THE RECENT AND FOSSIL MOLLUSKS OF THE GENUS RISSOINA FROM THE WEST COAST OF AMERICA.

By Paul Bartsch,

Curator, Division of Marine Invertebrates, United States National Museum.

INTRODUCTION.

It is interesting to note that the first species recorded from West American waters served also as the type of the world-wide distributed genus now under discussion. The noted traveler and naturalist, Chevalier Alcide D'Orbigny, in his Voyage dans L'Amerique Meridionale, which extended over the years 1826–1833, collected a wonderful lot of material and among other things a Rissoid, on the coasts of Bolivia and Peru, for which he erected the genus *Rissoina* [1] and which he christened *Rissoina inca*.[1]

Ten years later Dr. Karl Theodor Menke, in a paper, Conchylien von Mazatlan mit kritischen Anmerkungen, based on a large collection made in part by Heinrich Melcher, of Bremen, who spent several years at Mazatlan, and partly by an unnamed collector from whom Doctor Menke purchased a box of shells, also from Mazatlan, described *Rissoa stricta* [2] from that place. This is a true *Rissoina*.

Two years after this, Dr. F. H. Troschel, in his Verzeichniss der durch Herrn Dr. v. Tschudi in Peru gesammelten Conchylien, described *Rissoina sulcifera* [3] from Peru. This mollusk is not congeneric with *Rissoina* but must be referred to the Rissoid genus *Iravidia* of Blanford.

The same year Prof. C. B. Adams, of Amherst College, Massachusetts, published his Catalogue of Shells Collected at Panama.[4] In this paper, which details the result of one of the most wonderful records of intensive collecting, we learn that during the period between November 25, 1850, and January 3, 1851—that is, 40 days—Professor Adams collected and kept data upon no less than 41,830 specimens of mollusks. It is equally interesting to note that although the cases containing the specimens did not arrive until

[1] Voyage Amer. Merid., p. 395, 1840, pl. 53, figs. 11–16.
[2] Zeitschr. Malak., vol. 7, 1850, pp. 177–178.
[3] Wieg. Archiv. Naturg., vol. 1, 1852, pp. 154–155.
[4] Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, pp. 229–549.

August 14, 1851, the first part of the catalogue appeared in June, 1852, and the last part of the report upon the 516 species was printed in July of the same year, 11 months after the arrival of the collection at Amherst.

In this paper Professor Adams describes the following species under the genus *Rissoa* which belong to *Rissoina:*

Rissoa clandestina, p. 401.
Rissoa firmata, p. 401.
Rissoa fortis, p. 402.
Rissoa janus, p. 403.
Rissoa scalariformis, p. 404.

The last is a young specimen of *Rissoina firmata*. Here also the following shells are described as *Rissoa:*

Rissoa infrequens, p. 403, which is a *Pliciscala.*
Rissoa notabilis, p. 404, which is an *Odostomia.*
Rissoa inconspicua, p. 402, which is also an *Odostomia.*

Later Dr. Philip P. Carpenter reported upon a collection of shells made during 1848–1850 by Frederick Reigen, a Belgian gentleman, at Mazatlan. His report, Catalogue of the Collection of Mazatlan Shells in the British Museum, was published in parts during the years 1855–1857, the part dealing with our genus appearing in 1856.

Only two species are mentioned:

Rissoina stricta Menke, and
Rissoina woodwardii Carpenter,

the last being new.[1]

In 1860 O. A. L. Mörch, in his Beiträge zur Molluskenfauna Central Amerikas, a paper based upon shells collected by Dr. A. S. Oersted, lists the following members of the genus *Rissoina:*[2]

Rissoina woodwardi Carpenter, from Puntarenas.
Rissoina inca D'Orbigny, from Sonsonate.
Rissoina scalariformis, C. B. Adams, no specific locality mentioned.
Rissoina effusa Mörch, no specific locality mentioned.
Rissoina contabulata Mörch, Sonsonate.

The last two being additions to the Rissoina fauna of the West Coast of America.

In 1864 Dr. Philip P. Carpenter briefly described *Rissoina interfossa* on page 656 of his Supplementary Report on the Present State of our Knowledge with Regard to the Mollusca of the West Coast of America.[3] This he diagnosed more fully two years later on page 217 of his paper, Descriptions of New Marine Shells from the Coast of California.[4] This species has since been referred to the genus *Bit-*

[1] Cat. Mazat. Shells, 1856, p. 357.
[2] Maläk. Blät., vol. 7, 1860, pp. 67–78.
[3] Rept. Brit. Ass. Adv. Sci. for 1863.
[4] Proc. Cal. Acad. Nat. Sci., 1866, vol. 3.

tium; by Bartsch, in The Recent and Fossil Mollusks of the Genus Bittium from the West Coast of America, page 401.[1]

In the preceding year Doctor Carpenter described *Rissoina expansa* from Mazatlan, in his paper on Diagnosis of New Forms of Mollusca Collected by Col. E. Jewett on the West Tropical Shores of North America.[2]

The next paper dealing with members of this genus was published by L. DeFolin as Les Meleagrinicoles Especes Nouvelles (Havre, 1867). This deals with mollusks obtained from the burrows in pearl oyster shells, which came from the vicinity of Negritos, (does this mean Negros, P. I.?) and iles aux Perles (=Margarita Island), Bay of Panama. In this paper *Rissoa zeltneri* is described on pages 47–48 and figured on plate 5, figure 1, and *Rissoa insignis* on pages 48–49, figured on plate 5, figures 2 and 3.

The last species was made the type of the genus *Folinia* by H. Crosse in his review of DeFolin's paper.[3] Unfortunately, the name *Rissoa insignis* DeFolin is preoccupied by *Rissoa insignis* Adams and Reeve, 1850, which makes the new name given in our text necessary. We do not deem it of generic rank and shall consider *Folinia* a subgenus of the present group.

In 1870 DeFolin published *Rissoa laurae,*[4] which must be referred here.

No additions were made until 1897, when Dr. William Healey Dall, in his Notice of Some New or Interesting Species of Shells from British Columbia and the Adjacent Region, published *Rissoina newcombi*[5] from Cumshewa Inlet. This, to date, forms the northernmost record for the distribution of the genus on the west coast of America.

In 1902 the author described A New Rissoina from California,[6] calling it *Rissoina bakeri.*

In the same year Doctor Dall and the present writer described A New Rissoina from California,[7] under the name of *Rissoa kelseyi.*

The last paper dealing with West American members of this genus was published by Doctor Dall as Two Undescribed Californian Shells,[8] in which he described *Alaba oldroydi,* which must be considered as a synonym of *Rissoina kelseyi* Dall and Bartsch. This species has *Alabaid* sculpture, but has the clawed operculum of *Rissoina,* a fact unknown when Doctor Dall desoribed it, as all the specimens available at the time were without opercula. That he was in doubt about its

[1] Proc. U. S. Nat. Mus., vol. 40, 1911.
[2] Ann. Mag. Nat. Hist., ser. 3, vol. 15, 1865, p. 399.
[3] Journ. de Conch., vol. 16, 1866, p. 218.
[4] Fonds de la Mer., vol. 1, 1870, pp. 262–263.
[5] Bull. Nat. Hist. Soc. Brit. Col., No. 2, 1897, p. 14.
[6] Nautilus, vol. 16, p. 9.
[7] Idem, vol. 16, p. 94.
[8] Idem, vol. 19, 1905, p. 15.

generic position is shown by the statement following the description: "None of the specimens retains its operculum. The form of the shell, and especially of the aperture, recalls *Rissoina*, but the irregular varices, sculpture, and apex are more like *Alaba*. A certain amount of doubt as to its true zoological position must remain until the operculum is known."

I wish to express my extreme indebtedness to the Board of Trustees of Amherst College, and particularly to Prof. F. B. Loomis, through whose kind offices it was possible for me to have Prof. C. B. Adams' types of the Panama species for study, comparison and figuring. I am also indebted to Mr. Adolph Jensen, of the Zoological Museum of Copenhagen, for the loan of O. A. L. Mörch's types of his Central American forms.

The illustrations accompanying this report, with few exceptions, are from enlarged photographs made direct from specimens by Mr. T. W. Smillie, of the United States National Museum, and were retouched by Mrs. E. B. Decker. The exceptions are:

Carpenter's *Rissoina woodwardii*, of which I have not seen specimens, and of which I give camera lucida figures by Doctor Carpenter.

Of *Rissoina signae*, new name, *Rissoa insigne* DeFolin, *Rissoina laurae* DeFolin and *Rissoina zeltneri* DeFolin—I give figures copied from DeFolin's works because I have been unable to obtain specimens of these species.

ANALYTICAL KEYS.

KEY TO THE SUBGENERA OF THE WEST AMERICAN RISSOINAS.

Posterior angle of the aperture simple ..... *Rissoina*, pp. 38–61.
Posterior angle of the aperture almost constricted off into a separate opening by a projection from the parietal wall, and another apposing from the outer lip ..... *Folinia*, p. 61.

