and then a carina running to the end. I have asked for further information from Mr. Stebbing, and, in a letter, he kindly has furnished the additional character, that the last three segments of the peræon have, along the hind margin of each, four small tubercles.

Among our material, those specimens called the "smooth form," show exactly the characters given by White and Stebbing: a low elevation on the telson, divided by a groove, and an indistinct median keel running backward, so that there is no doubt that they belong to White's *S. lanceolatum*. I do not see, however, the four tubercles observed by Stebbing on the peræon-segments. The pleon and telson of these individuals possess fine granulations.

As regards *S. calcarea* of Dollfus, the chief characters are, beside the double keel in the anterior part of the telson, and the single median keel in the posterior, the distinct and prominent granulations on the posterior part of the body, chiefly on the telson. This character is strongly pronounced, among our specimens, in those that have been called above the "sculptured form." These granulations are somewhat irregular, and assume sometimes an almost vermiculate appearance. This form also shows the four little tubercles on the hind margins of the three posterior peræon-segments, observed by Stebbing. There is much variety in the degree of development of the granulations.

The fact that Dollfus mentions a smooth form, and that these two forms, the smooth and the sculptured, also have been found associated by Mr. Hatcher at Santa Cruz and San Julian, while the typical *E. gigas* is found not at all at these localities; and further, the fact that among the large number of *E. gigas* collected by Hatcher at Punta Arenas not a single individual of these forms has been discovered, is much in favor of the view that they really belong together, that is to say, to White's *S. lanceolatum*. All our specimens from Santa Cruz and San Julian differ in the same four characters, mentioned above, from *S. gigas*, and further,

Mr. Stebbing informs me that Dollfus' *S. calcarea* might very well be a form of that, which he is inclined to take for White's *S. lanceolatum*.

The question remains, whether Dollfus was justified in calling his species by the name of *S. calcarea* Dana. Dana's species came from Tierra del Fuego, but his description and figure (1852, p. 776, pl. 52, f. 2) do not give any characters that warrant this identification, and considering the adverse conditions by which Dana was hampered in the preparation of his figures and diagnoses (see Stebbing, 1900, p. 528), we had better disregard *S. calcarea* Dana altogether.

As regards the outer ramus of the uropods, which is given by White as an additional distinctive character of *S. lanceolatum*, I cannot say that it is very distinct from that of *E. gigas*. It is lanceolate, mostly rounded at the apex, but sometimes subacute, and offers about the same shape and variations as in *E. gigas*.

This species also belongs to the genus *Exosphaeroma* as defined by Stebbing.

CYMODOCEA Leach.

CYMODOCEA DARWINI Cunningham.

1871 *C. d.*, Cunningham in: Trans. Linn. Soc., v. 27, p. 499, pl. 59, f. 1.

1884 *C. d.*, Studer in: Abh. Akad. Berlin, p. 18, pl. 2, f. 6.

1886 *C. d.*, Beddard in: Rep. Voy. Challenger, v. 17, p. 150.

1891 *C. d.* Dollfus in: Miss. Cap Horn, v. 6, p. 65, pl. 8, f. 8.

Localities. — Mouth of Santa Cruz River, 1 sp. — San Julian, 1 sp.

Distribution. — Falkland Islands; Tierra del Fuego; East coast of S. Patagonia (off Port Desire, 47° S.); Kerguelen Islands. 0–127 fathoms.

DYNAMENE Leach.

DYNAMENE EATONI Miers.

1875 *D. e.* Miers in: Ann. Nat. Hist., ser. 4, v. 16, p. 73.

1879 *D. e.* Miers in: Philos. Trans., v. 168, p. 203, pl. 11, f. 2.

1891 *D. e.* Dollfus in: Miss. Cap Horn, v. 6, p. 66, pl. 8, f. 9.

Locality. — San Julian, 1 sp.

Distribution. — Tierra del Fuego (region of Cape Horn); Kerguelen Islands.

CASSIDINA Milne-Edwards.

CASSIDINA EMARGINATA Milne-Edwards.

1887 *C. e.* Pfeffer in: Jahrb. Hamburg. Wiss. Anstalt., v. 4, p. 103, pl. 2, f. 9, 10, pl. 5, f. 23-30, pl. 6, f. 1-10.

1891 *C. e.* Dollfus in: Miss. Cap Horn, v. 6, p. 67, pl. 8, f. 10.

1901 *C. e.* Stebbing in: Proc. Zool. Soc., p. 562.

Localities. — Punta Arenas, 1 ♂; Mouth of Santa Cruz River, 12 sp. (♂ and ♀); San Julian, 7 sp. (♂ and ♀).

Distribution. — Falkland Islands; Tierra del Fuego; Straits of Magellan; Channels of western Patagonia; South Georgia; Kerguelen Islands. 0-120 m.

Family SEROLIDÆ Dana.

SEROLIS Leach.

SEROLIS PARADOXA (Fabricius).

1884 *S. p.* Beddard in: Rep. Voy. Challenger, v. 11, p. 33, pl. 5, f. 12-14.

1891 *S. p.* Dollfus in: Miss. Cap Horn, v. 8, p. 61, pl. 8a, f. 4 (*nec* f. 5).

Locality. — Punta Arenas, 34 sp.

Distribution. — Falkland Islands; Tierra del Fuego; Straits of Magellan. Shallow water.

Remarks. — On Dollfus' plate 8a, the figures 4 and 5 are transposed, fig. 4 representing this species, while fig. 5 is *S. schythei* Ltk. (In the explanation of the plate, p. 76, the opposite is stated.)

Order AMPHIPODA.

Family ORCHESTIIDÆ Dana.

HYALELLA S. J. Smith.

HYALELLA PATAGONICA spec. nov.

(Plate XLVIII, Figs. 3, a-h.)

Localities. — This species seems to be very abundant in southern Patagonia. Hatcher has collected it at about 30-35 localities in the region of the Rio Chico (47-50° S.), from near the coast to the Cordilleras (highest altitudes: 1,750 and 2,000 feet). It is found in springs, small streams and pools of fresh water, sometimes slightly alkaline (Arroyo Gio).

Distribution. — Although a new species, some previous references might possibly belong to it. As we shall see below, a locality from which Faxon mentions *H. dentata inermis*, may belong to this species, namely: Puerto Bueno, Smyth Channel, Straits of Magellan. The same form, *H. inermis* has been mentioned by Wierzejski (1892, p. 187) from a stream that issues from a lagune near Mendoza (northern Argentina), the water of which has an odor of sulphur. However, what this form really is, remains to be seen.

