MINISTERIE VAN ONDERWIJS, KUNSTEN EN WETENSCHAPPEN

ZOOLOGISCHE VERHANDELINGEN

UITGEGEVEN DOOR HET RIJKSMUSEUM VAN NATUURLIJKE HISTORIE TE LEIDEN

ONDER REDACTIE VAN PROF. DR. H. BOSCHMA, DIRECTEUR VAN HET MUSEUM

No. 25

C. S. RAFINESQUE AS A CARCINOLOGIST, AN ANNOTATED COMPILATION OF THE INFORMATION ON CRUSTACEA CONTAINED IN THE WORKS OF THAT AUTHOR

by

L. B. HOLTHUIS

LEIDEN
E. J. BRILL
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1. INTRODUCTION

In the last tens of years more and more attention has been paid to the much neglected and ignored publications written by the eccentric early American naturalist Constantine Samuel Rafinesque. Until now, however, Rafinesque's work in the field of carcinology has received but little attention from modern authors. In 1905 Ortmann (1905, p. 107) pointed out that the name *Astacus limosus* Rafinesque, 1817, is older than the name *Astacus affinis* Say, 1817, for the same species, and that consequently the former name has to be used. In the same year Richardson (1905, p. 10) replaced the invalid generic name *Ligia* Fabricius, 1798, by *Ligyda* Rafinesque, 1815. M. J. Rathbun (1937, p. 63) substituted the generic name *Thelxiope* Rafinesque, 1814, for the name *Homola* Leach, 1815. Finally, in 1949 Hubricht & Mackin (1949, p. 334) dropped the generic name *Mancasellus* Harger, 1876, in favour of *Lirceus* Rafinesque, 1820, at the same time changing the species name *Mancasellus macrourus* Garman, 1890, to *Lirceus fontinalis* Rafinesque, 1820. I know of no other names given by Rafinesque to Crustacea that have been adopted by modern authors, though many of the names given by him to genera and species of that group antedate names which now are currently in use. Since the acceptance of most of Rafinesque's valid generic and specific names would greatly upset the stability of carcinological nomenclature, the present author has submitted to the International Commission on Zoological Nomenclature a proposal in which is asked the suppression of those of Rafinesque's Decapod and Stomatopod names that might cause undesirable nomenclatorial confusion.

Since most of Rafinesque's papers were not available to me in Holland, I eagerly made use of the opportunity that two visits (1947-1948 and 1952-1953) to the United States National Museum, Washington, D.C., offered me to consult all those publications by Rafinesque that might contain informa-

tion on Crustacea. The larger part of these publications is present in the library of the United States National Museum, while the rest was borrowed for me by this library from other institutions in the United States. Apart from these printed papers I also could consult a collection of some of Rafinesque's personal notebooks which are in the possession of the library of the U. S. National Museum. These notebooks proved to be of great interest since they contain original descriptions and unpublished figures of several of Rafinesque's new species of Crustacea. It is interesting to note in this connection that these original descriptions (with the exception of that of *Mesotropis*) all are written in French, though they were published by Rafinesque in English. I am much indebted to Mrs. Leila F. Clark, librarian, and to Mrs. Elisabeth H. Gazin, chief of the reference and circulation sections, of the library of the Smithsonian Institution, for most valuable assistance, which enabled me to consult all the papers I needed.

The number of publications by Rafinesque which contain, or are said to contain, information on recent Crustacea is rather small, in all totalling 8. These papers are dealt with below in chronological order (Chapter II). In Chapter III Rafinesque's system of the Crustacea is treated, followed by Chapter IV containing a systematical enumeration of all the genera and species of Crustacea mentioned in his publications. This chapter may be considered an index to all Crustacean names, generic as well as specific, used by Rafinesque. Of each of Rafinesque's genera and species the descriptions published by him, and also those found in his manuscripts, are cited in full in the present paper. Of each group of Crustacea Rafinesque's nomina nuda have been listed; often it proved hard to decide to which group a certain nomen nudum belongs and mistakes may have been made here. I have tried to identify all of the Decapod Crustacea described by Rafinesque while the identification of a few species of the other groups has been attempted also. I wish to thank here Dr. Fenner A. Chace, Jr., Curator of the Division of Marine Invertebrates of the U. S. National Museum, Washington, D.C., and Dr. Horton H. Hobbs, Jr., professor of Zoology, University of Virginia, Charlottesville, Va., for their most cordial assistance with the present study.

II. CARCINOLOGICAL PUBLICATIONS OF C. S. RAFINESQUE

1814 (February 1). Materia Medica. Illustrazioni di Materia Medica Siciliana. In: Specchio delle Scienze o Giornale enciclopedico di Sicilia, vol. 1 n. 2, pp. 55-58. Palermo. Deals rather extensively with *Grapsus fluviatilis* (= *Potamon edulis*).

1814a. (This book is published in the form of a letter to the well known

mycologist C. H. Persoon. The letter, as shown on p. 54, is dated June 3, 1814). Précis des Découvertes et Travaux somiologiques de Mr. C. S. Rafinesque-Schmaltz. entre 1800 et 1814. Ou choix raisonné de ses principales Découvertes en Zoologie et en Botanique, pour servir d'introduction à ses ouvrages futurs, pp. 1-55. Palermo. The Crustacea are treated on pp. 20-26. Mentioned are 14 species of Decapoda Brachyura (6 of which are nomina nuda), 2 species of Anomura, 24 of Macrura (15 nomina nuda), 2 of Stomatopoda, 15 of Isopoda (12 nomina nuda), 11 of Amphipoda (9 nomina nuda), 3 of Copepoda (2 nomina nuda), 1 of Cladocera (nomen nudum), 1 of Ostracoda (nomen nudum). All the material dealt with originates from Sicily. On the inside of the back cover of this booklet the Crustacean names *Yalomus* (Branchiopoda) and *Heterelus* (Amphipoda) are mentioned, both are nomina nuda. A lithoprint edition of this work was published in 1948 by Peter Smith, The Murray Printing Company, Wakefield, Mass.

1814b. Principes fondamentaux de Somiologie ou les loix de la nomenclature et de la classification de l'empire organique ou des animaux et végétaux contenant les Règles essentielles de l'Art de leur imposer des noms immuables et de les classer méthodiquement, pp. 1-51. Palermo. In this general paper on the nomenclature and the classification of the animal and plant kingdoms, Rafinesque uses a few names of Crustacean genera.

1815. Analyse de la Nature ou Tableau de l'Univers et des Corps organisés, pp. 1-224. Palermo. Here the author gives a classification of the animal and plant kingdoms down to the genera; numerous new generic Crustacean names are introduced, most of them being nomina nuda.

1817 (November). Synopsis of four New Genera and ten new Species of Crustacea, found in the United States. Museum of Natural Sciences. 9. Amer. monthly Mag. crit. Rev., vol. 2, pp. 40-43. New York. In his first paper dealing with American Crustacea Rafinesque described 10 Decapods (all of which are new species, two belonging to two different new genera), 2 new Amphipods (each belonging to a new genus), 1 new Isopod and 1 new Cladoceran. Furthermore Rafinesque remarks that he is acquainted with many more new species of Decapods and Isopods, which, however, are not named.

[1818 (November). Farther Account of Discoveries in Natural History, in the Western States, by Constantine Samuel Rafinesque, Esq. communicated in a Letter from that Gentleman to the Editor. Amer.

monthly Mag. crit. Rev., vol. 4, pp. 39-42. New York. On p. 42 Rafinesque described from springs of New Bedford, Pennsylvania, an animal which he thought to represent a new genus and species of his Crustacean family Phronimia, and which he named *Teliops bicolor*. From the description given by Rafinesque it is clear, however, that we have to do here with a caddisfly larva (Insecta Trichoptera) and not with a Crustacean.]

1820 (preface dated March 1, 1820). Annals of Nature or Annual Synopsis of new Genera and Species of Animals, Plants, &c. discovered in North America, no. 1, pp. 1-16. Lexington, Kentucky. In this paper (pp. 6, 7) Rafinesque described two new species of fresh-water Amphipods and one new species of fresh-water Isopod, all three representing new genera.

1832 (spring of 1832). Extracts from A Second Series of Zoological Letters written to Baron Cuvier of Paris, by Prof. Rafinesque in 1831. Atlantic Journal and Friend of Knowledge, vol. 1 no. 1, pp. 19-22. Philadelphia. A new genus and new species of marine Isopod is described.

III. RAFINESQUE'S SYSTEM OF THE CRUSTACEA

Rafinesque's classification of the Crustacea is as queer as the nomenclature that he used for this group and its subdivisions. The Class of the Crustacea is indicated by him with the name Plaxolia or some spelling variants of it (Plassolia, 1814, p. 57; Plaxolia, 1814a, p. 20, 1814b, p. 47, 1815, pp. 40, 94; Plaxomia, 1820, p. 6), though he used also the word Crustacea for the same purpose (Crostacei, 1814; Crustacés, 1814a, b, 1815; Crustacea, 1820). Carcinology is named by him Plaxology (Plassologia, 1814, p. 57; Plaxologie, 1814a, pp. 9, 20, 1815, p. 40; Plaxology, 1817, p. 41) for the following reason: the "names, Crustaceology and Gammarology, being both erroneous, the first being half Latin and half Greek, the second applying, or implying, a reference to the genus *Gammarus* only" (1817, p. 41).

In his 1814 paper Rafinesque stated on p. 57 that *Potamon edulis* (named *Grapsus fluviatilis* by him) "appartiene alla classe dei Crostacei o Plassolia, e sotto-classe Pediodia, ordine Decapodia, famiglia Canceridia", adopting the then current system of Lamarck and Latreille. In 1815, however, Rafinesque published his own system of the Crustacea going all the way down to the genera (Rafinesque, 1815, pp. 94-101). This classification is given in the following lines, Rafinesque's own words being used as much as possible.

5. Classe. PLAXOLIA. Les Crustacés

1. Sous-Classe. Pedioclia. Les Pédiocles. Deux yeux pédonculés et mobiles: ordinairement 9 pattes (quelquefois 6 à 14) ongulées et insérées sur le thorax, qui est confondu avec la tête.
   1. Ordre. Brachuria. Les Brachuriens. Dix pattes insérées sur le thorax qui est confondu avec la tête; queue plus courte que le corps; sans appendices et repliée sous lui: branchies sous le thorax.
      1. Famille. Canceridia. Les Cancérides. Tous les pieds munis d'ongles aigus; thorax plus large que long: antennes intérieures cachées sous le front.
         1. Sous-Famille. Platismia. Les Platismiens. Thorax en demi cercle antérieurement. Genre. 1. *Cancer* L. Latr. 2. *Dromia* Fabr. 3. *Calappa* Dald. 4. *Hepatus* Fabr.
         2. Sous-Famille. Ocypodia. Les Ocypodiens. Thorax arrondi, cordiforme ou équarri. Genre. 5. *Ocypoda* Dald. 6. *Ocypete* R. 7. *Cerophthalmus* R. 8. *Grapsus* Lam. 9. *Plagusia* Latr. 10. *Cylindusia* R. 11. *Pinnotheres* Latr.
      2. Famille. Nectonyxia. Les Nectonyxes. Quelqu'uns ou tous les pieds terminés par des lames applaties en nageoires.
         1. Sous-Famille. Portunidia. Les Portunides. Thorax plus large que long. Genre. 1. *Portunus* Fabr. 2. *Matuta* Fabr. 3. *Podophthalmus* Lam.
         2. Sous-Famille. Carcinidia. Les Carcinides. Thorax plus long que large. Genre. 4. *Orythyia* Fabr. 5. *Ranina* Lam. 6. *Albunea* Fabr.
      3. Famille. Metapoxia. Les Métapoxiens. Tous les ongles des pieds non dilatés en nageoires: corps plus long que large, front presque toujours aigu, antennes saillantes.
         1. Sous-Famille. Dorsigeria. Les Dorsigères. Les pattes postérieures insérées sur le dos. Genre. 1. *Corystes* Latr. 2. *Doripus* Dald. 3. *Thelxiope* R.
         2. Sous-Famille. Latigeria. Les Latigères. Toutes les pattes insérées latéralement sur les flancs. Genre. 4. *Porcellana* Lam. 5. *Leucosia* Latr. 6. *Nesea* R. 7. *Myctiris* Latr. 8. *Lithodes* Latr. 9. *Macropus* Latr. 10. *Inachus* Fabr. (*Maja* Lam. Latr. *Parthenopa* Fabr.).
   2. Ordre. Macruria. Les Macruriens. Dix pattes insérées sur le thorax, qui est confondu avec la tête, queue plus longue que le corps, munie d'appendices écailleux et servant à nager; branchies couchées sous le thorax.
      4. Famille. Paguria. Les Paguriens. Les appendices de la queue non conniventes en éventail à son extrèmité, les latérales éloignées des terminales.
         1. Sous-Famille. Apaluria. Les Apaluriens. Queue molle, mains didactyles. Genre. 1. *Pagurus* Dald. 2. *Eremitius* R. 3. *Apalurus* R.
         2. Sous-Famille. Plaxuria. Les Plaxuriens. Queue crustacée, mains monodactyles ou adactyles. Genre. 4. *Symnista* R. *Albunea* sp. Dald. Fabr. 5. *Remipes* Latr. 6. *Eremita* Gr. *Hippa* Fabr. 7. *Symethis* Fabr.
      5. Famille Palinuria. Les Palinuriens. Appendices de la queue en éventail, aucunes pattes pincifères. Genre. 1. *Syllarus* R. *Scyllarus* Fabr. 2. *Crangonus* R. *Crangon* Latr. 3. *Palinurus* Dald.
      6. Famille. Plyonuria. Les Plyonuriens. Appendices de la queue connivens en éventail, des pattes pincifères.
         1. Sous-Famille. Astacia. Les Astaciens. Antennes sur un seul rang sans écailles a leur base. Genre. 1. *Posydon* Fabr. 2. *Galathea* Fabr. 3. *Astacus* Gron. 4. *Thalassina* Latr.
         2. Sous-Famille. Alphidia. Les Alphides. Antennes sur deux rangs, les deux supérieures munies à leur base d'une écaille mutique. Genre. 5. *Alpheus* Fabr. 6. *Phorculus* R. 7. *Agerochus* R. 8. *Byzenus* R.
         3. Sous-Famille. Penedia. Les Pénédiens. Antennes sur deux rangs, les deux supérieures bifides et munies à leur base d'une écaille à dent extérieure épi-

neuse. Genre. 9. *Peneus* Dald. 10. *Carida* R. 11. *Mesapus* R. 12. *Etheria* R. 13. *Everne* R. (*Melicertus* R.) 14. *Symathus* R.

