Isopoda and Amphipoda from Angola and South Africa.

By the Rev. THOMAS R. R. STEBBING, M. A., F. R. S., F. L. S., F. Z. S.

The following Isopoda and Amphipoda were collected in 1912 by Mr H. SKOOG, conservator at the Museum of Natural History in Gothenburg, when visiting some whaling stations in Angola (Port Alexander) and South Africa with the purpose of making zoological collections.

His small collection is distinguished by the remarkable abundance of a species hitherto rare. A renewed discussion of its characters may be considered opportune. One species is here described as new to science, but in the varied assortment of specimens a paucity of examples has been rather an obstacle in the way of establishing novelties. Occasion has been taken, however, in dealing with several forms to supply information which, it is hoped, may be of use to future investigators.

ISOPODA.

Tribe **Flabellifera.**

Family *Gnathiidae.*

Genus *Gnathia*, LEACH, 1814.

For synonymy see BARNARD, Ann. S. Afr. Mus., vol. x, pt. 7, pp. 200, 201; 1914.

Gnathia africanus, BARNARD.

1914. *Gnathia africana*, BARNARD, Ann. S. Afr. Mus., vol. x, pt. 7, p. 201, pl. 17 (*africanus* in preliminary note and on plate).

1914. *Gnathia africana*, BARNARD, Ann. S. Afr. Mus., vol. x, pt. 11, p. 333 a, pl. 37 E, (*africanus* on plate and explanation of plate, ref. to pl. 38 E a misprint).

With some hesitation I refer to this species a specimen only 2 mm. long which I have not ventured to dissect. It was taken at Port Alexander

from 40 fathoms depth together with the Amphipods *Ampelisca anomalus*, SARS, and *Parelasmopus suluensis* (DANA).

Family *Aegidae*.

Genus *Aega*, LEACH, 1815.

For the family and genus see Ann. S. Afr. Mus., vol. vi, p. 422; 1910.

Aega megalops, NORMAN and STEBBING.

1904. *Aega megalops*, NORMAN and STEBBING, Ann. Nat. Hist., ser. 7, vol. xiv, p. 434, pl. 13, figs. 1—7.
1914. » » BARNARD, Ann. S. Afr. Mus., vol. x, p. 367.

A single specimen taken at Port Alexander completely agrees with the description and figures of the Portuguese specimen published in 1904. It happens that the length of the African specimen is the same, 13 mm. I make out the rows of numerous sparkling ocelli to be eight in number for each eye and the flagellum of the second antennae to have 20 jointlets. Taken on *Zeus faber*, the John Dory. At the same station, Port Alexander, Mr SKOOG obtained two other specimens of similar character from a depth of 60 fathoms.

Family *Cymothoidae*.

Genus *Nerocila*, LEACH, 1818.

For the family and genus see Ann. S. Afr. Mus., vol. vi, p. 423 and (BARNARD) Vol. x, p. 371; 1914.

Nerocila laticeps, BOVALLIUS.

1887. *Nerocila laticeps*, BOVALLIUS, Bih. K. Svenska Vet. Akad. Handl. vol. xii, pt. 4, p. 10, pl. 2, figs. 22—26, pl. 3, figs. 27, 28.

A single female specimen, about 27 mm. long, was obtained at Port Alexander from the gills of *Zeus faber*. The specimen agrees well with the description and illustrative figures supplied by BOVALLIUS for the ovigerous female, which he records from the »West coast of Africa«.

Family *Sphaeromidae*.

See Ann. S. Afr. Mus., vol. vi, p. 426; 1910; and (BARNARD) vol. x, p. 374; 1914 and vol. xvii, p. 358; 1920.

Genus *Cymodoce*, LEACH, 1814.

See Ann. S. Afr. Mus., vol. vi, p. 429; vol. x, p. 386; vol. xvii, p. 362

Cymodoce validus (STEBBING).

1902. *Exosphaeroma validum*, STEBBING, S. Afr. Crust., Part ii, p. 66, pl. 12 B.

1905. *Cymodoce valida* HANSEN, Q. J. Microsc. Sci., vol. xlix, pp. 118, 122.

1910. » » STEBBING, Ann. S. Afr. Mus., vol. vi, p. 430.

1914. » » BARNARD, Ann. S. Afr. Mus., vol. x, p. 388, pl. 33 C.

1920. » » BARNARD, Ann. S. Afr. Mus., vol. xvii, p. 363.

Mr SKOOG obtained a small specimen of this strikingly spotted species from a depth of 24 fathoms in Walker Bay, 4 miles from land.

Cymodoce comans, BARNARD.

1914. *Cymodoce comans*, BARNARD, Ann. S. Afr. Mus., vol. x, p. 391, pl. 33 D.

A female of this species was obtained from a depth of 40 fathoms in Sebastian Bay, 10 miles from land. Mr BARNARD comments on the rather striking difference in the pleon of the female from its more ornate structure in the male.

Tribe **Valvifera.**

See Sars, Crust. of Norway, vol. II, pp. 3, 78.

Family *Idoteidae*.

See S. Afr. Crust., Part I, p. 51; 1900; Part II, p. 55; 1902; Ann. S. Afr. Mus., vol. vi, p. 432; 1910.

Genus *Synidotea*, HARGER, 1878.

