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ICONOGRAPHY OF THE YPRESIAN FORAMINIFERA OF THE BELGIAN BASIN AND DESCRIPTION OF NEW BENTHIC SPECIES

by

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(with 1 table and 24 plates)

In 1980 W. Willems took the degree of doctor in science with his thesis: Foraminifera of the Ieper Formation (Early Eocene) in the southern North Sea basin (biostratigraphy, paleoecology and systematics). He intended to publish the systematic part of the thesis in English. When W. Willems left us, this new version was brought to an abrupt termination. The comments on many species had still to be translated, unfortunately. It was impossible for us to finish this work but we think that the publication of all plates illustrating the systematic part of Willems' thesis, and of the descriptions and comments for five new species described by Willems, will be very much appreciated.

SYSTEMATICS

Order *FORAMINIFERIDA* EICHWALD, 1830.
Suborder *TEXTULARIINA* DELAGE & HEROUARD, 1896.
Superfamily *AMMODISCACEA* REUSS, 1862.
Family *RZEHAKINIDAE* CUSHMAN, 1933.
Genus *Recurvoides* FARLAND, 1934.

Recurvoides buffardi n. sp.

Pl. 2, fig. 4a-c

1961 *Trochammina* sp. cf. *T. inflata* (not MONTAGU, 1808) — KAASSCHIETER, p. 142, pl. 1, fig. 20; Early Eocene, the Netherlands.

1960(?) *Recurvoides* sp. indet. — BROUWER, p. 403.

1980 *Recurvoides* sp. — WILLEMS, p. 17, pl. 2, fig. 4a-c; Early Eocene, Belgium.

Description: Test inflated, outline rounded to slightly oval, not lobed; periphery rounded; wall coarsely agglutinated but smooth; chambers well visible, about six in the last whorl; sutures slightly curved on the dorsal side, straight on the ventral side; umbilicus small, open; aperture an oval slit in the face of the last chamber, near the base.

Holotype: Specimen from the – 142,5m level in the Tielt boring, Belgium.

Paratypes: Three specimens from the – 140.5m level in the Tielt boring and 31 specimens from the – 80m level in the Ooigem boring.

Dimensions: Holotype: greatest diameter: 0.33mm; second diameter: 0.25mm; thickness: 0.20mm.

Type locality: Tielt boring, Belgium.

Name: In honour of Dr. R. BUFFARD (Dijon, France).

Remarks: The specimen figured by KAASSCHIETER (1961) is more inflated than the individuals recorded here. BROUWER (1968) renamed it as *Recurvoides* spec. indet.

Occurrence: Tielt: between – 142.5m and – 140.5m (rare); Ooigem: – 80m (abundant).

Genus *Trochamminoides* CUSHMAN, 1910.

Trochamminoides dedapperi n. sp.

Pl. 2, fig. 3a-d.

1980 *Discammina*? spec. — WILLEMS, p. 17, pl. 2, fig. 3a-d; Early Eocene, Belgium.

Description: Test planispiral, slightly evolute; outline rounded or slightly oval, somewhat lobed, umbilical region depressed; wall very coarsely agglutinated, built of quartz grains; sutures straight and somewhat depressed; six to eight chambers in the last whorl; aperture not easily visible.

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Holotype: Specimen from the −366 m level in the Kallo boring (pl. 2, fig. 3c).

Paratypes: Two other specimens from the same level as the holotype; 15 from other levels in the Kallo boring, five from the Tielt boring and seven from the Orchies outcrop.

Dimensions: Holotype: greatest diameter: 0.50 mm. The greatest diameter of some of the largest specimens varies between 0.29 mm and 0.65 mm with a mean value of 0.40 mm (n = 9).

Type locality: Kallo boring, Belgium.

Type strata: Mont Heribu Member, of Early Eocene age.

Name: In honour of Dr. M. DEDAPPER (Gent, Belgium).

Remarks: The very coarse wall texture is not typical for the genus *Trochamminoides* CUSHMAN, 1910 (LOEBLICH & TAPPAN, 1964, p. 226) but rather for the recent genus *Discammina* LACROIX, 1932 (LOEBLICH & TAPPAN, *ibid.*, p. 226). GRADSTEIN & BERGGREN (1981, p. 252), however also include coarse specimens in the first named genus.

Occurrence: Kallo: between −375 m and −361.5 m (rare-frequent); Tielt: at −146.5 m (frequent); Orchies (frequent).

Suborder *ROTALIINA* DELAGE & HEROUARD, 1896.
Superfamily *NODOSARIACEA* EHRENBERG, 1838.
Family *NODOSARIIDAE* EHRENBERG, 1838.
Subfamily *NODOSARIINAE* EHRENBERG, 1838.
Genus *Lagena* WALKER & JACOB, 1798.

***Lagena polygonissima* n. sp.**

Pl. 4, fig. 22

1944 *Lagena* cf. *hexagona* (not WILLIAMSON, 1858) — TEN DAM, p. 103, pl. 2, fig. 18; Palaeocene, the Netherlands.
1958b *Lagena hexagona* (not WILLIAMSON, 1858) — HAYNES, p. 72, pl. 17, fig. 8; Late Palaeocene, South England.
1968 *Lagena* cf. *hexagona* (not WILLIAMSON, 1858) — SCHICKOR, p. 118; Palaeocene, Northwest Germany.
1970 *Lagena* sp. — LE CALVEZ, p. 82, pl. 20, fig. 5; Middle Eocene, Paris Basin, France.

Description: Test unilocular, somewhat longer than wide; greatest width in the middle of the test; section round; wall with a fine pattern of irregular polygons which pass into irregular striae near the base of the test; neck about one third of the total length, covered by oblique striae; aperture small rounded and terminal.

Dimensions: holotype: length: 0.21 mm; width: 0.18 mm; paratype: length: 0.17 mm; width: 0.15 mm.

Holotype: Specimen from the level −310.8 m, Kallo boring, Belgium.

Type locality: Kallo borehole, Belgium.

Type level: Flanders Member, (Ieper Formation) or Early Eocene age.

Remarks: The polygonal pattern of these specimens is much finer than in typical specimens of *Oolina hexagona* (WILLIAMSON, 1858) as figured by MURRAY (1971, p. 93, pl. 37, fig. 1-3; Recent, North Sea). TEN DAM (1944) describes a short and smooth neck (about one fourth of the total length) and a pattern of fine hexagons, but the specimen figured shows a pattern of very fine, irregular polygons. HAYNES (1958b) figures three specimens covered with irregular, fine polygons, of which one has a very long neck (nearly one half of the total length), covered by very fine spines. SCHICKOR (1968) also reports a much finer pattern than that found in typical *hexagona*-specimens. LE CALVEZ (1970) described a test with fine longitudinal striae connecting in several places, forming a pattern of irregular polygons.

Occurrence: Kallo: at −310.8 m (rare); at −242.5 m (rare).

Superfamily *DISCORBACEA* EHRENBERG, 1838.
Family *DISCORBIDAE* EHRENBERG, 1838.
Subfamily *DISCORBINAE* EHRENBERG, 1838.
Genus *Eurycheilostoma* LOEBLICH & TAPPAN, 1957.

***Eurycheilostoma ? globospira* n. sp.**

Pl. 8, fig. 5a-c. Pl. 21, figs. 1-o.

Description: Test trochospiral, plano-convex; ventral side concave in the center, dorsal side strongly conical; rounded central part; outline rounded to slightly oval, lobed; wall smooth and finely perforated; chambers inflated, rapidly increasing in size; initial whorl with six to four chambers; later whorls four to three chambers per whorl; two to three whorls; after the first whorl the test becomes more elongated but not wider; the sutures are depressed, running obliquely on the spiral side and radially on the ventral side; aperture forming a wide arch at the base of the last chamber and preceded by a flap; umbilicus open.

Holotype: Specimen from the −315.9 m level in the Kallo boring, Belgium (pl. 8, fig. 5a-c).

Paratypes: 60 specimens.

Dimensions: Holotype: greatest diameter: 0.18 mm; second diameter: 0.15 mm; length: 0.16 mm.

Type locality: Kallo boring, Belgium.

Type stratum: Flanders Member, (Ieper Formation) of Early Eocene age.

