

CONTRIBUTIONS
FROM THE
CUSHMAN LABORATORY
FOR
FORAMINIFERAL RESEARCH

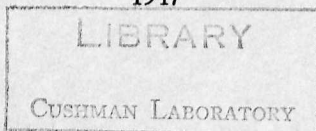
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1947



CUSHMAN LABORATORY FOR FORAMINIFERAL RESEARCH

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These Contributions will be issued quarterly. They will contain short papers with plates, describing new forms and other interesting notes on the general research work on the foraminifera being done on the group by the workers in this laboratory. New literature as it comes to hand will be briefly reviewed.

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CONTRIBUTIONS FROM THE CUSHMAN
LABORATORY FOR FORAMINIFERAL RESEARCH

299. *AMMOBACULITES PALEOCENICUS* CUSHMAN,
A NEW NAME

By JOSEPH A. CUSHMAN

In volume 16, 1940, of these Contributions a new species was described and named *Ammobaculites midwayensis* Cushman (p. 52, pl. 9, figs. 1, 2), overlooking the species described under this name, *A. midwayensis* Plummer (Univ. Texas Bull. 3201, 1933, p. 63, pl. 5, figs. 7-11) from the Paleocene of Texas. The name *Ammobaculites paleocenicus* Cushman, new name, is therefore proposed for the species described from the Paleocene, U. S. Highway 80, south of Sucarnoochee Creek, ½ mile SW. of Livingston, Sumter Co., Ala.

300. A NEW GENUS AND SOME NEW SPECIES OF
FORAMINIFERA FROM THE UPPER EOCENE OF ECUADOR

By J. A. CUSHMAN and R. M. STAINFORTH

ROBULUS INSUETUS Cushman and Stainforth, n. sp. (Pl. 17, fig. 1)

Test close coiled, strongly umbonate, periphery acute with a narrow keel, somewhat lobulate; chambers distinct, not inflated, 9-12 in number, increasing very gradually in size as added; sutures thick, with high ridges, very slightly curved, fusing at the center into an irregular umbonal boss; wall smooth except for the raised sutures; aperture peripheral, radiate. Diameter 0.75-0.90 mm.; thickness 0.40-0.45 mm.

Holotype (Cushman Coll. No. 54237) from the upper Eocene, Seca formation, sea cliffs at Punta Mambra, Ecuador.

This is a highly ornate species differing from *R. alato-limbatus* (Gümbel) in the higher, more nearly radial sutures, distinctly lobulate keel, and smaller size. It is fairly common at the type locality and shows little variation in its essential characters.

PLECTOFRONDICULARIA DENTIFERA Cushman and Stainforth, n. sp. (Pl. 17, figs. 2, 3)

Test small, about twice as long as wide, very strongly compressed, periphery subacute and somewhat dentate; chambers distinct, not inflated, earlier ones of about half the test biserial, the last 2 or 3 in the adult uniserial, the periphery extending out into a short angular projec-

tion; sutures distinct, not depressed; wall smooth; aperture terminal, elliptical, occasionally with a very short neck. Length 0.45-0.55 mm.; breadth 0.25-0.28 mm.; thickness 0.04-0.06 mm.

Holotype (Cushman Coll. No. 54239) from the upper Eocene, Seca formation, sea cliffs at Punta Mambra, Ecuador.

This species differs from *P. packardi* Cushman and Schenck, var. *spinata* Cushman and Schenck in the very much smaller size, very few uniserial chambers, and more compressed test, and from *P. spinifera* Cushman and Jarvis in the smaller size, larger proportion of biserial chambers, and the sutures not depressed.

BOLIVINOPSIS PULCHELLA Cushman and Stainforth, n. sp. (Pl. 17, figs. 4, 5)

Test elongate, strongly compressed, periphery acute but not keeled, center somewhat thickened, base broadly rounded, broad, sides slightly divergent; chambers numerous, the earlier ones close-coiled forming about $1\frac{1}{2}$ coils, then biserial throughout the adult stage, increasing very gradually in size as added with as many as ten pairs in the adult; sutures distinct, flush with the surface, strongly oblique; wall thin, finely perforate; aperture elongate, in the terminal face extending to the inner margin. Length 0.55-0.80 mm.; breadth 0.22-0.25 mm.; thickness 0.10-0.12 mm.

Holotype (Cushman Coll. No. 54254) from the upper Eocene, San Mateo formation, subsurface core material from a well near Manta, Ecuador.

This species might be mistaken for a *Bolivina* if the early stages were missing. The close coiled portion has many chambers and is strongly raised in the center forming the thickest part of the test. The species differs from *B. eocenica* (Cushman and Barksdale) in the much more elongate form, higher and more numerous chambers, thin wall, and somewhat tapering test. The species is common at the type locality.

Genus BULIMINELLITA Cushman and Stainforth, n. gen.

Genoholotype: *Buliminellita mirifica* Cushman and Stainforth, n. sp.

Test elongate, spiral, with the spiral suture distinct; chambers usually three to five in each whorl; wall calcareous, perforate; aperture in the early stages elongate, loop-shaped, in the adult terminal, rounded, with a distinct neck.—Eocene.

This genus is evidently derived directly from *Buliminella* with the adult developing a terminal aperture with a distinct neck.

BULIMINELLITA MIRIFICA Cushman and Stainforth, n. sp. (Pl. 17, figs. 6-8)

Test small, irregularly fusiform, initial end subacute, greatest breadth

slightly above the middle, circular in transverse section, apertural end tapering to a subacute point; chambers distinct, slightly inflated, three to five to a whorl, increasing very slightly in size as added; sutures distinct, slightly depressed, the spiral suture distinct and continuous; wall smooth; aperture in the early stage elongate, loop-shaped, in the adult terminal, rounded, with a distinct neck. Length 0.35-0.50 mm.; diameter 0.16-0.20 mm.

Holotype (Cushman Coll. No. 54242) from the upper Eocene, Seca formation, sea cliffs at Punta Mambra, Ecuador.

This species is fairly common at the type locality and represents a development from *Buliminella*.

BULIMINA SECAENSIS Cushman and Stainforth, n. sp. (Pl. 17, figs. 9, 10)

Test of medium size, tapering from the subacute to slightly rounded initial end to the greatest breadth above the middle, thence decreasing in breadth to the rounded apertural end; chambers distinct, inflated, increasing rather rapidly but evenly in size as added, the basal portion somewhat contracted; sutures distinct, strongly depressed; wall with numerous longitudinal costae, mostly continuous across but some broken at the sutures; aperture nearly terminal, loop-shaped, with the greatest width at the inner end thence tapering to a narrow opening at the basal margin of the chamber, with a slightly developed rim. Length 0.50-0.65 mm.; diameter 0.32-0.38 mm.

Holotype (Cushman Coll. No. 54245) from the upper Eocene, Seca formation, sea cliffs at Punta Mambra, Ecuador.

This species differs from *B. jacksonensis* Cushman in the more inflated chambers and deeper sutures, giving an irregular outline to the test, and the less strongly developed sutures, some of which are not continuous from chamber to chamber.

BULIMINA LINEATA Cushman and Stainforth, n. sp. (Pl. 17, fig. 12)

Test rather small, slender, tapering from the slightly rounded or subacute initial end to the greatest breadth formed by the last one or two whorls, periphery only slightly lobulate, nearly circular in end view with a slight tendency to concavity at the sides; chambers distinct, only slightly inflated, numerous, increasing gradually and rather evenly in size as added; sutures distinct, slightly depressed; wall ornamented by fine longitudinal costae, continuous across the sutures, the last one or two whorls in the adult often smooth; aperture elongate, slightly oblique, in the terminal face of the last-formed chamber extending from the inner margin a considerable distance into the terminal face. Length 0.50-0.60 mm.; diameter 0.17-0.22 mm.

Holotype (Cushman Coll. No. 54248) from the upper Eocene, San Mateo formation, subsurface core material from a well near Manta, Ecuador.

This species differs from *B. semicostata* Nuttall in the slenderer, more evenly tapering form, and fewer costae.

BULIMINA ACUTANGULARIS Cushman and Stainforth, n. sp. (Pl. 17, fig. 13)

Test small, initial end subacute, evenly tapering with the greatest breadth near the upper portion of the last whorl, apertural end obliquely truncate, irregularly triangular in transverse section, the earlier portion with acute angles; chambers rather indistinct, increasing rather rapidly in size as added; sutures rather indistinct, slightly depressed in the later portion; wall with very coarse longitudinal costae, somewhat irregular; aperture semi-elliptical, fairly large, with the greatest breadth at the base of the last-formed chamber. Length 0.37-0.42 mm.; breadth 0.20-0.23 mm.

