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VOLUTIDAE

VOL. 2, NO. 22

THE GENERA BATHYAURINIA, REHDERIA AND SCAPHELLA IN THE WESTERN ATLANTIC

BY
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The three genera considered in this report are worthy members of the family Volutidae, a family noted for the remarkable beauty of many of its species.

Scaphella, as now restricted, *Bathyaurnia* and *Rehderia* are known only from the temperate and tropical portions of the Western Atlantic. All species occur in moderate depths.

Nothing as yet is known regarding their life histories, and their distribution is based upon but few records. A few species are known only from single examples; the remainder from a few specimens, many of which were dead and occupied by hermit crabs.

Various genera in this family are remarkably diversified as regards sculpture, color, production of periostracum, the degree to which the mantle fold envelops the shell and other characteristics. Within any one genus, however, these characters are fairly constant.

The young are produced in membranous capsules, singly in some species or multiple in others. According to Dall, in *Scaphella* the early embryonic portion of the shell is membranous and sloughs off and this is probably true of *Bathyaurnia* and *Rehderia* as well. The calcareous portion starts as a minute papilliform point, the calcarella, which enlarges rapidly and may spiral immediately or coil in a single plane for an additional whorl, depending upon the species.

Various members of the three genera considered in this report show a rather wide range of depth tolerance. *Scaphella junonia* occurs in 2 to 45 fathoms while other mem-

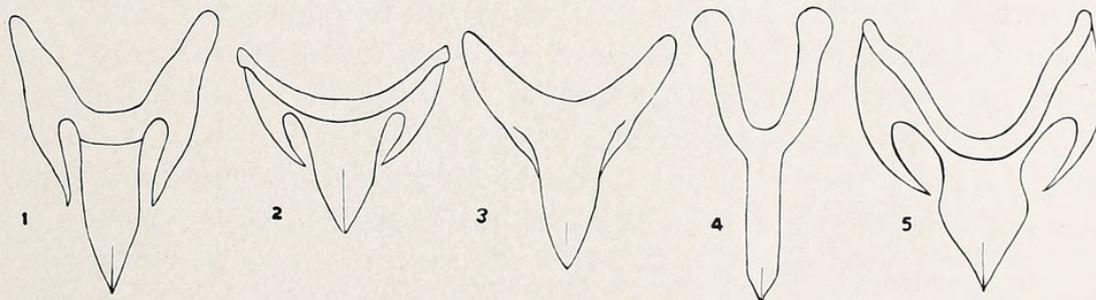


Plate 24. Radulae. Fig. 1. *Bathyaurnia torrei* Pilsbry. Fig. 2. *Bathyaurnia aguayoi* Clench. Fig. 3. *Scaphella (Aurinia) florida* Clench and Aguayo. Fig. 4. *Scaphella (Aurinia) junonia* Shaw. Fig. 5. *Rehderia georgiana* Clench.

bers of this genus extend to depths of 509 fathoms. The limits of the known depth range of *Rehderia* are from 40 to 125 fathoms and those of *Bathyaurlnia* are from 10 to 440 fathoms.

I am deeply indebted to Dr. Harald Rehder for the loan of the entire series of *Scaphella* and *Rehderia* contained in the collections of the United States National Museum.

Genus *Bathyaurlnia* Clench and Aguayo

Bathyaurlnia Clench and Aguayo 1940, Memorias de la Sociedad Cubana de Historia Natural 14, p. 92.

Genotype, *Aurlnia torrei* Pilsbry (original designation, Clench and Aguayo 1940).

The shells are elongate, polished, fairly light in structure and possessing a moderately well developed whorl shoulder which may be smooth or axially ridged. Columella without plicae. A very small radula is present (2 mm. in length for a shell measuring 54 mm.). Only a single longitudinal row of teeth remains, the rachidian or central row. Reduction or loss of parts has been less, however, than in *Aurlnia*, as a strong and well developed lateral denticle flanks each side of the large and robust central denticle (see plate 24, fig. 1-2).

Very little is known about the habits of this genus. *Bathyaurlnia torrei* was first obtained in a fish trap. This would indicate that this species and possibly others in the genus are scavengers, at least partially, in their procurement of food.

All of the dredged material that we possess in this genus came from fair depths: *Bathyaurlnia torrei* from 150 to 265 fathoms (900 to 1590 feet); *B. piratica* from 210 fathoms (1260 feet); *B. aguayoi* from 425 to 440 fathoms (2550 to 2640 feet). The original specimens of *B. torrei* were obtained in comparatively shallow water, 10 fathoms (60 feet).

Bathyaurlnia piratica Clench and Aguayo, Plate 25

Bathyaurlnia piratica Clench and Aguayo 1940, Memorias de la Sociedad Cubana de Historia Natural 14, p. 93, pl. 15, fig. 2 (off Punta Alegre, Camagüey, Cuba).

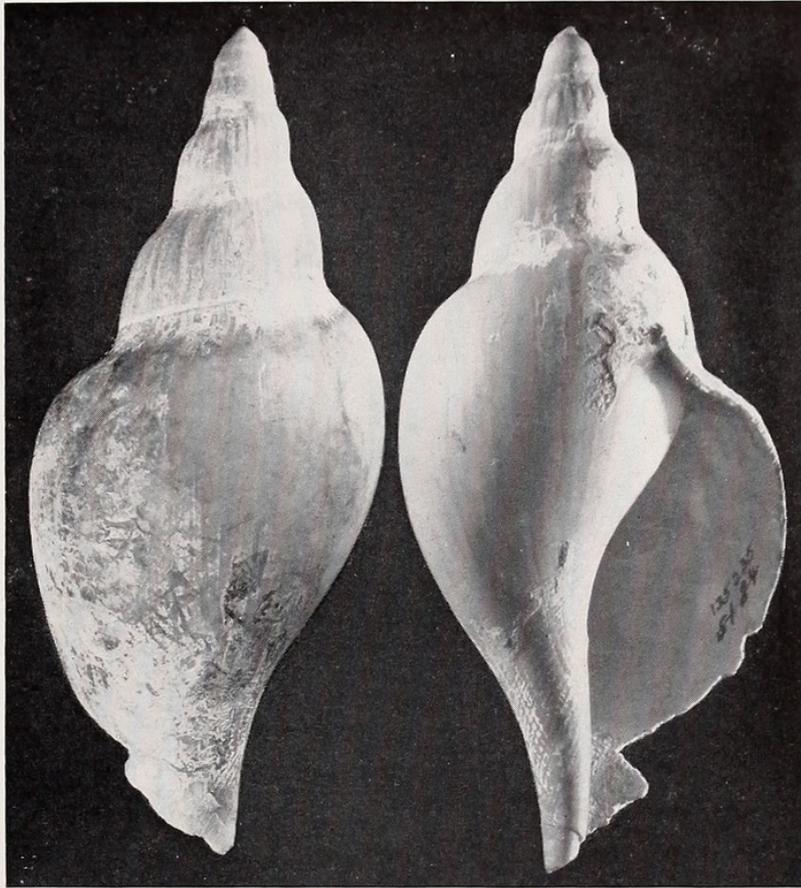
Description. Shell probably reaching 100 mm. (about 4 inches) in length, fusiform, rather light in structure, shining and faintly ridged axially on the upper whorls. Whorls 6, convex and shouldered, the last whorl much enlarged. Color probably yellowish to salmon in live specimens. Spire extended. Suture impressed and glazed smooth with the whorls shingled upon one another. Aperture sub-elliptical and rather elongate. Outer lip thin. Parietal lip not indicated by a reflected area. Siphonal canal broken. Columella nearly straight and without plicae. No spiral striae on the first post-nuclear whorl. Later whorls sculptured with very fine axial ridges which disappear on the body whorl. Sculpture on the body whorl consisting of exceedingly fine spiral threads which are a little more strongly developed near the base of the shell. No periostracum as the shell is highly glazed and is enveloped in the mantle. Operculum probably absent.

| | length | width | aperture | |
|-------|--------|-------|--------------|----------|
| large | 93.5+ | 41.8 | 55+ × 21 mm. | Holotype |

Types. Holotype, Museum of Comparative Zoölogy no. 135235, *Atlantis*, station no. 2982A (N. Lat. 22° 48'; W. Long. 78° 50') off Punta Alegre, Camagüey, Cuba, March 11, 1938, in 210 fathoms.

Remarks. (See also under *B. torrei*). Unfortunately the only specimen known is a dead and rather badly broken shell. However, sufficient characters remain so that it is readily differentiated from the other two species in the genus.