Remarks: The aperture and flap, the rounded outline and the high spiral side indicate the genus *Eurycheilostoma* LOEBLICH & TAPPAN, 1957 (LOEBLICH & TAPPAN, 1964, p. 578), which however was only recorded from the Late Jurassic till the Late Cretaceous.

In many specimens the last chambers are missing, so that only few measurements of the length could be made. The inflation of the chambers and the dimensions of the first chamber are variable. Specimens with a large first chamber have a rounder initial part; their length increases faster and they have a smaller number of whorls than individuals with a smaller first chamber (Pl. 21, figs. 1-o).

E. ? globospira differs because of its more inflated chambers, its smaller test and its narrower umbilical flap from the American Cretaceous species *E. altispira* LOEBLICH & TAPPAN, 1957 (LOEBLICH & TAPPAN, 1964, p. 578, fig. 456(3); TAPPAN & LOEBLICH, 1966, p. 377, pl. 1, fig. 2), *E. robinsonae* TAPPAN, 1957 (TAPPAN, 1962, p. 193, pl. 53, figs. 2-5) and *E. grandstandensis* TAPPAN, 1957 (TAPPAN, 1962, p. 193, pl. 53, figs. 6-12).

Gavelinella (?) sp. (BROTZEN, 1948, p. 76, pl. 9, fig. 10; Paleocene of Sweden) has spherical chambers, with a lip below which the aperture is situated; this species could be related to *E. ? globospira* nov. sp. but its dorsal side is more flattened.

Occurrence: Kallo boring: – 315.9 m (frequent).

Genus *Pijpersia* THALMANN, 1954.

***Pijpersia kalloensis* n. sp.**

Pl. 8, fig. 6a-c., Pl. 21, figs. p-q.

Description: Trochospiral test, plano-convex; ventral side flat, concave in the center, dorsal side convex but not conical; outline round to oval; wide periphery; wall coarsely perforated and knobbly; five to six chambers, inflated and dorsally tapering to a blunt spine or a keel; sutures clearly marked and depressed, oriented radially on the ventral side; aperture forming a large arch at the base of the last chamber and preceded by a spine; umbilicus open.

Holotype: Specimen from the – 242.5 m level in the Kallo boring, Belgium (pl. 8, fig. 6a-c).

Paratypes: 14 specimens.

Dimensions: Holotype: greatest diameter (gsd): 0.145 mm; second diameter (sd 90) perpendicular to the greatest diameter: 0.12 mm; length: 0.08 mm. Paratypes: see table 1.

Type locality: Kallo boring, Belgium.

Type stratum: Egem Member of Early Eocene age.

Remarks: The presence of keels and spines on the dorsal side of the test points to the genus *Pijpersia* THALMANN (1954). The specimens recovered show some variation of the outline of the test: from slightly oval to almost round. The extremes of variation differ considerably, but intermediary forms leave no possibilities for separation. Many individuals are eroded and present only faint keels on their chambers.

Pijpersia coronaeformis (PIJPERS, 1933) (LOEBLICH & TAPPAN, 1964, fig. 458(1), holotype; DROOGER, 1953, p. 102, pl. 1, fig. 9, lectotype, Eocene of the Dutch West Indies) has more spiny chambers, a more lobed outline and more distinct keels than the specimens recovered.

Glabratella diadematoides (LE CALVEZ, 1959) (*Pseudoruttenia diadematoides* n. sp., LE CALVEZ, 1959, p. 92, pl. 1, figs. 17-19; LE CALVEZ, 1970, p. 147, pl. 30, figs. 1-3, Early Eocene of the Paris Basin) has a knobbly testwall, spiny chambers like our specimens, but on the ventral side the knobs are disposed radially.

Rotorbinella papillata POZARYSKA & SZCZECHURA, 1968 (p. 56, pl. 6, fig. 11; Paleocene of Poland) resembles our specimens by the ornamentation (knobs and coarse perforations) of the testwall, but its outline is not as much lobed and the spiral side is more flattened.

Occurrence: Kallo boring: between – 312.5 m and – 242.5 m (rare); Ledeberg: between – 19.5 m and – 17.5 m (rare).

Level	gsd	sd90	L	0p	gsd/sd90	nclw	nw
Ka – 312,5	0,12	0,10	0,08	0,055	1,20	5	1 1/5
	0,12	0,10	0,07	-	1,20	5	1 1/3
	0,11	0,09	0,08	0,04	1,22	5	—
	0,11	0,10	0,07	0,055	1,10	5	—
	0,14	0,11	—	0,06	1,27	5	1
Ka – 296	0,13	0,12	0,09	0,045	1,08	5	1 2/5
Ka – 292,5	0,13	0,12	0,06	0,045	1,08	5	1 2/5
	0,15	0,13	0,09	0,06	1,15	5	2
	0,13	0,12	0,08	0,05	1,08	6	—
Ka – 257	0,19	0,16	0,11	0,06	1,19	6	—
Ka – 254,5	0,18	0,17	—	0,05	1,06	6	—
Ka – 242,5	0,14	0,12	0,08	0,045	1,17	5	—
Led – 19,5	0,13	0,12	0,07	0,04	1,08	5	—
	0,13	0,11	0,09	0,05	1,18	6	—

Table 1

Biometry of Pijpersia kalloensis *n. sp.*
(gsd: largest spiral diameter; sd90: spiral diameter measured perpendicular to gsd;
L: length of test; 0p: diameter of first chamber;
nclw: number of chambers in the last whorl;
nw: number of whorls).

EXPLANATION OF THE PLATES

Abbreviations used in the explanation of Willem plates :Ka: Kallo boring, Km: Kortemark, Led: Ledeberg, Me: Merelbeke, M-en-P: Mons-en-Pévèle, Og: Ooigem boring, Sj: Sint Jan, Tt: Tielt boring.

PLATE 1

Fig. 1 : *Rhabdammina annulata* GRZYBOWSKI, 1896; ×160; Tt −148.5m.
Fig. 2 : *Rhabdammina cylindrica* GLAESSNER, 1937; ×50; Ka −361.5m.
Fig. 3 : *Rhadamina eocenica* (CUSHMAN & HANNA, 1927); ×50; Ka −361.5m.
Fig. 4 : *Rhizammina sp. cf. R. excelsa* (GRZYBOWSKI); ×50; Ka −372m.
Fig. 5 : *Hyperammina ? sp.*; ×100; Ka −372m.
Fig. 6-7 : *Saccammina sp.*; 6, ×92, Ka −375m; 7, ×150, Ka −369m.
Fig. 8 : *Pilulina ? sp.*; ×100; Ka −369m.
Fig. 9 : *Hemisphaerammina ? sp.*; ×80; Og −90.5m.
Fig. 10 : *Ammodiscus siliceus* (TERQUEM, 1862); × 128; Ka −315,9m (draft).
Fig. 11 : *Ammodiscus septatus* GRZYBOWSKI, 1897; ×185; Tt −144.5m.
Fig. 12 : *Glomospira charoides* (JONES & PARKER, 1860); ×250; Ka −375m.
Fig. 13 : *Reophax sp. cf. R. bacillaris* BRADY, 1884; ×100; Ka −378m.
Fig. 14 : *Reophax sp. cf. R. cylindrica* BRADY, 1884; ×75; Ka −372m.
Fig. 15 : *Reophax subfusiformis* EARLAND, 1933, emend. HOGLUND, 1947; ×100; Ka −372m.
Fig. 16 : *Reophax splendida* GRZYBOWSKI (1897); ×212; Tt −144.5m.
Fig. 17 : *Reophax sp.*; ×80; Og −90.5m.
Fig. 18a-b : *Miliamina paleocenica* KIESEL, 1970; ×150; Tt −144.5m.
Fig. 19 : *Haplophragmoides burrowsi* HAYNES (1958); ×292; Tt −137.5m (draft).
Fig. 20a-c : *Trochaminoides subtrullisatus* GRZYBOWSKI, 1897; a, ×125, Ka −375m, umbilical side; b, ×85, Ka −364m, umbilical side; c, −100, Ka −375m, frontal view.
Fig. 21a-d : *Trochaminoides subtrullisatus* GRZYBOWSKI, 1897; Ka −372m; a, ×100, umbilical side; b, ×100, frontal view; c, ×130, umbilical side; d, ×75, umbilical view.
Fig. 22a-c : *Haplophragmoides walteri* (GRZYBOWSKI, 1897); ×100; Ka −366m; umbilical sides.
Fig. 23 : *Haplophragmoides walteri* (GRZYBOWSKI, 1897); ×100; Ka −369m.

