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SMITHSONIAN INSTITUTION,
UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 41.

BIBLIOGRAPHIES OF AMERICAN NATURALISTS:

V. THE PUBLISHED WRITINGS OF DR. CHARLES GIRARD.

BY

G. BROWN GOODE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1891.

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ADVERTISEMENT.

This work (Bulletin No. 41) is one of a series of papers intended to illustrate the collections belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 41, in continuous series, and the Proceedings, of which the fourteenth volume is now in press. A small edition of each paper in the Proceedings is distributed in pamphlet form to specialists in advance of the publication of the bound volume.

The Bulletins of the National Museum, the publication of which was commenced in 1875, consist of elaborate papers based upon the collections of the Museum, reports of expeditions, etc., while the Proceedings facilitate the prompt publication of freshly acquired facts relating to biology, anthropology, and geology, descriptions of restricted groups of animals and plants, the discussion of particular questions relative to the synonymy of species, and the diaries of minor expeditions.

Other papers, of more general popular interest, are printed in the Appendix to the Annual Report.

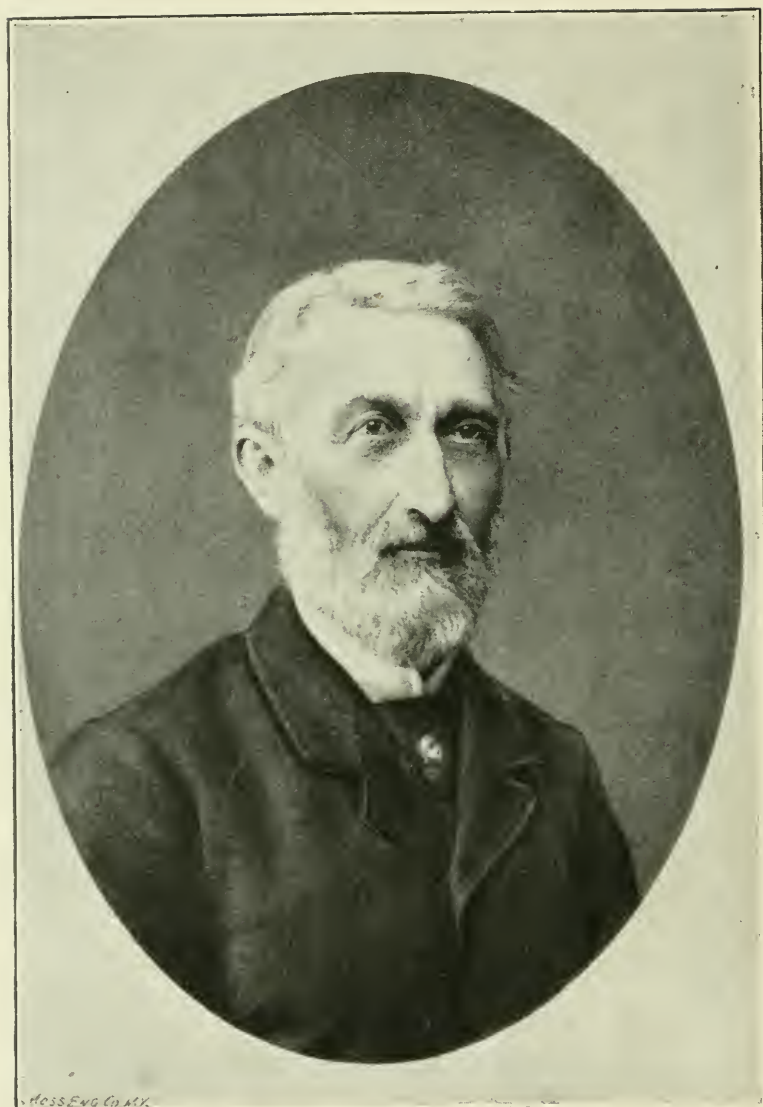
Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

Papers intended for publication in the Proceedings and Bulletins of the National Museum are referred to the Committee on Publications, composed as follows: T. H. Bean, A. Howard Clark (editor), R. E. Earll, Otis T. Mason, John Murdoch, Leonhard Stejneger, Frederick W. True, and Lester F. Ward.

S. P. LANGLEY,

Secretary of the Smithsonian Institution.

WASHINGTON, D. C., May 28, 1891.



CHARLES GIRARD, M. D.

BIBLIOGRAPHIES OF AMERICAN NATURALISTS.

V.

THE PUBLISHED WRITINGS

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1891.

BIOGRAPHICAL SKETCH OF DR. CHARLES GIRARD.

In the preface to Bulletin No. 20 of the U. S. National Museum, "The Published Writings of Spencer Fullerton Baird," mention was made of the contemplated publication of others in the same series, among them the "Bibliography of Dr. Charles Girard." The pressure of other duties has delayed the completion of this work, which is now presented as the fifth of the special bibliographies of prominent naturalists. Charles Girard was born in Mulhouse, France, March 9, 1822, and received his education at Neuchatel, Switzerland, where he was the assistant and pupil of Professor Agassiz, who brought him to the United States in 1847, in company with Mr. E. Desor. Dr. Girard remained in Cambridge, Massachusetts, as a student and assistant to Agassiz until the fall of 1850, when he removed to Washington, and engaged in the natural history work of the Smithsonian Institution, where for a number of years he was Professor Baird's principal assistant, showing marked aptitude for scientific work. The Smithsonian Institution afforded him new opportunities for the pursuit of scientific work, and becoming a naturalized citizen in 1854, he took a medical course at Georgetown College, and was graduated therefrom in 1856. In connection with his medical studies he pursued his scientific researches in the Smithsonian Institution where he remained until 1860, when he decided to visit Paris. Meanwhile the civil war occurred which delayed his return to Washington, he having accepted a commission to supply the Confederate army with drugs and surgical instruments. In 1863 Dr. Girard made a tour of the Southern States, and in 1865 returned to Paris, entering immediately upon the practice of medicine, to which he has devoted fifteen years of his life. He now lives in comparative retirement at Neuilly sur Seine, near Paris, where he still devotes himself to scientific study. He is a man of retiring habits and great industry. While in America he held high rank among descriptive naturalists.

His special studies were the herpetology and ichthyology of North America, and in the domain of ichthyology he is particularly well known for his work on the cyprinidae of North America and the fauna of the Pacific coast. His monograph of the cottoids is the most elaborate of his scientific writings, although his ichthyology of the Pacific coast, that of the Mexican boundary, and his herpetology of the United States Exploring Expedition are much more extensive. Several papers upon helminthology, the practice of medicine, the theory of life, the bibliography of science, and kindred subjects were published by him.

In 1861 Dr. Girard was awarded the Cuvier prize by the Institute of France.*

Dr. Girard's connection with the Smithsonian Institution is best remembered by his association with Prof. Spencer F. Baird, in preparing the well known Catalogue of North American Reptiles, Part 1, Serpents, and in describing numerous species and genera of American reptiles and fishes. His career as an author covered a period of about forty years, extending from 1850 to 1891. His contributions to science number eighty-one papers, distributed as follows: Herpetology, 21; ichthyology, 42; helminthology, 14; theoretical biology, 3; medicine, 1; bibliography, 3.

No portrait of Dr. Girard has been published, but the National Museum has a small portrait painted in Paris in 1847, by Albert de Menron.

The following genera and species have been named in his honor:

- Girardinus, Poey.
- Girardinichthys, Bleeker.
- Cambarus Girardianus, Faxon.
- Microcyphus Girardi, Desor.
- Synapta Girardi, Pomrtales.
- Vortex Girardi, Schmidt.

*The commission on awards in its report published in "Comptes Rendus des Séances de l'Académie des Sciences, 1861, Vol. LI, p. 594," says:

"Parmi les ouvrages adressés au concours pour le prix Cuvier, la Commission a remarqué ceux d'un zoologiste américain, M. Girard, sur la faune ichthyologique des régions occidentales du nouveau monde, et sur les reptiles recueillies pendant le voyage d'exploration du Capitaine Wilkes dans les mers antarctiques. Le dernier travail publié aux frais du gouvernement des États-Unis n'est pas indigne de prendre place à côté des beaux et importants ouvrages dont le principal naturaliste de cette expédition, M. Dana, avait précédemment enrichi la science."

BIBLIOGRAPHY
OF THE
PUBLISHED WRITINGS OF CHARLES GIRARD, M. D.

I.—CHRONOLOGICAL CATALOGUE.

1.

1849. GIRARD, CHARLES. On the Genus *Cottus* Auct.

Proceedings Boston Society Natural History, iii, 183-90, 1849.

Thus far the *Cottus* embodied both fresh-water and marine species. In compliance with the strict rules of scientific nomenclature, the name of *Cottus*, properly so called, created by Artédi, is henceforth retained for the fresh-water species, or Miller's Thumb; whilst that of *Acanthocottus* is made to include the marine species, or Sculpin and Bullheads.

The American species are recorded as follows:

ACANTHOCOTTUS, n. g.

<i>Acanthocottus Gronlandicus</i> , Grd.....	185
Davis Strait, Richardson; Maine and Massachusetts, D. H. Storer; Connecticut, Ayres; Hellgate, New York, De Kay.	
<i>Acanthocottus scorpioides</i> , Grd.....	185
Greenland, O. Fabricius.	
<i>Acanthocottus polaris</i> , Grd.....	186
Peninsula of Boothia, Ross, Sabine; North Georgia, Richardson.	
<i>Acanthocottus polyacanthocephalus</i> , Grd.....	186
Off Cape St. Elias, Billings, Richardson, Valenciennes.	
<i>Acanthocottus psittileger</i> , Grd.....	186
Unalaska and harbor of Avatcha, Cuv. and Valenciennes; coast of Kamtschatka, Richardson.	
<i>Acanthocottus hezacornis</i> , Grd.....	186
Mouth of Tree River, Richardson.	
<i>Acanthocottus porosus</i> , Grd.....	186
Baffin's Bay, Richardson.	
<i>Acanthocottus aneus</i> , Grd.....	186
New York, Mitchill, De Kay; Massachusetts, Storer.	
<i>Acanthocottus Mitchilli</i> , Grd.....	186
New York, Mitchill, De Kay.	
<i>Acanthocottus Virginianus</i> , Grd.....	187
Coast of Virginia. Willoughby; New York, Mitchill, De Kay; Newfoundland, Richardson.	

COTTUS, Artédi.

<i>Cottus cognatus</i> , Rich.....	189
Great Bear Lake, Richardson.	
<i>Cottus Richardsoni</i> , Agass.....	189
Northern shore of Lake Superior, Prof. Agassiz.	
<i>Cottus Bairdi</i> , Grd.....	189
Pennsylvania, in the tributaries of Ohio River, Baird; Mahoning River, Kirtland.	
<i>Cottus meridionalis</i> , Grd.....	189
James River, Baird.	
<i>Cottus gracilis</i> , Heck.....	189
Massachusetts, Connecticut, W. O. Ayres.	
<i>Cottus viscosus</i> , Hald.....	189
Eastern Pennsylvania, Haldeman, Baird.	

849. GIRARD, CHARLES—Continued.

<i>Cottus boleooides</i> , Grd	189
Windsor, Vermont, Ed. C. Cabot, Dr. Storer.	
<i>Cottus Franklini</i> , Agass	189
Eastern and southern shores of Lake Superior, Agassiz.	
<i>Cottus gobioides</i> , Grd	189
Burlington, Vermont, Z. Thompson, Dr. D. H. Storer.	
<i>Cottus Fabricii</i> , Grd	189
Greenland, O. Fabricius.	

2.

1850. GIRARD, CHARLES. On the so-called Biogen Liquid.

Proceedings Boston Society Natural History, iii, 239-40, 1850. *Silliman's American Journal Science and Arts*, 2d ser., ix, 399. 1850.

Refutation of Mr. Desor's theory on the formation of the primitive egg.

3.

850. GIRARD, CHARLES. Additional Observations on the Nomenclature and Classification of the Fishes of the genus *Cottus*.

Proceedings Boston Society Natural History, iii, 302-4. 1850.

TRACHIDERMIS, Heck	302
<i>Trachidermis faciatus</i> , Heck	302
Philippine Islands, Heckel.	
<i>Trachidermis uncinatus</i> , Grd	302
China Seas, Richardson.	
<i>Trachidermis intermedius</i> , Grd	302
Jesse Island, Siebold.	
COTTOPSIS, n. g.	303
<i>Cottopsis asper</i> , Grd	303
River Oregon, Lewis and Clarke, Richardson.	
PODABRUS, Richards	304
<i>Podabrus cottoides</i> , Richards	304
China Seas, Richardson.	
<i>Podabrus centropomus</i> , Richards	304
Island of Guelpert, Richardson.	

4.

1850. GIRARD, CHARLES. A Monograph of the Fresh-Water Cottii.

Proceedings American Association for Advancement of Science, ii, 409. 1850.

An abstract of a fuller work in preparation (n. 26). The following species are enumerated:

<i>Cottus cognatus</i> , Richards	410
<i>Cottus Richardsoni</i> , Agass	410
<i>Cottus Bairdi</i> , Grd	410
<i>Cottus meridionalis</i> , Grd	410
<i>Cottus Franklini</i> , Agass	411
<i>Cottus viscosus</i> , Hald	411
<i>Cottus gracilis</i> , Heck	411
<i>Cottus boleooides</i> , Grd	411
<i>Cottus gobioides</i> , Grd	411
<i>Cottus Fabricii</i> , Grd	411

5.

1850. GIRARD, CHARLES. "On Acanthocotti" in Storer's Fishes of Nova Scotia.

Boston Journal of Natural History, vi, 1850, pp. 247-250 (figs.).

<i>Acanthocottus Greenlandicus</i> , Grd	248
Greenland.	
<i>Acanthocottus Labradoricus</i> , Grd	248
Labrador, H. R. Storer.	
<i>Acanthocottus variabilis</i> , Grd	248
Maine, Massachusetts, Connecticut, New York; Storer, Ayres, DeKay.	

6.

1850. GIRARD, CHARLES. "On Gasterosteï" in Storer's Fishes of Nova Scotia.
Boston Journal of Natural History, vi, 1850, pp. 251-260.
Gasterosteus Cuvieri, Grd., Pl. vii, fig. 1..... 254
 Bras d'Or and Red Bay, Labrador H. R. Storer.

7.

1850. GIRARD, CHARLES. On the Development of *Planocera elliptica*.
Proceedings Boston Society Natural History, iii, 318. 1850.
 Tracing the egg through successive periods.

8.

1850. GIRARD, CHARLES. On the Embryology of Planaria.
Proceedings American Association Advancement of Science, ii, 398. 1850.
 Abstract of a fuller paper on the subject. (See below Nos. 58 and 59.)

9.

1850. GIRARD, CHARLES. Sur l'Embryologie des Planaires.
Bulletin Société des Sciences Naturelles, ii, 300. 1850. Neuchatel, Switzer-
 land.
 A French version of the preceding paper (No. 8).

10.

1850. GIRARD, CHARLES. Descriptions of Several New Species of Marine Planariæ
 from the Coast of Massachusetts.
Proceedings Boston Society of Natural History, iii, pp. 251, 264.
Polyseelis variabilis, n. s. 251
 Boston and Beverly Harbors, Girard.
Prosthostomum gracile, n. s. 251
 Boston Harbor, Girard.
 PROCERODES, n. g.
Procerodes Wheatlandi, n. s. 251
 Manchester, Massachusetts, Girard.
Planocera elliptica, n. s. 251
 Massachusetts, Girard.
Vortex Warreni, n. s. 264
 Boston Harbor, Girard.
Vortex candida, n. s. 264
 Chelsea Beach, Girard.

11.

1850. GIRARD, CHARLES. Brief Account of the Fresh-Water Planariæ so far known
 in the United States.
Proceedings Boston Society of Natural History, iii, 264-7. 1850.
Planaria gracilis, Hald. 264
 Cambridge.
Planaria tigrina, n. s. 264
 New Jersey.
Dendrocoelum pulcherrimum, n. s. 265
 New Jersey.
Dendrocoelum superbum, n. s. 265
 Vicinities of Philadelphia and Boston.
 DUGESIA, n. g. 265
Dugesia gonocephaloides, n. s. 265
 New Jersey.

12.

1850. GIRARD, CHARLES. Observations upon Planarian Worms.
Proceedings Boston Society of Natural History, iii, 363-4. 1850.
Vortex Warreni and *Phagocata gracilis*, bringing forth living young.

13.

1850. GIRARD, CHARLES. Descriptions of Several New Species of Echinoderms. *Proceedings Boston Society Natural History*, iii, 363-7. 1850.

<i>HELIECHINUS</i> , n. g.	365
<i>Heliechinus Gouldi</i> , n. s.	365
Key West, Florida.	
<i>MELEBOSIS</i> , n. g.	365
<i>Meleboxis mirabilis</i> , n. s.	365
East India.	
<i>Psammechinus asteroides</i> , n. s.	366
New Zealand.	
<i>Echinometra nigrina</i> , n. s.	366
Cape Palmas, Western Africa, Dr. G. A. Perkins.	
<i>Echinocyamus minimus</i> , n. s.	367
Mediterranean.	
<i>Schizaster lachesis</i> , n. s.	368
Gulf of Mexico, Texas shore, J. Bartlett.	

14.

1851. GIRARD, CHARLES. On a New American Saurian Reptile. *Proceedings American Association for Advancement of Science*, iv, 200-2. 1851.

<i>HOLBROOKIA</i> , n. g.	200
<i>Holbrookia maculata</i> , n. s.	201
Grand Island, Platte River, Colorado, William Tappan.	

15.

1851. GIRARD, CHARLES. A New Generic Type in the Class of Worms. *Proceedings American Association for Advancement of Science*, iv, 124. 1851.

<i>PHYLLOBRANCHIUS</i> , n. g.	124
<i>Phyllobranchus Raveneli</i> , n. s.	125
Specimen found attached to the body of a skate caught in Charleston Harbor, South Carolina, observed by Dr. Julian Ravenel.	

16.

1851. GIRARD, CHARLES. An Essay on the Classification of Nemertes and Planariæ, preceded by Some General Considerations on the Primary Divisions of the Animal Kingdom. *Silliman's American Journal of Science*, xi, 2d series, 41, 1851. Revised edition in *Proceedings American Association for Advancement of Science*, iv, 258, 1851.

17.

1851. GIRARD, CHARLES. On the Organs of Vision and Nervous System in the Embryo of Ascidia. *Proceedings Boston Society of Natural History*, iv, 30-31, 1851.

Views on the oculiform spot in embryo representing the nervous system of *Ascidia*.

18.

1851. GIRARD, CHARLES. Die Planarien und Nemertinen Nordamerikas. *Nordamerica-ircanischer Monatsbericht für Natur and Heilkunde*. Keller and Tiedeman, Philadelphia, ii, 1851, p. 1.

PLANARIANS.

<i>PHAGOCATA</i> , Leidy	1
<i>Phagocata gracilis</i> , Leidy	1
<i>Dendrocoelum pulcherrimum</i> , Grd	2
<i>Dendrocoelum superbum</i> , Grd	2
<i>Planaria tigrina</i> , Grd	2
<i>DUGESIA</i> , Grd	2
<i>Dugesia gonocephaloides</i> , Grd	2

1851. GIRARD, CHARLES—Continued.

<i>Ingesia maculata</i> , Grd	3
Vicinity of Phila., Leidy, Girard.	
<i>Prostoma marginatum</i> , Leidy	3
Vicinity of Phila., Leidy.	
<i>Planocera elliptica</i> , Grd	3
<i>Polycelis variabilis</i> , Grd	3
<i>Prosthiostomum gracile</i> , Grd	3
PROCERODES, Girard	4
<i>Procerodes Wheatlandi</i> , Grd	4
<i>Vortex Warreni</i> , Grd	4
<i>Vortex candida</i> , Grd	4
<i>Monocelis spatulicauda</i> , n. s.	4
Boston Harbor, Ch. Girard.	

NEMERTEANS.

<i>Polia gracilis</i> , n. s.	4
Boston Harbor, Ch. Girard.	
<i>Tetrastemma serpentina</i> , n. s.	4
Boston Harbor, Ch. Girard.	
<i>Meckelia fragilis</i> , n. s.	4
Chelsea Beach (Mass.), Ch. Girard.	

19.

1851. GIRARD, CHARLES. On a new Genus of American Cottoids.

Proceedings Boston Society of Natural History, iv, 18-19. 1851.

TRIGLOPSIS, n. g.	19
<i>Triglopsis Thompsoni</i> , n. s.	19
Oswego, Professor Baird.	

20.

1851. GIRARD, CHARLES. Historical sketch of Gordiacea.

Proceedings Academy of Natural Sciences Philadelphia, v, 279-284. 1851.

Observations on the anatomical structure of Gordiacea.

21.

1851. GIRARD, CHARLES. The Seventeen-year Locusts (*Cicada septendecim*.)

Boston Evening Traveller, Sept. 3, 1851.

The metamorphosis of the 17-year locust have been so thoroughly investigated, especially by the late Miss H. Morris, of Germantown, Pa., that no room is left for any doubt as to the period of 17 years of its underground life.

The phenomenon of its regular appearance above ground every 17 years has attracted the attention of the learned community, which carefully recorded the periods during the present century. A curious statement resulted therefrom, viz, that, although reappearing regularly every 17 years in the same locality, minor swarms of that insect were noticed in other localities, appearing likewise regularly every 17 years, the periods of which, however, were not synchronous with those of the appearance of the larger swarms.