Holotype (Cushman Coll. No. 54250) from the upper Eocene, San Mateo formation, subsurface core material from a well near Manta, Ecuador.

This species is common at the type locality. It differs from *B. truncana* Gümbel in the irregular costae, more concave sides, and more angled periphery.

BULIMINA DECURTATA Cushman and Stainforth, n. sp. (Pl. 17, fig. 11)

Test rather small, very short and broad, initial end subacute, greatest breadth near the middle, apertural end broadly rounded, the last whorl making up nearly the entire surface of the test; chambers few, increasing very rapidly in size as added, inflated; sutures distinct, slightly depressed; wall smooth; aperture loop-shaped, extending from the inner margin of the last-formed chamber well into the terminal face, curved, but of nearly uniform width, with a slightly thickened border. Length 0.45-0.60 mm.; diameter 0.40-0.50 mm.

Holotype (Cushman Coll. No. 54252) from the upper Eocene, San Mateo formation, subsurface core material from a well near Manta, Ecuador.

This species differs from *B. guayabalensis* Cole, var. *ampla* Cushman and Parker in the larger proportion of the surface occupied by the chambers of the last whorl, and the more tapering base.

301. SOME NEW FORAMINIFERA FROM THE PALEOCENE
OF THE SOUTHERN UNITED STATES

BY JOSEPH A. CUSHMAN

The following species and varieties seem to be new:

SPIROPLECTAMMINA PALEOCENICA Cushman, n. sp. (Pl. 17, fig. 17)

Test very small, evenly tapering from the slightly rounded initial end to the greatest width at the apertural end, central portion thick and rounded, tapering rapidly to the subacute periphery, apertural end truncate; chambers of the early portion planispiral, later biserial, increasing slowly in height as added, not inflated; sutures fairly distinct, not depressed, nearly straight to slightly convex upward; wall finely arenaceous, smoothly finished; aperture a slight, low opening at the base of the inner margin of the last-formed chamber. Length 0.35-0.43 mm.; breadth 0.22-0.25 mm.; thickness 0.20-0.23 mm.

Holotype (Cushman Coll. No. 54257) from the Paleocene, Naheola formation, road cut on E. slope to a branch in SW. $\frac{1}{4}$ sec. 12, T. 11 N.; R. 9 E., Wilcox Co., Ala.

This species differs from *S. wilcoxensis* Cushman and Ponton in the much thickened central portion, the chambers not inflated, and the sutures nearly straight and not depressed.

TEXTULARIA PORTENTA Cushman, n. sp. (Pl. 17, fig. 16)

Test small, initial end subacute, increasing rapidly in width in the early stages, only slightly increasing in width in the adult, periphery subacute in the early stages, rounded in the adult; chambers fairly distinct, increasing rapidly in size and height as added, somewhat inflated in the adult; sutures distinct and slightly depressed in the adult portion, slightly oblique; wall very finely arenaceous, exterior very smooth; aperture semicircular, at the inner margin of the last-formed chamber. Length 0.45-0.60 mm.; breadth 0.25-0.32 mm.; thickness 0.13-0.15 mm.

Holotype (Cushman Coll. No. 54259) from the Paleocene, middle Midway, foot of hill in S. slope to Wolf Creek, probably in SE, NE $\frac{1}{4}$ sec. 20, T. 11 N., R. 12 E., Butler Co., Arkansas. It is very common at the type locality.

This species somewhat resembles *T. dibollensis* Cushman and Applin but differs in the deeper sutures and very smooth exterior.

TEXTULARIA PLUMMERAE Lalicker, var. **ARKANSASANA** Cushman, n. var.

(Pl. 17, figs. 18, 19)

Textularia plummerae LALICKER, var. CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 22, 1946, p. 46, pl. 7, fig. 2.

Variety differing from the typical in the greater thickness and enlargement of the chambers at the apertural end and the much coarser arenaceous wall.

Holotype of variety (U. S. N. M. No. 104242) from the Paleocene, side of bank, N. side of Highway 67, 8 miles SW. of Benton, Saline Co., Arkansas.

MARTINOTTIELLA PALEOCENICA Cushman, n. sp. (Pl. 18, fig. 1)

Test minute, early portion irregularly triangular in section, later portion with a short, irregular biserial stage followed by a uniserial stage, rounded in section; chambers of the early portion indistinct, those of the later biserial and uniserial stages very few in number, not increasing in diameter as added, very slightly inflated; sutures of the early portion indistinct, later ones distinct and slightly depressed; wall finely arenaceous, smoothly finished; aperture terminal, rounded, with a slight neck. Length 0.30-0.40 mm.; diameter 0.12-0.15 mm.

Holotype (Cushman Coll. No. 54261) from the Paleocene, Naheola formation, road cut on E. slope to a branch in SW $\frac{1}{4}$ sec. 12, T. 11 N., R. 9 E., Wilcox Co., Ala.

This species differs from *M. eocenica* Cushman and Bermudez from the upper Eocene of Cuba in the less inflated chambers, smoother surface, and much smaller size.

QUINQUELOCULINA NAHEOLENSIS Cushman, n. sp. (Pl. 17, fig. 14)

Test very small, about twice as long as broad, periphery rounded, base broadly rounded, apertural end truncate, sides only slightly convex; chambers slightly inflated, increasing very little in breadth as added; sutures fairly distinct, very slightly depressed; wall smooth; aperture terminal, circular, without a neck, with a distinct tooth, broad at the inner end and occasionally slightly bifid. Length 0.30-0.35 mm.; breadth 0.15-0.18 mm.; thickness 0.12-0.15 mm.

Holotype (Cushman Coll. No. 54265) from the Paleocene, Naheola formation, Alabama Highway 96, 9.2 miles NE. of Kimbrough, Wilcox Co., Alabama.

This species differs from *Q. plummerae* Cushman and Todd in the narrower test, nearly parallel sides, rounded periphery, and truncate apertural end.

QUINQUELOCULINA PLUMMERAE Cushman and Todd, var. **FLECTATA** Cushman, n. var. (Pl. 17, fig. 15)

Variety differing from the typical form in the last-formed chambers which have the periphery in a tortuous line and in some specimens with a depressed area at the edge.

Holotype of variety (Cushman Coll. No. 54263) from the Paleocene, Naheola formation, road cut on E. slope to a branch in SW. $\frac{1}{4}$ sec. 12, T. 11 N., R. 9 E., Wilcox Co., Alabama. It occurs commonly at the type locality.

ROBULUS INSULSUS Cushman, n. sp. (Pl. 18, figs. 2, 3)

Cristellaria orbicularis PLUMMER (NOT D'ORBIGNY), Univ. Texas Bull. 2644, 1926 (1927), p. 92, pl. 7, fig. 1.

Test small, close coiled, very thick, periphery acute and slightly keeled; chambers six or seven in number, not inflated, increasing very gradually in size as added; sutures distinct, very strongly curved, sometimes slightly raised, usually flush with the surface; wall smooth, polished, somewhat transparent; aperture radiate, slightly projecting. Diameter 0.30-0.40 mm.; thickness 0.20-0.25 mm.

Holotype (Cushman Coll. No. 54269) from the Paleocene, 4.6 miles N. of Fentress, Caldwell Co., Texas.

This species differs from *Robulus orbicularis* (d'Orbigny) in the much smaller size and fewer chambers.

ROBULUS PILULIFERUS Cushman, n. sp. (Pl. 18, fig. 4)

Test of medium size, close coiled, apertural face slightly concave with raised borders, periphery acute, very slightly keeled; chambers ten to twelve in the adult coil, not inflated, of uniform shape and increasing very evenly and gradually in size as added; sutures distinct, curved, raised, the earlier ones often ending in a rounded boss near the umbo and broken into a series of bead-like projections toward the inner portion; wall smooth except for the raised sutures; aperture radiate, at the peripheral margin of the last-formed chamber. Diameter of holotype 1.50 mm.; thickness 0.65 mm.

Holotype (Cushman Coll. No. 54267) from the Paleocene, upper bed at Dry Brushy Creek, 6 miles S. of Thrall, Williamson Co., Texas.

The species differs from *R. midwayensis* (Plummer) in the generally smaller size and the beaded sutures.