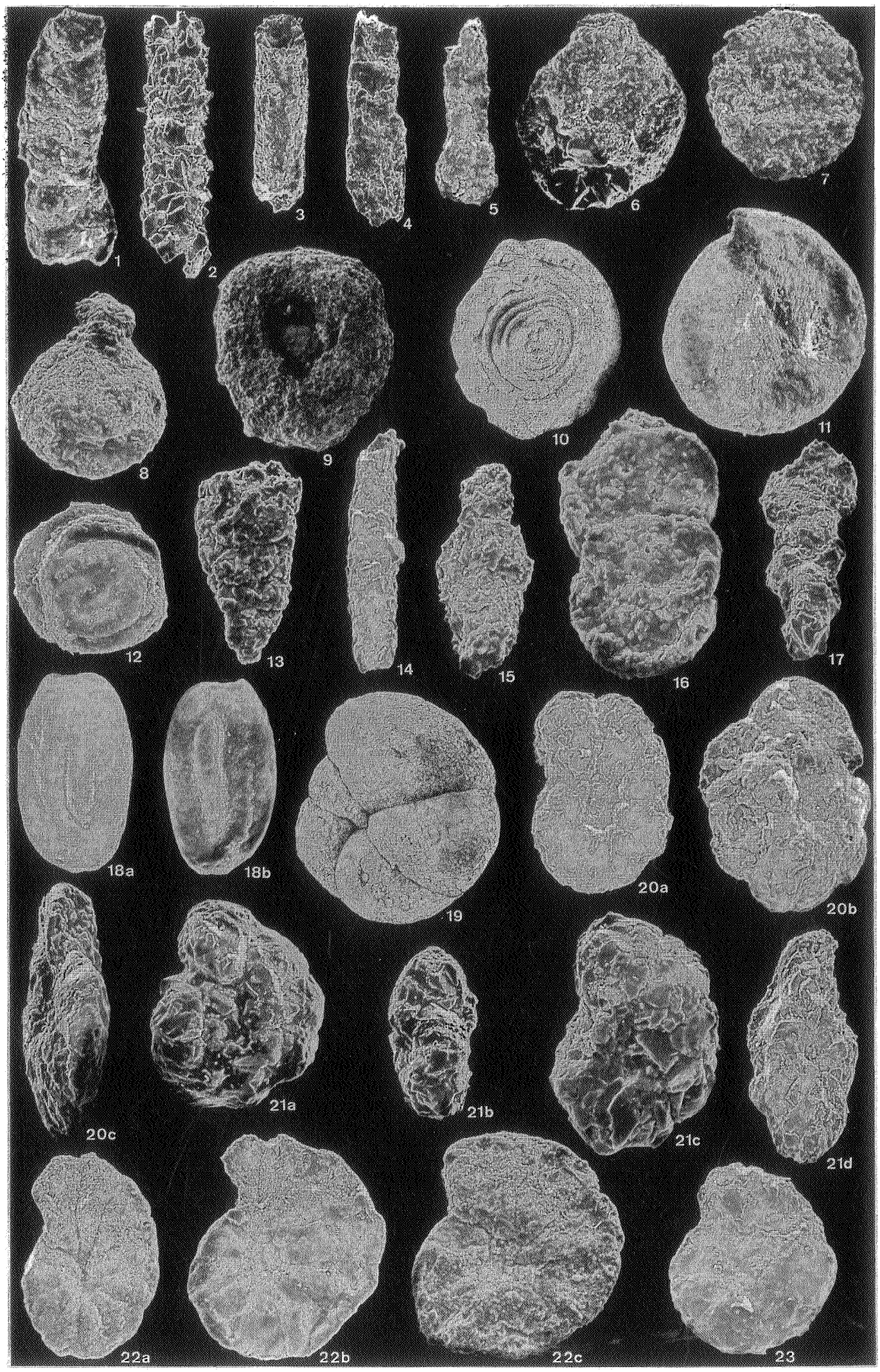
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PLATE 2

Fig. 1 : *Haplophragmoides sp.*; ×100; Ka −368.5m; umbilical side.
Fig. 2 : *Trochaminoides subtrullisatus* GRZYBOWSKI, 1897; ×100; Ka −368.5m; umbilical side.
Fig. 3a-d : *Trochaminoides dedapperi n. sp.*; a, ×65, Ka −372m; b, ×100, Ka −369m; c, ×75, Ka −366m, holotype; d, ×100, Ka ×375m; umbilical sides.
Fig. 4a-c : *Recurvoides buffardi n. sp*; ×130; Tt ×142.5m; a, dorsal side; b, frontal side; c, ventral side; holotype.
Fig. 5 : *Spiroplectammina adamsi* LALICKER, 1935; ×100; Ka −323.5m.
Fig. 6 : *Spiroplectammina deperdita* (d'ORBIGNY, 1846); ×70; Ka −301.5m.
Fig. 7 : *Spiroplectammina sp. cf. S. flabelliformis* (GUMBEL, 1868); ×105; Ka −337m.
Fig. 8 : *Spiroplectammina plummerae* CUSHMAN, 1948; ×85; Ka −321m.
Fig. 9 : *Spiroplectammina spectabilis* (GRZYBOWSKI, 1897); ×100; Ka −364m.
Fig. 10a-b : *Spiroplectammina wilcoxensis* CUSHMAN & PONTON, 1932; a, ×150, Ka −264m; b, ×140, Ka −280m.
Fig. 11 : *Vulvulina ? sp.*; ×100; Ka −356m.
Fig. 12 : *Textularia agglutinans* d'ORBIGNY, 1839; ×95. Ka −245m.
Fig. 13 : *Dorothia fallax* HAGN, 1954; ×53; Ka −303.9m; holotype.
Fig. 14 : *Textularia sp. cf. T. minuta* TERQUEM, 1882; ×50; M-en-P G55/5.
Fig. 15 : *Textularia plummerae* LALICKER, 1935; ×160; Ka −364m.
Fig. 16 : *Textularia smithvillensis* CUSHMAN & ELLISOR, 1933; ×45, Ka −323.5m.
Fig. 17 : *Textularia sp.; ×220; Ka −370m.*
Fig. 18 : Siphotextularia ? sp.; ×150; Ka −356m.
Fig. 19 : *Trochammina sp. cf. T. globigeriniformis* (PARKER & JONES, 1865); ×170; Og ±80m; ventral side.
Fig. 20a-d : *Trochammina sp. cf. T. inflata* (MONTAGU, 1808); a, ×200, Ka −366m, dorsal side; b, ×180, Ka −364m, ventral side; c-d, same specimen, ×150, Ka ×366m, c (ventral side), d (dorsal side).