KEY TO SPECIES OF WEST AMERICAN RISSOINAS.

a^1. Spiral sculpture present.
  b^1. Spiral sculpture on spire and base.
    c^1. Axial sculpture consisting of prominent ribs.
      d^1. Axial ribs acutely sublamellar; intercostal spaces with cloth-like textured sculpture.
        e^1. Adult shell about 5 mm. long ..... *firmata*, p. 38.
        e^2. Adult shell about 3 mm. long ..... *excolpa*, p. 39.
      d^2. Axial ribs not acutely sublamellar; intercostal spaces without cloth-like textured sculpture.
        e^1. Summit of whorls strongly shouldered.
          f^1. Base evenly curved; without a tumid area or keel on the anterior third.
            g^1. Shell broadly conic.
              h^1. Basal sculpture uniform.
                i^1. Intercostal spaces about as wide as the ribs.
                  j^1. Basal cords 15, adult more than 8.5 mm. ..... *stricta*, p. 39.
                  j^2. Basal cords 13, adult not more than 7.5 mm ..... *fortis*, p. 40.

i^2. Intercostal spaces double the width of the ribs.
j^1. Basal cords 11 ..... *gisna*, p. 41.
j^2. Basal cords more than 15 ..... *inca*, p. 42.
h^2. Basal sculpture not uniform, consisting of strong spiral cords and fine lines between them ..... *favilla*, p. 43.
g^2. Shell not broadly conic but elongate conic.
h^1. Spiral sculpture of the spire exceedingly fine ... *mazatlanica*, p. 43,
h^2. Spiral sculpture of the spire strong ..... *helena*, p. 44.
f^2. Base not evenly curved, with a decidedly tumid area or keel anteriorly.
g^1. Base with a tumid area on the anterior third.
h^1. Adult shell 9 mm. long ..... *io*, p. 44.
h^2. Adult shell 7 mm. long ..... *dina*, p. 45.
g^2. Base with a strong keel at the insertion of the columella ..... *signae*, p. 61.
e^2. Summit of the whorl not strongly shouldered but appressed.
f^1. Shell elongate-ovate ..... *expansa*, p. 46.
f^2. Shell not elongate-ovate.
g^1. Shell elongate-conic.
h^1. Axial ribs less than 32.
i^1. Last whorl inflated ..... *peninsularis*, p. 46.
i^2. Last whorl not inflated ..... *adamsi*, p. 47.
h^2. Axial ribs more than 42 ..... *townsendii*, p. 48.
g^2. Shell not elongate-conic but broadly conic ..... *barthelowi*, p. 48.
c^2. Axial sculpture not consisting of prominent ribs; ribs obsolete.
d^1. Whorls shouldered ..... *kelseyi*, p. 49.
d^2. Whorls not shouldered but overhanging ..... *lapazana*, p. 50.
b^2. Spiral sculpture on base only.
c^1. Axial ribs present.
d^1. Base with two keels ..... *contabulata*, p. 51.
d^2. Base with one keel and two incised spiral lines ..... *histia*, p. 51.
d^3. Base with many spiral cords ..... *zeltneri*, p. 52.
c^2. Axial ribs absent ..... *laurae*, p. 52.
a^2. Spiral sculpture absent.
b^1. Axial sculpture consisting of strong ribs.
c^1. Axial sculpture consisting of strong ribs only.
d^1. Summit of the whorls shouldered.
e^1. Axial ribs lamellar ..... *burragei*, p. 52.
e^2. Axial ribs not lamellar ..... *nereina*, p. 53.
d^2. Summit of the whorls not shouldered.
e^1. Whorls decidedly constricted immediately anterior to the summit ..... *effusa*, p. 54.
e^2. Whorls not or scarcely at all constricted anterior to the summit.
f^1 Adult shell more than 4.5 mm. long ..... *pleistocena*, p. 54.
f^2. Adult shell 3 mm. or less.
g^1. Anterior portion of base bordered by a fasciole .... *californica*, p. 55.
g^2. Anterior portion of base without fasciole.
h^1. Axial ribs on last whorl 20 ..... *clandestina*, p. 55.
h^2. Axial ribs on last whorl 16 ..... *mexicana*, p. 56.

c^2. Axial sculpture not consisting of ribs only.
d^1. Axial sculpture consisting of ribs and fine raised threads between them.
e^1. Whorls decidedly inflated ..... *bakeri*, p. 56.
e^2. Whorls not inflated.
f^1. Axial threads between the ribs fine..... *woodwardii*, p. 57.
f^2. Axial threads between the ribs coarse ..... *newcombii*, p. 58.
d^2. Axial sculpture consisting of ribs but no fine threads between them; sculpture between the ribs consisting of irregular crinkly markings ..... *cleo*, p. 58.
b^2. Axial sculpture consisting of obsolete ribs.
c^1. Shell elongate-ovate..... *cerrosensis*, p. 59.
c^2. Shell not elongate-ovate but elongate-conic.
d^1. Shell slender, ribs faint, adult shell 2.8 mm..... *dalli*, p. 59.
d^2. Shell stout; ribs more strongly developed, adult shell 3.5 mm ..... *coronadoensis*, p. 60.

DESCRIPTION OF SPECIES.

RISSOINA FIRMATA C. B. Adams.

Plate 32, figs. 4, 6.

Rissoa firmata C. B. Adams, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, p. 401.
Rissoa scalariformis C. B. Adams, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, p. 402.

Shell of medium size, white, semitranslucent. Nuclear whorls decollated, a portion of the last turn only remaining. The succeeding turns are well rounded, decidedly appressed at the summit with somewhat of a shoulder, which extends over the posterior third of the spaces between the sutures. The whorls are marked with exceedingly strong, decidedly protractively curved sublamellar axial ribs, which are somewhat irregularly spaced. Twelve of the ribs occur upon the first and 14 upon the remaining turns. The intercostal spaces are at least four times as broad as the ribs and are crossed by very slender, closely spaced, quite evenly developed spiral threads, which pass up on the sides of the ribs, but do not appear to cross their summit. Of these spiral threads, about 40 occur between the sutures on the antepenultimate turn. Sutures well impressed, rendered sinuous by the strong ribs. Periphery well rounded. Base moderately long, marked by the strong continuation of the axial ribs, which extends to the umbilical space, intercostal spaces sculptured, like those of the spire. Aperture moderately large, broadly oval; posterior angle neither acute nor obtuse; outer lip very thick at the edge. Columella short, very stout, curved, reflected over and appressed to the base as a thick callus; parietal wall covered with a thick callus, which fuses with the outer lip and the columella.

Professor Adams's type was found in sand at Panama. It has 7 postnuclear whorls and measures: Length, 4.7 mm.; diameter, 2 mm.

Professor Adams's *Rissoa scalariformis*, of which he collected a single specimen at Panama, proves to be the young of the present

species. It lacks the strong basal callus resulting from the reflection of the columella, and also the thickened lip. See plate 32, fig. 4.

Professor Adams's shells are at Amherst College, Massachusetts. The United States National Museum contains three lots of this species: Cat. No. 4163, 1 specimen from the Cape of San Lucas; Cat. No. 46151, 3 specimens from the Gulf of California, and Cat. No. 222865, 3 specimens from Cape Pulmo, Gulf of California.

RISSOINA EXCOLPA, new species.

Plate 30, fig. 2.

Shell elongate-conic, semitransparent, bluish white. Nuclear whorls decollated, except the last turn, which is smooth. Post-nuclear whorls moderately well rounded, appressed at the summit—which creeps up on the preceding whorl—marked by sublamellar, somewhat sinuous, protractive, axial ribs, which are about one-third as wide as the spaces that separate them and form continuous lines from whorl to whorl. Of these ribs, 12 occur upon the first and 14 upon each of the remaining turns. In addition to the axial ribs, the whorls are marked in the intercostal spaces by exceedingly fine lines of growth which, combined with the spiral sculpture, lend the surface of the shell a very minutely reticulated appearance. The spiral sculpture consists of numerous, fine, spiral lirations, which are about as wide as the spaces that separate them. Of these lirations, 28 occur between the sutures on the penultimate turn. Suture moderately constricted. Periphery of the last whorl well rounded. Base somewhat produced anteriorly, well rounded, marked by the strong continuations of the axial ribs which extend to the anterior end of the shell, the spiral sculpture of the base being in every way similar to that on the spire. Aperture irregularly oval; posterior angle acute; outer lip thick, reinforced by a strong varix; columella short, stout, strongly curved and decidedly reflected over and adnate to the base; parietal wall covered with a thick callus, which renders the peritreme complete.

The type and two other specimens, Cat. No. 46155, U.S.N.M., come from the Gulf of California. The type has 5½ post-nuclear whorls and measures: Length, 4.1 mm.; diameter, 1.8 mm. Cat. No. 23748, U.S.N.M., contains 2 additional specimens from the Gulf of California.

RISSOINA STRICTA Menke.

Plate 28, fig. 6.

Rissoina stricta MENKE, Zeit. f. Malak., 1850, p. 177, No. 37.

Shell large, elongate-conic, bluish white. Nuclear whorls at least 2, well rounded, smooth, forming a well elevated helicoid spire. Post-nuclear whorls flattened, weakly shouldered at the summit, marked by strong, slightly curved, decidedly protractive axial ribs of which

12 occur upon the first, 14 upon the second, 16 upon the third, 18 upon the fourth, 20 upon the fifth, 22 upon the sixth, 26 upon the seventh, and 28 upon the penultimate whorl. These ribs extend prominently to the summit and render the sutures crenulated. Intercostal spaces almost as wide as the ribs, crossed between the sutures by numerous very fine, closely spaced, spiral striations. Base of the last whorl moderately long, well rounded, marked by the continuations of the axial ribs which extend undiminished to the umbilical chink and by 15 equal, and equally spaced, slender, spiral threads which extend prominently across the intercostal spaces and weakly over the ribs. Aperture small, very oblique, channeled anteriorly and posteriorly; outer lip very thick, reinforced immediately behind the edge by a strong varix; inner lip moderately thick, appressed to the base, sinuous, the anterior portion so arranged as to give the aperture the aspect of having a truncated columella.