4. Sous-Famille. Palemonia. Les Palémoniens. Antennes sur deux rangs, les deux supérieures trifides et munies à leur base d'une écaille à dent extérieure épineuse. Genre. 15. *Palaemon* Dald. 16. *Carcinus* R. 17. *Cryptophthalmus* R. 18. *Niphea* R. (*Aglaope* R.).

3. Ordre. Plemeiopia. Plémeiopes. Plus ou moins de dix pattes, ordinairement insérées par paires sur autant d'articles, tête alors articulée au corps.

7. Famille. Meiopodia. Les Meiopodes. Moins de dix jambes ou pattes. Genre. 1. *Podexus* R. 2. *Alciope* R. 3. *Psimisa* R.

8. Famille. Pleiopodia. Les Pleiopodes. Plus de dix pattes ou jambes.

1. Sous-Famille. Squillacia. Les Squillacés. Branchies sous la queue. Genre. 1. *Squilla* Lam. 2. *Mysis* Latr. 3. *Pronoe* R.

2. Sous-Famillle. Branchiopia. Les Branchiopes. Pattes branchiales sans ongles. Genre. 4. *Brauchiopus* Lam. 5. *Peleus* R. 6. *Amphithoe* R. 7. *Yalomus* R.

2. Sous-Classe. Sessilioclia. Les Sessiliocles. Yeux sessiles non mobiles, ou effacés ou un seul ou aucun; tête articulée; ordinairement plus de 10 pattes exongulées et chaque paire inserée à un article.

4. Ordre. Ostracinia. Les Ostracins. Corps revêtu d'un test, pattes exongulées, branchiales.

9. Famille. Aspidiota. Les Aspidiotés. Corps revêtu en dessus d'un test en forme de bouclier.

1. Sous-Famille. Xyphuria. Les Xyphuriens. Bouclier double, pattes non foliacées, queue uniforme. Genre. 1. *Limula* R. *Limulus* Fabr. 2. *Polyphemus* R. 3. *Xyphurus* R.

2. Sous-Famille. Pneumuria. Les Pneumures. Bouclier simple, pattes non foliacées, queue non uniforme. Genre. 4. *Caligus* Mull. 5. *Binoculus* Geof. 6. *Ozolus* Latr. 7. *Calais* R.

3. Sous-Famille. Phillopia. Les Phyllopiens. Bouclier simple, pattes foliacées, queue filamenteuse. Genre. 8. *Phyllopus* R. *Apus* Latr. 9. *Trichosurus* R.

10. Famille. Ostracodia. Les Ostracodes. Corps revêtu d'un test bivalve.

1. Sous-Famille. Diopsia. Les Diopsiens. Deux yeux. Genre. 1. *Lynceus* Mull. 2. *Taphtus* R.

2. Sous-Famille. Monopsia. Les Monopsiens. Un seul oeil. Genre. 3. *Eurynome* R. 4. *Monoculus* Lin. *Daphnia* Mull. 5. *Cyprisia* R. *Cypris* Mull. 6. *Cythere* Mull.

5. Ordre. Pseudopia. Les Pseudopes. Corps sans test, annelé, tête indistincte, pattes branchiales exongulées.

11. Famille. Cephalopsia. Les Céphalopsiens. Tête distincte du corps, un ou deux yeux et des antennes. Genre. 1. *Cephalops* R. *Cephaloculus* Lam. *Polyphemus* Mull. 2. *Zoenus* R. *Zoe* Bosc.

12. Famille. Cyclopia. Les Cyclopiens. Tête confondue avec le corps, un ou deux yeux et des antennes..

1. Sous-Famille. Argulia. Les Arguliens. Deux yeux. Genre. 1. *Argulus* Mull. 2. *Amynome* Mull. 3. *Nauplius* Mull. 4. *Aonitus* R. 5. *Slaberius* R. 6. *Godeus* R. 7. *Zeteus* R.

2. Sous-Famille. Aplopsia. Les Aplopsiens. Un seul oeil. Genre. 8. *Cyclops* Mull. 9. *Bronteus* R. 10. *Clavilia* R. 11. *Cladeus* R. 12. *Agastor* R.

13. Famille. Bopyria. Les Bopyriens. Point d'yeux ou point d'antennes. Genre. 1. *Bopyrum* Latr. 2. *Janerea* R. 3. *Diprosia* R. 4. *Achesium* R.

6. Ordre. Branchypia. Les Branchypes. Corps sans test, annelé, tête distincte, pieds ongulés, branchies sous le ventre ou la queue.

14. Famille. Phronimia. Les Phronimiens. Deux antennes ou aucunes, quelques pattes chèliformes ou pincifères.

1. Sous-Famille. Elaphalia. Les Élaphales. Point d'antennes. Genre. 1. *Callirhoe* R. (*Heterelos* R.) 2. *Pisitoe* R.
2. Sous-Famille. Cerophalia. Les Cérophales. Deux antennes. Genre. 3. *Phronima* Foskael. 4. *Cerophas* R. 5. *Protonia* R.

15. Famille. Gammaria. Les Gammariens. Quatre antennes, quelques pattes chèliformes ou pincifères, corps ordinairement cylindrique ou comprimé, la tête plus longue du dernier article caudal.
    1. Sous-Famille. Talitridia. Les Talitrides. Queue terminée par des appendices ou soies. Genre. 1. *Talitrus* Bosc. 2 .*Corophium* Latr. 3. *Gammarus* Fabr. 4. *Asope* R. 5. *Plexaura* R. 6. *Hippias* R. 7. *Cychreus* R. 8. *Stenyolus* R. 9. *Pephredo* R. 10. *Dinoa* R. 11. *Thiella* R. 12. *Aglaura* R. 13. *Isolus* R. 14. *Eratea*. 15. *Zaccreus* R.
    2. Sous-Famille. Cyamidia. Les Cyamides. Queue sans appendices ni soies. Genre. 15. *Caprella* Lam. 16. *Cyamus* Latr.

16. Famille. Oniscia. Les Onisciens. Quatre antennes, quatorze pattes, dont aucunes chèliformes ni pincifères, corps déprimé, le dernier article de la queue plus long que la tête et à appendices articulés.
    1. Sous-Famille. Asellotia. Les Asellotiens. Quatre antennes très-apparentes. Genre. 1. *Asellus* Geofr. 2. *Idotea* Fabr. 3. *Sphaeroma* Latr. 4. *Cymothoa* Fabr. 5. *Tyronia* R. 6. *Primno* R. 7. *Psamathe* R.
    2. Sous-Famille. Lygidia. Les Lygidiens. Deux seules antennes apparentes, les deux autres cachées ou très-courtes. Genre. 8. *Ligyda* R. *Ligia* Fabr. 9. *Philoscia* Latr. 10. *Oniscus* L. 11. *Porcellio* Latr. 12. *Armadillo* Latr. 13. *Venilia* R. 14. *Gonotus* R. 15. *Cymodocea* R.

IV. ENUMERATION OF THE CRUSTACEA MENTIONED IN RAFINESQUE'S PUBLICATIONS

Subclass BRANCHIOPODA

Order ANOSTRACA

Generic names. *Branchipus* Schaeffer, 1766 (Rafinesque, 1815, p. 99, as *Brauchiopus*).

Nomina nuda. *Amphithoe* (Rafinesque, 1815, p. 99), *Peleus* (Rafinesque, 1815, p. 99), *Yalomus* (Rafinesque, 1814a, back cover; 1815, p. 99).

Order NOTOSTRACA

New generic names. *Apodium* Rafinesque (1814b, p. 29) to replace *Apus* Cuvier, 1797, the latter name resembling too much the generic name *Apium* L. for a plant. *Phyllopus* Rafinesque (1815, p. 99) a substitute name for *Apus* Latreille (= *Apus* Cuvier, 1797).

Other generic names. *Apus* Cuvier, 1797 (Rafinesque, 1814b, p. 28; 1815, p. 99).

Nomina nuda. *Trichosurus* Rafinesque (1815, p. 99).

Order CLADOCERA

New species.

Daphinia dorsalis Rafinesque (1817, p. 42)

"Antens unequally bifid, shorter than the body, branched one sided anterior, body oval, acute at both ends, whitish, with a brown streak on the back, eye black. — Obs. My genus *Daphinia* is the *Daphnia* of Latreille, which name was too much alike *Daphne,* an anterior genus. This species is common in the sea on the shores of Long-Island, &c. The whole length is less than one line." Fowler (1912, p. 131) synonymizes this species with some doubt with the copepod *Calanus finmarchicus* (Gunn.).

New generic names. *Cephalops* Rafinesque (1815, pp. 100, 221), a substitute name for *Cephaloculus* Lamarck, 1801, and for *Polyphemus* Müller, 1776. *Cephthalmus* Rafinesque (1815, p. 221) to replace *Cephalops* Rafinesque (1815). *Daphinia* Rafinesque (1817, p. 42), a substitute name for *Daphnia* Latreille (= *Daphnia* Müller, 1785) (see above under the new species).

Other generic names. *Cephaloculus* Lamarck, 1801 (Rafinesque, 1815, p. 100), *Daphnia* Müller, 1785 (Rafinesque, 1814a, p. 26; 1815, p. 99; 1817, p. 42), *Lynceus* Müller, 1776 (Rafinesque, 1815, p. 99), *Monoculus* Linnaeus, 1758 (Rafinesque, 1815, p. 99; 1817, p. 40), *Polyphemus* Müller, 1776 (Rafinesque, 1815, p. 100).

Nomina nuda. Genera: *Eurynome* Rafinesque (1815, p. 99), *Taphtus* Rafinesque (1815, p. 99). Species: *Daphnia ciliata* Rafinesque (1814a, p. 26).

Subclass OSTRACODA

New generic names. *Cyprisia* Rafinesque (1815, p. 99), a substitute name for *Cypris* Müller, 1776.

Other generic names. *Cypris* Müller, 1776 (Rafinesque, 1814a, p. 26; 1815, p. 99), *Cythere* Müller, 1785 (Rafinesque, 1815, p. 99).

Nomina nuda. *Cypris brachyura* Rafinesque (1814a, p. 26).

Subclass COPEPODA

Order EUCOPEPODA

Generic names. *Amymone* Müller, 1776 (Rafinesque, 1815, p. 100, as *Amynome*), *Caligus* Müller, 1785 (Rafinesque, 1815, p. 99), *Cyclops* Müller, 1776 (Rafinesque 1814a, p. 26; 1815, p. 100), *Nauplius* Müller, 1776 (Rafinesque, 1815, p. 100).

Nomina nuda. Genera: *Agastor* (Rafinesque, 1815, p. 100), *Aonitus* (Ra-

finesque, 1815, p. 100), *Bronteus* (Rafinesque, 1815, p. 100), *Calais* (Rafinesque, 1815, p. 99), *Cladeus* (Rafinesque, 1815, p. 100), *Clavilia* (Rafinesque, 1815, p. 100), *Godeus (Rafinesque,* 1815, p. 100), *Slaberius* (Rafinesque, 1815, p. 100), *Zeteus* (Rafinesque, 1815, p. 100). Species: *Cyclops obtusicanda* (Rafinesque, 1814a, p. 26), *Cyclops serratus* (Rafinesque, 1814a, p. 26).

Order BRANCHIURA

New genera and species.

Diprosia Rafinesque (1814a, p. 25)

"Manteau déprimé oblong feudu [typographical error for fendu] sans articulations postérieurement, queue inférieure plus longue et échancrée, deux yeux lisses en dessus, bouche inférieure, corps étroit articulé en dessous, 6 paires de jambes à 3 articles, 2 suçoirs antérieurement en dessous. — Obs. Ce genre est très-singulier, le caractère des suçoirs est peut-être unique parmi les Crustacés; il appartient à l'Ordre *Pseudopia,* et famille *Bopyria."* This genus was also mentioned by Rafinesque in his 1815 paper (p. 100) in the family Bopyria.

Diprosia vittata Rafinesque (1814a, p. 25)

"Blanc bleuâtre rayé longitudinalement de pourpre-violet, dos lisse légérement convêxe. — Parasite du *Sparus erythrinus,* la circulation du sang y est frappante." This description of *Diprosia vittata* leaves not the least doubt that Rafinesque's species is identical with *Argulus purpureus* (Risso, 1816), a Mediterranean Argulid which is a parasite of *Pagellus erythrinus* (L.) and other species of fishes. Rafinesque's specific name has priority over that of Risso, so that the nomenclatorially correct name of the species should be *Argulus vittatus* (Rafinesque, 1814). The generic name *Diprosia* Rafinesque, 1814, falls as a junior synonym of *Argulus* Müller, 1785. Desmarest (1823, pp. 392; 1825, pp. 356, 357) cited Rafinesque's description of *Diprosia* and *D. vittata,* but did not recognize the species, which he placed in the order Poecilopoda.

Other generic names. *Argulus* Müller, 1785 (Rafinesque, 1815, p. 100), *Binoculus* Geoffroy, 1764 (Rafinesque, 1815, p. 99), *Ozolus* Latreille, 1802 (Rafinesque, 1815, p. 99).

Nomina nuda. Perhaps some of the nomina nuda enumerated under the Eucopepoda actually belong here.

Subclass MALACOSTRACA

Order MYSIDACEA

Generic name. *Mysis* Latreille, 1802 (Rafinesque, 1815, p. 99).
Nomen nudum. *Pronoe* Rafinesque (1815, p. 99).

Order ISOPODA

New genera and species.

Gonotus Rafinesque (1814a, p. 26)

"Corps linéaire, plat à dos carèné, 14 jambes, 4 antennes, 2 plus longues à 4 longs articles et plusieurs courts, queue sans appendices, utriculée. — Famille *Oniscia.*" The genus was also mentioned by Rafinesque in later papers (1815, p. 101; 1832, p. 20). Its only species is:

Gonotus viridis Rafinesque (1814a, p. 26)

"Verdâtre, queue de la longueur des antennes, plate et lunulée." — As already pointed out by Desmarest (1823, p. 389; 1825, p. 327), H. Milne Edwards (1840, p. 133), and Miers (1881, p. 46) *Gonotus viridis* Rafinesque is identical with the species that is best known under the name *Idotea hectica* (Pallas, 1772). The names *Gonotus* Rafinesque (1814) and *viridis* Rafinesque (1814) thus are junior synonyms of the names *Idotea* Fabricius (1798) and *hectica* Pallas (1772) respectively.