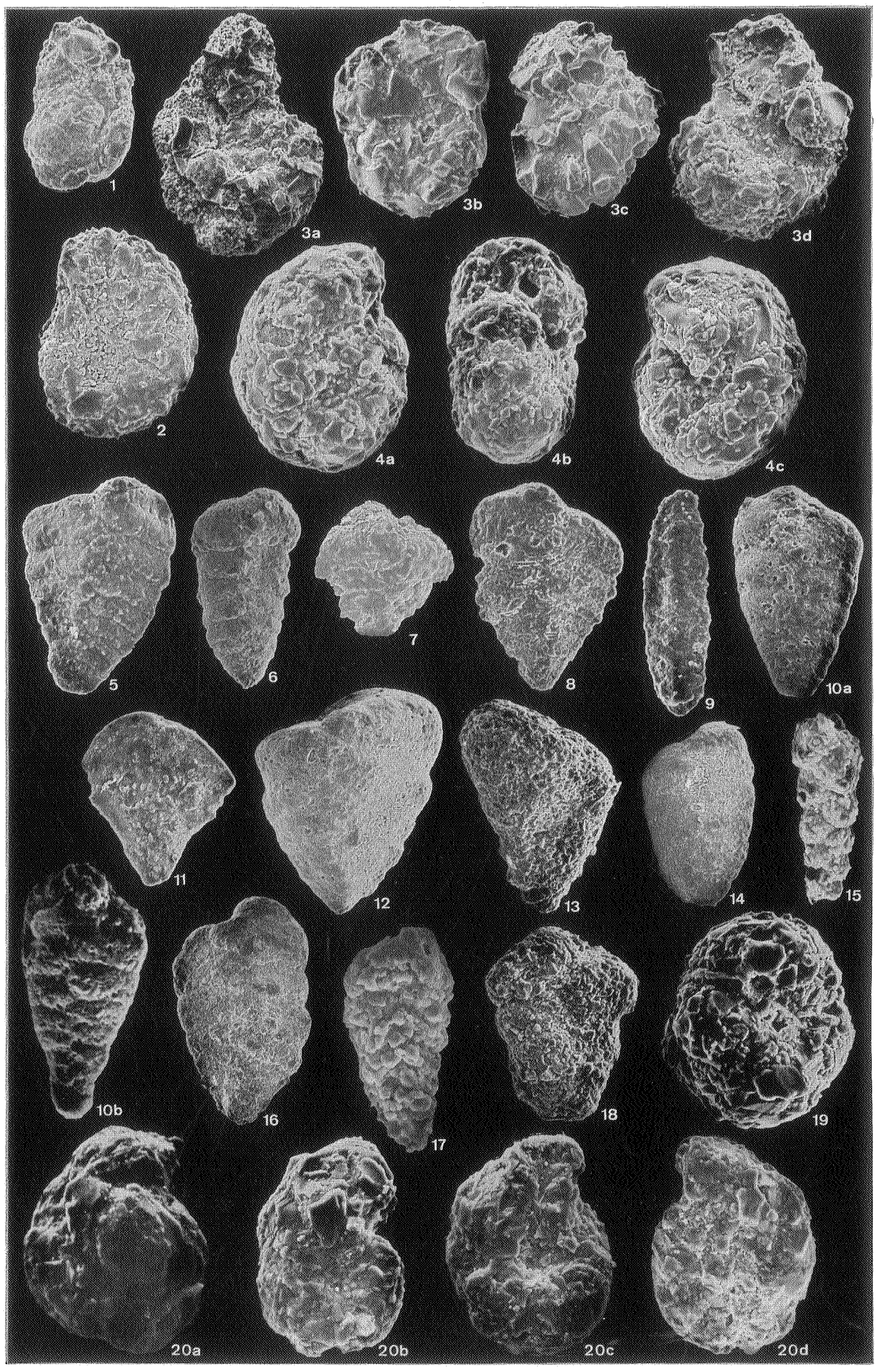
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PLATE 3

Fig. 1a-b : *Trochammina sp. A*; same specimen; ×130; Ka −364m; a, ventral side; b, dorsal side.
Fig. 2a-b : *Trochammina sp. B*; same specimen; ×150; tt −140.5m; a, dorsal side; b, ventral side.
Fig. 3a-c : *Verneuilina subeocaena* WICK, 1943; a-b, same specimen, ×92, Ka −372m; c, ×100; Ka −369m.
Fig. 4 : *Verneuilina sp.*; ×100; ka −369m.
Fig. 5 : *Gaudryinella ? sp.*; ×100; Ka −364m.
Fig. 6 : *Reophax subfusiformis* EARLAND, 1933, emend. HOGLUND, 1947; ×130; Ka −378m.
Fig. 7 : *Verneulinoides sp.*; ×100; Ka −369m.
Fig. 8 : *Eggerella palmerae* (COLE, 1927); ×250; Ka −318.5m (draft).
Fig. 9 : *Eggerella sp.*; ×250; Ka −368.5m.
Fig. 10a-c : *Karreriella danica* CUSHMAN, 1937; a, ×75, Ka −310.8m; b, ×75, Ka −294.5m; c, ×50, Ka −323.5m.
Fig. 11 : *Karreriella oveyi* (BOWEN, 1954); ×100; Ka −321m.
Fig. 12 : *Karreriella ? sp.*; ×100; Ka −364m.
Fig. 13 : *Clavulina anglica* (CUSHMAN, 1936); ×92; Ka −323.5m.
Fig. 14 : *Clavulina sp. cf. C. parisiensis* d'ORBIGNY, 1846; ×70; Ka −322m.
Fig. 15 : *Clavulina ? sp.*; ×190; Tt −135.5m.
Fig. 16 : *Spiroloculina ? sp. A*; ×150; Ka −303.9m.
Fig. 17 : *Spiroloculina ? sp. B*; ×150; Led −17.5m.
Fig. 18 : *Quinqueloculina juleana* d'ORBIGNY, 1846; ×65; Ka −303.9m.
Fig. 19 : *Quinqueloculina seminula* (LINNE, 1758); ×70; Ka −250m.

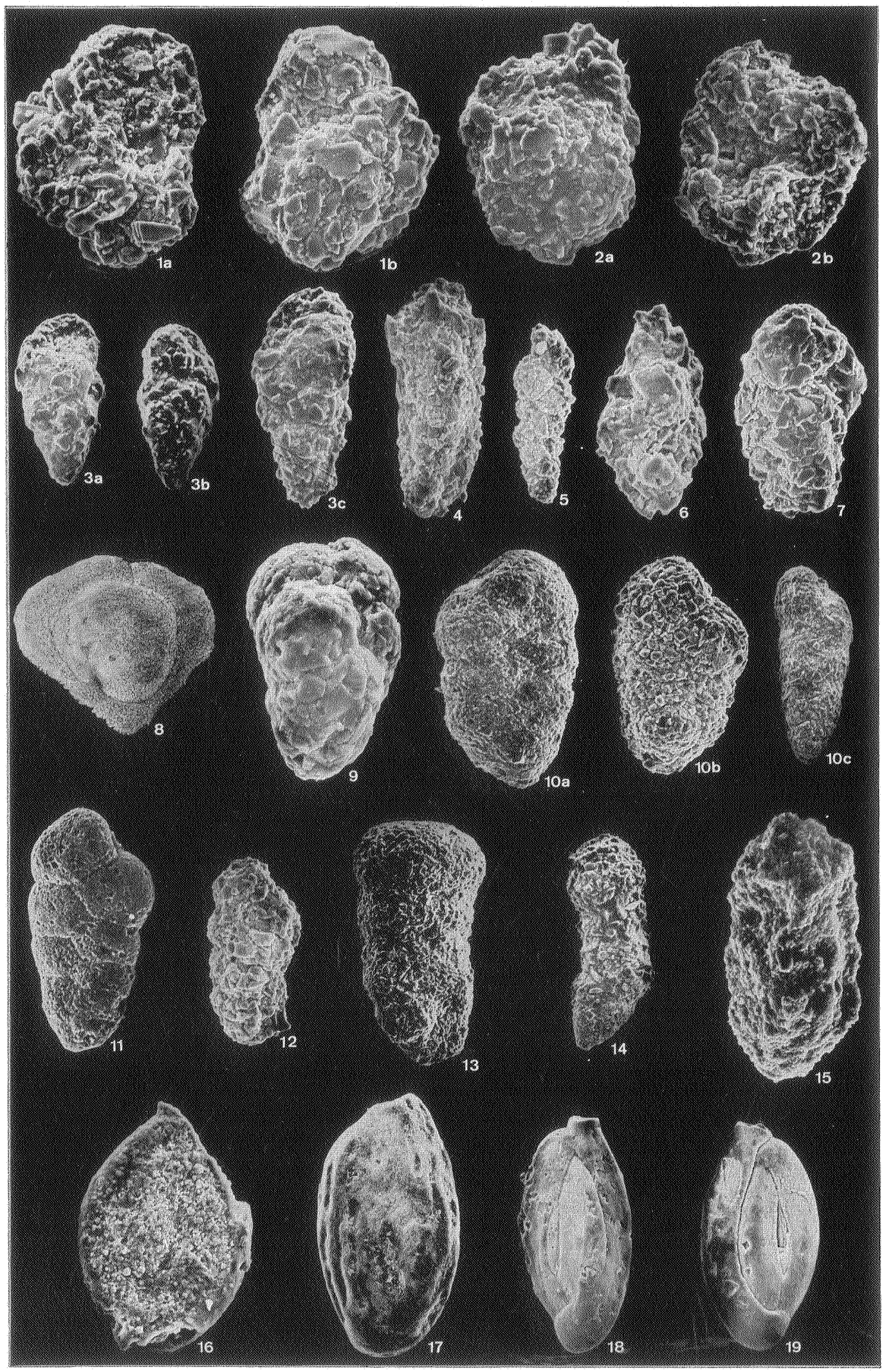
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PLATE 4