DENTALINA INEPTA Cushman, n. sp. (Pl. 18, fig. 5)

Dentalina sp. A CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 22, 1946, p. 51, pl. 8, fig. 10.

Test elongate, slender, slightly curved, later portion slightly compressed, basal end broadly rounded; chambers of nearly uniform width, distinctly inflated, increasing very slightly in size as added; sutures distinct, depressed, slightly oblique; wall smooth; aperture at the inner margin of the last-formed chamber, radiate, slightly projecting. Length 0.60-1.00 mm.; breadth 0.16-0.25 mm.

Holotype (Cushman Coll. No. 46318) from the Paleocene, about 1000 feet S. of Roosevelt Rd. viaduct, 200 feet E. of RR. tracks, in small gully heading E., just upstream from small abandoned bridge, NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 1 N., R. 12 W., Little Rock, Arkansas.

This species differs from *D. colei* Cushman and Dusenbury in the less curved and more slender test which is slightly compressed, and the nearly uniform size of the chambers.

DENTALINA INSULSA Cushman, n. sp. (Pl. 18, figs. 6, 7)

Dentalina sp. B CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 22, 1946, p. 51, pl. 8, figs. 15, 16.

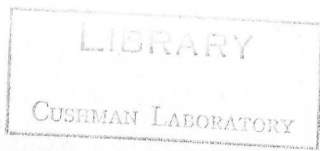
Test slightly curved, the megalospheric form with very little increase in diameter from the proloculum, the microspheric form more tapering and compressed, initial end often with a distinct spine; chambers inflated in the adult portion, increasing very gradually in size as added and becoming more distinct; sutures distinct except in the early stages of the microspheric form where they are obscured by the costae of the wall, in the later portion depressed; wall ornamented with numerous distinct, longitudinal costae, often slightly oblique to the longitudinal axis, especially in the microspheric form; aperture radiate, usually at one side of the axis of the test, only slightly projecting. Length 1.00-1.40 mm.; diameter 0.20-0.30 mm.

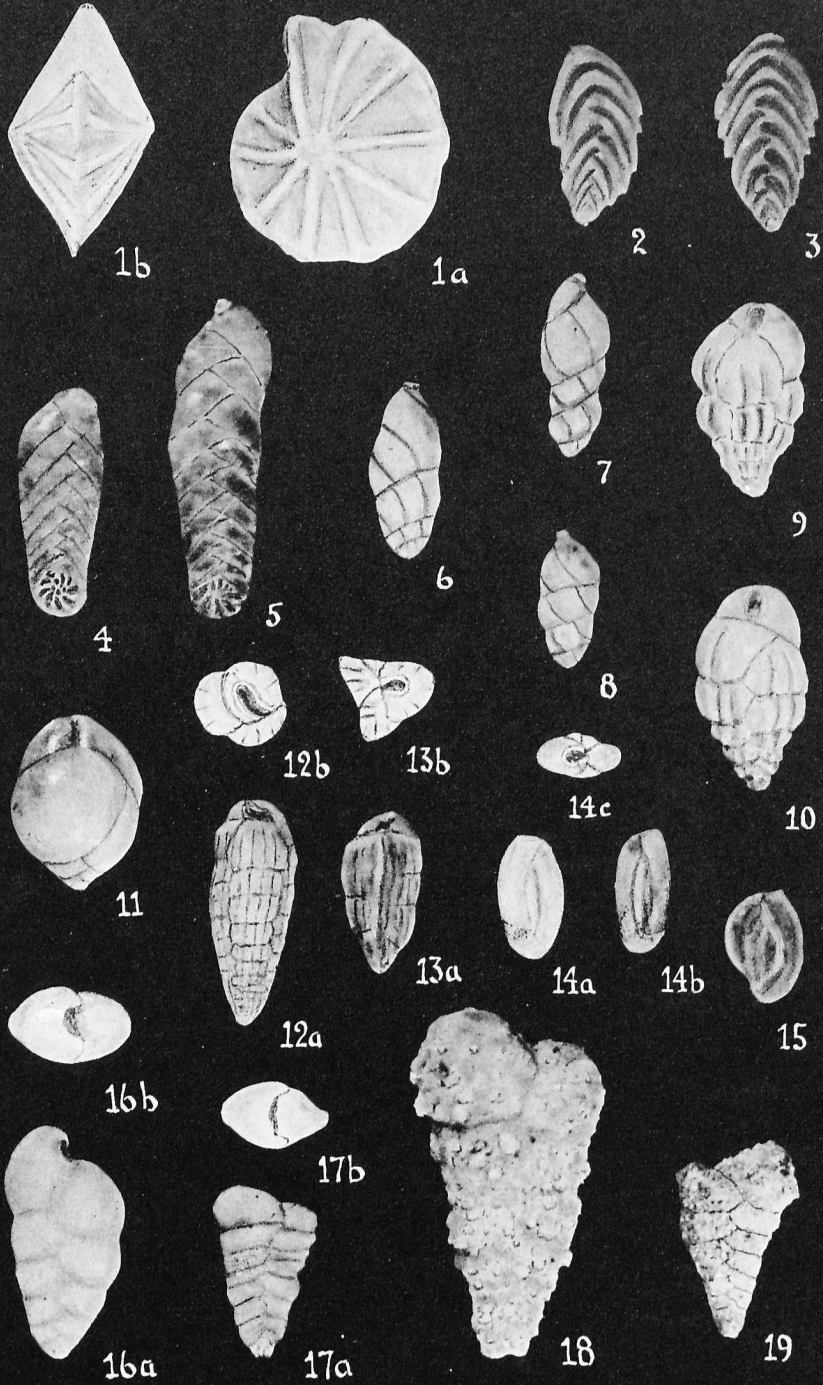
Holotype (Cushman Coll. No. 46321) from the Paleocene, about 1000 feet S. of Roosevelt Rd. viaduct, 200 feet E. of RR. tracks, in small gully heading E., just upstream from small abandoned bridge, NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 1 N., R. 12 W., Little Rock, Arkansas.

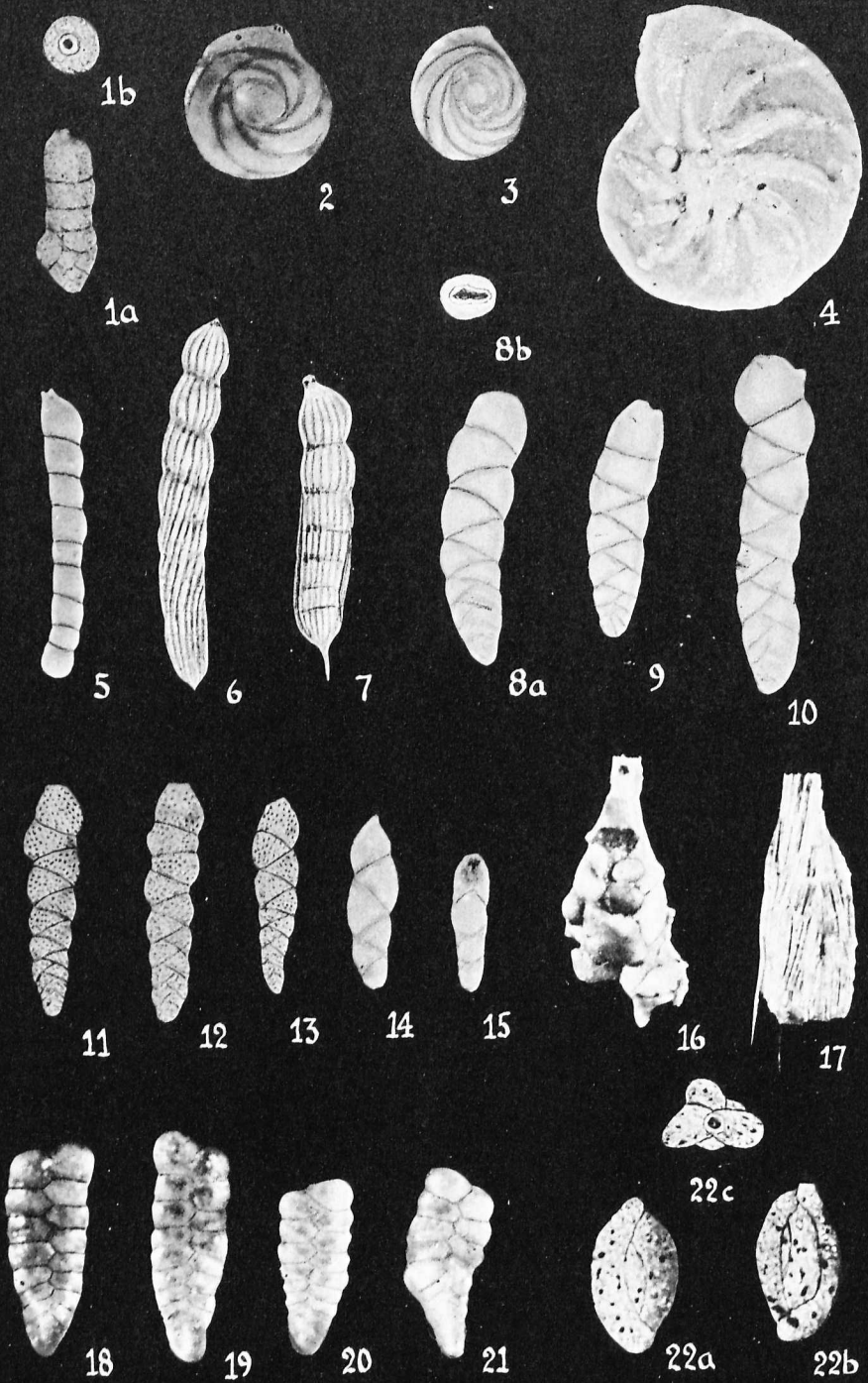
This species differs from *D. pseudo-nasuta* Cushman and Todd in the much shorter apertural neck, broader and generally larger test, the