The question then arose whether the insect had been created at repeated times during a given epoch in the history of the earth, or whether they all proceeded from a single creation in a single locality, whence they subsequently spread into the manifold places where they are now observed.

The late Dr. Burnett, of Boston, having brought the matter before the American Association for the Advancement of Science at the Albany meeting of August, 1852, upheld the theory of repeated creations of the insect in various localities.

Dr. Girard took up the opposite view, defending the idea of one sole creation on a single locality, imputing the existence of the minor swarms to accidental migrations and climatic influences, without actual transformation in their anatomical and zoölogical characters.

22.

1851. GIRARD, CHARLES. Description of a new Planaria and a new Nemertes from the Coast of Florida.

Proceedings Boston Society of Natural History, iv, 137. 1851.

<i>Thysanozoon nigrum</i> , n. s.	137
Cape Florida, L. F. Pourtales.	
<i>Meckelia atra</i> , n. s.	137
Cape Florida, L. F. Pourtales.	

23.

1851. GIRARD, CHARLES. Mammalia. *Iconographic Encyclopædia of Science, Literature, and Arts*. New York, 8°. 1851. (See No. 25.)

24.

1851. GIRARD, CHARLES. On the Classification of Mammalia.

Proceedings of American Association for Advancement of Science, iv, 319-35. 1851.

Two schematic plates represent, one, the classification of mammalia from a biological point of view; the other illustrates the historic development of that class through geological eras.

25.

1851. GIRARD, CHARLES, WITH SPENCER F. BAIRD AND OTHERS. Outlines | of | General Zoölogy | "Mammals," Charles Girard | "Birds," John Cassin | "Reptiles," Spencer F. Baird | "Fishes," Spencer F. Baird | "Invertebrates," S. S. Haldeman | — | Reprinted from the *Iconographic Encyclopædia* | of Science, Literature, and Art | — | New York: | Rudolph Garrique, Publisher | 2 Barclay St., Astor House | 1851. | 8vo. 502. 1851.

This extract constitutes the zoölogical portion of the work entitled "*Iconographic Encyclopædia*," specially compiled and rewritten, with special reference to adaptation to this country.

Section relating to mammalia, pp. 392-502, contains a full classification of the group, with a special chapter on Geographical Distribution of Mammalia, p. 498.

26.

1852. GIRARD, CHARLES. Contributions to the Natural History of the Fresh-water Fishes of North America. I, Monograph of the Cottoids, with 3 plates. [*Smithsonian Contributions to Knowledge*, vol. iii.] 1852. 4to.

COTTUS, Artedi	33
<i>Cottus Richardsoni</i> , Agass., pl. i, figs. 1-2.....	39
Northern shore of Lake Superior, Agassiz.	
<i>Cottus cognatus</i> , Richards	41
<i>Cottus Wilsoni</i> , n. s., pl. i, figs. 3, 4.....	42
French Creek, Pa., L. D. Williams; Alleghany River, Professor Baird.	
<i>Cottus Bairdi</i> , Grd., pl. i, figs. 5, 6.....	44
Mahoning River, Professor Baird.	
<i>Cottus Alvordi</i> , n. s., pl. i, figs. 7, 8.....	46
Lake Huron, Major Alvord.	
<i>Cottus meridionalis</i> , Grd., pl. i, figs. 9, 10.....	47
James River, Va., Rock Creek, District of Columbia.	
<i>Cottus gracilis</i> , Heck., pl. i, figs. 11, 12.....	49
Massachusetts, Connecticut, and New York States.	
<i>Cottus viscosus</i> , Hald., pl. ii, figs. 1, 2.....	51
Reading and Carlisle, Pennsylvania, Professor Baird; Rohrsersville, Maryland; Rock Creek, District of Columbia.	
<i>Cottus Franklinsi</i> , Agass., pl. ii, figs. 5, 6.....	53
Southern and eastern shores Lake Superior, Agassiz.	
<i>Cottus gobioides</i> , Grd., pl. ii, figs. 3, 4.....	55
Lamoille River, Ransom Colberth.	

1852. GIRARD, CHARLES—Continued.

<i>Cottus boleoides</i> , Grd., pl. ii, figs. 7, 8	56
Windsor, Vermont, Ed. Cabot.	
<i>Cottus formosus</i> , n. s.	58
Lake Ontario, Professor Baird.	
<i>Cottus Fabricii</i> , Grd.	59
Greenland, O. Fabricius.	
COTTOPSIS, Girard.	62
<i>Cottopsis asper</i> , Grd.	62
Columbia River, Dr. Gairdner.	
TRIGLOPSIS, Girard.	64
<i>Triglophis Thompsoni</i> , Grd., pl. ii, figs. 9, 10.	65
Lake Ontario, Professor Baird.	

26.a

1852. GIRARD, CHARLES. On *Salmo Oquassa*, a new species of Lake Trout.

Proceedings Boston Society of Natural History, iv, 262-3. 1852.

<i>Salmo oquassa</i> , n. s.	262
Moosemegantic Lake, Charles Girard.	

27.

1852. GIRARD, CHARLES. American Zoölogical, Botanical, and Geological Bibliography for the year 1851. Prepared at the request of Prof. Spencer F. Baird, Assistant Secretary, Smithsonian Institution.

Silliman's American Journal Science and Arts, xiii, 2 ser. 1852. Appendix. (See No. 28.)

28.

1852. GIRARD, CHARLES. Bibliographia Americana | Historico-naturalis | A. D. 1851 | Auctore | Carolo Girard | Smithsonian Institution | Washington | December, 1852. |

Reprint of the former paper (No. 27). The plan was to publish a yearly report, similar to the above; the second year was ready for the press when its publication was suspended and never resumed.

29.

1852. GIRARD, CHARLES. A revision of the North American Astaci with observations on their habits and geographical distribution.

Proceedings Academy of Natural Sciences Philadelphia, vi, 87-91. 1852.

FIRST GROUP.

ASTACUS, Gronor	87
ASTACOIDES, Guérin	87
CAMBARUS, Erichs	87
<i>Cambarus pellucidus</i> , Erichs	87
Mammoth Cave, Kentucky, Tellkampf.	
<i>Cambarus affinis</i> , Erichs	87
Schuylkill River at Reading, Pennsylvania, Baird; Delaware River, Say, Rafinesque.	
<i>Cambarus Oregonus</i> , Erichs	87
Columbia River, Nuttall.	
<i>Cambarus Peabii</i> , n. s.	87
Potomac at Washington, District of Columbia, Girard.	
<i>Cambarus rusticus</i> , n. s.	88
Ohio River at Cincinnati, Baird.	
<i>Cambarus propinquus</i> , n. s.	88
Lake Ontario, Sackett's Harbor, Oswego, Baird.	
<i>Cambarus fossor</i> , Grd.	88
Virginia, Pennsylvania, New York, Girard. (Rafinesque.)	

1852. GIRARD, CHARLES—Continued.

SECOND GROUP.

<i>Cambarus Bartoni</i> , Erichs.	88
Pennsylvania, New York, De Kay; Massachusetts, Gould, etc.	
<i>Cambarus Carolinus</i> , Erichs.	88
Carolina, Erichson; Anderson, South Carolina, Girard.	
<i>Cambarus montanus</i> , n. s.	88
Virginia and Maryland, Girard.	
<i>Cambarus diogenes</i> , n. s.	89
Meadows about Washington, District of Columbia, Charles Girard.	
<i>Cambarus longulus</i> , n. s.	90
Middle States of the United States, Girard.	
<i>Cambarus pusillus</i> , Grd.	90
Lake Ontario, near Saratoga, Lake George, Lake Champlain, Utica, Oswego, (Rafinesque) Baird.	
<i>Cambarus robustus</i> , n. s.	90
Humber River near Toronto, Canada, Girard.	
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1852. GIRARD, CHARLES. Révision du genre *Cottus* des antenrs.
Schweizerische Gesellschaft für die Gesammten Naturwissenschaften, xii, 1852,
pp. 28.

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<i>Acanthocottus jaok</i> , Grd.	7
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<i>Acanthocottus platycephalus</i> , Grd.	7
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<i>Acanthocottus diceraus</i> , Grd.	7
Sea of Kamtschatka, Tilesius.	
<i>Acanthocottus ventralis</i> , Grd.	8
Sea of Kamtschatka, Collie.	
<i>Acanthocottus clariger</i> , Grd.	8
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<i>Acanthocottus Mertensi</i> , Grd.	8
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1852. GIRARD, CHARLES. Description of two new genera and two species of Nemertes.

Proceedings Boston Society of Natural History, iv, 185-6. 1852.

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1852. GIRARD, CHARLES. Description of two new genera and two new species of Planarie.

Proceedings Boston Society of Natural History, iv, 210-19. 1852.

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1852. GIRARD, CHARLES. An account of a new species of Spatangidae.
Proceedings Boston Society of Natural History, iv., 213. 1852
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34.

1852. GIRARD, CHARLES, with SPENCER F. BAIRD. Characteristics of some New Reptiles in the Museum of the Smithsonian Institution. First Part.
Proceedings Academy of Natural Sciences Philadelphia, vi, 68-70. 1852.
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35.

1852. GIRARD, CHARLES, with SPENCER F. BAIRD. Characteristics of some New Reptiles in the Museum of the Smithsonian Institution. By Spencer F. Baird and Charles Girard. Second Part. Containing the species of the Saurian order, collected by John H. Clark, under Col. J. D. Graham, head of the Scientific Corps, United States and Mexican Boundary Commission, and a few others from the same adjoining territories, obtained from other sources, and mentioned under their special headings.
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1852. GIRARD, CHARLES, with SPENCER F. BAIRD. Characteristics of some New Reptiles in the Museum of the Smithsonian Institution. By Spencer F. Baird and Charles Girard. Third Part. Containing the Batrachians in the collection made by J. H. Clark, esq., under Col. J. D. Graham, on the United States and Mexican Boundary.

Proceedings Academy Natural Sciences Philadelphia, vi, p. 173. Presented for publication Oct. 21, ordered printed Oct. 26, 1852.

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37.

1852. GIRARD, CHARLES, with SPENCER F. BAIRD. Descriptions of New Species of Reptiles, collected by the U. S. Exploring Expedition under the command of Capt. Charles Wilkes, U. S. N. First part.—Including the species from the Western Coast of America.

Proceedings Academy Natural Sciences Philadelphia, vi, 174-177, 1852. Presented for publication Oct. 6, ordered printed Oct. 26, 1852.

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38.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. Catalogue | of | North American Reptiles | in the Museum of the | Smithsonian Institution. | — | Part I.—Serpents. | By | S. F. Baird and C. Girard. | —[Seal of the Smithsonian Institution.] | Washington: | Smithsonian Institution. | January, 1853. [Accepted for publication November, 1852.] 8vo, pp. xvi, 172.

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Although published under the names of the two authors as a joint production, this work is a series of monographs for which the individual authors only claimed to be responsible. The record of authorship is lost. In the following list of species discussed, the parts written by Professor Baird, so far as he can recall the matter to memory, are printed in italic type, those by Girard in heavy-faced type.

"In the present catalogue it is proposed to present a systematic account of the collection of North American Serpents in the museum of the Smithsonian Institution. In the Appendix will be found such species not in possession of the Institution, as could be borrowed for description, as well as notes on more or less authentic species of which no specimens could be found.

"A complete synonymy of all the species has not been attempted, as tending to swell the bulk of a catalogue too much. All those, however, necessary to a proper understanding of the history or character of the species, have been introduced, and all the synonyms quoted have been actually verified by original reference.

Owing to the want of osteological preparations, it has been a difficult task to arrange the genera in a natural succession. In many cases forms are now combined which will hereafter

1852. GIRARD, CHARLES, with SPENCER F. BAIRD—Continued.

necessarily be widely separated. The almost entire deficiency of modern general works upon the *Crotalidae*, has also been a serious obstacle to any correct idea of a natural system. The forthcoming work of M. M. Duméril will undoubtedly clear up much of the obscurity which now exists. But when systematic writers all carefully avoid the subject of the Ophidians, each waiting for the others to make the first step, the attempt to combine genera by well-marked, though perhaps artificial points of relation, will, it is hoped, be looked upon with indulgence, even after more comprehensive and extended investigations shall render it necessary to break up the combinations here adopted.

"The collections upon which the original descriptions of the present catalogue have been based are as follows:—

- Spencer F. Baird. Species from Massachusetts, New York, Ohio, and Pennsylvania.
 Charles Girard. Maine, Massachusetts, and South Carolina.
 Rev. Charles Fox. Species from eastern Michigan.
 Dr. P. R. Hoy. Species from eastern Wisconsin.
 Prof. L. Agassiz. Lake Superior, Lake Huron, and Florida.
 Dr. J. P. Kirkland. Northern Ohio.
 G. W. Fahnestock. Western Pennsylvania.
 Miss Valeria Blaney. Eastern Shore of Maryland.
 Dr. C. B. R. Kennerly. Northern Virginia.
 John H. Clark. Maryland, Texas, New Mexico, and Sonora.
 John Varden. District of Columbia and Louisiana.
 Dr. J. B. Barratt. Western South Carolina.
 Miss Charlotte Paine and Mrs. M. E. Daniel. Western South Carolina.
 Dr. S. B. Barker. Charleston, S. C.
 Prof. F. S. Holmes and Dr. W. J. Burnett. South Carolina.
 R. R. Cuyler and Dr. W. L. Jones. Georgia.
 D. C. Lloyd. Eastern Mississippi.
 Dr. B. F. Shumard and Col. B. L. C. Wailes. Mississippi.
 James Fairie. Mexico and Western Louisiana.
 Capts. R. B. Marcy and G. B. McClellan, U. S. A. Red River, Ark.
 Ferdinand Lindheimer. Central Texas.
 Col. J. D. Graham, U. S. A. The specimens collected while on the U. S. and Mex. Boundary Survey, by Mr. J. H. Clark, viz., in Texas, New Mexico, and Sonora.
 Maj. W. H. Emory. Specimens collected on the U. S. and Mexican Boundary Survey by Arthur Schott, at Eagle Pass, Tex., and by J. H. Clark, in Texas and New Mexico.
 Gen. S. Churchill, U. S. A. Valley of the Rio Grande.
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 Dr. Wm. Gambel. New Mexico and California.
 Dr. John L. Le Conte. Littoral California.
 Dr. C. C. Boyle and J. S. Bowman. Central California.
 Dr. A. J. Skilton. Species collected in California by Henry Moores, Esq.
 U. S. Exploring Expedition. Littoral California and Oregon.
 Academy of Natural Sciences of Philadelphia. Various unique specimens described by Dr. Holbrook.
 Boston Society of Natural History. California.
 "SMITHSONIAN INSTITUTION, January 5, 1853."

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SUMMARY.

GENERA.	Old	13
	New	22
	Total	35
SPECIES.	Old	65
	New	54
	Total	119

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1853. GIRARD, CHARLES, with SPENCER F. BAIRD. List of Reptiles collected in California by Dr. John L. Leconte, with description of New Species. *Proceedings Academy Natural Sciences Philadelphia*, vi, pp. 300-302. Presented for publication Feb. 15, ordered printed Feb. 22, 1853.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD—Continued.

OPHIDIANS.

- | | |
|--|-----|
| 1. <i>Crotalus lucifer?</i> ?, B. and G. | 300 |
| San Diego, California. | |
| 2. <i>Eutainia ordinoides</i> , B. and G. | |
| San Francisco. | |
| 3. <i>Bascanion vetustus</i> , B and G. (name only). | |
| San José. | |
| 4. <i>Pituophis annectens</i> , B. and G. | |
| San Diego. | |
| 5. <i>Rhinocheilus Lecontei</i> , B. and G. | |
| San Diego. | |
| 6. <i>Contea mitis</i> , B. and G. | |
| San José. | |
| 7. <i>Diadophis amabilis</i> , B. and G. | |
| San José. | |
| 8. <i>Rena humilis</i> , B. and G. | |
| Vallecitas, California | |

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- | | |
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| 2. <i>Sceloporus occidentalis</i> , B. and G. | |
| San Francisco. | |
| 3. <i>Uta Stansburiana</i> , B. and G. | |
| Valley of Great Salt Lake. | |
| 4. <i>Uta ornata</i> , B. and G. | |
| San Diego and San Francisco. | |
| 5. <i>Phrynosoma coronatum</i> , Blainv. | |
| San Diego. | |
| 6. <i>Cnemidophorus gracilis</i> , B. and G. | |
| Desert of Colorado. | |
| 7. <i>Elgaria scincicauda</i> , B. and G. | |
| California. | |
| 8. <i>Plestiodon Skiltonianum</i> , B. and G. | |
| San Diego. | |
| 9. <i>Anniella pulchra</i> , Gray. | |
| San Diego. | |

BATRACHIANS.

- | | |
|---|-----|
| 1. <i>Bufo halophila</i> , n. s. | 301 |
| Benicia. | |
| 2. <i>Hyla regilla</i> , B. and G. | |
| San Francisco or San Francisco. | |
| 3. <i>Litoria occidentalis</i> , n. s. | |
| San Francisco. | |
| 4. <i>Rana Lecontei</i> , n. s. | |
| San Francisco. | |
| 5. <i>Aneides lugubris</i> , Baird. | |
| San Francisco. | |
| 6. <i>Batrachoseps attenuata</i> , Bon. | |
| San Francisco. | |
| 7. <i>Taricha bevis</i> , n. s. | |
| San Francisco. | |

40.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. [Report on the] Reptiles in *Stansbury's Exploration and Survey of the Valley of Great Salt Lake of Utah*. Washington. 1853. 8°.

- | | |
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| <i>Crotaphytus Wislizeni</i> B. and G., pl. iii | 340 |

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41.

1853. GIRARD, CHARLES. A monographic essay on the genus *Phrynosoma*.
Stansbury's Exploration and Survey of the Valley of Great Salt Lake of Utah.
Washington. 8°. 1853.

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<i>Phrynosoma coronatum</i> , Blainv., pl. viii, fig. 7-12	360
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42.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. Description of some new fishes
from the River Zuñi.

Proceedings Academy Natural Sciences Philadelphia, vi, 1853, pp. 368, 369.

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3. <i>Gila gracilis</i> , n. s.....	369
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43.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. Description of New Species of
Fishes collected by Captains R. B. Marcy and Geo. B. McClellan in Arkansas.
Proceedings Academy Natural Sciences Philadelphia, vi, 1853, pp. 390-392. Read
Aug. 30, 1853.

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Otter Creek, Arkansas.	

44.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. [Report on the] Fishes in *Sitgreaves' Report of an Expedition down the Zuñi and Colorado Rivers*. Washington. 1853. 8°.

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45.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. [Report on the] Reptiles in *Marcy and McClellan's Exploration of the Red River of Louisiana in the year 1852*. Washington, 1853, pp. 217-244.

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46.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. [Report on the] Fishes in *Marcy and McClellan's Exploration of the Red River of Louisiana in the year 1852*. Washington. 1853, pp. 245-252.

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47.

1853. GIRARD, CHARLES. [Report on the] Orthopterous Insects in *Marcy and McClellan's Exploration of the Red River of Louisiana in 1852*. Washington. 8vo. 1853.

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48.

1853. GIRARD, CHARLES. [Report on the] Arachnidians in *Marcy and McClellan's Exploration of the Red River of Louisiana in 1852*. Washington. 8vo. 1853.

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49.

1853. GIRARD, CHARLES. [Report on the] Myriapods in *Marcy and McClellan's Exploration of the Red River of Louisiana in 1852*. Pl. xviii. Washington. 8°. 1853.
- Scelopendra heros*, n. sp., pl. xviii..... 272
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Prairie Mer Rouge, Louisiana. James Fairie.

50.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. "A communication * * * upon a species of frog, and another of toad, * * * recently described from specimens in the Herpetological Collections of the U. S. Exploring Expedition."
- Proceedings Academy Natural Sciences Philadelphia*, vi, 1853, pp. 378-379.
Read Aug. 9, 1853.
- Rana pretiosa*, n. s. 378
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- Bufo Columbiensis*, n. s.
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51.

1853. GIRARD, CHARLES. On a New Species of the Genus *Salmo*.
- Proceedings Academy of Natural Sciences Philadelphia*, vi, 380-1, 1853.
- Salmo sebago*, n. s. 380
Southern part of the State of Maine.

52.

1853. GIRARD, CHARLES. Observations upon the American Species of the Genus *Esox*.
- Proceedings Academy of Natural Sciences Philadelphia*, vi, 386. 1853.
- A comparative examination of *Esox estor* and *Esox reticulatus*.

53.

1853. GIRARD, CHARLES. Note upon a Nest Constructed by Catfish.
- Proceedings Academy of Natural Sciences Philadelphia*, vi, 387. 1853.
- Observations at Schuylkill Falls, Pennsylvania.

54.

1853. GIRARD, CHARLES. Publications of Learned Societies and Periodicals in the Library of the Smithsonian Institution.
- Smithsonian Contributions to Knowledge*, vii, 1853, Appendix. Part ii, *Ibid.*, viii, 1856.
- STIMPSONIA, n. g.
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- Planocera nebulosa*, n. s.
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- IMOGINE, n. g.
- Imagine oculifera*, n. s.
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55.

1853. GIRARD, CHARLES. Descriptions of New Nemertean and Planarians from the coast of the Carolinas.

Proceedings Academy of Natural Sciences Philadelphia, vi, 365-7, 1853.