Range and Records. See under Types.



Photograph by F. P. Orchard

Plate 25. *Bathyaurnia piratica* Clench and Aguayo (Holotype), off Punta Alegre, Camagüey, Cuba (natural size).

***Bathyaurnia torrei* Pilsbry, Plate 26, fig. 1-2**

Aurinia torrei Pilsbry 1937, *Nautilus* 51, p. 37, pl. 4, fig. 1 (off Cayo Francés, Caibarién, Cuba).

Description. Shell reaching at least 116 mm. (about $4\frac{1}{2}$ inches) in length, fusiform, rather light in structure, shining, and rather strongly ridged axially. Whorls six, convex and shouldered. Color of the first two whorls white, the remaining whorls a diffused salmon pink, with a series of small dark reddish brown spots in a spiral line just below the suture on the third and fourth whorls. These spots may start as a solid line on the first post-embryonic whorl; rarely do these spots continue to the fifth whorl. A second row of spots in spiral arrangement is located on the parietal area. Spire extended. Suture impressed and glazed smooth with the whorls shingled upon one another. Aperture sub-elliptical and rather elongate. Outer lip rather thin. Parietal lip not indicated by a reflected area. Siphonal canal rather broad and reflected backward. Columella nearly straight and without plicae. Sculpture consisting of a few very fine spiral striae on the first post-nuclear whorl. Later whorls with rather strong axial ridges which are most

prominent on the whorl shoulder. On the body whorl these ridges become irregular and rather indistinct. No periostracum as the shell is highly glazed and is enveloped entirely by the mantle. Operculum probably absent.

| | length | width | aperture | |
|-----------|--------|-------|-----------------|---------------------------------------|
| (large) | 113 | 38 | 75.5 × ± 18 mm. | Holotype |
| (large) | 116 | 40 | 77 × 17 | off Cayo Coco, Camagüey, Cuba |
| (average) | 94 | 33 | 62 × 15 | off Sagua la Grande, Las Villas, Cuba |

Types. Holotype, Academy of Natural Sciences, Philadelphia, no. 168804, from a fish trap off Cayo Francés, Caibarién, Cuba, in 10 fathoms. A paratype in the collection of Carlos de la Torre.

Remarks. This species differs from *piratica* by having a less swollen body whorl, much more pronounced axial ridges and having no trace of spiral sculpture on the body whorl. *B. torrei* differs from *B. aguayoi* in being much larger, possessing smaller nuclear whorls, lacking the fine axial striations, having the columella straight rather than arched and in possessing subsutural spots rather than a solidly colored band.

Range. North and south coasts of Cuba.

Records. All station numbers are those obtained by the *Atlantis*. CUBA: off Sagua la Grande, station 3438, (265 fathoms); off Caibarién, station 3434, (255 fathoms); off Punta Alegre, station 2980, (220–260 fathoms); off Cayo Coco, station 3405, (235 fathoms); off Cayo Romano, station 3388, (255 fathoms); off Bahía de Cochinos, station 3332, (220 fathoms); (all MCZ and Museo Poey).

***Bathyaurlinia aguayoi* Clench, Plate 26, fig. 3**

Bathyaurlinia aguayoi Clench 1940, Memorias de la Sociedad Cubana de Historia Natural **14**, p. 241, pl. 42, fig. 4 (about 164 miles east of St. Augustine, Florida).

Description. Shell reaching about 75 mm. (about 3 inches) in length, fusiform, rather light in structure, shining and faintly ridged axially on the upper whorls. Whorls six, convex and only moderately shouldered. Color of the first two whorls white, the remaining whorls a diffused light brownish orange with a deeper brownish subsutural band below a whitish band at the suture. Spire moderately extended. Suture impressed and glazed smooth with the whorls shingled upon one another. Aperture sub-elliptical and rather elongate. Outer lip rather thin. Parietal lip not indicated by a reflected area. Siphonal canal rather broad and reflected backward. Columella strongly arched and without plicae. No spiral striae on the first post-nuclear whorl. Later whorls sculptured with very small axial ridges which disappear on the penultimate and body whorls. Spiral sculpture on the body whorl consisting of numerous and exceedingly fine threads which are a little coarser toward the base. No periostracum as the shell is highly glazed and is enveloped entirely by the mantle. Operculum probably absent.

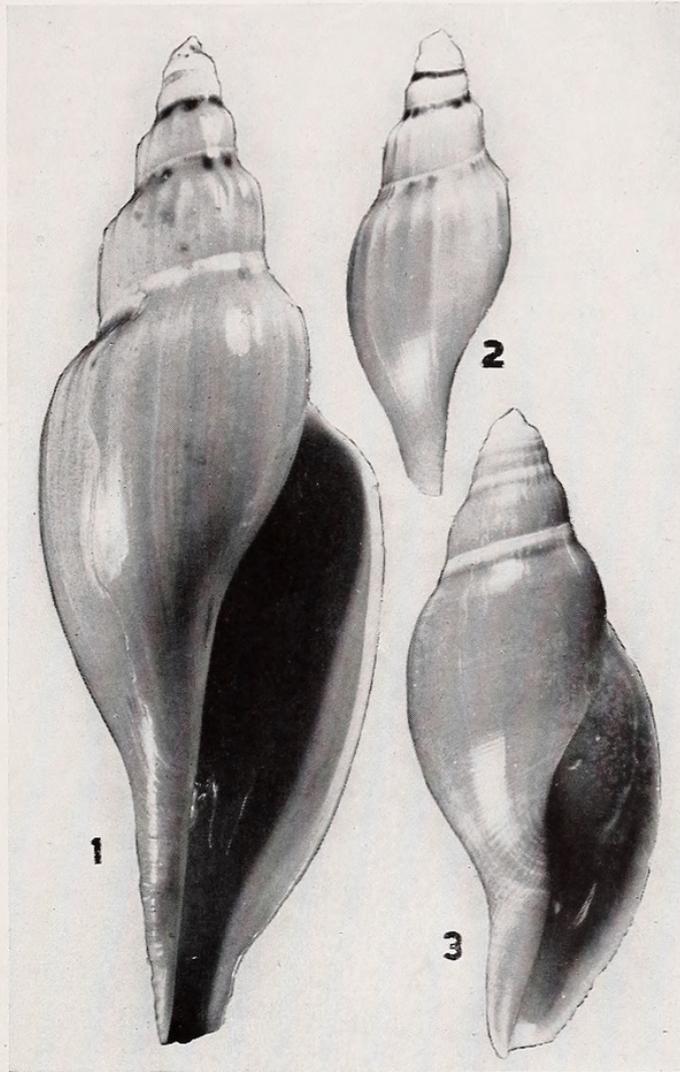
| | length | width | aperture | |
|---------|--------|-------|---------------|----------|
| (large) | 75 | 27.5 | 52 × 12.5 mm. | Holotype |
| (large) | 77.1 | 32.5 | 57 × 13.5 | Paratype |

Types. Holotype, Museum of Comparative Zoölogy no. 111858, *Atlantis*, station 3783 (N. Lat. 30°03'; W. Long. 78°37') about 164 miles east of St. Augustine, Florida

in 425 to 430 fathoms. A single dead paratype from station no. 3782 (N. Lat. $30^{\circ}10'$; W. Long. $78^{\circ}34'$) about 158 miles east of St. Augustine, Florida in 435 to 440 fathoms.

Remarks. (See also under *B. torrei*). This species, though congeneric with both *B. torrei* and *B. piratica*, differs rather sharply from them both in having less shouldered whorls, less pronounced axial ridges and in possessing a rather strongly arched columella.

Range and Records. See under Types.



Photographs by F. P. Orchard

Plate 26. Fig. 1 and 2. *Bathyaurlinia torrei* Pilsbry. Fig. 1, off Cayo Coco. Fig. 2, off Cayo Romano, Camagüey, Cuba. Fig. 3. *Bathyaurlinia aguayoi* Clench (Holotype), off St. Augustine, Florida (all natural size).

Rehderia, new genus

Shells are characterized by having large nuclear whorls with the calcarella smooth and hardly extending above the first whorl. This may be regularly coiled into the post embryonic whorl or may be somewhat offset to the main axis. Whorls are shouldered and the shell possesses a very heavy periostracum. The mantle envelops the ventral portion of the body whorl and most of the spire. Columellar plicae present.

A radula is present and an operculum absent in all members of this genus. On the basis of the radula the genus *Rehderia* is closely related to *Bathyaaurinia* (plate 24, fig. 1, 5).