Fig. 1 : *Nodosaria latejugata* GUMBEL, 1868; ×14; Ka –323.5m.
Fig. 2 : *Nodosaria minor von HANTKEN, 1875; ×23; Ka –321m.*
Fig. 3 : Nodosaria ? sp. cf. N. natchitochensis (HOWE, 1939); ×120; Ka –352m.
Fig. 4 : *Nodosaria ? sp.*; ×50; Ka –325.5m.
Fig. 5 : *Dentalina appoximata* (REUSS, 1866); ×30; Ka –329.5m.
Fig. 6 : *Dentalina consobrina* d'ORBIGNY, 1846; ×57; Ka –323.5m.
Fig. 7 : *Dentalina elegans* d'ORBIGNY, 1846; ×60; Ka –301.5m.
Fig. 8 : *Dentalina frankei* SCHICKOR, 1968; ×60; Ka ×332m.
Fig. 9 : *Dentalina inepta* CUSHMAN, 1947; ×65; Ka –323.5m.
Fig. 10 : *Dentalina nasuta* CUSHMAN, 1939; ×1939; ×65; Ka –325.5m.
Fig. 11 : *Dentalina pauperata* d'ORBIGNY, 1846; ×50; La –303.0m.
Fig. 12 : *Dentalina mucronata* NEUGEBOREN, 1856; ×42; Ka –292.5m.
Fig. 13 : *Dentalina megalopolitana* REUSS, 1855; ×32; Ka –310.8m.
Fig. 14 : *Dentalina subrecta* REUSS, 1860; ×85; Ka –310.8m.
Fig. 15a-b : *Dentalina spinescens* REUSS, 1851; a, ×60, Ka –330.5m; b, ×42, Ka –325.5m.
Fig. 16 : *Dentalina wilcoxensis* CUSHMAN, 1944; ×75; Ka –318.5m.
Fig. 17 : *Lagena amphora* REUSS, 1863; ×250; Ka –347.
Fig. 18 : *Lagena axiformis* MATTHES, 1939; ×170; Ka –312.5m.
Fig. 19 : *Lagena elegantissima* (BORNEMANN, 1855); ×200; Ka –315.9m.
Fig. 20 : *Lagena hystrix* REUSS, 1863; ×170; Ka –301.5m.
Fig. 21 : *Lagena cf. laevis* (MONTAGU, 1803); ×140; Ka –321m.
Fig. 22 : *Lagena polygonissima n. sp.*; ×150; Ka –310.8m; holotype.
Fig. 23 : *Lagena striata* d'ORBIGNY, 1839; ×112; Ka –301.5m.
Fig. 24 : *Lagena substriata* WILLIAMSON, 1848; ×130; Ka –299m.
Fig. 25 : *Lagena sp.*; ×140; Ka –283m.
Fig. 26a-d : *Lenticulina (A.) platypleura* (JONES, 1852); a-b, ×64, Ka –301.5m; a, frontal view; b, umbilical side, draw; c, ×50, Ka –301.5m, umbilical side; d, ×45, Ka ×303.9m, umbilical side.
Fig. 27 : *Lenticulina (Astacolus) sp. A*; ×45; Ka –294.5m, umbilical side.

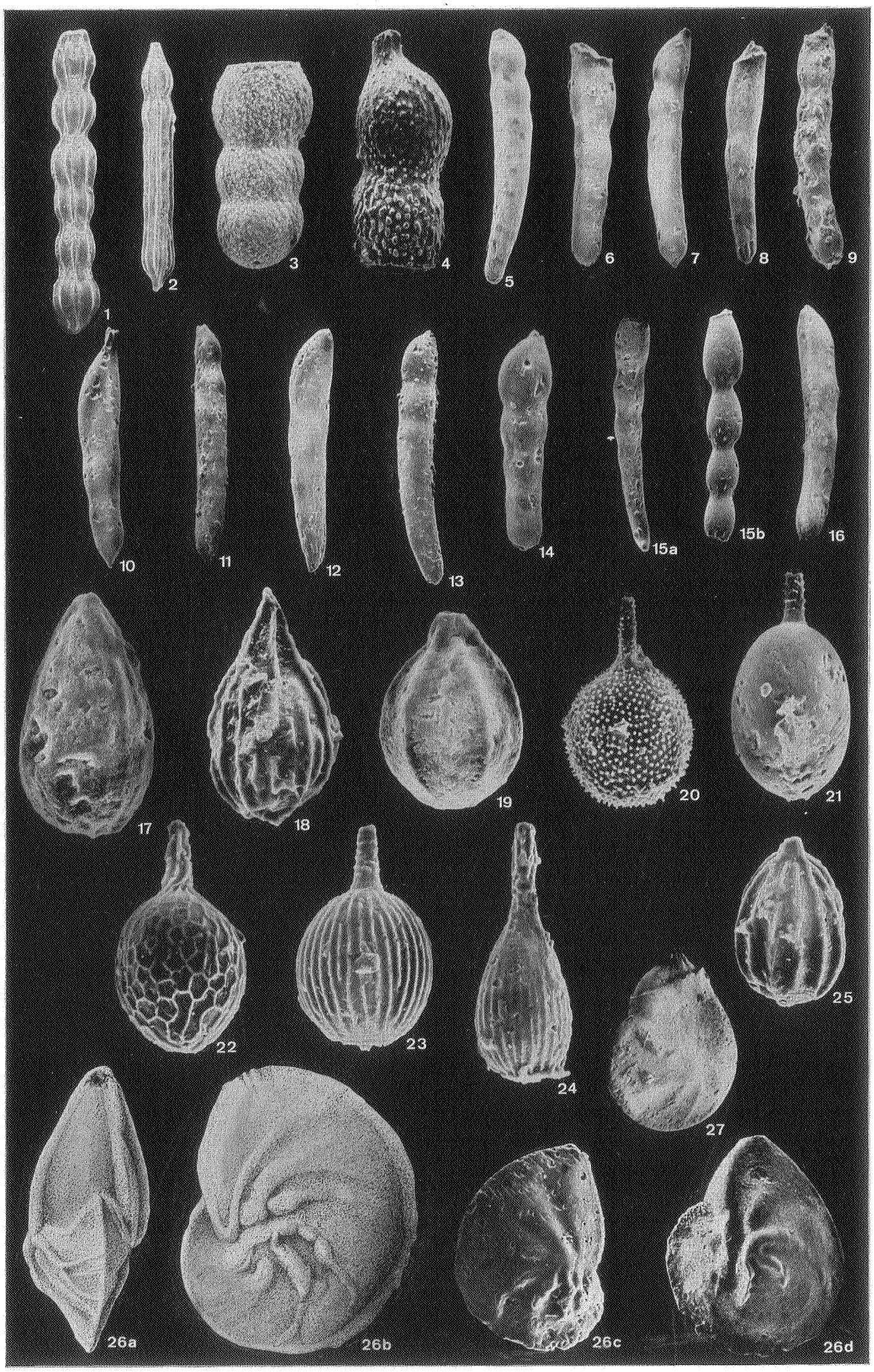
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PLATE 5

Fig. 1 : *Lenticulina (Darbyella) sp. cf. L. (D.) wilcoxensis* (CUSHMAN & GARRETT, 1939); ×45; Ka −292.5m; dorsal side.

Fig. 2 : *Lenticulina (R.) alata-limbata* (GUMBEL, 1868); ×40; Ka −301.5m; umbilical side; drawings.

Fig. 3 : *Lenticulina (R.) deformis* (REUSS,1851); ×100; Ka −324m; umbilical side.

Fig. 4 : *Lenticulina (R.) cultrata* (de MONTFORT, 1808); ×40; Ka −303.9m; umbilical side; drawing.

Fig. 5 : *Lenticulina (R.) sp. cf. L. (R.) degolyeri* (PLUMMER, 1926); ×110; Ka −261.5m; umbilical side.

Fig. 6a-b : *Lenticulina (R.) ellisori* BOWEN, 1954; ×40; Ka −323.5m; a, frontal view; b, umbilical side; drawings.

Fig. 7a-b : *Lenticulina (R.) sp. cf. L. (R.) galeata* (REUSS, 1851); ×64; Ka −325.5m; a, frontal view; b, umbilical side; drawings.