Lirceus Rafinesque (1820, p. 7)

"Four antenna, the two upper ones very long, with four large articles, increasing in size upwards, and many small ones; the two lower antenna shorter than the head and the fourth article of the long antenna, setaceous, adherent with the upper ones at their base. Head rounded, eyes lateral and rounded. Feet with a single claw; body pinnatifid with seven segments without lateral scales; tail large, rounded, utriculated beneath, with concealed bifid appendages. This fresh water genus belongs to the family *Oniscia* and sub-family *Aselotia.* The name was that of a spring in Greece." The only species assigned by Rafinesque to this genus is:

Lirceus fontinalis Rafinesque (1820, p. 7) (fig. 1)

"Blackish, upper antenna one-third of total length; segments broader than the head and truncate lateraly, separated by deep clefts; back convex; tail semitrilobe, margin hyalin, center raised longitudinally. — I detected it in October 1819 in a spring near Lexington. It swims well; feet short with four articles, one of which is a claw; the posterior ones longer and more slender. Length one-fourth of an inch without the antenna; breadth

about one-fourth of the length. Tail broad and twice as long as the head; appendages short, articulated, seldom jutting out of the utricule." The following manuscript description of this species was found among Rafinesque's papers (notebook 21, p. 15) in the Smithsonian library: "Lirceus fontinalis N G-fam[ille] des Aselotia, font[aine] de Sandersville. Sept[embre] 1819. Leach 1 Oct[obre] 1819. Palpes visibles. Long[ueur] 1/4 de p[ouce], diam[ètre] 1/4 [de la] long[ueur]. Ent[ièremen]t brun noirâtre non luisant. 4 Ant[ennes] appar[entes], les 2 courtes presque soudées avec les 2 grandes qui ont 4 gr[ands] articles et plus[ieurs] petits, et long 1/3 de long[ueur] tot[ale] (tête trop gr[ande dans la figure]) à 2 forts yeux lat[éral]s. 7 Articles pinnés lat[éralemen]t et tronq[ués], sans éc[ailles] addit[ionelles], centre élevé quoi, y dos convexe, 7 p[aires] de pattes à ongles, les post[érieures] un p[eu] pl[us] long[ues] mais plus grêles (à 4 art[icles]). Queue utriculée, dessous à append[ices] art[iculé]s bifid[es] courts, cachés, q[uel]q[ue]f[ois] saill[ant]s de l'utricule, tache trilobée, milieu relevé, bord appl[ati], marge hyaline semi-3 lob[ée]." This description is accompanied by a figure, which is reproduced here (fig. 1). Desmarest (1823, p. 389; 1825, p. 327) and H. Milne Edwards (1840, p. 151) mention the genus and species, but evidently consider them to be of doubtful standing. *Lirceus* Rafinesque was considered by Fowler (1912, p. 238) a doubtful synonym of *Asellus* Geoffroy, 1764. Hubricht & Mackin (1949, p. 334), however, showed that Rafinesque's genus is synonymous with *Mancasellus* Harger, 1876, *Lirceus fontinalis* Rafinesque, 1820, being identical with *Mancasellus macrourus* Garman, 1890. Hubricht & Mackin adopted Rafinesque's names for the genus and species concerned and rejected *Mancasellus* Harger and *macrourus* Garman as junior synonyms of *Lirceus* Rafinesque and *fontinalis* Rafinesque respectively.

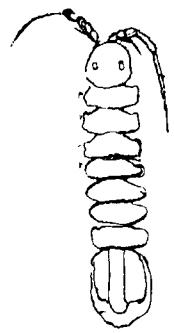

Fig. 1. *Lirceus fontinalis* Rafinesque. Drawing by Rafinesque.

Mesotropis albipes Rafinesque (1832, p. 20) (fig. 2)

"I send you ..... Also the description and figure of another living sea N.G. from the atlantic shore between *Idotea* and my *Gonotus* of 1814. I call it *Mesotropis albipes.* Body oblong, back carinated, small head, no eyes, fourteen feet, tail with many articles and ciliated, two antens, *Sp. Car.* greenish-brown, both ends obtuse, antens equal to body and tail, feet white." Among Rafinesque's manuscripts in the Smithsonian library the following notes were found dealing with the present species: "Gonotus albipes.

Ant[ennae] & feet white. Ant[ennae] as long as body [, the latter] oblong, back carinated. Tail obt[use,] ciliate. N[ew] Y[ork]. — On Fucus vesiculosus & Zostera. N.G. Mesotropis albipes. Greenish color." A very crude sketch, which is reproduced here as accurately as possible (fig. 2), accompanied these notes; it is said to be "6 times nat[ural] size." So far as I know neither the genus *Mesotropis* Rafinesque nor the species *M. albipes* Rafinesque has ever been identified by subsequent authors. The species might be identical with *Idotea phosphorea* Harger, which indeed has the back somewhat carinate and which often is greenish with legs of a lighter colour. However, this species possesses eyes and the end of the abdomen is not obtuse but somewhat pointed, while furthermore the antennae are shorter than the body. I do not know of any species that fully agrees with Rafinesque's description, which evidently contains many errors.

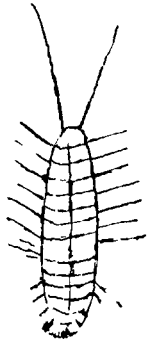

Fig. 2. *Mesotropis albipes* Rafinesque. Drawing by Rafinesque (enlarged).

Cymothoe brachyura Rafinesque (1814a, p. 26)

"Corps oblong blanc, tête brune, chaque anneau à un sillon transversal, queue courte, appendices aigus, inclus."

Cymothoe gonura Rafinesque (1814a, p. 26)

"Corps obovale, marginé de blanc, queue allongée, carènée en dessus. appendices saillans aigus."

Cymothoe brachyura and *C. gonura*, both originating from Sicily, as far as I know have not yet been identified by later authors. *Cymothoe* is an erroneous spelling of *Cymothoa* Fabricius, 1793.

Cymothoa pallida Rafinesque (1817, p. 42)

"Pale cinereous above, with two longitudinal whitish streaks, the three last segments of the abdomen broader, the three last pair of legs double the length of the others, body elliptic, head attenuated obtuse. — Obs. It lives by suction on the gills of Fishes, Shads, Herrings, Perches, Minnows, &c. Observed by Messrs. Clemens and Torrey, near New-York: length half an inch, white beneath, tail broad and flat, appendages much longer." It seems well possible that *Cymothoa pallida* Rafinesque is the same as *Livoneca ovalis* (Say, 1818), a Cymothoid Isopod which lives parasitic on the gills of numerous species of fishes, and which has been reported from a great number of localities on the Atlantic and Gulf coasts of the United

States between Massachusetts and Mississippi. Fowler (1912, p. 286), on the other hand, identifies *C. pallida* with some doubt with *Nerocila munda* Harger.

New generic name. *Ligyda* Rafinesque (1815, p. 101) a substitute name for *Ligia* Fabricius, 1798. After Rathbun (1904, p. 172) had shown that the name *Ligia* Fabricius, 1798, is nomenclatorially invalid, Richardson (1905, p. 10) reintroduced the name *Ligyda* Rafinesque, 1815. Richardson was followed by several authors in the use of Rafinesque's generic name. Recently, however, Buitendijk & Holthuis (1951, p. 99) submitted to the International Commission on Zoological Nomenclature a proposal to validate under the plenary powers the generic name *Ligia* Fabricius, 1798. If this proposal is accepted by the Commission, the name *Ligyda* Rafinesque will fall as a junior objective synonym of the then valid name *Ligia* Fabricius.

Other generic names. *Armadillo* Cuvier, 1792 (Rafinesque, 1815, p. 101), *Asellus* Geoffroy, 1764 (Rafinesque, 1815, p. 101), *Bopyrus* Latreille, 1802 (Rafinesque 1815, p. 100, as *Bopyrum*), *Cymothoa* Fabricius, 1793 (Rafinesque, 1814a, p. 26, as *Cymothoe*; 1815, p. 101; 1817, p. 42), *Idotea* Fabricius, 1798 (Rafinesque, 1814a, p. 26; 1815, p. 101; 1817, p. 42; 1832, p. 20), *Ligia* Fabricius, 1798 (Rafinesque, 1815, p. 101), *Oniscus* Linnaeus, 1758 (Rafinesque, 1815, p. 101; 1817, p. 40), *Philoscia* Latreille, 1804 (Rafinesque, 1815, p. 101), *Porcellio* Latreille, 1802 (Rafinesque, 1815, p. 101), *Sphaeroma* Bosc, 1801 (Rafinesque, 1815, p. 101).

Nomina nuda. Genera: *Acerina* Rafinesque (1814a, p. 26), *Achesium* Rafinesque (1815, p. 100), *Cymodocea* Rafinesque (1814a, p. 26; 1815, p. 101), *Ennarthrus* Rafinesque (1814a, p. 26), *Idyia* Rafinesque (1814a, p. 26), *Janerea* Rafinesque (1814a, p. 26; 1815, p. 100), *Primno* Rafinesque (1814a, p. 26; 1815, p. 101), *Psamathe* Rafinesque (1814a, p. 26; 1815, p. 101), *Tyronia* Rafinesque (1814a, p. 26; 1815, p. 101), *Venilia* Rafinesque (1815, p. 101). Species: *Acerina fulva, Cymodocea maculata, Cymothoe elongata, Cymothoe vittata, Ennarthrus cerulescens, Idotea emarginata, Idotea gonura, Idyia triloba, Janerea fimbriata, Primno lutescens, Psamathe mucronata, Tyronia villosa* all by Rafinesque (1814a, p. 26).

Order AMPHIPODA

New genera and species.

Lepleurus Rafinesque (1820, p. 7)

"Four antenna shorter than the head, nearly equal, truncate, with a single segment. Body rather compressed and straight, with twelve segments, all with a large lateral scale except the three anterior and the last, posterior segments and scales longer. First pair of feet with a large oblong cheliform

and cuspidate hand; the second and third pair cylindrical pinciferous or with two cylindrical and truncate fingers, the four other pairs slender; all the feet without real claws. Appendages beneath the rump almost similar to the hind feet; those of the tail short and with single segments. — Another fresh water genus of Shrimps, of the family *Gammaria.* The name means lateral scales."

Lepleurus rivularis Rafinesque (1820, p. 7)

"Olivaceous, eyes very faint irregular; appendage of the tail truncate straight obliqual; antenna nearly horizontal, feet longer than the breadth of the body. — I have detected it in the brooks of the mountains of Pennsylvania and at Shannon run, near Bedford Springs. Length about half an inch; it crawls on the stones rather than swims or jumps." Desmarest (1823, pp. 360, 361; 1825, p. 274) gives an abbreviated French translation of Rafinesque's English description of this genus and species, which he (Desmarest) considers to be of doubtful status. Stebbing (1888, p. 111) when discussing Rafinesque's 1820 paper remarked: "The short antennae of *Lepleurus* are suggestive of *Hyalella,* but the identification must be left to naturalists in Kentucky." In his 1906 monograph the same author lists *Lepleurus* Raf. and *Lepleurus rivularis* Raf. among the genera and species dubiae (Stebbing, 1906, p. 715). Fowler (1912, pp. 190, 194) lists *Lepleurus* as a doubtful synonym of *Gammarus* Fabricius, 1775, and *Lepleurus rivularis* as a doubtful synonym of *Gammarus fasciatus* Say (1818).

Pephredo Rafinesque (1817, p. 41)

"(Natural order and family of the foregoing [= Order Branchypia, Family Gammaria.].) The two upper antens longer [? than in *Psammylla*] and with six long segments; all the feet with one nail, and nearly equal, the two first pairs with thick swelled hands; body without lateral appendages, tail with simple filaments. Obs. This genus was noticed in my Analysis of nature, and formed on an European species; the name is mythological. It may be deemed a singularity in this family, that this genus should be a fresh water one, and the last [*Psammylla*] a land one!" The genus was mentioned as a nomen nudum by Rafinesque (1814a, p. 26; 1815, p. 101) in previous publications. The only described species placed by Rafinesque in the genus is

Pephredo potamogeti Rafinesque (1817, p. 41)

"Long antens, scarcely longer than the head and double of the short ones; body fulvous, transparent, with a central brown or longitudinal stripe. — Obs. It lives on the *Potamogeton perfoliatum* in the Hudson and the Fish-[p. 42:] kill, near Newburg. Length three lines, creeper, eyes very small."

Considered by most authors like Stebbing (1888, p. 100; 1906, p. 715) a genus and species incerta. Fowler (1912, p. 190) regards *Pephredo,* which is incorrectly spelled *Paphredo* by him, as a doubtful synonym of *Gammarus* Fabricius, 1775. *Pephredo heteroclitus* Rafinesque (1814a, p. 26) is a nomen nudum.

Pisitoe Rafinesque (1814a, p. 25)

"Antennes nulles, yeux irréguliers, bouche sous la tête, recourbée postérieurement, munie de crochets; Corps à 6 articles et 6 paires de jambes inégales, la quatrième paire la plus grande, queue à 4 articles, les 3 antérieurs à appendices. — Obs. Il appartient à l'ordre *Brangasteria,* et famille *Phronimia,* il diffère particulièrement du G. *Phronima* par son moindre nombre de jambes." The genus was also mentioned by Rafinesque (1815, p. 100). Two species were assigned to it by its author.

Pisitoe bispinosa Rafinesque (1814a, p. 25)

"Front à deux épines antérieurement, les trois premières paires de pattes à un seul ongle." There seems to be little doubt that *Pisitoe bispinosa* Raf. is identical with *Phrosina semilunata* Risso, 1822, as has been pointed out by several authors. However, no-one of these authors actually substituted the older names given by Rafinesque for the current but junior names of Risso's. It is evident that the name *semilunata* for this species only can be maintained if *bispinosa* Rafinesque is suppressed under the plenary powers of the International Commission on Zoological Nomenclature.

