

NEW FORAMINIFERA FROM NORTHWESTERN PERU

BENTON STONE

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ABSTRACT—Two new genera, *Sporobuliminella* and *Sporobulimina*, are described from the Upper Cretaceous "Clavulina" shale and a new species of *Stichocassidulina* is described from the upper Eocene Talara formation of northwestern Peru.

During the course of recent micropaleontological work on well and field samples from northwestern Peru three new species of Foraminifera have been found which may be of value in correlations with the Cretaceous and Eocene sections of other countries. Two of these are new genera from the Upper Cretaceous and the other is a new species of *Stichocassidulina* from the upper Eocene. The latter genus has been found very useful in correlations on the La Brea-Parinas Estate and in making correlations with Ecuador and California.

Disposition of Type Specimens.—The specimens illustrated and described in this paper have been deposited in the type collections of the U. S. National Museum, Washington, D. C. Topotypes of the new species will be deposited in the collections of the Cushman Laboratory for Foraminiferal Research, Sharon, Massachusetts.

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The illustrations of Foraminifera were drawn by Señor Manuel Alban.

Family BULIMINIDAE
Subfamily TURRILININAE
Genus SPOROBULIMINELLA Stone,
n. gen.

Genotype, *Sporobuliminella stainforthi*
Stone, n. sp.

Test a short tightly coiled spiral; four chambers in each whorl; spiral suture distinct; chambers inflated; sutures depressed; wall calcareous, perforate. Apertural area

composed of two parts: the principal aperture is a low arched opening with a slight lip at the base of the last-formed chamber; the supplementary apertures are arranged in an almost circular pattern adjacent to the principal aperture and consist of numerous small circular openings.

This genus is similar to *Buliminella* in having a distinct spiral suture and four chambers in each whorl. The character of the principal aperture and the presence of numerous supplementary apertures, however, serves to readily distinguish it from that genus. *Sporobuliminella* is placed in the Buliminidae because of its similarity to *Buliminella*.

SPOROBULIMINELLA STAINFORTHII
Stone, n. sp.

Plate 21, figures 4-7

Test a short tightly coiled spiral; four chambers in each whorl; spiral suture distinct; chambers inflated; sutures depressed; wall calcareous, perforate. Initial end of microspheric form is pointed; chambers increasing rapidly in size as added; greatest diameter at the central portion of the test. Initial end of megalospheric form broadly rounded; test sub-spherical; chambers increasing rapidly in size as added; greatest diameter at the central portion of the test. Apertural area composed of two parts: the principal aperture is a low arched opening with a slight lip at the base of the last-formed chamber, the supplementary apertures are arranged in an almost circular pattern adjacent to the principal aperture and consist of numerous small circular openings outlined by low up-turned lips.

Dimensions of holotype (microspheric form): height 0.60 mm. diameter, 0.49 mm. Dimensions of area occupied by supplementary apertures: width, 0.26 mm., length, 0.32 mm. Diameter of circular supplement-



tary apertural openings: .062 mm. Holotype and paratypes from the Upper Cretaceous "Clavulina" shale, sample No. S-49, on Las Cruces-Atascadera road in west bank of road cut 2.6 kilometers north of Las Cruces, Department of Piura, Peru.

Sporobuliminella stainforthi has been found to date only at its type locality about 100 feet above the base of the "Clavulina" shale. Here it is associated with a rich fauna consisting of *Lingulina taylorana* Cushman, *Siphogenerinoides clarki* Cushman and Campbell, *Neobulimina canadensis* Cushman and Wickenden and many other typical upper Cretaceous forms. It is very rare.

Family BULIMINIDAE

Subfamily BULIMININAE

Genus SPOROBULIMINA Stone

n. gen.

Genotype, *Sporobulimina perforata*

Stone, n. sp.

Test an elongate spiral; triserial; chambers inflated; spiral suture obsolete, other sutures somewhat depressed; wall calcareous, perforate. Apertural area composed of two parts: the principal aperture is a narrow elongate slit extending from the base of the last-formed chamber to about midway across the apertural face; supplementary apertures are numerous irregularly shaped openings arranged in a semicircular pattern adjacent to the principal aperture.

