

ROTALIA, Lamarck [1804].

Rotalia Soldanii (d'Orbigny), var. *nitida*, Reuss.

Rotalina nitida, Reuss, 1844, Geogn. Skizze Böhmen, vol. ii. pt. 1, p. 214.

Placentula nitida (Reuss), Berthelin, 1880, Mém. Soc. géol. France, sér. 3, vol. i. no. 5, p. 69, pl. iv. figs. 11 a-c.

Rotalia Soldanii (d'Orb.), var. *nitida*, Reuss, Chapman, 1898, Journ. R. Micr. Soc. pp. 9, 10, pl. ii. figs. 2 a-c.

Very common at Swaffham.

The types of the foregoing 138 species and vars. of the Foraminifera described or referred to in these papers, and also the figured Ostracoda, are now placed in the Woodwardian Museum at Cambridge.

XLVI.—*British Isopoda Chelifera*. By the Rev. Canon
A. M. NORMAN, M.A., D.C.L., LL.D., F.R.S.

OUR knowledge of the group of Isopoda entitled by Sars "Chelifera," and containing the two families Apseudidæ and Tanaidæ, has been greatly extended of late years. With respect to our own fauna no doubt many small species still await discovery in our seas, and it is remarkable that as yet no member of the genus *Typhlotanais* has been met with, although nine belong to the Norwegian fauna. Now, however, when these minute forms have been so fully illustrated by the publication of the classical work of Sars, some of the species will probably be soon added to our fauna. Bate and Westwood recorded seven British Isopoda Chelifera; the number in this paper is twenty-three. The following works have either been published since Bate and Westwood, and have reference to species which are here enumerated, or, if of earlier date, are necessitated by synonymy which is here specially noticed; but many authors who are only once mentioned are referred to in the text and not inserted in the following list.

Selected List of Publications on Isopoda.

- (1) BATE and WESTWOOD.—'History of British Sessile-eyed Crustacea,' vol. ii. 1863-9.
- (2) BARROIS (T.H.).—'Note préliminaire sur la Faune carcinologique des Açores.' Lille, 1888.

- (3) BARROIS (TH.).—'Catalogue des Crustacés marins recueillis aux Açores.' Lille, 1888.
- (4) BENEDICT (JAMES E.).—"The Arcturidæ of the U.S. National Museum," Proc. Biol. Soc. Washington, vol. xii. 1898, p. 41.
- (5) BOAS (J. E. V.).—"Kleinere carcinologische Mittheilungen. I. Eine neue Art der Gattung *Apseudes*," Zoolog. Jahrbücher, 1866, p. 109.
- (6) BOLIVAR (J.).—"Lista de la Colección der Custáceos de España y Portugal del Museo de Historia Naturali de Madrid," Anales Soc. Españ. Hist. Nat. ser. 2, vol. i. 1892.
- (7) BONNIER (JULES).—"Catalogue des Crustacés Malacostracés recueillis dans la Baie de Concarneau," Bull. scient. du Départ. du Nord, sér. 2, x^{me} Année, 1887.
- (8) BONNIER (JULES).—"Résultats scientifiques de la Campagne du 'Caudan' dans le Golfe de Gascogne: Edriophthalmes," Annales de l'Univers. de Lyon, 1896.
- (9) BOUCHARD-CHANTEREAUX.—'Catalogue des Crustacés observés jusqu'à ce jour à l'état vivant dans le Boulonnais.' 1833.
- (10) BOURNE (G. C.).—"Report Trawling Cruise of H.M.S. 'Research' off S.W. Ireland," Journ. Marine Biol. Assoc. new ser. vol. i. 1889, p. 306.
- (11) BOVALLIUS (C.).—"New Isopod from the Swedish Arctic Expedition of 1883," K. Svenska Vet.-Akad. Handl. vol. x. 1885.
- (12) BOVALLIUS (C.).—"New Isopod from the Coast of Sweden," K. Svenska Vet.-Akad. Handl. vol. x. 1885.
- (13) BOVALLIUS (C.).—"Notes on the Family Asellidæ," K. Svenska Vet.-Akad. Handl. vol. xi. 1866.
- (14) BOVALLIUS (C.).—"New and imperfectly-known Isopoda. II.," K. Svenska Vet.-Akad. Handl. vol. xi. 1866.
- (15) CARUS (V.).—"Prodromus Faunæ Mediterraneæ," vol. i. 1884-5.
- (16) CLAUS (C.).—"Ueber *Apseudes Latreillii*, Edw., und die Tanaiden," Arbeit. zool. Institut zu Wien, vol. v. pt. 3, 1884, p. 319.
- (17) CLAUS (C.).—"Ueber *Apseudes Latreillii*, Edw., und die Tanaiden. II.," Arbeit. zool. Instit. zu Wien, vol. vii. pt. 2, 1887, p. 139.
- (18) COLDSTREAM (J.).—"Structure and Habits of the *Limnoria terebrans*, a minute Crustaceous Animal, destructive of marine wooden erections, as piers, &c.," Edinb. New Phil. Journ. vol. xvi. 1834, p. 333.

- (19) DE BUEN (O.).—"Materiales para la Fauna carcinologica de España," *Anales Soc. Españ. Hist. Nat.* vol. xvi. 1887, p. 405.
- (20) DELAGE (YVES).—"Contribution à l'étude de l'Appareil circulatoire des Crustacés édriophthalmes marins," *Archiv. de Zool. exp. et gén.* vol. ix. 1881.
- (21) DOHRN (A.).—"Untersuchungen über Bau und Entwicklung der Arthropoden. Zur Kenntniss vom Bau und der Entwicklung von *Tanais*," *Jenaische Zeitschrift*, vol. v. 1870, p. 293.
- (22) DOLLFUS (A.).—"Troisième Campagne de l' 'Hirondelle,' 1887. Sur quelques Crustacés isopodes du littoral des Açores," *Bull. Soc. Zool. de France*, vol. xiii. 1888.
- (23) DOLLFUS (A.).—"Notes de Géographie zoologique sur la distribution du Genre *Ligia*, Fabr.," *Feuille des Jeunes Naturalistes*, sér. 3, 24^e Année, 1893.
- (24) DOLLFUS (A.).—"Les Idoteidæ des côtes de France," *Feuille des Jeunes Naturalistes*, sér. 3, 25^e Année, 1894-5 (two papers in numbers Nov. 1894 and Feb. 1895).
- (25) DOLLFUS (A.).—"Note préliminaire sur les Tanaidæ recueillis aux Açores pendant les Campagnes de l' 'Hirondelle' 1887-1888," *Bull. Soc. Zool. de France*, vol. xxi. 1897, p. 207.
- (26) DOLLFUS (A.).—"Campagnes de la 'Melita,' Tanaidæ récoltés par M. Ed. Chevreux dans l'Atlantique et dans la Méditerranée," *Mém. de la Soc. Zool. de France*, vol. xi. 1898, p. 35.
- (27) DOLLFUS (A.).—"Campagnes du 'Travailleur' et du 'Talisman,' *Neotanais Edwardsi*, sp. nov.," *Bull. du Muséum d'Hist. Nat.* 1898, no. 2, p. 77.
- (28) FORSSTRAND (C.).—"Det arktiska Hafsområdets djurgeografiska Begränsning med Ledning af Skalkräftornas (Crustacea Malacostraca) Uttredning." *Upsala*, 1886.
- (29) GOURRET (P.).—"Les Lemodipodes et les Isopodes du Golfe de Marseille," *Ann. du Muséum d'Hist. Nat. de Marseille, Zoologie*, vol. iv. 1891.
- (30) GREBNITZKY (N. A.).—"Crustacean Fauna of the Black Sea" (in Russian). 1873.
- (31) HANSEN (H. J.).—"Dijmphna - Togtets zoologisk-botaniske Udbytte," 1886, p. 185.
- (32) HANSEN (H. J.).—"Oversigt over det vestlige Grönlands Fauna af Malakostrake Havskrebsdyr," *Vidensk. Meddel. fra den Naturh. Foren. i Kjöbh.* 1887.