See S. Afr. Crust., Part II, pp. 56, 59.

Synidotea hirtipes (MILNE EDWARDS), 1840.

See S. Afr. Crust., Part II, p. 60; and Ann. S. Afr. Mus., vol. vi, p. 434.

Two specimens from 40 fathoms depth at 10 miles off Cape Barracouta were obtained by Mr SKOOG. The one, only about 15 mm. in length, agrees well with the description given by MIERS under the heading *Edotia hirtipes* (M. EDWARDS) and in the shape of peraeon and pleon, which he figures for his variety *laevidorsalis*. The other specimen is similar. A

further specimen was taken in Sebastian Bay, 10 miles from land, also at 40 fathoms depth. This specimen is about 20 mm. long, not oval like the other but more nearly parallel-sided, and the pleon apically truncate with the left corner sharply pointed, not emarginate with rounded corners as in the other specimens. Yet the agreement in the antennae and limbs and the valves of the pleon is so close that it seems desirable to leave the two forms under one name, until further material may afford an opportunity for surer discrimination. In fact a great number of specimens obtained in Walker Bay 5 miles from land at 24 fathoms depth have only afforded one small specimen with a rounded unemarginate end to the telson.

Tribe **Oniscidea.**

See Sars, Crust. of Norway, vol. ii, Oniscoidea, p. 3, Oniscoida, p. 153.

Family *Ligiidae.*

Genus *Ligia*, J. C. FABRICIUS, 1798.

1798. *Ligia*, FABRICIUS, Suppl. Ent. Syst., p. 301.

It is unnecessary here to discuss the synonymy or to cite the numerous authorities on this genus.

Ligia glabratus, BRANDT, 1833.

See Ann. S. Afr. Mus., vol. vi, p. 437; 1910.

This species was obtained at Dyer Islands, Cape Colony, along with, but in far less abundance than, *Deto echinatus*. None of the specimens approach the size given by KRAUSS of 11 lines long and 5 lines broad as compared with 13 or 14 millimetres in length and 6 or 7 in breadth. Even if we suppose that KRAUSS included the uropods in the length, the breadth he mentioned would be out of accord with our specimens.

Family *Detonidae.*

1904. *Detoninae*, BUDDE-LUND, Revision of Crust. Isop. Terrest., p. 37.
1908. » BUDDE-LUND, Deutsch. Südpol Exp. vol. ix, zool. pt. 1, p. 84.
1908. » BUDDE-LUND, Sjöstedt's Kilim. Meru Exp., Crust. Isop., p. 7.
1909. *Scyphacidae* (part), CHILTON, Subantarctic Is. N. Zealand, p. 664.
1910. *Detonidae*, STEBBING, Ann. S. Afr. Mus., vol. vi, p. 444.

DANA, when instituting the subfamily *Scyphacinae* in 1853, left GUÉRIN's *Deto* among the *Oniscinae*.

Genus *Deto*, GUÉRIN, 1836.

For references see Ann. S. Afr. Mus. as above.

Deto echinatus, GUÉRIN.

Plates 1, 2 A.

1836. *Deto echinata*, GUÉRIN, Magasin de Zool., Ann. vi, notice 21, p. 2, pl. 14.
1840. » » MILNE EDWARDS, Hist. Nat. Crust., vol. iii, p. 174.
1843. » » KRAUSS, Südafrik. Crust., p. 63.
1885. » » BUDDE-LUND, Isop. Terrest., p. 234.
1910. » » STEBBING, Ann. S. Afr. Mus., vol. vi, p. 444.

A large number of specimens which I assign to this species were obtained at Dyer Island, Cape Colony. They agree well with the account given by MILNE EDWARDS, and with the fuller account by BUDDE-LUND except in the particular of the eyes, which the latter writes of as »oculi majores«, whereas they appear to me to be very small. The most striking feature consists in the seven pairs of erected tall, acute, and slightly reflexed spine-like processes severally on the seven peraeon-segments. But these I am persuaded are furniture of the male sex, with only diminutive representatives on the back of the female. The back of the pleon is smooth in both sexes, while the rest of the body is variously tubercled. The eyes are crescentic, wide apart at the bottom of the cup-like prominences with which the head is flanked.

The first antennae are exceedingly small, as may be seen in the figures comparing the whole of a first antenna with the flagellum only of the second, though this flagellum itself in spite of its four joints is very small. The mouth-organs are akin to those of *Porcellio*. All the limbs of the peraeon are slender, ending in short curved fingers. The male organ of the second pleopod is of great length, produced to a needle-like apex. In the uropods the stem is broad, reaching just beyond the rounded apex of the triangular telson, the outer ramus elongate, the inner short and narrow, seldom visible in dorsal aspect of a specimen. Length of specimens difficult to obtain accurately because of their obstinate curvature, but 17 mm. long by 8 mm. broad might be accepted as representative. A very juvenile specimen, with no indication of spines and unfortunately without its head, measured 4 mm. by 2 mm.

Family *Oniscidae*.

Genus *Anchiphiloscia*, STEBBING.

1908. *Anchiphiloscia*, STEBBING, Proc. Zool. Soc. London, pp. 28 (May), 555 (October).

Anchiphiloscia karongae, STEBBING.