Genotype, *Aurinia schmitti* Bartsch

Rehderia schmitti Bartsch, Plate 27, fig. 1-2

Aurinia schmitti Bartsch 1931, Journal Washington Academy of Science **21**, pp. 539-540, fig. 1 (off Tortugas, Florida); M. Smith 1942, A Review of the Volutidae, Lantana, Florida, p. 66, pl. 7, fig. 58.

Description. Shell fusiform, large, reaching about 130 mm. (5 inches) in length, rather light in structure. Whorls six, slightly convex. Color, when periostracum is present, a yellowish to dark brown. Underneath the periostracum the shell is a very pale pinkish salmon with 4 or 5 spiral rows of dark brown, square spots. These are somewhat indistinct and can be seen only where the periostracum has been removed from the shell. Aperture lengthened and sub-elliptical. Outer lip thin. Parietal region with a yellowish gray glaze, its area taking in most of the lower surface whorl, and, in addition, including most of the ventral surface of the spire. This glaze actually overlays the periostracum from the inner margin of the aperture to nearly half way around the body whorl. However, within the aperture both this overlay and the periostracum are absorbed. Upper end of the aperture rather wide and somewhat ear-shaped which produces a high shoulder on the body whorl. Lower portion of the aperture rather wide and extending into the siphonal canal. Columella nearly straight and supporting two well-developed plicae. Spire extended, acute and produced at an angle of about 45°. Sculpture consisting of very fine spiral threads crossed by numerous irregular, coarse, arched growth lines. Nuclear whorls straw yellow and smooth. First two post-embryonic whorls sculptured with fine spiral threads and crossed by axial ridges. Operculum absent. The radula consists of a single row of rachidian teeth, 10½ mm. in length for a shell 129 mm. long. The individual teeth are almost exactly like the one figured for *R. georgiana* (plate 24, fig. 5).

| length | width | aperture | |
|--------|-------|-------------|-----------------------|
| 129 | 41 | 93 × 15 mm. | off Tortugas, Florida |
| 114 | 35 | 75 × 14 | Holotype |
| 97 | 33 | 71 × 13 | Paratype |

Types. Holotype, United States National Museum no. 382779, from south of the Tortugas Islands, Florida in 80 fathoms. A single paratype from the same locality and depth. An additional specimen from the same locality but collected in 125 to 65 fathoms.

Remarks. A remarkable feature of this species is that it has produced a very heavy protective periostracum and at the same time has the mantle so developed that it envelops most of the shell. I cannot recall any other species of mollusk in which this occurs, at least to the extent exhibited by *R. schmitti*. In the matter of mantle envelopment, the genus *Rehderia* is intermediate between *Scaphella*, in which the mantle does not envelop the shell, and *Bathyaaurinia*, in which, so far as known, the mantle completely envelops the shell.

The irregularity of the embryonic whorl appears to be variable in this species, as two specimens have the post-nuclear whorls continued evenly in spiral development, while the third (the holotype) has the axis of the nuclear whorl offset by at least 45°.

Range and Records. See under Types.

Rehderia georgiana, new species, Plate 27, fig. 3

Description. Shell fusiform, medium in size, reaching 82 mm. ($3\frac{1}{4}$ inches) in length, rather light in structure. Whorls six, slightly convex with a moderately strong shoulder on the body whorl. Color, when periostracum is present, a yellowish straw. Underneath the periostracum the shell is chalky white with a slight pinkish tinge. There are five spiral rows of rather large, dark brown, square spots. These are distinct only in transmitted light through the palatal area. Aperture lengthened and sub-elliptical. Outer lip thin. Parietal region with a heavy grayish glaze overlying the periostracum. This area extends to about the nuclear whorls and covers much of the lower half of the body whorl. Upper end of the aperture fairly wide, lower end of the aperture broad and extending into the siphonal canal. Columella rather strongly arched to the right and supporting two weak plicae. Spire extended, acute and produced at an angle of about 45° . Sculpture consisting of very fine spiral threads crossed by numerous and very fine growth lines. Nuclear whorl yellowish brown and smooth, the calcarella small and worn. The



Photographs by F. P. Orchard

Plate 27. Fig. 1-2. *Rehderia schmitti* Bartsch, south of Tortugas Islands, Florida. Fig. 1, Paratype; Fig. 2, Holotype). Fig. 3. *Rehderia georgiana* Clench (Holotype), about 100 miles off Darien, Georgia (all natural size).

post-embryonic whorls with rather well developed axial costae which disappear on the body whorl. Periostracum rather heavy.

The sides of the foot are granulose and mottled with both yellow and black. The radula is 7 mm. long (shell 82 mm., holotype) and consists of only a single row of rachidian teeth. These possess a well developed central denticle with two narrow lateral denticles (plate 24, fig. 5).

| length | width | aperture | |
|--------|-------|-------------|----------|
| 82 | 28 | 55 × 12 mm. | Holotype |
| 102 | 34 | 64 × 13 | Paratype |
| 85 | 30 | 57 × 11 | Paratype |

Types. Holotype, United States National Museum no. 543509, *Pelican*, station 179-5, from about 100 miles off Darien, Georgia (N. Lat. 31°29.5'; W. Long. 79°41.5') in 45 fathoms. A paratype from the same station in the Museum of Comparative Zoölogy.

Remarks. This species differs from *R. schmitti* by being smaller, having the columella strongly arched and in having the mantle covering a smaller portion of the parietal area.

Range. North Carolina south to Florida.

Records. NORTH CAROLINA: about 100 miles east of Cape Fear, *Pelican*, station no. 187-4 (N. Lat. 34°05'; W. Long. 76°10') in 80 to 100 fathoms. GEORGIA: about 100 miles east of Darien, *Pelican*, station no. 179-5 (N. Lat. 31°29.5'; W. Long. 79°41.5') in 45 fathoms. FLORIDA: about 40 miles east of Cape Canaveral, *Pelican*, station no. 169-8 (N. Lat. 28°25'; W. Long. 79°58') in 50-100 fathoms.

Genus *Scaphella* Swainson

Scaphella Swainson 1832, Zoological Illustrations (2) 2, p. 87; Swainson 1840, A Treatise on Malacology, p. 318; J. E. Gray 1847, Proc. Zoological Society of London, p. 141; W. H. Dall 1890, Trans. Wagner Free Institute of Science, Philadelphia 3, p. 79; *non Scaphella* 'Gray' H. and A. Adams 1858; M. Smith 1942, A Review of the Volutidae, Lantana, Florida, p. 55.

Amoria 'Gray' H. and A. Adams 1858, The Genera of Recent Mollusca 2, p. 619; *non Amoria* Gray 1855.

Maculopeplum Dall 1906, Nautilus 19, p. 143.

Genotype, *Voluta junonia* Shaw (subsequent designation, Gray 1847).

The shells are characterized by being rather solid in structure, generally spindle-shaped, the columella with or without plicae and possessing a color pattern of numerous spiral rows of spots or bands. The protoconch is membranous and is lost. The nuclear whorls consist of a papilliform nucleus, the calcarella, which enlarges rapidly into a normal whorl. The nuclear whorls are generally smooth, the post-nuclear whorls finely sculptured. Radula exceedingly small and short and consisting only of a single row of rachidian teeth in all of the species so far examined. Operculum absent so far as known.

The history of this genus and its type designations has not been a fortunate one. Swainson included four "typical species" in his genus *Scaphella*, namely *undulata*, *junonia*, *maculata* and *zebra*. J. E. Gray in 1847 listed *Scaphella* of Swainson with two type designations: his first, *Voluta fusiformis*, based on Swainson 1840, was invalid since this species was not listed by Swainson in 1832 in his original diagnosis of the genus. Gray's second choice was that of *Voluta junonia*, a species included by Swainson in 1832. So far as I can trace, this was the first type designation of this genus. This selection was followed by Dall who in 1890 indicated the same type. Unfortunately, Dall in 1906 completely overlooked his early designation and that of Gray by introducing the genus

Maculopeplum and gave *Voluta junonia* as its type. This latter type selection, of course, makes *Maculopeplum* an absolute synonym of *Scaphella*.

Smith (1942, p. 55) in a footnote states "*Scaphella* having been discarded" and proceeds to erect a new subfamily, *Auriniinae*, to replace *Scaphellinae*. I can find no valid grounds at all to discard *Scaphella*, nor does Smith give any reasons whatsoever for his stand. His name *Auriniinae* becomes an absolute synonym of *Scaphellinae*.