Cunningham (1871, p. 498, pl. 59, f. 14) mentions *Allorchestes patagonicus* from a freshwater stream near Punta Arenas. He does not give any description, since his single specimen was considerably injured, and the figure is quite poor, and, no doubt, even incorrect. It is possible that our species was intended, but we have no means of deciding this, and *Allorchestes patagonicus* must remain a "nomen nudum."

Description. — Body rather robust, general form agreeing with that of *H. dentata inermis* Sm. Eyes small, black, rounded, about twice their diameter distant from one another.

Antennulæ longer than the stalk of the antennæ, a little more than half as long as the whole of the antennæ. First and second joint of peduncle of the same length, third a little shorter. Flagellum with 10–12 joints in the ♂, and with 8–10 joints in the ♀.

Antennæ about one third as long as the body, or even shorter. The first joint of the peduncle short, the second a little longer, the third distinctly longer than the second. Flagellum with 12–17 joints in the ♂, and with 9–14 joints in the ♀.¹

Maxillipeds (fig. 3, *a*) of the usual form, but all the joints are more slender than in *H. dentata inermis*.

First gnathopod of the ♂ (fig. 3, *b*): Meropodite with a blunt prominence on the inferior margin, which is beset with a number of setæ. Carpopodite about twice as long as meropodite (measured from the middle of the articulation with meropodite to the middle of articulation with propodite), upper margin with a sharp spine near the distal end, which has a group of setæ; lower margin with a very prominent, lobiform, rounded projection, the margin of which is fringed with stiff setæ. Propodite almost triangular, almost as wide as long, and about as long as carpopo-

¹The number of joints of the flagella of both antennule and antennæ varies with age: it is less in young individuals, greater in adults. Often the number differs on either side; this difference, however, is always slight, only amounting to one or two joints.

dite; palmar margin oblique, nearly straight, with several rows of setæ, which become spine-like at the outer end; just below this end there is a group of more numerous setæ. There is no excavation to receive the tip of the dactylus. Outer surface of palm with an oblique row of setæ. Dactylopodite slender, slightly curved.

First gnathopod of ♀ (fig. 3, *c*) similar to that of the ♂, but propodite less distinctly triangular, and accordingly, less wide in proportion to length.

Second gnathopod of ♂ (fig. 3, *d*): meropodite with a triangular, pointed prominence on the lower margin. Carpopodite about as long as meropodite, with a narrow, pointed prolongation of the lower margin, which is longer than the width of the rest of the carpopodite. Palm (measured along the upper border) about 4 times as long as carpopodite, triangular, swollen, in general form very similar to that of *H. dentata inermis*. Palmar margin oblique, very slightly sinuous, with a series of small spines; the lower (outer) end with a depression to receive the tip of the dactylopodite, and around this depression with 2-3 stronger spines. Dactylopodite slender and curved.

Second gnathopod of ♀ (fig. 3, *e*) similar to the first gnathopods of ♂ and ♀, but meropodite with the prominence of the under margin more pronounced (but not triangular and pointed, as in the second gnathopod of the ♂); process of lower margin of carpopodite a little longer than that of the first gnathopod, and palm still more elongated, distinctly longer than the carpopodite, and less triangular than that of the first gnathopod of the ♀. (This is very dissimilar to that of *H. dentata inermis*.)

Peræopods: First (fig. 3, *f*), second and third of about the same length, fourth longer than third, fifth (fig. 3, *g*) about as long as fourth. The last (fifth) extends backward a little beyond the tip of the first uropod. Basipodite of third to fifth enlarged, oval, that of fifth pair larger than those of the third and fourth. Hind edge of third, fourth and fifth serrated, most distinctly so in the fifth. Accessory branchiæ on the first to the fifth peræopods. No ordinary branchiæ on fifth.

Uropods (fig. 3, *h*): First and second with spines on both rami. Third uropods: ramus about as long as the peduncle, only slightly extending beyond telson.

Telson (fig. 3, *h*), almost semicircular, or, more correctly, half-elliptic, with a pair of fine setæ on the rounded hind margin.

Color (in alcohol) whitish or grayish.

Length of large ♂ : 14–16 mm.

Remarks.—The following species of *Hyalella* have been described, which approach more or less closely the present one :

1. *H. dentata* Smith (1874, Geol. Surv., p. 608, pl. 1, f. 3–6, and Rep. Fish Comm., p. 645, pl. 2, f. 8–10), United States.¹

2. *H. inermis* Smith (1874, Geol. Surv., p. 609, pl. 1, f. 1, 2). Colorado, Utah, Florida.

This form is given by Faxon (1876, p. 373, textfig. 35) as *Allorchestes dentatus* var. *inermis* from the region of Lake Titicaca, from San Antonio, Peru (saline water, 3,300 feet above the sea), and from Puerto Bueno, Smyth Channel, Strait of Magellan (probably fresh water).

Faxon further describes (1876, pp. 374, 375, textfigs. 36, 37):

3. *Allorchestes dentatus* var. *gracilicornis* Fax., from near Campos (Rio de Janeiro), Brazil.

4. *Allorchestes longistilus* Fax., from the same locality.

Wrzesniowski (1879, pp. 176, 177, 199) describes :

5. *Hyale jelskii* Wrz., from Peru, east side of Cordilleras, 8,000 feet (Pumamarca).

6. *Hyale lubomirskii* Wrz., from Peru, west side of Cordilleras, 8,000 feet (Pacasmayo).

7. *Hyale dybowskii* Wrz., from Peru, west side of Cordilleras, 7,000 feet (Paucal, Montana de Nancho).

Finally, Stebbing (1899, pp. 406, 407, pl. 32, *A, B*) describes :

8. *Hyalella warmingi* Stebb., from Lagoa Santa (Prov. Minas Geraes, Brazil).

9. *Hyalella meinerti* Stebb., from "Laguna di Espino."²

All these forms belong to the genus *Hyalella*, founded by S. J. Smith (1874), and more sharply defined by Stebbing (1899, pp. 397–398) in his key to the genera of the family *Orchestiidae*.

H. dentata from the United States differs from our species (and all the

¹As has been surmised by Smith and Faxon, this species is very likely identical with *Allorchestes knickerbockeri* Bate (1862, p. 36, pl. 6, f. 1) from New York, and possibly with *Amphithoe aztecus* Saussure (1858) from Vera Cruz, Mexico. If the latter should prove to be true, the specific name of *aztecus* should be used.

²I have tried to locate "Laguna di Espino," but have been unable to do so. Places called by the name of "Espino" are found in Honduras and Venezuela (prov. Guarico), but no "Laguna di Espino" is known to me.

rest) in the spiniform prolongation of the segments of the pleon. This character, however, seems to be of minor importance, since there are intergradations in this respect between the typical *H. dentata* and *H. inermis* in the United States (see Smith, 1874, Fish Comm., p. 647; specimens from Florida). Faxon regards *H. inermis* only as a variety of *H. dentata*.