1908. *Anchiphiloscia karongae*, STEBBING, Pr. Zool. Soc., p. 556. pl. 27 A.

At Fransche Kraal, Gans Bay, Cape Colony, under stones at an elevation of about 800 feet, there were obtained two specimens, one of which combines the shape of the species figured in the above-cited pl. 27 A with the colouring illustrated on pl. 27 B of the same Proceedings, for a species which I distinguished as *A. cunningtoni*. The material isto o small for a renewed investigation. But the agreement of the two specimens in size with those earlier described, in the variation of colour there noticed, and in details that can be observed without dissection, induce me to withdraw the specific name *cunningtoni* as a synonym of *karongae*, which unfortunately has page precedence.

Tribe **Epicaridea.**

Family *Bopyridae*.

Between the first and second pleopods of a specimen of the small prawn *Processa canaliculatus* LEACH, collected at Port Alexander, was lodged a parasite, no doubt Bopyrian, 6 mm. long and 3 mm. broad, containing a multitude of minute eggs, and along the central line showing microscopic features with which I have not ventured to deal. It may be mentioned that GIARD and BONNIER (Bull. Sci. France-Belgique, vol. xxii, p. 387; 1890) record a species *Hemiarthrus philonika* G. ET B. from *Nika edulis* RISSO, which is a synonym of *Processa canaliculatus*. But in 1900 BONNIER (Monograph of the »Bopyridae«, p. 212) withdraws the generic name *Hemiarthrus* G. ET B. in favour of *Phryxus*, RATHKE, 1843, and he quotes in a single syllable »*Phryxus philonika*« on pp. 168 and 381. At the latter page is added »Bopyride?« as another parasite on *Nika edulis*. Unfortunately no references are given and I have been unable to trace the description of *P. philonika* among the numerous treatises of the French authors.

Another Bopyrian was found attached under the tail of the crab *Lambrus macrocheles* from Port Alexander. BONNIER in his Monograph of the »Bopyridae», p. 379, giving a list of the Crustacea infested by Epicaridea, was not able to include any species of *Lambrus*.

AMPHIPODA.

Tribe **Gammaridea.**

Family *Ampeliscidae.*

Genus *Ampelisca*, Kröyer, 1842.

Ampelisca anomalus, SARS, 1882.

For these items of classification see Das Tierreich, Lief. xxi, pp. 97, 98, 106; 1906.

A specimen, about 5 mm. in length, obtained from a depth of 40 fathoms at Port Alexander, proved on dissection to be undoubtedly an example of the species described and figured by SARS. Notable points are the considerable length of both pairs of antennae, and in the first pair the extensive second joint of the peduncle with the still greater length of the peduncle's terminal joint in the second pair. In the first and second peraeopods the finger is longer than the two proceding joints combined. The agreement of the fifth peraeopod with the figure given by SARS is an additional evidence of the specific identity. Another specimen from the same locality was obtained at a depth of 16 fathoms.

Family *Gammaridae.*

Genus *Parelasmopus*, STEBBING, 1888.

Parelasmopus suluensis (DANA), 1852.

For the classification and synonymy see Das Tierreich, Lief. xxi, pp. 364, 417, 732.

Along with the small specimen of *Ampelisca anomalus*, from the depth of 40 fathoms at Port Alexander, Mr SKOOG obtained a still smaller specimen about 3.5 mm. in length, which I did not attempt to determine without dissection. I now assign it to Dana's *Parelasmopus suluensis*, the specific name of which refers to the Sooloo Sea (between Borneo and the Philippine Islands). The first antennae in this species are longer than the second and have a delicate two-jointed accessory flagellum.

Family *Talitridae.*

1899. *Talitridae*, STEBBING, Tr. Linn. Soc. London, ser. 2, vol. vii, pt. 8, p. 395.
1906. » STEBBING, Das Tierreich, Lief. xxi, pp. 523, 735.
1916. » BARNARD, Ann. S. Afr. Mus., vol. xv, pt. 3, p. 215.

Genus *Talorchestia*, DANA, 1852.

See Das Tierreich, Lief. xxi, pp. 523, 543, 735, and add BARNARD, Ann. S. Afr. Mus., vol. xv, p, 215; 1916.

Talorchestia Skoogi, *n. sp.*

Plate 3.

The specimens obtained by Mr SKOOG at Port Alexander have all the characters proper to the genus, including the minute peculiarity of the constriction of the finger in the second peraeopods (see Ann. Nat. Hist., ser. 6, vol. viii, p. 327; 1891, and for variation *T. ancheidos* BARNARD).

In the first specimen examined I was surprised to find a third uropod with two rami, but this proved to be an abnormality, and finds a parallel in Professor CHILTON's account of *Orchestia marmoratus* (Haswell), in which a third uropod occurred with three terminal joints instead of one (J. Zool. Research, 1918, vol. iii, pt. 4, p. 98, text-figs.).

The present form has a combination of characters which I do not observe united in hitherto described species. The frontal curvature of the head is occupied by two irregularly rounded large dark eyes almost if not quite contiguous. The first antennae are very short, the three joints of the peduncle differing little in length, with a slender four-jointed flagellum not half as long. The second antennae are much more conspicuous, the last joint of the peduncle the longest, its length equalling that of the stouter penultimate plus the short preceding joint; the flagellum of about 20 jointlets equalling the combined length of all three. The mouth-organs appear to be of the usual type, the inner plate of the first maxilla having as in other species two terminal setae, though here the vestigial palp, which is occasionally two-jointed, is distinctly simple.