Dall states (1907, p. 366) that both *Aurinia* and *Scaphella* s.s. (*Maculopeplum*) represent two divergent lines of development from the Eocene genus, *Caricella*. *Aurinia* is also related to the recent Eastern Atlantic genus *Halia*. In this latter genus the shell has become very thin and rather broad, structurally a very different appearing genus. The persistence of the spiral rows of color spots is rather remarkable, considering the rather striking modifications that have taken place in the morphological structures of the shells.

Subgenus **Scaphella** Swainson

Scaphella Swainson 1832, Zoological Illustrations (2) 2, p. 87.

Maculopeplum Dall 1906, Nautilus 19, p. 143 [genotype, *Voluta junonia* Lamarck].

Subgenotype, *Voluta junonia* Shaw (subsequent designation, Gray 1847).

The typical subgenus is characterized by possessing shells that are a little more massive, and particularly by the shape of the rachidian teeth. These are almost wish-bone in shape with the denticle rather long and narrow, and the lateral shanks extending behind rather than to the side. No lateral denticles seen in the single specimen we have examined (plate 24, fig. 4). The nuclear whorls are extended and as a consequence the calcarella is generally worn away. Mantle extending only over the parietal area. Periostracum consisting of a very thin yellowish covering.

Scaphella (Scaphella) junonia Shaw, Plate 28, fig. 1-3

Voluta junonia G. Shaw 1808, The Naturalist's Miscellany 19, p. 815, pl. 5 (Southern Pacific?); Kuster 1840, Conchy.-Cab. (2) 5, pt. 2, p. 161, pl. 27, fig. 1-2; Reeve 1849, Conchologia Iconica 6, **Voluta**, pl. 20, fig. 50.

Scaphella junonia Hwass, Dall 1889, Bull. Museum of Comparative Zoölogy 18, p. 148, pl. 34, fig. 5b-e.

Maculopeplum junonia Lam., Dall 1906, Nautilus 19, p. 143; Dall 1907, Smithsonian Misc. Collections 48, p. 370; Perry 1940, Bull. American Paleontology No. 95, p. 155, pl. 36, fig. 241.

Aurinia junonia Hwass, M. Smith 1942, A Review of the Volutidae, Lantana, Florida, p. 65, pl. 6, fig. 53.

Description. Shell fusiform, reaching about 115 mm. ($4\frac{1}{2}$ inches) in length, solid and strong. Whorls 5 to 6, shouldered and moderately convex. Color old ivory to cream with a series of mahogany brown spots in spiral rows. These spots are somewhat irregular in shape and size, as they may be subcircular to almost square, the subsutural row being the largest. Aperture long and somewhat elliptical, ending below in an oblique and slightly upturned siphonal canal. Outer lip generally thin on its margin though thickened immediately below. Parietal area very thinly glazed. Columella nearly straight and margined on the parietal side by a low ridge which is formed by the successive growth stages of the siphonal canal. Parietal area supporting four strongly developed plicae. Sculpture consisting of spiral incised lines on the first two early whorls, in addition to very fine axial ridges. Last two whorls smooth except for a few fine cords near the base. Nuclear whorl smooth and brown in color. Calcarella generally worn away. Periostracum brownish and exceedingly thin. No operculum.

| | length | width | aperture | |
|-----------|--------|-------|-------------|---------------------|
| (large) | 114 | 47 | 90 × 18 mm. | West Coast, Florida |
| (average) | 93 | 42 | 73 × 17 | West Coast, Florida |
| (average) | 82 | 37.5 | 65 × 15 | Neoholotype |

Types. Nothing is known apparently about the disposition of Shaw's types. They have probably been lost and as a consequence it appears wise to select a neoholotype, (Mus. Comp. Zoöl. no. 178048), the restricted type locality being off Sanibel Island, Lee County, Florida.

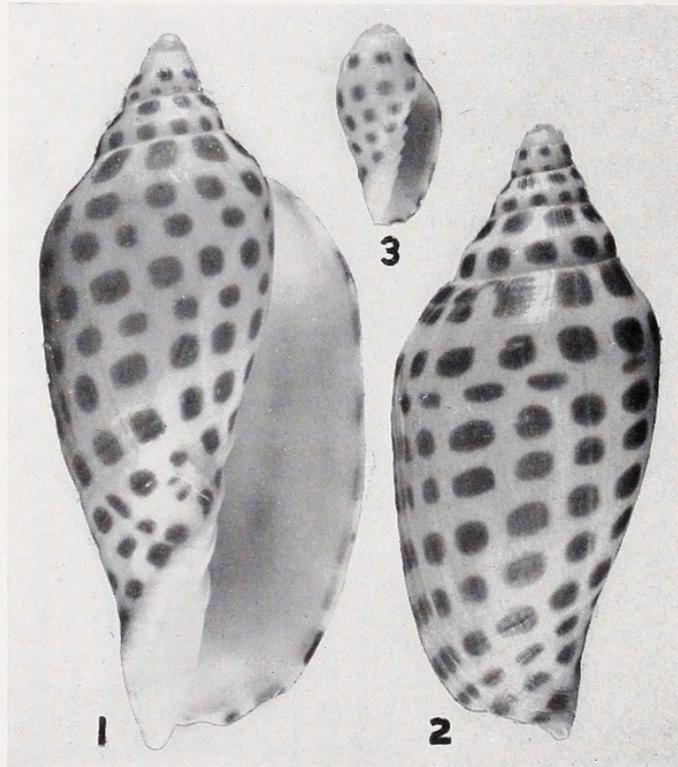
Common name. Juno's Volute; Junonia Shell.

Remarks. This is a rather rare species though of late years specimens have been dredged off the west coast of Florida in fair numbers.

Contrary to Dall's statement (1907, p. 370), this species, as well as others in the genus *Scaphella*, possesses a radula. This is remarkably small for the size of the animal and is thus very easily overlooked. The rachidian teeth of *S. junonia* are remarkably similar to those of *Volutomitra typica* Strebel as figured by Thiele (1929, p. 351, fig. 421). So far as we can determine, there are no traces of any lateral teeth in *junonia*, though a remnant of these teeth occur in *Volutomitra*. However, our observations are based upon but a single small specimen of *S. junonia* which was dredged in shallow water off Sanibel Island, Florida (plate 24, fig. 4).

The soft parts are colored much like the shell except that the spots are much larger and far more irregular in shape. The surface of the sides of the foot is finely granulose.

Range. North Carolina and south to both coasts of Florida.



Photographs by F. P. Orchard
 Plate 28. *Scaphella (Aurinia) junonia* Shaw. Fig. 1. (Neoholotype) off Sanibel Island, Florida. Fig. 2. Off Clearwater, Florida. Fig. 3. Off Tortugas, Florida (all natural size).

Records. NORTH CAROLINA: *Albatross*, station 2608 (a fragment), 17 miles off Cape Lookout (N. Lat. 34°32'; W. Long, 76°12') in 22 fathoms (USNM). FLORIDA: off Miami in 45 fathoms; off Tortugas in 15 fathoms; *Albatross*, station 2414, 30 miles north of Tortugas (N. Lat. 25°04'; W. Long. 82°59') in 26 fathoms (all USNM); Marco (P. T. Jackson); Pavilion Key; Naples; Sanibel Island; Boca Ciega; Passagrille; off Clearwater (all MCZ).

Subgenus *Aurinia* H. and A. Adams

Aurinia H. and A. Adams 1853, The Genera of Recent Mollusca 1, p. 166.

Livonia 'Gray' H. and A. Adams 1858, The Genera of Recent Mollusca 2, p. 617; *non Livonia* Gray 1842.

Volutifusus Conrad 1863, Proc. Academy Natural Sciences Philadelphia for 1862, p. 563 (genotype, *Fasciolaria mutabilis* Conrad, monotypic).

Genotype, *Voluta dubia* Broderip (monotypic).

This subgenus is characterized by having shells strong but not massive; nuclear whorls with a strongly developed calcarella; and rachidian teeth of the radula with a very strong denticle with the shanks above extending almost at right angles. At the base of the denticles there are two very small lateral teeth which appear to be fused to the central denticle (plate 24, fig. 3). Extended mantle covering only the parietal area. Periostracum consisting of a very thin yellowish covering. Operculum probably absent.

Smith's substitute designation (Smith 1942, p. 63) of *Aurinia dohrni dohrni* Sowerby as the genotype of *Aurinia* is invalid. His statement "The validity of that species [i.e. *Voluta dubia* Broderip] is now questionable" is certainly in error. Broderip's species is not only well described but is very well figured. Actually, Sowerby's *dohrni* is poorly figured and the few remarks given in the original citation hardly constitute a description.