Cat. No. 4062, U.S.N.M., contains 3 specimens from Cape San Lucas, 1 of which has served for our description and figure. This has lost the first 1½ nuclear whorls, retaining only 1 of them. It has 9 post-nuclear whorls and measures: Length, 8.7 mm.; diameter, 3.3 mm.

The following specimens are in the collection of the United States National Museum:

Cat. No. 4062, Cape San Lucas, Lower California, 3 specimens; Cat. No. 34209, La Paz, Lower California, 4 specimens; Cat. No. 46153, Gulf of California, 2 specimens; Cat. No. 46157, Gulf of California, 2 specimens; Cat. No. 46163, Mulege Bay, Lower California, 2 specimens; Cat. No. 46168, Gulf of California, 1 specimen; Cat. No. 76269, Mazatlan, Mexico, 1 specimen; Cat. No. 195370, St. Margarita Island, Lower California, 1 specimen; Cat. No. 222864, Cape Pulmo, Lower California, 9 specimens; Cat. No. 264297, south end of Tiburon Island, Gulf of California, 2 specimens; Cat. No. 264979, San Josef Island, Gulf of California, 12 specimens; Cat. No. 264990, Agua Verde Bay, Gulf of California, 14 specimens; Cat. No. 266657, San Francisquito Bay, Gulf of California, 3 specimens; Cat. No. 267154, San Francisquito Bay, Gulf of California, 12 specimens; Cat. No. 271616, Mazatlan, Mexico, 5 specimens.

RISSOINA FORTIS C. B. Adams.

Plate 29, figs. 5, 6.

Rissoa fortis C. B. Adams, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, p. 402.

Shell large, elongate-conic, milk-white. Nuclear whorls smooth, well rounded, separated by constricted sutures. Post-nuclear whorls flattened in the middle, roundly shouldered at the summit, marked by very regular, slightly sinuous, moderately protracted, well rounded axial ribs, of which 12 occur upon the first, 14 upon the second, 18

upon the third, 22 upon the fourth, 28 upon the fifth and sixth, and 30 upon the penultimate turn. These ribs extend prominently from the summit of the whorls to the umbilicus. Intercostal spaces a little wider than the ribs on the early turns, and about as wide on the later, marked by exceedingly fine and very numerous spiral threads. Sutures slightly sinuous. Periphery of the last whorl well rounded. Base short, well rounded, marked by the continuation of the axial ribs and about 13 spiral threads, which are much coarser than those on the spire. Aperture very oblique, auriculate, slightly channeled posteriorly and anteriorly, somewhat effuse at the junction of the basal and outer lip; outer and basal lip very much thickened at the edge; columella short, with a decided notch at its junction with the basal lip, reflected over and appressed to the base, where it appears as a thick callus; parietal wall covered with a thick callus, which joins the outer lip and the columella.

Thirty-one specimens of this species were collected by Professor Adams under stones, near low-water mark, at Taboga, Panama. We have figured two of these; the larger has 8 whorls and is minus the nucleus, and measures: Length, 7.5 mm.; diameter, 3 mm. The smaller has lost the first nuclear turn, and has 8 postnuclear whorls and measures: Length, 6 mm.; diameter, 2.7 mm. In addition to these two, 14 specimens of the type lot remain in the C. B. Adams' collection at Amherst. The United States National Museum has one, Cat. No. 204101, which was collected by the U. S. Bureau of Fisheries steamer *Albatross* on the beach at Taboquilla Island, Bay of Panama, and two additional specimens, Cat. No. 272937, from Panama.

RISSOINA GISNA, new species.

Plate 28, fig. 1.

Shell of medium size, bluish white, elongate-conic. Nuclear whorls $2\frac{1}{2}$, well rounded, smooth, forming a pupoid apex. Postnuclear whorls short, truncated, shouldered at the summit, moderately rounded, marked by decidedly protractive, feebly curved axial ribs, of which 14 occur upon the first, 16 upon the second to fourth, 18 upon the fifth and sixth, and 20 upon the penultimate turn. These ribs extend prominently to the summit and render the sutures sinuous. Intercostal spaces about two times as wide as the ribs, crossed by exceedingly fine spiral striations. Sutures well marked. Base short, moderately rounded, without fasciole, marked by the continuations of the axial ribs which extend undiminished to the umbilical chink. The intercostal spaces and the ribs are crossed by 13 slender, equal, and equally spaced, low, spiral cords which appear as coils of a bandage, the posterior edge of which is free. The extreme anterior portion of the base is free of spiral sculpture. Aperture small, channeled anteriorly and posteriorly; outer lip thin within, reinforced

immediately behind the edge by a strong varix; inner lip thin, sinuous, appressed to the base, the anterior portion is so arranged as to give the aperture the appearance of having a truncated columella. Peritreme complete.

The type and 15 specimens, Cat. No. 461588, U.S.N.M., come from Pearl Island, Panama. The type, a perfect specimen, has 8 postnuclear whorls, and measures: Length, 7 mm.; diameter, 3 mm. Cat. No. 23331, U.S.N.M., contains 3 specimens from the same place. Cat. No. 204118, U.S.N.M., contains 2 specimens from Perico Island, Bay of Panama. Cat. No. 272936, U.S.N.M., 7 specimens from Panama.

RISSOINA INCA D'Orbigny.

Plate 31, figs. 6, 8.

Rissoina inca D'Orbigny, Voy. Amer. Merid., 1840, p. 395, pl. 53, figs. 11–16.

Shell broadly conic, yellowish white, with a pinkish suffusion. Nuclear whorls smooth. Postnuclear whorls shouldered at the summit, which is rendered wavy by the axial ribs. Axial ribs strong, sinuous, about half as wide as the deep spaces that separate them. Of these ribs, 10 occur upon the first, 12 upon the second and third, 14 upon the fourth, and 16 or 17 upon the last whorl. These ribs extend prominently from the summit of the whorls to the umbilical area. The intercostal spaces are marked by fine spiral striations. Sutures rendered sinuous by the strongly developed ribs. Base well rounded, marked by a continuation of the axial ribs and strongly incised spiral cords, of which more than 15 are present. Aperture ear-shaped; outer lip reinforced immediately behind the edge by a thick callus; columella somewhat twisted and deflected; parietal wall covered with a thick callus, which renders the peritreme complete.

The type has 6 postnuclear whorls, and measures: Length, 8 mm.; diameter, 3 mm.

The species was collected by D'Orbigny in the neighborhood of Arica, Peru, and Cobija, Bolivia.

I have copied the figure given by Gustav Schwartz von Mohrenstern, in his monograph on the Family Rissoidae Besons. Abdr., vol. 19, Denksch. Math. Naturw. Class, Kais. Akad. Wissensch., p. 40, pl. 1, fig. 1, 1860, which gives more detail than Orbigny's original figure, which is a rather poor drawing. Mohrenstern says that Orbigny had found this species very abundant and had collected more than 1,000 specimens of it, and had been very generous in the distribution of his material.

This species is the type of the genus *Rissoina*, which was established by Orbigny in the same work in which he gives status to the present form.

RISSOINA FAVILLA, new species.

Plate 28, fig. 3.

Shell of medium size, bluish white, semitranslucent. Nuclear whorls decollated, except the last turn, which is smooth. Postnuclear whorls flattened in the middle, well rounded at the shouldered summit, marked by strong, very regular, somewhat curved protractive axial ribs, of which 14 occur upon the first and second, 18 upon the third, 20 upon the fourth, 22 upon the fifth, 26 upon the sixth and penultimate turn. These ribs extend prominently to the summit and render the sutures feebly wavy. Intercostal spaces as wide as the ribs, crossed between the sutures by very many, exceedingly fine, spiral striations. Sutures strongly marked. Base of the last whorl well rounded, marked by the continuations of the axial ribs which extend prominently to the umbilical chink and by about ten rather distantly spaced, spiral threads between which numerous, very fine, spiral striations occur. These threads extend prominently across the intercostal spaces, becoming obsolete on the ribs. Aperture rather large, very oblique, channeled anteriorly and posteriorly; outer lip thick, reinforced immediately behind the edge by a strong varix; inner lip appressed to the base, thick, sinuous, so arranged as to give the aspect of having a partially truncated columella. Peritreme complete.

The type, Cat. No. 4162*b*, U.S.N.M., comes from Cape San Lucas. It has the last nuclear whorl and 8 postnuclear turns and measures: Length, 7.1 mm.; diameter, 3 mm. Cat. No. 4062*a*, U.S.N.M., contains 2 specimens from the same locality. Cat. No. 46160, U.S.N.M., 1 specimen from Santa Maria Bay, Lower California.

RISSOINA MAZATLANICA, new species.

Plate 30, figs. 1, 3.

Shell small, elongate-conic, milk white. Nuclear whorls small, 1½, forming a depressed spire which gives the apex of the shell a truncated appearance. Post-nuclear whorls moderately rounded, appressed at the summit, marked by moderately strong, quite regularly disposed, rounded axial ribs, of which 14 occur upon the first and second, 16 upon the third, 18 upon the fourth, 24 upon the fifth, and 26 upon the penultimate turn. These ribs become somewhat enfeebled toward the summit, where they render the suture feebly sinuous. Intercostal spaces about as wide as the ribs, crossed between the sutures by numerous microscopic striations. Sutures feebly impressed. Base rather short, well rounded, marked by the continuations of the axial ribs and 13 equal, and equally spaced, slender, spiral threads which extend prominently across the intercostal spaces and

become obsolete on the ribs. Aperture small, channeled anteriorly and posteriorly; outer lip very thick; reinforced immediately behind the edge by a strong varix; inner lip very thick, sinuous, appressed to the base, the anterior portion being so arranged as to give the aperture the appearance of having a truncated columella.