In all other characters, *H. dentata* as well as *H. inermis* are closely allied to our species, especially the following characters agree:

1. General shape of body and eyes.
2. Length of antennulæ and antennæ. In *H. dentata* and *H. inermis* these are considerably shorter than half of the body.
3. Shape of the second gnathopod of the ♂. Especially the propodite is directly identical, as will be seen by comparing our figure (3*d*) with the figure of this joint of *H. dentata* (♂ ad.) given by Smith (1874, Geol. Surv., pl. 1, f. 3).
4. Relative length of the peræopoda.
5. Shape of uropods and telson.

The chief differences are the following:

1. The number of joints of both antennulæ and antennæ is greater in our species. Although these parts are about as long as those of *H. dentata* and *inermis*, the number of joints is slightly greater in *H. patagonica* (in *dentata* and *inermis*, 7–9 in the antennulæ, 8–12 in the antennæ; in *H. patagonica*, 8–12 in the antennulæ, 9–17 in the antennæ). The joints of the peduncles are a little different in length; while of those of the antennulæ, in *H. dentata* and *inermis*, the two distal ones are about alike, the last joint, in our species, is a little shorter than the second. In the antennæ, the second and third joints are alike in *H. dentata* and *inermis*, while, in *H. patagonica*, the third is distinctly longer than the second. These differences, however, seem to be of minor importance.

2. In the first gnathopod of the ♂ as well as the ♀, the propodite is, in *H. patagonica*, distinctly broader and more triangular; the propodite has a distinct lobiform prominence, which is much more developed than in *H. dentata* and *inermis*, and, consequently, the carpopodite appears shorter and broader in our species.

3. The same is true of the second gnathopod of the ♀: the carpopodite and propodite are shorter and comparatively broader in our species, and the process of the carpopodite is more pronounced. The propodite in *H. dentata* and *inermis* is much longer than in our species.

4. In our species, the meropodite of the second gnathopod of the ♂ has a triangular, pointed prominence on the lower margin, while in *H. dentata* and *inermis* this process is blunt and obtuse.

5. Size of our species much larger, up to 16 mm., while *H. dentata* and *inermis* measure not more than 6 mm.

Thus we see that *H. patagonica* differs from *H. dentata*, and especially from *H. inermis*, in some slight and unimportant features of the antennulæ and antennæ, and in some very marked characters of the first and second gnathopods of the ♂ and ♀, and in size. Nevertheless, these three forms seem to be very closely allied in the general shape of the body, length of antennulæ and antennæ, and the general shape of the chelæ of the second gnathopods of the ♂.

It remains doubtful, whether Faxon's *H. dentata* var. *inermis* from South America is really identical with the form of the United States. Faxon says that his Lake Titicaca specimens exhibit some differences in the shape of the propodite of the second gnathopods of the ♂, but his figure does not reveal them in a sufficient degree. Considering the fact that we possess several hundred individuals of our species, and that they all show a great uniformity in their characters, and that the differences mentioned above are constant among them, it is possible that also the Titicaca form — of which Faxon had only 6 specimens — might be a good species. As to the specimens from Peru and the Straits of Magellan, Faxon does not give any details of their characters, but I suspect very strongly that those from the latter locality really belong to our species.

H. dentata var. *gracilirostris* (Fax.) from Brazil differs at once from all others, discussed so far, in the much longer antennæ, which are half as long as the body. There may be other characters that differ, to which Faxon does not refer. He had only one female.

H. longistilus (Fax.) from Brazil differs at once in the third uropods, which are much longer, and in the longer antennulæ and antennæ. Carpopodite of second gnathopod of ♂ more oval, and less distinctly triangular.

H. jelskii (Wrz.) from Peru differs:¹

1. Antennulæ and antennæ much longer, and the antennæ of the ♂

¹Wrzesniowsky does not give any figures of his species, and consequently we cannot form, in some points, a good idea as to their characters. Nevertheless his descriptions are generally clear, and do mention characters that show conclusively that his species are different from *H. patagonica*.

are two thirds of the length of the body. Number of joints about the same as in our species (antennæ of ♂, 18 joints).

2. Shape of first gnathopod different, the carpopodite large, distinctly longer ($1\frac{1}{2}$ times as long as propodite).

3. In the second gnathopods of the ♂, carpopodite about one third of the propodite (expression ambiguous: "dreimal kuerzer"), and propodite apparently shorter than in our species. For the rest, the propodite seems to possess a similar shape, although the spinules of the palmar margin seem to be different.

4. The propodite of the second gnathopod of the ♀ seems to be quite different, being $2\frac{1}{2}$ times as long as broad.

5. No accessory branchiæ on the fifth peræopods.

6. Size smaller (5 mm.).

Thus it seems that this species is much more different from *H. patagonica* than *H. inermis*, especially in the shape of the antennulæ, antennæ and gnathopods.

H. lubomirskii (Wrz.) from Peru differs from our species :

1. Head shorter, and eyes oval (not round).

2. Antennulæ and antennæ longer (antennæ of ♂ over one half of the body). Number of joints slightly greater.

3. Second gnathopods of ♂ apparently similar to our species, but palmar margin cut into two lobes, and meropodite $1\frac{1}{2}$ times as long as carpopodite. In the ♀, the propodite is longer than in our species, almost twice as long as wide.

4. Size smaller (6 mm.).

Here the first gnathopods are apparently more like *H. patagonica* (carpopodite hardly longer than propodite). This species resembles more *H. inermis* in the first and second gnathopods, but head, eyes, antennulæ and antennæ are different.

H. dybowskii (Wrz.) from Peru differs from our species :

1. Eyes oval, dilated below.

2. Antennæ longer (half as long as body). Number of joints of antennulæ and antennæ near that of our species (antnl. 10-13, ant. 14-15).

3. Carpopodite and meropodite of second gnathopod about one third as long as propodite.¹ For the rest the first and second gnathopods seem

¹"Zweimal kuerzer." This expression is very ambiguous, in a double sense.

to resemble those of *H. patagonica*, although the description is very short and incomplete.

This species seems to be the most closely allied form among those described by Wrzesniowsky; it differs, however, distinctly in the shape of the eyes and the length of antennulæ and antennæ.

H. warmingi Stebb., from Lagoa Santa, Brazil.

This species differs at once and strikingly in the shape of the propodite of the second gnathopod of the ♂, which is more oval, and in the shape of the first gnathopod and the second gnathopod of the ♀. Also the antennæ are much longer, so that we do not need to compare it further.

