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On Non-Marine Shells from Northeastern Brazil and Peru

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Several collections of shells, recently received by Chicago Natural History Museum, fit into my previously published series of papers on the malacological fauna of South America (Haas, 1948-52). The present material adds considerably to our knowledge of the fauna of certain areas.

FRESH-WATER SHELLS FROM NORTHEASTERN PARÁ, BRAZIL

These shells, all gastropods, were collected by Dr. Harald Sioli, formerly of the Instituto Agronômico do Norte, Belém, Pará, and now in the Serviço Especial da Saúde Pública in Belo Horizonte, Minas Gerais, in the course of his official travels in the northeastern portion of the state of Pará. This region lies within 0° 30' to 1° 30' S. Lat. and 47° to 48° W. Long. and is crossed by many small coastal rivers. The malaco-fauna of the area is virtually unknown.

The following species of Ampullariidae were obtained by Dr. Sioli:

Ampullarius (Limnopomus) crassus Swainson

Localities: Igarapé, 27.5 km. north of Capanêma; Igarapé da Panela, 20 km. south of Bonito; Igarapé, 26 km. south of Bonito; Igarapé Salgado, 25.5 km. above Quatipurú.

Ampullarius (Limnopomus) nubilus Reeve

Localities: Rio Axindeúá; Rio Jaburú, between Capanêma and Salinópolis; Rio Siquiribão, 22.4 km. from Quatipurú.

Ampullarius (Ampullarius) papyraceus Spix

Localities: Rio Axindeúá; headwaters of Rio Peixe Boi at Bonito; Rio Soares, 23.7 km. above Quatipurú; Rio Paracanema at Fazenda

Velha, 6.5 km. above Pirabas; Igarapé, 11.1 km. south of Salinópolis and 14.8 km. west of Capanêma.

Ampullarius (Ampullarius) insularum Orbigny

Localities: Igarapé do Comarú, 10 km. south of Bonito; Igarapé Capanêma, 8 km. west of Capanêma; 8.7 km. from Pirabas; Igarapé, 11.9 km. above Pirabas; Igarapé Tres Antas, 25.9 km. above Quatipurú; Rio Siquiribão, 22.4 km. above Quatipurú; Igarapé do Major, near Derubada; Igarapé Corema near Salinópolis.

Ampullarius (Ampullarius) bridgesii Reeve

Localities: Tributary of Igarapé do Garrafão; Igarapé, 8 km. west of Capanêma; Igarapé, 18 km. above Quatipurú; Rio Soares, 23.7 km. above Quatipurú.

Large numbers of the following hydrobiid gastropod were also taken:

Potamopyrgus (Potamopyrgus) subgradatus Haas

Locality: Rio Urindeúa.

The presence of the two species of the subgenus *Limnopomus* of *Ampullarius* is surprising, since *Limnopomus* is presumed to be Upper Amazonian or even Andean in origin. On the other hand, the presence of the three forms of *Ampullarius* proper was to be expected. The fact that all the specimens of this species in the collection are Amazonian suggests that these coastal rivers were once tributaries of an Amazon river that extended much farther to the east than it does now.

LAND SHELLS FROM THE HIGH ANDES OF PERU—I.

The Peru Zoological Expedition, 1953, of Chicago Natural History Museum, gathered many land gastropods that are of interest because they include many new species as well as some forms described long ago by A. Morelet and L. Reeve and rarely, if ever, rediscovered. The collector, Mr. Celestino Kalinowski, obtained most of the shells in the Departments of Ayacucho, Huancavelica, and Apurimac, all of them little known zoologically.

HELICINIDAE

Helicina (Helicina) peruviana Morelet

Locality: Ceachubamba, Cuzco; collected between July 22 and August 30, 1953.

***Helicina (Helicina) chionea* Pilsbry**

Localities: Hacienda Piso, Mayoc, Huancavelica; collected on December 7-8, 1953. On km. 62 of the road from Huancayo to Mejorada, Huancavelica; collected on December 28, 1953.

SUCCINEIDAE***Succinea peruviana* Philippi**

Locality: Hacienda Piso, Locroja, Huancavelica; collected on December 8, 1953.

***Succinea aequinoctialis* Orbigny**

Locality: Hacienda Piso, Mayoc, Huancavelica; collected on December 7, 1953.

VERTIGINIDAE***Gastrocopta (Gastrocopta) wolfii* Miller**

Localities: Lircay, Huancavelica, 3,310 meters altitude; collected on December 17, 1953. Hacienda Piso, Mayoc, Huancavelica; collected on December 7, 1953.

Chicago Natural History Museum also has specimens from Huanta, Ayacucho, 2,600 meters altitude. This is the first record, to my knowledge, of the Ecuadorian *Gastrocopta wolfii* from Peru.

CLAUSILIIDAE***Nenia (Neniactra) adusta* O. Boettger**

Locality: Lircay, Huancavelica, 3,310 meters altitude; a large series collected on December 17, 1953.

***Nenia (Neniactra) adusta tumens* subsp. nov. Figure 57.**

Type.—Chicago Natural History Museum no. 51361; collected on km. 62 of the road between Huancayo and Mejorada, Huancavelica, Peru, on December 28, 1953.

Diagnosis.—A subspecies of *Nenia (Neniactra) adusta* O. Boettger, characterized by its distinct obesity.

Comparisons.—Closely related to the nominate form but easily distinguished by its more swollen later whorls and by the more solute last whorl.

Description of type.—Shell subsolid, definitely fusiform, with 11 whorls that are slightly swollen near the apex, becoming gradually flatter toward the aperture; last whorl somewhat solute; surface of shell covered with crowded, fine, whitish hair striae that become more irregular on the ultimate whorl.

Measurements of type.—Length 19.6 mm., width 5.0 mm., height of aperture 5.0 mm., width of aperture 3.7 mm.

Paratypes.—A series of paratypes (no. 51362), with the same data as the type, shows little variation but for the dimensions, which vary from 18 mm. to 24.9 mm. in the length and from 4.2 mm. to 5.7 mm. in the width of the shell.

***Nenia* (?) *angrandi kalinowskii* subsp. nov.** Figure 58.

Type.—Chicago Natural History Museum no. 51363; collected on November 28, 1953, at Polanco, Tambo, San Miguel, Ayacucho, Peru, at 4,100 meters altitude, by Mr. Celestino Kalinowski, after whom this new subspecies is named.

Diagnosis.—A subspecies of *Nenia angrandi* Morelet, characterized by its length and stoutness.

Comparisons.—Obviously a form of *Nenia angrandi* Morelet but distinguished from this species and from its subspecies *urubambensis* Pilsbry by being a trifle, but constantly larger, more regularly fusiform, and by its somewhat longer, less circular aperture.

Description of type.—Shell thin, with $9\frac{1}{2}$ whorls, of which the two first are light brown in color, almost horn-like, whereas the following ones are of a brown that gradually grows darker, almost purplish, toward the aperture. The surface is covered with crowded, hair-like striae that are often a little bit darker than the interstices between them. All the whorls increase gradually in thickness, rendering the outline of the shell perfectly fusiform. The ultimate whorl is but very little solute, the aperture is roundish-pearshaped; there is no basal keel on the last whorl, only a very inconspicuous "pinched" elevation, which is easily overlooked.

Measurements of type.—Length 16.2 mm., width 3.7 mm., height of aperture 3.5 mm., width of aperture 2.9 mm.

Paratypes.—There is a large series of paratypes (no. 51282), with the same data as the type, in which little variation, except as



FIG. 57. *Nenia (Neniactra) adusta tumens* subsp. nov. CNHM no. 51361, type, front view; about $\times 3$.



FIG. 58. *Nenia (?) angrandi kalinowskii* subsp. nov. CNHM no. 51363, type, front view; about $\times 3$.

to the dimensions, can be seen. One of the largest specimens is 17.2 mm. high and 4.0 mm. wide, whereas one of the smallest measures 15.8 mm. in length and 3.7 mm. in width. One more paratype (no. 51283) was taken at Huancavelica on December 14, 1953.

Remarks.—There can be no doubt that this novelty is closely related to *Nenia angrandi urubambensis* Pilsbry; however, it is by no means certain that the two are in fact subspecies of *Nenia angrandi* Morelet. Both lack the basal keel that Morelet's species is supposed to have. I thus agree with Pilsbry (1945, p. 84) that his subspecies *urubambensis* might represent a different species, to which, of course, *kalinowskii* would belong.

Nenia (Incania) warszewiczi Polinski

Locality: Ccachubamba, Marcapata, Cuzco; collected between July 22 and August 30, 1953.