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56.

1853. GIRARD, CHARLES, with SPENCER F. BAIRD. Description of New Species of Fishes collected by Mr. John H. Clark, on the U. S. and Mexican Boundary Survey, under Lt. Col. Jas. D. Graham.

Proceedings Academy Natural Sciences Philadelphia, vi, 1853, pp. 387-390. Read Aug. 30, 1853.

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<i>Heterandria occidentalis</i> , n. s.	
Rio Santa Cruz of the Rio Gila.	

57.

1853. GIRARD, CHARLES. Descriptions of New Species of Reptiles collected by the U. S. Exploring Expedition under the command of Capt. Charles Wilkes, U. S. N. Second Part.—Including the species of Batrachians exotic to North America.

Proceedings Academy of Natural Sciences Philadelphia, vi, 420-24, 1853.*

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1854. GIRARD, CHARLES. Embryology of Planocera elliptica.

Journal Academy of Natural Sciences. 2 Ser., ii, 307-25, 1854. (Three plates.)

59.

1854. GIRARD, CHARLES. Researches | upon | Nemerteans and Planarians. | by | Charles Girard, | corresponding member of the Academy of Natural Sciences, Philadelphia, | the Boston Society of Natural History, and the Lyceum of Natural | History of New York, member of the American Association | for the Advancement of Science, and the | National Institute of Washington | I | Embryonic Development of Planocera Elliptica. | [With Preliminary Remarks upon the general Plan of that Work.] Merrihew and Thompson, Philadelphia. 1-27. 1854.

60.

1854. GIRARD, CHARLES. On a New Entomostracan of the Family Limnadidæ inhabiting the Western Waters.

Proceedings Academy of Natural Sciences Philadelphia, vii, 3, 1854.

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1854. GIRARD, CHARLES, with SPENCER F. BAIRD. Description of New Species of Fishes collected in Texas, New Mexico, and Sonora, by John H. Clark, on the United States and Mexican Boundary Survey, and in Texas by Capt. Stewart Van Vliet, U. S. A. Second Part.

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1851. GIRARD, CHARLES. Notice of a new species of Salmonidæ from the north-eastern part of the United States.

Proceedings Academy Natural Sciences Philadelphia, vii, 1851, 85-86.

<i>Salmo Gloveri</i> , n. s.	85-86
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63.

1854. GIRARD, CHARLES. A list of the North American Bufonids, with diagnosis of new species.

Proceedings Academy Natural Sciences Philadelphia, vii, 86-88. 1854.

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Proceedings Natural Academy of Sciences Philadelphia, vii, 129-139. 1854.

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Proceedings Academy of Natural Sciences Philadelphia, vii, 141-2. 1854.

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Proceedings Academy of Natural Sciences Philadelphia, vii, 142-56. 1854.

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Proceedings Academy of Natural Sciences Philadelphia, vii, 1854, p. 156.

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Proceedings Academy of Natural Sciences Philadelphia, vii, 196-7. 1854.

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Proceedings Academy of Natural Sciences Philadelphia, vii, 197-9. 1854.

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1854. GIRARD, CHARLES. Abstract of a report to Lieut. James M. Gilliss, U. S. N., upon the reptiles collected during the U. S. N. Astronomical Expedition to Chile.

Proceedings Academy of Natural Sciences Philadelphia, vii, 226-7. 1854.

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Proceedings Boston Society Natural History, v, 40-41. 1854.

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1854. GIRARD, CHARLES. On the family of Embiotocoidæ and its mode of development.

Proceedings Boston Society of Natural History, v, 81-2. 1854.

An abstract of the paper, No. 80.

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1854. GIRARD, CHARLES. On *Placobranchus simplex*.

Proceedings Boston Society of Natural History, v, 89, 1854.

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Proceedings Boston Society of Natural History, v, 88-91, 1854.

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Proceedings Boston Society of Natural History, v, 89, 1854.

76.

1854. GIRARD, CHARLES. Dendroceæ (Planariæ and Nemertidæ) in Stimpson's Synopsis of the Marine Invertebrates of Grand Manan.

Smithsonian Contributions to Knowledge, vi, 27, 1854.

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Report of the U. S. Naval Astronomical Expedition to the Southern Hemisphere, ii,
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 ii, 230-53. 1855.

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79.

1855. GIRARD, CHARLES. Report to Lieut. James M. Gilliss upon the Crustacea collected during the U. S. N. Astronomical Expedition to Chile.

Report of the U. S. Naval Astronomical Expedition to the Southern Hemisphere, ii, 254-62. 1855.

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80.

1855. GIRARD, CHARLES. Notes upon the viviparous Fishes inhabiting the Pacific coast of North America, with an enumeration of the species observed.

Proceedings Academy of Natural Sciences Philadelphia, vii, 318-22. 1855.

From observations traced upon the genital apparatus of the female there exists an ovarian sheath or sack, which, during the early period of pregnancy, is an elongated and subcylindrical tube, containing the ovaries proper, two in number, each of which consisting of two, three, or more vascular membranes, attached by their upper edge to the upper floor or roof of the sheath, forming either one, two, or more pouches (according to the number of these membranes) of the same length as the sheath itself, widely open beneath, though not in a direct communication with one another, since the membranes hang loosely down, resting on the lower floor of the sheath.

The eggs are formed within the texture of the ovarian membranes themselves. We have examined the ovaries of *Eucinichthys Heermanni*, when the sheath, within which they were contained, was not larger than an ordinary quill. Numerous eggs could be observed in a very immature state, appearing to the naked eye like minute dots. Under the microscope, they exhibited evident traces of the germinal vesicle, surrounded as yet with a very scanty supply of vitelline substance.

The sheath and the ovaries gradually increase in bulk, as the eggs themselves first increase in size and the embryos afterwards. The sheath is a muscular membrane chiefly, whilst the ovarian membranes, we have stated, are altogether vascular.

1855. GIRARD, CHARLES—Continued.

When mature, the eggs either fall into the space between the membranes or ovarian pouches, or else remain attached to the ovaries until the embryos issue out of them. We are inclined to think that they drop into the pouches as eggs. At any rate, we found very young embryos loosely contained in the ovarian pouches, when no trace of the egg membrane could be seen within the tissues of the ovaries in the shape of corpora lutei or graafian vesicles. Whatever be the case, numerous eggs or embryos may be observed within one pouch. The young thus remain together until grown to a considerable size, when, filling up the space in a more compact manner, the ovarian membranes, in their nature very expansive, will extend a fold between each embryo. In this manner every individual young, when removed sideways from the ovary, appears to the operator as if inclosed in a separate cavity, pouch, or follicle of the ovary, whilst, in reality, the membranes may be stretched out or extended, and the entire progeny loosened from all adherence or connection with them.

The male organs of generation consist of two spermaries, a right and a left, perfectly independent of each other, each having its separate duct, discharging their contents into an elongated cloaca, into which the bladder likewise empties its contents. This cloaca communicates with the exterior by a subcircular opening, the edge of which is rather protruding. Such is that apparatus—the same in its general structure as in the other osseous fishes. There is no sheath inclosing the two spermaries, and this fact throws a considerable light upon the morphology of the ovaries, the latter being in fact two in number, but so closely connected together as to simulate a single organ. Thus the general disposition, not the plan of structure, of these organs is adapted to the mode of reproduction—a single sheath being a more simple adaptation than two, one for each ovary.

How the mechanical act of fecundation takes place we are not prepared to say from direct observations; the eggs themselves must be fecundated within the ovarian sheath; a copulation of some sort is therefore required, and it is not improbable that at this period the eggs have dropped from the ovarian membranes into the pouches or spaces between these membranes, in which they are freely floating.

The hatching of the embryos takes place at an early period. After leaving the egg shell, they have an abdominal bag containing the remaining yolk, which is to be gradually absorbed during a period when neither the mouth nor the esophagus are formed; the fins having not yet appeared. The visual organs begin with a deposition of an external layer of black pigmentum, in every respect similar to the same organs in invertebrata. The head is anteriorly rounded, and the cleft of the mouth not yet apparent at the period when the fins begin to develop. The caudal has the start over all other fins; its posterior margin is first lanceolated, then rounded, with a convexity gradually diminishing until it is perfectly straight, when a gradual emargination commences, and from a slight crescent reaches the forked shape which it assumes in the adult. The soft and articulated portion of the dorsal and anal fins next assume a development reaching extraordinary portions, which they again gradually lose as soon as free from parental sheltering. The posterior portion of these fins is especially to be noticed, being longer and deeper than the anterior portion (the reverse of what we observe in the adult,) and extending generally beyond the base of the caudal fin, a character, therefore, not exclusively proper to the genus *Rhacochelilus*. The spinous portions of these same fins, on the other hand, develop slowly and gradually, reaching their full growth at a late period. The ventrals and pectorals are likewise tardy in their appearance. The scales are fully developed before the young leave the ovary.

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81.

1855. GIRARD, CHARLES. Life | in its | Physical Aspects. | By | Charles Girard. | From the Proceedings of the National Institute | Washington | Printed by R. A. Waters | 1855 | R. A. Waters, Washington, 1-29. 1855.
Proceedings National Institute, i. 2-22. 1855.

We read in the preface:

"Of the physical nature of animated beings alone, we propose to treat in the present memoir: the different phases through which it passes from its first manifestation up to its last stage of existence constituting what we term the physical aspects of life.

"The physical aspects of life result from a series of functions, all of which depend on one general function presiding throughout the whole range of animal existence: in other words, the law under which a physical being starts is the law under which it lives its whole life through.

"It is therefore proposed, as our chief object, to inquire into the ultimate process of organic life, that is to say, the elaboration of matter, its assimilation, and its passage into the various parts and organs which it constitutes.

"Hence the leading thought of this essay may thus be briefly expressed: The phenomena of the animal economy take place as though the living fabric were but a factory of cells.

"First. All the organs and tissues are a compound of cells, diversely modified or metamorphosed.

"Second. The first aspect under which an animal manifests itself is that of a cell.

"Third. The subsequent growth of that animal is a simple multiplication of cells.

"Fourth. The nourishing process is a mere replacing of decayed or broken-up cells by new ones.

"Such is the hypothesis, theory, or law, whichever it may be termed."

82.

1856. GIRARD, CHARLES. Contributions to the Fauna of Chile. 1856. 4°. Fishes, Reptiles, and Crustacea. Reprint from the second volume of *Gillies's U. S. Naval Astronomical Expedition to the Southern Hemisphere during the years 1849, '50, '51, and '52.* (See above, Nos. 77, 78, and 79.)

83.

1856. GIRARD, CHARLES. Notice upon the species of the genus *Salmo* of authors, observed chiefly in Oregon and California.

Proceedings Academy Natural Sciences of Philadelphia, viii. 217-20. 1856.

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84.

1856. GIRARD, CHARLES. On a new genus and species of Urodela from the collections of the U. S. Exploring Expedition, under Commander Charles Wilkes, U. S. N.

Proceedings Academy of Natural Sciences Philadelphia, viii, 140. 1856.

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85.

1856. GIRARD, CHARLES. Contributions to the Ichthyology of the Western Coast of the United States from Specimens in the Museum of the Smithsonian Institution.

Proceedings Academy of Natural Sciences Philadelphia, viii, 131-7. 1856.

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86.

1856. GIRARD, CHARLES. Researches upon the Cyprinoid Fishes | inhabiting the | Fresh waters of the United States, | west of the Mississippi Valley, | from | Specimens in the Museum of the Smithsonian Institution.

Proceedings Academy of Natural Sciences Philadelphia, viii, 165-213, 1856.

[Also reprinted as a pamphlet of 48 pages. 8^o.]

The fishes which are the subject of the present memoir were collected at different times and periods by several naturalists and surgeons attached to the various surveys undertaken within the past five years.

And, first of all, there is the survey of the United States and Mexican boundary, from 1851 to 1855. John H. Clark, who accompanied Col. J. D. Graham in 1851, collected extensively in the rivers and creeks of Texas and New Mexico. Under Maj. W. H. Emory, now commissioner of the boundary line, numerous collections were made by Dr. C. B. Kennerly, in Texas, in the valley of the Rio Grande and provinces of Chihuahua and Sonora.

The survey of routes for a railroad to the Pacific was commenced in 1853, and continued until 1855. Lieut. A. W. Whipple, under whose command the survey near the thirty-fifth parallel of latitude was effected, in securing the services of Dr. C. B. Kennerly, contributed very largely to our collections of fishes from Texas and the numerous tributaries of the Arkansas River. H. B. Millhausen, artist to the same expedition, also showed much zeal and industry for collecting.

The survey near the thirty-second parallel of latitude, western end, under Lieut. J. G. Parke, contributed a few specimens, collected by Dr. A. L. Heermann.

The eastern end of the same thirty-second parallel was explored by Capt. John Pope, and under the direction of Dr. George G. Shumard, interesting specimens were obtained.

The survey of the partial routes on the Pacific side, under Lieut. R. S. Williamson, Dr. A. L. Heermann being surgeon and naturalist to the party, a large collection of fresh-water fishes, among which were several Cyprinoids, was made in the valley of the San Joaquin River and the Tulare Valley.

Subsequently, the same officer explored the Sacramento Valley from San Francisco, California, to Astoria, Oregon, having Dr. John S. Newberry as naturalist, who secured many interesting members of the family of fishes now under consideration.

The survey of the route near the thirty-eighth and thirty-ninth parallels, under the late Captain Gunnison, and of the forty-first, by Lieut. E. G. Beckwith, secured many interesting specimens from the valley of the Great Salt Lake and Humboldt River.

The survey of the northern route, under Governor I. I. Stevens, was as fruitful in many respects as both the United States and Mexican boundary survey and the survey of the thirty-fifth parallel. Dr. George Suckley, Dr. J. G. Cooper, and Dr. John Evans proved indefatigable in their efforts for collecting.

The upper Missouri and Yellowstone Rivers were explored by Dr. F. V. Hayden, under the protection of Col. A. Vaughan, and thus we were made acquainted with the ichthyic fauna of those remote waters.

Lieut. D. N. Couch, U. S. A., explored in the winter of 1852-'53 the Mexican provinces of Tamaulipas, New-Leon, and Coahuila, thus adding materials towards an elucidation of the natural history of the country south of the Rio Grande del Norte (Rio Bravo), and but partially explored by the United States and Mexican Boundary Commission.

Valuable specimens from Platte or Nebraska River, the valley of the Great Salt Lake of Utah, and Humboldt River were also received from the late J. Soule Bowman.

To John Potts, esq., of Chihuahua, we owe some very interesting species from the hydrographic basin of Chihuahua River and the valley of Mexico. One species was purchased in the market of the City of Mexico by Maj. William Rich.

The species formerly described from the River Zuni, collected by Dr. Woodhouse, under Capt. L. Sitgreaves, are likewise included.

Thus the country embraced within these surveys and fields of explorations is limited eastwardly by the valleys of the Missouri and Mississippi, and westwardly by the Pacific Ocean,

1856. GIRARD, CHARLES—Continued.

extending from Puget Sound and the British possessions at the north to the valleys of the Rio Gila and Rio Grande del Norte (Rio Bravo) to the south, and even including the Mexican provinces of Tamaulipas, New Leon, Coahuila, Chihuahua, and Sonora.

The investigations of such an amount of material could not be extemporized. Indeed, even investigations upon these various collections could not have been traced each separately in the order in which they were collected. From a preliminary examination of the first lot received in 1851 I became very soon impressed with the difficulty of the task and foresaw the utter impossibility, at that time, to do anything like justice to the subject.

In the mean time, however, a *Notice upon a collection of fishes from the southern bend of the Tennessee River, in the State of Alabama, by Louis Agassiz*, was published,* containing several members of the Cyprinoid family. And some time afterwards appeared a *Synopsis of the Ichthyological Fauna of the Pacific slope of North America, chiefly from the collections made by the U. S. Exploring Expedition under the command of Capt. C. Wilkes, with recent additions and comparisons with eastern types. By the same author.*†

These two papers, though anticipating some of the following results, were greeted with a hearty welcome, and I can only regret that the second was not concluded up to the time I am writing. I have delayed entering into this subject as long as was consistent with the duties imposed upon me.

In both of them we find the laudable desire of attempting to bring back into use the long-forgotten genera of Rafinesque, which fell into disuse because of their own imperfection, and if they have not passed into the common nomenclature of the day it was owing to their defect more than to the partiality of naturalists; for we may well imagine how anyone would feel when rebuilding another's work, as little known to the author as to the commentators themselves.

And yet, for my part, I have always looked upon the restoration of Rafinesque's genera and species as highly desirable, as soon as they had once been proposed and introduced into science as names. But in order to do justice to the scheme, it was necessary to the undertaking that one should go to the very ground covered by Rafinesque himself during all seasons of the year, to enable us to discriminate between that which Rafinesque really observed and that which is imaginary.

That the *Ichthyologia Ohionensis* has been and still is a stumbling block, is fully evinced by the fact that Dr. J. P. Kirtland, the Ohio ichthyologist, of untiring and energetic zeal and perseverance, was baffled in many of his attempts to determine Rafinesque's genera and species.

These genera and species, thus restored by Professor Agassiz, may therefore not be received by all ichthyologists as the final settlement of that much controverted question. But whether the identification be right or wrong, since we must have these names, I sincerely hope they will now be adopted, once for all, as proposed.

Since circumstances have compelled me to write this memoir before the completion of Agassiz's synopsis, I have restored the balance of Rafinesque's genera in the family of Cyprinoids: such are *Plargyrus* and *Semotilus*. Once upon that field of inquiry I reverted to Heckel's genera *Argyreus* and *Leucosomus*, and showed their claim for admission upon the same general principles and canons of scientific nomenclature.

On a former occasion the genus *Leucosomus* was altogether misunderstood by me, and it is thus entered into the "History of the Fishes of Massachusetts, by Dr. D. H. Storer." Professor Agassiz was led into the same error.‡ Heckel, by inadvertence, applies the name of *Cyprinus chrysoleucus*, Mitch., to *Leuciscus pulchellus*, Storer, as shown by the figures given of its teeth and the wording of its generic diagnosis. *Leucosomus*, therefore, is identical with *Cheiloneurus*, and accordingly the name is to be adopted. *Cheiloneurus* was proposed for *Leuciscus pulchellus*, and allied species, when it was supposed that *Leuciscus chrysoleucus* would constitute the type of the genus *Leucosomus*. But it is now well ascertained that *Leuciscus chrysoleucus* of Mitchell belongs to Rafinesque's genus *Luxilus*; and *Luxilus* has the priority over *Leucosomus*.

Leuciscus gracilis of Richardson, referred by Heckel to *Leucosomus*, is of a different generic type.

As to the genus *Argyreus*, Heckel includes in it two species generally distinct. *Cyprinus atronotus*, Mitch., and *Cypr. rubripinnis*, Mns. Par. MS. But *Cyprinus rubripinnis* is identical with *Leuciscus cornutus*, and since *Leuciscus cornutus* is to enter the genus *Plargyrus* of Rafinesque, *Cyprinus atronotus* remains as the type of the genus *Argyreus*, which again is identical with *Rhinichthys*. It must be recollected, however, that the teeth figured by Heckel under the name of *Argyreus rubripinnis* are those of *Plargyrus cornutus*.

* Am. Jour. of Sci., 2d ser. xvii, 1854, pp. 297, 353.

† Am. Jour. of Sci., 2d ser., xix, 1855, pp. 71, 215.

‡ Amer. Jour. of Sci., 2d ser., xix, 1855, p. 225.

1856. GIRARD, CHARLES—Continued.

All the species referred to in this memoir I have seen and examined; there is not a solitary fact here recorded that was not the result of personal researches.

On several occasions I have referred to species from the Atlantic States of the Union, and even from the northern lakes, but it will be obvious to everyone that it was only on such occasions as could not well be omitted without sacrifice to the completeness of the subject.

I have aimed at conciseness as far as consistent with the nature of the task. It was deemed unnecessary to recall, the history of any particular genus, unless it happened to be intricate; for whoever is interested in the subject is sufficiently familiar with it. It would be different were I to write a popular work on our fishes.

In the diagnosis of the genera I have often repeated characters shared by many of them; these repetitions I am convinced are needful to their proper understanding. It may not appear so to a few ichthyologists; but I write for naturalists, for the reader who seeks after general information. Besides, the method I follow is the natural, the true method; that which has superseded the artificial method of the last century. In describing the teeth I have adopted Heckel's phraseology, since it appears to me to answer to the present wants of ichthyology.

The coloration, as a general rule, is described from specimens preserved in alcohol, in which the brilliancy of the hues is seldom preserved, and occasionally quite altered.

In the course of these investigations I have carefully compared the fishes of our hemisphere with those occurring in the waters of the eastern hemisphere; and when genera and species, either of fishes or reptiles, have at any time been described as new, it was the result of such comparative study, shunning display of loose erudition and false criticism, which too often leads the true observer into error.

I have thus added many new genera and species to the known lists. This is not surprising; for a country so vast as North America, irrigated by so many branching streams and large bodies of water in the shape of lakes and numerous ponds, a country comparatively little explored, was to yield many species unknown to our predecessors in the field. A superficial knowledge of the history of ichthyology in North America, would at once explain how it is that a "Synopsis of the Fishes of North America," published in 1846, should not have proved a full and complete record of all existing fishes of the country; a synopsis which, moreover, only professes to give such species as were known at that time. If we are so fortunate as to be able to add to the known catalogue of genera and species, let us not lose sight of both the time and the circumstances under which we have accomplished it. Recriminations, in that respect, are not likely to advance our knowledge on the subject, and, furthermore, it places a cotemporary exactly in the same situation towards the next coming generations as the former generations held towards him.