H. meinerti Stebb., from "Laguna di Espino."

This is entirely different in the third uropods, which resemble those of *H. longistilus* (Fax.), and further, the shape of the first and second gnathopods and the length of the antennæ are quite unlike our species.

Thus we see that the species most closely allied to *H. patagonica* is *H. inermis* of the United States. According to Faxon, this species (or variety) is also found in Peru, near Lake Titicaca, and in the region of the Straits of Magellan. Yet Faxon regards differences in the shape of the first and second gnathopods not as specific characters, and thus it is quite possible that his South American specimens represent good species, different from *H. inermis*. I have said above that the differences of *H. patagonica* from *H. inermis*, although seemingly unimportant, are constant among the large number of our specimens, and consequently, I am forced to regard this Patagonian form as a new and good species.

The fact that the type of fresh-water amphipods, represented in the United States by *Hyalella dentata* and *inermis* extends, apparently, throughout America, over Central and South America to the Straits of Magellan, while this genus is found nowhere else, is very interesting from a zoögeographical point of view.

Order DECAPODA.

Family LITHODIDÆ Dana.

LITHODES Latreille.

LITHODES ANTARCTICA (Jacquinot).

1891 *L. a.*, A. Milne-Edwards in: Miss. Cap Horn, v. 6, p. 24.

1896 *L. a.*, Bouvier in: Ann. Sci. nat., ser. 8, v. 1, p. 23.

Locality.—Punta Arenas, 2 ♂ 1 ♀.

Distribution.—Tierra del Fuego; Straits of Magellan; northward to Chiloë. Shallow water.

PARALOMIS White.

PARALOMIS GRANULOSA (Jacquinot).

1891 *P. g.* A Milne-Edwards in: Miss. Cap Horn, v. 6, p. 20.

1896 *P. verrucosa* Bouvier in: Ann. Sci. nat., ser. 8, v. 1, p. 26.

1900 *P. granulosa* Stebbing in: Proc. Zool. Soc., p. 532.

Localities.—Punta Arenas, 4 ♂ 3 ♀; Cape Fairweather, 2 ♂ jun.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan. On the eastern Patagonian coast this species has been found as far north as Bahia Blanca (Prov. of Buenos Aires), 38° 42' S. (Berg, 1900), while on the western coast it does not seem to go beyond Trinidad Channel (50° S.).

Remarks.—According to Stebbing, the specific name of *P. granulosa* has to supersede that of *P. verrucosa*, having been published (on Jacquinot's plate) not later than in 1847, while *L. verrucosa* of Dana was published in 1852.

The two young individuals from Cape Fairweather correspond closely to *L. verrucosa* of Dana (1852, p. 428, pl. 26, f. 16). Both have the length of the carapace, 27 mm. The specimens from Punta Arenas are all larger, and most of them seem to be adult; the smallest, a soft shell female, is 61 mm. long (carapace only), and this one is intermediate in sculpture between the young and adult specimens; the tubercles of the surface are more crowded than in the latter, but a little more distant from each other than in the former. The same is true of the granulations of these tubercles, they being less developed than in *P. verrucosa*, but more strongly than in the adult individuals. Length of adult males: 92, 101, 107 mm.; of an adult female: 72 mm.

This leaves no doubt as to the identity of *P. granulosa* and *verrucosa*, the former being only the young stage of the latter, as already Bouvier (1896) maintained.

Family *GALATHEIDÆ* Dana.

MUNIDA Leach.

MUNIDA SUBRUGOSA Dana.

1888 *M. s.* Henderson in : Rep. Voy. Challenger, v. 27, p. 124.

1891 *M. s.* A. Milne-Edwards in : Miss. Cap Horn, v. 6, p. 36, pl. 2, f. 2.

Localities.—Punta Arenas, 1 ♂ 1 ♀ (ad.); San Julian, 29 jun.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan; along the Atlantic coast of Patagonia northward to off Monte Video; on the western coast northward to Messier Channel and Chiloë.

This species is also found in New Zealand, Auckland and Campbell Islands. A variety (var. *australiensis* Henderson, 1888, p. 125, pl. 13, f. 3) is found in Bass Strait, Australia.

Range in depth: southern localities 0–125 fath.; off Monte Video: 600 fath.

Remarks.—The specific differences of this species have been set forth best by A. Milne-Edwards, and I have been able to verify them in our material.

Henderson's *M. subrugosa* is the true *M. subrugosa*, although he also gives, among the synonyms, *Grimothea gregaria* (with a ?): he states expressly (p. 125) that no specimens representing the latter form were taken by the Challenger, and, further, he doubts the correctness of the identification of these two species.

MUNIDA GREGARIA (Fabricius).

1891 *M. g.* A. Milne-Edwards in : Miss. Cap Horn, v. 6, p. 32, pl. 2, f. 1.

1902 *M. g.* Benedict in : Proc. U. S. Mus., v. 26, p. 308, fig. 45, 46.

Locality.—Punta Arenas, 1 ♂ ad.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan.

It is doubtful whether this species is also found in New Zealand, since it has been confounded by some authors with *M. subrugosa*. A form allied to this is mentioned by Filhol (1885, p. 426) from Cook Strait, New Zealand: he distinguishes it well from *M. subrugosa*, but says that it is also not quite identical with "*Grimothea gregaria*," and proposes the name of *Grimothea novæ-zelandiæ* for it. See also Benedict, l. c.

Remarks.—Length of body of our specimen: 54 mm. (about as long

as Milne-Edwards' adult male). It agrees well with the description in every respect, but the spinules of the upper part of the carapace are less distinct, although present. The latter character seems to be not very important, since a variety of *M. subrugosa* (var. *australiensis*) also possesses a larger number of spinules on the carapace than the typical *subrugosa*.

Family *MAJIDÆ* Alcock.

EURYPODIUS Guérin-Ménéville.

EURYPODIUS LATREILLEI Guérin-Ménéville.

1891 *E. l.* A. Milne-Edwards in: Miss. Cap Horn, v. 6, p. 10.

Localities.—Punta Arenas, 1 ♂ ad. 15 ♂ jun., 1 ♀ ad. 4 ♀ jun.; Mount of Observation (near Santa Cruz) 1 ♂ ad. 2 ♀ jun.; Mouth of Santa Cruz River, 2 ♂ 1 ♀ (all jun.); San Julian, 1 ♀ jun.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan; northward, on the western coast, to Chili and Peru, and on the eastern coast to the Gulf San Matias (Rathbun, Pr. U. S. Mus., v. 21, 1898, p. 571). 0–70 fath.

Remarks.—Our series corresponds exactly to the account given of this species by A. Milne-Edwards, showing the identical differences of the characters in the different sexes and ages.

Family *HYMENOSOMIDÆ* Stimpson.

HALICARCINUS White.