- (33) HANSEN (H. J.).—‘Cirolanidæ et Familiæ nonnullæ propinquæ Musei Hauniensis.’ Kjöbenhavn, 1890.
- (34) HANSEN (H. J.).—‘Isopoden, Cumaceen und Stomatopoden der Plankton-Expedition.’ 1895.
- (35) HARGER (O.).—“Descriptions of new Genera and Species of Isopoda from New England and adjacent Regions,” Amer. Journ. Sci. & Art, vol. xv. 1878, p. 373.
- (36) HARGER (O.).—“Notes on New England Isopoda,” Proc. U.S. Nat. Mus. 1879, p. 157.
- (37) HARGER (O.).—“Report Marine Isopoda of New England and adjacent Waters,” Rep. U.S. Comm. Fish and Fisheries, pt. vi. for 1878 (not published, I think, until 1881), p. 297.
- (38) HARGER (O.).—“Reports of Dredging East Coast of United States, ‘Blake,’ 1880: XXIII. Report on the Isopoda,” Bull. Mus. Comp. Zool. vol. xi. 1883, p. 91.
- (39) HELLER (C.).—“Carcinologische Beiträge zur Fauna des adriatischen Meeres,” Verh. zool.-bot. Gesellsch. Wien, 1866, p. 723.
- (40) HERDMAN and others.—“The Marine Zoology, Botany, and Geology of the Irish Sea. Fourth and Final Report of the Committee consisting of &c.”—including Mr. A. O. WALKER. [This report gives complete lists of the Crustacea recorded in many scattered papers of Mr. Walker. It will suffice therefore to refer to this for the fauna, except in cases where new species are described.] Brit. Assoc. Rep. for 1886 (1887), p. 417.
- (41) HESSE (E.).—‘Mémoire sur les Pranizes et les Ancées.’ 1864.
- (42) HESSE (E.).—“Mémoire sur des Crustacés rares ou nouveaux des côtes de France: Article XXI. Mémoire sur les Sphéromiens &c.,” Ann. des Sci. nat. sér. 5, Zool. vol. xvii. 1872, p. 1.
- (43) HESSE (E.).—“Id. Art. XXIII. Pranizes et Ancées nouveaux,” *ibid.* vol. xix. 1874.
- (44) HESSE (E.).—“Description d’un nouvel Ancée (*Anceus Congeri*),” Revue des Sci. nat. vol. iv. 1876.
- (45) HOEK (P.).—‘Die zoologischen Ergebnisse der zwei in den Jahren 1878 und 1879 ausgeführten Fahrten des ‘Willem Barents,’ 1881–2. Crustacea.
- (46) HOEK (P.).—“Schaaldieren van de Oosterschelde,” Tijdschr. Ned. Dierk. Vereen. 1884.
- (47) HOEK (P.).—“Crustacea Neerlandica,” Tijdschr. Ned. Dierk. Vereen. 1889.

- (48) HOEK (P.).—‘Rapport der Commissie uit de Koninklijke Akademie van Wetenschappen, *Linnoria lig-norum*.’ 1893.
- (49) HOYLE (W. E.).—“Deep-water Fauna of the Clyde Sea-area,” Journ. Linn. Soc. vol. xx. 1889, p. 442.
- (50) KÆHLER (R.).—‘Recherches sur la Faune marine des Iles Anglo-Normandes.’ 1885.
- (51) KÆHLER (R.).—“Description d’un Isopode nouveau le *Jæropsis brevicornis*,” Ann. des Sci. nat., Zool. sér. 6, vol. xix. p. 1.
- (52) KRÖYER (H.).—“Nye Arter af Slægten *Tanaïs*,” Naturhist. Tidssk. vol. iv. 1842–3, p. 167.
- (53) KRÖYER (H.).—Gaimard, ‘Voyages en Scandinavie, &c.’ Crustacea.
- (54) LEACH (W. E.).—“Crustaceology,” Edinb. Encycl. vol. vii. 1813–14, and Appendix, vol. vii. pp. 429–437 (1814).
- (55) LEACH (W. E.).—“Tabular View of External Characters of Four Classes of Animals &c.,” Trans. Linn. Soc. vol. xi. 1815, p. 306.
- (56) LEACH (W. E.).—“Annulosa,” Encyclop. Brit., Supplement, 1816, p. 401.
- (57) LEACH (W. E.).—“Crustacés,” Dict. des Sci. nat. vol. xi. 1818, p. 69.
- (58) LEICHMAN (G.).—“Beiträge zur Naturgeschichte der Isopoden,” Bibliotheca Zoologica. Cassel, 1891.
- (59) LILLJEBORG (W.).—“Norges Crustaceer,” Æfvers. K. Vet.-Akad. Förhand. 1851, p. 19.
- (60) LILLJEBORG (W.).—“Hafs Crustaceer vid Kullaberg,” Æfvers. K. Vet.-Akad. Förhand. 1852, p. 1.
- (61) LILLJEBORG (W.).—‘Bidrag till Kännedomen om de inom Sverige och Norrige förekommande Crustaceen af Isopodernas Underordning och Tanaidernas Familj.’ Upsala, 1864.
- (62) LUCAS (H.).—“Observations sur quelques Espèces nouvelles de Crustacés du Nord de l’Afrique,” Annales Soc. Entom. de France, sér. 2, vol. vii. 1849, p. 457.
- (63) LUCAS (H.).—‘Histoire naturelle des Animaux articulés de l’Algérie : Crustacés.’ 1845.
- (64) LÜTKEN (CHR.).—“Nogle Bemærkninger om de Nordiske *Æga*-Arter, samt om *Æga*-Slægtens rette Begrændsning,” Naturhist. Foren. Vidensk. Meddel. 1858.
- (65) LÜTKEN (CHR.).—“Tillæg til ‘Nogle &c.’ Om *Æga tridens*, Leach, og *Æga rotundicauda*, Lilljeborg, samt
Ann. & Mag. N. Hist. Ser. 7. Vol. iii.

- om Slægterne *Acherusia* og *Ægacilla*," Naturhist. Foren. Vidensk. Meddel. 1860.
- (66) MAITLAND (R. T.).—'Naamlijst van Nederlandsche Shaaldieren,' Rotterdam, 1876.
- (67) MATTHEWS (J. DUNCAN).—" *Æga crenulata*, Lütken," Ann. & Mag. Nat. Hist. ser. 5, vol. xx. 1887, p. 444.
- (68) MATZDORFF (C.).—"Ueber die Färbung von *Idotea tricuspidata*," Jenaische Zeitschr. vol. xvi. 1882, p. 1.
- (69) MAX WEBER (Professor).—"Die Isopoden gesammelt während der Fahrten des 'Willem Barents' in das nördliche Eismeer in den Jahren 1880 und 1881," Bidragen tot de Dierkunde. Amsterdam, 1884.
- (70) MEINERT (FR.).—"Crustacea Isopoda, Amphipoda et Decapoda Daniæ," Naturhist. Tidssk. ser. 3, vol. xi. 1877, p. 57, and vol. xii. 1880, p. 465.
- (71) MEINERT (FR.).—"Crustacea Malacostraca in Petersen's 'Det Videnskabelige Udbette kanonbaden 'Hauchs' Togter in de Danske Have indenfor Skagen 1883-6.' 1889-90.
- (72) METZGER (A.).—"Jahresbericht der Commission zur wissenschaftlichen Untersuchung der deutschen Meere in Kiel für die Jahre 1872-1878: Crustaceen." 1875.
- (73) MIERS (E. J.).—"Report on the Crustacea collected by the Naturalists of the Arctic Expedition in 1875-76," Ann. & Mag. Nat. Hist. ser. 4, vol. xx. 1877.
- (74) MIERS (E. J.).—"Small Collection of Crustacea made by Edward Whymper, Esq., chiefly in the N. Greenland Seas," Journ. Linn. Soc., Zool. vol. xv. 1880, p. 59.
- (75) MIERS (E. J.).—"Revision of the Idoteidæ, a Family of Sessile-eyed Crustacea," Journ. Linn. Soc., Zool. vol. xvi. 1881, p. 1.
- (76) MOSSIN (J. R.).—"Ueber die *Anilocera mediterranea*," St. Petersburg, 1870.
- (77) MONTAGU (G.).—"Description of several Marine Animals found on the Coast of Devonshire," Trans. Linn. Soc. vol. vii. 1804, p. 61.
- (78) NORMAN (A. M.).—"Report Dredging Expedition to Dogger Bank and Coasts of Northumberland," Trans. Tyneside Nat. Field-Club, vol. v. 1863, p. 263.
- (79) NORMAN (A. M.).—"Report Deep-sea Dredging of Coast of Northumberland and Durham: Crustacea," Nat. Hist. Trans. Northumb. and Durham, vol. i. 1865, p. 12.
- (80) NORMAN (A. M.).—"Report Committee for Exploring