Sporobulimina is very similar to *Bulimina* from which it may be distinguished by the aperture and the presence of numerous supplementary apertures. It differs from *Sporobuliminella* in being triserial with an obsolete spiral suture, and having irregularly

shaped supplementary apertures and an elongate slit principal aperture.

SPOROBULIMINA PERFORATA

Stone, n. sp.

Plate 21, figures 1-3

Test elongate, triserial; chambers inflated; sutures depressed; wall calcareous, perforate. Initial end of microspheric form pointed; chambers increasing rapidly in size as added; greatest diameter at central portion of test. Initial end of megalospheric form bluntly rounded, with a small sharp spine; chambers increasing slowly in size as added; greatest diameter is attained in the upper one-third of the test. Apertural area composed of two parts: the principal aperture is a narrow elongate slit extending from the base of the last-formed chamber to about midway across the apertural face; supplementary apertures are numerous irregularly shaped openings arranged in a semicircular pattern adjacent to the principal aperture. Both principal and supplementary apertures are rimmed by low up-turned lips.

Dimensions of holotype (megalospheric form): height, 0.62 mm., diameter, 0.39 mm. Dimensions of area occupied by supplementary apertures: length, 0.09 mm., width 0.06 mm. Diameter of circular supplementary apertures: 0.02 mm. Measurements of slit-like supplementary apertures: length, 0.04 mm., width, 0.01 mm. Holotype and paratypes from the Upper Cretaceous "Clavulina" shale, sample No. S-106, in south bank of Quebrada Chungo, 200 meters east of the Las Cruces-Pazul road.

At its type locality *Sporobulimina perforata* is associated with *Siphogenerinoides ber-*

EXPLANATION OF PLATE 21

- FIGS. 1-3—*Sporobulimina perforata* Stone, n. sp., 1, Holotype, X36; 2-3, paratypes, X36. 1a, Front view; 1b, side view; 1c, apertural view showing principal aperture and supplementary openings. 2, side view of broken specimen showing apertures and foramina of the subjacent chamber. 3a, front view of microspheric specimen; 3b, back view of microspheric specimen; 3c, apertural view of microspheric specimen. (p. 82)
- 4-7—*Sporobuliminella stainforthi* Stone, n. sp., 4, Holotype, X36; 5-7, paratypes, X36. 4a, Front view; 4b, back view; 4c, apertural view showing principal aperture and numerous supplementary openings. 5a, Front view of immature megalospheric form; 5b, back view. 6a, Front view of adult megalospheric form; 6b, back view; 6c, apertural view. 7a, Front view of immature microspheric form; 7b, back view. (p. 81)
- 8—*Stichocassidulina peruviana* Stone, n. sp., 8, Holotype, X36. 8a, 8c, Side views showing slit-like supplementary apertures along the sutures; 8b, apertural view showing principal aperture. (p. 83)

mudezi Stone, *S. reticulata* Stone, *Bolivina explicata* Cushman and Hedberg and other typical Cretaceous forms. It is most abundant at its type locality 650 feet stratigraphically below the middle member of the "Clavulina" shale, but occurs rarely as much as 900 feet higher in the section.

Family CASSIDULINIDAE

Subfamily CASSIDULININAE

Genus STICHOCASSIDULINA Stone, 1946

STICHOCASSIDULINA PERUVIANA

Stone, n. sp.

Plate 21, figures 8a-c

Test close coiled, biserial, involute; chambers alternating on the two sides of the periphery, smooth, inflated; wall calcareous, finely perforate; sutures depressed. Apertures of two types: the principal aperture is a large roughly loop-shaped elongate opening in the apertural face of the last-formed