To the best of my knowledge this is only the second time that this species, described in 1925 (Polinski, 1925, p. 739) from the

"Andes du Pérou," has been recorded; the locality given here is therefore the first exact one we have of this distinct species.

Nenia (Gonionenia?) weyrauchi Pilsbry

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho, 2,000 meters altitude; collected in October, 1953.

ENDODONTIDAE

Radiodiscus (Radiodiscus) peruvianus Crawford

Localities: Huancavelica, 3,680 meters altitude; collected on December 11, 1953. Another lot from the same locality; collected on December 14, 1953. Lircay, Huancavelica, 3,310 meters altitude; collected on December 17, 1953.

On the second of these stations, this species occurs together with its relative, *Radiodiscus (Radioconus) andium* Pilsbry.

Radiodiscus (Radioconus) andium Pilsbry

Localities: Huancavelica; collected on December 14, 1953. San Jenaro, Santa Inez, Huancavelica, 4,760 meters altitude; collected on December 25, 1953.

SYSTROPHIIDAE

Systrophia (Systrophiella) andivaga Pilsbry

Localities: Hacienda Piso, Mayoc, Huancavelica; collected on December 7, 1953. Lircay, Huancavelica, 3,310 meters altitude; collected on December 17, 1953. Huancavelica; collected on December 14, 1953. Hacienda Pajonal, Ocos, Cangallo, Ayacucho, 2,000 meters altitude; collected in October, 1953. Hacienda Palmira, Andahuaylas, Apurimac; collected on September 18, 1953.

ARIOPHANTIDAE

Habroconus (Pseudoguppya)? semen-lini Moricand

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho; collected in October, 1953.

Since the series that I tentatively call *H. semen-lini* consists of only immature specimens, the identification may not be correct.

No species of *Habroconus* has hitherto been recorded from Peru; the species *semen-lini* is thus far known only from northeastern South America, so that its presence in the Andes seems rather doubtful.

STROPHOCHEILIDAE

Strophocheilus (*Megalobulimus*) *popelairianus* Nyst

Locality: Hacienda Cadena, Cuzco; one specimen collected on August 30, 1953.

Strophocheilus (*Megalobulimus*) *maximus vestitus* Pilsbry

Locality: Limacpunco, Cuzco; two specimens, collected on July 11, 1953.

BULIMULIDAE

Thaumastus (*Scholvenia*) *porphyreus* Pfeiffer

Locality: Hacienda Mozobamba, Ongoy, Andahuaylas, Apurimac; a large series collected on October 10, 1953.

Thaumastus (*Scholvenia*) *schmidti* sp. nov. Figure 59.

Type.—Chicago Natural History Museum no. 51305; collected in Hacienda Piso, Locroja, Huancavelica, Peru, December 8, 1953.

Diagnosis.—A medium-sized species of the subgenus *Scholvenia*, characterized by its rather stout shape, the presence of a columellar fold, and a comparatively faint pattern of light bands on a dark background.

Comparisons.—*Thaumastus* (*Scholvenia*) *jelskii* Lubomirski seems to be the closest relative of this novelty, sharing with it the general shape of the shell and the possession of a columellar fold; it differs, however, by being more delicate in general and by an entirely different color pattern. *Thaumastus* (*Scholvenia*) *bitaeniatus* Nyst, though rather similar to our new species, is more slender and strictly two-banded.

Description of type.—Shell ovately conical, rather stout, narrowly perforated, subsolid, consisting of $8\frac{1}{2}$ moderately convex whorls, which at first grow regularly; last whorl almost two-thirds of entire height; suture distinct, bordered with white from the fifth whorl on, showing white, squarish crenulations from about the fifth whorl.

Surface of shell light horn color, with the typical sculpture on the nepionic whorls, becoming a darker grayish brown on the later whorls. From three to four whitish, diluted bands appear from the fourth whorl on, one subsutural, one supraperipheral, and one or two subperipheral ones, to which is added, on the ultimate whorl,



FIG. 59. *Thaumastus (Scholvenia) schmidti* sp. nov. CNHM no. 51305, type, front view; about $\times 1.5$.

a circumumbilical one. Rather heavy, irregular, axial striae cover the entire surface, the third or fourth being always a little stronger and more projecting, thus creating the crenulations mentioned before; the striae on the first post-nepionic whorls are cancelled by distinct spiral lirae, thus producing grains on the points of intersection. On the later whorls, the spiral lirae become more inconspicuous and too weak to cross the heavier axial striae. The aperture is about five-twelfths of the entire height of the shell, pear-shaped, with a white lip that is reflected except for the right upper margin; the columella is broad, white, and has an entering, broad fold; the parietal callus is whitish and rather thick.

Measurements of type.—Length 46.1 mm., width 20.0 mm., height of aperture 19.7 mm., width of aperture 13.2 mm.

Paratypes.—There are two sets of paratypes at hand, one (no. 51306) with the same data as the type; the other (no. 51307) comes

from Hacienda Piso, Mayoc, Huancavelica, and was collected on December 7, 1953. All of them look very much alike and show, besides slight differences in the intensity of the color pattern, only the usual variation of measurements. Thus, the height of the shell varies between 38.2 mm. and 50.2 mm., and the width between 17.2 mm. and 21.1 mm.

Neopetraeus platycheilus sp. nov. Figures 60, 61.

Type.—Chicago Natural History Museum no. 51315, from Hacienda Palmira, Andahuaylas, Apurimac, Peru; collected September 18, 1953.

Diagnosis.—A species of the group of *Neopetraeus* with completely smooth apical whorls, and notable among these by its thin, translucent shell and the wide peristome with almost joined margins.

Comparisons.—The only near relative, *Neopetraeus rhodolarynx* Reeve, also from Peru, is said to have a rather solid shell, whereas this new species is thin-shelled and translucent; furthermore, in *rhodolarynx* the margins of the peristome are not as convergent as in *platycheilus*.

Description of type.—Shell oblong conic with a sharply pointed apex, thin, translucent, with an open, shaft-like umbilicus. Whorls 8, growing rapidly but regularly, separated by a simple suture; nepionic whorls $2\frac{1}{2}$, swollen, glossy, and yellowish, smooth; post-nepionic whorls less ventricose, grayish with brownish streaks or rows of triangular spots, slightly hair-striate; the bases of these spots spirally arranged, so as to represent an incomplete band; occasional traces of spiral striation in the spaces between the hair striae on the earlier whorls. Last whorl a little ascending in front, smoother than the earlier ones, with traces of spiral lines on the under side, which is slightly compressed around the umbilicus and descends steeply into it. Aperture rounded-oval, somewhat oblique, measuring almost one-half of the entire height of the shell, with an expanded, livid lip, narrower near the curved right upper margin, much wider at the right lower margin and below, then narrowing again to broaden into a triangular wing that hides, but does not close, the umbilicus; both ends of the peristome close together but not joined; inside of the aperture a livid brownish color.

Measurements of type.—Height 34.3 mm., width 16.6 mm., height of aperture 18.0 mm., width of aperture 13.2 mm.

Paratypes.—One set of paratypes (no. 51316) with the same data as the type. Besides some variation in the intensity of the color