- the Coasts of the Hebrides : Part 2," Brit. Assoc. Rep. for 1866 (1867), p. 193.
- (81) NORMAN (A. M.).—"On two Isopods belonging to the Genera *Cirolana* and *Anilocra* new to the British Islands," Ann. & Mag. Nat. Hist. ser. 4, vol. ii. 1868, p. 421.
- (82) NORMAN (A. M.).—"Last Report Dredging among the Shetland Isles," Brit. Assoc. Rep. for 1868 (1869), p. 232.
- (83) NORMAN (A. M.).—"Exploration of the Faroe Channel in 1880 by H.M.S. 'Knight Errant': Report on the Crustacea," Proc. Roy. Soc. Edinb. 1881-82, p. 46.
- (84) NORMAN (A. M.).—"Notes on the French Expedition of 'Le Travailleur' in the Bay of Biscay," Report Brit. Assoc. for 1880-1881, p. 10, and printed separately in a fuller form by Taylor and Francis, 1880.
- (85) NORMAN (A. M.).—"A Month on the Trondhjem Fiord," Ann. & Mag. Nat. Hist. ser. 6, vol. xii. 1893, pp. 341 & 441, vol. xiii. 1894, pp. 112, 150, 268, vol. xv. 1895, p. 476.
- (86) NORMAN and STEBBING.—"Crustacea Isopoda of the 'Lightning,' 'Porcupine,' and 'Valorous' Expeditions," Trans. Zool. Soc. vol. xii. 1886, p. 77.
- (87) PROUDHOMME DE BORRE (A.).—"Note sur les Crustacés Isopodes de la Belgique," Comptes Rendus Soc. Entom. de Belgique, April 1866.
- (88) RATHKE (H.).—"Zur Fauna der Krym," Mém. des Sav. Etrang. vol. iii. 1837, p. 291.
- (89) RATHKE (H.).—"Beiträge zur Fauna Norwegens," Acta Acad. Leopoldino-Carolinæ, vol. xx. 1843, p. 1.
- (90) RICHARDSON (HARRIET).—"Descriptions of Four new Species of *Rocinela*, with a Synopsis of the Genus," Proc. Amer. Phil. Soc. vol. xxxvi. 1898, p. 8.
- (91) ROBERTSON (D.).—"Contribution towards a Catalogue of the Amphipoda and Isopoda of the Firth of Clyde," Glasgow, 1888 (separately), and Trans. Nat. Hist. Soc. Glasgow, vol. ii. p. 9.
- (92) ROBERTSON (D.).—"Second Contribution towards Catalogue of the Amphipoda and Isopoda of the Clyde and West of Scotland," Trans. Nat. Hist. Soc. Glasgow, vol. iii. 1892, p. 199.
- (93) SARS (G. O.).—"Om en anomal Gruppe af Isopoden," Vidensk.-Selsk. Forhand. 1863.
- (94) SARS (G. O.).—"Beretning om en i Sommeren 1865 foretagen zoologisk Reise ved Kysterne af Christianias og Christiansands Stifter.' 1866.

- (95) SARS (G. O.). — "Nye Dybvandscrustaceer fra Lofoten," Vidensk.-Selsk. Forhand. 1869, p. 147.
- (96) SARS (G. O.). — 'Undersøgelser over Christianiafjordens Dybvandsfauna.' 1869.
- (97) SARS (G. O.). — "Undersøgelser over Hardangerfjordens Fauna: I. Crustacea," Vidensk.-Selsk. Forhand. 1871.
- (98) SARS (G. O.). — "Bidrag til Kundskaben om Dyrelivet paa vore Hafbanker," Vidensk.-Selsk. Forhand. 1872.
- (99) SARS (G. O.). — "Prodromus descriptionis Crustaceorum et Pycnogonorum quæ in expeditione Norvegica anno 1876 observavit G. O. Sars," Archiv for Math. og Naturvid. Christiania, 1876.
- (100) SARS (G. O.). — "Crustacea et Pycnogonoidea nova in itinere 2^{ndo} et 3^{tio} Expeditionis Norvegiæ anno 1877-8 collecta," Archiv for Math. og Naturvid. Christiania, 1880, p. 428.
- (101) SARS (G. O.). — "Revision af Gruppen Isopoda Chelifera," Archiv for Math. og Naturvid. 1880, p. 1.
- (102) SARS (G. O.). — "Oversigt af Norges Crustaceer med foreløbege Bemærkninger over de nye eller mindre bekendte Arter. I.," Vidensk.-Selsk. Forhand. 1882.
- (103) SARS (G. O.). — "Nye Bidrag til Kundskaben om Middelhavets Invertebratfauna. III. Middelhavets Saxipoder (Isopoda Chelifera)," Archiv for Math. og Naturvid. Christiania, 1886, p. 263.
- (104) SARS (G. O.). — 'Norwegian North Atlantic Expedition, 1876-1878,' Crustacea, i. 1885, ii. 1886.
- (105) SARS (G. O.). — 'Account of the Crustacea of Norway,' vol. ii. Isopoda, 1896-99.
- (106) SARS (M.). — "Beskrivelse af en ny Slægt og Art af Isopoder, *Munnopsis typica*, Sars," Vidensk.-Selsk. Forhand. 1863.
- (107) SARS (M.). — "Beretning om en i Sommeren 1859 foretagen zoologisk Reise ved Kyster af Romsdals Amt," Mag. for Naturvidens. 1861.
- (108) SARS (M.). — 'Bidrag til Kundskab til Christianiafjordens Fauna.' 1868.
- (109) SCHIÖDTE (J. C.). — "Krebsdyrenes Sugemund," Naturhist. Tidssk. ser. 3, vol. iv. 1866, p. 169, vol. x. 1875, p. 211.
- (110) SCHIÖDTE (J. C.) and MEINERT (F.). — "Symbolæ ad Monographiam Cymothoarum Crustaceorum Isopodum Familiæ," Naturhist. Tidssk. ser. 3, vols. xiii., xiv., 1879-84.
- (111) SCOTT (THOMAS). — "Revised List of the Crustacea of

- the Firth of Forth," Sixth Ann. Rep. Fishery Board of Scotland, 1888, p. 235.
- (112) SCOTT (THOMAS).—"Additions to the Fauna of the Firth of Forth," Eighth Ann. Rep. Fishery Board of Scotland, 1890, p. 312.
- (113) SCOTT (THOMAS).—"Additions to the Fauna of the Firth of Forth," Ninth Ann. Rep. Fishery Board of Scotland, 1891, p. 300.
- (114) SCOTT (THOMAS).—"Marine Fishes and Invertebrates of Loch Fyne," Fifteenth Ann. Rep. Fishery Board of Scotland, 1897, p. 107.
- (115) SCOTT (THOMAS).—"Some Additions to the Invertebrate Fauna of Loch Fyne," Sixteenth Ann. Rep. Fishery Board of Scotland, 1898, p. 261.
- (116) SCOTT (THOMAS).—"Notes on some Scottish Marine Isopods," Annals of Scottish Nat. Hist., Oct. 1898, p. 218.
- (117) SMITH (S. I.).—"Review of the Marine Crustacea of Labrador," Proc. U.S. Nat. Mus. vol. vi. 1882, p. 223.
- (118) SOWINSKY (B.).—"Les Crustacées malacostragues recueillis par deux Expéditions pour les explorations des profondeurs de la Mer Noire en 1890-91." 1895 (in Russian).
- (119) SOWINSKY (B.).—"Les Crustacées supérieures (Malacostraca) de Bosphor : I. Amphipoda et Isopoda." 1897 (in Russian).
- (120) STEBBING (Rev. T. R. R.).—"On a new Species of *Arcturus* (*A. damnoniensis*)," Ann. & Mag. Nat. Hist. ser. 4, vol. xiii.
- (121) STEBBING (Rev. T. R. R.).—"A new Australian Sphæromid (*Cyctura venosa*), and Notes on *Dynamene rubra* and *viridis*," Journ. Linn. Soc. vol. xii. 1874, p. 146.
- (122) STEBBING (Rev. T. R. R.).—"Description of a new Species of Sessile-eyed Crustacean, and other Notices," Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. 1876, p. 73.
- (123) STEBBING (Rev. T. R. R.).—"The Sessile-eyed Crustacea of Devon," Trans. Devonshire Assoc. Advancement of Sci., Lit., & Art, 1874.
- (124) STEBBING (Rev. T. R. R.).—"Sessile-eyed Crustacea of Devonshire, a Supplementary List," Trans. Devon. Assoc. Advanc. of Sci., Lit., & Art, 1879.
- (125) STEBBING (Rev. T. R. R.).—"Sessile-eyed Crustacea," Ann. & Mag. Nat. Hist. ser. 6, vol. viii. 1891, p. 324.
- (126) STEBBING (Rev. T. R. R.).—"On the Isopod Genus