HALICARCINUS PLANATUS (Fabricius).

1852 *H. p.* Dana, U. S. Expl. Exp., v. 13, p. 385, pl. 24, f. 7.

1852 *H. pubescens* Dana, *ibid.*, p. 386, pl. 24, f. 8.

1886 *H. plan.* Miers in: Rep. Voy. Challenger, v. 17, p. 281.

1891 *H. pl.* A. Milne-Edwards in: Miss. Cap Horn, v. 6, p. 27.

1900 *H. pl.* Stebbing in: Proc. Zool. Soc. p. 524, pl. 36, *B.*

Localities.—Punta Arenas, 6 ♂ ad. and half grown, 3 ♂ jun., 10 ♀; Mount of Observation, 1 ♀; Mouth of Santa Cruz River, 14 ♀; San Julian 1 ♂ jun., 7 ♀.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan. It has been found, on the east coast of Patagonia, at Cape Virgin

(entrance of Straits [of Magellan), and at Cape Blanco (47-48 S.); on the western coast it seems to extend to Chili.

This species has been recorded from New Zealand, Auckland Islands, Kerguelen Islands, Marion and Prince Edwards Islands. Range in depth: 0-150 fath.

On the Australian coast it is represented by the very closely allied species: *H. ovatus* Stps. (see Stebbing, l. c.).

Remarks.—The young ♂ from San Julian, and the three young ♂ from Punta Arenas, of the lengths: 2.5-3-3.5-4 mm., agree completely with Dana's *H. pubescens*, which is said to be one tenth of an inch long (= 2-3 mm.): the form of the carapace is more rounded (less transverse than in *H. planatus*), the walking legs (and sometimes the carapace) are slightly pubescent, and the sides of the male abdomen are parallel, with the exception of the last joint. A young ♂, 6 mm. long has the typical form of the male abdomen of *H. planatus*, but the form of the carapace is less transverse. The pubescence is not present. Larger males (from 10 mm. upward) acquire by degrees the greatly swollen chelipeds. Our largest male has the following measurements: Length 13 mm., width 16 mm.

Family *ATELECYCLIDÆ* Ortmann.

HYPOPELTARIUM Miers.

HYPOPELTARIUM SPINOSULUM (White).

1886 *Hypopeltarium spinosulum* Miers in: Rep. Voy. Challenger, v. 17, p. 211.

1891 *Peltarion spinulosum* (sic) A. Milne-Edwards in: Miss. Cap Horn, v. 6, p. 17.

1900 *Peltarion spinosulum* Stebbing in: Pr. Zool. Soc., p. 519.

Locality.—Punta Arenas, 3 ♂, 17 ♀, 19 jun.

Distribution.—Falkland Islands; Tierra del Fuego; Straits of Magellan; Chiloë; Chili; Valparaiso; Gulf San Matias, Argentina. 0-45 fath.

Remarks.—The specific name *spinosulum* was used by White in 1843, *spinulosum* by the same author in 1847; the latter form was accepted by all subsequent writers except Miers (1886) and Stebbing (1900).

The generic name *Peltarion* Jacquinot is correctly to be transcribed as *Peltarium*, and this is preoccupied; it has, therefore, to give way to *Hypopeltarium* Miers.

A. Milne-Edwards describes the rostrum of this species as bifid with two lateral teeth: in most of our individuals, however, it is three-spined, the median spine being entire; only in rare cases there is a slight emargination or notch at its distal extremity.

ZOÖGEOGRAPHICAL REMARKS.

Among the *marine forms* collected by Mr. Hatcher, four groups are distinguishable according to their geographical range:

1. *Cosmopolitan.*

Lepas anatifera L.

2. *West American* (California to Patagonia).

Balanus lævis Brug. (also in the Atlantic, northward to southern Brazil).

3. *Antarctic types.*

1. *Iais pubescens* (Dan.), also: S. Georgia, New Zealand, Tasmania, Kerguelen.

2. *Exosphæroma gigas* (Leach), also: New Zealand, Auckland, Australia, Kerguelen.

3. *Cymodocea darwini* Cunn., also: Kerguelen.

4. *Dynamene eatoni* Mrs., also: Kerguelen.

5. *Cassidina emarginata* M.-E., also: S. Georgia, Kerguelen.

6. *Munida subrugosa* Dan., also: New Zealand, Auckland, Campbell, Australia.

7. *Halicarcinus planatus* (F.), also: New Zealand, Auckland, Kerguelen, Marion, Prince Edward.

4. *Local types*, restricted to so called Magellanian province.

1. *Elminius kingi* Gr.

2. *Edotia tuberculata* Guér.

3. *Rocinela australiensis* Sch. & Mein.

4. *Exosphæroma lanceolatum* (Wh.).

5. *Serolis paradoxa* (F.).

6. *Lithodes antarctica* Jacqu.

7. *Paralomis granulosa* (Jacqu.).

8. *Munida gregaria* (F.).

9. *Eurypodius latreillei* Guér.

10. *Hypopeltarium spinosulum* (Wh.).

We see at once that, while the prevailing features of the southern Patagonian marine fauna are made up chiefly by peculiar species, another large part of the fauna shows unmistakable affinities to other Antarctic countries. Looking more closely upon the peculiar types (group 4), we are able to state the following particulars with regard to their relationship to other parts of the world.

The genera *Elminius*, *Edotia*, and *Eurypodius* do not find any closer relations elsewhere. *Exospharoma* and *Serolis* are distinctly Antarctic types, while the affinities of *Rocinela* and *Munida* are more or less cosmopolitan. There remain only the two *Lithodidae* and *Hypopeltarium*. The *Lithodidae* apparently are to be classed with those forms which possess a kind of bipolar distribution, but where the two polar areas are connected along the western coast of America. This has been called by the present writer "meridional distribution,"¹ and such cases are not considered to belong to "bipolarity" in the original sense. *Hypopeltarium*, which is represented in European waters by *Atelecyclus*, might be taken for a case of bipolarity, if it were not for the fact that a species of this genus lately has been discovered in the West Indian region.² This renders it impossible to regard this case (of *Hypopeltarium* and *Atelecyclus*) as one of bipolarity.

Examining the Antarctic types (group 3), we find that none of them can be regarded as a representative of any characteristic Arctic form, although among the five isopods the generic affinities need further investigation. This much is known, that all five of them are hardly represented in any part outside of the Antarctic regions. The same is true of *Hallicarcinus*, while *Munida*, as has been stated above, is cosmopolitan.

Thus, among the forms discussed here, the bulk is to be regarded as peculiar to this region, representing a local Magellanian fauna. A large part of this fauna exhibits characteristic Antarctic affinities, pointing to a former closer connection of the different parts (South America, New Zealand, Australia, Kerguelen, etc.). The remaining small number represent either immigrants from the north, along the western coast of America, or more or less cosmopolitan types.