The second gnathopod of the male is a very marked feature, the finger being of great length, with smooth inner margin closing over the elongate palm into a cavity beyond which the base of the hand forms a blunt prominence. At the distal extremity not far from the finger-hinge the palm puts out a blunt process furnished with four spines. On either side of this process the closed finger shows a small cavity, thence closely matching the long setulose convexity of the palm. The third, fourth, and fifth joints form a very small base for the massive hand. The characters of the other gnathopods in both sexes are perhaps sufficiently shown by the figures. The second peraeopods are as usual shorter than the first, and the third much shorter than the elongate fourth and fifth pairs, in both of which the fourth, fifth, and sixth joints are moderately slender.

The third uropods are very slight as compared with the first and second pairs. The telson carries several spines and appears to be distally emarginate. The obstinate folding of the pleon makes exact measurement difficult. The males might be estimated at 12 mm. in length, the females at 9 mm. The specific name is given out of respect to the energetic collector Mr Skoog.

Talorchestia sp.

At Fransche Kraal, Gans Bay, Cape Colony, under stones at an elevation of about 800 feet Mr Skoog collected four specimens, all females, referable by the simple first gnathopod to this genus, but from absence of the other sex difficult to allot to any of its established species. In length the specimens varied from 12 to 15 mm. The largest contained a few large eggs, one millimetre long. The round dark eyes are rather more than their diameter apart. The third joint of the peduncle in the first antennae is the longest, the 7-8-jointed flagellum a little shorter than the peduncle. In the second antenna the last joint of the peduncle is more than twice as long as the penultimate, the 29-32-jointed flagellum longer than the peduncle. The mandibles are compact with three setae in the spine-row and prominent molar. The first maxillae are without palp; palp of maxilliped with minute fourth joint, the three teeth on the inner plate conspicuous. Both gnathopods are slight in structure, the first with the hand narrow, spinose, tapering without palm to the small finger in which the nail is as long as the base. In the second pair the membranaceous hand is longer than the wrist, rather narrowly produced beyond the minute chela-forming finger. The peraeopods all have comparatively long fingers, with a spine at the junction of the nail with its base; the fifth, which is the longest, is distinguished by the subquadrate production of its large second joint behind the third. The pleopods are degraded. The first and second uropods have only apical and subapical spines on the inner ramus. The third uropods are very short, the ramus shorter and much narrower than the peduncle.

Along with the above was another specimen, also female, clearly distinct, with larger eyes, nearer together, and in near agreement by both pairs of antennae and the limbs with *Talorchestia Skoogi*, yet differing by the shorter rami in relation to their peduncles of all the uropods, and the fifth peraeopod has the lower hind corner of its second joint rounded.

Genus *Parorchestia*, STEBBING, 1899.

1899. *Parorchestia*, STEBBING, Tr. Linn. Soc. London, ser. 2, vol. vii, p. 396.

1906. *Parorchestia*, STEBBING, Das Tierreich, Lief. xxi, pp. 523, 557, 735.
1909. » CHILTON, Subantarctic Is. N. Zealand, pp. 603, 636.
1916. » BARNARD, Ann. S. Afr. Mus., vol, xv. p. 226.

Dr. CHILTON's essay includes an important discussion of this genus and the description of a very anomalous form in his *Parorchestia improvisus*.

Parorchestia tenuis (DANA).

Plate 4.

1852. *Orchestia tenuis*, DANA, U. S. Expl. Exp., vol xiii, pp. 872, 874, 875, pl. 59, fig. 1.
1884. *Allorchestes recens*, THOMSON, Tr. N. Zeal. Inst., vol. xvi, p. 235, pl. 13, figs. 2—5.
1899. *Parorchestia tenuis*, STEBBING, Das Tierreich, Lief. xxi, p. 557.
1909. » » CHILTON, Subantarct. Is. N. Zealand, p. 642.
1916. » » BARNARD, Ann. S. Afr. Mus., vol. xv, p. 226.

The specimens which I have figured as belonging to this species were obtained at Dyer Islands, Cape Colony. It should be remembered that DANA figured and described only the female, though suggesting that the male form might be that which he named *sylvicola*, a suggestion which cannot be accepted. On p. 874 by a confusing slip he writes »superior antennae« when he is really referring to the inferior. It is by the small fourth joint of the palp in the maxillipeds that this species takes its place in the genus, and that character, as CHILTON points out, is itself open to criticism. DANA's figure of the maxillipeds is useless, but that of the first maxilla in being devoid of any palp agrees with the form here examined. Allowance must be made for variability in several details. Thus in a male specimen 11 mm. long and a female 6.5 mm., the eyes are more than their diameter apart, whereas in Barnard's specimens, respectively 9 and 6 mm. they are »almost meeting on the top of the head«. In the first antennae of our specimens the middle joint of the peduncle is the longest, with a flagellum 8-jointed in male, 6-jointed in female. The second antennae agree with Dana's description. In the flagellum of the male I count 16 jointlets, in a female only 12. The first gnathopods are remarkably alike in the two sexes, except for smaller size in the female. The second gnathopod of the male makes a near agreement with G. M. THOMSON's figure, but I found no spine at the point of the hand reached by the closed finger. The fingers of the peraeopods are very short, but

short as they are, there appears to be a minute apical nail. In Barnard's specimens the first and second uropods have »marginal spines on inner ramus only». In our specimens this is true of the first uropod only, and the third uropod has its ramus less than half as wide as the peduncle.