Scaphella (*Aurinia*) *dohrni* Sowerby, Plate 29, fig. 1-2

Voluta dohrni Sowerby 1903, Jour. Malacology 10, p. 74, pl. 5, fig. 8 (locality not given).

Aurinia dohrni Sowerby, Clench and Aguayo 1940, Memorias de la Sociedad Cubana de Historia Natural 14, p. 88, pl. 16, fig. 2.

Aurinia dohrni dohrni Sowerby, M. Smith 1942, A Review of the Volutidae, Lantana, Florida, p. 63, pl. 6, fig. 61.

Description. Shell large, reaching about 100 mm. (4 inches) in length, fusiform and fairly solid. Whorls 7, strongly convex. Color a more or less uniform yellowish orange with nine or ten spiral rows of square dark brown spots. Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin; parietal wall thinly glazed. Columella moderately arched with three to four rather well developed plicae. Siphonal canal rather broad and arched dorsally. Sculpture: nuclear whorl smooth, remaining whorls with exceedingly fine incised spiral lines which persist to the body whorl; these are somewhat coarser toward the base. No axial costae developed. Nuclear whorl and calcarella very small and moderately extended.

| | length | width | aperture | |
|-----------|--------|-------|-------------|------------------------|
| (large) | 81 | 30 | 49 × 11 mm. | off Sandy Key, Florida |
| (average) | 65 | 25.5 | 42 × 10.5 | off Key West, Florida |

Types. The type of this species may possibly be in the British Museum. The type locality is here restricted to off the Lower Florida Keys.

Remarks. (See also under *S. dubia*). This species is also close to *S. florida* and this latter may be possibly only a form of the present one. However, differentiation between the two is readily made and there is a difference in their ranges. The young of many of these

several forms are difficult if not impossible to separate, as the diagnostic characters are mainly invested in the adult, the early whorls being quite similar.

This species differs from *S. florida* by possessing smoothly rounded whorls, not angled as in *florida*, and in lacking completely the axial costae, so pronounced in this other species. From *S. bermudezi*, which appears to resemble *dohrni*, it differs by possessing only three or four well spaced, low and smoothly rounded columellar plicae. There are four rail-like (cross-section) plicae in *bermudezi*. From *S. atlantis* it differs in being smaller, heavier and far more yellowish in color and having far fewer axial rows of spots (9 or 10 rows in *dohrni* and 15 in *atlantis*).

Scaphella dohrni is known to occur in depths of from 75 to 144 fathoms (450 to 864 feet).

Range. Known only from off the Lower Florida Keys in the vicinity of Key West and Tortugas, Florida.

Records. FLORIDA: off Sambo Reef (110 fathoms); off Key West (75 to 109 fathoms); off Western Dry Rocks (80 to 144 fathoms); off Sand Key (75 to 120 fathoms); (all USNM); off Lower Florida Keys (MCZ); off Tortugas (J. Miller); off Key West in 100 fathoms (Mrs. John Wentworth). Most of the above records from the United States National Museum were obtained by the *Eolis*.

Scaphella (Aurinia) florida Clench and Aguayo, Plate 29, fig. 3-4

Voluta dubia 'Broderip' Dohrn 1879, Jahrbücher Deutschen Malakozoologischen Gesell. **6**, p. 150, pl. 4, fig. 1-3 (shores of the Caribbean on the Florida Peninsula); *non V. dubia* Broderip 1827.

Voluta (Aulica) dubia 'Broderip' Tryon 1882 (in part) Manual of Conchology (1) **4**, p. 90, pl. 27, fig. 77 (Caribbean Sea off Florida).

Aurinia dohrni florida Clench and Aguayo 1940, Memorias de la Sociedad Cubana de Historia Natural **14**, p. 88, pl. 16, fig. 1, text fig. 1.

Description. Shell large, reaching about 100 mm. (4 inches) in length, fusiform and fairly solid. Whorls seven and moderately convex. Color a more or less uniform yellowish ivory with nine to ten spiral rows of square dark brown spots. Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin; parietal wall thinly glazed. Columella moderately arched with three to four rather well developed plicae. Siphonal canal rather broad and arched dorsally. Sculpture: nuclear whorls smooth, remaining whorls with exceedingly fine incised spiral lines which persist more or less to the body whorl; these become somewhat coarser toward the base. From the third to the fifth whorls there is a series of rather fine axial costae at the whorl shoulder. Nuclear whorl and calcarella small and somewhat extended.

| length | width | aperture | |
|--------|-------|-------------|-------------------------|
| 90 | 31 | 57 × 14 mm. | Holotype |
| 63 | 26 | 43 × 12 | Paratype |
| 77.5 | 27.5 | 49 × 13 | off Key West, Florida |
| 97.5 | 33.5 | 61 × 16 | off Lower Keys, Florida |

Types. The holotype of *S. florida* is based upon Dohrn's fig. 1, pl. 4, Jahr. Deut. Malak. Gesell. **6**, 1879. The type locality, here restricted, is off the Lower Florida Keys.

Remarks. (See also under *S. dohrni* and *S. dubia*). This species is readily differentiated from *dohrni* by its angled whorls and numerous axial costae on the mid-whorls. From *S. gouldiana*, which also possesses strongly developed axial costae, it differs in having spiral rows of spots rather than a uniform straw-yellow color or rarely with bands of color.

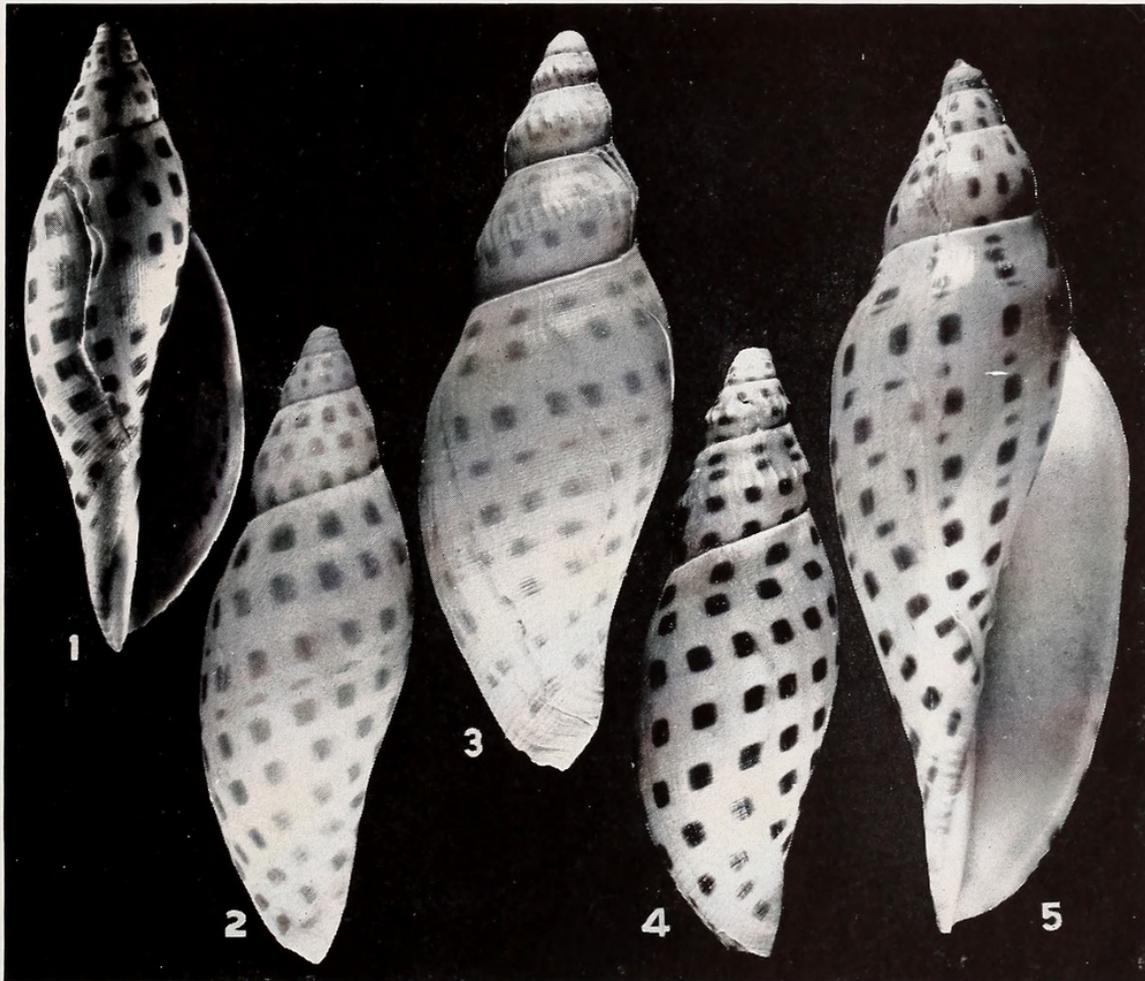
This species is known to occur in depths of from 67 to 122 fathoms (402 to 732 feet).