Pisitoe levifrons Rafinesque (1814a, p. 26)

"Front lisse, sans épines, les trois premières paires de pattes à deux ongles." According to Costa (1853) *Pisitoe levifrons* is synonymous with *Phronima sedentaria* (Forskål, 1775). If this is true, the name *levifrons* falls in the synonymy of the older specific name *sedentaria,* while a proper choice of the type species of *Pisitoe* (if this has not yet been done by a previous author) could make the name of this genus a junior synonym of *Phronima* Latreille, 1802.

Psammylla Rafinesque (1817, p. 41)

"(N[atural] Order *Branchypia,* N[atural] Family *Gammaria.*) The two upper antens, with two long segments at the base, and many small articles at the top; lower antens very short; all the feet with one nail, the last pair much longer and larger: each segment of the body with a lateral appendage, tail with four bifid unequal filaments. — Obs. The name is abbreviated

from *Psammopsylla,* which means sand-flea. The family *Gammaria* is the fifteenth in my natural classification, and is distinguished by fourteen feet, four antens, body not depressed, &c." Fowler (1912, p. 210) treats *Psammopsylla* also as a generic name proposed by Rafinesque, this is incorrect, however, since Rafinesque only mentioned the word Psammopsylla to explain the derivation of the generic name *Psammylla* and certainly did not treat the former as a generic name. The only species placed by Rafinesque in his new genus is

Psammylla littoralis Rafinesque (1817, p. 41)

"Longer antens doubly than the head, short antens not longer than their first segment; last pair of feet double in length; body rufous above, white beneath. — Obs. I have found this animal in great numbers on the shores of Long-Island and New-York, and on the Hudson river, jumping about like fleas, whence its vulgar name Sandflea; it jumps by means of its hind feet and tail, like locusts. Length about half an inch, often less; eyes large and round." Stebbing (1888, p. 100) says of this species "*Psammylla littoralis* is obviously one of the Orchestidae, a "beach-flea". The upper and lower antens of Rafinesque's terminology would be respectively the lower and upper antennae of ordinary language". It seems most probable (see also Fowler, 1912, p. 211) that *Psammylla littoralis* is identical with *Orchestia agilis* Smith (1874); if so, Rafinesque's specific name *littoralis* has a distinct priority over the much younger *agilis* Smith, while *Psammylla* Raf. then becomes a junior synonym of *Orchestia* Leach, 1814.

Sperchius Rafinesque (1820, p. 6)

"Antenna double than the head, four nearly equal, with two long truncate articles, the upper pair rather broader and longer. Body compressed, with seven segments, each with a large lateral appendage or scale; the fourth larger and with an additional posterior appendage, the corresponding feet [p. 7:] larger and with a large rounded and thick hand, all the feet with only one claw. Rump with four large segments, without lateral appendages, but with the usual ones beneath. Tail with short and recurved appendages. — It belongs to the family *Gammaria,* the name was that of an ancient fluviatile God of Thessaly." The only species mentioned by Rafinesque as belonging to this genus is

Sperchius lucidus Rafinesque (1820, p. 7) (fig. 3)

"Shining brown, eyes black, nearly round; appendages of the tail shorter than the last article, curved outwards, with two articles and a terminal

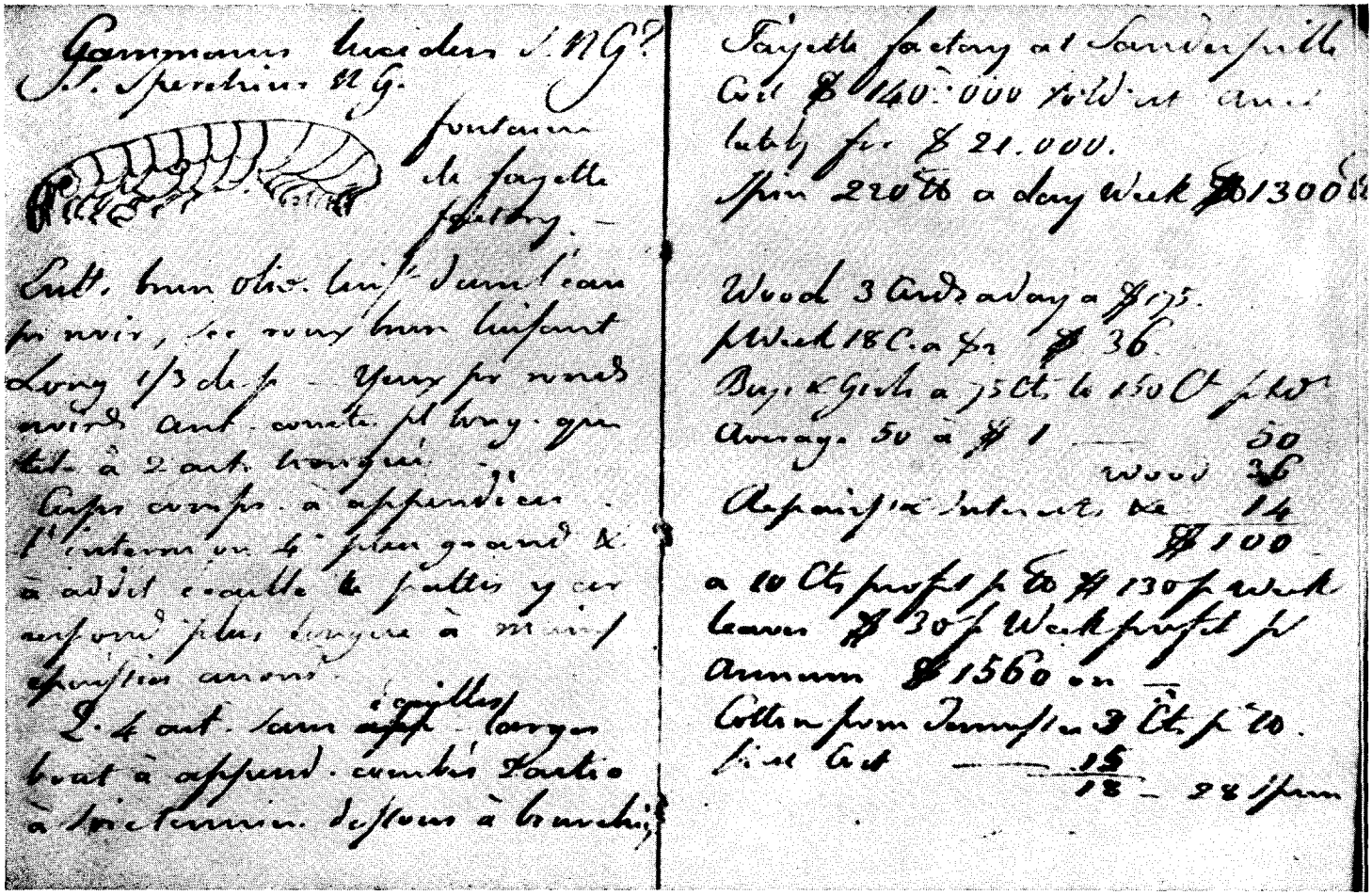

Fig. 3. Reproduction of two pages of Rafinesque's notebook 21 (pp. 22 and 23), one containing the description of *Sperchius lucidus* Rafinesque.

filament. — Discovered in the springs and brooks near Lexington, Ky. Length about one-third of an inch, almost black when in the water, olivaceous brown when out of it, and pale when dry. Body arched, antenna descending. It swims well." On p. 22 of Rafinesque's Notebook 21, which is in the possession of the Library of the Smithsonian Institution, the following manuscript description of this species was found: "Gammarus lucidus S.N. G? S. Sperchius N.G. Fontaine de fayette factory [at Sandersville, Kentucky?]. Ent[ièremen]t brun oliv[âtre] luis[ant], dans l'eau pr[esque] noir, sec roux brun luisant. Long[ueur] 1/3 de p[ouce]. Yeux pr[esque] ronds noirs, ant[ennes] courtes pl[us] long[ues] que [la] tête, à 2 art[icles] tronqués. Corps compr[imé] à appendices, l'interm[édiaire] ou 4e plus grand et à addit[ionelle] écaille. Les pattes y correspond[antes] plus longues à mains épaissies arrond[ies]. Les 4 art[icles] sans écailles larges, bout à append[ices] courbés, 2 artic[ules] à soie termin[ale], dessous à branchies." The figure accompanying this manuscript description is reproduced here (fig. 3). On the page facing the one on which the above description was made, Rafinesque wrote down several observations on a fayette factory at Sandersville, which probably is the factory referred to in the description of *Sperchius* (see fig. 3). *Sperchius lucidus* generally has been considered a species incerta, e.g., by Desmarest (1823, p. 360; 1825, pp. 273, 274) and by Stebbing (1906, p. 716); Fowler (1912, p. 190) lists *Sperchius* as a doubtful synonym of *Gammarus* Fabricius, 1775. With the data now at hand it may prove to be possible to find the identity of Rafinesque's species.

Other generic names. *Caprella* Lamarck, 1801 (Rafinesque, 1815, p. 101), *Cerapus* Say, 1817 (Rafinesque, 1817, p. 40), *Corophium* Latreille, 1806 (Rafinesque, 1815, p. 101), *Cyamus* Latreille, 1796 (Rafinesque, 1815, p. 101), *Gammarus* Fabricius, 1775 (Rafinesque, 1815, p. 101; 1817, p. 41), *Phronima* Latreille, 1802 (Rafinesque, 1814a, p. 25; 1815, p. 100), *Talitrus* Bosc, 1801 (Rafinesque, 1815, p. 101).

Nomina nuda. Genera: *Aglaura* Rafinesque (1815, p. 101), *Asope* Rafinesque (1815, p. 101), *Callirhoe* Rafinesque (1815, p. 100), *Cerophas* Rafinesque (1814a, p. 26; 1815, p. 100), *Cychreus* Rafinesque (1814a, p. 26; 1815, p. 101), *Dameus* Rafinesque (1814a, p. 26), *Dinoa* Rafinesque (1814a, p. 26; 1815, p. 101), *Eratea* Rafinesque (1815, p. 101), *Heterelus* Rafinesque (1814a, backcover; 1815, p. 100, as *Heterelos*), *Hippias* Rafinesque (1815, p. 101), *Isolus* Rafinesque (1814a, p. 26; 1815, p. 101), *Pephredo* Rafinesque (1814a, p. 26; 1815, p. 101; described in 1817, see above), *Plexaura* Rafinesque (1815, p. 101), *Protonia* Rafinesque (1814a, p. 26;

1815, p. 100), *Stenyo* Rafinesque (1814a, p. 26), *Stenyolus* Rafinesque (1815, p. 101), *Telesto* Rafinesque (1814a, p. 26), *Thiella* Rafinesque (1815, p. 101), *Zaccreus* Rafinesque (1815, p. 101). Species: *Cerophas oxyura, Cychreus truncatus, Dameus crassimanus, Dinoa circinnata, Isolus pilosus, Pephredo heteroclitus, Protonia fusca, Stenyo longicornis, Telesto urocera,* all of Rafinesque (1814a, p. 26).

Order DECAPODA

Suborder MACRURA

Supersection NATANTIA

New genera and species.

Aglaope Rafinesque (1814a, p. 24)

"Antennes intérieures à 3 filets, et à écailles épineuses, la première paire de jambes seulement pincifère, aucune chèlifère." The genus was also mentioned by Rafinesque in 1815 (p. 98), when he proposed the name *Niphea* to replace *Aglaope*. The only species placed in it by Rafinesque is

Aglaope striata Rafinesque (1814a, p. 24)

"Rostre plus court des écailles, serreté dessus et dessous, épaules bidentées, dents inégales; corps rouge foncé, strié longitudinalement de rouge pâle, pattes rouges pubescentes, queue ciliée à l'extremité." In modern carcinological literature this species is named *Lysmata seticaudata* (Risso, 1816); the striking colour pattern together with the shape of the rostrum and the fringe of hairs of the telson (the latter character induced Risso to give the specific name *seticaudata* to the animal) leave not the least doubt concerning the identity of Rafinesque's species. Rafinesque is mistaken when he states that only the first legs bear pincers; however, those of the second legs are small and may easily be overlooked. Desmarest (1823, p. 311; 1825, pp. 214, 215) cites Rafinesque's (1814a) descriptions, but regards both the genus and the species as of uncertain status. *Aglaope* Rafinesque, 1814, is a junior homonym of *Aglaope* Latreille, 1809, and thus is invalid. The generic name *Niphea* which Rafinesque (1815, p. 98) proposed as a substitute for his *Aglaope*, is the first valid name ever given to the genus. The name *Lysmata* Risso, 1816, which is currently used, is a junior synonym of *Niphea* Raf., and should be replaced by the latter. In order to avoid unnecessary name-changing, the International Commission on Zoological Nomenclature has been asked to suppress *Niphea* Rafinesque, 1815, and *striata* Rafinesque, 1814, in order to save the well known names *Lysmata* Risso, 1816, and *seticaudata* Risso, 1816.

Alciope Rafinesque (1814a, p. 24)

"Antennes intérieures à 2 filets et à écailles épineuses, 3 seules paires de jambes dont la seconde est chèliforme." This genus has also been mentioned by Rafinesque in 1815 (p. 99). The only species in it is

Alciope heterochelus Rafinesque (1814a, p. 24)

"Glabre, rostre subulé entier plus court des écailles, le bras gauche plus grand, queue mucronée." This description is very poor, but it still is sufficient for the identification of Rafinesque's species. The fact that *Alciope* should have only three pairs of legs, the second of which bears the chelae, shows that Rafinesque's specimen must have been incomplete, lacking the last two pairs of pereiopods. Rafinesque states that the left second leg is larger than the right and that it is "chèliforme", i.e., with large claws. The only Mediterranean genera known to me that have the second legs with large unequal chelae are *Pontonia* and *Typton*. Rafinesque described the rostrum as being shorter than the "écailles"; with these écailles he certainly means the scaphocerites. Since the scaphocerites lack in *Typton, Alciope* cannot be anything but *Pontonia*. Also, if Rafinesque's animal had been a *Typton,* he certainly would have described the supra-orbital spines, which are almost as long as the rostrum. Of the two Mediterranean species of *Pontonia* only *Pontonia flavomaculata* Heller, 1864, has the rostrum subulate, in *P. pinnophylax* (Otto, 1821) the rostrum is depressed and triangular. As Rafinesque states that the rostrum in his species is "subulé", there can be little doubt that *Alciope heterochelus* Rafinesque, 1814, is identical with *Pontonia flavomaculata* Heller, 1864, and that *Alciope* Rafinesque, 1814, is a senior synonym of *Pontonia* Latreille, 1819. Suspension of the International Rules of Zoological Nomenclature has been requested to save both the generic name *Pontonia* and the specific name *flavomaculata*. Desmarest (1823, p. 312; 1825, p. 216) and H. Milne Edwards (1837, p. 430) regard the genus and species as of doubtful status.