The 2 cotypes and 9 other specimens, Cat. No. 46153, U.S.N.M., come from the Gulf of California. The young specimen of the two cotypes shows the nuclear whorls. The adult has lost all the nuclear turns, having 7 postnuclear whorls, which measure: Length, 6 mm.; diameter, 2.2 mm. Cat. No. 46154, U.S.N.M., contains 9 specimens from the Gulf of California. Cat. No. 46165, U.S.N.M., 4 specimens from the same place. Cat. No. 23763, U.S.N.M., 3 specimens from Mazatlan. Cat. No. 46153, U.S.N.M., 3 specimens from the Gulf of California. Cat. No. 59338, U.S.N.M., 20 specimens from Acapulco, Mexico. Cat. No. 251588, U.S.N.M., 3 specimens from Puerto Angeles, Oaxaca, Mexico.

RISSOINA HELENA, new species.

Plate 28, fig. 2.

Shell elongate-conic, yellowish white. (Nuclear whorls decollated.) Postnuclear whorls moderately rounded, very weakly shouldered at the summit, marked by very strong, slightly protractive axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third, and 22 upon the penultimate turn. Intercostal spaces about as wide as the ribs, marked between the sutures by about 30 well incised spiral striations, which are about as far apart as the spaces that separate them, causing these to appear as slender lirations. Base moderately long, well rounded, without fasciole, marked by the continuations of the axial ribs which extend to the umbilical chink and numerous spiral lirations, which are a little stronger here than on the spire. Aperture small, slightly channeled anteriorly and posteriorly; outer lip thick, reinforced immediately behind the edge by a thick varix; inner lip thick, appressed to the base, thickening anteriorly in such a way as to give the aperture the aspect of having a truncated columella.

The type and another specimen of this species, Cat. No. 149341, U.S.N.M., come from Peru. The type has 6 postnuclear whorls and measures: Length, 7.2 mm.; diameter, 3.1 mm.

RISSOINA IO, new species.

Plate 28, fig. 4.

Shell large, elongate-conic, yellowish white. Nuclear whorls decollated. Postnuclear whorls slightly rounded, almost flattened in the middle between the sutures, weakly shouldered at the summit, marked by strong, rounded, slightly sinuous, decidedly protractive

axial ribs which are about one-half as broad as the spaces that separate them. Of these ribs, 12 occur upon the first, 14 upon the second, 16 upon the third and fifth, 18 upon the sixth, 20 upon the seventh and penultimate turn. These ribs extend prominently to the summit, rendering the suture sinuous. Intercostal spaces marked between the sutures by numerous exceedingly fine, closely spaced, spiral striations. On the later turn a few of the coarser basal threads appear immediately above the suture. Base moderately long, marked by continuations of the axial ribs, which extend prominently to the umbilical chink, where they become somewhat fused, forming a basal fasciole. The spiral structure of the base consists of about 15 threads, which pass over the intercostal spaces and the axial ribs. The spaces separating these threads are almost equal to the threads in width. Aperture small, oblique, auricular, slightly channeled anteriorly and posteriorly. Outer lip thin at the edge, reinforced immediately behind the edge by a strong varix. Inner lip thick, appressed to the base, free only at the extreme anterior margin, connecting with the outer lip at the posterior margin and rendering the peritreme complete.

The type and another specimen, Cat. No. 46161, U.S.N.M., come from the Galapagos Islands. The type has 9 postnuclear whorls and measures: Length, 9 mm.; diameter, 3.5 mm. Cat. No. 56348, U.S.N.M., contains another specimen from the same locality.

RISSOINA DINA, new species.

Plate 29, fig. 4.

Shell medium size, elongate-conic, yellowish white. Nuclear whorls decollated. Postnuclear whorls moderately rounded, feebly shouldered at the summit, marked by strongly rounded, somewhat sinuous, protractive axial ribs of which 12 occur upon the first, 14 upon the second, 16 upon the third and fourth, 18 upon the fifth, 22 upon the sixth and the penultimate turn. These ribs extend prominently to the summit of the whorls, rendering the suture sinuous. Intercostal spaces about one and one-half times as wide as the ribs, marked between the sutures by exceedingly fine spiral striations. Base moderately long, marked by the continuations of the axial ribs, which extend prominently to the anterior portion of the base passing over the well-expressed fasciole. The spiral sculpture of the base consists of 16 low, broad cords which pass over the intercostal spaces and the ribs, appearing on the latter as overlapping tiles, the free edge being directed posteriorly. Aperture very oblique, small, auricular, channeled anteriorly and posteriorly; outer lip very thick within, reinforced immediately behind the edge by a strong varix; inner lip very thick, appressed and adnate to the base throughout its entire length.

The type and two other specimens, Cat. No. 56350, U.S.N.M., come from the Galapagos Islands. The type has 8 postnuclear whorls and measures: Length, 7 mm.; diameter, 3 mm.

RISSOINA EXPANSA Carpenter.

Plate 28, fig. 5.

Rissoina expansa CARPENTER, Ann. and Mag. Nat. Hist., ser. 3, vol. 15, 1865, pp. 399–400.

Shell broadly conic, bluish white, semitranslucent. Nuclear whorls decollated. Postnuclear whorls increasing rapidly in size, much broader at the sutures than at the summit, which is almost appressed; marked by low, broad, axial ribs which are less elevated and much wider at the periphery of the whorls than at the summit. Of these ribs, 16 occur upon the first, 18 upon the second and third, 22 upon the fourth, and 24 upon the penultimate turn. On the last two turns, these axial ribs become obsolete a little posterior to the periphery, leaving a narrow, smooth band in the sutures and on the posterior half of the base of the last whorl. The intercostal spaces are triangular in shape, being broader at the summit and narrowing at the suture, or periphery in the case of the last whorl. These spaces are not quite as wide as the ribs and are crossed by numerous, fine, spiral striations. Base inflated, well rounded, slightly concaved anteriorly, marked by very feeble continuations of the axial ribs which are scarcely more expressed than lines of growth and about 13 spiral cords which are situated on the anterior half of the base growing gradually weaker from the anterior portion of the base to the middle. Aperture very oblique, strongly channeled anteriorly and posteriorly; outer lip thick, claw-shaped; inner lip moderately thick, sinuous, strongly appressed to the base and so arranged as to give the aperture the aspect of having a truncated columella.

Doctor Carpenter's type, Cat. No. 15954, U.S.N.M., comes from Mazatlan, Mexico. It has lost the nucleus and probably the first 2 postnuclear turns. The 5 remaining measure: Length, 9.1 mm.; diameter, 4.7 mm. Cat. No. 59339, U.S.N.M., contains 2 specimens from Acapulco. Cat. No. 271642, U.S.N.M., 1 specimen from Guaymas, the latter a perfect specimen in every way excepting the lost nucleus. The 2 early postnuclear whorls in this have 14 and 16 axial ribs respectively. The spiral sculpture is a little more strongly expressed on the early whorls than on the succeeding turns.

RISSOINA PENINSULARIS, new species.

Plate 29, fig. 1.

Shell of medium size, elongate-conic, bluish white, semitranslucent. Early nuclear whorls decollated, one only remaining which is smooth. Postnuclear whorls increasing very regularly in size, flattened, much

wider at the sutures than at the appressed summit, marked by very regular, moderately strong, protractive axial ribs of which 16 occur upon the first, 18 upon the second, 22 upon the third, 24 upon the fourth, 30 upon the fifth, and 32 upon the penultimate turn. These ribs extend prominently to the summit, which they render feebly crenulated. Intercostal spaces as wide as the ribs, crossed by numerous, well-defined, equal, and equally spaced, incised, spiral lines, 28 of which occur between the sutures on the last turn. Sutures feebly impressed. Base of last whorl rather long, moderately rounded, marked by the continuations of the axial ribs which become very much enfeebled on the anterior portion of the base. In addition to the axial ribs, the base is marked with 19 almost equal and almost equally spaced spiral threads; these, in conjunction with the axial ribs, give the base a cancellatedly sculptured appearance. Aperture large, channeled anteriorly and posteriorly; outer lip patulous, very thick, reinforced immediately behind the edge by a strong varix; inner lip moderately thick, sinuous, appressed to the base and so arranged as to lend the aperture the aspect of having a partially truncated columella.

The type and another specimen, Cat. No. 56349, U.S.N.M., come from Cape San Lucas. The type has the last nuclear whorl and 7 postnuclear turns and measures: Length, 6 mm.; diameter, 1.5 mm. Cat. No. 45156, U.S.N.M., contains another specimen from the Gulf of California.

RISSOINA ADAMSI, new species.

Plate 30, fig. 5.

Rissoa janus var. *a.* C. B. ADAMS, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, p. 403.