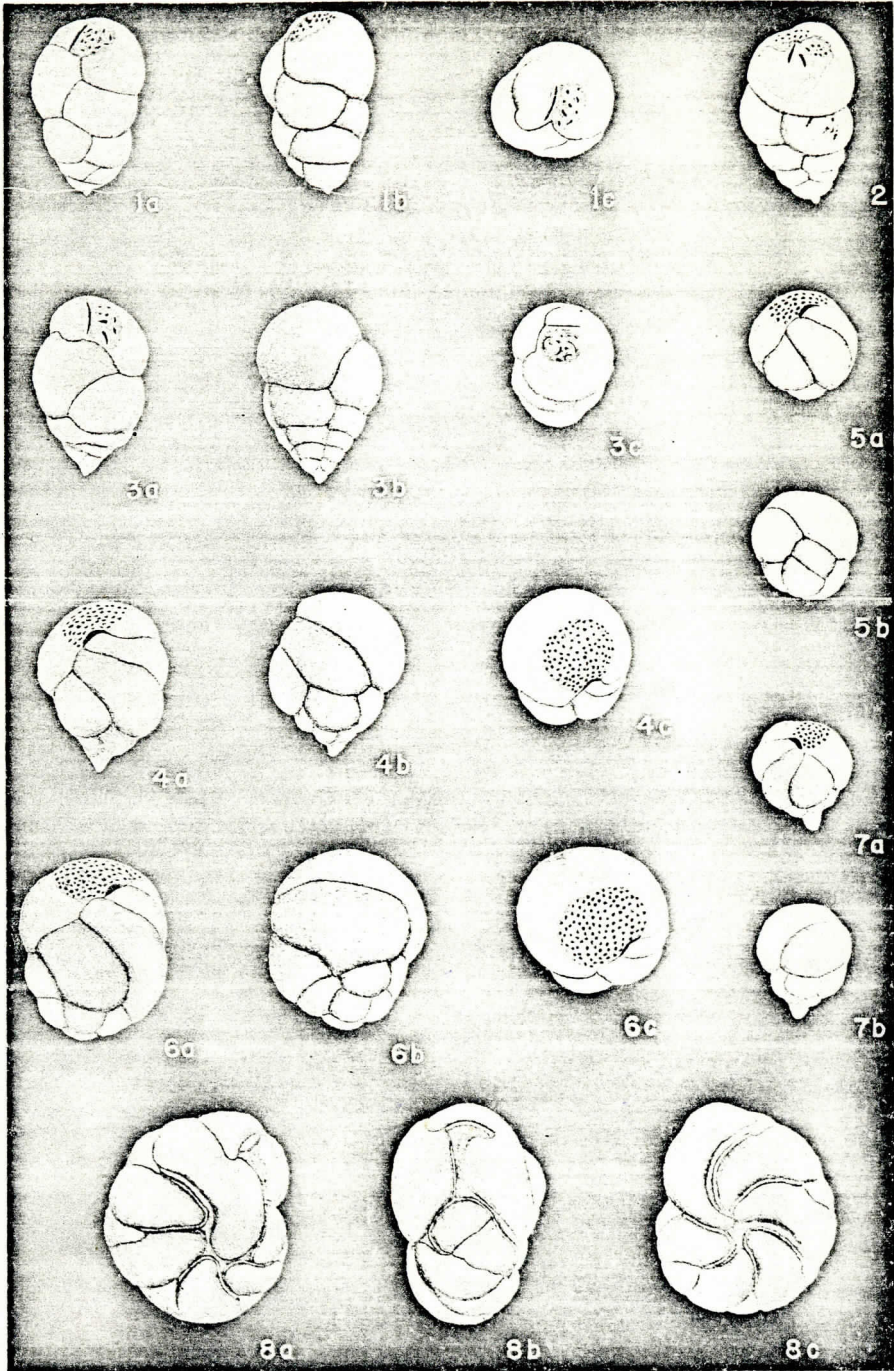
chamber and almost entirely covered by a flat tooth-like plate; supplementary apertures are long narrow slit-like openings along the sutures of the test.

Dimensions of holotype height, 0.75 mm., breadth, 0.63 mm., thickness, 0.53 mm. The slit-like supplementary apertures of ten measure up to 0.25 mm. in length. Holotype from the upper Eocene Talara formation, Well No. 3565, depth 2040 feet, Square Mile 11-N-5, Malaca District, Department of Piura, northwestern Peru. In Well No. 3565 *Stichocassidulina peruviana* occurs 790 feet below the top of the Talara formation.

This species differs from *Stichocassidulina thalmani* Stone by being more compressed, having narrower chambers and very long slit-like supplementary apertures along the sutures. In *S. thalmani* the supplementary apertures are numerous small arcuate openings along the sutures.

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Stone, New Foraminifera from Peru