Byzenus Rafinesque (1814a, p. 23)

"Antennes intérieures bifides, écailles sans dents; les deux paires antérieures de jambes pincifères mais très-courtes, la troisieme pincifère chèliforme très-grosse." *Byzenus* was also mentioned by Rafinesque (1815, p. 98). Only one species has been placed in this genus:

Byzenus scaber Rafinesque (1814a, p. 23)

"Entièrement scabre par des tubercules aigus, rostre serreté dessus et dessous, bidenté latéralement, plus court des écailles; doigts tridentés in-

térieurement." This description fits so well for *Stenopus spinosus* Risso, 1826, that there can be no doubt that the two species are identical. Desmarest (1823, p. 312; 1825, p. 216) already said of *Byzenus*: "Par le nombre des pieds terminés en serres, ce genre se rapproche seulement de ceux des penées et des stenopes. La grosseur des pieds de sa troisième paire, la rugosité du corps, les trois tubercules de l'intérieur des doigts le rapportent presque sans aucun doute au dernier de ceux-ci." H. Milne Edwards (1837, p. 408) states that probably *Stenopus* and *Byzenus* are closely related. In 1946 (p. 10) I showed that *Byzenus scaber* is synonymous with *Stenopus spinosus* Risso. Both the generic name *Byzenus* Rafinesque, 1814 and the specific name *scaber* Rafinesque, 1814 are senior synonyms of the generic name *Stenopus* Latreille, 1819, and *spinosus* Risso, 1826, respectively. In order to save the two last-mentioned names, the International Commission on Zoological Nomenclature has been requested to suppress both of Rafinesque's names.

Cryptophthalmus Rafinesque (1814a, p. 23)

"Antennes intérieures à 3 filets, écailles épineuses, yeux cachés sous deux prolongemens du corselet; la premiere paire de jambes simplement chèliforme, la seconde pincifère et à 11 articles." The generic name *Cryptophthalmus* is mentioned in two more publications by Rafinesque. In his 1814b paper he gives on p. 26 *Cryptophthalmus* as an example of a generic name indicating a character typical of the genus. Furthermore the name is mentioned in his 1815 paper on p. 98. The only species placed by Rafinesque in the genus is

Cryptophthalmus ruber Rafinesque (1814a, p. 23)

"Glabre, rougeâtre, corselet entier, une simple épine entre les yeux; mains inégales hérissées latéralement et déprimées, la plus grande à 3 angles en dessous, extremité de la queue 4 dentée et ciliée." Desmarest (1823, p. 311; 1825, p. 215) gave an abstract of Rafinesque's description of this species. When H. Milne Edwards (1837, p. 351) described his *Alpheus ruber* he remarked in a footnote "Cette espèce me paraît être la même que le *Cryptophthalmus ruber* de Raffinesque". As shown by Rafinesque's description, H. Milne Edwards is perfectly right in this. Coutière (1899, p. 8) pointed out that though the genus *Alpheus* was instituted in 1798, Rafinesque "est le premier qui paraisse avoir été frappé de la disposition des yeux chez *Alpheus*". Also Coutière identifies *Cryptophthalmus ruber* Rafinesque, 1814, with *Alpheus ruber* H. Milne Edwards, 1837, and indeed the description by Rafinesque is such that there can be no doubt about this identity.

Cancer glaber Olivi, 1792, is a still older name for the species, the correct name of which therefore is *Alpheus glaber* (Olivi). The name *Cryptophthalmus* Rafinesque is a junior synonym of *Alpheus* Fabricius, 1798.

Melicertus Rafinesque (1814a, p. 22)

"Tête rostrée, antennes intérieures très courtes bifides, les extérieures simples très-longues et inférieures, écailles lisses à la base des antennes; la seconde et troisième paire de jambes simplement pincifères, la première chèlifère." The genus was mentioned also by Rafinesque (1815, p. 98), where this author proposed the new name *Everne* to replace *Melicertus*. The only species placed by Rafinesque in it is

Melicertus tigrinus Rafinesque (1814a, p. 22)

"Glabre, rostre serreté en dessus, unidenté en dessous, plus court des écailles; une épine sous chaque oeuil, épaules unidentées, antennes inférieures plus longues du corps, queue comprimée, carènée en dessus." Desmarest (1823, p. 312; 1825, p. 215) remarks about this genus: "Ce genre ne me paroît pas différer de celui des penées."; H. Milne Edwards (1837, p. 420) says "Le genre MELICERTUS, de Raffinesque, paraît différer peu de celui des Penées." Indeed there can be little doubt that *Melicertus* Rafinesque, 1814, is identical with *Penaeus* Fabricius, 1798. The fact that *Melicertus* possesses three pairs of chelipeds, of which the second and third are of about equal strength, shows that the genus is a Penaeid. If Rafinesque with his remark that the first leg is "chèlifère" and the second and third just "pincifères", means to say that the first pair is stronger than the second and third, then this observation is incorrect, since the three legs hardly at all differ in size. Since *Penaeus kerathurus* (Forskål, 1775) is the only Mediterranean Penaeid with a ventral rostral tooth, there is little doubt that *Melicertus tigrinus* is identical with that species. Also the other characters mentioned by Rafinesque agree with those shown by *Penaeus kerathurus*. Though in his description Rafinesque does not deal with the colour of his species, the name *tigrinus* in all probability is indicative of the colour pattern of the animal. In specimens of *Penaeus kerathurus* the body shows broad vertical bands of a blue colour, so that for this species the name *tigrinus* would be very appropriate. Both the names *Melicertus* Rafinesque, 1814, and *tigrinus* Rafinesque, 1814, fall as junior synonyms, namely of *Penaeus* Fabricius, 1798, and of *kerathurus* Forskål, 1775, respectively.

Mesapus Rafinesque (1814a, p. 22)

"Antennes intérieures à 2 filets, écailles épineuses, la 2 et quel- [p. 23:]

quefois 3e. paire de jambes pincifères, la premiere simplement chèliforme." The genus is also mentioned in Rafinesque (1815, p. 98). The only species is

Mesapus fasciatus Rafinesque (1814a, p. 23)

"Glabre, rostre tronqué entier, épaules bispineuses, dos épineux, bras égaux; queue à 2 bandes noires transversales et terminée ar 2 appendices membraneux." Desmarest (1823, p. 312; 1825, p. 215) remarks of this genus: "Il paroît avoir plus de rapports avec le genre Egéon qu'avec les autres". There can indeed be little doubt that *Mesapus* belongs to the Crangonidae, and that *Mesapus fasciatus* must be one of the *Pontophilus* species that show dark transverse bands on the abdomen. From the Mediterranean only two of such species have been reported, viz., *Pontophilus fasciatus* (Risso) and *Pontophilus neglectus* (G. O. Sars). In the truncate shape of its rostrum *Mesapus fasciatus* differs from *Pontophilus neglectus* and agrees with *P. fasciatus*. In my opinion we may safely identify *Mesapus fasciatus* Rafinesque, 1814, with *Pontophilus fasciatus* (Risso, 1816). The generic name *Mesapus* Rafinesque thereby becomes a senior synonym of *Pontophilus* Leach, 1817. For the sake of nomenclatorial stability the International Commission on Zoological Nomenclature has been asked to suppress both the names *Mesapus* Rafinesque and *fasciatus* Rafinesque, and so to save the names *Pontophilus* Leach and *fasciatus* Risso. Rafinesque's statement that the third leg sometimes possesses a chela, is evidently based on an incorrect observation.

Nectoceras Rafinesque (1817, p. 41)

"Two interior antens bearing at the top a flat appendage, the two lateral antens longer simple, eyes lateral behind them: feet nearly equal, with simple nails: tail four lobed. — Obs. The name of this singular genus is derived from the two antens which have a foliaceous and swimming appendage, and means swimming horns. It has very much the habit of its family, and particularly of the genera *Crangon* and *Palinurus:* this family is the fifth belonging to the second natural order, and is distinguished by its long fan tail, ten feet without nippers, peduncled eyes, &c." Rafinesque brought this genus to his order Macruria and family Palinuria, only one species was described in it.

Nectoceras pelagica Rafinesque (1817, p. 41)

"Rostrum subulate, equal in length to the interior antens, their appendages oboval: body smooth fulvous, tail white, with four violet spots opposed to the lobes. — Obs. It lives in the Atlantic ocean and in the gulph stream on the *Fucus natans,* where it was first observed by Mr. Bradbury, who

has shown me a fine drawing of it; I observed it likewise in 1815. Its length is two or three inches; when it loses its hold it swims with its antens and tail." Rafinesque's description is such that the species cannot be identified with certainty. It is obvious that this description contains a considerable number of errors. In my opinion it is possible that *Nectoceras pelagica* is the species which at present is best known under the name *Hippolyte coerulescens* (Fabricius, 1775). In this species, which is a typical inhabitant of the Gulfweed, one of the flagella of the antennula is somewhat broadened, while the rostrum is subulate and about as long as the antennular peduncles. However, the first two legs are not simple, but have chelae, though these are very small and may have been overlooked. Furthermore the length of the species is not two or three, but only ½ inch (exclusive of the antennae). *Hippolyte coerulescens,* notwithstanding the differences that it shows with Rafinesque's description of *Nectoceras pelagica,* is the species which, in my opinion, agrees most closely with that description and therefore Rafinesque's species is provisionally identified here with it. *Nectoceras* Rafinesque, 1817, then becomes a junior synonym of *Hippolyte* Leach, 1814, and *pelagica* Rafinesque, 1817, a junior synonym of *coerulescens* Fabricius, 1775.

Symethus Rafinesque (1814a, p. 23)

"Antennes intérieures à 2 filets, écailles épineuses; palpes filiformes allongés; la seule premiere paire de pattes chèliforme et pincifère." In Analyse de la Nature Rafinesque (1815, p. 98) mentioned the genus under the erroneous spelling *Symathus.* In the Erratum to this book (p. 221) he corrected this error, and at the same time proposed the new name *Acilius* to replace *Symethus,* possibly while the latter name resembles too much the generic name *Symethis* Fabricius, 1798, for a genus of crabs. The only species included by Rafinesque in his genus is

Symethus fluviatilis Rafinesque (1814a, p. 23)

"Rostre comprimé, serrulé en dessus et en dessous, un peu- [p. 24:] plus long que les écailles, rouge ainsi que la partie antérieure du corselet, épaules bidentées, queue ciliée. — Obs. Dans les ruisseaux et les mares." Desmarest (1823, p. 312; 1825, p. 216) stated: "On ne connoît aucun crustacé macroure de la division des salicoques vivant dans les eaux douces et aucun qui présente les caractères que nous venons de rapporter"; he evidently does not believe in Rafinesque's species, and treats it as a dubious form. Also H. Milne Edwards (1837, p. 431) treated the genus as dubious. "Il nous paraît ... difficile d'adopter dans l'état actuel de la science le genre SYMÉTHUS". However, there can be very

little doubt that *Symethus fluviatilis* is the same as *Atyaephyra desmaresti* (Millet), the only fresh water macruran occurring in Sicily. Rafinesque's description fits very well for *Atyaephyra desmaresti* and one safely may consider the two species identical. The only discrepancy in Rafinesque's description is that he states that there is only one pair of legs provided with chelae, but obviously this observation is erroneous. Both the generic and the specific name given by Rafinesque to this species are older than the names *Atyaephyra* de Brito Capello, 1864, and *desmaresti* Millet, 1831, which at present are currently used. The suppression of Rafinesque's names has been requested in order to avoid an undesirable and unnecessary nomenclatorial confusion.

Rafinesque described only one new species of Natantia belonging in an old genus:

Peneus quadricolor Rafinesque (1814a, p. 22)

"Corps brun ponctué de jaune, queue rostre et écailles blanches, jambes et antennes bleus; rostre plus court des écailles, serreté en dessus et unidenté en dessous, épaules bidentées." There cannot be the least doubt that this species is *Gnathophyllum elegans* (Risso, 1816). In the latter species the body indeed is of a dark brown colour which is sprinkled with bright yellow spots, while the rostrum, the tailfan, and the bases of the antennae and antennulae, including the scaphocerites, are white; this colour pattern immediately differentiates *Gnathophyllum elegans* from all other Mediterranean shrimps. Rafinesque's remark that the legs are blue is somewhat misleading, there are blue rings visible on the legs, but their larger part is white. The rest of the description by Rafinesque, however, is correct. The International Commission on Zoological Nomenclature has been asked to suppress the name *quadricolor* Rafinesque, 1814, which has been overlooked for more than a century, and to validate the name *elegans* Risso, 1816, which practically always has been used for the species.

New generic names. *Acilius* Rafinesque (1815, p. 221) a substitute name for *Symethus* Rafinesque, 1814a. *Crangonus* Rafinesque (1815, p. 98) a substitute name for *Crangon* Fabricius, 1798. *Everne* Rafinesque (1815, p. 98) a substitute name for *Melicertus* Rafinesque, 1814. *Niphea* Rafinesque (1815, p. 98) a substitute name for *Aglaope* Rafinesque, 1814.

Other generic names. *Alpheus* Fabricius, 1798 (Rafinesque, 1814a, p. 24; 1814b, p. 31, cited as a generic name based on mythology; 1815, p. 98), *Crangon* Fabricius, 1798 (Rafinesque, 1814a, p. 24; 1815, p. 98; 1817, p. 41), *Palaemon* Weber, 1795 (Rafinesque, 1814a, p. 24, as *Palemon*; 1815,

p. 98, as *Palaemon*; 1817, p. 42, as *Palemon*), *Penaeus* Fabricius, 1798 (Rafinesque, 1814a, p. 22, as *Pencus*; 1814b, p. 31, as *Peneus*, cited as an example of a generic name based on mythology; 1815, p. 98, as *Peneus* Dald.).