EXPLANATION OF PLATE 17

FIG. 1. *Robulus insuetus* Cushman and Stainforth, n. sp. $\times 45$. *a*, side view; *b*, peripheral view. 2, 3. *Plectofrondicularia dentifera* Cushman and Stainforth, n. sp. $\times 60$. 2, Holotype. 3, Paratype. 4, 5. *Bolivinospis pulchella* Cushman and Stainforth, n. sp. $\times 60$. 4, Holotype. 5, Paratype. 6-8. *Buliminellita mirifica* Cushman and Stainforth, n. gen., n. sp. $\times 60$. 6, Holotype. 7, 8, Paratypes. 9, 10. *Bulimina secaensis* Cushman and Stainforth, n. sp. $\times 45$. 9, Paratype. 10, Holotype. 11. *B. decurtata* Cushman and Stainforth, n. sp. $\times 45$. 12. *B. lineata* Cushman and Stainforth, n. sp. $\times 60$. *a*, front view; *b*, apertural view. 13. *B. acutangularis* Cushman and Stainforth, n. sp. $\times 60$. *a*, front view; *b*, apertural view. 14. *Quinqueloculina naheolensis* Cushman, n. sp. $\times 60$. *a*, *b*, opposite sides; *c*, apertural view. 15. *Q. plummerae* Cushman and Todd, var. *flectata* Cushman, n. var. $\times 60$. 16. *Textularia portenta* Cushman, n. sp. $\times 60$. *a*, front view; *b*, apertural view. 17. *Spiroplectammina paleocenica* Cushman, n. sp. $\times 60$. *a*, front view; *b*, apertural view. 18, 19. *Textularia plummerae* Lalicker, var. *arkansasana* Cushman, n. var. $\times 45$. 18, Holotype. 19, Paratype.







costae somewhat oblique, and the less distinct chambers in the early portion.

LOXOSTOMUM DEADERICKI Cushman, n. sp. (Pl. 18, figs. 8-10)

Test elongate, slender, little if at all compressed, early portion biserial and somewhat twisted, later chambers becoming uniserial; chambers distinct, slightly inflated, increasing very gradually in size as added; sutures distinct, slightly depressed, earlier ones strongly oblique, becoming less so, and in the last-formed portion at right angles to the elongate axis; wall smooth, but distinctly perforate; aperture in the adult, terminal, narrow. Length 0.60-0.90 mm.; breadth 0.17-0.20 mm.; thickness 0.15-0.18 mm.

Holotype (U. S. N. M. No. 104245) from the Paleocene, N. side of Highway 67, 8 miles SW. of Benton, Saline Co., Arkansas.

The species is very common at the type locality. It differs from *L. applinae* (Plummer) in the less tapering form, only slightly compressed, and without the basal indentations. It is named for Dr. W. H. Deaderick who collected this and much other rich foraminiferal material.

LOXOSTOMUM DEADERICKI Cushman, n. sp., var. **EXILIS** Cushman, n. var.
(Pl. 18, figs. 11-13)

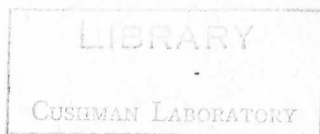
Variety differing from the typical form in the smaller size and more slender form, deeper sutures, and more inflated chambers, and the more tapering early portion. Length 0.40-0.60 mm.; breadth 0.10-0.12 mm.; thickness 0.08-0.10 mm.

Holotype of variety (Cushman Coll. No. 54275) from the Paleocene, Clayton formation, top of fuller's earth zone, immediately underlying *Turritella* rock, SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 18, T. 11 N., R. 14 E., Butler Co., Alabama.

This variety is common at the type locality.

EXPLANATION OF PLATE 18

FIG. 1. *Martinottiella paleocenica* Cushman, n. sp. $\times 60$. a, front view; b, apertural view. 2, 3. *Robulus insulsus* Cushman, n. sp. $\times 60$. 2, Paratype. 3, Holotype. 4. *R. piluliferus* Cushman, n. sp. $\times 30$. 5. *Dentalina inepta* Cushman, n. sp. $\times 45$. 6, 7. *D. insulsa* Cushman, n. sp. 6, Holotype, microspheric form. $\times 30$. 7, Paratype, megalospheric form. $\times 45$. 8-10. *Loxostomum deadericki* Cushman, n. sp. $\times 60$. 8, 10, Paratypes. 8a, front view; 8b, apertural view. 9, Holotype. 11-13. *L. deadericki* Cushman, n. sp., var. *exilis* Cushman, n. var. $\times 60$. 11, Holotype. 12, 13, Paratypes. 14, 15. *Pleurostomella paleocenica* Cushman, n. sp. $\times 60$. 14, Holotype, side view. 15, Paratype, front view. 16. *Proteonina disflugiformis* (H. B. Brady), var. *calcareo* Cushman, n. var. $\times 25$. 17. *Technitella atlantica* Cushman, n. sp. $\times 25$. 18-21. *Gaudryina aequa* Cushman, n. sp. $\times 50$. 18, Holotype. 19-21, Paratypes. 22. *Quinqueloculina sabulosa* Cushman, n. sp. $\times 38$. a, b, opposite sides; c, apertural view.



PLEUROSATOMELLA PALEOCENICA Cushman, n. sp. (Pl. 18, figs. 14, 15)

Pleurostomella alternans PLUMMER (NOT SCHWAGER), Univ. Texas Bull. 2644, 1926 (1927), p. 69, pl. 4, fig. 2.

Pleurostomella cf. *brevis*, var. *alternans* KLINE (NOT SCHWAGER), Bull. 53, Mississippi State Geol. Survey, 1943, p. 50, pl. 6, fig. 23.

Test very small, slender, tapering from the slightly rounded base to the greatest breadth formed by the last pair of chambers, nearly circular in transverse section; chambers few, distinctly inflated in the later portion, nearly as wide as high, increasing rapidly in size in the early portion, only slightly in the later portion; sutures distinct, later ones strongly depressed; wall smooth; aperture on the upper part of the inner face of the last-formed chamber, with a deeper reëntrant toward the base of the opening, without definite tooth-like projections. Length 0.38-0.45 mm.; breadth 0.10-0.12 mm.; thickness 0.10-0.12 mm.

Holotype (Cushman Coll. No. 54272) from the Paleocene, 4.6 miles N. of Fentress, Caldwell Co., Texas.

This species has been referred to *P. alternans* Schwager, a name that has been used for specimens from Cretaceous to Recent. A comparison with topotypes from the Pliocene of the Pacific shows that the Paleocene species differs in the much smaller size, fewer and shorter chambers, and smaller and more rounded aperture. Kline has recorded it from the Porters Creek clay of Mississippi.