- Leptochelia*," Ann. & Mag. Nat. Hist. ser. 6, vol. xix. 1896, p. 156.
- (127) STEVENSON (D.).—"Notice of the Ravages of *Limnoria terebrans* in Creosoted Timber," Proc. Roy. Soc. Edinb. vol. iv. 1862.
- (128) STIMPSON (W.).—"Marine Invertebrates of Grand Manan." 1853.
- (129) STOSSICH (M.).—"Prospetto della Fauna del Mare Adriatico: III. Crustacea," Bollettino Trieste, vol. vi. 1881.
- (130) STUXBERG (A.).—"Faunan på och kring Novaja Semlja," 'Vega' Exped. Vetenskap. Arbeten, 1886.
- (131) SYE (C. G.).—"Beiträge zur Anatomie und Histologie von *Jæra marina*." Kiel, 1887.
- (132) THOMSON (C. WYVILLE).—"The Depths of the Sea." 1873.
- WALKER (A. O.).—See HADDON.
- (133) WALKER (A. O.).—"New Species of *Edriophthalma* from the Irish Sea," Journ. Linn. Soc., Zool. vol. xxvi. 1897, p. 226.
- (134) WALKER (A. O.).—"Malacostraca from the West Coast of Ireland," Trans. Liverpool Biol. Soc. vol. xii. 1898, p. 159.
- (135) WALKER (A. O.) and HORNEILL (J.).—"Report Schizopoda, Cumacea, Isopoda, and Amphipoda of the Channel Isles," Journ. Marine Zool. & Microsc. vol. ii. 1896, p. 49.
- (136) WHITE (A.).—"Popular History of British Crustacea." 1857.

In the following Reports will be found the "Stations" &c. referred to under *Hab.* and *Distrib.* :—

1. "Preliminary Report of the Scientific Exploration of the Deep Sea in H.M. Surveying-Vessel 'Porcupine' during the Summer of 1869," Proc. Roy. Soc. no. 121 (1870).
2. "Report of Deep-Sea Researches, July, August, and September 1870, in H.M. Surveying-Ship 'Porcupine,'" Proc. Roy. Soc. no. 125 (1870).
3. "The 'Valorous' Expedition: Reports of Dr. Gwyn Jeffreys and Dr. Carpenter," Proc. Roy. Soc. vol. xxv. no. 173 (1876).

ISOPODA CHELIFERA.

Fam. I. Apseudidæ.

Genus 1. APSEUDES, Leach.

1. *Apseudes talpa* (Montagu).

1866. *Apseudes talpa*, Bate & Westwood, (1) vol. ii. p. 148.

1880. *Apseudes talpa*, G. O. Sars, (101) p. 10.

1886. *Apseudes talpa*, Norman & Stebbing, (86) p. 81.

1886. *Apseudes talpa*, G. O. Sars, (103) p. 267, pls. i., ii.

Hab. Guernsey, and among stones, the Fleet, Weymouth (*A. M. N.*). Tidemark, Jersey (*Sinel & Hornell*, 135). Among roots of *Laminaria saccharina* in 7 fath., near the Tan Buoy, Cumbræ, N.B. (*D. Robertson*, 91). Montagu's specimen was taken at Salcombe; and Barlee procured it at Plymouth.

Distrib. Off Capri, Bay of Naples (*A. M. N.*); Sardinian coast (*Prof. Emery*); Adriatic (*Heller* as "*Rhœa Latreillii*"); *Mus. Nor.*, Messina (*G. O. Sars*). The species recorded under this name by Meinert from Denmark was subsequently found by him to be *A. spinosus*.

2. *Apseudes Latreillii* (Milne-Edwards).

1866. *Apseudes Latreillii*, Bate & Westwood, (1) vol. ii. p. 153.

1880. *Apseudes Latreillii*, G. O. Sars, (101) p. 14.

1886. *Apseudes Latreillii*, Norman & Stebbing, (86) p. 82, pl. xvi.

1886. *Apseudes Latreillii*, G. O. Sars, (103) p. 290, pl. v.

Hab. Guernsey; Jersey; mouth of the Yealm, Devon (*A. M. N.*). Moray Firth (*T. Edward* in *Mus. Nor.*). Plymouth (Biol. Lab.: in *Mus. Nor.*). Salcombe, Devon (*Stebbing*, 124).

Distrib. Coast of France (*H. Milne-Edwards*); Naples and Golelta (*G. O. Sars*).

This is not *Apseudes Latreillii*, Claus; but appears to be the *Rhœa Latreillii* of Milne-Edwards, and certainly the *Apseudes Latreillii* of Bate and Westw., of G. O. Sars, and of Norman and Stebbing. Professor Claus, in the exhaustive memoirs (16 and 17) on the morphology and physiology of *Apseudes*, named the Adriatic species which he was investigating *Apseudes Latreillii*, M.-Edwards. Immediately after the publication of his first memoir, Mr. Stebbing and myself (86, p. 133) pointed out that Claus's species was not that understood by *A. Latreillii*, and we named this new Adriatic form *Apseudes hastifrons*; and Boas (5), arriving shortly after at the same conclusion, named the same Adriatic form

A. Clausi. In the same year Professor G. O. Sars published his work on the Mediterranean Isopoda Chelifera (103), in which full illustrations were given of a Mediterranean *Apseudes*, which he had previously characterized (101) under the name *A. acutifrons*, G. O. Sars. Professor Claus, replying to the criticisms of Boas on this and other points in his second memoir (17), argued that the Adriatic form he had described was the true *Rhæa Latreillii* of Milne-Edwards, and that it was the same species as *A. acutifrons*, G. O. Sars, which latter name must become a synonym of the former, while the *A. Latreillii* of Bate and Westwood, of Norman and Stebbing, and of Sars must be renamed as *A. Sarsii*, Claus. It is necessary, therefore, to carefully examine the form described by Milne-Edwards. *Rhæa Latreillii*, H. Milne-Edwards, was twice figured by its describer, originally in *Annales des Sci. Nat.* vol. xiii. 1828, p. 292, pl. xiii. A, figs. 1-8, and then again in 'Règne Animal Cuvier. Les Crustacés,' par Milne-Edwards, pl. lxii. fig. 2. A comparison of these figures brings out some important points. In both figures the hand of the second gnathopod is represented as armed with four spines and the wrist with one: in the 'Annales' fig. 2 represents a conspicuous rostrum, and the last segment of the pleon is of considerable length, as long as the three preceding segments; in the larger figure which we find in the 'Règne Animal' the rostrum has the proportions of that of Spence Bate's *Latreillii*, and the large pleon-segment only equals the length of two preceding segments. Taking these facts together, and the general details of the figures as well as the description, it would seem that M.-Edwards's species cannot be *A. acutifrons*, Sars. First, as regards the rostrum, the description "extrémité antérieure se prolonge sur la forme d'un rostre pointu et légèrement recourbée," applies closely to *Latreillii**, but scarcely to *acutifrons*: the last segment of pleon is described as "remarquable par sa longueur"; it is represented in the 'Annales' as equal in length to the three preceding segments, but in Cuvier as equal to only two—in the former case resembling that of *acutifrons*, in the latter that of *Latreillii*. The fossorial second gnathopods are both described and figured as having four spines on the margin of the hand and one on the carpus: now *acutifrons* has four on the hand and two on the carpus, six in all on these two joints; while *Latreillii* has three spines on the hand and two on the carpus, five in all.

* Henceforward I shall use the term "*Latreillii*" for *Latreillii*, Bate and Westwood.

Thus M.-Edwards's description and figure of this limb does not accord with that of either of the species we are considering: if *acutifrons*, then one of the wrist-spines is omitted; if *Latreillii*, then one of the spines which really belonged to the wrist has been attributed to the hand. The last appears to be the more likely supposition. But it may be that the specimen was an abnormal one, or that *A. Latreillii* of Milne-Edwards was another species, and neither *A. Latreillii* of Bate and Westwood nor *A. acutifrons*. That it is not the latter species I think we may be satisfied, for Milne-Edwards, who describes the spine-formed epimeral process of the first segment of the peræon, could not have entirely omitted, both in his illustration and in his description, the spine-processes at the anterior corners of the cephalon or those on the sides of the segments of the peræon, which are conspicuous in *acutifrons* but absent in *Latreillii*.