Fig. 8a-b : *Lenticulina (R.) sp. cf. (R.) hornerstownensis* (OLSSON, 1960); ×64; Ka −358.5m; a, frontal view; b, umbilical side; drawings.

Fig. 9a-b : *Lenticulina (R.) sp. cf. L. (R.) kreyenhagenensis* (MALLORY, 1959); ×40; Ka −323.5m; a, frontal view; b, umbilical side; drawings.

Fig. 10 : *Lenticulina (R.) sp. cf. L. (R.) semiimpressa* (REUSS, 1866); ×128; Ka −358.5m; umbilical side; drawing.

Fig. 11 : *Lenticulina (R.) sp. cf. L. (R.) umbonata* (REUSS, 1851); ×225; Ka −358.5m; umbilical side.

Fig. 12 : *Lenticulina (R.) sp. cf. L. (R.) yeguatensis* (BERMUDEZ, 1949); ×64; Ka −323.5m; umbilical side; drawing.

Fig. 13 : *Marginulina acuticauda* TEN DAM, 1944. ×105: Ka −323.5m.

Fig. 14 : *Marginulina pediformis* BORNEMANN, 1855; ×83; Ka −303.9m.

Fig. 15a-b : *Marginulinopsis decorata* (REUSS, 1855); a, ×83; Ka −323.5m; b, ×72, Ka −321m.

Fig. 16 : *Marginulinopsis decorata* (REUSS, 1855); ×65; Ka −328m.

Fig. 17 : *Marginulinopsis wetherelli* (JONES, 1854); ×32; Ka −323.5m; drawing.

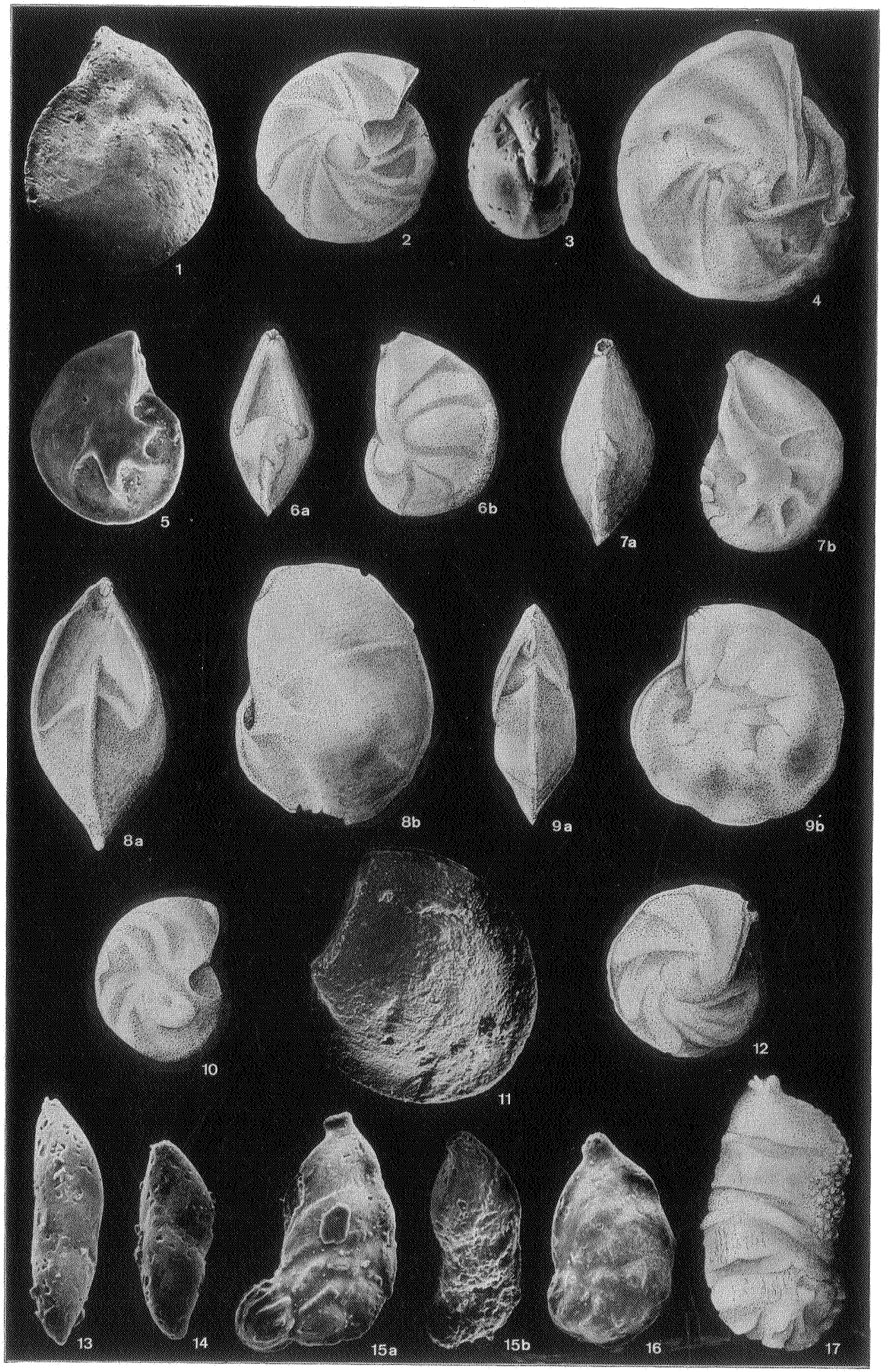
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PLATE 6

Fig. 1 : *Globulina ampulla* (JONES, 1852); ×165; Ka −315.9m.
Fig. 2 : *Globulina gibba* (d'ORBIGNY, 1826); ×83; Ka −300.7m.
Fig. 3a-b : *Globulina gravida* (TERQUEM, 1878); ×192; Ka −292.5m; drawing.
Fig. 4 : *Globulina inaequalis* REUSS, 1850; ×173; Ka −306m.
Fig. 5 : *Globulina hispida* TERQUEM, 1882; ×190; Ka −254.5m
Fig. 6 : *Globulina sp.*; ×195; Ka −248m.
Fig. 7 : *Guttulina irregularis* (d'ORBIGNY, 1846); ×110; Ka −245m.
Fig. 8 : *Guttulina parisiensis* LE CALVEZ, 1950; ×73; Ka −254.5m.
Fig. 9 : *Guttulina lactea* (WALKER & JACOB, 1798); ×283; Ka −242.5m.
Fig. 10 : *Guttulina problema* (d'ORBIGNY, 1826); ×79; Ka −257m.
Fig. 11 : *Pseudopolymorphina sp.*; ×190; Ka −242.5m.
Fig. 12 : *Pseudopolymorphina sp.*; ×240; Ka −318.5m.
Fig. 13a-b : *Pyrulina polita* (TERQUEM, 1882); a, ×125, Ka −308.6m; b, ×184; Ka −322m.
Fig. 14 : *Pyrulina thouini* (d'ORBIGNY, 1826); ×165; Ka −321m.
Fig. 15 : *Sigmomorphina amygdaloides* (REUSS, 1846); ×120; Ka −245m.
Fig. 16 : *Glandulina laevigata* (d'ORBIGNY, 1826); ×64; Ka −294.5m.
Fig. 17 : *Glandulina ? sp. cf. G. ovula* (d'ORBIGNY, 1826); ×110; Ka −299m.
Fig. 18 : *Glandulina ? elongata* BORNEMANN, 1855; ×105; Kā −321m.
Fig. 19 : *Glandulina ? tumida* (BOWEN, 1954); ×110; Ka −250m.
Fig. 20 : *Oolina sp. cf. O. globosa* (WALKER & BOYS, 1784); ×195; Ka −297m.
Fig. 21 : *Fissurina laevigata* (REUSS, 1850); ×225; Tt −105.5m.
Fig. 22 : *Fissurina marginata* (WALKER & BOYS, 1784); ×225; Ka −354.5m.
Fig. 23 : *Fissurina sp.*; ×330; Ka −323.5m.
Fig. 24 : *Fissurina orbignyana* SEGUENZA, 1826; ×200; Ka −312.5m.
Fig. 25 : *Fissurina creba* (MATTHES, 1939); ×90; Ka −321m.