302. NEW SPECIES AND VARIETIES OF FORAMINIFERA FROM OFF THE SOUTHEASTERN COAST OF THE UNITED STATES

BY JOSEPH A. CUSHMAN

The following new species and varieties are from the area from Cape Hatteras south to southern Florida. A full description of the foraminiferal fauna of this region, with data in regard to temperatures, depths, and distribution of species, is to be published later by the Geological Society of America.

PROTEONINA DIFFLUGIFORMIS (H. B. Brady), var. **CALCAREA** Cushman, n. var.
(Pl. 18, fig. 16)

Variety differing from the typical form in the larger size, more irregular shape, and much coarser and calcareous material of which the test is made.

Holotype of variety (Cushman Coll. No. 49013) from station 1614a, off Canaveral, Florida. It is quite different from the typical form and may perhaps be a distinct species.

TECHNITELLA ATLANTICA Cushman, n. sp. (Pl. 18, fig. 17)

Test composed of a single chamber, somewhat compressed, the sides nearly parallel, base truncated, apertural end contracted to a cylindrical neck; wall composed of sponge spicules arranged generally lengthwise of the test and usually with one or more elongate ones extending beyond the base of the test; aperture rounded, at the end of the apertural neck. Length 1.15-1.30 mm.; breadth 0.50-0.55 mm.

Holotype (Cushman Coll. No. 49014) from station 1614a, off Canaveral, Florida. The species is rare at the type locality but very constant in its characters. It most resembles *T. nitida* Heron-Allen and Earland but differs in the nearly parallel sides, truncate base and distinct apertural neck.

GAUDRYINA AEQUA Cushman, n. sp. (Pl. 18, figs. 18-21)

Test small, elongate, initial end rounded to subacute, apertural end obliquely truncate, periphery broadly rounded, sides nearly parallel, slightly lobulate; chambers distinct except in the early triserial portion, biserial portion with about eight pairs of chambers of nearly equal size; sutures distinct in the biserial portion, horizontal or sloping slightly upward toward the periphery; wall thin, smooth, very finely arenaceous, the upper portion of each chamber translucent; aperture a low opening at the base of the apertural face of the last-formed chamber. Length 0.55-0.65 mm.; breadth 0.20-0.25 mm.

Holotype (Cushman Coll. No. 49024) from station 1629a in 99 meters, off Charleston, South Carolina. The species differs from *G. flintii* Cushman in its smaller size, more slender test with parallel sides, and the thin, smooth wall.

QUINQUELOCULINA SABULOSA Cushman, n. sp. (Pl. 18, fig. 22)

Test small, nearly twice as long as broad, basal end rounded but somewhat projecting, apertural end continued into a short but definite neck, generally triangular in end view, the angles subacute; chambers distinct, somewhat inflated; sutures fairly distinct, slightly depressed; wall rather coarsely arenaceous with a small proportion of cement, surface roughened; aperture at the end of a short but distinct neck, rounded with a short, broad tooth at the inner margin. Length 0.50-0.60 mm.; breadth 0.30-0.35 mm.

Holotype (Cushman Coll. No. 49034) from station 1629 in 120 meters, off Charleston, South Carolina. The species differs from *Q. agglutinans* d'Orbigny in the smaller size, much smaller aperture and subacute angles.

QUINQUELOCULINA COMPTA Cushman, n. sp. (Pl. 19, fig. 2)

Test of medium size, about twice as long as broad, basal end slightly

rounded, apertural end continued into a short but distinct neck bending back slightly from the elongate axis of the chamber, generally triangular in end view, the angles acute; chambers distinct not inflated; sutures distinct, slightly depressed; wall largely calcareous but with fine sand grains in the exterior, fairly smooth; aperture at the end of the short neck with a slightly flaring lip and small, simple tooth. Length 0.80-0.90 mm.; breadth 0.40-0.45 mm.

Holotype (Cushman Coll. No. 49036) from station 1615c in 45 meters, off Canaveral, Florida. The species differs from *Q. sabulosa*, n. sp., in the larger size, less arenaceous test, more acute angles and the small, simple tooth.

QUINQUELOCULINA HORRIDA Cushman, n. sp. (Pl. 19, fig. 1)

Test very small, nearly twice as long as broad, basal end rounded, very slightly projecting, apertural end continued into a fairly long, cylindrical neck with a distinct phialine lip, rounded in end view; chambers indistinct; sutures indistinct; wall very coarsely arenaceous, surface very rough except at the apertural end; aperture at the end of the cylindrical neck with a slender, bifid tooth. Length 0.50-0.55 mm.; breadth 0.28-0.33 mm.

Holotype (Cushman Coll. No. 49038) from station 1629 in 120 meters, off Charleston, South Carolina. The species differs from *Q. sabulosa*, n. sp., in the rounded test in end view, the cylindrical neck, phialine lip and slender bifid tooth.

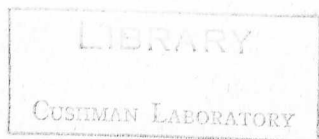
SPIROLOCULINA ATLANTICA Cushman, n. sp. (Pl. 19, figs. 3-5)

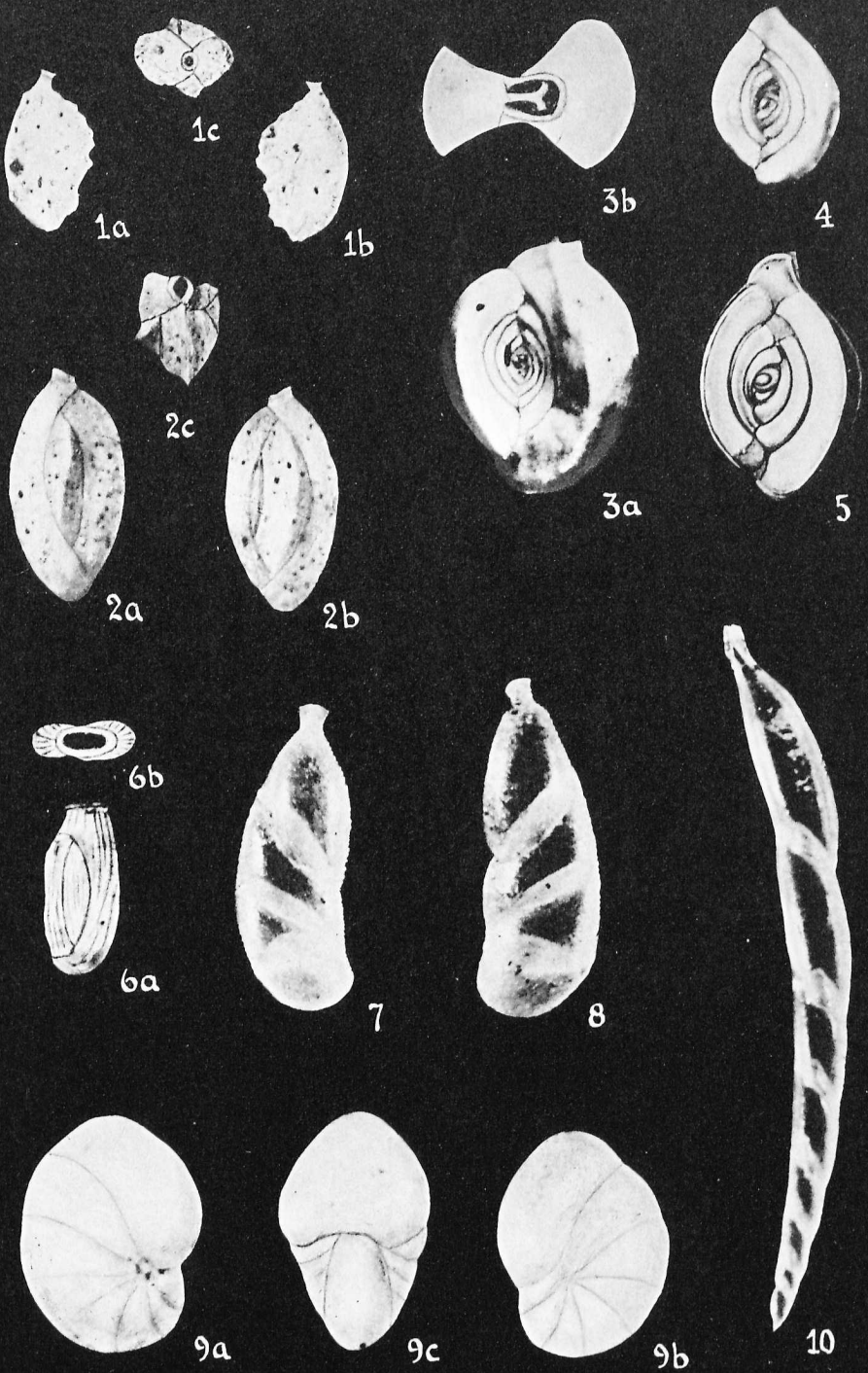
Spiroloculina planulata CUSHMAN (part) (not LAMARCK), Bull. 104, U. S. Nat. Mus., pt. 6, 1929, p. 41, pl. 8, fig. 2 (not 3-5).