The Magellanian fauna, according to this material—and this is no doubt a fair representation of the more abundant forms of it—is descended

¹See Ortmann in Zool. Jahrb. Syst., v. 9, 1896, p. 584, and Bronns Klass. and Ordn. d. Thierreichs, v. 5, Crust., 1900, p. 1279; see also Bouvier, 1896.

²*H. dextrum* Rathbun in: Bull. Labor. Univ. Iowa, 1898, p. 277 (from Yucatan).

from a general Antarctic fauna, which has developed some peculiar local types; a few elements of it (*Elminius*, *Edotia*, *Eurypodius*) seem to be altogether peculiar to these parts, while a few others belong to different sources; some immigrated from the north, and others are cosmopolitan forms, the original home of which cannot be traced. No indications of bipolarity are found, that is to say, in no case are the affinities of any of these Antarctic forms to Arctic forms closer than to any other region of the earth.

This points distinctly to the former existence of an Antarctic fauna peculiar to the shores of the supposed old Antarctic continent, of which fauna the Magellanian is a slightly modified offshoot, blended with a few types of different, presumably northern, origin and the view is supported that the Antarctic fauna, in its origin, is totally different from the Arctic.¹

With regard to the *fresh-water fauna* we may make the following remarks.

Most of the species recorded here belong to the class of those small fresh-water organisms, for which exceptional means of dispersal (passive transport by wind, water-fowl, etc.) are admissible, and even observed, so that a more or less cosmopolitan distribution is not astonishing. Although most of the species (except *Daphnia hastata*) are peculiar to Patagonia, the genera are universally distributed.

A very remarkable exception to this is presented by the Copepod genus *Pseudobackella*. The distribution of this and the allied genera (*Backella*, *Backellopsis*, *Parabackella*) is almost exclusively restricted to the Antarctic countries (only in S. America the range extends into Brazil). I give here a synopsis of the known localities, following Mrazek's (1901) classification.

The genus *Backella* (typ.) Mraz. contains three species from Australia and New Zealand (*B. triarticulata* (Thoms), *minuta* Sars, *robusta* Sars). To these we have possibly to add: *B. gracilipes* Dad., *gracilis* (Dad.) and *pygmaea* Dad., from Patagonia and Chili.²

Pseudobackella Mraz. contains the following species: *brasiliensis* (Lubb.), Patagonia and Brazil; *poppei* Mraz., S. Georgia and S. Patagonia; *longicanda* (Dad.) and *entzi* (Dad.) both from Patagonia; and probably also: *dubia* (Dad.) and *silvestrii* (Dad.) from Patagonia.

¹See Ortmann in Proc. Americ. Philosoph. Soc., v. 41, 1902, p. 399, footnotes.

²Daday in Term. Füz., v. 25, 1902, p. 444.

Bæckellopsis Mraz. possesses only the species *B. bergi* (Rich.) from Buenos Aires and S. Patagonia.

Parabæckella Mraz. is made up of *P. brevicaudata* (Brad.) from Kerguelen and Punta Arenas.

This distribution is so remarkable, including only S. America, S. Georgia, Kerguelen, Australia and New Zealand, that this group of genera, which are no doubt closely related to one another, clearly is to be classed with those freshwater and land animals that point to a former connection of these regions.¹ Under the same head comes also *Lepidurus hatcheri* Ortm., of which we have demonstrated above, that it is most closely allied to *L. angasi* Baird of South Australia.

BIBLIOGRAPHY.

Baird, W.

1850, 1852 Description of several new species of Entomostraca (Proc. Zool. Soc. London, 1850, and Ann. Nat. Hist., ser. 2, v. 10, 1852).

1866 Description of two new species of Phyllopodous Crustaceans (Proc. Zool. Soc. London, 1866).

Bate, C. Sp.

1862 Catalogue of the specimens of Amphipodous Crustacea in the collection of the British Museum, 1862.

Beddard, F. E.

1884 Report on the Isopoda collected by H. M. S. Challenger. Part 1 (The Voyage of H. M. S. Challenger, Zool., v. 11, 1884). Do. Part 2 (ibid., v. 17, 1886).

Benedict, J. E.

1902 Description of a new genus and forty-six new species of Crustaceans of the family Galatheidæ, with a list of the known marine species (Proc. U. S. Mus., v. 26, 1902).

Berg, C.

1900 Datos sobre algunos crustaceos nuevos para la fauna argentina (Communic. Mus. Buenos Aires, v. 1, No. 7, 1900).

Bouvier, E.-L.

1896 Sur la classification des Lithodinés et sur leur distribution dans les océans (Ann. Sci. Nat. Zool., ser. 8, v. 1, 1896).

Brady, G. S.

1886 Notes on freshwater Entomostraca from South Australia (Proc. Zool. Soc. London, 1886).

Cunningham, R. O.

1871 Notes on the Reptiles, Amphibia, Fishes, Mollusca, and Crustacea obtained during the voyage of H. M. S. Nassau (Trans. Linn. Soc. London, v. 27, 1871).

¹Ortmann in Proc. Americ. Philos. Soc., v. 41, 1902, p. 335 ff.

Daday, E. von.

- 1901 Diagnoses præcursoriæ Copepodorum novorum e Patagonia (Termesztrajzi Füzetek, v. 24, 1901).
 1902 Microscopische Suesswasserthiere aus Patagonia (Termesztrajzi Füzetek, v. 25, 1902).

Dana, J. D.

- 1852 Crustacea in U. S. Exploring Expedition, v. 13, part 1, 1852.

Darwin, C.

- 1851, 1854 A Monograph on the sub-class Cirripedia. Lepadidæ, 1851.—Balanidæ and Ver-
 rucidæ, 1854.

Dollfus, A.

- 1891 Crustacés Isopodes in Mission scientifique du Cap Horn, v. 6, Zool., 1891.

Faxon, W.

- 1876 Crustacea (Exploration of Lake Titicaca) (Bull. Mus. Harvard, v. 3, 1876).

Filhol, H.

- 1885 Catalogue des Crustacés de la Nouvelle Zélande, des îles Auckland and Campbell in
 Mission de l'île Campbell (Passage du Venus sur le Soleil), v. 3, part 2, 1885.

Giesbrecht, W. & Schmeil, O.

- 1898 Copepoda Gymnoplea, in: Das Tierreich., 6 Lief, 1898.

Guerne, J. de & Richard, J.

- 1889 Revision des Calanides d'eau douce (Mem. Soc. Zool. France, v. 2, 1889).

Henderson, J. R.