Tribe **Cyamidea.**

Family *Cyamidae.*

Genus *Cyamus*, LATREILLE, 1796.

Cyamus erraticus, ROUSSEL DE VAUZÈME, 1834.

For the above items of classification see Ann. S. Afr. Mus., vol. vi, pp. 464, 471, 472; 1910.

Numerous specimens of this species were taken by Mr Skoog from *Megaptera longimanus*, at Port Alexander. The great length of the branchiae in the male is a leading character in de Vauzème's species.

Tribe **Phronimidea.**

Family *Lycaeidae.*

See Ann. S. Afr. Mus., vol. vi, pp. 473, 479; 1910.

The family has the interesting character that the fifth peraeopod though diminutive has its full number of joints.

Genus *Thamyris*, SPENCE BATE, 1862.

For a discussion of this genus see the Monograph by CLAUS, Die Platysceliden, pp. 55—60, pls. 16, 17, 19, 21.; 1887.

CLAUS distinguishes *Thamyris* from *Lycaea* partly by the character that the peduncle of the first uropods is scarcely longer than the rami. In the species here figured it is rather shorter, but the difference is inconsiderable.

Thamyris sp.

Plate 2 B.

At Port Alexander, Portuguese West Africa, Mr Skoog collected two specimens which I assign without doubt to this genus. Each is, or was before dissection, about 6 mm. long. That which I have figured is probably *T. mediterraneus*, CLAUS, the other may be his *T. globiceps*. Both are females. In the former I may call attention to the two strong spines on the wrist of the second gnathopod which are not marginal but overlie

and obscure much of the marginal denticulation. In the absence of males and in the paucity of material it seems unadvisable to increase the number of species grounded on minute differences of measurement. The shape of the head in *Thamyris rapax* (Claus) is very different.

Appendix.

COPEPODA.

Tribe **Calanidea.**

Family *Pontellidae.*

Genus *Pontellina*, Dana, 1853.

Pontellina plumatus (DANA).

See Ann. S. Afr. Mus., vol. vi, pp. 518, 519, 540, 541.

The species was instituted by DANA in 1849 under the name *Pontella plumata* and, for the male, *P. turgida*. A pair of specimens, male and female, were obtained at Port Alexander. A beautiful figure of the male is supplied by GIESBRECHT in the Fauna und Flora des Golfes von Neapel, Mon. xix, Atlas, pl. 4, fig. 11 with other details on pls. 25 and 40;1892. No. 479.

Plate 1.

Deto echinatus, GUÉRIN.

n. s. Lines indicating natural size of specimen figured above in dorsal view, with rough sketch in lateral view of first four peraeon segments.

T; urp. Telsonic segment and uropods.

gn. 1; prp. 5. First gnathopod and fifth peraeopod on scale of preceding figures, but with higher magnification of terminal joints appended.

l. s.; l. i. Upper lip with mandibles in situ, and lower lip, from a different specimen.

m.; mx. 1; mx. 2; mxp. Mandible, first and second maxillae and maxilliped, to a uniform scale, with terminal parts more highly magnified.

plp. 1; plp. 2. First and second pleopods of male, uniform with mouth-organs.

Plate 2 A.

Deto echinatus, GUÉRIN.

C. Head, deprived of antennae, in dorsal aspect.
a. s.; a. i. First antenna and flagellum of second, uniformly magnified.
mxp. Maxillipeds highly magnified.
n. s.; ♀ Lines indicating natural size of female shown in dorsal view.
plp. 1 ♀; T.; urp. ♀; urp. ♀ First pleopod, uropod and telson of female in dorsal view, and a uropod detached, uniformly magnified.

Plate 2 B.

Thamyris sp.

n. s. Line indicating length of the specimen figured in lateral view (without the intertwined gnathopods).
a. s. First antenna, uniform with higher and lower magnification of details.
gn. 1; gn. 2; prp. 4; prp. 5. First and second gnathopods and fourth and fifth peraeopods to a uniform scale, with higher magnification of the distal portions of the gnathopods.
T.; urp. 1; urp. 2; urp. 3. Telson in dorsal aspect and the three uropods.

Plate 3.

Talorchestia Skoogi n. sp.

n. s.; n. s. ♀. Lines indicating natural length of male and female specimens, from front of head to beginning of the third pleon segment.
C. ♀; a. s.; a. i. Dorsal view of head, female; first and second antennae, male.
l. s. ♀; m. ♀; m., l. i.; mx. 1; mx. 2. Upper lip and mandible of female; from the male one mandible and part of the other; lower lip; first and second maxillae all more magnified than the preceding group of details, with which the group next following are uniform
gn. 1; gn. 1 ♀.; gn. 2 ♀.; prp. 2 ♀, 3 ♀, 5 ♀; urp. 1 ♀; urp. 3 ♀. First and second gnathopods of male and female; second, third, and fifth peraeopods of female; first and third uropods of female.
urp. Abnormal uropod of male magnified uniformly with the mouth-organs.