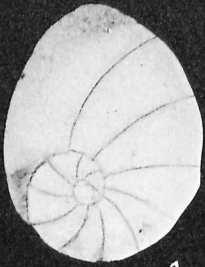
Test slightly longer than broad, in the megalospheric form with the sides only slightly concave, in the microspheric form the sides deeply concave and the test of much larger size, periphery broadly rounded, the edges slightly keeled; chambers distinct, increasing very rapidly in size and in the microspheric form in thickness also; sutures distinct, slightly depressed; wall smooth or often with irregular longitudinal de-

EXPLANATION OF PLATE 19

FIG. 1. *Quinqueloculina horrida* Cushman, n. sp. $\times 38$. *a, b*, opposite sides; *c*, apertural view. 2. *Q. compta* Cushman, n. sp. $\times 38$. *a, b*, opposite sides; *c*, apertural view. 3-5. *Spiroloculina atlantica* Cushman, n. sp. 3, $\times 25$. 4, $\times 38$. 5, $\times 42$. 3, Holotype. *a*, front view; *b*, apertural view. 4, 5, Paratypes. 6. *Articulina atlantica* Cushman, n. sp. $\times 25$. *a*, front view; *b*, apertural view. 7, 8. *Marginulina villa* Cushman, n. sp. $\times 75$. 7, Paratype. 8, Holotype. 9. *Nonion sloani* (d'Orbigny), var. *nitida* Cushman, n. var. $\times 80$. *a, b*, opposite sides; *c*, peripheral view. 10. *Chrysalonium atlanticum* Cushman, n. sp. $\times 50$.







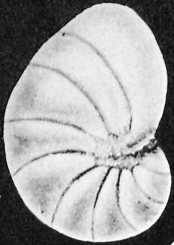
1



2



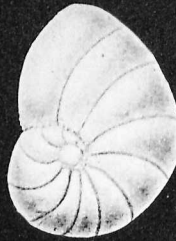
3



4b



4c



4a



5



6



7



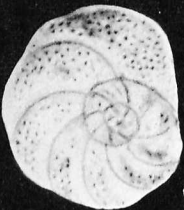
8a



8b



9c



9a



9b



10c



10a



10b

pressions, especially in the later chambers; aperture in the early stages rectangular, with a narrow, simple tooth, in the adult microspheric form with a bifid tooth. Length of megalospheric form up to 0.95 mm.; breadth 0.65 mm.; thickness 0.25 mm. Length of microspheric form up to 1.75 mm.; breadth 1.40 mm.; thickness 0.75 mm.

Holotype (Cushman Coll. No. 49054) from station 1618e, off Jacksonville, Florida, at a depth of 27 meters.

The species is very abundant in this region. The microspheric and megalospheric forms seem different until a large series is obtained and then all stages are seen and the two are connected. It resembles *S. dentata* Cushman and Todd, especially in the earlier stages, but the adult test is much more concave and has a more keeled periphery. It also somewhat resembles *S. norvegica* Cushman and Todd from the North Atlantic but differs in the same characters noted above and from both in its strongly bifid tooth in the adult.

ARTICULINA ATLANTICA Cushman, n. sp. (Pl. 19, fig. 6)

Test small, elliptical or oval in end view, base broadly rounded, apertural end truncate; chambers fairly distinct, inflated, three visible in the adult, increasing rather rapidly in length and diameter as added; sutures very slightly depressed; wall ornamented by numerous fine longitudinal costae; aperture rounded, terminal, with a distinct, erected lip. Length of holotype 0.45 mm.; breadth 0.20 mm.

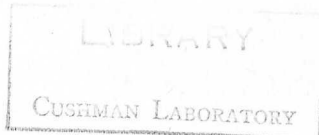
Holotype (Cushman Coll. No. 49059) from station 1617 in 23 meters, off Canaveral, Florida. This species is rare in our material and no specimens were found with uniserial chambers. It differs from *A. pacifica* Cushman in the more elongate form and more even outline.

MARGINULINA VILLA Cushman, n. sp. (Pl. 19, figs. 7, 8)

Test elongate, compressed, periphery rounded, early portion close coiled, later tending to become uniserial; chambers not inflated, increasing very gradually in size, few in number, usually only 3 in the uncoiled portion; sutures not depressed, strongly oblique in the uncoiled portion; wall translucent with a finely hispid surface; aperture radiate, at the

EXPLANATION OF PLATE 20

FIGS. 1-3. *Nonionella opima* Cushman, n. sp. $\times 100$. 1, Holotype, dorsal view. 2, Paratype, peripheral view. 3, Paratype, ventral view. 4, 5. *N. atlantica* Cushman, n. sp. $\times 50$. 4, Holotype. *a*, dorsal view; *b*, ventral view; *c*, peripheral view. 5, Paratype. 6, 7. *Reussella spinulosa* (Reuss), var. *atlantica* Cushman, n. var. $\times 50$. 6, Holotype. 7, Paratype. 8. *Conicospirulina atlantica* Cushman, n. sp. $\times 110$. *a*, dorsal view; *b*, peripheral view. 9. *Discorbis pulchra* Cushman, n. sp. $\times 50$. *a*, dorsal view; *b*, ventral view; *c*, peripheral view. 10. *Cassidulina insueta* Cushman, n. sp. $\times 75$. *a*, peripheral view; *b*, ventral view; *c*, apertural view.



end of a distinct neck, expanding somewhat at the outer end. Length 0.55-0.80 mm.; breadth 0.20-0.28 mm.; thickness 0.12-0.15 mm.

Holotype (Cushman Coll. No. 49090) from station 1629 in 120 meters, off Charleston, South Carolina. It differs from *M. striatula* Cushman in the compressed test, oblique sutures, and hispid surface.

CHRYSALOGONIUM ATLANTICUM Cushman, n. sp. (Pl. 19, fig. 10)

Test slender, tapering from the pointed initial end to the greatest breadth formed by the final chamber, slightly arcuate, circular in transverse section; chambers of uniform shape, increasing rather rapidly but evenly in size as added, slightly inflated; sutures oblique, slightly depressed; wall thin, nearly transparent, smooth; aperture terminal, with numerous, small openings at the end of a short, cylindrical neck. Length of holotype 1.90 mm.; diameter 0.20 mm.

Holotype (Cushman Coll. No. 49103) from station 1629 in 120 meters, off Charleston, South Carolina. This species differs from *C. lanceolum* Cushman and Jarvis in the very oblique sutures, and more curved and more tapering test.

NONION SLOANI (d'Orbigny), var. **NITIDA** Cushman, n. var. (Pl. 19, fig. 9)

Variety differing from the typical form in having the later chambers much more inflated and the number of chambers slightly less in the adult coil.

Holotype of variety (Cushman Coll. No. 49127) from station 1614a, off Canaveral, Florida. This variety seems quite distinct from the typical form and is apparently to be found in deeper water.

NONIONELLA OPIMA Cushman, n. sp. (Pl. 20, figs. 1-3)

Test of medium size for the genus, asymmetrical, periphery broadly rounded; chambers distinct, increasing very rapidly in size as added, the last-formed one on the ventral side forming more than half the surface of the test; sutures distinct, not depressed, only slightly curved; wall smooth; aperture extending from the periphery over into the ventral side below the overhanging extension of the last-formed chamber. Length 0.35-0.40 mm.; breadth 0.25-0.32 mm.; thickness 0.17-0.20 mm.

Holotype (Cushman Coll. No. 49130) from station 1614a, off Canaveral, Florida. This species somewhat resembles *N. jacksonensis* Cushman but differs in the shorter, broader form and more expanded final chamber.