Range. Found off the Lower Florida Keys from Miami to Key West.

Records. FLORIDA: off Cape Florida (67 fathoms); off Ragged Keys (80 fathoms); off Sambo Reef (118 fathoms); off Key West (87 to 122 fathoms); off Sand Key (75 to 110 fathoms); off Western Dry Rocks (80 fathoms) (all USNM); off Lower Florida Keys (MCZ); off Miami in 100 fathoms (Mrs. John Wentworth). The above records from the United States National Museum were obtained mainly by the *Eolis*.

***Scaphella (Aurinia) atlantis*, new species, Plate 29, fig. 5**

Description. Shell large, reaching about 100 mm. (4 inches) in length, fusiform and rather thin. Whorls seven and moderately convex. Color a more or less uniform yellowish ivory with 15 spiral rows of square dark brown spots (holotype). Aperture elliptical and somewhat lengthened. Suture slightly indented. Outer lip thin, parietal wall thinly glazed. Columella straight with three very strongly developed plicae. Siphonal canal rather broad and straight. Sculpture: nuclear whorl smooth, remaining whorls displaying a fine reticulated pattern with the spiral lines the stronger. This sculpture becomes obsolete on the body whorl. No axial costae on the mid-whorls though the shoulder is



Photographs by F. P. Orchard

Plate 29. Fig. 1-2. *Scaphella (Aurinia) dohrni* Sowerby, off Lower Florida Keys. Fig. 3. *Scaphella (Aurinia) florida* Clench and Aguayo, off Lower Florida Keys. Fig. 4. *S. florida* Clench and Aguayo, off Western Dry Rocks, Florida. Fig. 5. *Scaphella (Aurinia) atlantis* Clench (Holotype), off Punta Alegre, Camagüey, Cuba (all natural size).

slightly angled at this point. Nuclear whorl and calcarella small and partially submerged within the second whorl.

| length | width | aperture |
|--------|-------|------------------------|
| 97.5 | 34.5 | 67 × 14.5 mm. Holotype |

Types. Holotype, Museum of Comparative Zoölogy no. 135263, off Punta Alegre, Camagüey, Cuba. *Atlantis*, station 3415 (N. Lat. 22°51'30"; W. Long. 78°55'30") in 210 fathoms.

Remarks. (See also under *S. dohrni*). This species differs from *dohrni* by being pale yellowish ivory in color, rather than a deep yellowish orange. In addition, it has 15 spiral rows of spots, while in *dohrni* there are nine to ten rows. It is also lighter in structure, a little larger in size with the mid-whorls slightly angled at the periphery and is moderately shouldered on the body whorl. No axial costae present. Only a single adult specimen is known, though we possess a few young specimens which may possibly be this species.

Range and Records. See under *Types*.

Scaphella (Aurinia) dubia Broderip, Plate 30, fig. 1-2

Voluta dubia Broderip 1827, Zoological Journal **3**, p. 81, pl. 3, fig. 1 (locality unknown); Reeve 1849, Conchologia Iconica **6**, *Voluta*, p. 22, fig. 59.

Fulguraria (Aurinia) dubia Broderip, H. and A. Adams 1853, The Genera of Recent Mollusca **1**, p. 166.

Scapha (Aurinia) dubia Broderip, H. and A. Adams 1858, The Genera of Recent Mollusca **2**, p. 617.

Description. Shell large, reaching 100 mm. (4 inches) in length, fusiform and rather thin. Whorls six and slightly convex. Color a more or less uniform yellowish ivory to pinkish with six to seven spiral rows of square dark brown spots. Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin, parietal wall thinly glazed. Columella straight, with or without one or two fairly well developed plicae. Siphonal canal rather narrow and straight. Sculpture: nuclear whorl smooth, remaining whorls with five raised spiral threads. From the third to the last whorl there may be a series of fine or rather strong axial costae at the whorl shoulder. Nuclear whorl and calcarella large and extended, sometimes being larger than the first post-nuclear whorl.

The following is the original description of Broderip:

"Shell fusiform, slightly ribbed, longitudinally and transversely striated, yellowish, with many bands of interrupted, somewhat square fulvous spots; spire short, apex rude, with the papilla terminating almost acutely; the pillar very slightly marked with two plaits, and the base entire. Length 2½ inches."

| length | width | aperture |
|--------|--------|---------------------------------------|
| 70 | 21.5 | 49.5 × 10 mm. Neoholotype |
| 57.5 | 18.5 | 40.5 × 9 Neoparatype |
| 98 | broken | 66 × ? (broken) off Key West, Florida |

Types. According to Dall (1907, p. 367) the original type specimen has been lost. We here designate a neoholotype, United States National Museum no. 54544, Gulf of Mexico, about 75 miles south of Cape San Blas, Florida. *Albatross*, station 2402 (N. Lat. 28°36'; W. Long. 85°33'30"). A neoparatype from the same locality in the Museum of Comparative Zoölogy.

Remarks. (See also under *S. kieneri*). This species has had a peculiar history so far as the name is concerned. It was originally described by Broderip in 1827 from a specimen without a locality. It remained practically unknown until 1853 when the Adams brothers created the subgenus *Aurinia* for its reception. In 1879, Dohrn received some specimens from Agassiz that had been collected by Pourtalès off the Lower Florida Keys. He thought these specimens to be the same as *dubia*, and described and figured them under this name. However, they were quite different. This fact was noted by Sowerby, and in a review of the question (1903, p. 74) he described and figured still another species which he called *dohrni*. This still left the specimens of Dohrn without a name until 1940 when the name *florida* was given by Clench and Aguayo.

Range. Gulf of Mexico from northern Florida south to Key West.

Records. FLORIDA: *Albatross*, station 2402, about 75 miles south of Cape San Blas (N. Lat. 28°36'; W. Long. 85°33'30") in 111 fathoms; *Eolis*, off Key West in 90 and 95 fathoms (all USNM).

Scaphella (Aurinia) gouldiana Dall, Plate 30, fig. 3-5

Voluta gouldiana Dall 1887, The Conchologists' Exchange [Nautilus] 2, p. 10 (West Indies); *ibid.* 1889, Bull. Museum of Comp. Zoölogy 18, p. 154, pl. 19, fig. 3 (many localities between Georgia and Key West).

Description. Shell moderate in size reaching about 70 mm. ($2\frac{3}{4}$ inches) in length, fusiform and rather solid. Whorls six and rather strongly convex. Color a straw yellow with a tinge of pink along the margin of the columella. Occasionally specimens possess a series of rather dark brown, spiral bands, about seven or eight in number. Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin, parietal wall thinly glazed. Columella arched and supporting two or three weak plicae. Siphonal canal rather broad and arched dorsally. Sculpture: nuclear whorl smooth, remaining whorls with numerous and exceedingly fine spiral incised lines. On the body whorl these lines become quite strong toward the base. From the third to the last whorl there is a series of strong axial costae at the whorl shoulder. Nuclear whorl small with the calcarella and first whorl extended.

| length | width | aperture | |
|--------|-------|-------------|-----------------------------|
| 69 | 25 | 45 × 11 mm. | Holotype |
| 52.5 | 21.5 | 35 × 9.5 | off Cape Canaveral, Florida |
| 53 | 22.5 | 33 × 8.5 | off Ragged Keys, Florida |

Types. Holotype, United States National Museum no. 83873, *Albatross*, station no. 2625, about 75 miles off Cape Fear, North Carolina (N. Lat. 32°35'; W. Long. 77°30') in 247 fathoms.

Remarks. (See also under *S. florida*). This species is superficially like *S. florida*, but differs by being smaller, lacking the spiral rows of spots and having only two rather weak columellar plicae. Occasional specimens of *S. gouldiana* may be white or a very pale straw-yellow. Three specimens in the United States National Museum possesses rather indistinct spiral bands of brown. This is a persistence of a character which is remarkably consistent for the entire genus *Scaphella*. In most cases the bands have become broken into series of spots; in others they remain as bands or broken bands of color. The occurrence of nearly white forms shows a variability of color in this species not shared by other members of this genus. It is to be remembered, however, that what little knowledge we possess of this entire genus is based upon but very few specimens.