Most of the new genera which I propose have been designated by words taken from the North American Indians, as being more euphonic than any one I might have framed from the Greek. The classic literature has already furnished so many names that there are but few instances in which a name might yet be coined and express what it is intended to represent. I offer this remark as a mere statement, not as an apology.

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1857. GIRARD, CHARLES. Descriptions of New Species of Reptiles collected by the U. S. Exploring Expedition under the command of Capt. Charles Wilkes, U. S. N. Third Part. Including the species of Ophidians exotic to North America. *Proceedings Academy Natural Sciences Philadelphia*, ix, 1857, 181-2.

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1857. GIRARD, CHARLES. A list of the Fishes collected in California by Mr. E. Samuels, with descriptions of the New Species.

Boston Journal of Natural Sciences, vi, 533-4. 1857.

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1857. GIRARD, CHARLES. Descriptions of New Species of Reptiles collected by the U. S. Exploring Expedition under command of Capt. Charles Wilkes, U. S. N. Fourth part. Including the species of Saurians native to North America. *Proceedings Academy Natural Sciences Philadelphia*, ix, 1857, 195-99.

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1857. GIRARD, CHARLES, Notes upon New Genera and New Species of Marine and Freshwater Fishes from western North America.

Proceedings Academy Natural Sciences of Philadelphia, ix, 1857, 200-202.

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1858. GIRARD, CHARLES. Notes upon various New Genera and New Species of Fishes in the Museum of the Smithsonian Institution, and collected in connection with the United States and Mexican Boundary Survey, Maj. William Emory, Commissioner.

Proceedings Academy Natural Sciences of Philadelphia, x, 1858, p. 167-171.

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This book was not written by Professor Baird, who assures me that he did not touch pen to it. The book was done entirely by Dr. Charles Girard, but through some technicality his name was not allowed to appear on the title page by the naval authorities having the matter in charge, who insisted in publishing the book under the name of Professor Baird, to whom the original contract was given out. The matter is explained fully in the introduction, which is quoted entire:

"INTRODUCTION.—The Joint Committee of the Library of Congress entered into an engagement with the undersigned, in 1857, to prepare the Report upon the Herpetological collections made by the United States Exploring Expedition. Finding that other duties would interfere with the proper performance of the work, he was permitted to associate Dr. Girard with him in its execution, by whom the determinations and descriptions have been made, the drawings overlooked, and the work carried through the press. S. F. BAIRD. Washington, May, 1858. (p. vii.)"

As is well known, only 100 copies of these reports were published by the Government, while the authors of the separate volumes were allowed to have 150 more printed at their own individual expense. In accordance with this ruling a special edition of this report was published by Girard with the following title:

1858. GIRARD, CHARLES. United States | Exploring Expedition. | During the years | 1838, 1839, 1840, 1841, 1842. | Under the command of | Charles Wilkes, U. S. N. | Vol. XX. | Herpetology. | By Charles Girard, | Doctor in Medicine and Surgery, | Corresponding Member of the Boston | Society of Natural History; the Academy of Natural Sciences of Philadelphia; | the Lyceum of Natural History of New York; the Elliot Society of | Natural History of Charleston, South Carolina; | the California Academy | of Natural Sciences, San Francisco; the "Société Helvétique | des Sciences Naturelles;" the "Naturforschende Gesell- | schaft in Zurich; and the "Société des Sciences | Naturelles de Neuchâtel (Switzerland)," etc., | with a folio atlas. | Philadelphia: | J. B. Lippincott & Co. | 1858. | 4to. pp. i-xvii, 1-496, pll, i-xxxii.

Several additional plates were included in the atlas to this edition.

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1859. GIRARD, CHARLES. Reports of Explorations and Surveys to ascertain the Most Practical and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean. Made under the direction of the Secretary of War in 1853-56, according to acts of Congress of March 3, 1853, May 31, 1854, and August 5, 1854. Vol. x, FISHES, 1858. By Charles Girard, M. D., Washington, 1859. With 76 plates. 1.

The fishes of western North America are as yet too little known, and the amount of new materials for further investigations too great, also, to warrant anything like an attempt on the present occasion to establish a natural series. After treating of the various groups in a

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series of monographs, as already begun (see No. 26), we shall be better prepared to do justice to that part of this subject.

We have dwelt at some length upon two groups—the Cataphræti, or mailed cheeks, and the Embiotocoids, or viviparous family, both of them having numerous representatives along the Pacific coast. They constitute the most prominent feature of the ichthyic fauna of that region of the North American continent, together with the Trachinids and the Heterolepids, which seemingly bring into closer relationships the Percoids and the Cottoids, properly so called. The true Percoids themselves appear isolated west of the Rocky Mountain range.

The Sphyraenid family is represented by one species of the genus *Sphyraena*.

The Scienoids, so far as observed, are few in numbers, and remind us of the Atlantic types.

Not a single species of Sparoids has, as yet, come to our knowledge from the coasts of Oregon and California.

As to the Atherinoid family, we find in California a rather large species designated by the settlers under the name of "Smelt," possibly on account of its delicacy, and which is, truly speaking, an ally of the "Silverside" or "Silver-fish" of our Atlantic coast, and the "Pesce del Rey" or "Pescadilla del Rey" of Central and South America. The "Silver-fish" being of a diminutive size, even when full grown, its esculent qualities have remained unnoticed by either fishermen or gastronomers. The "Pesce del Rey" tells its own story.

The scarcity of Scomberoids is a curious feature in the fauna of our western coast; a Mackerel (*Scomber*), a Bonito (*Pelamyx*) and two (*Caranx*), constitute thus far the entire known list. But we venture to say that further researches will bring to light many more of them.

The only species of Chetodonts we are acquainted with from the western coast was obtained in the southern part of the State of California.

The Bleennioid family is seemingly more numerous than the preceding ones, new generic types (*Neoclinus*, *Xiphidion*, *Apodichthys*, *Cebidichthys*, and *Anarrichthys*) having been found, along with species of known genera (*Bleminus*, *Gunnellus*, and *Luapentus*).

The Gobioids, properly so called, are comparatively scarce, two species of the genus *Gobius* constituting the entire known list.

The Cyclopterids, or Discoboli, are represented by two species also, one of which is a *Lepadogaster*, the other a *Cyelogaster*.

The Batrachoid or toad fish family has furnished one species to the fauna, exhibiting the characters of a new genus, which we have called *Porichthys*.

The Labroids proper are anything but numerous, the Embiotocoids being considered as a separate family. We believe, nevertheless, that many more will be discovered along the southern coast of California.

The Pomacentrid family, or marine Labroids, with pectinated scales, has yielded one species, which we place in the genus *Glyphisodon*, not having the means of determining more accurately its generic position.

The Chromids, or fresh-water Labroids with pectinated scales also, have not yet been met with along the Pacific range of North America. We have evidences of their presence in the basin of the Rio Grande del Norte (Rio Bravo), one species being figured and described in the "Ichthyology" of the *United States and Mexican Boundary Survey*.

The Scomberesocids, or "garfishes," on the other hand, are represented, thus far, by a species of billfish (*Belone*).

The Gadoid family has given us a Cod, a Whiting (*Merlangus*), and a Cusk (*Brosmeus*); the latter we have not examined.

The Pleuronectids, or flatfishes, are tolerably well represented, though we observe, as yet, no turbot (*Rhombus*) proper. The halibut (*Hippoglossus*) is spoken of as occurring along the coast, but we have not had it in our hands.

The Ophidioid family is represented by two known genera, *Ophidion* and *Anmodytes*, whilst the true eels have not yet been heard of.

The Salmonoids are abundant, especially in species of the Linnean genus *Salmo*, to which may be added a white fish (*Coregonus*) and two smelts, one belonging to the genus *Osmerus*, the other to that of *Thaleichthys* of recent creation.

No Characiniids are known north of the valley of the Rio Grande del Norte (Rio Bravo), in which one species was collected by the Mexican Boundary Commission, in whose report it is figured and described.

The Scopelids have furnished us, so far, with one species of the genus *Saurus* from the Pacific coast.

The fresh waters teem with Cyprinoids and Percoids, the former east and west of the Rocky Mountains, the latter almost solely eastwardly, in the shape of sunfishes (*Pomoxis*) and bass (*Ambloplites* and *Centrarchus*), a single species of bass having been noticed in California.

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Of the Cyprinodont family, we mention but one species, an inhabitant of the fresh waters of California. Those collected in the interior of the continent we propose to investigate at some future time.

The Etheostomoids are likewise left aside for the present.

A few pickerels, or Esocids, have been observed in the hydrographic basin of the Arkansas.

Some catfishes, or Pimelodi, were secured at the initial point of exploration of the thirty-fifth and forty-seventh parallels, none having been noticed west of the Rocky Mountains.

Of the Clupeidæ or herring family we meet with two herrings proper, one belonging to the genus *Clupea*, the other to the genus *Meletta*, and several anchovies (*Engraulis*), but thus far no shad (*Alosa*) have been seen in the collections, which have been made and submitted to our examination.

Three Plectognaths have been noticed, a "Moon-fish" (*Orthogoriscus*), a "Balloon-fish" (*Tetraodon*), and a "Trigger" (*Balistes*).

Five "Pipe-fishes" (*Syngnathus*) and one "Sea-horse" (*Hippocampus*) represent the Lophobranch family.

The Ganoids of the western coast consist in three species of sturgeons (*Acipenser*), and in the interior of the continent in a "Paddle-fish" (*Polyodon*), a "Shovel-nose" (*Scaphirhynchus*), two species of "Mud-fishes" (*Amia*), and three species of "Gar-pikes" (*Lepidosteus*).

The cartilaginous fishes, as observed, are anything but numerous; five species of Sharks belonging to the genera *Triakis*, *Mustelus*, *Cestracion*, *Heptanchus*, and *Acanthias*; five species of Skates belonging to the genera *Rhinobatus*, *Narcine*, *Raja*, *Uroptera*, and *Rhinoptera*, and nine species of Lampreys belonging to the genera *Petromyzon*, *Ichthyomyzon*, *Ammocoetes*, and *Scolecossoma*.

The "Elephant-fish" (*Chimara*) was observed as far up as Puget Sound.

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1859. GIRARD, CHARLES. Report upon Fishes Collected on the Survey of routes in California and Oregon, explored by Lieut. R. S. Williamson and Lieut. Henry L. Abbot. Pacific Rail Road Expl. and Surv., vol. vi. [Also referred to in Part iv, vol. x.]

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1859. GIRARD, CHARLES, with SPENCER F. BAIRD. Reports of Explorations and Surveys to Ascertain the Most Practical and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean. Made under the direction of the Secretary of War in 1853-'56, according to acts of Congress of March 3, 1853, May 31, 1853, and August 5, 1851. Vol. x. REPTILES. By Spencer F. Baird. Washington, 1859. 4°.

A "general report" upon the reptiles collected by the various explorations and surveys for the Pacific Railroad was contemplated by Spencer F. Baird and Charles Girard. Plates for

1859. GIRARD, CHARLES—Continued.

that purpose were prepared at the Smithsonian Institution under their supervision and care, including those accompanying the reports of Drs. Cooper and Hallowell, as shown by the unique serial numeration. In the mean time the characteristics of the new genera and species appeared in the *Proceedings of the Academy of Natural Sciences of Philadelphia*. (See above, Nos. 34, 35, 36, 37, 39, and 63.) Professor Baird being personally in charge of the reports upon "mammals" and "birds," and Dr. Girard of the report upon "fishes," there was not sufficient time to do justice to the report upon "reptiles." Dr. Girard being called abroad, the entire task fell upon Professor Baird, who prepared all the data upon the subject, describing such new species as had not been characterized before. It is much to be regretted that plates xxiv to xxxvi appeared with a merely nominal explanation, when a comparative discussion of all the genera and species figured was contemplated by both of the herpetologists named.

The following list enumerates the species which have been studied by Dr. Girard, under whose direction the plates were prepared.

CHELONIA.

- Actinemys marmorata*, Agass.
Emy nigra, Hollow.

SAURIA.

- Callisaurus ventralis*, Baird.
Crotaphytus collaris, Holbr., pl. xxiv, fig. 1.
Crotaphytus Wislizeni, B. & G.
Cnemidophorus tessellatus.
Dipsosaurus dorsalis, Hallow.
Doliosaurus platyrhinos, Grd.
Elgaria grandis, B. & G.
Elgaria principis, B. & G.
Heloderma horridum, Wieg.
Holbrookia maculata, Grd.
Holbrookia texana, B. & G.
Lygosoma lateralis, Dum. & Bilbr.
Ptygnosoma cornutum, Gray.
Plestiodon skiltonianum, B. & G.
Plestiodon septentrionalis, B. & G., pl. xxiv, fig. 2.
Plestiodon fasciatus, B. & G.
Plestiodon obsoletum, B. & G.
Sceloporus graciosus, B. & G.
Sceloporus occidentalis, B. & G.
Sceloporus undulatus, Wieg.
Sceloporus consobrinus, B. & G.
Sceloporus Thayeri, B. & G.
Tapaya brevirostris, Grd.
Tapaya Douglasi, Grd.
Tapaya Hernandezi, Grd.
Tapaya ornatissima, Grd.
Troscurus graciosus, Hallow.
Uta Stansburiana, B. & G.

OPHIDIA.

- Ancistrodon contortrix*, B. & G., pl. xxv, fig. 12.
Abastor erythrogrammus, Gray, pl. xxxiii, fig. 83.
Bascanion constrictor, B. & G., pl. xxxi, fig. 67.
Bascanion Fremonti, B. & G., pl. xxxi, fig. 68.
Bascanion Foxi, B. & G., pl. xxxi, 69.
Bascanion flaviventris, B. & G., pl. xxxi, fig. 70.
Bascanion vetustus, B. & G., pl. xx, fig. 1, and pl. xxxvi, fig. 6.
Celuta amona, B. & G., pl. xix, fig. 2, and pl. xxxiii, fig. 95.
Chlorosoma vernalis, B. & G., pl. xxxii, fig. 81.
Contia mitis, B. & G., pl. xxxvi, fig. 7.
Crotalus lucifer, B. & G., pl. xi and pl. xxxvi, fig. 1.
Crotalus durissus, L., pl. xxiv, fig. 1.
Crotalus atrox, B. & G., pl. xxiv, fig. 3.
Crotalus confluentus, Say, pl. xii and pl. xxiv, fig. 4.
Crotalus adamantus, Beauv., pl. xxiv, fig. 2.
Crotalus molossus, B. & G., pl. xxiv, fig. 5.
Crotalus Oregonus, Holbr., pl. xxiv, fig. 6.
Crotalus cerastes, Holbr., pl. xxxv, figs. 4-5.
Crotalus tigris, Kenn., pl. xxxv, fig. 1.
Crotalophorus miliarius, Holbr., pl. xxiv, fig. 7.

1859. GIRARD, CHARLES—Continued.

- Crotalophorus consors*, B. & G., pl. xxiv, fig. 8.
Crotalophorus tergeminus, Holbr., pl. xxv, fig. 9.
Crotalophorus Edwardsi, B. & G., pl. xxv, fig. 10.
Crotalophorus Kirtlandi, Holbr., pl. xxv, fig. 11.
Diadophis punctatus, B. & G., pl. xxxiii, fig. 82.
Diadophis amabilis, B. & G., pl. xxxiii, fig. 83.
Diadophis docilis, B. & G., pl. xxxii, fig. 1. and pl. xxxiii, fig. 84.
Diadophis pulchellus, B. & G., pl. xxxii, fig. 85.
Diadophis regalis, B. & G., pl. xxx, fig. 86.
Dipsos septentrionalis, Kenn., pl. xxv, fig. 18.
Elaps fulvius, Cuv., pl. xxv, fig. 15.
Elaps tener, B. & G., pl. xxv, fig. 16.
Elaps tristis, B. & G., pl. xxv, fig. 17.
Eutania saurita, B. & G., pl. xxvi, fig. 19.
Eutania faureyi, B. and G., pl. xiii and xvi, and pl. xxvi, fig. 20.
Eutania proxima, B. & G., pl. xxvi, fig. 21.
Eutania ornata, B. & G., pl. xxvi, fig. 23.
Eutania sirtalis, B. & G., pl. xxvi, fig. 23.
Eutania ordinata, B. & G., pl. xxvi, fig. 24.
Eutania radix, B. & G., pl. xxvi, fig. 25 and pl. xxxiv, fig. 5.
Eutania marciana, B. & G., pl. xxvi, fig. 26.
Eutania ordinoides, B. & G., pl. xxvi, fig. 3.
Eutania dorsalis, B. & G., pl. xxvi, fig. 2.
Eutania vagrans, B. & G., pl. xvii.
Eutania infernalis, B. & G.
Eutania concinna, B. & G., pl. xv, fig. 2.
Eutania elegans, B. & G.
Eutania Cooperi, Kenn., pl. xv, fig. 1.
Eutania Pickeringi, B. & G., pl. xxxvi, fig. 3.
Eutania leptcephala, B. & G., pl. xxxvi, fig. 2.
Eutania Haydeni, Kenn., pl. xiv.
Farancia obscura, B. & G., pl. xxxiii, fig. 82.
Georgia obsoleta, B. & G., pl. xxxi, fig. 66.
Georgia Cooperi, B. & G., pl. xxxiv, fig. 1.
Haldea striatula, B. & G., pl. xxxiii, fig. 81.
Herpetodryas flavigularis, Hallow.
Heterodon platyrhinos, Latr., pl. xxviii, fig. 38.
Heterodon cognatus, B. & G., pl. xxviii, fig. 39.
Heterodon niger, Troost., pl. xxviii, fig. 40.
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Heterodon nasicus, B. & G., pl. xxviii, fig. 43.
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Leptophis majalis, B. & G., pl. xxxii, fig. 80.
Lodia tenuis, B. & G., pl. xxxvi, fig. 8.
Masticophis flagelliformis, B. & G., pl. xxxi, fig. 71, and pl. xxxii, fig. 72.
Masticophis flavigularis, B. & G., pl. xxxii, fig. 73.
Masticophis normon, B. & G., pl. xxxii, fig. 74.
Masticophis ornatus, B. & G., pl. xxxiii, fig. 75.
Masticophis tenuatus, B. & G., pl. xxxii, and pl. xxxii, fig. 76.
Masticophis Schotti, B. & G., pl. xxxii, fig. 77.
Masticophis testaceus, B. & G.
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Nerodia fasciata, B. & G., pl. xxxiv, fig. 4.
Nerodia sipedon, B. & G., pl. xxvii, fig. 27.
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Nerodia Holbrookii, B. & G., pl. xxvii, fig. 30.
Nerodia nigra, B. & G., pl. xxvii, fig. 31.
Nerodia rhombifer, B. & G., pl. xxxiv, fig. 2.
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Ophibolus splendidus, B. & G., pl. xxx, fig. 58.
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Ophibolus clericus, B. & G., pl. xxx, fig. 62.
Ophibolus dotiatus, B. & G., pl. xxx, fig. 63.
Ophibolus gentilis, B. & G., pl. xxx, fig. 64.
Ophibolus getulus, B. & G., pl. xxxi, fig. 65.
Oseocla clapsoides, B. & G., pl. xxxiii, fig. 97.
Pityophis bellona, B. & G., pl. xxix, fig. 46.
Pityophis melanoleucus, Holbr., pl. xxix, fig. 44.
Pityophis, Sayi, B. & G., pl. xxii, and pl. xxix, fig. 45.
Pityophis, McClellani, B. & G., pl. xxix, fig. 47.
Pityophis, annectens, B. & G., pl. xxix, fig. 48.
Pityophis, catenifer, B. & G., pl. xxxvi, fig. 4.
Pityophis, Wilkesi, B. & G., pl. xxxvi, fig. 5.
Regina leberis, B. & G., pl. xxvii, fig. 32.
Regina rigida, B. & G., pl. xxvii, fig. 33.
Regina Grahami, B. & G., pl. xix, fig. 1, and pl. xxvii, fig. 34.
Regina Clarki, B. & G., pl. xxvii, fig. 35.
Regina Kirtlandi, Kenn., pl. xx, fig. 2; pl. xxvii, fig. 36.
Rena dulcis, B. & G., pl. xxxiii, fig. 100.
Rhinocheilus Leonti, B. & G., pl. xxxiii, fig. 90.
Rhinostoma coccinea, Holbr., pl. xxxiii, fig. 89.
Salvadora Grahamia, B. & G., pl. xix, fig. 1.
Scotophis Alleghaniensis, B. & G., pl. xxix, fig. 49.
Scotophis Lindheimeri, B. & G., pl. xxix, fig. 50.
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Scotophis guttatus, B. & G., pl. xxx, fig. 54.
Scotophis 4-vittatus, B. & G., pl. xxx, fig. 55.
Scotophis Emoryi, B. & G., pl. xxx, fig. 56.
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Toluca lineata, Kenn., pl. xxxv, fig. 8.
Toxicophis piscivorus, B. & G., pl. xxv, fig. 13.
Toxicophis pugnax, B. & G., pl. xxv, fig. 14.
Virginia valeria, B. & G., pl. xxxiii, fig. 84.
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Bufo Columbiensis, B. & G.
Bufo Americanus, Leconte, pl. xxxv, fig. 2.
Bufo nebulifer, Girard.
Bufo Woodhousi, Girard, pl. xxxv, fig. 1.
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Bufo boreas, B. & G.
Hyla regilla, B. & G., pl. xxviii, fig. 3.
Rana catesbiana, Shaw.
Rana clamitans, Daud.
Rana halerina, Kalm., pl. xxix, fig. 7.
Rana pretiosa, B. & G.
Scaphiopus Hammondi, Baird, pl. xxviii, fig. 2.
Siredon lichenodes, Baird.
Siredon gracilis, Baird, pl. xlv, fig. 2.
Taricha torosa, Gray.