Some uncertainty must remain as to whether Milne-Edwards's species is the same as that of Bate and Westwood; but it seems desirable to retain the name for the latter form until this use shall have been proved to be wrong by any future discovery of an *Apseudes* which more closely accords with the figures of Milne-Edwards and found on the French coast.

The second point for consideration is what name the Adriatic species described by Claus as *A. Latreillii*, and subsequently identified by him with *A. acutifrons*, G. O. Sars, ought to bear. Unquestionably the form is remarkably near to that described by Sars, and to this Claus would assign it as a local variety. It differs, however, in some important details, chiefly in the armature of the hand of the second gnathopods. This in *A. acutifrons* is furnished with four long acute spines, but in the Adriatic form with six such spines. I have examined forty specimens of the former, taken by myself at Naples, and six of the latter, given to me by Professor Claus; every Neapolitan example had the four spines and each of the Adriatic specimens six. Now the spines which are in this position I have found in all the *Apseudidæ* examined by me to afford valuable specific characters, and the number in each species to be remarkably constant. There are other minute differences between the two forms; thus, the outer ramus of the uropods in *A. acutifrons* is two-jointed, but in the Adriatic form three-jointed. These two forms, however, agree in a very important character, and differ from other species referred to the genus *Apseudes*, inasmuch as the eye-lobes, which are usually

separable from the cephalon, are here firmly connected to and form a portion of it. The divergence of structure is so remarkable that it appears to me that *A. acutifrons* and *A. hastifrons* ought to be generically separated from their allies; and I would propose for them the name *Apseudopsis*. The synonymy will be:—

(1) *Apseudopsis acutifrons* (G. O. Sars).

1880. *Apseudes acutifrons*, G. O. Sars, (101) p. 15.

1886. *Apseudes acutifrons*, G. O. Sars, (103) p. 295, pl. vi.

(2) *Apseudopsis hastifrons* (Norman & Stebbing).

1884. *Apseudes Latreillii*, Claus, (16) p. 316, pls. i., ii.

1886. *Apseudes hastifrons*, Norman & Stebbing, (86) p. 133.

1886. *Apseudes Clausi*, Boas, (15) p. 109.

1887. *Apseudes Latreillii*, Claus, (17) p. 139, pls. i.-vii.

3. *Apseudes hibernicus*, Walker.

1897. *Apseudes hibernicus*, A. O. Walker, (133) p. 228, pl. xvii. figs. 2-2d, pl. xviii. figs. 2e & 2f, and (134) p. 164 (name only).

Through the kindness of Dr. Scharff I have had an opportunity of examining two specimens of this species which are preserved in the Natural History Museum of Dublin and are referred to and identified with the species by Mr. Walker. These *Apseudes* appear to me to approach nearest to *A. tenuimanus*, G. O. Sars (103, pl. iii.), but the antennal filaments are more numerously jointed, the sides of the segments of the peræon are without the lateral and posterior projections, and the telson is shorter.

Hab. Between tide-marks on Church Island, Valentia, Ireland, where it was taken by Mr. F. W. Gamble.

4. *Apseudes spinosus* (M. Sars).

1864. *Apseudes talpa*, Lilljeborg, (61) p. 9.

1858. *Rhoëa spinosa*, M. Sars, "Oversigt over de i den Norske-arktiske Region forekommende Krebsdyr," Christ. Vid. Selsk. Forhand. 1858, p. 30.

1869. *Apseudes talpa*, G. O. Sars, (96) p. 45.

1877. *Apseudes talpa*, Meinert, (70) vol. xi. p. 85 (*fide* Meinert, (71) p. 125).

1880. *Apseudes spinosus*, G. O. Sars, (101) p. 11.

1886. *Apseudes spinosus*, Norman & Stebbing, (103) p. 85, pl. xvii. fig. 1.

1896. *Apseudes spinosus*, G. O. Sars, (105) p. 7, pls. i. & ii.

1896. *Apseudes Kæhlert*, Bonnier, (8) p. 562, pl. xxxi. figs. 1 a-n.

Hab. 'Porcupine' Expedition, 1869, off S.S.W. Ireland, 725 fath. (Stat. 36, lat. 48° 50' N., long. 11° 9' W.).

Distrib. On the Norwegian coast I have dredged it at Drobak, near Christiania, and very abundantly near Lervig in the Hardanger Fiord in 180 fath.; and I am indebted to Herr I. Sparre Schneider for examples from Tromsö. Vadsö, East Finmark (*G. O. Sars*); Bohuslän, Sweden (*Lilljeborg*); Denmark (*Meinert*); Bay of Biscay (*Bonnier*).

5. *Apseudes simplicirostris*, Norman & Stebbing.

1886. *Apseudes simplicirostris*, Norman & Stebbing, (86) p. 91, pl. xviii. fig. 1.

The type and only known specimen of this marked form was taken by the 'Porcupine,' 1869 (Stat. 22, lat. $56^{\circ} 8' N.$, long. $13^{\circ} 34' W.$), about 100 miles directly south of Rockall, in 1263 fath.

6. *Apseudes grossimanus*, Norman.

1870. *Apseudes grossimanus*, Norman, Proc. Royal Soc. no. 125, p. 157 (no description).

1881. *Apseudes grossimanus*, Norman, (84) p. 10 (name only).

1886. *Apseudes grossimanus*, Norman & Stebbing, (86) p. 93, pl. xix.

Hab. 'Porcupine,' 1869, off S.W. Ireland, in 90 fath. (Stat. 6, lat. $52^{\circ} 25' N.$, long. $11^{\circ} 40' W.$).

Distrib. 'Porcupine,' 1870, off coast of Portugal, in 740 fath. (Stat. 17 a, lat. $39^{\circ} 3' N.$, long. $9^{\circ} 39' W.$); and off Sidi Terri, North African coast. I also saw it dredged in the Bay of Biscay when with the 'Travailleur' Expedition in 1880.

Genus 2. SPHYRAPUS, Norman & Stebbing, 1886.

7. *Sphyrapus malleolus*, Norman & Stebbing.

1886. *Sphyrapus malleolus*, Norman & Stebbing, (86) p. 98, pl. xxii. figs. 2, 3.

1896. *Sphyrapus malleolus*, Bonnier, (8) p. 565, pl. xxxi. fig. 1.

Hab. 'Porcupine,' 1869, at two stations (Stat. 22 and 24) to the south of Rockall, in 109 and 1263 fath.

Distrib. 'Porcupine,' 1870, Stat. 17 a, lat. $39^{\circ} 39' W.$, long. $9^{\circ} 39' W.$, in 740 fath., off the coast of Portugal; 'Valorous,' 1875, Stat. 11, lat. $57^{\circ} 11' N.$, long. $37^{\circ} 41' W.$, south of Cape Farewell, Greenland, in 1450 fath. From the 'Caudan' Expedition Bonnier records it from the Bay of Biscay in 650 and 1410 metres.

8. *Sphyrapus tudes*, Norman & Stebbing.

1886. *Sphyrapus tudes*, Norman & Stebbing, (86) p. 99, pl. xxii. fig. 1.

Hab. 'Porcupine,' 1869, Stat. 23 a, lat. 56° 13' N., long. 14° 18' W., to the south of Rockall, in 420 fath.

Fam. II. Tanaidæ.

Genus 1. TANAIS, M.-Edwards.

9. *Tanais Cavolinii*, H. M.-Edwards.

1828. *Tanais Cavolinii*, H. Milne-Edwards in Audouin & Milne-Edwards's Précis d'Entomologie, vol. i. pl. xxix. fig. 1.

1840. *Tanais Cavolinii*, H. Milne-Edwards, Hist. Nat. des Crust. vol. iii. p. 141, pl. xxxi. fig. 6.

1842. *Tanais tomentosus*, Krøyer, (52) p. 183, and Voyage en Scandinavie &c. (1849 ?) pl. xxvii. figs. 2 a-g.

1843. *Crossurus vittatus*, Rathke, (89) p. 39, pl. i. figs. 1-7.

1866. *Tanais vittatus*, Bate & Westwood, (1) vol. ii. p. 125.