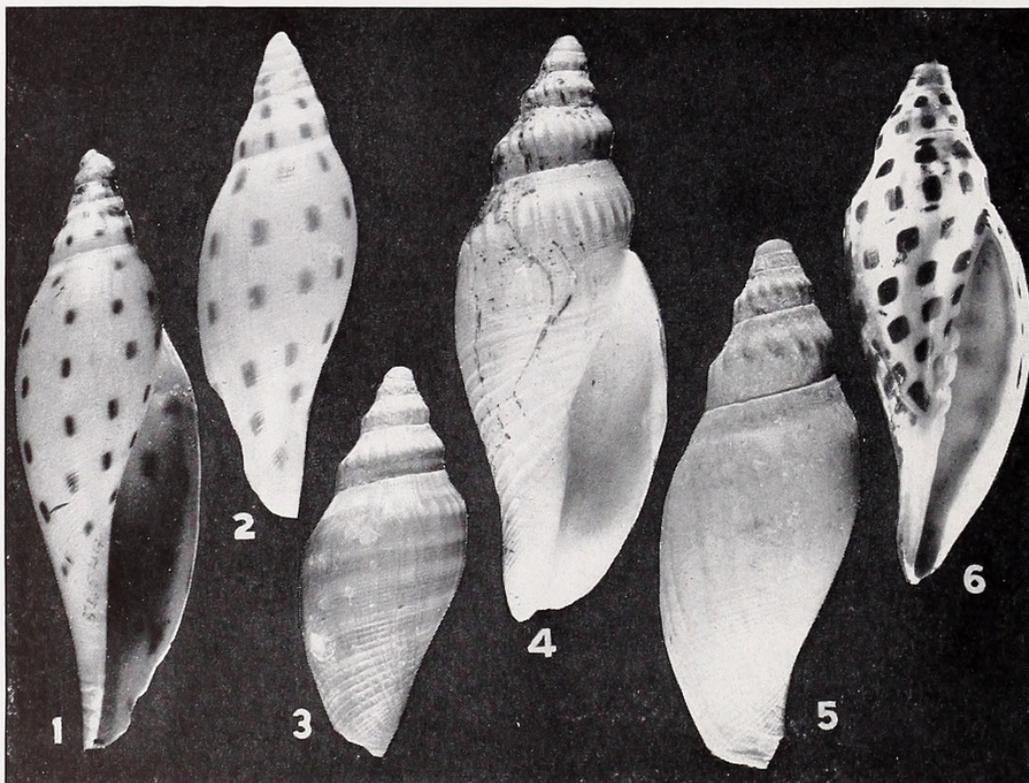
This species occurs in depths of 78 to 509 fathoms (468 to 3054 feet).

Range. North Carolina south to the Florida Keys, the western Bahamas and the northern coast of Cuba.

Records. NORTH CAROLINA: about 75 miles off Cape Fear, *Albatross*, station no. 2624 (N. Lat. $32^{\circ}36'$; W. Long. $77^{\circ}29'15''$) in 258 fathoms; station 2625 (N. Lat. $32^{\circ}35'$; W. Long. $77^{\circ}30'$) in 247 fathoms. SOUTH CAROLINA: *Albatross*, station 2314, about 130 miles east of Charleston (N. Lat. $32^{\circ}43'$; W. Long. $77^{\circ}51'$) in 159 fathoms. FLORIDA: *Albatross*, station 2666, about 110 miles east of Fernandina (N. Lat. $30^{\circ}47'$; W. Long. $79^{\circ}49'$) in 270 fathoms; *Albatross*, station 2661, about 80 miles east of Daytona (N. Lat. $29^{\circ}16'30''$; W. Long. $79^{\circ}36'30''$) in 438 fathoms; *Albatross*, station 2659, about 120 miles east of Cape Canaveral (N. Lat. $28^{\circ}32'$; W. Long. $78^{\circ}42'$) in 509 fathoms; *Eolis*, station 194, off Ragged Keys, in 85 fathoms; *Eolis*, station 165, off Fowery Light in 78 fathoms (all USNM). BAHAMA ISLANDS: *Atlantis*, station 2951, off Great Isaac, Bimini Ids. (N. Lat. $26^{\circ}08'$; W. Long. $79^{\circ}02'$) in 155 fathoms. CUBA: *Atlantis*, station 3437, off Caibarién, Las Villas (N. Lat. $23^{\circ}05'$; W. Long. $79^{\circ}37'$) in 260 fathoms; *Atlantis*, station 2980A, off Punta Alegre, Camagüey, (N. Lat. $22^{\circ}48'$; W. Long. $78^{\circ}41'$) in 260 fathoms (all MCZ).

Scaphella (Aurinia) bermudezi *Clench and Aguayo*, Plate 30, fig. 6

Aurinia bermudezi Clench and Aguayo 1940, *Memorias de la Sociedad Cubana de Historia Natural* 14, p. 89, pl. 16, fig. 2 (Bahía de Cochinos, Cuba).



Photographs by F. P. Orchard

Plate 30. Fig. 1-2. *Scaphella (Aurinia) dubia* Broderip, 75 miles south of Cape San Blas, Florida. (Fig. 1, Neoholotype; Fig. 2, Neoparatype). Fig. 3. *Scaphella (Aurinia) gouldiana* Dall, off Fowey Light, Florida. Fig. 4. *S. gouldiana* Dall, off Fernandina, Florida. Fig. 5. *S. gouldiana* Dall (Holotype), about 75 miles off Cape Fear, North Carolina. Fig. 6. *Scaphella (Aurinia) bermudezi* Clench and Aguayo (Holotype), off Bahía de Cochinos, Las Villas, Cuba (all natural size).

Description. Shell medium in size, about 60 mm. ($2\frac{1}{4}$ inches) in length, fusiform and rather solid. Whorls six, slightly convex. Color a more or less uniform yellowish ivory with eight spiral rows of dark brown spots (holotype). Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin, parietal wall thinly glazed. Columella slightly arched and supporting five strong plicae. Siphonal canal rather broad and slightly arched dorsally. Sculpture: nuclear whorl smooth, succeeding whorls with a very fine reticulated pattern, the spiral lines being the stronger, the sculpture becoming more or less obsolete on the body whorl. From the fourth to the last whorl there is a series of small and fine axial costae at the whorl shoulder. Nuclear whorl small with the calcarella and the first whorl partially submerged in the second whorl.

| length | width | aperture |
|--------|-------|-------------------------|
| 59.2 | 20.4 | 42.2 × 9.1 mm. Holotype |

Types. Holotype, Museum of Comparative Zoölogy no. 135245, *Atlantis*, station no. 2962 (N. Lat. $22^{\circ}07'$; W. Long. $81^{\circ}08'$), Bahía de Cochinos, Las Villas, Cuba, in 180–190 fathoms.

Remarks. (See also under *S. dohrni*). Little can be added about this species as only a single specimen is known. It differs from *dohrni* by being lighter in color and particularly by possessing four closely set rail-like (cross section) and strongly developed columellar plicae and an additional rather weak one near the base. It is somewhat lighter in structure and lacks the spiral threads of *dohrni*.

Range and Records. See under Types.

Scaphella (Aurinia) neptunia *Clench and Aguayo*, Plate 31, fig. 3–4

Aurinia neptunia Clench and Aguayo 1940, *Memorias de la Sociedad Cubana de Historia Natural* 14, p. 90, pl. 16, fig. 5 (off Banner Reef, Pedro Bank, 75 miles south of Jamaica).

Description. Shell medium, about 50 mm. (2 inches) in length, fusiform and rather thin. Whorls five, slightly convex (specimen probably only partially grown). Color a straw yellow with five (holotype) brownish bands which may be solid or broken up into lengthened bars. Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin, parietal wall thinly glazed. Columella nearly straight and supporting two or three rather weak plicae. Siphonal canal rather broad and straight. Sculpture: nuclear whorls smooth, remaining whorls with numerous and very fine incised spiral grooves. These are cut by irregular and fine axial growth lines. Nuclear whorls large with the calcarella and first whorl extended above the second whorl.

| length | width | aperture |
|--------|-------|-----------------------|
| 50.5 | 18.1 | 35 × 8.5 mm. Holotype |

Types. Holotype, Museum of Comparative Zoölogy no. 119025, *Blake*, station no. 8, off Banner Reef, Pedro Bank, 75 miles south of Jamaica (N. Lat. $17^{\circ}45'$; W. Long. $77^{\circ}58'40''$) in 322 fathoms.