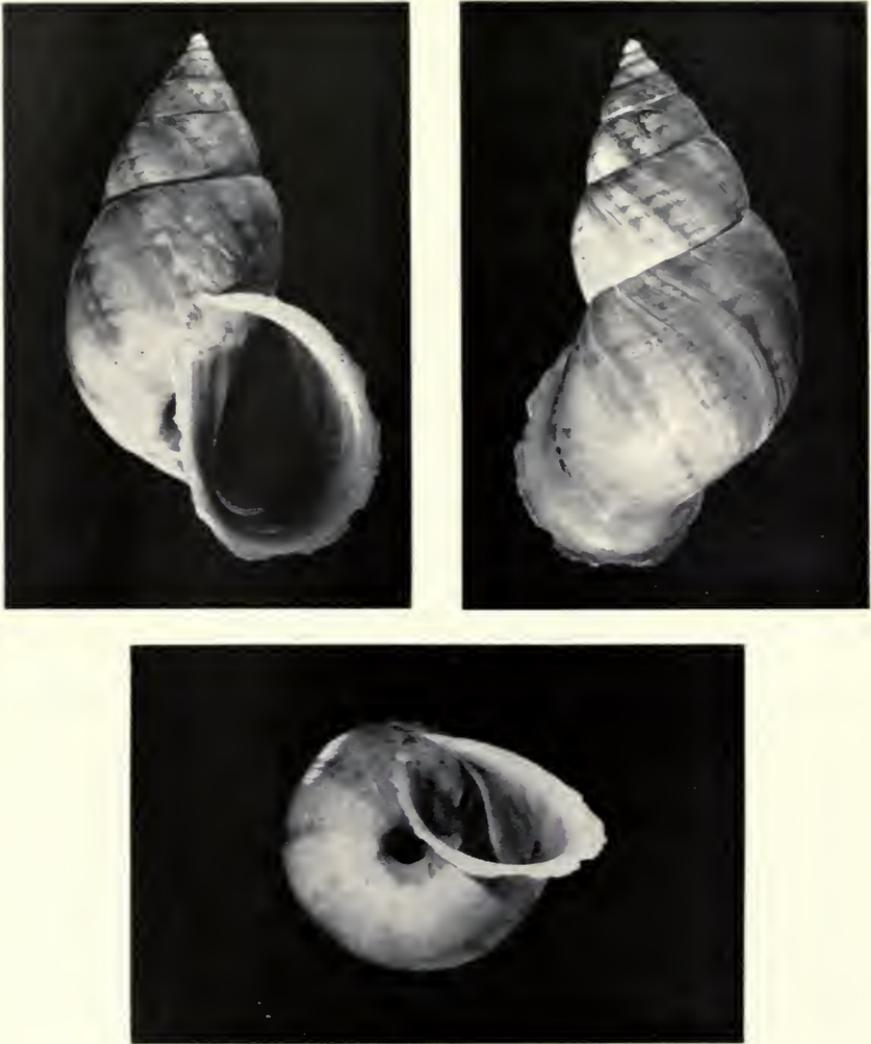


FIG. 60. *Neopetraeus platycheilus* sp. nov. CNHM no. 51315, type, front, back, and bottom views; about $\times 2$.

pattern—some specimens hardly showing any trace of pattern, while in others the brownish spots predominate over the basic gray color—there is some variation also in the shell measurements. Thus, the height may vary from 31.3 mm. to 37.7 mm., and the width from 15.8 mm. to 18.6 mm. Young specimens of this lot have the last whorl keeled,

Another set of paratypes (no. 51317), from Hacienda Pajonal, Ocos, Cangallo, Ayacucho, 2,000 meters altitude, was collected in October, 1953. While the specimens represented in it belong doubtless to the same species, *platycheilus*, they differ from those of the first lot by being conspicuously smaller, the height varying between 22.1 mm. and 30.2 mm., with a mean height of 25.5 mm. (fig. 61).



FIG. 61. *Neopetraeus platycheilus* sp. nov. CNHM no. 51317a, paratype, front view; about $\times 2$.

The Ayacucho shells are more solid and are bluish-white without any color markings; their aperture is more nearly circular and its lip is reflected at a right angle. However, some small specimens from that lot show the basic color of the Apurimac series, marked by several narrow grayish bands.

Drymaeus (Drymaeus) serotinus Morelet

Localities: Huanta, Ayacucho, 2,800 meters altitude; collected on December 3, 1953. Mayoc, Huancavelica; collected on December 6, 1953. Hacienda Piso, Mayoc, Huancavelica; collected on December 7, 1953.

The specimens of the three lots differ in a very peculiar way, aside from the well-known and considerable variation of the shell measurements. Those from Huanta are thin, very frail, subpellucid and of the typical color pattern displayed in all the variations listed

by Pilsbry (1898, p. 293). Only a few of those from near Mayoc show these characteristics, the majority being composed of subsolid, chalky white shells often even without a vestige of the typical color pattern. The specimens having this pattern are heavier and more solid than those from Huanta, and the background of the pattern is chalky white too. In addition, the specimens from Mayoc are decidedly longer than those from Huanta. Some of the shells from Hacienda Piso resemble the frail, grayish or corneous form with the typical pattern, whereas others resemble the more solid, whitish, elongated form from Mayoc.

Measurements of the shells from Huanta: height 26.8 to 33.5 mm., width 10.9 to 12.8 mm.

Measurements of the shells from Mayoc: height 30.7 to 41.6 mm., width 13.5 to 16.0 mm.; one specimen is 30.9 mm. high and 15.0 mm. wide, being thus much stouter and less cylindrical, and having a widely open umbilicus.

It may be added, finally, that a characteristic of this species is its exceedingly weak apical sculpture, which in many individuals, including some immature shells, can hardly be detected.

Drymaeus (Drymaeus) schmidti sp. nov. Figure 62.

Type.—Chicago Natural History Museum no. 51323, from Ccachubamba, Marcapata, Cuzco, Peru; collected between July 22 and August 30, 1953.

Diagnosis.—A species of the typical subgenus of *Drymaeus*, characterized by its frail shell, by the pointed, canaliculate lower end of the aperture, and by a roundish, pinched-up keel around the umbilical chink.

Comparisons.—This new species resembles the Bolivian *D. canaliculatus* Pfeiffer, the Colombian *D. pamplonensis* Pilsbry, and the Peruvian *Goniosomus subhybridus* Da Costa (probably a *Drymaeus*!) in the shape of the aperture. All three species, however, are larger than *schmidti*. In addition, *schmidti* differs from *canaliculatus* in color pattern, from *pamplonensis* in apical structure, and from *subhybridus* in color pattern and relative shell width.

Description of type.—Shell thin, transparent, fusiform, wrinkle-striate, narrowly umbilicate, shining, creamy white, at places mottled pale grayish-green, with an ill-defined bluish band at the aperture. Spire acute, its apex of a reddish horn color. Whorls $5\frac{1}{2}$, little convex, the last somewhat higher than the spire, with a rounded, pinched-up keel around the umbilical chink; suture dis-

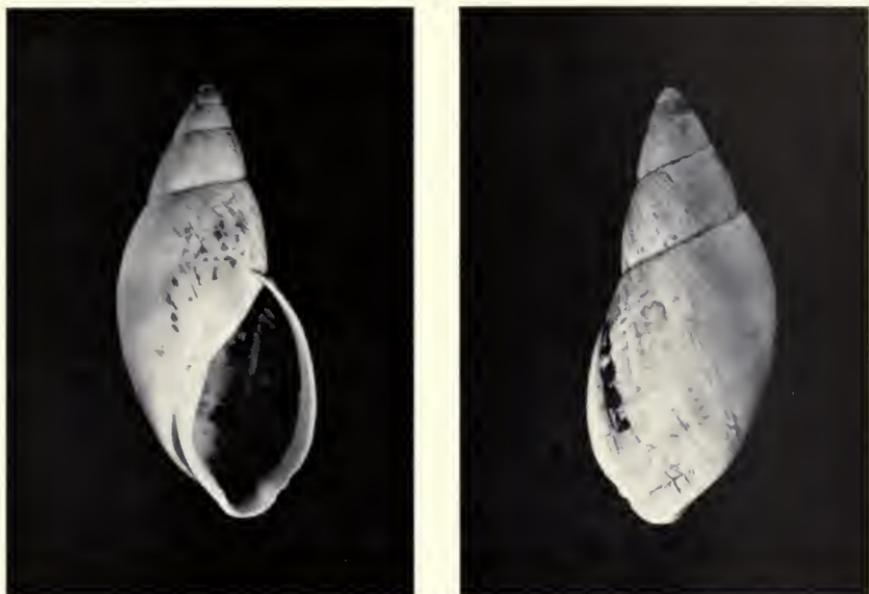


FIG. 62. *Drymaeus (Drymaeus) schmidti* sp. nov. CNHM no. 51323, type, front and back views; about $\times 2$.

tinct, crenulate; columella arcuate, prolonged forward. Aperture oval, pointed at both ends, channelled at base; a heavy blackish-brown border on the inside, well defined toward the lip, ill defined toward the inside; peristome simple, the right margin slightly expanded, the columellar margin narrowly reflected.

Measurements of type.—Length 28.2 mm., width 12.1 mm., height of aperture 16.0 mm., width of aperture 8.7 mm.

Paratypes.—A series of paratypes (no. 51324) with the same data as the type is at hand. They show little variation; even that of the dimensions is within narrow limits: height 26.0 to 30.0 mm., width 11.0 to 13.5 mm.

***Bulimulus (Scutalus) culmineus* Orbigny**

Localities: Toctoccasa, Cangallo, Ayacucho; collected on November 19, 1953. San Genaro, Santa Inez, Huancavelica, 4,760 meters altitude; collected on December 25, 1953.

***Bulimulus (Scutalus) angrandi* Morelet**

Localities: Huanta, Ayacucho; collected on December 2, 1953. Lircay, Huancavelica, 3,680 meters altitude; collected on December 11, 1953.



FIG. 63. *Bulimulus (Scutalus) longitudinalis* sp. nov. CNHM no. 51328, type, front and back views; about $\times 1.5$.