1875. *Tanais vittatus*, Macdonald, Trans. Linn. Soc. ser. 2, vol. i. (Zoology) p. 67, pl. xv.

1881. *Tanais vittatus*, Harger, (37) p. 418, pl. xiii. figs. 81, 82.

1896. *Tanais tomentosus*, G. O. Sars, (105) p. 12, pl. v.

1897. *Tanais Cavolinii*, A. Dollfus, (25) p. 207.

1898. *Tanais Cavolinii*, A. Dollfus, (26) p. 35.

Hab. Tide-marks among weeds, Farland Point, Cumbræ, N.B., and Tobermory in the Isle of Mull (*A. M. N.*); May Island, Firth of Forth, and Dunbar (*Henderson*). Bate & Westwood record it from Berwick (*Dr. Johnston*) and Polperro, Cornwall (*Laughrin*); Jersey (*Kæhler*); Netley Hospital Pier and Alum Bay, Isle of Wight (*Macdonald*).

Distrib. It is found on the coast of Norway (*Rathke &c.*); Öresund (*Krøyer*); West France (*Chevreaux*); Mediterranean, in many places (*Chevreaux*, fide *Dollfus*); Azores (*Th. Barrois*); Greenland (*Hansen*).

M. A. Dollfus has described several closely allied species from the Mediterranean—one with the uropods three-jointed, which is the species of which the above are synonyms, the true *T. Cavolinii* of Milne-Edwards; and three others which agree in having the uropods four-jointed and differ from each other in slight particulars. It is probable that the form which Prof. G. O. Sars has described in his memoir on the Mediterranean Isopoda Chelifera (103, pl. ix. figs. 1-3) is referable to *T. Chevreauxi*, A. Dollfus. It differs from *T. Cavolinii* (= *T. vittatus*) in having the body more slender and the uropods four-jointed.

This species may hereafter be found on our southern coasts, and it is possible that the "very slender form" which

the late Mr. D. Robertson sent to Spence Bate, which that author at first thought a distinct species and named in MS. *T. hirticaudatus*, may really have been that now known as *T. Chevreuxi*.

10. *Tanais Dulongii* (Audouin).

1866. *Tanais Dulongii*, Bate & Westwood, (1) vol. ii. p. 129.

This species is at present unknown to me, and I am unable to throw any light upon it.

Bate and Westwood write :—"The only individuals which we have seen were sent to us from Polperro by Mr. Laughrin." In the "Last Report of Dredging among the Shetland Isles" I recorded this species from "St. Magnus Bay, rare." I have now searched in vain in my collection for the specimens, and can neither find it or any other Shetland form which could have been confounded with it. I know that many of my Tanaidæ were years ago dried up, and this form was probably among them.

Genus 2. LEPTOCHELIA, Dana.

11. *Leptochelia Savignii* (Krøyer).

1842-3. *Tanais Savignii*, Krøyer, (52) p. 168, pl. ii. figs. 1-12, ♂.

1842-3. *Tanais Edwardsii*, Krøyer, (52) p. 174, pl. ii. figs. 13-19, ♀.

1866. *Leptochelia Edwardsii*, Bate & Westwood, (1) vol. ii. p. 134, ♂.

1881. *Leptochelia alyicola*, Harger, (37) p. 423 (meum exemplum illi transmissum, nec Americæ exempla).

1881. *Paratanais Savignii*, Delage, (20) p. 134, pl. xi. figs. 1-8.

1880. *Leptochelia Savignii*, G. O. Sars, (101) p. 25.

1886. *Leptochelia Savignii*, G. O. Sars, (103) p. 326, pl. ix. figs. 4-8.

1898. *Leptochelia Savignii*, A. Dollfus, (26) p. 41 and woodcuts.

Hab. The specimens described by Bate and Westwood were found by me among *Zostera* between tide-marks in Belgrave Bay, Guernsey. Since the publication of that work it has been recorded from Sark (*Kæhler*) and Jersey (*Sinell and Hornell*).

Distrib. I have procured it at Naples. Gourret records it from Marseilles; Sars from Trieste, Spezia, Messina, and Syracuse; and Chevreux and Dollfus also from many places in the Mediterranean. The former of these has proved its range on the Atlantic coast from Brittany to Senegal. Azores (*Th. Barrois*). Krøyer's type specimens were from Madeira.

12. *Leptochelia dubia* (Kröyer).

1842-3. *Tanais dubius*, Kröyer, (52) p. 178, pl. ii. figs. 20-22.

1878. *Paratanais algicola*, Harger, (35) p. 377.

1879. *Paratanais algicola*, Harger, (36) p. 162.

1870. *Tanais Savignii*, Dohrn, (21) p. 293, pls. xi., xii. figs. 6-19.

1881 (?). *Leptochelia algicola*, Harger, (37) p. 421, pl. xii. fig. 3, pl. xiii. figs. 83-86.

1880. *Leptochelia dubia*, G. O. Sars, (101) p. 26.

1886. *Leptochelia dubia*, G. O. Sars, (103) p. 317, pls. x., xi.

1898. *Leptochelia algicola*, A. Dollfus, (26) p. 44 and woodcuts.

Hab. Jersey; Birterbuy Bay, Ireland, 1874; Falmouth Harbour, 1884 (*A. M. N.*); Valentia, Ireland, 1½ fath., mud (*A. O. Walker*).

Distrib. Mediterranean (*Dohrn, Sars*); on the Atlantic coast it has been procured by Chevreux (fide *Dollfus*) from Brittany to Senegal and Teneriffe. Harger has found it on the N.E. coast of America. Kröyer's types were from Brazil, and Dollfus has rejected his name on account chiefly of the distance of that locality; but the range of the species is known to be very extensive, and until the Brazilian form is proved to be something different it is surely preferable to retain Kröyer's name.

Genus 3. ALAOTANAIS, Norman & Stebbing.

13. *Alaotanaïs serratispinosus*, Norman & Stebbing.

1886. *Alaotanaïs serratispinosus*, Norman & Stebbing, (86) p. 113, pl. xxiii. fig. 2.

Hab. 'Porcupine,' 1869, dredged in two places between Ireland and Rockall (Stats. 19 and 30), in 1360 and 1380 fath.

Distrib. 'Valorous,' 1875, Stat. 15, lat. 56° 11' N., long. 37° 41' W., at the depth of 1450 fath.

14. *Alaotanaïs lævispinosus*, Norman & Stebbing.

1886. *Alaotanaïs lævispinosus*, Norman & Stebbing, (86) p. 114, pl. xxiv. fig. 11.

Hab. The type and only known specimen was dredged by the 'Porcupine,' 1869, off Valentia, S.W. Ireland, in 370 fath. (Stat. 1).

Genus 4. PARATANAIS, Dana.

15. *Paratanais Batei*, G. O. Sars.

1855. *Tanais Savignii*, Gosse, Manual Marine Zoology, vol. i. p. 137 (not *T. Savignii*, Kröyer).

1866. *Paratanais forcipatus*, Bate & Westwood, (1) vol. ii. p. 138 (not *Tanais forcipatus*, Lilljeborg).

1880. *Paratanais Batei*, G. O. Sars, (101) p. 32.

1886. *Paratanais Batei*, G. O. Sars, (103) p. 338, pl. xiv. figs. 1-3.

1896. *Paratanais Batei*, G. O. Sars, (105) p. 16, pl. vii.

Hab. Falmouth Harbour, 1884, Plymouth, 1889 (*A. M. N.*). It has been recorded from Sark (*Køhler*); tide-marks, Jersey (*Sinel and Hornell*); Cumbrae, Firth of Clyde (*D. Robertson*); Arran, N. B.; Loch Fyne and the Firth of Forth (*T. Scott*). Bate and Westwood gave Banff (*T. Edward*).

Distrib. Spezia in the Mediterranean, in 6-10 fath. (*G. O. Sars*); Saint-Jean-de-Luz, S.W. France (*Dollfus*); several places in West Norway, at roots of *Laminaria* (*G. O. Sars*).

Genus 5. LEPTOGNATHIA, G. O. Sars.

16. *Leptognathia longiremis* (Lilljeborg).

1864. *Tanais longiremis*, Lilljeborg, (61) p. 19.

1876. *Tanais islandicus*, G. O. Sars, (99) p. 346.

1880. *Leptognathia longiremis*, G. O. Sars, (101) p. 41.