Plate 4.

Parorchestia tenuis, (DANA).

n. s. ♂., n. s. ♀. Lines indicating natural length of the specimens from which the details are drawn.

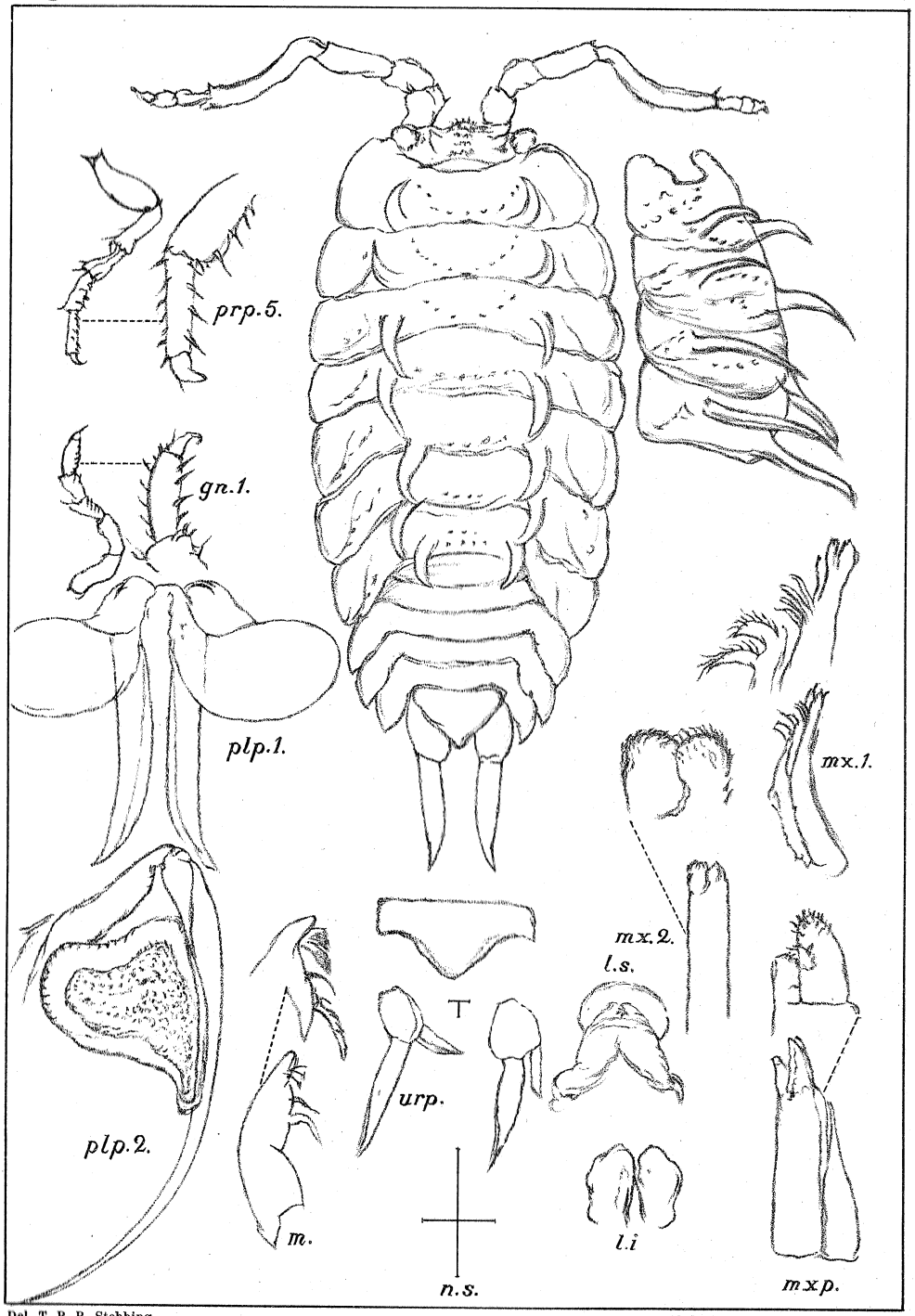
a. s.; a. i. First and second antennae of the male.

l. s. ♀; m. ♀; mx. 1. ♀; mxp. ♀. Upper lip, parts of both mandibles, first maxilla, and maxilliped of female, higher scale than other details.

gn. 1.; gn. 1 ♀; gn. 2 ♀; prp 2, 3, 4, 5. First and second gnathopods of male and female, and second, third, fourth, and fifth peraeopods of male uniform in magnification with the antennae.

urp. 1 ♀.; urp. 2 ♀; urp., 3 ♀; T. The three uropods and the telson (not in fully dorsal aspect) of the female, on a higher scale than the limbs, but less than that of the mouth-organs.