- 1888 Report on the Anomura collected by H. M. S. Challenger (The Voyage of H. M. S.
 Challenger, Zool., v. 27, 1888).

Ihering, H. von.

- 1895 Os Crustaceos Phyllopodos do Brazil (Rev. Mus. Paulista, v. 1, 1895).

Lilljeborg, W.

- 1891 Diagnosen zweier Phyllopoden-Arten aus Sued-Brasilien (Abhandl. naturwiss. Ver.
 Bremen, v. 10, 1891).

Miers, E. J.

- 1875 Descriptions of new species of Crustacea collected at Kerguelen's Island by the Rev.
 A. E. Eaton (Ann. Nat. Hist., ser. 4, v. 16, 1875).
 1879 Zoology of Kerguelen Island. Crustacea (Philosoph. Trans. London, v. 168, 1879).
 1883 Revision of the Idotheidæ, a family of sessile eyed Crustacea (Journ. Linn. Soc. London,
 Zool., v. 16, 1883).
 1886 Report on the Brachyura collected by H. M. S. Challenger (The Voyage of H. M. S.
 Challenger, Zool., v. 17, 1886).

Milne-Edwards, A.

- 1891 Crustacés in Mission scientifique du Cap Horn, v. 6, Zool., 1891.

Mrazek, A.

- 1901 Suesswasser-Copepoden in Hamburg. Magell. Sammelreise, 6 Lief., 1901.

Packard, A. S.

- 1883 A monograph of the Phyllopod Crustacea of North America, with remarks on the
 order Phyllocarida (12th Ann. Rep. U. S. Geol. & Geogr. Surv. Terr., part 1, 1883).

Pfeffer, G.

- 1887 Die Krebse von Sued Georgien (Jahrb. Hamburg. wissensch. Anstalt., v. 4, 1887).

Richard, J.

1896 Revision des Cladocères (2) (Ann. Sci. Nat. Zool., ser. 8, v. 2, 1896).

Richardson, H.

1898 Description of four new species of Rocinela with a synopsis of the genus (Proc. Americ. Philosoph. Soc., v. 37, 1898).

Schiøedte, J. C. & Meinert, F.

1879 Symbolæ ad monographiam Cymothoarum Crustaceorum Isopodum familiæ (Naturhist. Tidskr., ser. 3, v. 12, 1879).

Simon, E.

1886 Étude sur les Crustacés du sous-ordre des Phyllopoies (Ann. Soc. entomol. France, ser. 6, v. 6, 1886).

Smith, S. I.

1874 The Crustacea of the freshwaters of the United States (U. S. Comm. Fish & Fisher. Rep. for 1872 and 73, part 2, 1874).

1874 Report on the Amphipod Crustaceans (Ann. Rep. U. S. Geol. & Geogr. Surv. Terr. for 1873, 1874).

Stebbing, T. R. R.

1899 Amphipoda from the Copenhagen Museum and other sources (Trans. Linn. Soc. London Zool., ser. 2, v. 7, 1899).

1900 On some Crustaceans from the Falkland Islands collected by Mr. Rupert Vallentin (Proc. Zool. Soc. London, 1900).

Studer, Th.

1884 Isopoden gesammelt waehrend der Reise S. M. S. Gazelle (Abhandl. Akad. Berlin a. d. J. 1883, 1884).

Tate, R.

1879 Description of a new species of Phyllopodous Crustacean (Trans. Proc. Philosoph. Soc. Adelaide, S. Austral., for 1873-9, 1879).

Thomson, G. M.

1879 On the New Zealand Entomostraca (Trans. Proc. New Zealand Instit. for 1878, 1879).

Weltner, W.

1897 Verzeichnis der bisher beschriebenen recenten Cirripedienarten (Arch. f. Naturgesch., 1897, v. 1, Heft 3).

White, A.

1843 Descriptions of apparently new species and varieties of Insects and other Annulosa, principally from the collection in the British Museum (Ann. Nat. Hist., ser. 1, v. 12, 1843).

Wierzejski, A.

1892 In Bull. intern. Acad. Sci. Cracovie. Compt. rend., 1892.

Wrzesniowski, A.

1879 Vorlaeufige Mitteilungen ueber einige Amphipoden (Zool. Anzeig., v. 2, 1879).

EXPLANATION OF PLATE XLVIII.

	PAGE
Fig. 1. <i>LEPIDURUS HATCHERI</i> sp. nov.	640
1, <i>a.</i> Dorsal view of entire animal, nat. size	640
1, <i>b.</i> Dorsal view of last abdominal segment and caudal flap, $\frac{3}{1}$	641
Fig. 2. <i>BRANCHINECTA GRANULOSA</i> Daday	644
Front view of head of male with claspers, about $\frac{1^0}{1}$	644
Fig. 3. <i>HYALELLA PATAGONICA</i> sp. nov.	650
3, <i>a.</i> Maxilliped of male, about $\frac{3^0}{1}$	651
3, <i>b.</i> First gnathopod of male, about $\frac{1^5}{1}$	651
3, <i>c.</i> First gnathopod of female, about $\frac{1^5}{1}$	652
3, <i>d.</i> Second gnathopod of male, about $\frac{1^5}{1}$	652
3, <i>e.</i> Second gnathopod of female, about $\frac{1^5}{1}$	652
3, <i>f.</i> First peræopod of male, about $\frac{9}{1}$	652
3, <i>g.</i> Fifth peræopod of male, about $\frac{9}{1}$	652
3, <i>h.</i> Upper view of telson, and second and third uropods, about $\frac{1^5}{1}$	652