1885. *Leptognathia longiremis*, G. O. Sars, (104) p. 79, pl. vii. figs. 17-28.

1896. *Leptognathia longiremis*, G. O. Sars, (105) p. 27, pl. xii.

1898. *Leptognathia longiremis*, T. Scott, (116) p. 220.

Hab. This species has been taken by Mr. Thomas Scott on both sides of Scotland—on the west in Loch Fyne, on the east in the Moray Firth and Firth of Forth.

Distrib. In Norway I have dredged it in the Hardanger Fiord, off Lervig, in 150-180 fath.; and in East Finmark in 110-125 fath. in the Varanger Fiord, and in Klosterelv Fiord in shallow water. Other localities are:—off Reykjavik, Iceland (*G. O. Sars*), Denmark (*Meinert*), Greenland (*Hansen*).

Hansen (31) describes and figures a Greenland *Leptognathia* which he considers to be *L. longiremis* of Lilljeborg, but doubtfully refers to it the *L. longiremis* of Sars. The Greenland form has the hand of the first gnathopod less robust and without the characteristic serration of the outer margin of the finger, and the uropods three-jointed, the first joint markedly longer than the rest of the limb, the terminal joint minute.

17. *Leptognathia Lilljeborgi*, Stebbing.

1891. *Leptognathia Lilljeborgi*, Stebbing, (125) p. 328, pl. xvi.

1898. *Leptognathia Lilljeborgi*, T. Scott, (116) p. 219.

Hab. The type specimens were found by Mr. Stebbing in

the sands at Lee and Woolacombe, North Devon. Mr. T. Scott has met with it in several places in the Firth of Forth.

Mr. Scott writes of this species:—" *Leptognathia Lilljeborgi* appears to be somewhat out of place among the species of that genus described by Sars; these all have the 'superior antennæ in the female distinctly 4-articulated,' whereas in this one the fourth joint is described as 'quite rudimentary.' In the specimens from the Firth of Forth I have been unable to satisfactorily make out a fourth joint; in one or two instances, when there was the appearance of a fourth joint, examination with a 'higher' objective showed that the appearance was produced by the approximation of the bases of the subterminal setæ. For this reason I was inclined at first to consider the species as a member of the genus *Typhlotanais*, the females of which have the superior antennæ 3-articulate; but as the general structure of the antennæ in the male and female, together with the form of the chelæ, do not fit in well with either genus, it is perhaps better to leave this Isopod where it is at present. In the female the first joint of the superior antennæ is long, but the other joints are short, and the second appears to be hinged to the first joint, for in some of my specimens the short end-joints bend over at nearly right angles to the first, as if the antennæ were being used as a grasping-organ."

I have written to Mr. Stebbing to ask his present views as to this species. With regard to the antennæ he writes:—"In the upper antennæ the little fourth joint about which Scott is doubtful is quite distinct under a quarter-of-an-inch power. It is a stumpy little articulus, not a triangle such as could be represented by the meeting of two setules." As compared with *L. longiremis* "the differences are considerable. The upper antennæ, as Scott has noticed, are strikingly unlike. The thumb of the first gnathopods and the tuberculation of the fingers do not at all agree, and the last peræopods are also rather strikingly unlike. As to the uropods you will notice that in my species the second joint of the inner ramus is longer than the first, and the reverse in Sars's figure. The apical part of the last pleon-segment is a little differently shaped in the two species, and in *L. longicornis* there is a denticle on each side of which I find not the slightest trace in *L. Lilljeborgi*. The latter species in the female appears to be much smaller than in the former. I incline to agree with Scott that it looks very like a linking species between *Typhlotanais* and *Leptognathia*." (Stebbing, *in litt.*)

18. *Leptognathia brevimana* (Lilljeborg).1864. *Tanais brevimanus*, Lilljeborg, (61) p. 22.1880. *Leptognathia brevimana*, G. O. Sars, (101) p. 42.1886. *Leptognathia brevimana*, G. O. Sars, (103) p. 350, pl. xv. figs. 7-13.1896. *Leptognathia brevimana*, G. O. Sars, (105) p. 29, pl. xiii. fig. 3.1898. *Leptognathia brevimana*, T. Scott, (116) p. 220.

Hab. Off Valentia, Ireland, 1870 (*A. M. N.*) ; Firth of Forth (*T. Scott*) ; Moray Firth (*T. Scott and F. G. Pearcey*).

Distrib. Sars says that it occurs all along the coast of Norway from Christiania Fiord to Vadsö. In the Mediterranean he procured it at Messina. Bohuslän, Sweden (*Lilljeborg*) ; coast of Denmark (*Meinert*) ; Brittany (*Chevreaux*, fide *Dollfus*).

19. *Leptognathia rigida* (Bate & Westwood).1866. *Paratanais rigidus*, Bate & Westwood, (1) vol. ii. p. 141.1880. *Leptognathia rigida*, G. O. Sars, (101) p. 45.

Hab. The type specimen described by Bate and Westwood was dredged at the roots of *Laminaria saccharina*, near Cumbrae in the Firth of Clyde, by the late Mr. D. Robertson, in 7-8 fath. St. Magnus Bay, Shetland, 1867 (*A. M. N.*) : so recorded (83) ; but I no longer have the specimen, and thus cannot again determine it.

20. *Leptognathia breviremis* (Lilljeborg).1864. *Tanais breviremis*, Lilljeborg, (6) p. 21.1880. *Leptognathia breviremis*, G. O. Sars, (101) p. 42.1896. *Leptognathia breviremis*, G. O. Sars, (105) p. 28, pl. xiii. fig. 1.

Hab. This species was found by me in Plymouth Harbour in 1889. Loch Fyne, Firth of Forth, and Moray Firth (*T. Scott*).

Distrib. Bohuslän, Sweden (*Lilljeborg*) ; Kattegat (*Meinert*). In Christiania Fiord in 20-60 fath., and in several places in south and west of Norway, as far north as Kvalö on the Nordland coast (*G. O. Sars*).

Genus 6. *TANAOPSIS*, G. O. Sars.21. *Tanaopsis laticaudata*, G. O. Sars.1880. *Leptognathia laticaudata*, G. O. Sars, (101) p. 43.1886. *Leptognathia laticaudata*, G. O. Sars, (103) p. 353, pl. xv. figs. 14-17.1896. *Tanaopsis laticaudata*, G. O. Sars, (105) p. 32, pl. xiv. fig. 1.

Hab. I took this species in some abundance in Birterbuy Bay, West Ireland, in 1874, and subsequently near Cumbrae
Ann. & Mag. N. Hist. Ser. 7. Vol. iii. 25

in the Firth of Clyde, where also it has been found by Mr. D. Robertson. Gair Loch in Loch Fyne, Firth of Forth, and Moray Firth (*T. Scott*).

Distrib. Naples and Messina, and in a few places on the west of Norway in 6–20 fath. (*G. O. Sars*).

Genus 7. *STRONGYLURA*, G. O. Sars.

22. *Strongylura arctophylax*, Norman & Stebbing.

1886. *Strongylura arctophylax*, Norman & Stebbing, (86) p. 116, pl. xxiv. fig. 3.

Hab. The type and only known specimen was procured in the 'Porcupine' dredgings of 1869 at Stat. 30, lat. $56^{\circ} 24' N.$, long. $11^{\circ} 49' W.$ (that is, between Ireland and Rockall), in 1380 fath.

Genus 8. *PSEUDOTANAIS*, G. O. Sars.

23. *Pseudotanaïs forcipatus* (Lilljeborg).

1864. *Tanaïs forcipatus*, Lilljeborg, (61) p. 16.

1880. *Pseudotanaïs forcipatus*, G. O. Sars, (101) p. 46.

1896. *Pseudotanaïs forcipatus*, G. O. Sars, (105) p. 40, pl. xvii. fig. 1.

Hab. Tarbert Bank in Loch Fyne; Guillam Bank in Moray Firth (*T. Scott*); Smith Bank, Moray Firth (*F. G. Pearcey*, fide *Scott*).

Distrib. Klosterelv Fiord, East Finmark, which is close upon the frontiers of Russia (*A. M. N.*). Sars has found it "along the whole Norwegian coast, as far north as Kvalö." Bohuslän, Sweden (*Lilljeborg*); Oresund, Denmark (*Meinert*).

This is not *Paratanaïs forcipatus*, Bate and Westwood, for which see under *Paratanaïs Batei*, G. O. Sars.