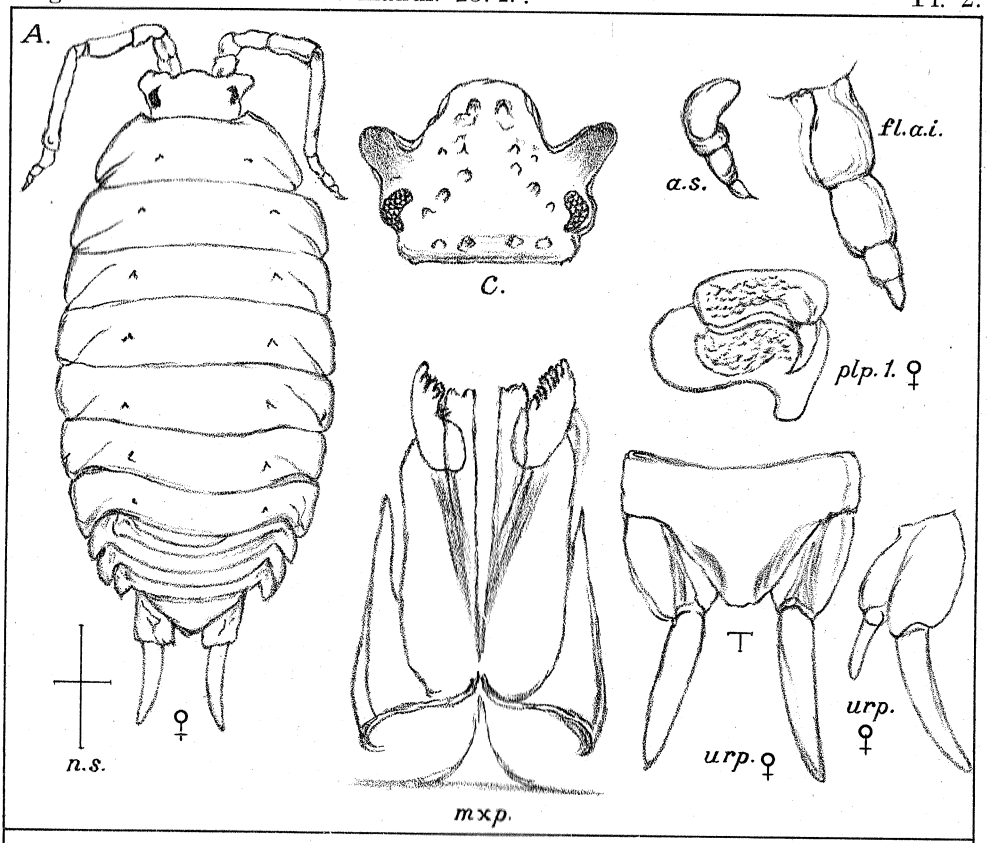
INDEX.



Del. T. R. R. Stebbing

Almqvist & Wiksells Lito, Uppsala

DETO ECHINATUS, Guérin.



Del. T. R. R. Stebbing

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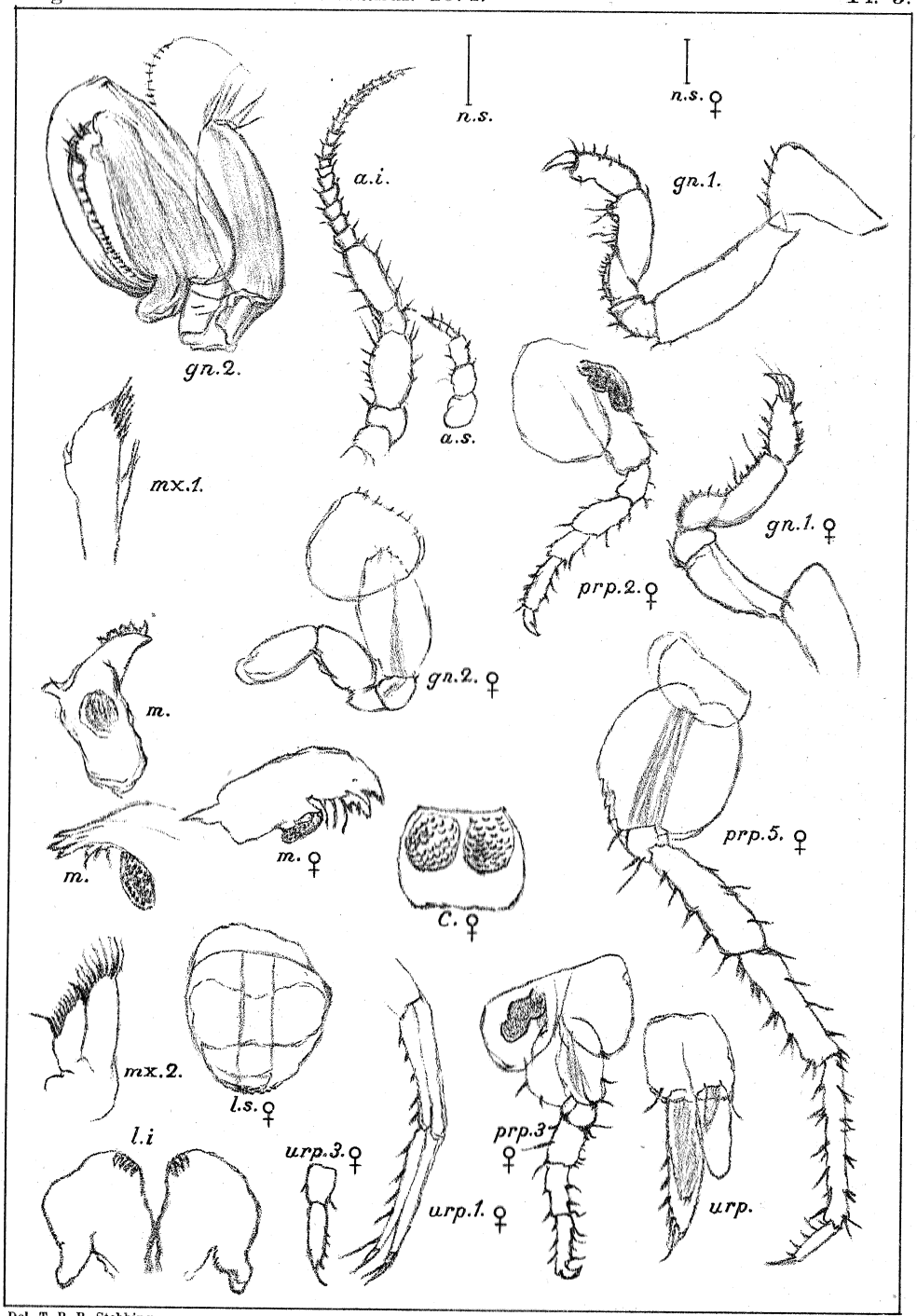
A. DETO ECHINATUS, Guérin. B. THAMYRIS, sp.