Shell elongate-conic, bluish-white with a faint narrow, yellowish-white band marking the anterior boundary of the posterior third of the spaces between the sutures. Nuclear whorls decollated. Postnuclear whorls slightly rounded, appressed at the summit, marked by very regular, moderately protractive, slightly curved axial ribs, which are about as wide as the spaces that separate them. Of these ribs, 20 occur upon the second, 26 upon the third, 30 upon the fourth, 36 upon the fifth and the penultimate whorl. The shallow intercostal spaces are crossed by well-impressed spiral lines, of which about 25 occur between the sutures on the antepenultimate whorl. Sutures well impressed. Base short, prolonged, well rounded, marked by the feeble continuation of the ribs on the posterior two-thirds below the periphery, by about 13 spiral series of pits, which are broader and more deeply impressed than those of the spire, while on the extreme anterior portion of the base the spiral lines again become weakened. Aperture large, very oblique, decidedly patulous at the junction of the outer and basal lip. Posterior angle acute; outer lip very much thickened at the edge. Columella short, with a decided

twist a little posterior to its junction, with the basal lip reflected over and appressed to the base; parietal wall covered with a thick callus, which connects the columella with the outer lip.

The type, which is in the Amherst collection, and comes from Panama, has lost the nucleus and the first portion of the postnuclear whorl. The 7 remaining whorls measure: Length, 6 mm.; diameter, 2.3 mm.

RISSOINA TOWNSENDI, new species.

Plate 29, fig. 3.

Shell of medium size, elongate conic, bluish white. Nuclear whorls 3½, well rounded, smooth, shining; post-nuclear whorls appressed at the summit, moderately rounded, marked by strong, well-rounded, slightly protractive, axial ribs, of which 16 occur upon the first, 18 upon the second, 24 upon the third, 26 upon the fourth, 38 upon the fifth, and 52 upon the last turn. The intercostal spaces on the first 3 whorls are a little more than twice as wide as the ribs, while on the next 2 they are about double as wide. On the last turn, however, they are only about one and one-half times as broad as the ribs. In addition to the axial sculpture, the intercostal spaces are marked by well-incised spiral lines, of which about 22 occur on the penultimate turn. Sutures slightly impressed. Base somewhat produced, marked by the continuation of the axial ribs which extend to the umbilical chink, and by 13 well-rounded, somewhat irregularly spaced, spiral cords which are not quite as wide as the spaces that separate them. Aperture auricular; outer lip slightly channeled at the posterior angle and at the junction of the outer and basal lip; outer lip reinforced by a thick callus immediately behind the edge; columella short, stout, twisted and reflected over and appressed to the base; parietal wall covered with a thick callus which renders the peritreme complete.

The type and 2 additional specimens, Cat. No. 266290, U.S.N.M., were dredged by the author at Agua Verde Bay, Lower California.

The type has 6 postnuclear whorls and measures: Length, 5.3 mm.; diameter, 2.4 mm. Two additional lots of this species, both collected by the author in the Gulf of California, are in the collection of the U.S.N.M.: Cat. No. 265934, 1 specimen dredged in shallow water at Mulege, and Cat. No. 267287, Gulf of California.

RISSOINA BARTHELOWI, new species.

Plate 29, fig. 2.

Shell very regularly elongate-conic, bluish white, nuclear whorls 3, well rounded, smooth. Postnuclear whorls decidedly appressed at the summit, slightly rounded, the first two with a strong spiral cord which becomes decidedly weakened on the third whorl and disappears on the fourth. Axial sculpture consisting of closely placed

somewhat sinuous, rounded ribs which are much wider than the spaces which separate them, on the later whorls. On the first three turns the intercostal spaces are about twice as wide as the ribs. Of these ribs 16 occur upon the first and second, 18 upon the third, 24 upon the fourth, 30 upon the fifth, and 38 upon the sixth and penultimate whorl. The intercostal spaces are crossed by spiral lirations, of which three occur between the summit and the shoulder on the first three turns and three between the shoulder and the base of the same turns. These spiral threads become less strong on the succeeding turns, and more closely spaced. On the last whorl 15 are present between the summit and the periphery. The spiral threads are not quite as wide as the spaces that separate them. Sutures moderately impressed. Periphery of the last whorl slightly angulated. Base rather short and well rounded, marked by the continuations of the axial ribs, and 20 spiral cords which become successively stronger from the periphery to the umbilical area. Aperture very oblique, decidedly channeled at the posterior angle and at the junction of the columella and the basal lip; outer lip decidedly twisted, reinforced immediately behind the edge with a thick callus, posterior portion drawn forward into a claw-shaped element; columella short, twisted, reflected over and appressed to the base; parietal wall covered with a thick callus, which renders the peritreme complete.

The type and 106 specimens of this species, Cat. No. 267666, were dredged by the author at the head of Concepcion Bay, Lower California, in 2 to 4 fathoms of water. The type has 8 postnuclear whorls and measures: Length, 7 mm.; diameter, 3 mm.

RISSOINA KELSEYI Dall and Bartsch.

Plate 30, fig. 4.

Rissoa kelseyi DALL and BARTSCH, The Nautilus, vol. 16, 1902, p. 94=*Alaba oldroydi* DALL, The Nautilus, vol. 19, 1905. p. 15,

Shell cylindric-conic, varying in color from yellow to light red, unicolor or longitudinally streaked. Nuclear whorls 2, well rounded, smooth. Postnuclear whorls slightly shouldered at the summit, marked by obsolete, broad, rounded, low, axial ribs, of which 12 occur upon the first and second, and 14 upon the third and fourth, while on the penultimate whorl they are altogether wanting. In addition to the axial ribs, the whorls are marked by strongly incised, spiral lines, which are a little closer spaced at the summit of the whorls than at the suture. Of these, 15 occur upon the third, and 22 upon the penultimate turn between the sutures. Suture moderately constricted. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked like the spire by about 10 subequal and irregularly spaced, incised, spiral lines. Aperture irregularly oval, oblique; posterior angle obtuse; outer lip thick;

columella short, strongly curved and decidedly reflected over and appressed to the base; parietal wall covered with a thick callus, which joins the posterior angle of the aperture to the reflected edge of the columella, rendering the peritreme complete.

The type and 2 specimens, Cat. No. 168605, U.S.N.M., come from San Diego, California. The type has 6 postnuclear whorls and measures: Length, 6.3 mm.; diameter, 2.5 mm.

The following specimens have been examined:

Cat. No. 168605, U.S.N.M., 3 specimens from San Diego, California, one = figured type. Cat. No. 158771, U.S.N.M., 2 specimens from San Pedro, California, dredged in 10 fathoms (type of *A. oldroydi* Dall.). Cat. No. 128355, U.S.N.M., 8 specimens from San Pedro, California (beach drift and also living). Cat. No. 151732, U.S.N.M., 4 specimens from San Pedro, California. Cat. No. 213368, U.S.N.M., U.S.B.F. station 2932, 20 specimens off Coronados, California, in 20 fathoms, on gray sand and broken shell bottom. Cat. No. 271643, U.S.N.M., U.S.B.F. station 4347, off Point Loma Light, California, in 55–58 fathoms, on fine gray sand, broken shell, sponge, and mud bottom. (One specimen.)

RISSOINA LAPAZANA, new species.

Plate 30, fig. 6.

Shell of medium size, milk white, excepting a single narrow peripheral band of golden brown. Nuclear whorls large, a little more than two, well rounded, forming a mammilated apex. Postnuclear whorls well rounded, appressed at the summit, overhanging, and marked by about 14 feebly developed, distantly spaced axial ribs which are obsolete on the first and last turns. These ribs are about one-third as wide as the spaces that separate them. In addition to the axial ribs the whorls are crossed by subequal and subequally spaced, sinuous, spiral threads of which 7 occur on the first, 8 on the second, 11 on the third and fourth, and about 16 on the last turn. Of these the primary threads have been split usually on their middle by the intercalation of incised lines. The lines separating these cords are narrower than the cords. Sutures well impressed. Periphery of the last whorl well rounded. Base short, well rounded, marked by about 10 low, broad, spiral cords. Aperture large; outer lip very effuse, thin, showing the external sculpture within; inner lip strongly curved, thin, reflected over and appressed to the base.

The type, Cat. No. 211410, U.S.N.M., was dredged by the U.S. Bureau of Fisheries steamer *Albatross* at station 2823 in 26½ fathoms on broken shell bottom off La Paz, Gulf of California. It is a perfect specimen having almost 6 postnuclear whorls and measures: Length, 6 mm.; diameter, 2 mm.

RISSOINA CONTABULATA Mörch.

Rissoina contabulata MÖRCH, Mal. Blatt., vol. 7, 1861, p. 68.

Shell cylindric, scalate, with straight, distantly spaced, axial ribs. Of these ribs, which are squarish, about 14 occur upon the last turn. They are sharply cusped at the summit and joined together at the periphery by a strong spiral cord. Suture channeled. The axial ribs on the last whorl are joined on the middle by a squarish spiral cord. Columella encircled by a spiral cord. Aperture triangular lunate. Length, 3 mm.; diameter, 1 mm. A single specimen from Sonsonate.

To the above Mörch adds:

Rissoa scalaris Frem. Mon., fig. 32, has a great resemblance to this species, and has likewise a decollated apex. *Rissoa notabilis* Adams, Pan. Shells, p. 181, is not unlike it. The axial ribs and the two basal keels are angular with very deep interspaces.