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1859. GIRARD, CHARLES, with SPENCER F. BAIRD. United States and Mexican |
 Boundary Survey, | under the order of | Lieut. Col. W. H. Emory, | Major
 First Cavalry, and United States Commissioner. | — | Reptiles | of the

1859. GIRARD, CHARLES, with SPENCER F. BAIRD.—Continued.

Boundary, | by | Spencer F. Baird, | Assistant Secretary of the Smithsonian Institution. | With notes by the Naturalists of the Survey. | = | 4to. pp. (2) 3-35, pl. xli (for title of volume see under 80 and 81).

The remarks above under No. 94 apply equally here.

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4. <i>Thyrosternum sonoriense</i> , Agassiz.....	
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6. <i>Ptychenys mobilensis</i> , Agassiz.....	
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89. <i>Georgia obsoleta</i> , B. & G., pl. xv.	
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91. <i>Masticophis Schotti</i> , B. & G., pl. xviii.	
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1859. GIRARD, CHARLES, with SPENCER F. BAIRD—Continued.

116. *Rana Montezumae*, Baird, pl. xxxvi, figs. 1-6.
 117. *Rana Berlandieri*, Baird, pl. xxxvi, figs. 7-10.
 118. *Rana arcolata*, B. & G., pl. xxxvi, figs. 11, 12. 28
 119. *Scaphiopus Couchi*, Baird, pl. xxxv, figs. 1-6.
 120. *Aeris crepitans*, Baird, pl. xxxvii, figs. 14-17.
 121. *Helocetes Clarki*, Baird, pl. xxxvii, figs. 4-9.
 122. *Hyla semifasciata*, Hallow.
 123. *Hyla eximia*, Baird, pl. xxxviii, figs. 8-10. 29
 124. *Hyla Vanvicti*, Baird, pl. xxxviii, figs. 1-3.
 125. *Hyla affinis*, Baird, pl. xxxviii, figs. 4-7.
 126. *Amblystoma proserpina*, B. & G., pl. xxxv, figs. 7-14.
 127. *Amblystoma Texanum*, Baird, pl. xxxv, fig. 15.
 128. *Siren lacertina*, L.

102.

1858. GIRARD, CHARLES. "A Representative of the *Myxinoïd* Family on the north-eastern Coast."

Proceedings Academy of Natural Sciences Philadelphia, x, 223-4. 1858.

Ichthyological Notices, i.

Myxine limosa, n. s.

Bay of Fundy, Dr. W. Stimpson.

103.

1858. GIRARD, CHARLES. "A Giant Herring caught off Long Island."

Proceedings Academy of Natural Sciences Philadelphia, x, 224. 1858.

Ichthyological Notices, ii.

Megalops elongatus, n. s.

Off Long Island, W. H. Dougal. Probable habitat, Gulf of Mexico.

104.

1858. GIRARD, CHARLES. "New facts relating to the History of the Salmon of Columbia River."

Proceedings Academy of Natural Sciences Philadelphia, x, 224-5. 1858.

Ichthyological Notices, iii.

Salmo Newberri, n. s.

Columbia River.

105.

1858. GIRARD, CHARLES. "The Genus *Thaleichthys*."

Proceedings Academy of Natural Sciences Philadelphia, x, 225. 1858.

Ichthyological Notices, iv.

Thaleichthys Pacificus, Grd., identical with *T. Stevensi*, Grd.*

106.

1859. GIRARD, CHARLES. "Curious traits of Organization amongst the Fishes of California and Oregon."

Proceedings Academy of Natural Sciences Philadelphia, xi, 56-8. 1859.

Ichthyological Notices, v.

Neoclinus satiricus, n. s.

Bay of Monterey, California, A. S. Taylor.

107.

1859. GIRARD, CHARLES. "A Representative of the Family *Ophisurida*, from the Pacific coast."

Proceedings Academy of Natural Sciences Philadelphia, xi, 58. 1859.

Ichthyological Notices, vi.

MYRICHTHYS, n. g.

Myrichthys tigrinus, n. s.

Adair Bay, Oregon, Capt. C. P. Stone.

*Report upon the Fishes of the U. S. P. R. R. Explorations and Surveys.

108.

1859. GIRARD, CHARLES. "A *Cyprinella* from the waters of Rock Creek."
Proceedings Academy of Natural Sciences Philadelphia, xi, 58-9. 1859.
 Ichthyological Notices, vii.
Cyprinella analostana, n. s.
 Rock Creek, Potomac River.

109.

1859. GIRARD, CHARLES. "A *Fundulus* from Palatka, East Florida."
Proceedings Academy of Natural Sciences Philadelphia, xi, 59-60. 1859.
 Ichthyological Notices, viii.
Fundulus seminolis, n. s.
 East Florida, Townsend, Glover.

110.

1859. GIRARD, CHARLES. "*Fundulus tenellus*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 60. 1859.
 Ichthyological Notices, ix.
Zygocetes tenellus.
 Prairie Mer Rouge, Louisiana; Russellville, Kentucky.

111.

1859. GIRARD, CHARLES. "*Hydrargyra*, collected between Fort Defiance and Fort Union, New Mexico."
Proceedings Academy of Natural Sciences Philadelphia, xi, 60-1. 1859.
 Ichthyological Notices, x.
Hydrargyra zebra, n. s.
 Rio Bravo, tributary Rio Grande del Norte, Ives' Party.

112.

1859. GIRARD, CHARLES. "The Genus *Gambusia*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 61-2, 1859.
 Ichthyological Notices, xi.
Gambusia Holbrooki, n. s.
 South Carolina, Florida, Ch. Girard; T. Glover.
 Note by Professor Poey of Cuba.

113.

1859. GIRARD, CHARLES. "On *Girardinus formosus*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 62-3, 1859.
 Ichthyological Notices, xii.
Girardinus formosus, Grd.
 South Carolina, Mr. Glover.
 Noticed by Agassiz, as *Heterandria formosa*, Ag. (M. S.)

114.

1859. GIRARD, CHARLES. "A Blind Fish, taken from a well, near Bowling Green, Kentucky."
Proceedings Academy of Natural Sciences Philadelphia, xi, 63-4, 1859.
 Ichthyological Notices, xiii.
 TYPHLICHTHYS, n. g.
Typhlichthys subterraneus, n. s.
 Bowling Green, Kentucky, J. E. Younglove.

115.

1859. GIRARD, CHARLES. "On *Pomotis obesus*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 64, 1859.
 Ichthyological Notices, xiv.
 Refers to *Pomotis obesus*, Grd., and genus *Bryttus*; *Bryttus obesus*, Grd.

116.

1859. GIRARD, CHARLES. "A *Megalops* from the Tortugas, Garden Key, Florida." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 64, 1859. *Ichthyological Notices*, xv.
Refers to *Megalops elongatus*, Girard.

117.

1859. GIRARD, CHARLES. "The genus *Arlina*." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 64-5, 1859. *Ichthyological Notices*, xvi.
ARLINA, n. g.
Arlina effulgens, n. s.
Potomac River and tributaries.

118.

1859. GIRARD, CHARLES. "Another Representative of the Etheostomid family, from the Potomac River." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 65-6. 1859. *Ichthyological Notices*, xvii.
ESTRELLA, n. g.
Estrella atromaculata, n. s.
Potomac River.

119.

1859. GIRARD, CHARLES. "*Percina nebulosa*, in the waters of the Potomac River." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 66. 1859. *Ichthyological Notices*, xviii.
Described by Professor Haldeman; captured in the Susquehanna River.

120.

1859. GIRARD, CHARLES. "*Etheostoma caprodes* of Rafinesque." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 66. 1859. *Ichthyological Notices*, xix.
Refers to genus PERCINA, Haldeman; *Percina caprodes*, Grd.

121.

1859. GIRARD, CHARLES. "Are *Pileoma semifasciatum* and *Percina nebulosa* identical?" *Proceedings Academy of Natural Sciences Philadelphia*, xi, 66. 1859. *Ichthyological Notices*, xx.
Reference to the third species of the genus PERCINA: *Percina semifasciata*, Grd.

122.

1859. GIRARD, CHARLES. "*Pileoma Zebra*." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 66. 1859. *Ichthyological Notices*, xxi.
Reference to the fourth species of Percina, appellation, *Percina zebra*, Grd.

123.

1859. GIRARD, CHARLES. "*Pileoma carbonaria*." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 66. 1859. *Ichthyological Notices*, xxii.
Reference to the fifth species of PERCINA, appellation, *Percina carbonaria*, Grd.
Bull. 41, N. M.—6

124.

1859. GIRARD, CHARLES. "A new genus of Etheostomid."
Proceedings Academy of Natural Sciences Philadelphia, xi, 67. 1859.
 Ichthyological Notices, xxiii.
 OLIGOCEPHALUS, n. g.
Oligocephalus lepidus, n. s.
 Described under the name of *Pocilichthys lepidus*, Grd., in the report of the United States and Mexican Boundary Commission.

125.

1859. GIRARD, CHARLES. "Oligocephalus from James River, Virginia."
Proceedings Academy of Natural Sciences Philadelphia, xi, 67. 1859.
 Ichthyological Notices, xxiv.
Oligocephalus humeralis, n. s.
 James River, Virginia.

126.

1859. GIRARD, CHARLES. "Oligocephalus Linslii from Wolcott, Wayne County, New York."
Proceedings Academy of Natural Sciences Philadelphia, xi, 67, 1859.
 Ichthyological Notices, xxv.
Oligocephalus Linslii, Grd.
 Wolcott, Wayne County New York.
 Described by Dr. H. R. Storer under the appellation of *Etheostoma Linsleyi*.

127.

1859. GIRARD, CHARLES. "A Species of Etheostoma collected at Fort Gratiot, Lake Huron."
Proceedings Academy of Natural Sciences Philadelphia, xi, 67-8, 1859.
 Ichthyological Notices, xxvi.
 ALVORDIUS, n. g.
Alvordius maculatus, n. s.
 Lake Huron, Maj. B. Alvord.

128.

1859. GIRARD, CHARLES. "*Catonotus fasciatus*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 68, 1859.
 Ichthyological Notices, xxvii.
Catonotus fasciatus, n. s.
 E. S. Dayton.

129.

1859. GIRARD, CHARLES. "Hadropterus in the Waters of the Potomac River."
Proceedings Academy of Natural Sciences Philadelphia, xi, 100, 1859.
 Ichthyological Notices, xxviii.
Hadropterus maculatus, n. s.
 Tributary of the Potomac River, in Anne Arundel County, Maryland.

130.

1859. GIRARD, CHARLES. "Hadropterus in the Arkansas River."
Proceedings Academy of Natural Sciences Philadelphia, xi, 100, 1859.
 Ichthyological Notices, xxix.
Hadropterus Shumardi, n. s.
 Arkansas River, Dr. George G. Shumard.

131.

1859. GIRARD, CHARLES. "A Representative of the *Etheostoma* family procured by the U. S. and Mexican Boundary Commission."
Proceedings Academy of Natural Sciences Philadelphia, xi, 101, 1859.
 Ichthyological Notices, xxx.
ALVARIUS, n. g.
Alvarius lateralis, n. s.
 Rio Bravo of the Rio Grande del Norte.

132.

1859. GIRARD, CHARLES. "Diplesion in the Waters of Chihuahua River."
Proceedings Academy of Natural Sciences Philadelphia, xi, 101-2, 1859.
 Ichthyological Notices, xxxi.
Diplesion fasciatus, n. s.
 Chihuahua River, John Potts.

133.

1859. GIRARD, CHARLES. "Aplasion in Chihuahua River."
Proceedings Academy of Natural Sciences Philadelphia, xi, 102, 1859.
 Ichthyological Notices, xxxii.
Aplasion Pottsi, n. s.
 Chihuahua River, John Potts.

134.

1859. GIRARD, CHARLES. "Oligocephalus in Devil's River, Texas."
Proceedings Academy of Natural Sciences Philadelphia, xi, 102, 1859.
 Ichthyological Notices, xxxiii.
Oligocephalus Grahamii, n. s.
 Devil's River, Texas, John H. Clark.

135.

1859. GIRARD, CHARLES. "Oligocephalus in the Rio Leona, Texas."
Proceedings Academy of Natural Sciences Philadelphia, xi, 102, 1859.
 Ichthyological Notices, xxxiv.
Oligocephalus Leonensis, n. s.
 Rio Leona, Texas, John H. Clark.

136.

1859. GIRARD, CHARLES. "Oligocephalus in a Tributary of Gypsum Creek."
Proceedings Academy of Natural Sciences Philadelphia, xi, 102-3, 1859.
 Ichthyological Notices, xxxv.
Oligocephalus pulchellus, n. s.
 Gypsum Creek, Whipple party.

137.

1859. GIRARD, CHARLES. "Boleosoma in the Rio Seco, Texas."
Proceedings Academy of Natural Sciences Philadelphia, xi, 103, 1859.
 Ichthyological Notices, xxxvi.
Boleosoma gracile, n. s.
 Rio Seco and Rio Leona, Texas, Dr. C. B. Kennerly.

138.

1859. GIRARD, CHARLES. "The Genus *Boleichthys*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 103-4, 1859.
 Ichthyological Notices, xxxvii.
BOLEICHTHYS, n. g.
Boleichthys exilis, n. s.
 Little Muddy River, Upper Missouri, Dr. George Suckley.

139.

1859. GIRARD, CHARLES. "Boleichthys in Coal Creek, Arkansas."
Proceedings Academy of Natural Sciences Philadelphia, xi, 103, 1859.
 Ichthyological Notices, xxxviii.
Boleichthys Whippli, n. s.
 Coal Creek, Arkansas, Whipple party.

140.

1859. GIRARD, CHARLES. "Boleichthys at Piedrapainte, Texas."
Proceedings Academy of Natural Sciences Philadelphia, xi, 104, 1859.
 Ichthyological Notices, xxxix.
Boleichthys elegans, n. s.
 Piedrapainte, Texas, John H. Clark.

141.

1859. GIRARD, CHARLES. "Boleichthys in Cannon Ball River."
Proceedings Academy of Natural Sciences Philadelphia, xi, 104, 1859.
 Ichthyological Notices, xl.
Boleichthys Warreni, n. s.
 Upper Missouri and Yellowstone Rivers, Lieut. G. K. Warren.

142.

1859. GIRARD, CHARLES. "The Genus *Zygonyctes*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 113, 1859.
 Ichthyological Notices, xli.
Zygonyctes pulchellus, n. s.
 Sugar Loaf Creek, Arkansas, Whipple party.

143.

1859. GIRARD, CHARLES. "*Limia* Along Our Own Shores and in the Mexican Provinces."
Proceedings Academy of Natural Sciences Philadelphia, xi, 114, 1859.
 Ichthyological Notices, xlii.
 Comparison between the genus *Limia* and *Pacilia*. Professor Poey quoted.
Mollinesia latipinna were collected at Galveston, Texas, by Dr. Kennedy, and *Pacilia multilincata* collected at Palatka, East Florida, by Mr. Glover.

144.

1859. GIRARD, CHARLES. "*Pacilia lincolata* from Brownsville."
Proceedings Academy of Natural Sciences Philadelphia, xi, 114-15, 1859.
 Ichthyological Notices, xliii.
Pacilia lincolata, Grd.
 Rio Bravo of the Rio Grande del Norte.

145.

1859. GIRARD, CHARLES. "The Species *Limia pauciloides*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 115, 1859.
 Ichthyological Notices, xlv.
Limia pauciloides, n. s.
 Indianola, Texas, John H. Clark.

146.

1859. GIRARD, CHARLES. "*Limia formosa* in a Lagoon at Paolo Alto."
Proceedings Academy of Natural Sciences Philadelphia, xi, 115, 1859.
 Ichthyological Notices, xlv.
Limia formosa, n. s.
 Paolo Alto, Mexico, John H. Clark.

147.

1859. GIRARD, CHARLES. "*Limia* in the Province of New Leon."
Proceeding Academy of Natural Sciences Philadelphia, xi, 116, 1859.
 Ichthyological Notices, xlvi.
Limia Conchiana, n. s.
 Rio San Juan, Lieut. D. N. Conch.

148.

1859. GIRARD, CHARLES. "A Species of *Limia* Common about Matamoras."
Proceedings Academy of Natural Sciences Philadelphia, xi, 116-17, 1859.
 Ichthyological Notices, xlvii.
Limia Matamorensis, n. s.
 Matamoras, L. Berlandier.

149.

1859. GIRARD, CHARLES. "The genus *Adinia*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 117. 1859.
 Ichthyological Notices, xlviii.
ADINIA, n. g.
Adinia multifasciata, n. s.
 Galveston, Texas, Dr. C. B. K. Kennerly.

150:

1859. GIRARD, CHARLES. "The genus *Lucania*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 118. 1859.
 Ichthyological Notices, xlix.
LUCANIA, n. g.
Lucania venusta, Grd.
 Indianola, Texas, John H. Clark.
 This is *Limia venusta*, Grd., described and figured in the Ichthyology of the United States and Mexican Boundary.

151.

1859. GIRARD, CHARLES. "*Lucania*, collected in the Neighborhood of Matamoras."
Proceedings Academy of Natural Sciences Philadelphia, xi, 118. 1859.
 Ichthyological Notices, l.
Lucania affinis, n. s.
 Matamoras, L. Berlandier.

152.

1859. GIRARD, CHARLES. "*Lucania* collected in the Vicinity of the City of Mexico."
Proceedings Academy of Natural Sciences Philadelphia, xi, 118-19. 1859.
 Ichthyological Notices, li.
 A cyprinodont of peculiar shape, collected in the vicinity of the City of Mexico in 1853 by Maj. W. Rich. The specific name originally selected was *L. Richi*, but by a singular oversight it disappeared from the text while going through the press.

153.

1859. GIRARD, CHARLES. "The Characters to be assigned to *Girardinus*." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 119. 1859. Ichthyological Notices, lii.
Girardinus occidentalis, Grd.
Rio Santa Cruz, John H. Clark; Tneson, Dr Heermann.

154.

1859. GIRARD, CHARLES. "*Girardinus sonoriensis* collected in San Bernardino Creek, Mexico." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 120. 1859. Ichthyological Notices, liii.
Girardinus sonoriensis, n. s.
San Bernardino Creek, Dr. C. B. R. Kennerly.

155.

1859. GIRARD, CHARLES. "The Affinities between *Gambusia* and *Zygonectes*." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 120. 1859. Ichthyological Notices, liv.
Gambusia nobilis, Grd.
Specimens collected by Lieut. J. G. Parke in Comanche Spring, Mexico.

156.

1859. GIRARD, CHARLES. "*Gambusia affinis* collected in Texas." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 120. 1859. Ichthyological Notices, lv.
Specimens collected in San Pedro Creek and in Dry Creek, Texas, by Dr. C. B. R. Kennerly.

157.

1859. GIRARD, CHARLES. "As to *Gambusia patruelis*." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 121. 1859. Ichthyological Notices, lvi.
Collected by Dr. C. B. R. Kennerly in the Rio Nueces; also, in the Rio Leona, Rio Blanco, and Rio Seco.

158.

1859. GIRARD, CHARLES. "Gambusia from the Hydrographic Basin of the Rio San Juan." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 121. 1859. Ichthyological Notices, lvii.
Gambusia speciosa, n. s.
Rio San Diego, New Leon, D. N. Couch.

159.

1859. GIRARD, CHARLES. "Gambusia in the Collection of the late Louis Berlandier, of Matamoras." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 121. 1859. Ichthyological Notices, lviii.
Gambusia gracilis, n. s.

160.

1859. GIRARD, CHARLES. "A species of *Gambusia* in Chihuahua River." *Proceedings Academy of Natural Sciences Philadelphia*, xi, 121-22. 1859. Ichthyological Notices, lix.
Gambusia senilis, n. s.
Chihuahua, John Potts.

161.

1859. GIRARD, CHARLES. "Fundulus in Charlotte Bay, Florida."
Proceedings Academy of Natural Sciences Philadelphia, xi, 157. 1859.
 Ichthyological Notices, ix.
Fundulus Floridensis, n. s.
 Charlotte Bay, Florida.

162.

1859. GIRARD, CHARLES. "A Cyprinodon collected in the Neighborhood of San Diego, California."
Proceedings Academy of Natural Sciences Philadelphia, xi, 157. 1859.
 Ichthyological Notices, Ixi.
Cyprinodon Californiensis, n. s.
 San Diego, California, Dr. Thomas Webb.

163.

1859. GIRARD, CHARLES. "A Cyprinodon collected in Chihuahua River."
Proceedings Academy of Natural Sciences Philadelphia, xi, 158. 1859.
 Ichthyological Notices, Ixii.
Cyprinodon eximius, n. s.
 Chihuahua River, John Potts.

164.