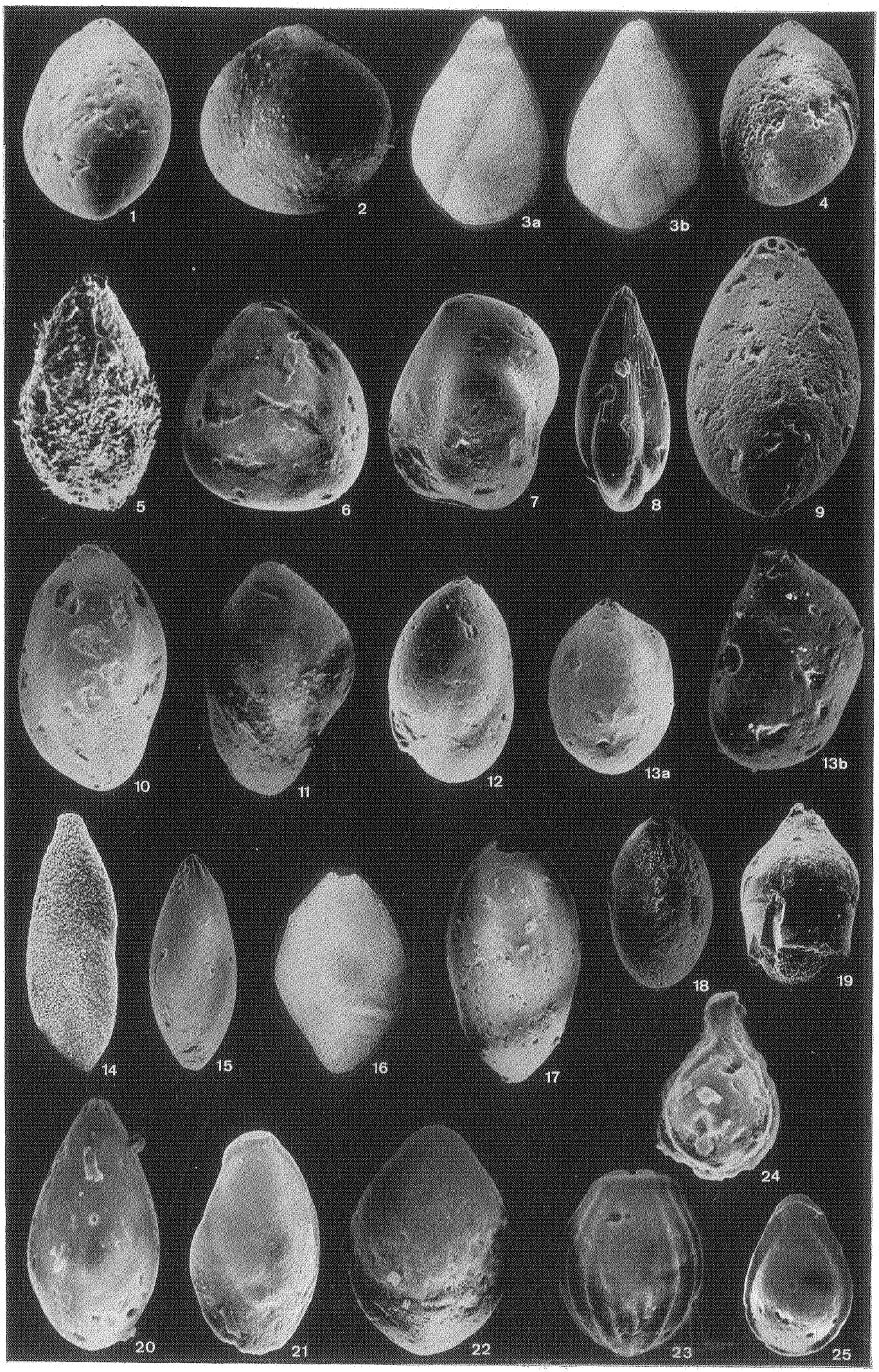
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PLATE 7

Fig. 1a-b : *Turrilina brevispina* TEN DAM, 1944; a, ×238; Ka −277m; b, ×230; Ka −273m.
Fig. 2a-b : *Bagatella ? canteni* (BHATIA, 1955); ×225; Ka −335,5m; a, initial whorl; b, last whorl; different specimens.
Fig. 3 : *Bolivina anglica* CUSHMAN, 1936; ×100; Tt −105,5m.
Fig. 4 : *Bolivina brabantica* KAASSCHIETER, 1961; ×140; Ka −257m.
Fig. 5 : *Bolivina budensis* (von HANTKEN, 1875); ×230; Ka −245m.
Fig. 6 : *Bolivina carinata* TERQUEM, 1882; ×130; Me 5.
Fig. 7 : *Bolivina sp. cf. B. cookei* CUSHMAN, 1922; ×105; Ka −329,5m.
Fig. 8 : *Bolivina crenulata* CUSHMAN 1936; ×140; Ka −297m.
Fig. 9 : *Bolivina pulchra* LE CALVEZ, 1950; ×180; Ka −242,5m.
Fig. 10 : *Stilostomella ? sp.*; ×75; Ka −318,5m.
Fig. 11a-c : *Bulimina parisiensis* KAASSCHIETER, 1961; a, ×237, Ka −242,5m; b, ×180, Ka −257m; c, ×148, Ka −257m.
Fig. 12 : *Uvigerina garzaensis* CUSHMAN & SIEGFUS, 1939; ×120; Ka −299m.
Fig. 13 : *Sagrina limbata* (TERQUEM, 1882); ×160; Ka −245m.
Fig. 14 : *Trifarina muralis* (TERQUEM, 1882); ×160; Ka −254,5m.
Fig. 15 : *Trifarina wilcoxensis* (CUSHMAN & PONTON, 1932); ×160; Ka −254,5m.
Fig. 16 : *Uvigerinella abbreviata* (TERQUEM, 1882); ×200; Ka −323,5m.
Fig. 17a-b : *Discorbis alata* LE CALVEZ, 1949; ×250; Ka −354,5m; a, dorsal side; b, ventral side; same specimen.
Fig. 18 : *Discorbis perovalis* (TERQUEM, 1882); ×170; Ka −280m; ventral side.
Fig. 19a-b : *Discorbis vesicularis* (de LAMARCK, 1804); ×180; Ka −245m; a, ventral side; b, dorsal side; same specimen.