Remarks. This species is known from only a single young specimen. It is characterized by a very large nuclear whorl and having but five spiral bands which are broken into lengthened bars of color rather than spots.

Range and Records. See under Types.

Scaphella (Aurinia) cuba, new species, Plate 31, fig. 2

Description. Shell medium to small, about 60 mm. ($2\frac{1}{2}$ inches) in length, fusiform and rather solid. Whorls six, slightly convex. Color a straw yellow with seven spiral rows of square to rectangular dark brown spots which may be lengthened axially (holotype). Aperture elliptical and somewhat lengthened. Spire acute and moderately lengthened. Suture slightly indented. Outer lip thin, parietal wall thinly glazed. Columella arched and supporting four moderately developed plicae. Siphonal canal rather narrow and moderately arched dorsally. Sculpture: nuclear whorl smooth, remaining whorls with numerous and fine incised grooves which persist to the body whorl. These are a little coarser toward the base of the shell. From the third to the fifth whorl there is a series of fine axial costae at the whorl shoulder. Nuclear whorl small with the calcarella and first whorl partially submerged in the second whorl.

| length | width | aperture | |
|--------|-------|-------------|----------|
| 56 | 24.5 | 40 × 11 mm. | Holotype |

Types. Holotype, Museum of Comparative Zoölogy no. 135229, *Atlantis*, station 2988, off Sagua la Grande, Las Villas, Cuba (N. Lat. $23^{\circ}15'$; W. Long. $79^{\circ}57'$) in 380 fathoms.

Remarks. This species is based upon a single specimen. It is proportionately wider than all known species except *S. robusta*. It differs from *robusta* in having the spiral rows of spots lengthened axially and in having four rather well developed columellar plicae, whereas *robusta* possesses only three weakly developed plicae. In addition, the columella is only slightly arched and the siphonal canal is nearly straight rather than definitely up-turned or recurved as it is in *robusta*.

Range and Records. See under Types.

Scaphella (Aurinia) kieneri, new name, Plate 31, fig. 1

Fusus tessellatus 'Schubert and Wagner' Kiener 1840, Icon. Coquilles Vivantes 5, p. 38, pl. 29, fig. 1 (locality unknown); *non F. tessellatus* Schubert and Wagner 1829.

Description. "Shell thin, elongate, fusiform, with a conical spire; composed of six slightly convex whorls, of which the first form at the apex a smooth rounded nipple; the succeeding, except for the last, are provided with small, narrow, longitudinal ribs; the last whorl is attenuate, scarcely globose, ending at the base in a rather broad canal, with a slight notch; the entire surface of the shell is covered with very fine and close-set transverse striae. The aperture is elongate, violaceous-white inside; the right edge [outer lip] is thin, sharp, marked inside with cloudy spots which correspond to those on the outside; the columella is feebly curved, rounded, smooth, and non-spotted. This shell is pale fulvous, covered with a large number of russet sub-elongate or rectangular, well separated spots. Length 5 inches 6 lines."

Types. The type specimen, originally in the collection of Prince Massena, is now in the Museum at Geneva, Switzerland (Dall 1907, p. 368). The type locality is still unknown.

Remarks. The above quotation is a translation of Kiener's description by J. Bequaert. Kiener's specimen still remains the only known example of this beautiful species.

It would be exceedingly interesting to know just how Prince Massena and Broderip came into possession of *S. kieneri* and *S. dubia*. Both were obtained prior to 1829. All

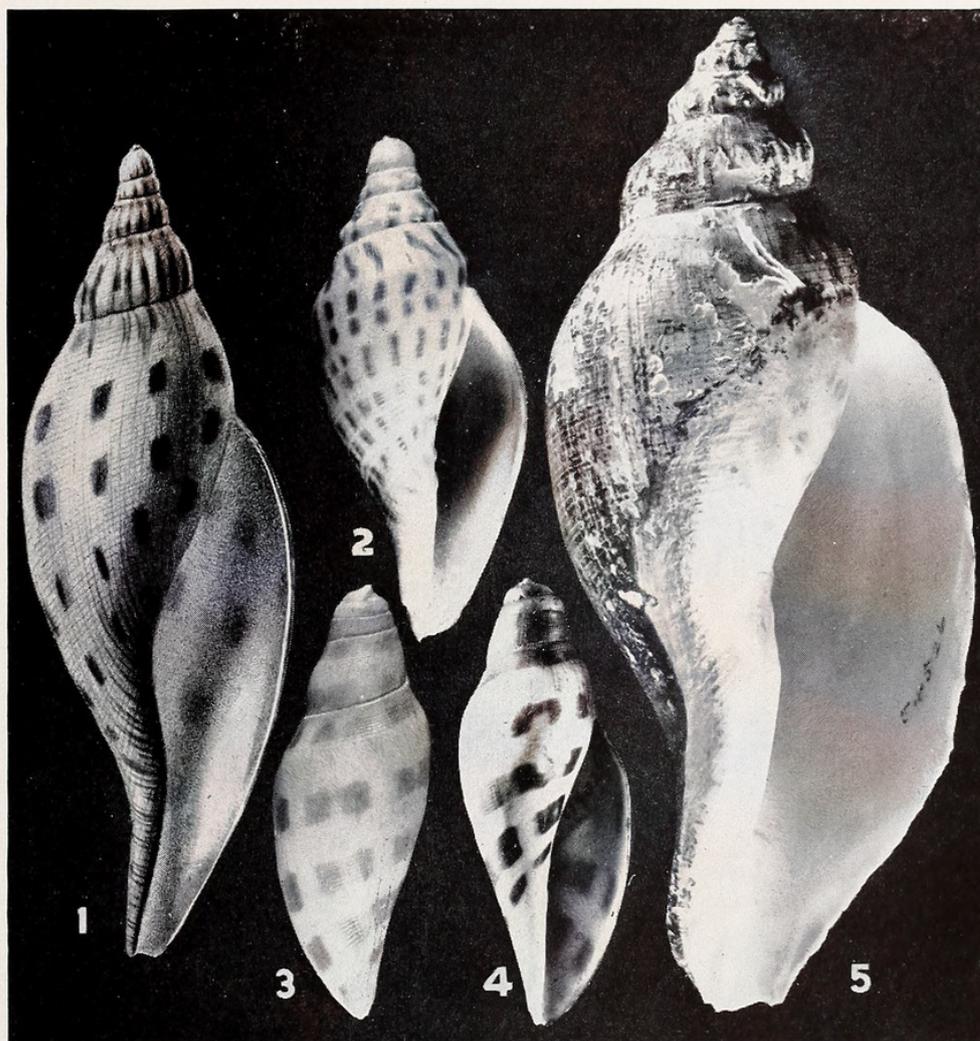
known species in *Scaphella* are deep water forms other than *S. junonia* which lives just below low water, and this latter form was known to Favanne sometime prior to 1780. It is possible, of course, that both these species were obtained in fish traps off the French islands that compose a part of the Lesser Antilles, a source of rare deep water forms that furnished Fischer and Bernardi, years later, with several fine species. *Bathyaaurinia torrei* was first discovered by this means. This method is still used to collect some of the finest deep water species off the Japanese coast, many of which are in the *Volutidae*.

Range and Records. See under Types.

Scaphella (Aurinia) robusta Dall, Plate 31, fig. 5

Aurinia robusta Dall 1889, Bull. Museum of Comparative Zoölogy **18**, p. 153, pl. 35, fig. 2. Gulf of Mexico [about 80 miles southwest of Cape San Blas, Florida].

Description. Shell large, reaching about 112 mm. ($4\frac{3}{4}$ inches) in length, fusiform and



Photographs by F. P Orchard

Plate 31. Fig. 1. *Scaphella (Aurinia) kieneri* Clench (after Kiener pl. 29, fig. 1). Fig. 2. *Scaphella (Aurinia) cuba* Clench (Holotype), off Sagua la Grande, Las Villas, Cuba. Fig. 3-4. *Scaphella (Aurinia) neptunia* Clench and Aguayo (Holotype), off Banner Reef, Pedro Bank, 75 miles south of Jamaica. Fig. 5. *Scaphella (Aurinia) robusta* Dall (Holotype), about 80 miles S. W. of Cape San Blas, Florida (all natural size).



Clench, William James. 1946. "The Genera Bathyaaurinia, Rehderia and Scaphella in the Western Atlantic." *Johnsonia* 2(22), 41–60.

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