1859. GIRARD, CHARLES. "*Pomotis chaetodon*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 158. 1859.
 Ichthyological Notices, Ixiii.
Bryttus chaetodon, Grd.
Pomotis chaetodon, Baird, ix, Ann. Rep. Smiths. Inst., 1855, 324.

165.

1859. GIRARD, CHARLES. "*Clupea teres*?"
Proceedings Academy of Natural Sciences Philadelphia, xi, 158. 1859.
 Ichthyological Notices, Ixiv.
 Refers that species to genus *Harengula*, of Valenciennes, under the name of *H. teres*. Baird and DeKay quoted.

166.

1859. GIRARD, CHARLES. "*Pimelodus lemniscatus*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 158. 1859.
 Ichthyological Notices, Ixv.
 This is the same as *Noturus lemniscatus*, Grd
 Pennsylvania, Lesueur.

167.

1859. GIRARD, CHARLES. "*Pimelodus gracilis*."
Proceedings Academy of Natural Sciences Philadelphia, xi, 158-9. 1859.
 Ichthyological Notices, Ixvi.
 This is the same as *Pimelodus Houghi*, Grd.
 Sommersville, New York, F. B. Hough; Foxburgh and Ogdenburg, Pennsylvania,
 Baird.

168.

1859. GIRARD, CHARLES. "A Species of *Pimelodus* collected in the Neighborhood of Racine, Wisconsin."
Proceedings Academy of Natural Sciences Philadelphia, xi, 159. 1859.
 Ichthyological Notices, Ixvii,
Pimelodus Hoyi, n. s.
 Racine, Wisconsin, Dr. Hoy.

169.

1859. GIRARD, CHARLES. "Specimens of a Species of *Pimelodus* caught in Root River, near Racine, Wisconsin."
Proceedings Academy of Natural Sciences Philadelphia, xi, 159. 1859.
 Ichthyological Notices, lxxviii.
Pimelodus confinis, n. s.
 Root River, Wisconsin, S. F. Baird.

170.

1859. GIRARD, CHARLES. "A Species of *Pimelodus* collected by Robert Kennicott, Aux Plaines, Illinois."
Proceedings Academy of Natural Sciences Philadelphia, xi, 159. 1859.
 Ichthyological Notices, lxxix.
Pimelodus cupreoides, n. s.
 Aux Plaines, Illinois, Robert Kennicott.

171.

1859. GIRARD, CHARLES. "*Pimolodus catus*," DeKay (not Cuv. and Val.).
Proceedings Academy of Natural Sciences Philadelphia, xi, 160. 1859.
 Ichthyological Notices, lxxx.
Pimelodus DeKayi, n. s.
 Lake Ontario, S. F. Baird.

172.

1859. GIRARD, CHARLES. "The true *Pimolodus catus*" (not DeKay).
Proceedings Academy of Natural Sciences Philadelphia, xi, 160. 1859.
 Ichthyological Notices, lxxxi.
Pimelodus catus, Cuv. and Val., l.
 Southern States.

173.

1859. GIRARD, CHARLES. "The 'Channel Cat,' or 'Mud Cat,' of the Chesapeake."
Proceedings Academy of Natural Sciences Philadelphia, xi, 160, 1859.
 Ichthyological Notices, lxxxii.
Pimelodus lynx, n. s.
 Potomac River and Deep Run, and at Carlisle, Pennsylvania.

174

1859. GIRARD, CHARLES. "*Pimelodus puma* collected in Charleston, South Carolina."
Proceedings Academy of Natural Sciences Philadelphia, xi, 160, 1859.
 Ichthyological Notices, lxxxiii.
Pimelodus puma, n. s.
 Charleston, South Carolina, Charles Girard.

175.

1859. GIRARD, CHARLES. "*Pimelodus vulpeculus*, collected in Charleston, South Carolina."
Proceedings Academy of Natural Sciences Philadelphia, xi, 160, 1859.
 Ichthyological Notices, lxxxiv.
Pimelodus vulpeculus, n. s.
 Charleston, South Carolina, Charles Girard.

176.

1859. GIRARD, CHARLES. "*Pimelodus platycephalus* collected in the Neighborhood of Anderson, South Carolina."
Proceedings Academy of Natural Sciences Philadelphia, xi, 161, 1859.
 Ichthyological Notices, lxxxv.
Pimelodus platycephalus, n. s.
 Anderson, South Carolina, Mrs. Daniel.

177.

1859. GIRARD, CHARLES. "A Catfish collected in the Black Warrior and Bigsby Rivers, Alabama.

Proceedings Academy of Natural Sciences Philadelphia, xi, 161, 1859.

Ichthyological Notices, lxxvi.

Pimelodus megalops, n. s.

Black Warrior and Bigsby Rivers, Alabama. Prof. A. Winchell.

178.

1859. GIRARD, CHARLES. "A Catfish collected at Prairie Mer Rouge, Louisiana."

Proceedings Academy of Natural Sciences Philadelphia, xi, 161, 1859.

Ichthyological Notices, lxxvii.

Pimelodus graciosus, n. s.

Prairie Mer Rouge, Louisiana, James Fairie.

179.

1858-59. GIRARD, CHARLES. Ichthyological Notices, a reprint from the *Proceedings of the Academy of Natural Sciences of Philadelphia*, December 14, 1858; March, April, and May, 1859. A pamphlet of 36 pages, 8vo.

Alphabetical list of the species as discussed *supra*:

<i>Adinia multifasciata</i> , G	25
<i>Alvarius lateralis</i> , G	17
<i>Alvordius maculatus</i> , G	14
<i>Aplesion Pottsi</i> , G	18
<i>Artina efulgens</i> , G	12
<i>Boleichthys elegans</i> , G	20
<i>Boleichthys exilis</i> , G	20
<i>Boleichthys Warreni</i> , G	20
<i>Boleichthys Whipplei</i> , G	20
<i>Boleosoma gracile</i> , G	19
<i>Bryttus chetodon</i> , G	32
<i>Bryttus obesus</i> , G	11
<i>Catonotus fuscatus</i> , G	15
<i>Cyprinella analostana</i> , G	6
<i>Cyprinodon Californiensis</i> , G	32
<i>Cyprinodon eximius</i> , G	32
<i>Diplesion bleunioides</i> , Rafin	17
<i>Diplesion fuscatus</i> , G	17
<i>Estrella atromaculata</i> , G	13
<i>Fario Newberri</i> , G	3
<i>Fundulus Floridensis</i> , G	31
<i>Fundulus scutinoles</i> , G	6
<i>Gambusia affinis</i> , G	28
<i>Gambusia formosa</i> , G	9
<i>Gambusia gracilis</i> , G	29
<i>Gambusia Holbrookii</i> , G	8
<i>Gambusia nobilis</i> , G	28
<i>Gambusia patruelis</i> , G	28
<i>Gambusia senilis</i> , G	30
<i>Gambusia speciosa</i> , G	29
<i>Girardinus occidentalis</i> , G	27
<i>Girardinus sonoriensis</i> , G	28
<i>Hadropterus maculatus</i> , G	10
<i>Hadropterus Shumardi</i> , G	16
<i>Harenula teres</i> , G	33
<i>Hydrargyra zebra</i> , G	7
<i>Limia Couchiana</i> , G	24
<i>Limia formosa</i> , G	23
<i>Limia matamorensis</i> , G	25
<i>Limia pœciloides</i> , G	22
<i>Lucania affinis</i> , G	26

1858-'59. GIRARD, CHARLES—Continued.

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<i>Lucania</i> [spec. innom.].....	26
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<i>Myrichthys tigrinus</i> , G.....	5
<i>Myxine limosa</i> , G.....	2
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<i>Oligocephalus humeralis</i> , G.....	11
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180.

1859. GIRARD, CHARLES. Herpetological Notices.

Proceedings Academy of Natural Sciences Philadelphia, xi, 169-70, 1859.

Bufo lamentor, n. s.

Fort Bridger, Utah, Mr. Drexler.

Egystoma Texense, n. s.

Texas, Capt. John Pope.

181.

1860. GIRARD, CHARLES. La vie | au point de vue Physique | ou | Physiogénie Philosophique | par | Charles Girard | Docteur en Médecine et en Chirurgie, | membres de plusieurs sociétés Savantes. | Paris | J. B. Baillière et Fils. | Librairie de l'Académie Impériale de Médecine. | 19, Rue Hautefeuille. | J. B. Baillière et Fils, Paris, 1-73, 1860.

A French edition of "Life in its Physical Aspect," published at Washington in the "Proceedings of the National Institute" and subsequently in a separate pamphlet printed by R. A. Waters, 1855. (See No. 81.)

182.

1863. GIRARD, CHARLES. Les États Confédérés d'Amérique. Paris, 1863. Svo. Pamphlet.

A trip through both Carolinas and Virginia during the months of July and August, 1863.

183.

1872. GIRARD, CHARLES. Principes de Biologie appliqués à la Médecine. Paris, 18. 1872.

A second and revised edition of "La vie au point de vue physique."

184.

1872. GIRARD, CHARLES. Contribution à l'Histoire médico-chirurgicale du Siège de Paris. L'ambulance militaire de la rue Violet, No. 57. Succursale de l'Hôtel des Invalides. Paris. 1872. Pp. 100. 8vo.

As chief physician of one of the military ambulances during the memorable siege of Paris, in 1870-71, Dr. Girard was afforded an opportunity for writing an elaborate chapter on the diseases originating in the alimentary canal, with special reference to the etiology of typhoid fever, of which the various stages have been carefully described.

185.

1888. GIRARD, CHARLES. Systematic Catalogue | of the | Scientific Labors | of | Dr. Charles Girard. Poissy. 8°. Pp. 3-13. 1888.

A limited number of copies were printed for private circulation.

186.

1888. GIRARD, CHARLES. Les Poissons Aveugles des Cavernes Américaines. *Le Naturaliste*, Paris, 107-8. 1888.

Typhliethys subterraneus, Grd., is figured from an original drawing graciously furnished by Professor Baird, Secretary Smithsonian Institution.

187.

1888. GIRARD, CHARLES. Les Poissons souterrains du Nouveau Monde. *Le Naturaliste*, Paris, 222. 1888.

Animal life exists in the underground waters and is only seen incidentally. Thus the volcanos of the equator throw up periodically large quantities of fishes of which but little is known. The mad volcanos of Guatemala likewise emit fishes yet undescribed. We are aware by the inspection of the so-called "Cénotés" of Yucatan that in the sheets of subterranean water of that region are to be found fishes of various kinds. In California the artesian wells furnish fishes, of whose character, however, we know but little.

Explorers of those regions ought to devote some of their time to the investigation of these matters.

188.

1889. GIRARD, CHARLES. Les Poissons Musiciens. *Le Naturaliste*, Paris, 57-8. 1889. (fig.)

The fact that certain fishes possess the singular faculty of emitting given sounds within the element in which they live is well known. The names of *Gurnards*, *Grunters*, *Croakers*, *Drums*, and similar appellations by which they are usually designated have been named with reference to the sounds they emit.

Extraordinary sounds attributed to a fish are reported upon by Lieutenant Gilliss, U. S. Navy, as follows:

"During the following summer of 1852—a submarine phenomenon attracted no little attention among the residents and visitors at Caldera, of which more than one account reached Santiago. One correspondent wrote me: 'The night I stopped at Caldera I went at half past 11 o'clock to hear the submarine music, and I confess it has astonished me. Though the position is neither graceful nor comfortable, on lying down in the boat and placing your ear upon the bottom you hear it in its perfection. I stuck to it for a long time and was charmed indeed. It has now been pretty well ascertained that it comes from fish, which gather in great number on a quiet and retired spot on the bay, and as each one produces a single note, the most soft and charming harmony results, resembling the Æolian harp nearer than anything to which I can compare it. If we suppose the sounds to be produced by fish, that will also account for the different localities where they are heard. On my return to Caldera I will endeavor to obtain the name by which the fish is known there, if

1889. GIRARD, CHARLES—Continued.

I should not succeed in obtaining a specimen for you.' Another friend, to whom I wrote on receiving the above, tells me: 'The idea of the music heard here being produced by fish never entered my brain until you wrote me about Mr. H. I am not fully prepared to oppose the señoritas who pronounce it a siren, and among whom it has caused no little sensation. It is always near one place, and is never heard during the day. You must come down for a personal examination, because, though I shall send you a box containing some of the small fish caught in the bay, I have no intention to assert that *a* or *the* musical fish shall be among them.' My friend sent fish according to promise, of which an account is given in the report from Mr. Charles Girard. One of them he has named *Alosa musica* from this circumstance. When I wrote again, only four months later, these charming aquatic serenaders had shut up their orchestra, or gone elsewhere."—[Gilliss's Exp. to South Hemisphere, vol. 1, p. 270, 271.]

According to all probabilities, says Dr. Girard, those musicians have taken a northerly direction, having been heard near the equator by the engineer Ouffroy de Thoron, who speaks of them as follows:

"It was in the Bay of Paillon, surrounded with virgin forests, that I heard for the first time the song of the *fish musician*. Already, while at Campana, much about it was told me. There were many of those fishes in the Matajé; they were heard at certain hours in the evening and in certain quarters pointed out to me. But I attached no great importance to the subject at that moment, my conviction being that this animal was well known to naturalists, so that as a mere satisfaction of curiosity I awaited a favorable opportunity in going to hear them. But as it sometimes happens that these fishes do not await obscurity for uttering their music, a chance served me admirably on my return from Paillon to Campana.

"On proceeding along a seacoast at sunset, a strange song, extremely grave and prolonged, was suddenly heard about me. I first thought it to be a gnat or a bumblebee of an extraordinary size, but perceiving nothing above or around me, I asked the oarsman of my pirogue whence this noise came. 'Sir,' he answered, 'it is a fish which thus sings; some call these fishes *siren*, and others *musicians*.' On progressing a little further I heard a multitude of divers voices, harmonizing amongst themselves, imitating to perfection the sound of a church organ.

"The Bay of Paillon is not the sole locality where one may enjoy this phenomenon. It occurs in several places, and even with greater power and evidence in the river Matajé, especially at the foot of a promontory called Campanilla. This river has two outlets upon the Pacific Ocean and a third one into the bay already named. By ascending it beyond Campana one reaches Campanilla, where the same phenomenon occurs. I was told that in the River *del Molino*, an affluent of the Matajé, the song of these fishes had likewise been heard. It may not be uninteresting to know that these animals live in waters of different qualities, since that of Paillon is salted, whilst that of the river does not mingle with the preceding except at tide times. The fishes musicians execute their music without being troubled by your presence, and this for several hours consecutively without exhibiting themselves near the surface of the water, and the continuous vibration of their song produces an aerial sound. One feels amazed that such a noise could proceed from an animal *no more than 10 inches in length. It is a fish, the exterior configuration of which presents nothing peculiar; its color is white with some olivish spots along the back.* Such is the fish which is taken by the hook on the very places where the song is uttered. It is towards sunset when these fishes begin to make themselves heard, continuing their song during the night, imitating the grave and medial sounds of an organ, [Ouffroy de Thoron, *l'Amérique équatoriale*, 1866, 137-140.]

The origin of the harmonious sounds heard in the bays of Caldera and Paillon deserve the attention of the future explorers of the Pacific coast of South America. The magnitude of the scene on which the phenomenon is displayed, the mystery which surrounds its manifestation, are such as to awaken general curiosity.

189.

1889. GIRARD, CHARLES. Les Poissons Souterraines du Nord de l'Afrique. *Le Naturaliste*, Paris, 103-6, 1889.

The Desert of Sahara contains many wells of considerable magnitude. Surrounding these wells rich oases have sprung up, sustaining a native population of some importance. But what is most remarkable about the wells is the fact that they bring forth from great depths living fishes, which, instead of being blind, as one would be led to suppose *a priori*, are provided with eyes as perfect as those of fishes living in the rivers. The prevailing opinion is that the fishes from the artesian wells are native of the water courses over the surface of the soil and have penetrated subsequently into the ground, whence they are brought up by the wells.

1889. GIRARD, CHARLES—Continued.

This question, however, has not been definitely settled. The objections to this theory are given in the above paper.

The following species have been observed and figured:

Cyprinodon calaritanus, Val.

Zab occidental and all the wells of Oued Rix.

Chromis Desfontainii, Sauv.

Hot Springs of Gaffa. 30° R.

Chromis zillii, Sauv.

Oued Rix from Melrix Chott to Tongourt.

Hemichromis Sahara, Sauv.

Wells from the vicinities of Tongourt.

Hemichromis Rolandii, Sauv.

Zab occidental (Zibans).

Similar, though different species of the Chromid family, live in the depths of the Lake of Tiberias, with the curious habits of hatching their own eggs and bringing up their progeny sheltered in their buccal cavity. It remains to be seen whether the Chromids of Africa exhibit the same traits in their habits.

190.

1889. GIRARD, CHARLES. Les Andes et la Cordillère équatoriennes. *Le Naturaliste*, Paris, 37-38, 159-161, 1889.

The committee for the organization of the first international congress of zoölogy have endeavored to point out a certain number of questions upon which a discussion might be usefully raised by its future members. Among those questions was the "Determination of the regions of the globe the fauna of which was insufficiently known."

The above paper tends to show that the Republic of the Equator throughout, with the surrounding headwaters of the Rio del Cauca, the Rio Magdalena, the Amazon River, the Rio Parana, and the Rio La Plata, with special references to the subterranean faunas, were included in that category.

191.

1889. GIRARD, CHARLES. Les Andes, la Cordillère d'Amazonie: Précédé d'une lettre à Mr. Raph. Blanchard.

Congrès international de Zoölogie, Paris, 1889, 101.

Revised edition of the foregoing paper, together with special reference to the fishes ejected by the volcanos of the equator, and to the lack of scientific information as to their natural history. A letter to R. Blanchard enumerates the species actually living in open waters surrounding those volcanos, and which have been too hastily identified from Humboldt's time to our days by ichthyologists.

192.

1889. GIRARD, CHARLES. La Faune Souterraine des Andes et de la Cordillère.

Congrès international de Zoölogie, Paris, 1889, 110.

A complement of the foregoing "Paper," and entering into fuller details respecting our actual knowledge upon the subterranean fauna of the regions previously mentioned.

193.

1890. GIRARD, CHARLES. Les Poissons vivipares de la côte Américaine de l'océan Pacifique.

Le Naturaliste, No. 69, 24-25; No. 70, 39; No. 72, 61-62 (figs.). Paris, 1890.

A French translation from the "Report on the Fishes in the Explorations and Surveys of the Pacific Railroad." [No. 93.]

194.

1890. GIRARD, CHARLES. De la Phosphorescence en général et celle des mers en particulier.

Le Naturaliste Paris, 1890, pp. 210-212.

1890. GIRARD, CHARLES—Continued.

ABSTRACT.

There are naturalists who still believe that phosphorescence is the "result of a peculiar secretion of a viscous or slimy liquid." Others think that the same phenomenon "does not depend upon the will of the animal and manifests itself through anomalous circumstances."

To show the inanity of such conceptions Dr. Girard relates a curious and quite decisive observation made in Boston harbor in 1847, in company with Agassiz, Desor, and Pourtalès. "The house we inhabited on the cliff of East Boston, faced the harbor, Birds Island, and Governors Island on the left hand, and the city of Boston on the right.

"Towards the end of summer, during a calm night lighted by a full moon, Pourtalès called our attention to an unusual brightness of a silvery blue over the surface of the water. It looked like a sheet of liquid silver. Agassiz and Desor thought it to be a reflection of the satellite. We were, however, soon convinced that such was not the case, inasmuch as the brightness continued, even with a greater intensity, when the moon happened to be momentarily hidden behind packs of heavy clouds driven by upper currents of the atmosphere.

"To leave no room for any possible doubt, Pourtalès and myself went on a little skiff gathering in a pail a sample of water from the center of the phenomenon. Nothing particular attracted our attention except that as we were progressing, the brightness which we still perceived at a given distance, disappeared from our immediate surroundings, the surface of the water showing its usual aspect, and the thought occurred whether we were not laboring under an optical delusion. Nevertheless we filled our pail to examine its contents at home. By the light of our lamps, the water appeared perfectly limpid and contained no living beings visible to the naked eye. But in the obscurity and calmness one could see a myriad of sparks darting to and fro—genuine aquatic fireworks in miniature. The least agitation or a simple shock against the pail would cause these sparks to vanish, and to reappear after quietness was restored. In a transparent glass jar, little animalcules could be distinguished like so many whitish dots disseminated throughout the liquid. The microscope showed a small crustacea of the genus *calanus*, bearing a strong resemblance to *Varietes* of Templeton. The luminous emission, of a celestial blue, could be seen proceeding from the nervous system of the little animal whose transparency enabled us to see its entire organization. The point initial was the cephalic ganglion above the esophagus, subject to isochronal contractions, and whence the luminous flashing passed rapidly through all the nervous strings to the other ganglia, which themselves were motionless."

Dr. Girard considers the phenomenon of phosphorescence as manifesting itself under two distinct aspects. First, an *active state*, and second, a *passive state*. The active state proceeds, during life, from the nervous system of the animals in which the phenomenon occurs and under the immediate control of their will, intermittent therefore in its aspect, whilst the passive state resides latent among diffused or disaggregated organic substances without vital impulse, and showing some activity under agitation of various sorts and under the action too, of luminous rays like those of the moon.

195.