I add a list of North-Atlantic and Arctic Chelifera, which may prove useful to students, as supplying them with information respecting our present knowledge of the northern species of these Crustacea, and references where descriptions of them may be found.

Isopoda Chelifera of North Atlantic and Arctic Oceans not known in British Seas.

Apseudes uncidigitatus, Norman & Stebbing (86).—Mediterranean.

— *obtusifrons*, Nor. & Stebb. (86).—Near Gibraltar.

- Apseudes echinatus*, G. O. Sars (101, 103), = *A. lunarifrons*, Nor. & Stebb. (86).—Mediterranean.
- *gracilis*, Nor. & Stebb. (86).—North Atlantic and Davis Strait.
- *tenuimanus*, G. O. Sars (101, 103).—Mediterranean.
- *robustus*, G. O. Sars (101, 103).—Mediterranean.
- Apseudopsis acutifrons*, G. O. Sars (101, 103).—Mediterranean.
- *hastifrons*, Nor. & Stebb. (86, p. 133), = *A. Latreillii*, Claus (16, 17), = *A. Clausii*, Boas (5).—Adriatic.
- Parapseudes latifrons* (Grube*), G. O. Sars (101, 103).—Mediterranean and Adriatic.
- Sphyrapus anomalus*, G. O. Sars (96, 101, 105), Nor. & Stebb. (86).—Norway and between Iceland and Jan Mayen; Kara Sea (Hansen, 31).
- *serratus*, G. O. Sars (101, 104).—Between Iceland and Norway and near Spitsbergen.
- Tanais Grimaldii*, A. Dollfus (25).—Azores.
- *Chevreauxi*, A. Dollfus (26) = ? *T. Cavolinii*, G. O. Sars (101, 103), nec *T. Cavolinii*, M.-Edw.—Mediterranean and Adriatic (Heller).
- *testudinicola*, A. Dollfus (26).—Mediterranean.
- Heterotanais algiricus*, A. Dollfus (26).—Mediterranean.
- *provincialis*, A. Dollfus (26).—Mediterranean.
- *Örstedii* (Kröyer) (52 †), = *T. curculio*, Kröyer, ♂ (52), = *T. balticus*, Fr. Müller, ♀, and *T. rhynchites*, Fr. Müller, ♂ ‡.—Greifswalde, Prussia; Norway (G. O. Sars, 101, 105); Baltic and Sweden (Lilljeborg, 61); Kiel (Blanc) §.
- *anomalus*, G. O. Sars (101, 103).—It was assigned as a second form of the male of *Tanais dubius* by Dohrn (21).—Mediterranean.
- *limicola* (Harger), = *Leptochelia limicola*, Harger (35, 37).—N.E. America and Greenland (Hansen, 31).
- Leptochelia neapolitana*, G. O. Sars (101, 103).—Mediterranean.
- *rapax*, Harger (36, 37).—N.E. America.
- *filum* (Stimpson, 128), Harger (36, 37).—N.E. America.
- *corsica*, A. Dollfus (26).—Mediterranean.

* Grube (A. E.), 'Die Insel Lussin und ihre Meeresfauna,' 1864, p. 75.

† Figured by Kröyer, in Gaimard, Voyage en Scandinavie &c. pl. xxxi. fig. 3, ♀, pl. xxx. fig. 4 (*T. curculio*), ♂.

‡ Fr. Müller, Archiv für Naturges., Jahr. 18, Bd. i. pp. 88, 89, pl. iv.

§ Blanc (H.), "Contributions à l'Hist. nat. des Asellotes Hétéropodes: Observations faites sur la *Tanais Örstedii*," Recueil Zoologique Suisse, vol. i. pt. 2 (1884).

- Alaotanaïs hastiger*, Nor. & Stebb. (86).—Entrance to Davis Strait.
- Paratanaïs atlanticus*, A. Dollfus (25).—Azores.
- Typhlotanaïs tenuimanus* (Lilljeborg) (61), G. O. Sars (101, 105).—Norway.
- *æquiremis* (Lilljeborg) (61), G. O. Sars (101, 105), = *Tanaïs depressus*, G. O. Sars (96).—Sweden (*Lilljeborg*); Norway (*Lilljeborg and Sars*).
- *brevicornis* (Lilljeborg) (61), G. O. Sars (101, 105).—Norway (*Lilljeborg and Sars*); Denmark (*Meinert*, 71).
- *finmarchicus*, G. O. Sars (101, 105).—East Finmark.
- *assimilis*, G. O. Sars (101, 105).—Norway.
- *tenuicornis*, G. O. Sars (101, 105).—Norway.
- *microcheles*, G. O. Sars (101, 105).—Norway.
- *cornutus*, G. O. Sars (100, 101, 104, 105).—Between Beeren Island and Finmark and Norway.
- *penicillatus*, G. O. Sars (101, 105).—Norway.
- *messinensis*, G. O. Sars (101, 105).—Mediterranean.
- *spiniventris*, A. Dollfus (25).—Azores.
- *Richardi*, A. Dollfus (25).—Azores.
- *longimanus*, A. Dollfus (25).—Azores.
- Leptognathia filiformis* (Lilljeborg) (61).—Sweden (*G. O. Sars*, 101, 105); Norway (*Meinert*, 71); Denmark.
- *manca*, G. O. Sars (101, 105).—Norway.
- *gracilis* (Krøyer) (52), figured ‘Voyage en Scandinavie &c.’ pl. xxxi. fig. 4.—Spitsbergen and Norway (*J. Hansen*, 31); Kara Sea.
- *graciloides* (Lilljeborg) (61).—Sweden.
- *cæca* (Harger) (35, 36, 37).—N.E. America.
- *crassimana*, A. Dollfus (26).—Brittany.
- Pseudotanaïs macrocheles*, G. O. Sars (101, 105).—Norway.
- *Lilljeborgii*, G. O. Sars (101, 105).—Finmark.
- *mediterraneus*, G. O. Sars (101, 105).—Mediterranean.
- *affinis*, Hansen (71).—Kara Sea.
- *crassicornis*, Hansen (71).—Kara Sea.
- Cryptocope abbreviata*, G. O. Sars (94, 101, 105).—Norway.
- *vöringii*, G. O. Sars (94, 101, 104).—To the west of Norway in the ocean.
- *arctica*, Hansen (31, 32).—Kara Sea and Greenland.
- Haplocope angusta*, G. O. Sars (101, 105).—Norway.
- ? *abyssorum*, A. Dollfus (25).—Azores.

Strongylura cylindrica, G. O. Sars (101, 105).—Norway.

Anarthura simplex, G. O. Sars (101, 105).—Norway, West France
(A. Dollfus, 26).

Mesotanais dubius, A. Dollfus (25).—Azores.

Neotanais Edwardsi, A. Dollfus (27).—Bay of Biscay.

Tanaella unguicillata, Nor. & Stebb. (86).—Lat. 49° 7' N., long.
10° 57' W., which is a little south of the British Area as
defined by me.

XLVII.—*Note on the Harvest-Mice of the Palæarctic Region.*

By G. E. H. BARRETT-HAMILTON.

VERY little is known of the variations in colour, size, or proportions of the harvest-mice of different parts of the Palæarctic Region. It could, however, hardly be doubted that some such variations exist in an animal which is distributed over so wide an extent of country, occurring as it does from Great Britain to the coast of China. Accordingly we find that specimens in the British Museum collection from North-western Fokien, Western Hungary, and England are readily distinguishable from each other, and it is plain that each of these series represents a distinct local race or subspecies.

As regards nomenclature, the harvest-mouse was first described by Pallas, who, in 1779, gave to it the name of *Mus minutus*, but did not localize his type. As, however, he alludes to Siberian specimens as differing from those of which he writes under the heading of *M. minutus*, it seems clear that this name must be used for the harvest-mice of Continental Europe, and that all other names given to European harvest-mice (except, as shown below, that of *M. messorius* for the harvest-mouse of Great Britain) must rank as synonyms of it until it can be shown that more than one form of harvest-mouse exists in Continental Europe.

The name *messorius* of Kerr must stand for the British form, while *pygmæus* of Milne-Edwards, from Eastern Asia, is another subspecies. Lastly, I propose the name of *ussuricus* for the Northern Siberian form, of which the British Museum possesses a specimen from Ussuri in the Coast Province of Eastern Siberia (no. 91. 6. 29. 1).

The following are the forms which may at present be distinguished. They may be conveniently regarded as subspecies of *Mus minutus*.