100

100

100

100

100



100

100

100

100

100

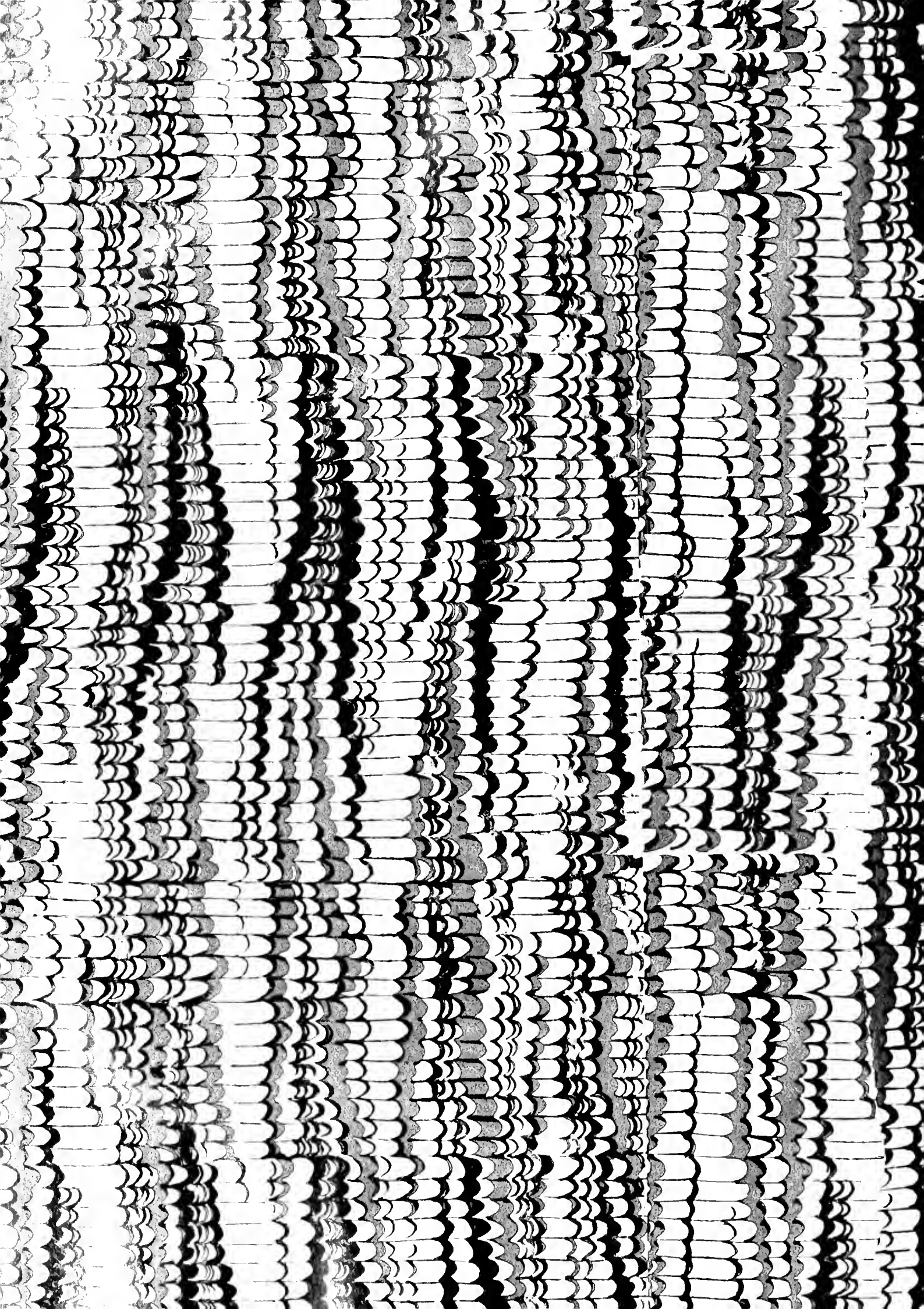
100

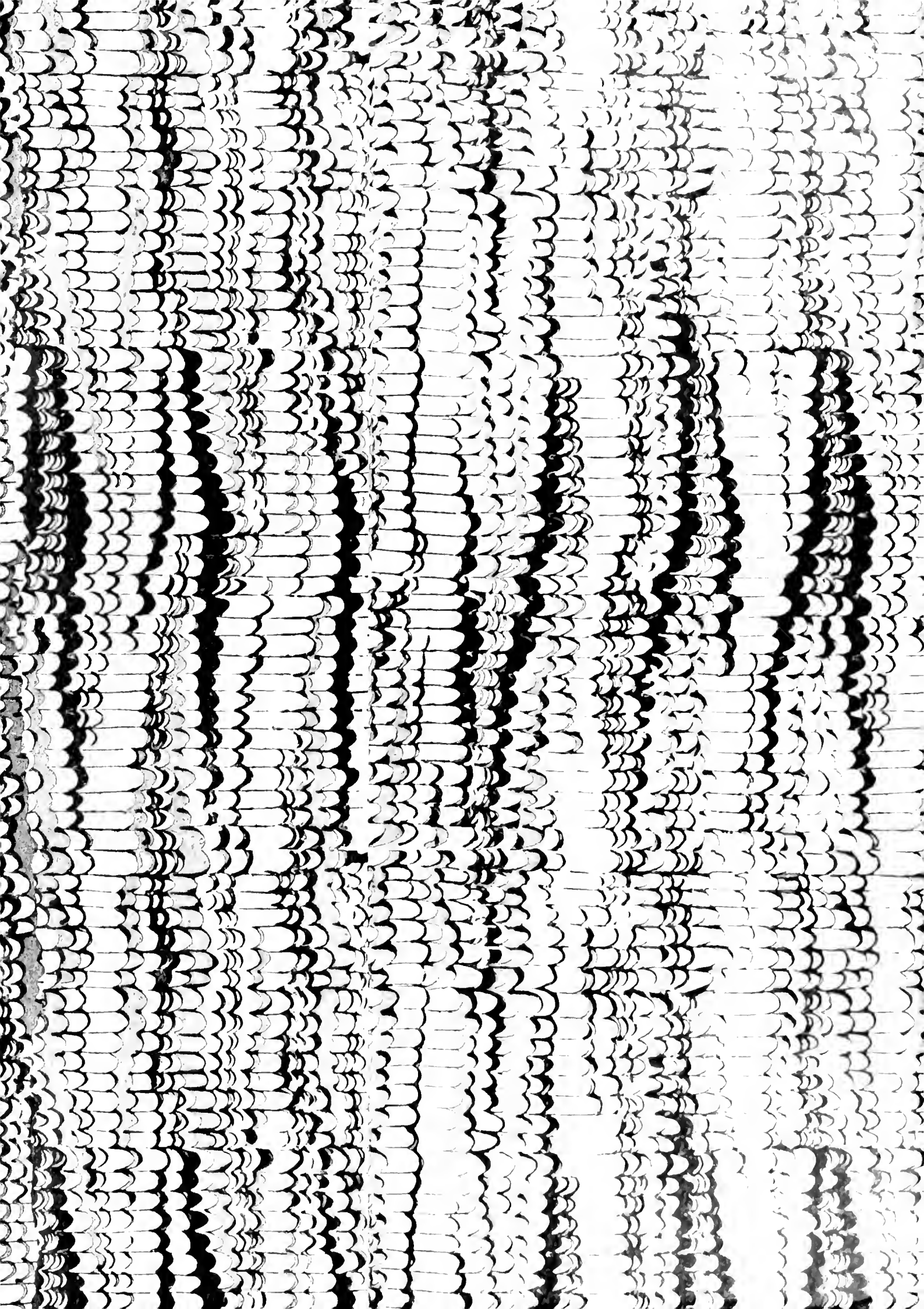
100

100

100







SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00048 2216