1890. GIRARD, CHARLES. La maladie du Barbeau (*Barbus fluviatilis* L.) *Le Naturaliste*, Paris, p. 254, 1890.

ABSTRACT.

A very strange and serious disease, characterized by an accumulation, between skin and flesh, all along the lateral line, of an apparently fatty substance made of *sarcosproïde*, affected the common barbel of the river Seine in its windings about Paris. That disease assumes the character of an epidemic, already observed years ago among the same fish in the rivers Meuse and Moselle. It terminates fatally and the dead fishes may be seen floating on the surface of the water. Death is brought about by asphyxia in the following manner: The bulky and fatty substance affecting but one side of the body, the fish loses both equilibrium and specific gravity. Unable to maintain itself any longer swimming in full water, it rises thus forcibly to the surface, where the access of the air to the gills impedes respiration and brings about death. The flesh as well as the organs in the abdominal cavity exhibit at first no signs of alteration. By and by suppuration may set in and the swollen region then bursts open like an abscess.

196.

1891. GIRARD, CHARLES. Une tortue bicéphale. *Le Naturaliste*, Paris, p. 1, 1891, (fig.).

A very young specimen of *Chrysemys picta* from the United States, exhibits two well-formed heads emerging from under a carapax seemingly normal in its exterior aspect. Four limbs,

1891. GIRARD, CHARLES—Continued.

two to the right and two to the left, and a single tail are well developed, the limbs on the right side probably belonging to one fetus and those of the left side to the other fetus. Dissection, however, was not made, the author having had but one sketch of the animal at his command.

197.

1891. GIRARD, CHARLES. Deux espèces nouvelles de planariés américaines.

Le Naturaliste, Paris, 1891.

Hydrolimax brunneus, n. s.

Rivulet from Fairmount Park, Jos. Leidy.

Phagocata coronata, n. s.

Near Fort Bridger, Wyoming, Jos. Leidy.

198.

1891. GIRARD, CHARLES. Recherches sur les planaires et les némertiens de l'Amérique du Nord.

Annales Sciences Naturelles, Paris, 1891.

A systematic record of notes and cursory observations, viewing a general treatise on the subject (see No. 59), and which circumstances prevented from carrying out fully.

TERRESTRIAL PLANARIANS:

RHYNCHODEMUS, Leidy.

Rhynchodemus sylvestris, Leidy.

FRESH-WATER PLANARIANS:

HYDROLIMAX, Hald.

Hydrolimax griseus, Hald.

Hydrolimax brunneus, Grd.

PROCOTYLA, Leidy.

Procotyla fluviatilis, Leidy.

PHAGOCATA, Leidy.

Phagocata gracilis, Leidy.

Phagocata coronata, Grd.

DUGESIA, Girard.

Dugesia gonocephaloides, Grd.

Dugesia Foremani, Grd.

Dugesia maculata, Grd.

Dugesia truncata, Grd.

DENDROCOELUM, Oerst.

Dendrocoelum superbum, Grd.

Dendrocoelum pulcherrimum, Grd.

MARINE PLANARIANS:

PLANOCERA, Blainv.

Planocera elliptica, Grd.

Planocera nebulosa, Grd.

LEPTOPLANA.

Leptoplana ellipsoides, Grd.

IMOGINE, Girard.

Imogine oculifera, Grd.

THYSANOOZON, Grube.

Thysanozoon nigrum, Grd.

PROCERODES, Girard.

Procerodes Wheatlandi, Grd.

NIOBE, Girard.

Niobe zonata, Grd.

TYPHLOLEPTA, Oerst.

Typhlolepta acuta, Grd.

Typhlolepta fuliginosa, Leidy.

POLYCELIS, Ehr.

Polycelis variabilis, Grd.

Polycelis tigrinus, Grd.

PROSTHIOSTOMUM, Quatref.

Prosthiostomum gracile, Grd.

1891. GIRARD, CHARLES—Continued.

BDELLOURA, Leidy.

Bdelloura candida, Grd.*Bdelloura rustica*, Leidy.

RHABDOCELA:

DEROSTOMA, Dugis.

Derostoma marginatum, Grd.

FOVIA, Girard.

Fovia Warreni, Grd.

MONOCELIS, Ehr.

Monocelis spatulicauda, Grd.

MACROSTOMA, Ed. v. Ben.

Macrostoma hystrix, Oerst.*Macrostoma sensitivum*, Sillim.

MICROSTOMA, O. Sch.

Microstoma lineare, Oerst.*Microstoma caudatum*, Leidy.*Microstoma Philadelphicum*, Leidy.*Microstoma variabile*, Leidy.

STENOSTOMA, O. Sch.

Stenostoma leucaps, O. Sch.*Stenostoma agile*, Sillim.

PRORHYNCHUS, M. Schultze.

Prorhynchus fluviatilis, Leydig.

MESOSTOMA, Dugis.

Mesostoma gonocephalum, Sillim.*Mesostoma cæcum*, Sillim.*Mesostoma Pattersoni*, Sillim.*Mesostoma viviparum*, Sillim.

GYRATOR.

Gyrator albus, Sillim.

VORTEX, Ehr.

Vortex armiger, S. Sch.*Vortex Pinguis*, Sillim.*Vortex Blodgettii*, Sillim.

PLAGIOSTOMA.

Plagiostoma planum, Sillim.

FRESH-WATER NEMERTEANS:

EMEA, Leidy.

Emea rubra, Leidy.*Emea Sillimani*, Grd.

MARINE NEMERTEANS:

TETRASTEMMA, Ehr.

Tetраstemma serpentina, Grd.

HECATE, Girard.

Hecate elegans, Grd.

POSEIDON, Girard.

Poseidon colci, Grd.*Poseidon affinis*, Grd.

NAREDA, Girard.

Nareda superba, Grd.

BORLASIA, Oken.

Borlasia Kürtzi, Grd.

LEODES, Girard.

Leodes striolata, Grd.

RENIERIA, Girard.

Renieria rubra, Grd.

AMPHIPORUS, Ehr.

Amphiporus sanguineus, Grd.

POLIA, Dellechiaje.

Polia gracilis, Grd.

MECKELIA, Leuck.

Meckelia fragilis, Grd.*Meckelia atra*, Grd.*Meckelia pocahontas*, Grd.*Meckelia lizzice*, Grd.

1891. GIRARD, CHARLES—Continued.

Meckelia latea, Leidy.*Meckelia rosea*, Leidy.

OMMATOPLEA, Ehr.

Ommatoplea Stimpsoni, Grd.

STIMPSONIA, Girard.

Stimpsonia aurantiaca, Grd.

II. SYSTEMATIC CATALOGUE.

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7. On the Development of *Planocera elliptica*. Proc. Bost. Soc. Nat. Hist., iii, 1850, 348.
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Marcy and McClellan's Rep. Expl. Red River La., 1853, p. 239; Gilliss's Rep. Exp. S. Hemisph., ii, 1855, p. 22.
- CNEMIDOPHORUS GRACILIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128; Pr. Acad. Nat. Sci. Phila., vi, 1853, p. 301; Mex. Bound. Surv., vol. ii, p. 10, pl. xxxiv, figs. 7-14.
- CNEMIDOPHORUS GRAHAMI.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128; Mex. Bound. Surv., vol. ii, p. 10, pl. xxxii, figs. 1-6.
- CNEMIDOPHORUS GULARIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128; Marcy and McClellan's Expl. Red River, La., 1853, p. 239, pl. x, figs. 1-4; Mex. Bound. Surv., vol. ii, p. 11; P. R. R. Surv., vol. x, p. 38.
- CNEMIDOPHORUS INORNATUS.**
Pr. Acad. Nat. Sci. Phila., 1858, p. 255; Mex. Bound. Surv., vol. ii, p. 10.
- CNEMIDOPHORUS MARMORATUS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128.
- CNEMIDOPHORUS OCTOLINEATUS.**
Pr. Acad. Nat. Sci. Phila., 1858, p. 255; Mex. Bound. Surv., vol. ii, p. 10.
- CNEMIDOPHORUS PERPLEXUS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128; Mex. Bound. Surv., vol. ii, p. 10.
- CNEMIDOPHORUS PRÆSIGNIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128; Gilliss's Rep. Exp. S. Hemisph., vol. ii, 1855, p. 23, pl. xxxviii, figs. 1-5.
- CNEMIDOPHORUS SEXLINEATUS.**
P. R. R. Surv., vol. x, p. 38.
- CNEMIDOPHORUS TESSELLATUS.**
P. R. R. Surv., vol. x, p. 18.
- CNEMIDOPHORUS TIGRIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 69; Stansbury's Surv. Salt Lake, 1853, p. 338, pl. ii, Mex. Bound. Surv., vol. ii, p. 10, pl. xxxiii.
- COLUBER MORMON.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 70; Stansbury's Surv. Salt Lake, 1853, p. 351.
- CONTIA.**
Cat. N. A. Reptiles, 1853, part i, p. 110; U. S. Expl. Exp., 1858, p. 124.
- CONTIA MITIS.**
Cat. N. A. Reptiles, 1853, part i, p. 110; Pr. Acad. Nat. Sci. Phila., 1853, p. 300; U. S. Expl. Exp., 1858, p. 125, pl. x, figs. 6-10; P. R. R. Surv., vol. x, pl. xxxvi, fig. 7.
- CROSSCURS.**
U. S. Expl. Exp., 1858, p. 281.
- CROSSURUS PLATYURUS.**
U. S. Expl. Exp., 1858, p. 281.
- CROTALOPHORUS.**
Cat. N. A. Reptiles, 1853, part —, p. 11.
- CROTALOPHORUS CONSORS.**
Cat. N. A. Reptiles, 1853, part i, p. 12; Mex. Bound. Surv., vol. ii, p. 15; P. R. R. Surv., vol. x, pl. xxvi, fig. 8.
- CROTALOPHORUS EDWARDSI.**
Cat. N. A. Reptiles, 1853, part i, p. 15; Mex. Bound. Surv., vol. ii, p. 15, pl. v, fig. 1; P. R. R. Surv., vol. x, pl. xxv, fig. 10.
- CROTALOPHORUS KIRTLANDI.**
Cat. N. A. Reptiles, 1853, part i, p. 16; P. R. R. Surv., vol. x, pl. xxv, fig. 11.
- CROTALOPHORUS MILLIARI.**
Cat. N. A. Reptiles, 1853, part i, p. 11; P. R. R. Surv., vol. x, p. 40, pl. xxiv, fig. 7.
- CROTALOPHORUS TERGEMINUS.**
Cat. N. A. Reptiles, 1853, part i, p. 14; P. R. R. Surv., vol. x, pl. xxv, fig. 9.
- CROTALUS.**
Cat. N. A. Reptiles, 1853, p. 1; Marcy and McClellan's Rep. Expl. Red River, La., 1853, p. 217; U. S. Expl. Exp., 1858, p. 187.
- CROTALUS ADAMANTEUS.**
Cat. N. A. Reptiles, 1853, part i, p. 3; P. R. R. Surv., vol. x, pl. xxiv, fig. 2.
- CROTALUS ATROX.**
Cat. N. A. Reptiles, 1853, part i, p. 5; Mex. Bound. Surv., ii, p. 14, pl. 1; P. R. R. Surv., vol. x, p. 39, pl. xxiv, fig. 3.

- CROTALUS CERASTES.**
Mex. Bound. Surv., vol. ii, p. 14, fig. 3; P. R. R. Surv., vol. x, pl. xxxv, fig. 4.
- CROTALUS CONFLUENTUS.**
Cat. N. A. Reptiles, 1853, part i, p. 8; Marey and McClellan's Expl. Red River, La., 1853, p. 217, pl. i; Mex. Bound. Surv., vol. ii, p. 14; P. R. R. Surv., vol. x, p. 40, pl. xxiv, fig. 4.
- CROTALUS DURISSUS.**
Cat. N. A. Reptiles, 1853, part i, p. 1; P. R. R. Surv., vol. x, p. 39, pl. xxiv, fig. 1.
- CROTALUS LUCIFER.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 176; Cat. N. A. Reptiles, 1853, part i, p. 6; Pr. Acad. Nat. Sci. Phila., 1853, p. 300; U. S. Expl. Exp., 1858, p. 187, pl. xv, figs. 1-6; P. R. R. Surv., vol. x, pl. xxxvi, fig. 1.
- CROTALUS MOLOSSUS.**
Cat. N. A. Reptiles, 1853, part i, p. 10; Mex. Bound. Surv., vol. ii, p. 14, pl. ii; P. R. R. Surv., vol. x, pl. xxiv, fig. 5.
- CROTALUS OREGONUS.**
Cat. N. A. Reptiles, 1853, part i, p. 145; P. R. R. Surv., vol. x, pl. xxiv, fig. 6.
- CROTALUS TIGRIS.**
Mex. Bound. Surv., vol. ii, p. 14, pl. iv; P. R. R. Surv., vol. x, pl. xxv, fig. 1.
- CROTAPHYTUS.**
Stansbury's Surv. Salt Lake, 1853, p. 339; Marey and McClellan's Rep. Expl. Red River, La., 1853, p. 234.
- CROTAPHYTUS COLLARIS.**
Marcy and McClellan's Expl. Red River, La., 1853, p. 235; Mex. Bound. Surv., vol. ii, p. 6; P. R. R. Surv., vol. x, p. 17 and 37, pl. xxiv, fig. 1.
- CROTAPHYTUS DORSALIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 126; Pr. Acad. Nat. Sci. Phila., vi, 1853, p. 301.
- CROTAPHYTUS GAMBELL.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 126.
- CROTAPHYTUS RETICULATUS.**
Pr. Acad. Nat. Sci. Phila., 1858, p. 253; Mex. Bound. Surv., vol. ii, p. 6.
- CROTAPHYTUS WISLEZENI.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 69; Stansbury's Surv. Salt Lake, p. 340, pl. iii; Mex. Bound. Surv., vol. ii, p. 7, pl. xxxi; P. R. R. Surv., vol. x, pp. 17 and 37.
- CRYPTOBLEPHARUS.**
U. S. Expl. Exped., 1858, p. 219.
- CRYPTOBLEPHARUS EXIMICUS.**
U. S. Expl. Exped., 1858, p. 222, pl. xxvi, figs. 25-32; Pr. Acad. Nat. Sci., Phila., ix, 1857, p. 195.
- CRYPTOBLEPHARUS PLAGIOCEPHALUS.**
U. S. Expl. Exped., 1858, p. 222, pl. xxvi, figs. 17-24.
- CYCLODINA.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 195; U. S. Expl. Exped., 1858, p. 235.
- CYCLODINA ÆNEA.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 195; U. S. Expl. Exped., 1858, p. 236, pl. xxvi, figs. 9-16.
- CYCLODINA TEMMINCKI.**
U. S. Expl. Exped., 1858, p. 236.
- CYCLODUS.**
U. S. Expl. Exped., 1858, p. 232.
- CYCLODUS GIGAS.**
U. S. Expl. Exped., 1858, p. 233.
- CYLNDROPHIS.**
U. S. Expl. Exped., 1858, p. 108.
- CYLINDROPHIS RUFA.**
U. S. Expl. Exped., 1858, p. 109.
- DACTYLOPERUS.**
U. S. Expl. Exped., 1858, p. 279.
- DACTYLOPERUS INSCULENSIS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 197; U. S. Expl. Exped., 1858, p. 280.
- DENDROPHIS.**
U. S. Expl. Exped., 1858, p. 129.
- DENDROPHIS PICTA.**
U. S. Expl. Exped., 1858, p. 129.
- DENDROPHIS PRASINUS.**
U. S. Expl. Exped., 1858, p. 131, pl. xii, figs. 7-10; Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 181.
- DIADOPHIS.**
Cat. N. A. Reptiles, 1853, part i, p. 112.
- DIADOPHIS AMABILIS.**
Cat. N. A. Reptiles, 1853, part i, p. 113; Pr. Acad. Nat. Sci. Phila., vi, 1853, p. 300; P. R. R. Surv., vol. x, pl. xxxiii, fig. 83.
- DIADOPHIS DOCILIS.**
Cat. N. A. Reptiles, 1853, part i, p. 114; Mex. Bound. Surv., vol. ii, p. 22, pl. xxi, fig. 3; P. R. R. Surv., vol. x, p. 43, pl. xxxii, fig. 1, and pl. xxxiii, fig. 84.
- DIADOPHIS PULCHELLUS.**
Cat. N. A. Reptiles, 1853, part i, p. 115; P. R. R. Surv., vol. x, pl. xxxiii, fig. 85.
- DIADOPHIS PUNCTATUS.**
Cat. N. A. Reptiles, 1853, part i, p. 112; P. R. R. Surv., vol. x, pl. xxxiii, fig. 82.
- DIADOPHIS REGALIS.**
Cat. N. A. Reptiles, 1853, part i, p. 115; Mex. Bound. Surv., vol. ii, p. 22; P. R. R. Surv., vol. x, pl. xxxiii, fig. 86.
- DIPSAS SEPTENTRIONALIS.**
Mex. Bound. Surv., vol. ii, p. 16, pl. viii, fig. 1; P. R. R. Surv., vol. x, pl. xxv, fig. 18.
- DIPSOSAURUS DORSALIS.**
Mex. Bound. Surv., vol. ii, p. 8; pl. xxxii, figs. 7-13; P. R. R. Surv., x, 1859.
- DIPLODACTYLUS.**
U. S. Expl. Exped., 1858, p. 296.
- DIPLODACTYLUS VITATUS.**
U. S. Expl. Exped., 1858, p. 297, pl. xxiv, figs. 9-16.
- DISCODACTYLUS.**
U. S. Expl. Exped., 1858, p. 299.
- DISCODACTYLUS PHACOPHORUS.**
U. S. Expl. Exped., 1858, p. 300, pl. xxv, figs. 25-32.
- DOLIOPHIS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 182; U. S. Expl. Exped., 1858, p. 175.

- DOLIOPHIS FLAVICEPS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 182; U. S. Expl. Exped., 1858, p. 176, pl. x, figs. 1-5.
- DOLIOSAURUS.**
U. S. Expl. Exped., 1858, p. 407.
- DOLIOSAURUS MCCALLI.**
U. S. Expl. Exp., 1858, p. 408; Mex. Bound. Surv., vol. ii, p. 9, pl. xxviii, figs. 4-6.
- DOLIOSAURUS MODESTUS.**
U. S. Expl. Exp., 1858, p. 409; Mex. Bound. Surv., vol. ii, p. 10; P. R. R. Surv., vol. x, p. 38.
- DOLIOSAURUS PLATYRHINOS.**
U. S. Expl. Exp., 1858, p. 409; P. R. R. Surv., vol. x, p. 18.
- DORYURA.**
U. S. Expl. Exped., 1858, p. 285.
- DORYURA VULPECULA.**
U. S. Expl. Exp., 1858, p. 286, pl. xxiv, figs. 17-24; Pr. Acad. Nat. Sci. Phila., 1857.
- DROMICUS TEMMINCKI.**
U. S. Expl. Exp., 1858, p. 161.
- DRYOPHIS.**
Gilliss' Rep. Exp. S. Hemisph., ii, 1855, p. 7.
- DRYOPHIS VITTATUS.**
Pr. Acad. Nat. Sci. Phila., 1854, p. 226; Gilliss' Rep. Exped. S. Hemisph., vol. ii, 1855, p. 7, pl. xxxvi, figs. 1-6.
- ELAPS.**
Cat. N. A. Reptiles, 1853, part i, p. 21; Gilliss' Rep. Exp. S. Hemisph., ii, 1855, p. 5.
- ELAPS FULVIUS.**
Cat. N. A. Reptiles, part i, 1853, p. 21; P. R. R. Surv., vol. x, pl. xxv, fig. 15.
- ELAPS NIGROCINCTUS.**
Pr. Acad. Nat. Sci. Phila., vii, 1854, p. 226; Gilliss' Rep. Exp. S. Hemisph., vol. ii, 1855, p. 6, pl. xxxv, figs. 1-6.
- ELAPS TENER.**
Cat. N. A. Reptiles, 1853, part i, p. 22; Mex. Bound. Surv., vol. ii, p. 15, pl. vii, fig. 1; P. R. R. Surv., vol. x, pl. xxv, fig. 16.
- ELAPS TRISTIS.**
Cat. N. A. Reptiles, 1853, p. 23; P. R. R. Surv., vol. x, pl. xxv, fig. 17.
- ELGARIA.**
U. S. Expl. Exped., 1858, p. 205.
- ELGARIA FORMOSA.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, 175; U. S. Expl. Exp., 1858, p. 206, pl. xxiii, figs. 10-17.
- ELGARIA GRANDIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 176; U. S. Expl. Exp., 1858, p. 212, pl. xxii, fig. 1-9.
- ELGARIA NOBILIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 128.
- ELGARIA PRINCIPIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 175; U. S. Expl. Exp., 1858, p. 214, pl. xxii, figs. 9-16.
- ELGARIA SCINCICAUDA.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 69; Stansbury Surv. Salt Lake, 1853, p. 348.
- ELGARIA SCINCICAUDA—continued.**
pl. iv, figs. 1-4; Pr. Acad. Nat. Sci. Phila., vi, 1853, 301; U. S. Expl. Exp., 1858, p. 210, pl. xxiii, figs. 1-9.
- EMOA.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 197; U. S. Expl. Exped., 1858, p. 261.
- EMOA ATROCOSTATA.**
U. S. Expl. Exp., 1858, p. 264.
- EMOA BAUDINI.**
U. S. Expl. Exp., 1858, p. 263.
- EMOA CARTERETI.**
U. S. Expl. Exp., 1858, p. 263.
- EMOA CYANURA.**
U. S. Expl. Exp., 1858, p. 270.
- EMOA HIEROGLYPHICA.**
U. S. Expl. Exp., 1858, p. 263.
- EMOA NIGRITA.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 197; U. S. Expl. Exp., 1858, p. 268.
- EMOA SAMSENSIS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 197; U. S. Expl. Exp., 1858, p. 265.
- EMYS MARMORATA.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 176.
- EMYS NIGRA.**
P. R. R. Surv., x, 1859, pl. i.
- ENYGRUS.**
U. S. Expl. Exped., 1858, p. 117.
- ENYGRUS BIBRONI.**
U. S. Expl. Exped., 1858, p. 117, pl. viii, figs. 8-11.
- ERETMOCHELYS.**
U. S. Expl. Exped., 1858, p. 439.
- ERYTHROLAMPRIUS VENUSTISSIMUS.**
U. S. Expl. Exped., 1858, p. 169.
- EUCHELYS.**
U. S. Expl. Exped., 1858, p. 447.
- EUCHELYS MEROPIUS.**
U. S. Expl. Exp., 1858, p. 448.
- EULEMUS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exped., 1858, p. 357.
- EULEMUS AFFINIS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exp., 1858, p. 366.
- EULEMUS DARWINI.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exped., 1858, p. 361, pl. xvii, figs. 8-14.
- EULEMUS FITZINGERI.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exp., 1858, p. 365.
- EULEMUS MAMMATUS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exp., 1858, p. 367.
- EULEMIUS PICTUS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exped., 1858, p. 364.
- EULEMIUS SIGNIFER.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exp., 1858, p. 366.
- EULEMIUS TENUIS.**
Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 198; U. S. Expl. Exp., 1858, p. 358, pl. xxviii, figs. 9-16.
- EUPHRYNE OBESA.**
Mex. Bound. Surv., vol. ii, p. 6, pl. 27.