Carpenter,[1] makes the following statement regarding the *Rissoa notabilis:*

After drawing this unique shell carefully under the microscope, and making copious notes on the diagnosis from the specimen, an untoward cough lodged it among the meshes of the curator's carpet, whence I endeavored in vain to extricate it. This unfortunate accident, however, is the less to be regretted, as I can state with perfect confidence that it was exactly identical with another shell in the collection, p. 255, q. v.; and with M. 498, *Parthenia quinquecincta*. The "concave summits" of the ribs imply that the ribs are sharp, with concave interstices; and the "upper keel" is simply due to the angulation of the whorls. Though the lip was broken, the columellar plait as well as the sinistral apex, escaped the professor's notice.

RISSOINA HISTIA, new species.

Plate 33, fig. 9.

Shell minute, highly polished, milk white. Nuclear whorls a little more than one, smooth, well rounded. Postnuclear whorls moderately rounded, appressed at the summit, polished, marked by exceedingly fine, microscopic, incremental lines only. Sutures moderately impressed. Periphery of the last whorl well rounded, marked by a single incised line. Base moderately long, well rounded, provided with a strong fasciole anteriorly, polished, marked by a single incised line which is a little anterior to the peripheral one which it equals in length. Aperture very irregular in outline, oblique, channeled anteriorly and posteriorly; outer lip claw-shaped, twisted and sinuous, having a little projection in the middle of the basal line reinforced immediately behind by a strong varix; inner lip thin, appressed to the base with which it becomes completely fused, the continuations of the curved basal fasciole being responsible for the projection on the basal lip.

The type, Cat. No. 151927, U.S.N.M., and another specimen were dredged by the U. S. Bureau of Fisheries steamer *Albatross* at stations

[1] Proc. Zool. Soc. London, 1863, p. 189.

2826 to 2828 in 9½ to 10 fathoms, off La Paz, Gulf of California. The type has 9 postnuclear whorls and measures: Length, 2.8 mm.; diameter, 1.1 mm.

RISSOINA ZELTNERI DeFolin.

Plate 31, fig. 3.

Rissoina zeltneri DeFolin, Les Meleagrinicoles, p. 47, 1867, pl. 5, fig. 1.

Shell elongate-conic, white, shining. Nuclear whorls smooth, well rounded, forming a helicoid spire. Postnuclear whorls marked by feebly developed, decidedly protractive, closely spaced, rounded axial ribs, of which DeFolin figures about 26 on the sixth, 28 on the seventh, 30 on the eighth, and 42 on the penultimate turn. Intercostal spaces very feebly impressed, smooth. Suture well marked. Base moderately long, slightly concaved anteriorly, crossed by the continuations of the axial ribs which extend to the umbilical chink and about 14 equal and equally spaced, spiral lirations which pass over the intercostal spaces and ribs. Aperture rather large, channeled anteriorly and posteriorly; outer lip effuse, reinforced immediately behind the edge by a strong varix; inner lip sinuous, thick and appressed to the base.

DeFolin's figure shows a shell of 10 whorls which measures: Length, 4.5 mm.; diameter, 1.8 mm. It comes either from Panama or Negritos Island (probably Negros, Philippine Islands). I have not seen this specimen.

RISSOINA LAURAE De Folin.

Plate 31, fig. 7.

Rissoina laurae De Folin, Fonds de la Mer, vol. 1, 1870, p. 263, vol. 24, fig. 3.

Shell small, ovate-conic, crystalline, shining. Apex subacute. Whorls 8, sutures moderately well impressed, the last whorl equaling the rest of the shell in length. Base well rounded, smooth, excepting a series of weakly developed spiral threads. Aperture semilunar, oblique; outer lip thickened, spirally lirated within.

De Folin's type comes from Panama and measures: Length, 2 mm.; diameter, 1 mm.

I have not seen this species and quote De Folin's description and copy his figure.

RISSOINA BURRAGEI, new species.

Plate 32, fig. 3.

Shell small, broadly conic, bluish white; nuclear whorls 2½, well rounded, smooth; postnuclear whorls somewhat inflated, shouldered near the summit, marked by very strong, curved, protractive, sublamellar axial ribs, of which 12 occur upon the first, 14 upon the second and third, 16 upon the fourth, and 18 upon the penultimate

turn. These ribs become slightly attenuated near the summit, frequently fusing there, with the ribs of the preceding turn. Intercostal spaces about three times as wide as the ribs; marked by lines of growth only. Sutures well impressed. Periphery of the last whorl well rounded. Base somewhat produced, marked by the continuations of the axial ribs, which fuse at the columella and there form a somewhat tumid area. Aperture oval; slightly channeled at the posterior angle and at the junction of the columella and the outer lip; outer lip reinforced by a thick callus immediately behind the edge; columella short, very thick, and somewhat reflected and appressed to the base; parietal wall covered with a thick callus which renders the peritreme complete.

The type and 12 specimens, Cat. No. 266595, were dredged by the author in shallow water in San Francisquito Bay, Gulf of California. The type has 6 postnuclear whorls and measures: Length, 3.7 mm.; diameter, 1.6 mm.

In addition to these, the following specimens, all dredged by the author in the Gulf of California, are in the collection of the U.S.N.M.: Cat. No. 267155, 1 specimen from the same locality; Cat. No. 264653, 1 specimen from the head of Concepcion Bay; Cat. No. 267623, 5 specimens from head of Concepcion Bay; Cat. No. 267662, an additional specimen from same locality; Cat. No. 265940, 16 specimens from Mulege; Cat. No. 266287, 2 specimens from Agua Verde Bay.

RISSOINA NÉREINA, new species.

Plate 32, fig. 1.

Shell small, elongate-conic, milk white. Nuclear whorls 3, decidedly rounded, scarcely increasing in diameter, forming a pupoid apex. Postnuclear whorls well rounded, increasing regularly in size, feebly shouldered at the summit, marked by strong, retractive axial ribs which are about one-half as wide as the spaces that separate them. Of these ribs, 14 occur upon the first and second, 16 upon the third, 18 upon the fourth, and 22 upon the penultimate turn. Intercostal spaces well impressed, smooth. Suture strongly impressed, slightly sinuous. Base of the last whorl somewhat prolonged, moderately rounded, marked only by the continuations of the axial ribs which extend prominently to the umbilical area. Aperture large, feebly channeled anteriorly and posteriorly; outer lip thickened at the edge, thin deep within, where the external sculpture may be seen by transmitted light; a strong varix reinforces the outer lip immediately behind its edge. Inner lip thick, slightly sinuous, appressed to the base, rendering the peritreme complete.

The type and eight additional specimens were obtained in shell washings at Point Abreojos, Lower California. The type has 5½ postnuclear whorls and measures: Length, 4.3 mm.; diameter, 2 mm.

Cat. No. 105574, U.S.N.M., contains 9 specimens from the same locality. Cat. No. 105560, U.S.N.M., 2 specimens from San Ignacio Lagoon. Cat. No. 105545, U.S.N.M., 2 specimens from Scammons Lagoon.

RISSOINA EFFUSA Mörch.

Plate 32, fig. 7.

Rissoina effusa Mörch, Mal. Blätt., vol. 7, 1860, p. 67.

Shell small, elongate-conic, yellowish white, translucent. Of the nuclear whorls the last volution only remains, the first half of which is well rounded and smooth, while the second half bears a small, acute spiral keel on its middle. Postnuclear whorls strongly, slopingly, shouldered at the summit, marked by very flexuous, strong, acute axial ribs, of which 10 occur upon the first, 12 upon the second, 14 upon the third, and 16 upon the remaining whorls. These ribs extend prominently over the shoulder at the summit where they take a protractive curve which emphasizes decidedly the sinuosity of the ribs. The intercostal spaces are strongly impressed and about three times as wide as the ribs. Sutures moderately constricted. The periphery of the last whorl well rounded, base somewhat prolonged, well rounded, marked by the continuation of the axial ribs which extend prominently to the callus at the end. Aperture moderately large, irregularly ovate, feebly channeled anteriorly and posteriorly; outer lip moderately thick at the edge, reinforced immediately behind the edge by a strong varix; inner lip twisted and strongly curved, strongly reflected over and appressed to the base in the form of a callus; parietal wall covered by a thick callus which renders the peritreme complete. The entire peritreme is heavier in this shell than in any other we have seen from the west coast.

Our description and figure have been based upon the type which was kindly loaned to us by Mr. Ad. Jensen of the Zoological Museum, of Copenhagen. The type has 6 postnuclear whorls and measures: length, 4.8 mm.; diameter, 1.9 mm. Locality, Central America, without specific designation.

RISSOINA PLEISTOCENA, new species.

Plate 32, fig. 2.

Shell small, elongate-ovate, yellowish white. Nuclear whorls decollated. Postnuclear whorls well rounded, appressed at the summit, marked by very strong, distantly spaced, lamelliform, protractive, axial ribs which form continuous series from the apex of the shell to the base. Of these ribs 12 occur upon the first to third whorls and 14 upon the remaining turns. Intercostal spaces a little more than three times as wide as the ribs, smooth. Suture moderately impressed, rendered wavy by the strong axial ribs. Base well

rounded, short, marked by the continuations of the axial ribs which extend to the umbilical area. Aperture rather large, slightly channeled anteriorly and posteriorly; outer lip very thick, reinforced immediately behind the edge by a strong varix; inner lip very thick, somewhat sinuous, appressed to the base. Peristome complete.

The type and another specimen, Cat. No. 7975, U.S.N.M., come from the Lower Pleistocene of San Diego. The type has 6 whorls and measures: Length, 4.8 mm.; diameter, 1.8 mm.

RISSOINA CALIFORNICA, new species.

Plate 33, fig. 1.