Nomina nuda. Genera: *Agerochus* Rafinesque (1815, p. 98), *Carcinus* Rafinesque (1814a, p. 24; 1815, p. 98), *Carida* Rafinesque (1814a, p. 24; 1815, p. 98), *Etheria* Rafinesque (1814a, p. 24; 1815, pp. 98, 221), *Ethionome* Rafinesque (1815, p. 221), *Everne* Rafinesque (1814a, p. 24; in 1815, p. 98, Rafinesque used the name *Everne* as a substitute name for *Melicertus* Rafinesque, 1814a, probably the nomen nudum *Everne* 1814a is a different genus from *Everne* 1815, which is the same as *Melicertus* Rafinesque 1814a), *Neleus* Rafinesque (1814a, p. 24), *Phorculus* Rafinesque (1815, p. 98), *Podexus* Rafinesque (1815, p. 99), *Psimisa* Rafinesque (1815, p. 99). Species: *Alpheus tyrrhenus, Carcinus maculatus, Carcinus pallidus, Carida viridis, Crangon cataphractus, Etheria gonotus, E. locustella, Everne carinata, Neleus aterostris, N. glaber, N. longirostris, N. notatus, Palemon pusillum,* all of which were mentioned by Rafinesque, 1814a, p. 24. Before listing the above nomina specifica nuda Rafinesque remarked: "J'ai une multitude d'autres N.G. et N. Espèces de la famille *Palemonia,* je les nomme ..." From this remark and from the fact that Rafinesque does not give any author's name with these specific names we may, I believe, conclude that all these names are entirely new. However, it might be possible that the names *Palemon pusillum, Alpheus tyrrhenus, Everne carinata, Neleus glaber,* and *Crangon cataphractus* are only new combinations made with the specific names of *Astacus pusillus* Petagna, 1792, *Astacus tyrrhenus* Petagna, 1792, *Cancer carinatus* Olivi, 1792, *Cancer glaber* Olivi, 1792, and *Cancer cataphractus* Olivi, 1792, respectively. In the latter case the generic names *Everne* Rafinesque, 1814 and *Neleus* Rafinesque, 1814, would not be nomina nuda, but valid generic names. *Everne* then would become a senior synonym of *Sicyonia* H. Milne Edwards, 1830, while *Neleus* would disappear in the synonymy of the older *Alpheus* Fabricius, 1798. The uncommonness of the specific names *tyrrhenus* and *cataphractus* makes it probable that *Alpheus tyrrhenus* Rafinesque, 1814, is based on *Astacus tyrrhenus* Petagna, 1792, and that *Crangon cataphractus* Rafinesque is the same as *Cancer cataphractus* Olivi, while this possibility is made even more probable by that *Cancer cataphractus* Olivi actually is a Crangonid shrimp, though at present it no longer is maintained in the genus *Crangon*. However, we cannot prove this supposition, and this is even more true for the cases involving the more common specific names *pusillus, carinata,* and *glaber*. The only thing we

can do therefore is to consider nomina nuda all the names listed above as such.

Supersection MACRURA REPTANTIA

New species.

Astacus ciliaris Rafinesque (1817, p. 42) (fig. 4a)

"Antens length of the thorax, rostrum short acute, without teeth; three pairs of pinciferous ciliated feet; hands of the first, short thick dotted;

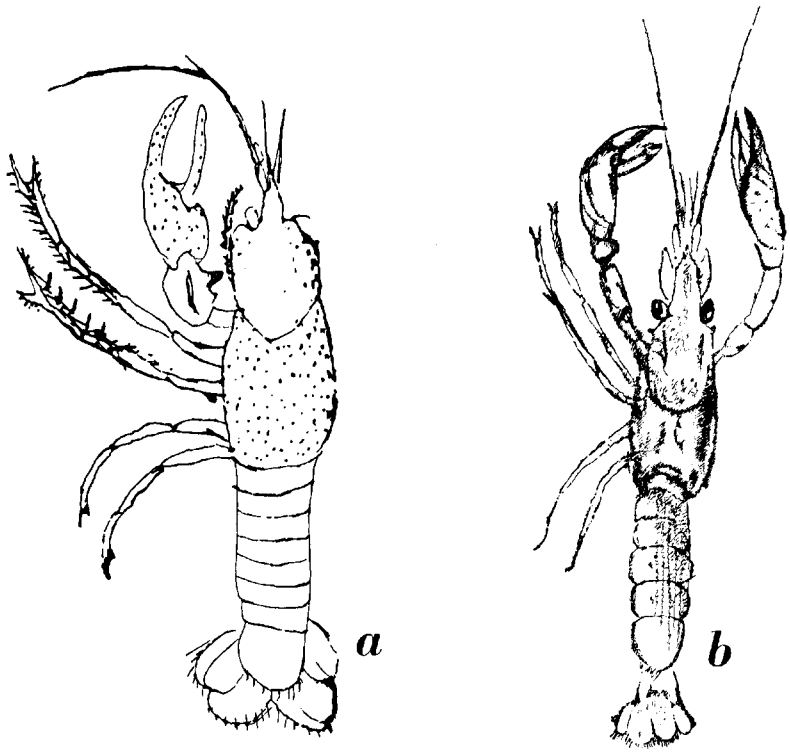

Fig. 4 a, *Astacus ciliaris* Rafinesque; b, *Astacus pusillus* Rafinesque. Drawings by Rafinesque.

wrist furrowed, with two unequal teeth. Obs. Length three to four inches, entirely olivaceous brown, lives in brooks near Fishkill, Newburg, &c." A manuscript description of this species was found on p. 10 of Rafinesque's Notebook 4, which is in the possession of the library of the Smithsonian

Institution. It runs as follows: "Astacus ciliaris N. Sp. Fishkill brooks. Rostre déprimé acuminé court, poignet canaliculé à 2 dents inég[ales] intér[ieuremen]t, 3 paires de pattes pincifères, mains ponctuées, doigts crenelés. Antennes longueur du corselet. Ent[ièremen]t brun olivâtre, long 4 pouces env[iron], corselet ponctué, mains en dessous rousse, jambes en dessous blanches, mains de [la] 2[e] paire de pattes ciliées, 3e seul[emen]t doigts — base de 3 à append[ice] jaune obtus — dessous du corps noirâtre, palpes très grands velus." The figure accompanying this manuscript description is reproduced here (fig. 4a). The localities Fishkill and Newburg both are situated in the state of New York. American carcinologists like Girard (1852, p. 88), Hagen (1870, p. 77), Faxon (1885, pp. 59, 65; 1914, p. 423), Ortmann (1906, p. 377), and Fowler (1912, p. 344) are unanimous in identifying this species with *Cambarus bartoni* (Fabricius, 1798).

Astacus fossor Rafinesque (1817, p. 42)

"Antens length of the body, rostrum short, one toothed on each side, a thorn behind the eyes; three pairs of pinciferous feet, hands of the first pair very large, granular gaping toothed, with a furrowed and bispinous wrist. — Obs. Vulgar name, burrowing lobster — communicated to me by Dr. Samuel L. Mitchill — native of Virginia, Pennsylvania, and New-York; size from four to six inches, it burrows in meadows and mill dams, which it perforates and damages." Generally this species is considered a species incerta (Hagen, 1870, p. 70; Faxon, 1885, p. 93; Ortmann, 1906, p. 348). The larger part of the description, and especially that dealing with the habit of burrowing, fits very well for *Cambarus diogenes* Girard, 1852, the most common burrowing species of the eastern United States and the only one of the burrowing forms that occupies the whole of the region indicated by Rafinesque. However, the rostrum in *Cambarus diogenes* (as well as in the other eastern burrowing forms) does not have any lateral tooth as described by Rafinesque for his *Astacus fossor*. It is possible that Rafinesque made a mistake here, as was supposed by Girard (1852, p. 88), who remarked: "We cannot help, however, from expressing some apprehension that on the examination of authentic specimens from the same localities whence Rafinesque had obtained his, the rostrum should be found without lateral tooth, in which case the *C[ambarus] fossor* might not differ from our *C. diogenes*". Also Fowler (1912, p. 349) identifies, though with some doubt, *Astacus fossor* with *Cambarus diogenes*. Another possibility is that Rafinesque's material of *Astacus fossor* is not homogeneous and that it consists of two different species: one being the burrowing *C. diogenes*, the other a non-burrowing form, like *Orconectes limosus* (Raf.), that has the rostrum with

distinct lateral teeth. It seems to be beyond doubt that at least part of Rafinesque's description of *A. fossor* is based on the species now known as *Cambarus diogenes*. Therefore I propose to settle the problem of the identity of *Astacus fossor* by linking the specific name *fossor* to those original specimens of Rafinesque's species that belong to *Cambarus diogenes*. *Astacus fossor* Rafinesque, 1817, thereby becomes a senior synonym of *Cambarus diogenes* Girard, 1852, and under a strict application of the International Rules of Zoological Nomenclature, it should replace the latter name. As the specific name *diogenes* has practically always been used for the species, while the name *fossor* has hardly ever been employed, I have submitted to the International Commission on Zoological Nomenclature a proposal asking for the use of their plenary powers to suppress the name *fossor* in order to validate the name *diogenes* for this species.

Astacus limosus Rafinesque (1817, p. 42)

"Antens length of the thorax, rostrum equal to their peduncle, one toothed on each side, canaliculated at its base; a thorn above the eyes, another on each flank, three pairs of pinciferous feet, bearded at their articulations, hands short, smooth, unarmed. — Obs. I discovered this species in 1803, and observed it again in 1816, in the muddy banks of the Delaware, near Philadelphia; vulgar name mud-lobster, length from three to nine inches; good to eat, commonly brown, with an olivaceous tinge." The species is identical with *Astacus affinis* Say, 1817, as has already been pointed out by authors like Girard (1852, p. 87), Hagen (1870, p. 62), Ortmann (1905, p. 107; 1906, p. 352), and Fowler (1912, p. 353). Faxon (1885, pp. 86, 87; 1914, p. 417) considered Rafinesque's species "indeterminable from the description" though he agrees that taking the type locality into account it hardly can be anything but *Astacus affinis* Say. Ortmann (1905) is the first to restore the name *limosus* for the species, which until then always had been given the specific name *affinis*. Rafinesque's description was published in November 1817, that of Say in December of the same year; the name *limosus* thus has one month priority over *affinis* and Ortmann's action consequently is entirely correct. At present Rafinesque's name *limosus* is generally accepted by American carcinologists, the species being given the name *Orconectes limosus* (Rafinesque, 1817).

Astacus pusillus Rafinesque (1817, p. 42) (fig. 4b)

"Antens length of the thorax, rostrum oval acute, a thorn and a longitudinal angle behind each eye; three pairs of pinciferous feet, hands of the first oblong dotted, wrist smooth. Obs. A very small species, living in the

brooks near Saratoga, Lake George, Lake Champlain, Utica, Oswego, &c. length one or two inches; vulgar name, brook prawn, shrimp, or lobster, entirely fulvous brown". Rafinesque's Notebook 15 contains on p. 16 the following manuscript description of this species: "Brun roussâtre, plus clair post[érieuremen]t, bec déprimé court épineux, épine derr[ière] les yeux, antennes internes bifides, 3 paires de jambes pincifères, corselet ponctué par fossules, un angle longit[udinale] derr[ière] les yeux, tête separée par suture. Une écaille très petite aig[ue] à la base des long[ues] antennes — palpes ciliés, mains et tout le corps ponctué, bout des doigts jaunes, 4 append[ices] arr[ondis] et ciliés au bout de la queue, dessous et jambes roussâtre clair. Yeux noirs, bras rousse. Freshwater Crab, Brook Prawn, Small Lobster." The figure accompanying this description is reproduced here as accurately as possible (fig. 4b). Girard (1852, p. 90) considered this a valid species which he named *Cambarus pusillus*. Other authors like Hagen (1870, p. 77), Faxon (1885, p. 65; 1914, p. 423), Ortmann (1906, p. 377), and Fowler (1912, p. 344) identify it with *Cambarus bartoni* (Fabricius, 1798). The localities cited by Rafinesque all are situated in the state of New York.

Astacus rugosus Rafinesque (1814, p. 22)

"Corselet rugueux, à suture transversale intérieurement et suture longitudinale au milieu, rostre de la longueur du pédoncule des antennes, denté des deux cotés; mains déprimées dentées intérieurement, deux paires de jambes pincifères." This description leaves little doubt that the species is identical with *Nephrops norvegicus* (L., 1758). The fact that apart from the "mains" (= large chelipeds) there are two pairs of "jambes pincifères" makes it clear that the animal is either *Nephrops norvegicus* (L., 1758) or *Homarus gammarus* (L., 1758), no other Mediterranean species showing this character. The rugose carapace shows that *Nephrops* and not *Homarus* was meant.

Unpublished species. In Rafinesque's notebooks the unpublished descriptions of three species of freshwater crayfish from the United States were found. These descriptions are reproduced here. Rafinesque's manuscript names are given here only for historical and not for nomenclatorial purposes, therefore they do not gain any nomenclatorial status by being published in the present paper. The most extensively treated of these species is described on p. 25 of Rafinesque's Notebook 17 and was given by Rafinesque the number 102. The description runs as follows:

"Astacus Occidentalis. Crawfish of Ohio.

2 à 6 pouces de long, perce la terre, fait des mounds [sic] verruqueux

percés etc. 4 paires de pattes pincifères, la 1e chèlif[ère] inég[ale] la droite plus grosse, main oblongue déprimée sans épines, doigts allongés à 1 l[o]ng sillon, un peu enchus au bout, peu crenelés int[érieurement], poignet à 2 épines, 1 de chaque côté, bras à 1 ép[ine] dessus et dessous près du poignet. Bec court produit, plus c[ourt] que le péd[oncule] des ant[ennes], concave, à 1 ép[ine] de chaq[ue] côté, 1 épine dessus chaque oeil. Corselet un peu granuleux. Ant[ennes] pr[esque] aussi long que le corps. Jambes un p[eu] ciliées, pileuses. Queue lisse; extr[émité] en eventail, frangé. Couleur ent[ièremen]t olivâtre brun. Devient rouge en séchant. Raccoon. Excellent appât pour poissons." The significance of the word Raccoon in this description is not very clear, perhaps the species is eaten by raccoons.

The same notebook (no. 17), on pp. 24 and 25, gives the description of another unpublished species, which was given the number 101 by Rafinesque. This description is as follows:

"Var[iété] d'Astacus ou N.Sp. A. Viridis.