***Bulimulus (Scutalus) revinctus* Hupé**

Localities: Huancavelica, 3,680 meters altitude; collected on December 11, 1953. Lircay, Huancavelica, 3,310 meters altitude; collected on December 17, 1953.

***Bulimulus (Scutalus) tupacii* Orbigny**

Locality: Huancavelica, 3,680 meters altitude; collected on December 11, 1953.

***Bulimulus (Scutalus) longitudinalis* sp. nov. Figure 63.**

Type.—Chicago Natural History Museum no. 51328, from Polanco, Tambo, San Miguel, Ayacucho, Peru; collected on November 28, 1953.

Diagnosis.—A species of *Scutalus* characterized by its pointed shape, and by its axial, longitudinal color pattern.

Comparisons.—Species of *Scutalus* with longitudinal streaks are very uncommon; among the few with that color pattern *nemorensis* Pfeiffer from southeastern Peru seems to be closest to our novelty, although it is distinctly smaller and more slender.

Description of type.—Shell ovate-conic, perforate, subsolid, axially closely striate, irregularly decussated by spiral grooves, which give

the surface a granose appearance. Whitish, variegated with irregular brownish streaks. Spire conic, acute, apex rose-colored. Whorls $6\frac{1}{2}$, somewhat convex, the ultimate a little saccate at base; suture distinct, crenulate. Aperture about as long as the spire, little oblique, ovate and pointed above, white inside with the streaks shining through; peristome simple, unexpanded, the columellar margin dilated above and reflected over the umbilical chink.

Measurements of type.—Height 35.7 mm., width 18.1 mm., height of aperture 17.9 mm., width of aperture 12.0 mm.

Paratypes.—A lot (no. 51329), with the same data as the type, shows the following range of variation of the shell measurements: height 36.4 to 41.3 mm., width 17.4 to 20.8 mm. The nepionic whorls are either rose-colored or deep purple. One specimen (no. 51330) from Hacienda Palmira, Andahuaylas, Apurimac, collected in September, 1953, is somewhat more granose than the form from the type locality and has broader and darker brown streaks; it does not differ otherwise. Another single specimen (no. 51331) from Pacucha, Laguna, Andahuaylas, Apurimac, collected in October, 1953, has the brown streaks broader than the spaces between them so that the shell looks brown with lighter, grayish-yellow streaks.

***Bulimulus (Lissoacme) derelictus ascendens* Pilsbry**

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho; collected on November 6, 1953.

A number of very young and half grown specimens that permit, however, an unmistakable specific identification.

***Bulimulus (Lissoacme) cereicola* Morelet**

Localities: Km. 62 on the road between Huancayo and Mejorada, Huancavelica; collected on December 28, 1953. Lircay, Huancavelica, 3,310 meters altitude; collected on December 17, 1953. Hacienda Palmira, Andahuaylas, Apurimac; collected on September 18, 1953.

Some of the specimens at hand tend to be stouter than the form described by Morelet. Both the streaked and the unicolor white forms are represented. The specimens from Hacienda Palmira are more heavily striate than the typical form, and some of them attain, with $10\frac{1}{2}$ or even $11\frac{1}{2}$ whorls, the height of 27.9 mm. and 31.6 mm., respectively, whereas the average height of the species, seldom with more than 7 whorls, is only about 20.5 mm.

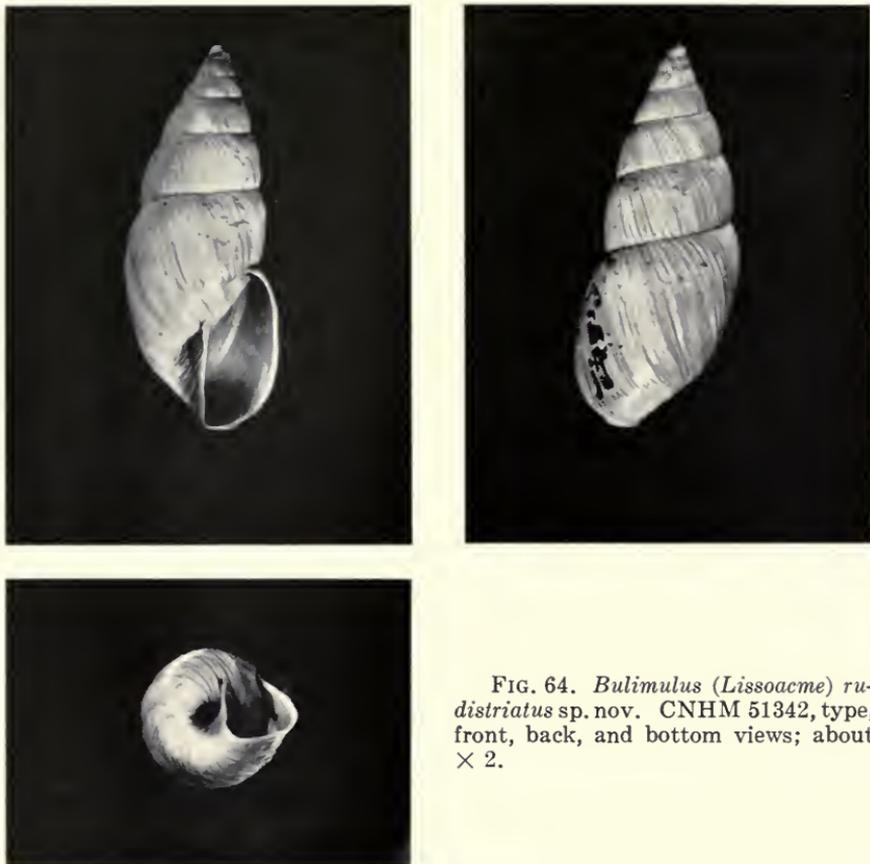


FIG. 64. *Bulimulus (Lissoacme) rudistriatus* sp. nov. CNHM 51342, type, front, back, and bottom views; about $\times 2$.

***Bulimulus (Lissoacme) rudistriatus* sp. nov.** Figure 64.

Type.—Chicago Natural History Museum no. 51342, from Hacienda Palmira, Andahuaylas, Apurimac, Peru, 2,200 meters altitude; collected on September 13, 1953.

Diagnosis.—A species of the subgenus *Lissoacme*, characterized by the conspicuously wide umbilical chink, the heavy striation of the shell, and the rose-colored inner border of the aperture.

Comparisons.—Most closely related to *Bulimulus (Lissoacme) modestus* Broderip, but of an oblong-turreted shape instead of being ovate-pyramidal, and also differing from it by the coloration of the inner border of the aperture.

Description of type.—Shell oblong-turreted, narrowly but deeply umbilicate, rather thin; surface covered with thread-like, crowded

striae that are about as wide as their interstices; only the nepionic whorls are smooth. Color whitish-brown, in places more grayish, apex light rose-colored. Whorls about 8, rather convex, the last shortly attenuated at base and descending steeply into the umbilicus; suture simple, rather deep. Aperture small, oblong oval, narrow at base, inside bordered by a rose-colored zone; peristome simple, acute, unexpanded, the outer margin slightly arcuate, the columellar one straight, narrowly dilated above and reflected over the umbilical opening.

Measurements of type.—Height 24.8 mm., width 8.2 mm., height of aperture 11.0 mm., width of aperture 5.2 mm.

Paratypes.—No. 51343, with the same data as the type. No. 51344, from Hacienda Mozobamba, Ongoy, Andahuaylas, Apurimac; collected in October, 1953.

The paratypes from the type locality correspond with the type in most respects; however, the shell is a deeper hue in some individuals. Furthermore, some specimens show a trace of a narrow peripheral band on the last whorl. One even has an entirely different color pattern, being whitish with brown streaks that in places are confluent and make the basic color brown, leaving always a narrow sutural zone of white; on the last whorl there is an indistinct, white peripheral band on a brownish background.

The specimens from Hacienda Mozobamba conform to those from Hacienda Palmira; one is darker than all the others, being a deeper brown in the interstices of the yellowish-white striae.

***Bulimulus (Lissoacme) dentritis* Morelet**

Locality: Hacienda Palmira, Andahuaylas, Apurimac, 2,200 meters altitude; collected on September 13, 1953.

When the tenth volume of Pilsbry's *Manual of Conchology* was written, in 1896, the apical sculpture of this species was still unknown, and Pilsbry (p. 186) stated that it might prove to be a *Drymaeus* of the subgenus *Mesembrinus*. The nepionic whorls of the specimens before me are entirely smooth, so that, provided that my identification is correct, *dentritis* definitely belongs to *Lissoacme*.