NONIONELLA ATLANTICA Cushman, n. sp. (Pl. 20, figs. 4, 5)

Test compressed, asymmetrical, periphery rounded, dorsal side showing the earlier coils which are covered on the ventral side; chambers numerous, 10-12 in the adult whorl, slightly inflated, increasing very

gradually in size as added; sutures distinct, slightly depressed, very slightly curved; wall smooth except the lobe on the ventral side which is somewhat papillate; aperture extending from the periphery along the ventral margin of the last-formed chamber. Length of holotype 0.60 mm.; breadth 0.42 mm.; thickness 0.25 mm.

Holotype (Cushman Coll. No. 49133) from station 1615⁶c in 45 meters, off Canaveral, Florida. This species resembles *Nonion sloani* (d'Orbigny) in some of its characters but is definitely a *Nonionella*. It is common in our material.

REUSSELLA SPINULOSA (Reuss), var. **ATLANTICA** Cushman, n. var. (Pl. 20, figs. 6, 7)

Variety differing from the typical in the smaller size, more slender form, thinner-walled and more coarsely perforate test, and tendency for the later portion in the adult to decrease in diameter.

Holotype of variety (Cushman Coll. No. 49169) from station 1614a, off Canaveral, Florida. This is one of the common species in this material. It is quite distinct from typical *R. spinulosa* (Reuss) from the Miocene of Europe and distinct from the species known from the late Tertiary of the West Indian region. It may be a new species.

CONICOSPIRILLINA ATLANTICA Cushman, n. sp. (Pl. 20, fig. 8)

Test consisting of an undivided tube in a conical spiral, the dorsal side strongly convex, ventral side concave, earlier coils very narrow and numerous, forming the conical portion, adult one or two coils very much larger; wall fairly smooth, rather coarsely perforate; aperture at the open end of the tube. Diameter up to 0.32 mm.

Holotype (Cushman Coll. No. 49180) from station 1635 in 35 meters, Onslow Bay, North Carolina. The species differs from *C. semi-involuta* Cushman in lacking the radiating ridges, in the closer coils in the early portion and broader final whorl with coarse perforations.

DISCORBIS PULCHRA Cushman, n. sp. (Pl. 20, fig. 9)

Test strongly compressed, dorsal side somewhat convex, ventral side flattened or slightly concave, periphery subacute, earlier whorls showing from both dorsal and ventral sides; chambers distinct, about 9 in the final whorl, increasing rather rapidly but evenly in size as added, little if at all inflated; sutures distinct, strongly curved, very slightly depressed in the later portion; wall smooth on the ventral side with a narrow thickened area parallel to the periphery appearing as a white area against the thinner wall at either side; aperture extending along the ventral border of the chamber from the periphery to the umbilicus with a slightly curved lip. Diameter up to 0.65 mm.; thickness up to 0.22 mm.

Holotype (Cushman Coll. No. 49187) from station 1636d, in 65 meters, off Onslow Bay, North Carolina. The species differs from *D. bertheloti* (d'Orbigny) in the larger number of chambers and the peculiar thickened area along the ventral periphery.

CASSIDULINA INSUETA Cushman, n. sp. (Pl. 20, fig. 10)

Test small, sides in end view nearly parallel, periphery angled at the edges, concave or convex at the ends; chambers rather indistinct, about 4 pairs in the final whorl, increasing very gradually in size as added, sides somewhat concave and edges sharply angled; sutures rather indistinct, not depressed; wall smooth but coarsely perforate; aperture elongate; curved, parallel to the border of the somewhat depressed apertural face. Diameter of holotype 0.35 mm.; thickness 0.25 mm.

Holotype (Cushman Coll. No. 49199) from station 1636A, in 72 meters, off Onslow Bay, North Carolina. This unique species is abundant in the Onslow Bay region. It somewhat resembles *C. palmerae* Bermudez and Acosta from the north coast of Cuba but has been compared with the types of that species and differs in the parallel or concave sides, more angled test and the lack of definite raised costae on the surface.

303. HOMONYMS IN FORAMINIFERA ERECTED DURING 1946

BY HANS E. THALMANN

In accordance with the International Rules of Zoological Nomenclature the following homonyms in Foraminifera, erected in the year 1946, and not yet provided with a *nomen novum*, are herewith brought to the attention of the respective authors:

Ammodiscus cretaceus (Reuss, 1845) var. *rugosa* Schijfsma, 1946, Mededeel. Geol. Stichting, Haarlem, ser. C, vol. V, No. 7, p. 28, pl. 6, fig. 2 (Campanian of Holland), preoccupied by *A. rugosus* Terquem, 1886, Mém. Soc. géol. France, ser. 3, vol. 4, p. 9, pl. 1, fig. 15.

Assilina sublacunata de Cizancourt, 1946, *nom. nov.*, Comptes-Rendus Soc. Géol. France, fasc. 16, p. 335. Madame de Cizancourt substituted this new name for *Assilina subumbilicata* de Cizancourt, 1938, Mém. Soc. Géol. France, new ser., vol. 17, fasc. 1, Mém. No. 39, p. 24, pl. 3, figs. 21-23 (Ypresian, Afghanistan). This change of name seems to the writer unjustified, and against the International Rules, because, amongst the genus *Assilina*, there appears to be no species name "*subumbilicata*" on which to base a change of name on account of homo-

nymy. *Assilina sublacunata* becomes, therefore, a *nomen delendum*; the valid name is *A. subumbilicata* de Cizancourt, 1938.

Bolivina subangularis Brady, 1881, var. *irregularis* Germeraad, 1946, in Rutten and Hotz, Geol., Petrogr. and Palaeont. Results, Ceram, ser. 3, Geology, No. 2, p. 68, pl. 3, figs. 15, 16 (Pliocene of Ceram, Netherlands East Indies), preoccupied by *Bolivina irregularis* Terquem, 1882, Mém. Soc. Géol. France, ser. 3, vol. 2, No. 3, p. 149, pl. 15, fig. 21.

Nodosaria rugosa ten Dam, 1946, Journ. Pal., vol. 20, p. 575, pl. 88, fig. 7 (Neocomian of Holland), preoccupied by *N. rugosa* d'Orbigny, 1839, in De la Sagra, Hist. Phys. Nat. Ile de Cuba, vol. 8, "Foraminiferes," p. 13, pl. 1, figs. 2, 3.

Quinqueloculina transverse-striata Germeraad, 1946, *loc. cit. ut supra*, p. 64, pl. 1, figs. 12-14 (Recent, Ceram), preoccupied by *Q. transverse-striata* van Soest, 1942, Proefschrift (Thesis), Rijks-Univ. Utrecht, p. 25, pl. 1, figs. 5, 6.

Robulus alto-costatus Germeraad, 1946, *loc. cit.*, p. 61, pl. 1, figs. 20, 21 (Pliocene, Ceram), preoccupied by *R. mexicanus* (Cushman, 1925) var. *alticostatus* Cushman and Barksdale, 1930, Stanford Univ., Geol. Dept., Contr., vol. 1, p. 63, pl. 9, figs. 4-7.

SPHARELLA gen. nov. Keller, 1946, Soc. Natural. Moscou, Bull., vol. 51, sect. géol., vol. 21, p. 95. New genus of the family Pithonellidae Keller, 1946; genotype: *Lagena orbulinaria* de Lapparent, 1923, Lecons de Petrogr., p. 273, pl. 14, fig. 1 (Upper Cretaceous). The generic name is already four times preoccupied, namely by Sommerfeldt, 1824, Mag. Naturw., vol. 4, p. 252 (Protoz.); Conrad, 1838, Foss. Med. Tert. U. S., (1), p. 17 (Mollusca); Conrad, 1860 (non Conrad, 1838), Acad. Nat. Sci. Philadelphia, Jour., (2), vol. 4, p. 280 (Mollusca); and Gray, 1869, Ann. Mag. Nat. Hist., (4), vol. 3, p. 122 (Coelent.).

RECENT LITERATURE ON THE FORAMINIFERA

Below are given some of the more recent works on the foraminifera that have come to hand:

Keijzer, F. A contribution to the geology of Bawean.—Proc. Kon. Ned. Akad. Wetenschappen, vol. XLIII, No. 5, 1940, pp. 618-629 (1-12), 1 text fig.—Lists a number of foraminifera.

Rutten, M. G. On *Lepidorbitoides* and *Orbitocyclina*.—Geologie en Mijnbouw, 1^e Jaarg., No. 11, Nov. 1940, pp. 263-267, text figs. 1-5.—The details of structure and the relationships of the two genera are discussed.