Diff[ère de l'Astacus Occidentalis] par main gauche pl[us] gr[ande], 3 fois plus, mains et corsel[et] ponctué par points enfoncés, verruqueux ant[érieuremen]t, doigts à dents obtuses et rug[ueuses]. Poignet à sillon dessus et 3 dents int[érieuremen]t. 3 paires de pattes chélif[ères] seul[emen]t. Ant[ennes] inég[ales], pl[us] courtes que le corps. Coul[eur] ent[ièremen]t verdâtre olivâtre, 1 épine à ch[aque] épaule au sommet du corsel[et] divisé par un sillon flexueux de la tête."

Finally, on p. 26 of the same notebook, as no. 104 figures the following description: "Vu un gros Astacus, Crayfish à mains égales aussi l[ongues] que le corps. Dos et mains ponctués, doigts un p[eu] chagrinés, l'inf[érieure] mobile flexueux plus long. Divis[ion] de la tête très marquée." This species has not been given a name by Rafinesque.

New generic names. *Syllarus* Rafinesque (1815, p. 98) a substitute name for *Scyllarus* Fabricius, 1775.

Other generic names. *Astacus* Fabricius, 1775 (Rafinesque, 1814, p. 58; 1814a, p. 22; 1815, p. 98; 1817, p. 42), *Palinurus* Fabricius, 1798 (Rafinesque, 1814a, p. 24; 1814b, p. 31, as an example of a generic name based on mythology; 1815, p. 98; 1817, p. 41), *Scyllarus* Fabricius, 1775 (Rafinesque, 1815, p. 98), *Thalassina* Latreille, 1806 (Rafinesque, 1815, p. 98).

Old species names. *Astacus fluviatilis* Fabricius, 1775 (Rafinesque, 1814, p. 58, as *Astaco fluviatile,* named in comparison with *Grapsus fluviatilis* (= *Potamon edulis*)).

Nomina nuda. Species: *Astacus tomentosus* Rafinesque, 1814a, p. 22; *Palinurus langusta* Rafinesque, 1814a, p. 24.

Suborder ANOMURA

New genera and species.

Nectylus Rafinesque (1817, p. 41)

"Body eliptic, two pairs of antens ciliated, the upper antens longer; two large thick and bifid palps; feet nearly equal, the first pair a little swelled, all with flat toes, without nails; the last segment of the tail very long. — Obs. The name means in Greek, swimming fingers, being contracted from *Nectodactylus*. It has much affinity with the genera *Orithyia* and *Ranina*, from which it differs by having all the feet without nails, and two large cheliform palps. The family *Nectonyxia* contains all the short tailed crabs with swimming nails or feet." The genus was referred by Rafinesque to "N[atural] Order *Brachuria*, N. Family *Nectonyxia*", the only species placed by Rafinesque in it is

Nectylus rugosus Rafinesque (1817, p. 41)

"Palps cheliform two-thorned as long as the eyes; forehead three toothed and ciliated; first pair of feet with a long external thorn to the wrist; body olivaceous above, white beneath, thorax wrinkled, last segment of the tail lanceolate acute ciliated. — Obs. This beautiful little animal is about one inch long, and lives on the sandy shores of Long-Island, where it burrows in the sand as a mole with great rapidity, and swims with equal swiftness. It was communicated to me and the Lyceum by Dr. S. L. Mitchill, who has named it *Hippaachiria* in his paper on the New-York Crustacea; but the genus *Hippa* (or rather *Emerita* of Gronovius, an anterior and better name) belongs to the longtailed cancers, and this has the tail shorter than the thorax, and all the characters of *Ranina*, &c." There is not the least doubt that *Nectylus rugosus* is identical with *Hippa talpoida* Say (September, 1817), and is a junior synonym of that name (by two months). Rafinesque's description of the animal (though somewhat obscure in some places) and of its habits make the identity beyond any doubt. Already Fowler (1912, p. 367), who spelled the name of Rafinesque's species *Nectylus rugosa*, identified the two species with each other. Mitchill's name *Hippaachiria* mentioned by Rafinesque evidently should be written *Hippa achiria*; it thus is not a generic but a species name, as is evident from Rafinesque's subsequent remarks. The name *Hippa achiria* was first mentioned in Rafinesque's 1817 paper (as far as is known to me Dr. Mitchill's article on the New York Crustacea has never been published), consequently it also is a junior synonym of *Hippa talpoida* Say. Rafinesque is entirely wrong in his conclusions concerning the place of the present form in the classification of the

Decapoda: *Nectylus* is a synonym of *Emerita* and is not in the least related to the Raninidae.

The following of Rafinesque's new Anomuran species were placed in old genera:

Pagurus granulatus Rafinesque (1814a, p. 22)

"Dos glabre, angle postérieur des jambes et dessus du dernier article des bras muriqués, le bras droit le plus grand, mains ovales-oblongues granulées et à 2 larges sillons an dessus." This Sicilian pagurid at present is best known as *Pagurus excavatus* (Herbst); the fact that in Rafinesque's species the right chela is the larger and that it shows two broad grooves on the upper surface makes its identity beyond all doubt. *Pagurus granulatus* Rafinesque, 1814, falls as a junior synonym of *Cancer excavatus* Herbst, 1796.

Pagurus truncatulus Rafinesque (1817, p. 42)

"Right hand the longest, reaching the two following pairs of long feet; hands granular; fingers with two obtuse teeth; wrist prismatic; thorax smooth, nearly square; forehead broad, truncated. — Obs. A very small species, scarcely one inch long; it lives on the shores of Long-Island in the shells of the small species of *Buccinum* and *Murex*." Though Rafinesque's description is short there can be little doubt that his species is identical with *Pagurus longicarpus* Say, 1817, the commonest hermit crab of the Long Island shores. Rafinesque's description of the prismatic wrist serves very well to distinguish this species from *Pagurus pollicaris* Say, another east coast form. The remaining hermit crabs of the region generally live in deeper water. Therefore we confidently may identify *Pagurus truncatulus* Rafinesque (Nov., 1817) with *P. longicarpus* Say (Dec., 1817). Already Fowler (1912, p. 374) doubtfully identified the two species. Rafinesque's name, being the older, has priority, but since *P. longicarpus* is so well known, while *P. truncatulus* has been overlooked by practically all authors, the International Commission on Zoological Nomenclature has been requested to suppress Rafinesque's name.

New generic names. *Symnista* Rafinesque, 1815, p. 98, a substitute name for *Albunea* Weber, 1795.

Other generic names. *Albunea* Fabricius, 1798 (Rafinesque, 1814a, p. 20; 1815, pp. 97, 98), *Emerita* Gronovius, 1764 (Rafinesque, 1815, p. 98; 1817, p. 41), *Galathea* Fabricius, 1793 (Rafinesque, 1815, p. 98), *Hippa* Fabricius, 1787 (Rafinesque, 1815, p. 98; 1817, p. 41), *Lithodes* Latreille, 1806 (Rafinesque, 1815, p. 97), *Pagurus* Fabricius, 1775 (Rafinesque,

1814a, p. 21; 1815, p. 97; 1817, p. 42), *Porcellana* Lamarck, 1801 (Rafinesque, 1815, p. 97), *Posydon* Fabricius, 1798 (Rafinesque, 1815, p. 98), *Remipes* Latreille, 1804 (Rafinesque, 1815, p. 98).

Old species names. *Albunea symmista* (Linnaeus, 1758) was reported by Rafinesque (1814a, p. 20) from Sicily; the name was spelled by Rafinesque *Albunea symnista,* as has been done by numerous other authors. Evidently Rafinesque's animal belongs to the mediterranean species *Albunea carabus* (Linnaeus, 1758), *A. symmista* being a form from the Indo-West Pacific region.

Nomina nuda. Genera: *Apalurus* Rafinesque, 1815, p. 97; *Eremitius* Rafinesque, 1815, p. 97.

Suborder BRACHYURA

New genera and species.

Thelxiope Rafinesque (1814a, p. 21)

"Corps quarré allongé cubique, yeux à longs pédicules articules, palpes inférieurs très-longs, chèliformes, les pieds postérieurs courts et dorsigères. — Obs. Ce N.G. diffère des Genres *Ocypoda* et *Dorippus* par sa forme, ses palpes et yeux articulés." The genus was also mentioned by Rafinesque (1815, p. 97). The only species placed by him in it is

Thelxiope palpigera Rafinesque (1814a, p. 21)

"Velu, dos tomenteux à 3 larges sillons, rostre court bidenté, front à 4 dents épineuses, épaules à 4 dents inégales, 5 petites dents entre les épaules, flancs denticulés intérieurement. — Obs. Le *Maja barbata* de Latr. lui est peut-être congénère." The description leaves no doubt that *Thelxiope palpigera* is the species that at present generally is given the name *Homola barbata* (Fabricius, 1793). In his discussion of the genus *Homola* the following statement is made by Desmarest (1823, p. 250; 1825, p. 134): "le genre THELXIOPE de M. Rafinesque paroît s'y rapporter également". Desmarest as well as several subsequent authors (Roux, 1828, p. 85; Latreille, 1829, p. 68; White, 1847, p. 55; Stebbing, 1902, p. 22) recognize the identity of *Thelxiope* and *Homola,* but ignore the former name, though it is a senior synonym of *Homola* Leach, 1815, and for that reason should replace the latter. It seems that William Elford Leach, the author of the genus *Homola,* is the only one of the early authors who recognized the rights of Rafinesque's *Thelxiope* and actually substituted that name for his own *Homola.* We namely find in the 13th volume of Dictionnaire des Sciences naturelles (1819) under the word *Dromia* (p. 512) the statement: "DROMIA. (*Crust.*)

Voyez *Thelxiopédés.* (W.E.L.)". W.E.L. stands for W. E. Leach, who treated the Crustacea in the earlier volumes of the Dictionnaire, while in the later volumes they were dealt with by Desmarest. The word Thelxiopédés is not mentioned in these later volumes except for Desmarest's statement in his article Malacostracés (vol. 28, p. 252) that "M. Leach le [= the genus *Dromia*] rapporte à une famille qu'il nomme les *Thelxiopédées,* dont les caractères ne me sont pas connus". In vol. 21 (p. 416) of the Dictionnaire, Leach mentions the genus *Homola* (which is written *Homolus* by him) and gives *Thelaiope* (spelling error for *Thelxiope*) as a synonym. It was Miss Mary Jane Rathbun (1937, Bull. U. S. Nat. Mus., vol. 166, p. 63) who brought to the attention of carcinologists that the name *Thelxiope* has priority over *Homola,* and she consequently substituted the former name for the latter. Miss Rathbun is followed in this by a few modern authors (Barnard, 1950, p. 338; Gordon, 1950, p. 221). In order to end the state of instability in the nomenclature of the present genus, the International Commission on Zoological Nomenclature has been asked for the suppression of the name *Thelxiope,* which name has been far less frequently employed than that of *Homola.*

The following new species of Brachyura were placed by Rafinesque in old genera.

Cancer levifrons Rafinesque (1814a, p. 20)

"Glabre, jambes pubescentes, épaules à 5 dents obtuses, les 3 antérieures plus petites, front égal et entier, doigts noirs." The only mediterranean crabs that have the fingers of the chelae black, and the carapace with a straight front and five antero-lateral teeth are those belonging to the genus *Xantho.* The description fits slightly better (especially by the statement that the antero-lateral teeth of the carapace are blunt) for the common *Xantho poressa* (Olivi, 1792) than for the rather rare *Xantho granulicarpus* Forest (1952); *Cancer levifrons* therefore is identified with the former species (see also Holthuis, 1954, p. 105).

Cancer portunoides Rafinesque (1814a, p. 20)

"Glabre, épaules à 5 dents, l'inférieure anguleuse, la supérieure presque bilobée, front saillant presqu'à 5. lobes, mains anguleuses, ongles des pieds postérieurs applatis et ciliés intérieurement." The flattened dactylus of the last pair of pereiopods shows that the present species belongs to the Portunids. The fact that the front is 5-lobed and that the posterior antero-lateral tooth of the carapace is angular (by the presence of a dorsal carina) leave not the least doubt that this species is identical with *Bathynectes longipes*

(Risso, 1816). A strict application of the International Rules of Zoological Nomenclature necessitates the substitution of Rafinesque's name *portunoides* for Risso's *longipes*. Since the latter name at present is currently used for the species, while the former has been overlooked by practically all carcinologists, the suppression of Rafinesque's name has been requested.

Cancer villosissimus Rafinesque (1814a, p. 20)

"Entièrement velu excepté la paume des mains, épaules à 5 dents épineuses, les postérieures plus longues, front échancré." The only mediterranean crab showing the characters mentioned by Rafinesque for his *Cancer villosissimus* is *Pilumnus hirtellus* (Linnaeus, 1758), so that we confidently may identify it with that species.

Grapsus limosus Rafinesque (1817, p. 42)

"Forehead broad entire, sinus of the eyes lunular, with sharp angles, sides angular entire, back convex smooth, with some transverse wrinkles: feet compressed, angular, nearly smooth, hands small, smooth. — Obs. A small brownish species with yellowish hands and belly, about one inch in diameter; the body is quite square, scarcely half an inch broad. I have found it common on the sea shores of Long-Island in muddy overflowed banks, where it burrows in the mud, and is always covered with a muddy slime". Dr. Fenner A. Chace, Jr., (in litt.) gave me as his opinion that "*Grapsus limosus* Rafinesque, 1817, is probably the same as *Ocypode reticulatus* Say, 1817 [= *Sesarma* (*Sesarma*) *reticulatum* (Say)] despite the fact that Rafinesque describes the lateral margins as entire. The lateral tooth is very poorly marked off in this species and would be indistinguishable in a mud-covered specimen. It is the only Long Island crab I can think of in which the "body is quite square".". Fowler's (1912, p. 407) doubtful identification of Rafinesque's species with *Eurytium limosum* (Say, 1818) cannot be accepted.

Inachus levigatus Rafinesque (1814a, p. 21)

"Parfaitement glabre, dos plât, front à 4 dents ciliées, 2 appendices ciliés entre les 2 extérieures, épaules anguleuses unidentées, deux tubercules entr'elles, flancs bidentés, mains ovales enflées." *Inachus levigatus* clearly is identical with *Acanthonyx lunulatus* (Risso, 1816), no other Mediterranean species shows the above cited characters, while these are quite distinct in *Acanthonyx*. The four frontal teeth of Rafinesque's description are the two rostral plus the two supraorbital teeth of *A. lunulatus;* these teeth indeed bear small hairs. Rafinesque's ciliated appendages are the antennae,

his one-toothed angular shoulders are the anterior lateral teeth of the carapace, between which the upper surface of the carapace shows two tubercles. Rafinesque's specific name *laevigatus* has priority over Risso's *lunulatus*. The latter name, however, has become firmly established in carcinological literature, while the former has been overlooked from the beginning. Suppression of the name *levigatus* therefore has been requested.