***Bulimulus (Lissoacme) scutulatus* Broderip**

Locality: Hacienda Pajonal, Oeros, Cangallo, Ayacucho; collected on November 6, 1953.

These shells are somewhat more slender than typical *scutulatus*, but this seems to be their only distinguishing feature.

Bulimulus (Lissoacme) reconditus Reeve

Locality: Huancavelica, 3,680 meters altitude; collected on December 11, 1953.

Bulimulus (Geoceras) veruculum Morelet

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho; collected on October 19 and November 6, 1953, respectively.

Bulimulus (Ataxus) infundibulum Pfeiffer

Locality: Hacienda Palmira, Andahuaylas, Apurimac, 2,200 meters altitude; collected on September 13, 1953.

All the specimens are uniformly white.

Bulimulus (Ataxus) infundibulum umbilicatus Pilsbry

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho; collected on November 6, 1953.

This lot seems to constitute a small race of the subspecies *umbilicatus*. While typical specimens of *umbilicatus* are composed of only $8\frac{1}{2}$ whorls and measure 17.5 mm. in height and 6.0 mm. in width, our largest specimen from Hacienda Pajonal is only 15.3 mm. high and 5.5 mm. in diameter, despite its $10\frac{1}{4}$ whorls. Since the number of whorls and the dimensions are the only differential characters, I am reluctant to designate the Pajonal lot as a distinct subspecies.

Bulimulus (Ataxus) perforatus Haas. Figure 65.

Hacienda Pajonal, Ocos, Cangallo, Ayacucho, 2,000 meters altitude; collected in October, 1953.

This large lot gives me the opportunity to broaden the description previously published (Haas, 1951, p. 518, fig. 106). At the time of the original description, I had at hand only specimens of a constant height-diameter ratio, all of them with at least traces of brownish streaks. Shells of that type are represented also in the lot from Hacienda Pajonal, though in some of them the width of the shell is definitely greater and the shell thus more obese than in the type lots of 1951. However, the majority of specimens from Hacienda Pajonal are uniformly chalky white, while the height-diameter ratio is higher than in the streaked shells from the same locality. The following measurements of a series of five specimens (no. 51320; fig. 65) show that there is a gradual transition from slender to



FIG. 65. *Bulimulus (Ataxus) perforatus* Haas. CNHM no. 51320, a series of five, showing variation in size; about $\times 2$.

obese shells: height 16.1, 20.7, 19.1, 19.9, 19.0 mm.; width 7.4, 7.7, 8.6, 9.1, 9.2 mm.

As is easily understood, the umbilicus is larger in the stouter specimens, there being a constant ratio between its width and that of the shell.

The unstreaked specimens have some characters not seen in the streaked ones. Thus, the penultimate whorl and/or the ultimate one often exhibit a rounded shoulder near the upper suture. There is almost always a slight spiral swelling under the periphery of the last whorl.

The streaked race from Hacienda Pajonal often has dark nepionic whorls, varying from rose-color to blackish purple, while in unstreaked shells the apex is generally light in color. This difference may be due to the presence of pigments even in the embryos of the streaked form, while the unstreaked one is pigmentless at all stages.

Moderately obese specimens of the unstreaked race often resemble the species *infundibulum* Pfeiffer, but one can always distinguish the two by the much finer axial striation of *perforatus* Haas.

***Bulimulus (Peronaeus) pyrgidium* sp. nov.** Figure 66.

Type.—Chicago Natural History Museum no. 51310, from Hacienda Mozobamba, Ongoy, Andahuaylas, Apurimac, Peru, 2,500 meters altitude; collected in October, 1953.



FIG. 66. *Bulimulus (Peronaeus) pyrgidium* sp. nov. CNHM no. 51310, type, front view; about $\times 3$.



FIG. 67. *Bulimulus (Peronaeus) extensus* sp. nov. CNHM no. 51312, type, front view; about $\times 2$.

Diagnosis.—A short, slenderly conical species of *Peronaeus* characterized by the distinct axial striation of the white shell ornate with a narrow, brownish-purple subperipheral band.

Comparisons.—This novelty resembles the species *obeliscus* Zilch (1954). The latter tapers a trifle toward the aperture, however, and is therefore slightly fusiform, whereas the shell of *pyrgidium* has a straight outline, widest at the base and very slenderly conical; thus the new form more nearly resembles *jocosensis* Dautzenberg, although it has a greater number of whorls and a different color pattern.

Description of type.—Shell narrowly conical, almost cylindrical, thin and translucent, extremely narrowly rimate, white with one brownish-purple band. Whorls $12\frac{1}{2}$, very slowly and regularly increasing, the first two convex, the following ones less so, separated by a simple but distinct suture. Nepionic whorls smooth, glossy white, the post-nepionic ones chalky white. Last whorl with a narrow, brownish-purple basal band. Surface of the shell covered with strong, almost rib-like, oblique striae as wide as or a little narrower than the interstices between them. Aperture small, about

two-ninths of the height of the shell, vertical, subelliptical, peristome acute, with no trace of a lip; the columellar end somewhat broadened, spreading over the umbilical chink; no parietal callus; inside of aperture light brown, with the band of the surface showing through.

Measurements of type.—Height 20.0 mm., width 5.6 mm., height of aperture 4.5 mm., width of aperture 3.4 mm.

Paratypes.—A series with the same data as the type is at hand (no. 51311). Most of the specimens are immature; in them, the upper and lower halves of the last whorl meet at a distinct, almost keel-like angle. In some specimens, the nepionic whorls are of a purplish color which extends occasionally to the first post-nepionic whorls. The purplish band of the whorls may be very faint or even missing. The unbanded specimens often have yellowish or purplish streaks that follow the axial striae. There are even specimens in which the apex is more or less intensely rose-colored.

***Bulimulus (Peronaeus) extensus* sp. nov.** Figure 67.

Type.—Chicago Natural History Museum no. 51312, from Hacienda Palmira, Andahuaylas, Apurimac, Peru, 2,200 meters altitude; collected on September 13, 1953.

Diagnosis.—A rather stout, large, slenderly conical species of the subgenus *Peronaeus*, notable for its black apex and the strong axial striation of the surface.

Comparisons.—This novelty is unlike most species of *Peronaeus*; together with the species *pyrgidium* just described above, it belongs to a group having the shell very elongatedly conical instead of cylindrically fusiform, as in the typical representatives of *Peronaeus*. From its closest relatives, *pyrgidium* and *jocosensis*, this new species differs by its much larger size and its color pattern.

Description of type.—Shell long and extremely slender, conical, rather thin, imperforate. Whorls $20\frac{1}{2}$, increasing very slowly and regularly, little ventricose, separated by a rather shallow though distinct suture, which is bordered by a narrow, dark purplish-brown band starting at the fourteenth whorl. Nepionic whorls blackish-blue and smooth; the post-nepionic ones chalky white and roughly sculptured by retractive, rather straight, rib-like striae as wide as or a little bit wider than the spaces between them; brown and/or purplish-brown streaks at irregular intervals, extending from suture to suture, running parallel with the striae. The last whorl with four bands on its lower half, the subperipheral and the circum-umbilical ones the widest. Aperture small, less than one-fifth of

the entire height of the shell, almost elliptical, definitely oblique, without a lip, the right margin receding in a sigmoid curve, the lower one broad and almost effuse, the columellar one narrowly reflected and covering the umbilical region. The columella slightly flattened; no parietal callus. The bands visible through the brownish inside of the aperture.

Measurements of type.—Height 35.3 mm., width 5.4 mm., height of aperture 7.2 mm., width of aperture 4.0 mm.

Paratypes.—There are two sets of paratypes, one (no. 51313) with the same data as the type and the other (no. 51314) from the same locality but collected on September 18, 1953.

Besides variation in the measurements of the shell, which may attain a height of 39.0 mm. and a width of 8.4 mm., there is also variation in color pattern. In some specimens the brownish axial striae are completely absent; in others they are so crowded as to make the background appear brown; in still others a narrow brownish peripheral band is visible; and in most of them the black bordering line of the suture seen in the type is missing.

***Bulimulus (Peronaeus) andoicus* Morelet**

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho; collected in October, 1953. Another lot from the same locality; collected November 6, 1953.

The well-known variability of this species is also shown in the first lot of more than 100 specimens. As was to be expected, the umbilical chink in the stouter shells is wider than in the more slender ones. About half of the specimens at hand are uniform tawny or whitish. The other half shows a pattern of color apparently not yet known in this species, namely, brown streaks of varying lengths and widths. Specimens intermediate between these extremes, with plain earlier whorls and streaks or traces on the last whorl, are rare. In some of the streaked shells the marks stop at the periphery of the ultimate whorl, leaving its base plain. In some of the plain shells very pale traces of a narrow peripheral band can be detected. The previously known striped form of this species is hardly represented in the abundant material at hand.