Shell very minute, elongate-conic, semi-translucent, yellowish white. Nuclear whorls 27, well rounded, smooth. Postnuclear turns well rounded, marked by strong, decidedly protractive, slightly sinuous axial ribs which are about half as wide as the spaces that separate them. Of these ribs 14 occur upon the first, and 16 upon the remaining turns. These ribs extend strongly from the summit to the sutures on each turn and are not at all constricted below the summit. The intercostal spaces are deep, well rounded, and smooth. Suture strongly impressed. Periphery of the last whorl well rounded, marked by the continuation of the axial ribs which extend over the somewhat prolonged base to the umbilical chink where they become slightly fused on the tumid area surrounding the umbilical region. Aperture oval; slightly channeled at the posterior angle and at the junction of the outer lip and the columella; outer lip reinforced immediately behind the edge by a thick callus; columella strongly reflected over and appressed to the base; parietal wall covered with a thick callus which renders the peritreme complete.

The type, Cat. No. 271644, U.S.N.M., was dredged in 3 fathoms off South Coronado Island by Doctor Baker. It has 5 postnuclear whorls and measures: Length, 2.8 mm.; diameter, 1.2 mm. Cat. No. 271645, U.S.N.M., contains the tip of a young specimen from Catalina Island, California.

RISSOINA CLANDESTINA C. B. Adams.

Plate 32, fig. 5.

Rissoa clandestina C. B. Adams, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, p. 401.

Shell very small, elongate-ovate, yellowish-white. Nuclear whorls 3½, smooth, well rounded, separated by a well impressed suture. Post-nuclear whorls moderately rounded, appressed at the summit, marked by protractive, somewhat sinuous, rather strong axial ribs, of which 14 occur upon the first, 16 upon the second and third, and 20 upon the penultimate turn. The spaces between the axial ribs are about three times as wide as the ribs and are smooth. Suture

rendered sinuous by the summit of the strong axial ribs. Periphery well rounded. Base moderately long, well rounded. Aperture decidedly oblique, oval; posterior angle acute, slightly channeled; outer lip very thick, reinforced by a callus on the outside; columella short, curved, very thick, reflected over and appressed to the base as a very thick callus; parietal wall covered with a thick callus which connect the outer lip and the insertion of the columella.

Three specimens of this species are in the collection of Amherst College. They were collected by Professor Adams at Panama and served for his description. The one described and figured above has 5 postnuclear whorls in addition to the nucleus, and measures: Length, 3 mm.; diameter, 1.2 mm.

RISSOINA MEXICANA, new species.

Plate 33, fig. 6.

Shell small, narrowly elongate-conic, bluish white, semi-translucent. Nuclear whorls 2, well rounded, smooth, forming a truncated pupoid apex. Postnuclear whorls appressed at the summit, moderately well rounded, marked by well developed, retractive, axial ribs which are about one-half as wide as the spaces that separate them and form continuous series from the apex to the base. Of these ribs 12 occur upon the first, 14 upon the second, 16 upon the third and the penultimate turn. Intercostal spaces smooth. Suture slightly wavy, feebly impressed. Base of the last whorl slightly produced, marked by the continuations of the axial ribs which extend prominently to the umbilical area. Aperture moderately large, weakly channeled anteriorly and posteriorly; outer lip thin within where the external sculpture is seen by transmitted light, thick at the edge and reinforced immediately behind the edge by a strong varix; inner lip thickened, appressed to the base, rendering the peritreme complete.

The type, Cat. No. 271646, U.S.N.M., was collected by the author along the rocky shores at Mazatlan. It has 4½ postnuclear whorls and measures: Length, 2.7 mm.; diameter, 1.2 mm. Cat. No. 15422, U.S.N.M., contains 1 specimen from Guacomayo, Mexico, and Cat. No. 46167, U.S.N.M., 1 specimen from the Gulf of California.

RISSOINA BAKERI Bartsch.

Plate 33, fig. 4.

Rissoina bakeri Bartsch, Nautilus, vol. 16, 1902, p. 9.

Shell small, sub-diaphanous, milk white. Nuclear whorls 2, quite large, with beveled shoulder, smooth. Postnuclear whorls well rounded, somewhat angulated at the anterior termination of the posterior fourth between the sutures, ornamented by 12 to 14

well developed, narrow, sinuous, protractive, axial ribs. Intercostal spaces about four times as wide as the ribs, marked by slender, very strong, axial threads. Sutures well impressed. Periphery of the last whorl well rounded. Base rendered concaved in the middle by a slender fasciole at its anterior termination, marked by the feeble continuations of the axial ribs and threads. Aperture large, very oblique, sub-oval, slightly notched at the posterior angle; outer lip reinforced by a thick varix immediately behind the edge; inner lip slender, strongly curved, appressed to the base, parietal wall covered with a thick callus.

The type, Cat. No. 130562, U.S.N.M., comes from San Pedro, California. It has 5 postnuclear whorls and measures: Length, 2.7 mm.; diameter, 1 mm. Cat. No. 271647, U.S.N.M., 1 specimen from Pacific Beach. Cat. No. 225186, U.S.N.M., 2 specimens dredged in 3 fathoms off Coronado Island. I have also seen it, from 12 fathoms, off Monterey, California. Cat. No. 271648, U.S.N.M., 1 specimen from Whites Point, California. Two from the same locality are in Mrs. Oldroyd's collection. One in Dr. Fred Baker's collection came from 3 to 7 fathoms, off Coronados Island, California.

RISSOINA WOODWARDII Carpenter.

Plate 31, figs. 2, 5.

Rissoina woodwardii CARPENTER, Cat. Mazatlan Shells, 1856, p. 357.

Shell small, elongate-ovate, semitranslucent. Nuclear whorls a little more than 3, smooth, forming a well elevated helicoid apex. Postnuclear whorls well rounded, marked by slender, lamelliform, protractive, axial ribs of which 12 occur upon the first and second and 14 upon the remaining whorls. These ribs are about one-fourth as wide as the spaces that separate them. The intercostal spaces are marked by lines of growth which appear as fine lirations on the early whorls, becoming obsolete on the later. Sutures strongly impressed. Aperture decidedly oblique; posterior angle acute, outer lip thickened at the edge; inner lip very thick, reflected over and appressed to the base, joining this with the outer lip to form a continuous peristome.

Seventy specimens of this species were collected on *Chama* and *Spondylus;* 11 of these are on Tablet 1706 in the Liverpool collection at the British Museum and 2 additional ones are on Tablet 1707 at the same place. Doctor Carpenter mentions in his Catalogue of Mazatlan Shells that an unusually large specimen measures: Length, 3 mm.; diameter, 0.8 mm.

I have not seen this species and figure an unpublished camera lucida drawing by Doctor Carpenter of it.

RISSOINA NEWCOMBEI Dall.

Plate 33, fig. 7.

Rissoina newcombei DALL, Bull. Nat. Soc. British Columbia, No. 2, 1897, art. 1, p. 14, pl. 1, fig. 2.

Shell small, elongate-conic, yellowish white. Nuclear whorls 2, well rounded, smooth. Postnuclear whorls well rounded, appressed at the summit, marked on the first whorl by about 30 slender, protractive, axial threads which are almost as wide as the spaces that separate them. On the second whorl about 42 of the same strength occur; here also the first indication of the more prominent ribs which are characteristic of the subsequent whorls, occurs. On the third whorl there are 14 slender, narrow, somewhat sinuous, protractive axial ribs which are about one-fourth as wide as the spaces that separate them. In the intercostal spaces of these whorls there are usually three of the finer riblets described for the whorls above. On the last whorl, the prominent riblets again become enfeebled and the surface is marked by about 36 of the finer threads. Sutures moderately impressed. Periphery of the last whorl well rounded. Base slightly concaved in the middle, marked by the continuations of the axial riblets. Aperture rather large, very oblique, slightly channeled posteriorly; outer lip claw-shaped, effuse, reinforced immediately behind the edge by a moderately thick varix; inner lip strongly curved, reflected over and appressed to the base; parietal wall covered with a moderately thick callus which renders the peritreme complete.

The type, Cat. No. 107421, U.S.N.M., was dredged in 20 fathoms in Cumsheava Inlet, Vancouver Island. It has almost 5 postnuclear whorls and measures: Length, 3 mm.; diameter, 1.1 mm.

RISSOINA CLEO, new species.

Plate 33, fig. 3.

Shell small, elongate-conic, milk white. Nuclear whorls 2, well rounded, slightly shouldered near the summit. Postnuclear whorls well rounded, very feebly shouldered at the summit, marked by slender, very distantly spaced, somewhat sinuous, decidedly protractive axial ribs, of which 16 occur upon the first, 18 upon the second and third, and 20 upon the penultimate whorl. Intercostal spaces about four times as wide as the ribs, marked by numerous, fine, irregular wavy markings which give a watered silk effect. Suture moderately constricted. Periphery well rounded. Base of last whorl moderately long, concaved in the middle, having a slender fasciole at its anterior termination, marked by the feeble continuations of the axial ribs and the same wavy sculpture observed in the intercostal spaces of the spire. Aperture large, decidedly effuse,

feebly channeled posteriorly; outer lip very thick and effuse, reinforced immediately behind the edge by a thick varix; inner lip slender, curved and appressed at the base; parietal wall covered with a thick callus which renders the peritreme complete.

The type, Cat. No. 226456, U.S.N.M., was dredged in 3 fathoms off South Coronado Island. It has almost 5 postnuclear whorls and measures: Length, 2.8 mm.; diameter, 1.2 mm.