- A Synopsis of the Orbitoididae.—L. c., 3^e Jaarg., No. 2, Feb. 1941, pp. 34-62, pls. I, II, text figs. 1-21.—Gives figures and relationships of the various genera, with detailed descriptions.
- van der Sluis, J. P., and D. R. de Vletter. Youngtertiary smaller foraminifera from the neighbourhood of Ngimbang, East Java.—Proc. Ned. Akad. Wetenschappen, vol. XLV, No. 10, 1942, pp. 1008-1015 (1-8), 1 pl. (8 figs.)—Several new species and varieties are described and figured.
- Mehes, Kalman. Földtani Tanulmányok a Dunabogdanyi Csodi-hegy Környeken (Geologische Studien in der Umgebung des Csoder Berges bei Dunabogdany (Ungarn)).—M. kir. Földt., 1942, pp. 1-36, pls. I, II, map, profile.—Lists numerous species of foraminifera.
- Uj Pontozott Camerina Faj a Zirci Lencsesgödörből.—M. kir. Földt. Int. Evi, 1943, pp. 201-205, 3 text figs.—Describes and figures a new species, *Camerina pseudo-parva*.
- Also Oligocen *Lepidocyclinas* Kepzodmeny Elofordulasa Solymaron.—L. c., pp. 1-5, map.—A few foraminifera are mentioned and a world map given showing the geographical distribution of the genus *Lepidocyclina*.
- Ösi Eletterek es Nagy Hegyszerkezeti Összefüggések Rekonstrukcioja Nehany Foraminifera-Csoport Elterjedese Alapjan (Die Rekonstruktion von Alten Lebensräumen und Grossen Tektonischen Zusammenhängen auf grund der Verbreitung von einigen Foraminiferen-Gruppen).—L. c., 1944, pp. 371-384, text figs. 1-5 (maps).—A few foraminifera are mentioned and world maps showing the distribution of certain foraminiferal groups in the Oligocene and Eocene are given.
- di Napoli Alliata, Enrico. Nuovi ritrovamenti del genere Hantkenina Cushman.—Boll. Soc. Geol. Ital., vol. LXII, fasc. 1, 1943 (1944), 2 pp.
- Esame paleontologico di alcuni campioni della formazione marnoso-arenacea umbromagnola.—L. c., 2 pp.—Lists numerous foraminifera.
- Parr, Walter J. On *Torresina*, a new genus of the Foraminifera from Eastern Australia.—Journ. Roy. Micr. Soc., ser. III, vol. LXIV, pts. 3 & 4, Sept. & Dec. 1944, pp. 129-135, 1 pl., text figs. 1-3.—A new genus related to *Discorbinella*, from which it was probably derived, but having the chambers partially subdivided.
- Silvestri, Alfredo. Sull'Esistenza del Cretaceo Superiore nella Somalia.—Boll. Soc. Geol. Ital., vol. LXIV, 1945, pp. 1, 2.—Mentions a few foraminifera.
- Keijzer, F. G. Upper Cretaceous Smaller Foraminifera from Buton (D. E. I.).—Proc. Kon. Ned. Akad. Wetenschappen, vol. XLVIII, 1945, pp. 338, 339 (Reprint 1946).—Lists a number of species of foraminifera.
- Dunbar, Carl O. The Geologic and Biologic Significance of the Evolution of the Fusulinidae.—Trans. New York Acad. Sci., ser. II, vol. 7, No. 3, Jan. 1945, pp. 57-60.
- Parafusulina* from the Permian of Alaska.—Amer. Mus. Novitates, No. 1325, Sept. 16, 1946, pp. 1-4, figs. 1-9.—A new species, *P. alaskensis*, is described and figured.

- Dunbar, Carl O., and Norman D. Newell.** Early Permian Rocks of Southern Peru and Bolivia.—*Amer. Journ. Sci.*, vol. 243, April 1945, p. 218.—A few genera of foraminifera mentioned.
- Marine Early Permian of the Central Andes and its Fusuline Faunas.—L. c., vol. 244, June 1946, pp. 377-402, July 1946, pp. 457-491, pls. 1-12, text figs. 1-3.—The foraminifera are described and illustrated with several new species.
- Hermes, J. J.** Geology and Paleontology of East Camaguey and West Oriente, Cuba.—Thesis, Univ. Utrecht, Nov. 28, 1945, *Geogr. en Geol. Mededeelingen, Physiogr.-Geol. Reeks*, ser. II, No. 7, pp. 1-75, pls. I-V, tables, map.—Describes and figures a number of foraminifera, some new.
- de Vletter, D. R.** Geology of the Western Part of Middle Oriente, Cuba (west of Holguin).—Thesis, Univ. Utrecht, July 10, 1946, L. c., ser. II, No. 8, pp. 1-101, pls. 1-3, map.—Numerous foraminifera mentioned and a few sections figured.
- Jepps, Margaret W.** Are there Triflagellate Gametes in the Foraminifera? *Nature*, vol. 157, March 23, 1946, p. 374.
- Germeraad, J. H.** Geology of Central Seran, in L. Rutten and W. Hotz, *Geological, Petrographical and Palaeontological Results of Explorations, carried out from September 1917 till June 1919 in the Island of Ceram, 1946*, pp. 1-135, pls. I-XII, 5 tables, map.—Gives distribution table of 445 species and varieties of foraminifera with 6 plates of figures. Numerous new species and varieties described.
- Vasicek, Miloslav.** Moravska neogenni orbulineta a jejich stratigraficke svedectvi (Moravian Neogene Orbulineta and their Stratigraphical Significance).—*Vestnik Statniho Geologickeho Ustavu Republiky Ceskoslovenske, Rocnik XXI, 1946*, pp. 79-89 (pp. 88, 89, Summary in English).—The ecologic conditions of deposition in this area are described, based on the occurrence of different types of foraminifera.
- Poznamky k mikrobiostratigrafii magurskeho flyse na Morave (Remarks on the Microbiostratigraphy of the Magura Flysch in Moravia).—L. c., *Rocnik XXII, 1947*, pp. 235-256 (pp. 250-256, Summary in English), pls. I-III, text figs. 1-3.—A number of new species are described and figured, with a new genus, *Remesella* (genotype *R. mariae* n. sp.). A stratigraphic distribution table is given.
- Stetson, Henry C., and Fred B. Phleger, Jr.** Oceanography as Related to Petroleum Geology.—*Bull. Amer. Assoc. Petr. Geol.*, vol. 31, No. 1, Jan. 1947, pp. 175-178.—The usefulness of studies of Recent marine sediments to give data for the interpretation of older formations is stressed. The foraminifera are mentioned as probably the most useful fossils for this purpose in marine rocks of post-Jurassic age.
- van Voorthuysen, J. H.** An Internal Tube in the genus *Tristix* Macfadyen, 1941. *Geologie en Mijnbouw*, No. 3, March 1947, 2 pp., 2 text figs.—The structure is illustrated and the genus placed in the family Buliminidae with some question.
- Crespin, Irene.** Foraminifera in the Permian Rocks of Australia.—Commonwealth of Australia, Bureau of Mineral Resources, Geology and Geophysics, *Bull.* 15 (Pal.

- Ser. 5), 1947, pp. 1-31, pls. 1, 2, fig. 1 (map), tables II-IV.—Notes on distribution, with charts, are given and a number of species figured.
- Cole, W. Storrs, and Pedro J. Bermudez.** Eocene Discocyclinidae and other Foraminifera from Cuba.—Bull. Amer. Pal., vol. 31, No. 125, Sept. 18, 1947, pp. 1-37, pls. 1-7.—Several new species are described and figured and a new genus, *Boreloides* (genotype *B. cubensis* n. sp.), in the family Alveolinellidae.
- Cole, W. Storrs.** Internal Structure of some Floridian Foraminifera.—L. c., No. 126, Oct. 8, 1947, pp. 1-30, pls. 1-5, text fig. 1, 1 table.
- Phleger, Fred B., Jr.** Foraminifera of three submarine cores from the Tyrrhenian Sea. (with a foreword by Hans Pettersson)—Meddelanden fran Oceanografiska Institutet i Göteborg. 13. (Göteborgs Kungl. Vetenskaps- och Vitterhets-Samhälles Handlingar. Sjätte Följden. ser. B, Band 5, No. 5), 1947, pp. 1-19, 2 tables.—Lists of the species are given with their occurrence at different depths in the cores. A study of the change in the foraminiferal faunas gives data for the interpretation of the changes in conditions during the deposition.

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