***Bulimulus (Peronaeus) elatus* Philippi**

Localities: Hacienda Palmira, Andahuaylas, Apurimac; collected on September 18, 1953. Mayoc, Huancavelica; collected on December 16, 1953. Hacienda Piso, Mayoc, Huancavelica; collected

on December 7, 1953. Hacienda Piso, Locroja, Huancavelica; collected on December 7, 1953.

The color of the nepionic whorls of these specimens varies from a yellowish horn-color to a deep rose-red. The color pattern also seems to be rather variable, more so in the specimens from Huancavelica proper. The shell is entirely white, or white above and slightly streaked on the last one or two whorls, or streaked all over. These markings are of a lighter or darker brown, of varying density and width, but always narrower than the intervening spaces. The specimens from the two localities on Hacienda Piso are generally smaller than those from the other localities and they are more heavily streaked. The markings occasionally stop at the periphery of the last whorl. On the periphery there may be a narrow brown spiral band that either borders or crosses the streaks, depending on the extent of the latter. Additional, narrower and lighter bands may be seen on the base of the ultimate whorl. In one shell the streaks show lateral, triangular appendages that tend to be arranged in spiral rows; in this specimen, the basal spiral bands are very pronounced. This series of small shells reminds me of the species *subelatus* Haas, which, however, is smaller and has a different shape.

***Bulimulus (Peronaeus) hamiltoni* Reeve**

Locality: Hacienda Mozobamba, Andahuaylas, Apurimac, 2,500 meters altitude; collected on October 8, 1953.

***Bulimulus (Peronaeus) acme* sp. nov. Figure 68.**

Type.—Chicago Natural History Museum no. 51355, from "Altura de la Hacienda Mozobamba," Ongoy, Andahuaylas, Apurimac, Peru, 2,500 meters altitude; collected in October, 1953.

Diagnosis.—An extremely slender, conical species of *Peronaeus*, plainly white without bands, with rather swollen whorls.

Comparisons.—This novelty is a member of slender *Peronaeus* centering around *pupiformis* Broderip. It differs from all of the known forms of this group by its shape, which is that of a very slender cone with almost straight outlines and hardly tapering at the base. Thus the maximum width of the shell is at the periphery of the ultimate whorl and not at the penultimate whorl, as is the case in the remaining species of the *pupiformis* group.

Description of type.—Shell very slender, cone-shaped, rather thin, whitish, densely rib-striate, widest at the periphery of the last

whorl, rimate; apex glossy, whitish and roseate; whorls $12\frac{1}{2}$, exceedingly slowly growing, rather swollen, the ultimate slightly attenuated below its periphery; suture plain, distinct. Aperture small, somewhat oval, simple, peristome acute, gently curved on



FIG. 68. *Bulimulus (Peronaeus) acme* sp. nov. CNHM no. 51355, type, front view; about $\times 3$.

the right margin and straight on the left one, which ends in a small triangular reflection partly hiding the umbilical chink; inside of aperture brownish.

Measurements of type.—Height 18.3 mm., width 5.1 mm., height of aperture 4.0 mm., width of aperture 3.1 mm.

Paratypes.—No. 51356, with the same data as the type. No. 51357, from Hacienda Mozobamba, Andahuaylas, Apurimac; collected on October 8, 1953.

The measurements of the paratypes vary little, but the coloration of the shell shows some differences. There are plain, white specimens, others of a plain, yellowish tint and still others with light brown, narrow, straight streaks on a yellowish tint. One specimen of the white type is remarkable by attaining the exceptional height of 19.6 mm.

FRUTICICOLIDAE

Epiphragmophora (Epiphragmophora) claromphalos Deville and Hupé

Localities: Hacienda Palmira, Andahuaylas, Apurimac, 2,200 meters altitude; collected in September, 1953. Hacienda Pajonal, Ocos, Cangallo, Ayacucho, 2,000 meters altitude; collected in October, 1953.

Epiphragmophora (Epiphragmophora) atahualpa Pilsbry

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho, 2,000 meters altitude; collected in October, 1953.

Epiphragmophora (Epiphragmophora) patasensis Pfeiffer

Localities: Hacienda Palmira, Andahuaylas, Apurimac, 2,300 meters altitude; collected on September 18, 1953. Hacienda La Laguna, Andahuaylas, Apurimac; collected in September, 1953.

Epiphragmophora (Epiphragmophora) diluta Pfeiffer

Localities: Tambo, San Miguel, Ayacucho; collected on November 26, 1953. Polanco, San Miguel, Ayacucho, 4,100 meters altitude; collected on November 28, 1953.

Epiphragmophora (Pilsbryna) clausomphalos Deville and Hupé

Locality: Huancavelica, 3,680 meters altitude; collected on December 11, 1953.

Epiphragmophora (Pilsbryna) clausomphalos inferior Pilsbry

Locality: Lircay, Huancavelica, 3,310 meters altitude; collected on December 17, 1953.

Karlschmidtia gen. nov.

Diagnosis.—A new genus of the epiphragmophorine tribe of the fruticicolids, characterized by the keeled, lens-shaped shell of thin, transparent texture, by the sharp axial costulation of the upper surface, and by the wide, open umbilicus, which exhibits all the whorls.

Type.—*Karlschmidtia lentiformis* sp. nov.

Comparisons.—*Karlschmidtia* is most closely related to *Epiphragmophora* Doering. Though the vast majority of the species of

Epiphragmophora have perfectly rounded, keelless whorls and hardly ever show the very obvious costulation of the upper surface, *Epiphragmophora huanucensis* Philippi is keeled and *Epiphragmophora puntana* Holmberg shows at least traces of axial costulation on the upper side. No species of *Epiphragmophora*, however, combines these features. It is this combination of characters that distinguishes the new genus.

I take great pleasure in naming this new genus after my distinguished colleague and dear friend of many years, Dr. Karl P. Schmidt.

Karlschmidtia lentiformis sp. nov. Figure 69.

Type.—Chicago Natural History Museum no. 51271, from Hacienda Mozobamba, Andahuaylas, Apurimac, Peru; collected in October, 1953.

Diagnosis.—See that of the genus.

Comparisons.—See those of the genus.

Description of type.—Shell flat, lens-shaped, distinctly carinate, thin and transparent, very openly umbilicate. Whorls $4\frac{3}{4}$, growing regularly, very depressed and flat above, rounded below; upper surface costulate, with the space between two following ribs three to four times as wide as these; the ribs continuing beyond the keel, becoming much finer and vanishing toward the umbilicus, with the exception of the last half whorl, where the ribs, though less conspicuously, almost reach the umbilical wall. Surface of shell yellowish brown, shiny, with a narrow brown supraperipheral band on the upper side and a somewhat wider, paler, diluted one on the lower side close to the periphery; the interstices of the ribs on the under side slightly corrugated-malleated. The ultimate whorl descending but very slightly at the aperture, which is very oblique, shortly elliptical and hardly pointed at the keel; the lip whitish, rather broad, reflected, with approaching ends, the columellar end slightly broadened. Umbilicus widely open, shaft-like, exhibiting all the whorls.

Measurements of type.—Greater diameter 30.1 mm., smaller diameter 25.8 mm., height 11.5 mm., width of aperture 15.3 mm., height of aperture 12.1 mm., diameter of umbilicus 6.3 mm.

Paratypes.—There are numerous paratypes (no. 51272) from the same locality as the type. These vary somewhat in the proportions of the shell but agree with the type in most other respects.