RISSOINA CERROSENSIS, new species.

Plate 33, fig. 5.

Shell elongate-ovate, diaphanous. Nuclear whorls 2, well rounded, smooth. Postnuclear whorls well rounded, appressed at the summit, smooth, excepting feeble lines of growth and an occasional stronger thread. Suture moderately constricted. Periphery of the last whorl well rounded. Base moderately well rounded, without fasciole, marked like the spire. Aperture rather large, decidedly oblique, effuse at the junction of the outer and basal lips, feebly channeled anteriorly; outer lip thin; inner lip strongly curved, reflected over and adnate to the base; parietal wall covered with a moderately thick callus.

The type, Cat. No. 129318, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 2983 in 58 fathoms on sand bottom, bottom temperature 55°, off Cerros Island, Lower California. It has 5 postnuclear whorls and measures: Length, 2.4 mm.; diameter, 1.2 mm.

RISSOINA DALLI, new species.

Plate 33, fig. 2.

Shell small, elongate-conic, subdiaphanous. Nuclear whorls almost 2, inflated, well rounded, smooth. Postnuclear whorls moderately rounded, appressed at the summit, the appressed portion being somewhat excurved, lending the whorls the aspect of having a double suture. Whorls marked by numerous, very fine, closely spaced, almost vertical, axial threads which are about as wide as the spaces that separate them. Suture feebly impressed. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked like the spire. Aperture moderaly large, ovate; outer lip somewhat effuse, thick at the edge, thin within where the external sculpture is seen through the substance of the shell; inner lip moderately thick, strongly curved, reflected over and adnate to the base. Parietal wall covered with a thick callus which renders the peritreme complete.

Cat. No. 107281, U.S.N.M., contains the type and 18 specimens from San Pedro, Cal. The type has almost 6 postnuclear whorls

and measures: Length, 2.8 mm.; diameter, 1 mm. Sixty-one specimens were examined from the same locality, in Mrs. Oldroyd's collection. Cat. No. 129334, U.S.N.M., contains 8 specimens from San Pedro. Cat. No. 225187, U.S.N.M., 3 specimens, dredged in 3 fathoms off South Coronado Island.

RISSOINA CORONADENSIS, new species.

Plate 33, fig. 8.

Shell small, elongate-conic, milk white. Nuclear whorls a little more than 2, well rounded, smooth. Postnuclear whorls moderately rounded, appressed at the summit, the appressed portion slightly excurved, marked by slender, slightly protractive, somewhat sinuous, axial threads of which 40 occur upon the first, 42 upon the second, 48 upon the third, 56 upon the fourth, and 52 upon the penultimate turn. These threads are separated by intercostal spaces about as wide as the threads. Suture well impressed. Periphery of the last whorl well rounded. Base rather short, slightly concaved, marked by the continuations of the axial threads which extend undiminished to the umbilical area. Aperture oval, posterior angle acute; outer lip thin at the edge, thickened immediately behind the edge by a varix, thin deep within where the external sculpture shines through the substance of the shell; inner lip short, strongly curved, reflected over and adnate to the base; parietal wall covered with a thick callus which renders the peritreme complete.

The type, Cat. No. 271649, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 2932 in 20 fathoms, on gray sand and broken shell bottom, bottom temperature 58°, off Los Coronados Islands. The type has 6 postnuclear whorls and measures: Length, 3.5 mm.; diameter, 1.3 mm. Cat. No. 271650, U.S.N.M., 1 specimen, dredged by the *Albatross* at station 4309 in 67 to 78 fathoms on sand, shell and rocky bottom, off Point Loma, California. Cat. No. 162663, U.S.N.M., 1 specimen from San Martin Island, Lower California.

RISSOINA JANUS C. B. Adams.

Plate 32, fig. 8.

Rissoa janus C. B. Adams, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, p. 403.

The type of *R. janus* in the Amherst collection, collected by C. B. Adams, at Panama, is a very badly worn medium sized Rissoina, in which the ribs have been worn down to such an extent that one can scarcely count them. There are probably 20 on each of the last 2 whorls. It is absolutely impossible to decide whether spiral sculpture may have been present or absent. The only thing that will help in the identification of the present form with good material is the outline. The part of the original description referring to this character evidently belongs to var. *a*, which is now named *R. adamsi*.

The specimen has lost the nucleus; the 6 whorls remaining measure: Length, 4.5 mm.; diameter, 2mm.

I have seen nothing in the collection examined that we could refer to this species.

RISSOINA (Folinia) SIGNAE, new name.

Plate 31, figs. 1, 4.

=*Rissoa insignis* DE FOLIN, Meleagrinicoles, 1867, pp. 48–49, pl. 5, figs. 2 and 3, not *Rissoa insignis* Adams and Reeve, 1850.

Shell elongate-ovate, white. Nuclear whorls 2, well rounded, smooth; post-nuclear whorls exceedingly, strongly, tabulatedly shouldered at the summit, the axial ribs terminating at the angle of the shoulders in strong cusps. Axial ribs 12 upon all the turns, strong, sublamellar. Intercostal spaces about three times as wide as the ribs, crossed by very regular, fine, spiral striations. Sutures rendered deeply channeled by the summit of the whorls and wavy by the strong axial ribs. Periphery well rounded, base somewhat produced, marked by the continuations of the axial ribs, which become evanescent on the middle and fine spiral striations; anteriorly at the insertion of the columella a strong fasciole is present. Aperture oval, consisting of almost two openings—one the main portion, the other smaller portion connected with this by a narrow slit. It is really formed by a triangular projection of the strongly callused outer lip and another, equally strong, projecting inward from the strong parietal callus to meet this; columella strongly curved.

The type, which is said to come from Negrito Island (loc.?) or Margarita Island, Bay of Panama, measures: Length, 2.2 mm.; diameter, 1.2 mm.

EXPLANATION OF PLATES.

The measurement cited after each species is the actual length of the specimen.

PLATE 28.

FIG. 1. *R. gisna*, new species, type, 7 mm., p. 41.
2. *R. helena*, new species, type, 7.2 mm., p. 44.
3. *R. favilla*, new species, type, 7.1 mm., p. 43.
4. *R. io*, new species, type, 9 mm., p. 44.
5. *R. expansa* Carpenter, type, 9.1 mm., p. 46.
6. *R. stricta* Menke, 8.7 mm., p. 39.

PLATE 29.

FIG. 1. *R. peninsularis*, new species, type, 6 mm., p. 46.
2. *R. barthelowi*, new species, type, 7 mm., p. 48.
3. *R. townsendi*, new species, type, 5.3 mm., p. 48.
4. *R. dina*, new species. The fine sculpture on the spire has been omitted. Type, 7 mm., p. 45.
5. *R. fortis* C. B. Adams. The fine sculpture on the spire has been omitted. Cotype, 7.5 mm., p. 40.
6. *R. fortis* C. B. Adams. The fine sculpture on the spire has been omitted. Cotype, 6 mm., p. 40.

PLATE 30.

FIG. 1. *R. mazatlanica*, new species, cotype, 6 mm., p. 43.
2. *R. excolpa*, new species, type, 4.1 mm., p. 39.
3. *R. mazatlanica*, new species, cotype, p. 43.
4. *R. kelseyi* Dall and Bartsch type, 6.3 mm., p. 49.
5. *R. adamsi*, new species, type, 6 mm., p. 47.
6. *R. lapazana*, new species, type, 6 mm., p. 50.

PLATE 31.

FIG. 1. *R. signae*, new name, type, 2.2 mm., p. 61.
2. *R. woodwardii* Carpenter, back view, cotype, 3 mm., p. 57.
3. *R. zeltneri* De Folin, type, 4.5 mm., p. 52.
4. *R. signae*, new name, back of basal portion of last whorl, p. 61.
5. *R. woodwardii* Carpenter, cotype, 3 mm., p. 57.
6. *R. inca* D'Orbrigny, 8 mm., p. 42.
7. *R. laurae* De Folin, type, 2 mm., p. 52.
8. *R. inca* D'Orbigny, 8 mm., p. 42.

PLATE 32.

FIG. 1. *R. nereina*, new species, type, 4.3 mm., p. 53.
2. *R. pleistocena*, new species, type, 4.8 mm., p. 54.
3. *R. burragei*, new species, type, 3.7 mm., p. 52.
4. *R. firmata* C. B. Adams, type, 4.7 mm.=type of *R. scalariformis*, p. 38.
5. *R. clandestina* C. B. Adams, type, 3 mm., p. 55.
6. *R. firmata* C. B. Adams, type, 4.7 mm., p. 38.
7. *R. effusa* Mörch, type, 4.8 mm., p. 54.
8. *R. janus* C. B. Adams, type, 4.5 mm., p. 60.

PLATE 33.

FIG. 1. *R. californica*, new species, type, 2.8 mm., p. 55.
2. *R. dalli*, new species, type, 2.8 mm., p. 59.
3. *R. cleo*, new species, type, 2.8 mm., p. 58.
4. *R. bakeri* Bartsch, type, 2.7 mm., p. 56.
5. *R. cerrocensis*, new species, type, 2.4 mm., p. 59.
6. *R. mexicana*, new species, type, 2.7 mm., p. 56.
7. *R. newcombei* Dall, type, 3 mm., p. 58.
8. *R. coronadoensis*, new species, type, 3.5 mm., p. 60.
9. *R. histia*, new species, type, 2.8 mm., p. 51.