EUPREPIS.

U. S. Expl. Exped., 1858, p. 229.

EUPREMS VENUSTUS.

Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 195; U. S. Expl. Exp., 1858, p. 229, pl. xxvi, figs. 1-8.

EUTENIA.

Cat. N. A. Reptiles, 1853, part i, p. 24; Marcy and McClellan Rep. Expl. Salt Lake, 1853, p. 209; U. S. Expl. Exped., 1858, p. 147.

EUTENIA CONCINNA.

Cat. N. A. Reptiles, 1853, part i, p. 46; P. R. R. Surv., vol. x, 1859, pl. xv, fig. 2.

EUTENIA COOPERI.

P. R. R. Surv., vol. x, 1859, pl. xv, fig. 1.

EUTENIA DORSALIS.

Cat. N. A. Reptiles, 1853, part i, p. 31; P. R. R. Surv., vol. x, p. 40, pl. xxvi, fig. 2.

EUTENIA ELEGANS.

Cat. N. A. Reptiles, 1853, part i, p. 34; P. R. R. Surv., x, 1859.

EUTENIA FAHRENI.

Cat. N. A. Reptiles, 1853, part i, p. 25; P. R. R. Surv., vol. x, pl. xxvi, fig. 20.

EUTENIA HAYDENI.

P. R. R. Surv., vol. x, 1859, pl. xiv.

EUTENIA INFERNALIS.

Cat. N. A. Reptiles, 1853, part i, p. 26; U. S. Expl. Exp., 1858, p. 148, pl. xvi, figs. 11-16; P. R. R. Surv., vol. x, 1859.

EUTENIA LEPTOCEPHALA.

Cat. N. A. Reptiles, 1853, part i, p. 29; U. S. Expl. Exp., 1858, p. 151, pl. xiii, figs. 7-13; P. R. R. Surv., vol. x, 1859, pl. xxxvi, fig. 2.

EUTENIA MARCIANA.

Cat. N. A. Reptiles, 1853, part i, p. 30; Marcy and McClellan Expl. Red River, La., 1853, p. 221, pl. iii; Mex. Bound. Surv., vol. ii, p. 17; P. R. R. Surv., vol. x, p. 41, pl. xxxvi, fig. 26.

EUTENIA ORDINATA.

Cat. N. A. Reptiles, 1853, part i, p. 32; P. R. R. Surv., vol. x, pl. xxvi, fig. 24.

EUTENIA ORDINOIDES.

Cat. N. A. Reptiles, 1853, part i, p. 33; Pr. Acad. Nat. Sci. Phila., 1853, p. 300; U. S. Expl. Exp., 1858, p. 153, pl. xix, figs. 1-4; P. R. R. Surv., vol. x, p. 19, pl. xxvi, fig. 3.

EUTENIA ORNATA.

Mex. Bound. Surv., vol. ii, p. 16, pl. ix; P. R. R. Surv., vol. x, pl. xxvi, fig. 22.

EUTENIA PARIETALIS.

Cat. N. A. Reptiles, 1853, part i, p. 28.

EUTENIA PICKERINGI.

Cat. N. A. Reptiles, 1853, part i, p. 27; U. S. Expl. Exp., 1857, p. 150, pl. xiii, figs. 14-20; P. R. R. Surv., vol. x, pl. xxxvi, fig. 3.

EUTENIA PROXIMA.

Cat. N. A. Reptiles, 1853, part i, p. 25; Marcy and McClellan's Expl. Red River, La., 1853, p. 220, pl. ii; Mex. Bound. Surv., vol. ii, p. 16; P. R. R. Surv., vol. x, p. 40, pl. xxvi, fig. 21.

EUTENIA RADIX.

Cat. N. A. Reptiles, 1853, part i, p. 34; P. R. R. Surv., vol. x, pl. xxxiv, fig. 5, and pl. xxvi, fig. 25.

EUTENIA SAURITA.

Cat. N. A. Reptiles, 1853, part i, p. 24; P. R. R. Surv., vol. x, pl. xxvi, fig. 19.

EUTENIA SIRTALIS.

Cat. N. A. Reptiles, 1853, part i, p. 30; P. R. R. Surv., vol. x, pl. xxvi, fig. 23.

EUTENIA YAGRANS.

Cat. N. A. Reptiles, 1853, part i, p. 35; U. S. Expl. Exp., 1858, p. 154, pl. xiv, figs. 5-10; P. R. R. Surv., vol. x, pp. 19 and 41, pl. xvii.

FARANCIA.

Cat. N. A. Reptiles, 1853, part i, p. 123.

FARANCIA ABACURA.

Cat. N. A. Reptiles, 1853, part i, p. 123; P. R. R. Surv., vol. x, pl. xxxiii, fig. 92.

GEKKO.

U. S. Expl. Exped., 1858, p. 290.

GEKKO INDICUS.

U. S. Expl. Exped., 1858, p. 290.

GEKKO MONARCHUS.

U. S. Expl. Exped., 1858, p. 292.

GEHYRA.

U. S. Expl. Exped., 1858, p. 272.

GEHYRA OCEANICA.

U. S. Expl. Exp., 1858, p. 273.

GEHYRA VORAX.

Pr. Acad. Nat. Sci. Phila., ix, 1857, p. 197; U. S. Expl. Exp., 1858, p. 274, pl. xvi, figs. 1-8.

GEORGIA.

Cat. N. A. Reptiles, 1853, part i, p. 92.

GEORGIA COOPERI.

Cat. N. A. Reptiles, 1853, part i, p. 92; P. R. R. Surv., vol. x, pl. xxxiv, fig. 1.

GEORGIA OBSOLETA.

Cat. N. A. Reptiles, 1853, part i, p. 158; Mex. Bound. Surv., vol. ii, p. 20, pl. xv; P. R. R. Surv., vol. x, pl. xxxi, fig. 66.

GERRHONOTUS INFERNALIS.

Pr. Acad. Nat. Sci. Phila., 1858, p. 255; Mex. Bound. Surv., vol. ii, p. 71.

GERRHONOTUS NOBILIS.

Mex. Bound. Surv., vol. ii, p. 11, pl. xxv, figs. 1-8.

GERRHONOTUS OLIVACEUS.

Pr. Acad. Nat. Sci. Phila., 1858, p. 255; Mex. Bound. Surv., vol. ii, p. 11.

GERRHONOTUS WEBBI.

Pr. Acad. Nat. Sci. Phila., 1858, p. 255; Mex. Bound. Surv., vol. ii, p. 11, pl. xxiv, figs. 1-10.

GONIODACTYLUS.

U. S. Expl. Exped., 1858, p. 304.

GONIODACTYLUS MARMORATUS.

U. S. Expl. Exped., 1858, p. 304.

GYPOCHELYS LACERTINA.

Mex. Bound. Surv., vol. ii, p. 3.

HALDEA.

Cat. N. A. Reptiles, 1853, part i, p. 122.

HALDEA STRIATULA.

Cat. N. A. Reptiles, 1853, part i, p. 122; P. R. R. Surv., vol. x, pl. xxxiii, fig. 91.

HALICHELYS ATRA.

U. S. Expl. Exped., 1858, p. 452.

HELODERMA HOBRIDUM.

Mex. Bound. Surv., vol. ii, p. 11, pl. xxvi; P. R. R. Surv., vol. x, p. 38.

HEMIDACTYLUS.

U. S. Expl. Exped., 1858, p. 282.

HEMIDACTYLUS CYANODACTYLUS.

U. S. Expl. Exp., 1858, p. 284, pl. xxv, figs. 17-24.

HEMIDACTYLUS MABULA.

U. S. Expl. Exp., 1858, p. 283.

HERPETODRYAS FLAVIGULARIS.

P. R. R. Surv., x, 1859.

HETERODON.

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HETERODON ATMODES.

Cat. N. A. Reptiles, 1853, part i, p. 57; P. R. R. Surv., vol. x, pl. xxxviii, fig. 41.

HETERODON COGNATUS.

Cat. N. A. Reptiles, 1853, part i, p. 54; Mex. Bound. Surv., ii, p. 17; P. R. R. Surv., vol. x, pl. xxviii, fig. 39.

HETERODON NASICUS.

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HETERODON SIMUS.

Cat. N. A. Reptiles, 1853, part i, p. 59; P. R. R. Surv., vol. x, pl. xxviii, fig. 42.

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HETERONOTA PELAGICA.

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HOLBROOKIA AFFINIS.

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HOMBRONIA CRASSICAUDA.

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HOMBRONIA FASCIOLARIS.

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HOPILODACTYLUS BREVIDACTYLUS.

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HOPILODACTYLUS DUVAUCCELLI.

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HOPILODACTYLUS GRANULATUS.

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HYDROSAURUS VARIUS.

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LACERTA MADERENSIS.

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LIODEIRA CHILENSIS.

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- LILOLEMUS.**
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- LILOLEMUS NITIDUS.**
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- LIOPHIS MEREMI.**
U. S. Expl. Exp., 1858, p. 159, pl. xi, fig. 1-6.
- LIPINIA.**
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- LIPINIA VULCUNIA.**
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- LODIA.**
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- LODIA TENCIS.**
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- LYGOPHIS ELEGANS.**
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- LYGOSOMA.**
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- LYGOSOMA LATERALIS.**
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- MABUYA.**
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- MABUYA AGILIS.**
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- MASTICOPHIS.**
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- MASTICOPHIS FLAVIGULARIS.**
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- MASTICOPHIS MORMON.**
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- MASTICOPHIS ORNATUS.**
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- MASTICOPHIS SCHOTTI.**
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- MASTICOPHIS TENIATUS.**
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- MASTICOPHIS TESTACEUS.**
Mex. Bound. Surv., vol. ii, p. 20, pl. xvi; P. R. R. Surv., vol. x, p. 43.
- MICROLOPHUS.**
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- MICROLOPHUS PERUVIANUS.**
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- MORELIA.**
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- NERODIA WOODHOUSI.**
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- OLIGOSOMA.**
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- OLIGOSOMA NOCTUUM.**
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PHRYNOSOMA CREVIROSTRUM.

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REGINA KIRKLANDI.

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REGINA LEBERIS.

Cat. N. A. Reptiles, 1853, part i, p. 45; P. R. R. Surv., vol. x, pl. xxvii, fig. 32.

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Cat. N. A. Reptiles, 1853, part i, p. 46; P. R. R. Surv., vol. x, pl. xxvii, fig. 33.

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Cat. N. A. Reptiles, 1853, part i, p. 142; Mex. Bound. Surv., vol. ii, p. 24; P. R. R. Surv., vol. x, pl. xxxiii, fig. 100.

- RENA HUMILIS.**
Cat. N. A. Reptiles, 1853, part i, p. 143; Pr. Acad. Nat. Sci. Phila., vi, 1853, p. 300.
- RHINOCHILUS.**
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- RHINOCHILUS LECONTI.**
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- RHINOSTOMA.**
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- RHINOSTOMA COCCINEA.**
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- RHYTIDODEIRA.**
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- RHYTIDODEIRA BIBRONI.**
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- RHYTIDODEIRA KINGI.**
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- RHYTIDODEIRA MAGELLONICA.**
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- RHYTIDODEIRA NIGROMACULATA.**
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- RHYTIDODEIRA OXYCEPHALA.**
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- RHYTIDODEIRA WIEGMANNI.**
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- SABRINA.**
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- SABRINA TESSELLATA.**
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- SACCODEIRA.**
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- SACCODEIRA ORNATISSIMA.**
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- SALVADORA.**
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- SALVADORA GRAHAMLE.**
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- SAURIDIS MODESTUS.**
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- SCELOPORUS.**
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- SCELOPORUS CLARKI.**
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- SCELOPORUS CONSOBRINUS.**
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- SCELOPORUS COUCHI.**
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- SCELOPORUS DISPAR.**
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- SCELOPORUS FRONTALIS.**
Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 175; U. S. Expl. Exp., 1858, p. 384, pl. xix, fig. 1-7.
- SCELOPORUS GRACILIS.**
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- SCELOPORUS GRACIOSUS.**
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- SCELOPORUS LONGIPES.**
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- SCELOPORUS MARMORATUS.**
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- SCELOPORUS OCCIDENTALIS.**
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- SCELOPORUS ORNATUS.**
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- SCELOPORUS POINSETTI.**
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- SCELOPORUS SCALARIS.**
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- SCELOPORUS SPINOSUS.**
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- SCELOPORUS THAYERI.**
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- SCELOPORUS TORQUATUS.**
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- SCELOPORUS UNDLUATUS.**
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- SCOTOPIHIS.**
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- SCOTOPIHIS ALLEGHANIENSIS.**
Cat. N. A. Reptiles, 1853, part i, p. 73; P. R. R. Surv., vol. x, p. 42, pl. xxix, fig. 49.
- SCOTOPIHIS CONFINIS.**
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- SCOTOPIHIS EMORVI.**
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- SCOTOPHIS GUTTATUS.
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- SCOTOPHIS LÆTUS.
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- SCOTOPHIS LINDHEIMERI.
Cat. N. A. Reptiles, 1853, part i, p. 74; Mex. Bound. Surv., vol. ii, p. 19; P. R. R. Surv., vol. x, pl. xix, fig. 50.
- SCOTOPHIS QUADRIVITTATUS.
Cat. N. A. Reptiles, 1853, part i, p. 80; P. R. R. Surv., vol. x, pl. xxx, fig. 55.
- SCOTOPHIS YULPINUS.
Cat. N. A. Reptiles, 1853, part i, p. 75; P. R. R. Surv., vol. x, pl. xix, fig. 51.
- SIBYNON.
U. S. Expl. Exp., 1858, p. 142.
- SIBYNON NEBULATUS.
U. S. Expl. Exp., 1858, p. 142, pl. xi, figs. 11-16.
- SONORA.
Cat. N. A. Reptiles, 1853, part i, p. 117.
- SONORA SEMIANNULATA.
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- SPHERIODACTYLUS NOTATUS.
Mex. Bound. Surv., vol. ii, p. 12, pl. xxiv, figs. 29-37.
- SPHARGIS.
U. S. Expl. Exp., 1858, p. 429.
- STEIROLEPIS QUADRIVITTATA.
U. S. Expl. Exp., 1858, p. 314.
- STEIROLEPIS THORACICA.
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- STEIROLEPIS TIGRIS.
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- STEIROLEPIS XANTOSTIGMA.
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- STENODACTYLUS VARIEGATUS.
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- STENOSTOMA.
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- STORERIA.
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- STORERIA DEKAYI.
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- STORERIA OCCIPITO-MACULATA.
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- TACHYMENIS.
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- TACHYMENIS CHILENSIS.
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- TÆNIOPHIS.
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- TÆNIOPHIS IMPERIALIS.
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- TÆNIOPHIS TANTILLUS.
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- TANTILLA.
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- TANTILLA GRACILIS.
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- TAPAYA.
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- TAPAYA BREVIROSTRIS.
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- TAPAYA DOUGLASSI.
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- TAPAYA HERNANDESI.
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- TAPAYA ORBICULARIS.
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- TAPAYA ORNATISSIMA.
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- TARAGUIRA.
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- TARAGUIRA TORQUATA.
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- TEIUS.
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- TEIUS TEGUININ.
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- TESTUDO.
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- TESTUDO AUSTRALIS.
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- TESTUDO TABULATA.
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- THALASSOCHELYS.
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- THALASSOCHELYS CAOUANA.
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- THALASSOCHELYS CORTICATA.
U. S. Expl. Exped., 1858, p. 431, pl. xxix.
- THYROSTERNUM SONORIENSE.
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- TILIQUA.
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- TILIQUA RUFESCENS.
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- TOLUCA LINEATA.
Mex. Bound. Surv., ii, 1859, p. 23, pl. xxi, fig. 2; P. R. R. Surv., x, 1859, pl. xxxv, fig. 8.
- TOXICOPHIS.
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TOXICOPHIS PISCIVORUS.

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TRACHEMYS ELEGANS.

Mex. Bound. Surv., ii, 1859, p. 3.

TROPIDONOTUS JUNCATUS.

U. S. Expl. Exped., 1858, p. 145, pl. xiii, figs. 1-6.

TROPIDONOTUS ORDINOIDES.

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UROSAURUS GRACIOSUS.

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UTA.

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UTA GRACIS.

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UTA ORNATA.

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UTA ORNATA LINEARIS.

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UTA SCHOTTI.

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UTA STANSBURIANA.

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1853, p. 345, pl. v, figs. 4-6; Mex. Bound. Surv., ii, 1859, p. 7; P. R. R. Surv., x, 1859, p. 37.

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VIRGINIA.

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VIRGINIA VALERLE.

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XENODON ANCORUS.

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P. R. R. Surv., x, 1859, pl. xxx, figs. 1-3.

AMBLYSTOMA MAVORTIUM.

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AMBLYSTOMA PROSERPINA.

Pr. Acad. Nat. Sci. Phila., vi, 1852, p. 173; Mex. Bound. Surv., ii, 1859, p. 29, pl. xxxv, figs. 7-14.

AMBLYSTOMA TENEBROSUM.

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AMBLYSTOMA TEXANUM.

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ANAIDES.

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ANAIDES LUGUBRIS.

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BRACHYCEPHALUS.

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BRACHYCEPHALUS ACURANTIACUS.

U. S. Expl. Exped., 1858, p. 100, pl. v, figs. 20-24.

BUFO.

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BUFO ALVARIUS.

Mex. Bound. Surv., ii, 1859, p. 26, pl. xii, figs. 1-6.

BUFO AMERICANUS.

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BUFO BOREAS.

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BUFO COGNATUS.

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BUFO DEBILIS.

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- BUFO GRANULOSUS.**
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- BUFO HALOPHILA.**
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- BUFO INSIDIOR.**
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- BUFO LAMENTOR.**
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- BUFO LENTIGINOSUS.**
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- BUFO MARINUS.**
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- BUFO MELANOSTICTUS.**
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- BUFO NEBULIFER.**
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- BUFO PEPPIGI.**
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- BUFO PUNCTATUS.**
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- BUFO QUERCINUS.**
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- BUFO SPECIOSUS.**
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- BUFO THAUL.**
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- BUFO WOODHOUST.**
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- BUFONELLA.**
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- BUFONELLA CRUCIFERA.**
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- CRINIA.**
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- CRINIA GEORGIANA.**
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- CYSTIGNATHUS.**
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- CYSTIGNATHUS GRACILIS.**
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- CYSTIGNATHUS MACROGLOSSUS.**
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- CYSTIGNATHUS NEBULOSUS.**
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- CYSTIGNATHUS PARVULUS.**
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- CYSTIGNATHUS ROSEUS.**
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- ELOSIA BUFONIUM.**
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- ELOSIA NASUTA.**
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- ELOSIA VOMERINA.**
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- ENGYSTOMA CAROLINENSIS.**
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xxi, figs. 1-4.
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xxx, figs. 13-16.
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xxx, figs. 17-20.
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xxx, figs. 21-24.
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xxx, figs. 5-8.

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xxx, figs. 17-20; P. R. R. Surv., vol. x, 1859,
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xxx, figs. 9-12.

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11-15.

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xx, figs. 4-6.

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figs. 5-9.

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xx, figs. 7-9.

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xx, figs. 1-3.

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1-4.

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figs. 1-4.

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1-4.

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ix, figs. 5-8.

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xxiv, fig. 7.

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figs. 4-7.

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figs. 1-4.

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ix, figs. 1-4.

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OSMERUS PRETIOSUS.

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fig. 5.

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