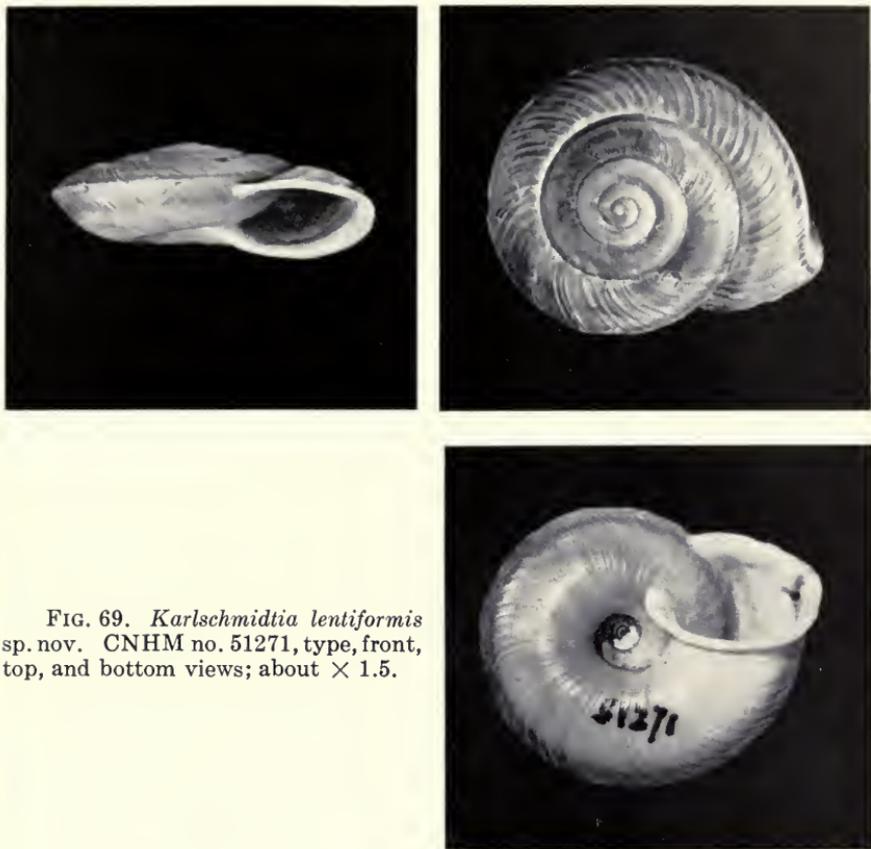


FIG. 69. *Karlschmidtia lentiformis* sp. nov. CNHM no. 51271, type, front, top, and bottom views; about $\times 1.5$.

The biggest specimen has a greater diameter of 31.5 mm., the smallest one of 26.2 mm. In some specimens the height of the shell is somewhat greater than in the type, reaching 12.8 mm. In these higher shells the last whorl descends a little more toward the aperture than is the case in the type.

STREPTAXIDAE

Streptaxis (*Scolodonta*) *andivaga* Pilsbry

Locality: Hacienda Pajonal, Ocos, Cangallo, Ayacucho; collected in October, 1953.

These shells have one half whorl less than the type and are, therefore, not quite as large. There can be no doubt, however, about the specific identity of our material with that of Pilsbry.



FIG. 70. *Strophocheilus (Microborus) tenuis* sp. nov. CNHM no. 51925, type, front and back views; about $\times 1.5$.

LAND SHELLS FROM THE HIGH ANDES OF PERU—II.

The Peru Zoological Expedition, 1954, of Chicago Natural History Museum, visited mainly the Departments of Tumbes, Lambayeque, and Ancash, which are very little known from a zoological standpoint. The area explored by the collector, Mr. Celestino Kalinowski, extends from the low coastal area of northern Peru to the high Andes in the Department of Ancash, reaching altitudes up to 4,300 meters. Though the amount of molluscan material brought together is not very large, it reveals many interesting ecological features.

STROPHOCHEILIDAE

Strophocheilus (Microborus) tenuis sp. nov. Figure 70.

Type.—Chicago Natural History Museum no. 51925, from Yungay, Ancash, Peru; collected March 7, 1954.

Diagnosis.—A species of the subgenus *Microborus* of *Strophocheilus*, characterized by the unusual thinness of its shell, by its relatively low spire, and by the broader reflection of the columellar margin of the aperture.

Comparisons.—Closely related to the Peruvian species *incarum* Pilsbry (1944, p. 29, pl. 1, figs. 8, 9), but differing by its translucent, thin shell, and by the somewhat lower spire with a broader apex.

Description of type.—Shell covered by a very thin, deciduous, pinkish, conchinic layer, pinkish-gray beneath this, ovate, thin, translucent, rimate, with short spire and broad apex. Nepionic whorls two, with a fine, shallow, somewhat irregular radial corrugation, followed, from the third whorl on, by a sculpture of conspicuous axial and somewhat retractive striae that are strongest near the suture, which hence is crenulated. Whorls $4\frac{1}{2}$. A trace of a narrow, darker peripheral band. Aperture ovate, outer lip very little thickened and expanded, columellar margin broadly reflexed.

Measurements of type.—Length 30.1 mm., width 18.8 mm., height of aperture 19.6 mm., width of aperture 10.8 mm.

Paratypes.—There are five paratypes (no. 51926), with the same data as the type. Only one is fully grown. The remaining ones are in different stages of growth, from three to four whorls.

BULIMULIDAE

Thaumastus (*Quechua*) *conspicuus* Pilsbry

Locality: Huasimo, Tumbes, Peru, 220 meters altitude; a rather large series collected on June 24, 1954.

In accordance with Zilch's opinion (1954, p. 78, pl. 6, fig. 9) I consider this species, originally described as a *Plekocheilus*, as belonging to the subgenus *Quechua* of *Thaumastus*. Zilch's *Thaumastus olmosensis* (1954, p. 76, pl. 6, figs. 10, 11) seems to be very closely related to, if not identical with, *conspicuus*.

Porphyrobaphe (*Porphyrobaphe*) *iostoma* Sowerby

Locality: Matapalo, Tumbes, Peru; a series collected on July 5, 1954.

Drymaeus (*Drymaeus*) *eucosmetus* sp. nov. Figures 71, 72.

Type.—Chicago Natural History Museum no. 51920, from Cambache near Chongoyape, Lambayeque, Peru, 460 meters altitude; collected on March 3, 1954.

Diagnosis.—A species of *Drymaeus* proper, characterized by its elongate-oval shape, the narrow umbilicus, the narrow columellar

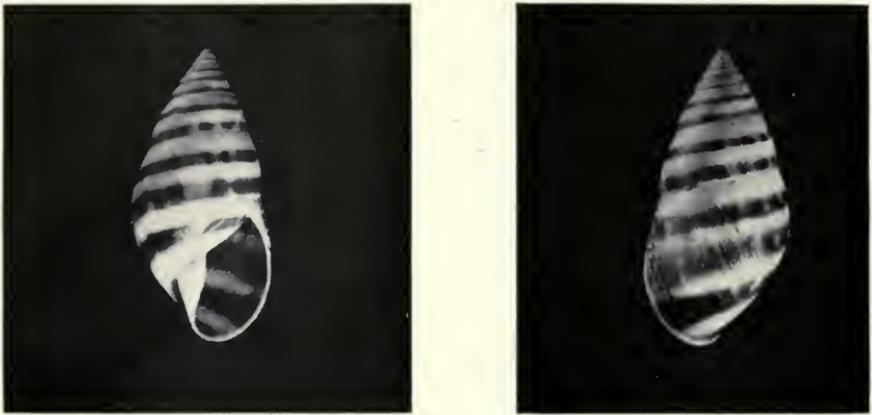


FIG. 71. *Drymaeus (Drymaeus) eucosmetus* sp. nov. CNHM no. 51920, type, front and back views; about $\times 1.5$.

reflection, and the lack of malleation of the densely, but finely striate shell surface.

Comparisons.—This new species is similar to *Drymaeus serotinus* Morelet in its general shape, but it is not as widely umbilicate and it presents a different pattern. *Drymaeus ponsonbyi* Da Costa is similar in shape but is malleate throughout. The type of *eucosmetus* looks much like some phases of *Drymaeus poecilus* Orbigny, but it is more widely umbilicate and more egg-shaped, and it lacks the obvious columellar reflection.

Description of type.—Shell elongate-ovate, moderately thick but translucent, narrowly perforate, evenly though finely striate all over, with four chestnut bands on yellowish white background, the second and third bands the widest. Whorls $6\frac{1}{2}$, little inflated, the last one tapering beneath the periphery; suture distinct but shallow, somewhat appressed on the last whorl. Aperture narrowly ovate, with the peristome simple, unexpanded, thin, the outer color visible from inside; upper right margin slightly protracted, columellar margin narrowly expanded and covering almost half of the narrow, tube-like umbilicus, which is surrounded by the basal band.

Measurements of type.—Length 25.4 mm., width 11.6 mm., height of aperture 13.0 mm., width of aperture 6.3 mm.

Paratypes.—Twelve specimens (no. 51921), with the same data as the type. They reveal a good deal of variation (see fig. 72). The shape of the shell varies from almost obesely ovate to rather slenderly ovate. The color pattern of bands may be breaking up



FIG. 72. *Drymaeus (Drymaeus) eucosmetus* sp. nov. CNHM no. 51921, paratypes, back views; about $\times 1.5$.

into spots (fig. 72, left), which may unite into axial streaks (fig. 72, center) and these streaks may become very pale, almost cloud-like on the otherwise purely yellowish pink background (fig. 72, right).