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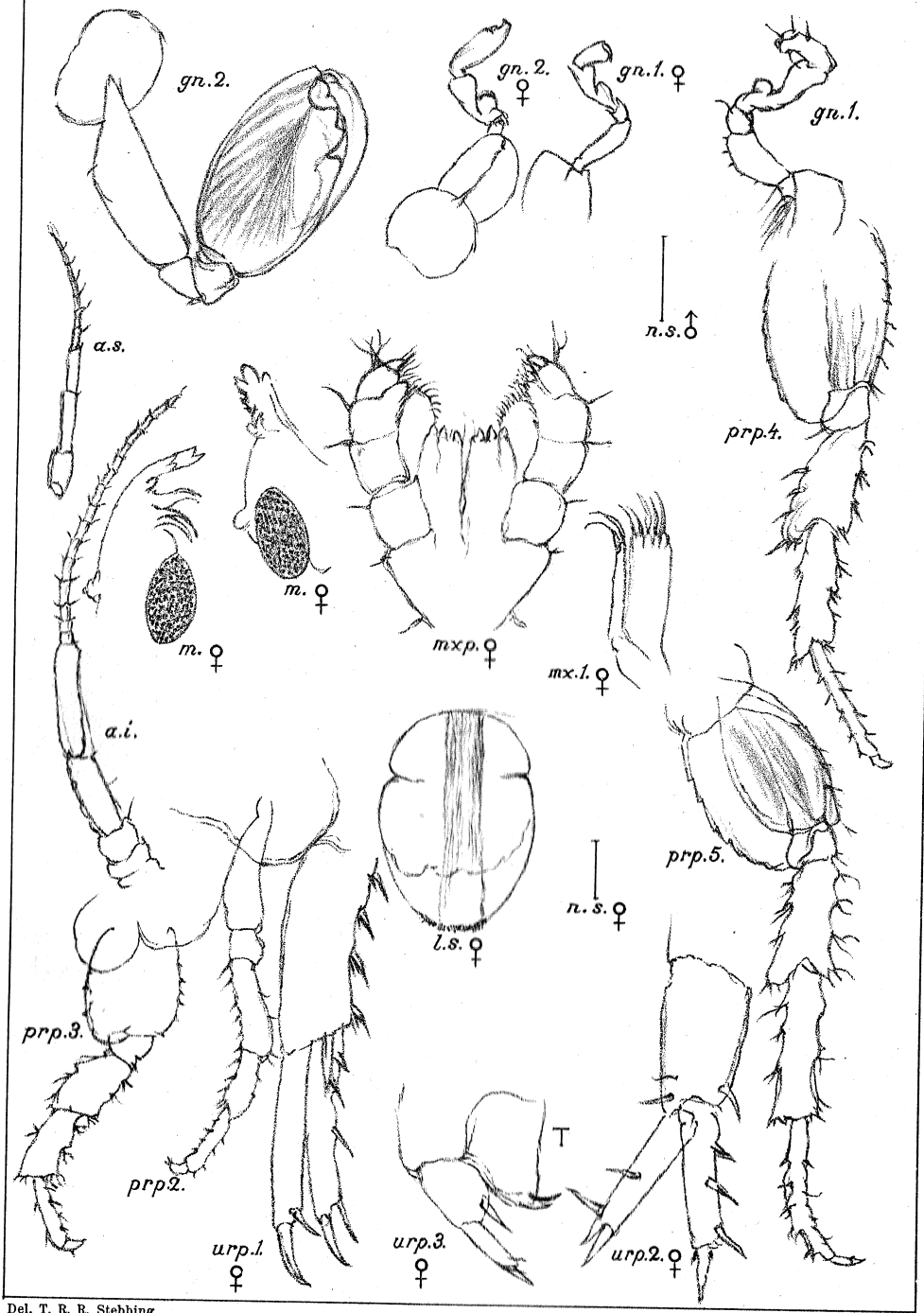
TALORCHESTIA SKOOGI, n. sp.



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PARORCHESTIA TENUIS (Dana)