Inachus tomentosus Rafinesque (1814a, p. 21)

"Entièrement laineux, dos convexe scabre spongieux, front saillant bidenté finissant en deux appendices molles, jambes courtes cirrhifères, mains oblongues comprimées." There can be little doubt that *Inachus tomentosus* is a species of the genus *Pisa*, but Rafinesque's description is not sufficient to permit of a certain identification of his species with any of the species of *Pisa* known from the Mediterranean. As *Pisa tetraodon* (Pennant, 1777) in the Mediterranean is the most common of the species of that genus, we might provisionally identify Rafinesque's *Inachus tomentosus* with it. Rafinesque's statement that his animal has the upper surface of the carapace "spongieux" and that its rostrum ends in two "appendices molles" shows that this specimen evidently was covered by a sponge, a phenomenon often observed in *Pisa tetraodon* and other species of that genus.

Ocypoda pusilla Rafinesque (1817, p. 42)

"Forehead advancing obtuse entire, shoulders flexuose with a sharp angle, sides angular with two angles below, and a suture between them, back convex shining olivaceous; feet compressed and bristly, hands unequal, the left granular, the right very small and smooth. — Obs. Shape of a short rhomboid, broader anteriorly as in all the real species of *Ocypoda*; those with a different shape belong to my genus *Ocypete*. Size of the foregoing [*Grapsus limosus*], common in salt marshes and on the south shores of Long-Island." Dr. Fenner A. Chace, Jr. (in litt.) gave me his opinion on the identity of this species as follows: "*Ocypoda pusilla* Rafinesque, 1817, is undoubtedly the same as *Uca pugnax* (Smith, 1870), *Uca minax* (Le Conte, 1855) or *Uca pugilator* (Bosc, 1801-02). If I had to be specific, I should probably call it *Uca pugnax* because of the color and the fact that that species is probably more common than *Uca minax*. It is not unlikely that Rafinesque had more than one species, and possibly all three." Fowler (1912, pp. 440, 447) placed the name *Ocypoda pusilla* Rafinesque in the synonymy of both *Sesarma reticulatum* (Say) and *Uca pugilator* (Bosc), both times the entry is preceded by a question mark. If the identity of *Ocypoda pusilla* Rafinesque, 1814, and *Uca pugnax* (Smith, 1870) is accep-

ted, Smith's specific name should have to be replaced by that of *pusilla* Rafinesque. To prevent this undesirable change, the suppression of Rafinesque's name has been requested.

Ocypoda unispinosa Rafinesque (1814, p. 21)

"Glabre, dos lisse, épaules à une épine, reins ou angles postérieurs obtus, bras de la longueur du thorax.—" The only Mediterranean species for which Rafinesque's description fits is *Goneplax angulata* (Pennant, 1777) and with that species it is identified here. The fact that the "bras" in Rafinesque's material is short indicates that his specimen was a female.

Portunus menoides Rafinesque (1817, p. 42)

"Forehead with three teeth, the middle one longer, one fissure behind each eye, sides with five nearly equal teeth: hands prismatic, with one internal tooth, and the wrist with two teeth, the external larger, back olivaceous with small black dots. — Obs. Similar to *Portunus menas* of Europe, which has, however, only one tooth to each wrist, the hands not prismatic, the forehead equally trilobed, and the back with large spots. Size from one to three inches, common in New-York, Long-Island, New-Jersey, &c." Rafinesque's description makes it quite clear that his *Portunus menoides* is identical with *Carcinus maenas* (Linnaeus, 1758). This identity was already recognized by Fowler (1912, p. 411, where the name is spelled *Portunus maenoides*) and Rathbun (1930, p. 15).

New generic names. *Zoenus* Rafinesque, 1815, p. 100, a substitute for *Zoëa* Bosc, 1801.

Other generic names. *Calappa* Weber, 1795 (Rafinesque, 1815, p. 97), *Cancer* Linnaeus, 1758 (Rafinesque, 1814, pp. 56, 57; 1814a, p. 20; 1814b, p. 21, mentioned as a genus containing a heterogeneous assemblage of species, and therefore in need of being split up, p. 27, mentioned as invalidating the generic name *Anser* L.; 1815, p. 97; 1817, pp. 40, 42), *Corystes* Latreille, 1802 (Rafinesque, 1815, p. 97), *Dorippe* Weber, 1795 (Rafinesque, 1814a, p. 21, as *Dorippus*; 1815, p. 97, as *Doripus*), *Dromia* Fabricius, 1798 (Rafinesque, 1815, p. 97), *Grapsus* Lamarck, 1801 (Rafinesque, 1814, pp. 55, 56, 57; 1814a, p. 21; 1815, p. 97; 1817, pp. 42, 43), *Hepatus* Latreille, 1802 (Rafinesque, 1815, p. 97), *Inachus* Fabricius, 1798 (Rafinesque 1814a, p. 21; 1815, p. 97; 1817, p. 42), *Leucosia* Weber, 1795 (Rafinesque, 1814b, p. 25, mentioned as a generic name preoccupying *Leucosia* Thouars, a botanical name; 1815, p. 97), *Macropus* Latreille, 1802 (Rafinesque, 1815, p. 97), *Maja* Lamarck, 1801 (Rafinesque, 1814a, p. 21; 1815, p. 97), *Matuta*

Fabricius, 1798 (Rafinesque, 1815, p. 97), *Mictyris* Latreille, 1806 (Rafinesque, 1815, p. 97, as *Myctiris*), *Ocypode* Weber, 1795 (Rafinesque, 1814, p. 57; 1814a, p. 21; 1815, p. 97; 1817, p. 42; everywhere as *Ocypoda*), *Orithyia* Fabricius, 1798 (Rafinesque, 1815, p. 97, as *Orythyia;* 1817, p. 41), *Parthenope* Fabricius, 1798 (Rafinesque, 1815, p. 97, as *Parthenopa*), *Pinnotheres* Latreille, 1802 (Rafinesque, 1815, p. 97), *Plagusia* Latreille, 1804 (Rafinesque, 1815, p. 97), *Podophthalmus* Lamarck, 1801 (Rafinesque, 1815, p. 97), *Portunus* Fabricius, 1798 (Rafinesque, 1814a, p. 21; 1815, p. 97; 1817, p. 42), *Ranina* Lamarck, 1801 (Rafinesque, 1815, p. 97; 1817, p. 41), *Symethis* Fabricius, 1798 (Rafinesque, 1815, p. 98), *Zoëa* Bosc, 1801 (Rafinesque, 1815, p. 100, as *Zoe*).

Old species names. *Cancer fluviatilis* (Latreille, 1803) (Rafinesque, 1814, p. 56), *Grapsus fluviatilis* (Latreille, 1803) (Rafinesque, 1814, pp. 55, 56, 57, on pp. 56-58 is given a rather extensive discussion of the nomenclature, the characters, the classification, and the different uses (medical, pharmacological, and economic) of the species; 1814a, p. 21), *Maja barbata* (Fabricius, 1793) (Rafinesque, 1814a, p. 21), *Ocypode fluviatilis* Latreille, 1803 (Rafinesque, 1814, p. 57; 1814a, p. 21; both times as *Ocypoda fluviatilis*), *Portunus maenas* (Linnaeus, 1758) (Rafinesque, 1817, p. 42, as *P. menas*).

Nomina nuda. Genera: *Cerophthalmus* Rafinesque (1815, p. 97), *Cylindusia* Rafinesque (1815, p. 97), *Nesea* Rafinesque (1815, p. 97), *Ocypete* Rafinesque (1815, p. 97; 1817, p. 42). Species: *Cancer emarginatus* Rafinesque (1814a, p. 20), *Cancer gibesinus* Rafinesque (1814a, p. 20), *Cancer olivaceus* Rafinesque (1814a, p. 20), *Cancer poressoides* Rafinesque (1814a, p. 20), *Portunus levifrons* Rafinesque (1814a, p. 21), *Portunus trilobus* Rafinesque (1814a, p. 21).

Order STOMATOPODA

New species.

Squilla crocea Rafinesque (1814a, p. 25)

"Dos convèxe agone safrané, front tridenté, les 4 premières paires de jambes à mains arrondies comprimées sans ongles, les paires postérieures à troisième article appendiculé; queue à 2 taches brunes, contour à 10 dents, appendices égaux à la queue." This description fits so well for *Lysiosquilla eusebia* (Risso, 1816), that there cannot be the least doubt about the identity of the two species. To save the well known name *eusebia,* the suppression of the senior name *crocea* has been requested.

Squilla triodona Rafinesque (1814a, p. 24)

"Dos à 7 angles longitudinaux, article pénultième à 6 angles, pouces en

faux à 3 dents; queue à carène épineuse postérieurement, contour à 10 dents èpineuses, appendices plus longs de la queue." The fact that the dorsal surface of the body shows longitudinal ridges and that the raptorial claw bears only three teeth immediately shows that *Squilla triodona* is identical with *Pseudosquilla ferussaci* (Roux, 1828). Suppression of Rafinesque's name has been asked in order to save Roux's well known specific name *ferussaci*.

Old generic names. *Squilla* Fabricius, 1787 (Rafinesque, 1814a, pp. 24, 25; 1815, p. 99; 1817, p. 42).

V. RAFINESQUE'S MERITS AS A CARCINOLOGIST

Rafinesque has described 19 new genera (Branchiura: 1, Isopoda: 3, Amphipoda: 5, Macrura Natantia: 8, Anomura: 1, Brachyura: 1) and 42 new species of Crustacea (Cladocera: 1, Branchiura: 1, Isopoda: 6, Amphipoda: 6, Macrura Natantia: 8, Macrura Reptantia: 5, Anomura: 3, Brachyura: 10, Stomatopoda: 2). Furthermore he proposed 14 new generic (Notostraca: 2, Cladocera: 1, Ostracoda: 1, Isopoda: 1, Macrura Natantia: 4, Macrura Reptantia: 1, Anomura: 1, Brachyura: 1) and one new specific name (Anomura) to replace existing Crustacean names. Of all the names introduced by Rafinesque at least 8 generic and 21 specific are the oldest available names for the taxa for which they have been proposed. It is surprising therefore that until now only three generic (*Ligyda, Lirceus, Thelxiope*) and two specific names (*Lirceus fontinalis, Astacus limosus*) have ever been accepted by carcinologists. The reasons for this utter neglect of Rafinesque's carcinological writings in my opinion are the following:

1. Most of Rafinesque's papers were privately printed and evidently had a very limited distribution, so that very few authors could consult them.

2. Rafinesque's descriptions were short, often not entirely accurate, and never illustrated. This made it difficult, especially for contemporary scientists, to place his species. At present it is far more easy to find out in which respects Rafinesque's descriptions are deficient, since the carcinological fauna of the regions in which he worked (Sicily, and the eastern U.S.A.) are fairly well known by now. The fact that some of Rafinesque's descriptions in one or more respects were clearly faulty must have been the cause that the carcinologists of the beginning of the 19th century distrusted all of Rafinesque's work and discarded it as worthless. This evidently is the reason why in H. Milne Edwards's (1837, 1840) and Desmarest's (1823 and 1825) books Rafinesque's genera and species all are treated as dubious, even those like *Byzenus scaber* and *Thelxiope* of which both authors suspected the identity.

3. The eccentricity shown in many of Rafinesque's publications obviously caused the antagonism and distrust of contemporary authors, who considered him not only a poor systematist, but also an erratic.

We cannot blame Rafinesque for keeping his descriptions short. In most of the handbooks of that time, like those by Linnaeus and Fabricius, the descriptions do not occupy more than a few lines, neither were these publications illustrated. The only real faults that can be found in Rafinesque's publications on Crustacea are the rather large number of inaccuracies and incorrect statements made in his descriptions. These inaccuracies are partly due to the fact that Rafinesque seldom preserved his specimens but made his notes on the spot, discarding the material afterwards. This is clearly stated by Swainson (cf. Fitzpatrick, 1911, p. 46): "We both [Swainson and Rafinesque] used to frequent the fish-markets [of Sicily], and we procured all our specimens there, or from fisherman who were in our employ. I was frequently urgent with my friend to preserve, at least, such as were the most remarkable of his new genera, anticipating the incredulity that has since been attached to them; but this advice, unfortunately, he never adopted. The greater part of those which I examined, after being drawn and described, were thrown away or eaten". The notes made by Rafinesque during his trips hardly could be in the form of extensive descriptions and his (unpublished) figures also prove to be quite sketchy. A wrong observation could easily be made this way and an incorrect later interpretation of a figure might make the entire description unintelligible. Furthermore Rafinesque trusted the observations made by others too much; e.g., his new genus *Nectoceras* is partly based on a drawing by a Mr. Bradbury and partly on Rafinesque's own recollection of this animal, which he had seen two years before he published the description. It is very well possible that errors in Mr. Bradbury's drawing have found their way into Rafinesque's description, which may be the reason that now it is very hard to find out which species actually was meant by Rafinesque.

It cannot be denied that Rafinesque's work has been quite unfairly ignored and its importance unjustly minimized by contemporary and later carcinologists. It is of course altogether logical and intelligible that the specialists on Crustacea of the beginning of the 19th century did not pay attention to the incomplete and inaccurate descriptions of Rafinesque's, but it is unpardonable that they also refused to accept the names of the species for which he as the first gave a good and recognizable description. This is the more true since there are several of such identifiable descriptions, especially in his early work. On the other hand, however, the recent trend of taxonomists to consider Rafinesque a neglected taxonomical genius,

who only through the malice and jealousy of his colleagues and their lack of understanding, failed to occupy the foremost place in the ranks of the biologists of his time, in my opinion goes too far. I fully agree that Rafinesque certainly did not receive the recognition that he deserved, but as far as I can judge from his work in the field of carcinology, I can only find that his work is far inferior to that of his contemporaries like A. Risso, who worked on Mediterranean Crustacea, or Thomas Say, who published a few papers on the Crustacea of the eastern U.S.A.

In bringing together here all the carcinological information found in Rafinesque's work, I leave it to the interested carcinologists to form for themselves a judgment of the accomplishments of this highly eccentric and interesting scientist.

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