Drymaeus (Drymaeus) zilchi sp. nov. Figure 73.

Type.—Chicago Natural History Museum no. 51927, from Huasimo, Tumbes, Peru, 220 meters altitude; collected June 24, 1954, and named for my friend and colleague Dr. Adolf Zilch of Senckenberg Museum, Frankfort-on-Main, Germany.

Diagnosis.—A rather inconspicuous, medium-sized species of *Drymaeus* proper, characterized by its conically ovate shape and its pink nepionic whorls.

Comparisons.—*Drymaeus interruptus* Preston from Venezuela is similar but decidedly more slender, whereas *Drymaeus poecilus* Orbigny, also similar in pattern in certain of its phases, has more inflated whorls.

Description of type.—Shell elongate-ovate, comparatively thin and translucent, rimate, with $6\frac{1}{2}$ whorls, which increase rather slowly and which are separated by a simple suture. Apex pink, remainder of shell yellowish white with four chestnut bands broken into rectangular dots; second and third bands widest. Surface of shell smooth. Aperture with the surface pattern shining through, small,

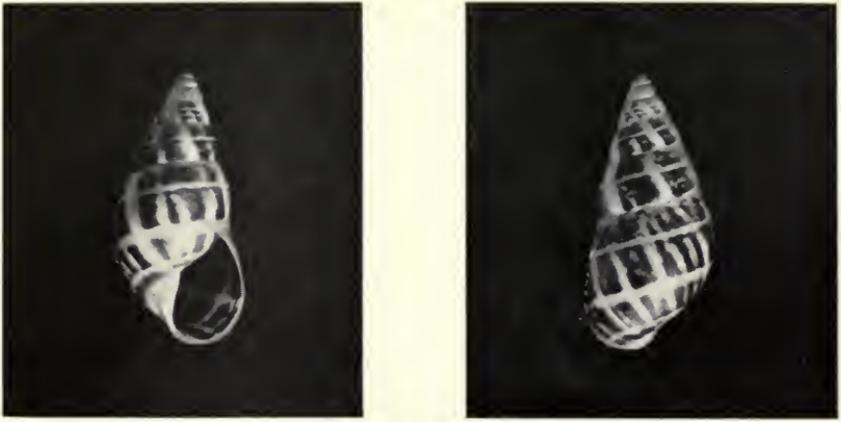


FIG. 73. *Drymaeus (Drymaeus) zilchi* sp. nov. CNHM no. 51927, type, front and back views; about $\times 1.5$.

ovate, with simple margins, unexpanded and thin, the upper right one slightly protracted, the columellar one narrowly reflexed and almost covering the umbilical chink.

Measurements of type.—Length 24.1 mm., width 10.4 mm., height of aperture 10.8 mm., width of aperture 6.1 mm.

Paratypes.—Two specimens (no. 51928), with the same data as the type. They show little variation in the shape of the shell but a larger range of pattern variation. Thus, in one of the paratypes, the spiral order of the rectangular dots is almost lost by their arrangement into axial streaks, while the other specimen is almost uniformly yellowish white but for the pink apex, with only the slightest traces of streaks on the last whorl.

***Bulimulus (Scutalus) mutabilis* Broderip**

Locality: Pariacoto, Huaraz, Ancash, Peru, 220 meters altitude; a series collected on March 13, 1954.

Very variable, as its name indicates, both in the measurements and in the shape of the shells.

***Bulimulus (Scutalus) phaeocheilus* sp. nov.** Figure 74.

Type.—Chicago Natural History Museum no. 51918, from Chongoyape, Lambayeque, Peru, 300 meters altitude; collected on March 24, 1954.

Diagnosis.—A slightly granose species of *Scutalus*, characterized by the liver-colored interior of the aperture and of the peristome.

Comparisons.—This new species belongs to the group of *Bulimulus (Scutalus) proteus* Broderip, to which it is closely related, although it is decidedly less granose. Dohrn's *proteiformis*, which was never figured, seems to lack the granules entirely, while they are weakly developed in this novelty; otherwise Dohrn's original

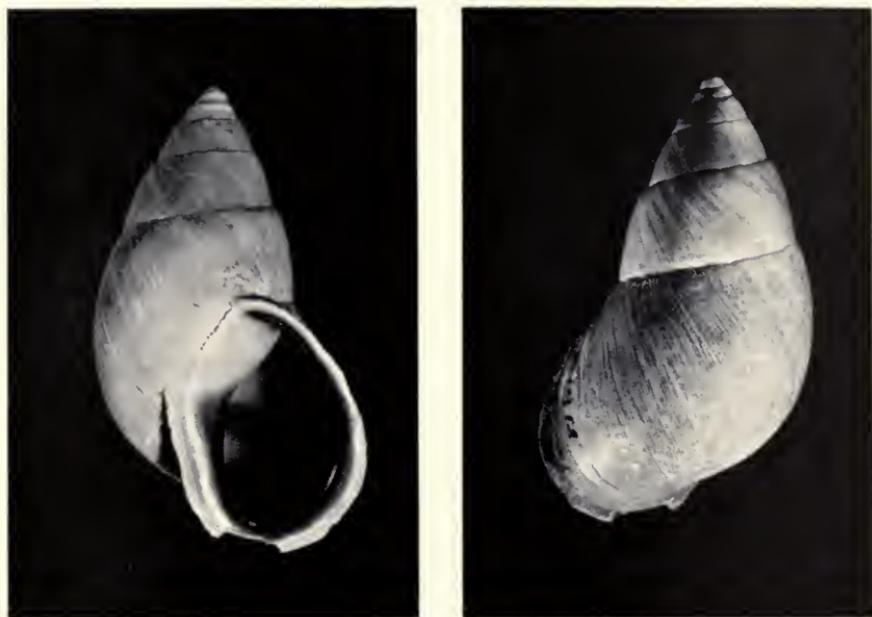


FIG. 74. *Bulimulus (Scutalus) phaeocheilus* sp. nov. CNHM no. 51918, type, front and back views; about $\times 1.5$.

description might well apply to *phaecheilus*. Our new species has exactly the shape of *Neopetraeus cora unicolor* Pfeiffer and of *N. cretaceus* Pfeiffer, but it shows the typical apical sculpture of *Scutalus*.

Description of type.—Shell ovate-conic, saccate below, subsolid, very slightly striate and granose, with $6\frac{3}{4}$ whorls of regular growth, separated by a deep, almost channelled suture. Unicolored grayish white with a lighter apex. Whorls subinflated, the last one widest below the periphery, saccate, ascending in front. Umbilicus deeply arcuate-rimate. Aperture large, oval, liver-colored inside and on the broad, widely expanded peristome.

Measurements of type.—Length 41.0 mm., width 22.7 mm., height of aperture 22.0 mm., width of aperture 16.0 mm.

Bulimulus (Scutalus) subjussieui Pilsbry

Locality: Tullparáju, Huaraz, Ancash, Peru, 4,300 meters altitude; three specimens collected on February 16, 1954.

Bulimulus (Spirosulcatus) endospira Pilsbry

Locality: Pariacoto, Huaraz, Ancash, Peru, 220 meters altitude; a series collected on March 13, 1954. Huasimo, Tumbes, Peru, 220 meters altitude; one specimen collected on June 24, 1954.

Besides the typical, streaked phase, there is another which is either roseate whitish or almost white, with a cloud-like pattern of streaks.

Bulimulus (Protoglyptus) rivasii Orbigny

Locality: Pariacoto, Huaraz, Ancash, Peru, 1,360 meters altitude; three specimens collected on March 13, 1954.

This is, to the best of my knowledge, the first record of this southern species from Peru. I am unable to determine from these three bleached specimens whether the shells are identical with or only closely related, perhaps subspecifically, to *rivasii*.

Bulimulus (Geopyrgus) turritus Broderip

Locality: Pariacoto, Huaraz, Ancash, Peru, 1,360 meters altitude; four specimens collected on March 13, 1954.

My bleached shells are slightly more slender than the typical form, and only one specimen shows traces of spiral bands.

FRUTICICOLIDAE

Epiphragmophora (Epiphragmophora) olssoni Pilsbry

Locality: Cambache near Chongoyape, Lambayeque, Peru, 460 meters altitude; three specimens collected on March 19, 1954.

The specimens from Cambache, at an elevation of only 460 meters, differ from the typical form from Huancabamba (Pilsbry, 1926, p. 4, pl. 1, fig. 6), situated at almost 3,500 meters of altitude, only in that the last whorl is not descending near the aperture and the basal margin of the peristome arches forward less.

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