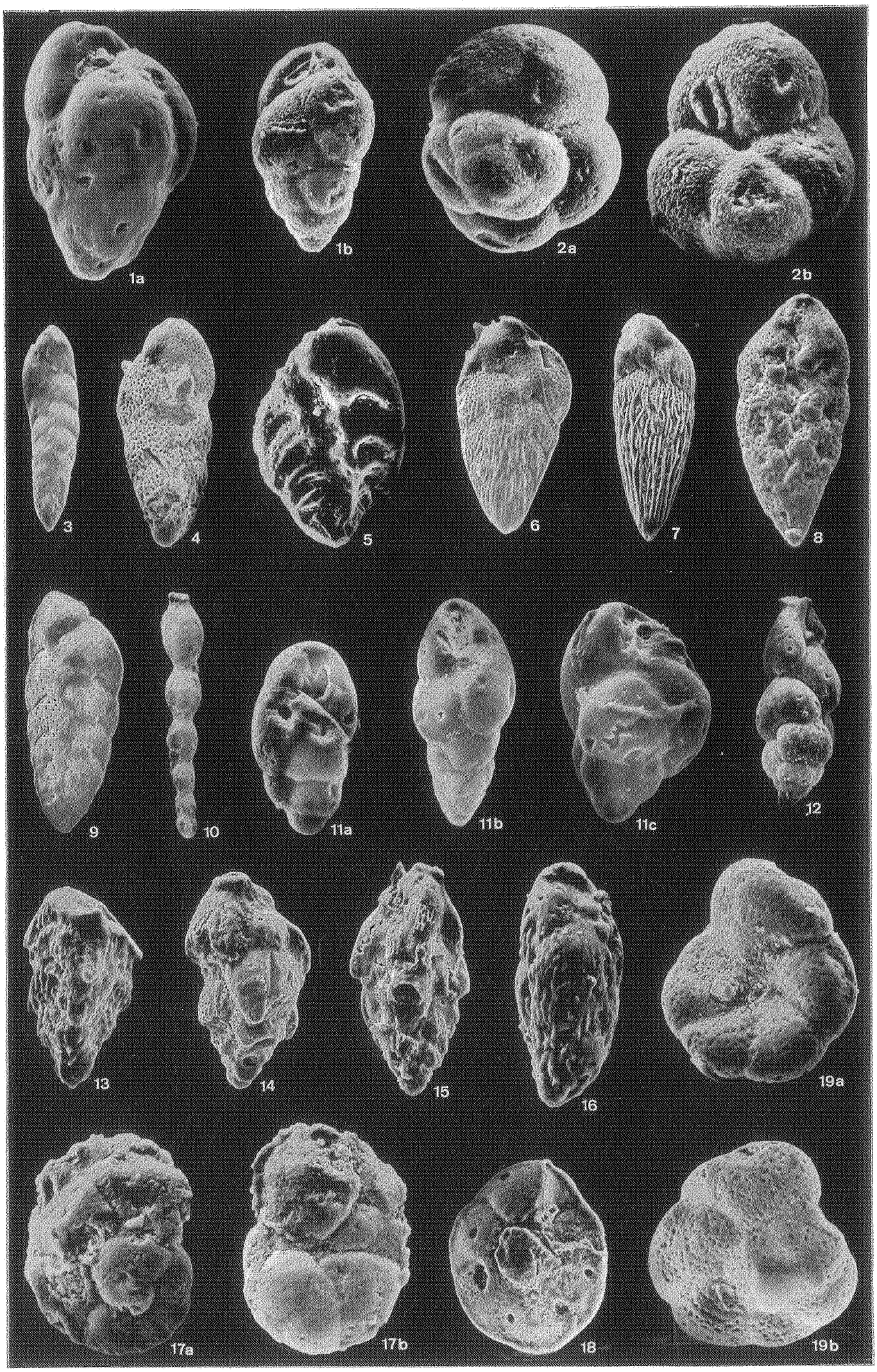
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PLATE 8

Fig. 1a-c : *Discorbis perplexa* LE CALVEZ, 1949; ×263; a & b, Led −17,5 m, ventral sides; c, Led −19,5 m, dorsal side; different specimens.

Fig. 2 : *Epistominella vitrea* PARKER, 1953; ×250; Ka −292,5 m; ventral side.

Fig. 3a-b : *Eoeponidella linki* WICKENDEN, 1948; ×250; a, Ka −242,5 m, ventral side; b, Tt −41,5 m, dorsal side; different specimens.

Fig. 4a-b : *Eoeponidella sp. cf. E. multisecta* (GALLOWAY & HEMINWAY, 1941); ×200; Ka −301,5 m; a, ventral side; b, dorsal side; same specimen.

Fig. 5a-c : *Eurycheilostoma ? globospina n. sp.*; ×250; Ka −315,9 m; holotype; a, dorsal side; b, frontal view; c, ventral side.

Fig. 6a-c : *Pijpersia kalloensis n. sp.*; ×350; Ka −242,5 m; holotype; a, ventral side; b, frontal view; c, dorsal side.

Fig. 7a-b : *Cancris subonica* (TERQUEM, 1882); Ka −254,5 m; a, ×100, ventral side; b, ×110, dorsal side; same specimen.

Fig. 8 : *Asterigerina bartoniana* (TEN DAM, 1947); ×110; Led −17,5 m; ventral side.

Fig. 9a-b : *Asterigerina bartoniana kaasschieteri* ZANEVA, 1972; ×53; Ka −310,8 m; a, dorsal side; b, ventral side; different specimens.

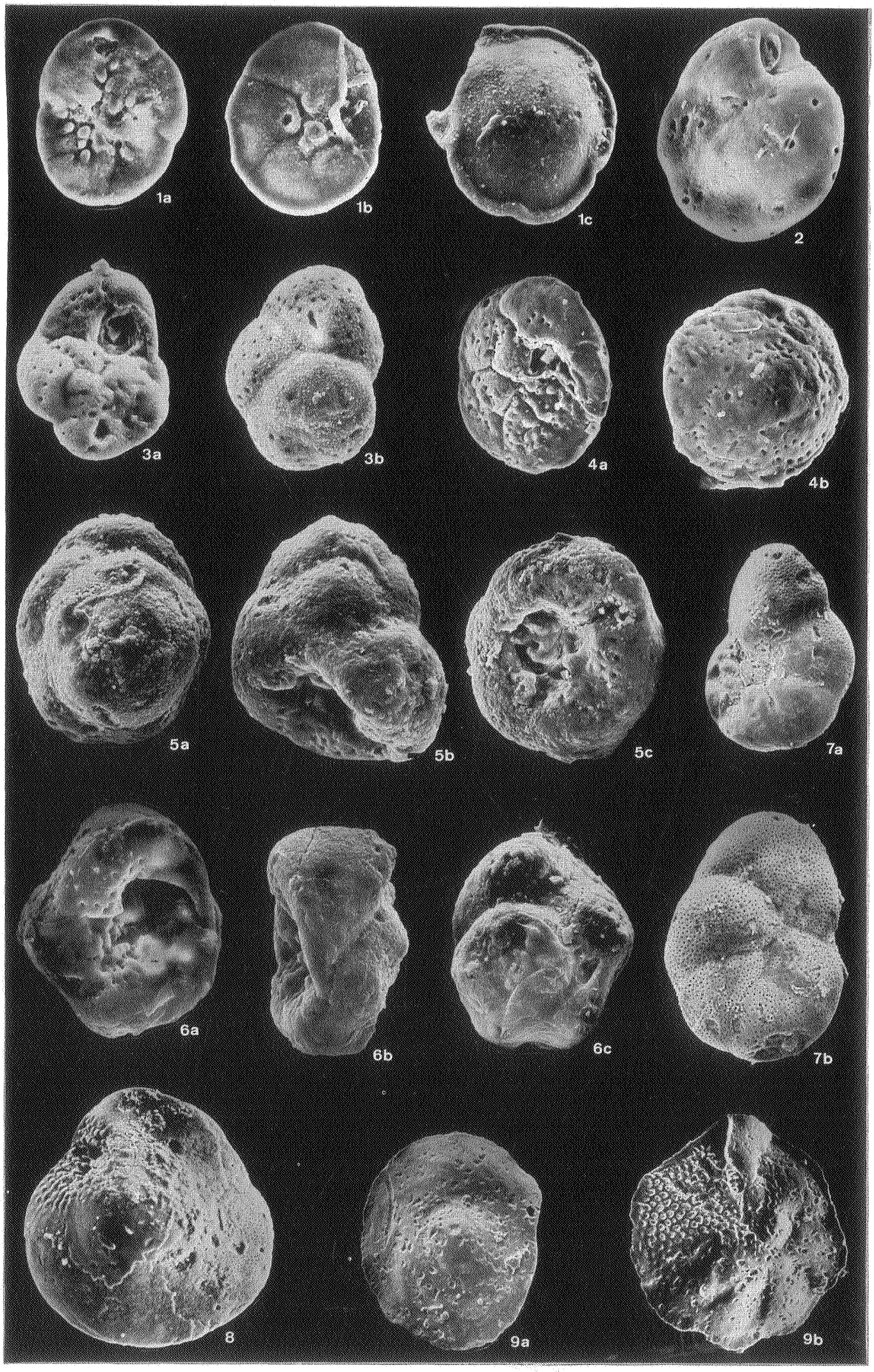
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PLATE 9

Fig. 1a-B : *Asterigerina guerrai* (BERMUDEZ, 1952); Ka −301,5m; a, ×135, dorsal side; b, ×110, ventral side; same specimen.

Fig. 2a-b : *Asterigerina wilcoxensis* CUSHMAN & GARRETT, 1939; Ka −310,8m; a, ×100, ventral side; b, :150, dorsal side; same specimen.

Fig. 3a-b : *Pararotalia armata* (d'ORBIGNY, 1826); a, ×140, Me 5, ventral side; b, ×180, Led −19,5m, dorsal side; different specimens.

Fig. 4 : *Pararotalia curryi* LOEBLICH & TAPPAN, 1957; ×220; Ka −257m; dorsal side.

Fig. 5 : *Pararotalia inermis* (TERQUEM, 1882); ×130; Led −17,5m; ventral side.

Fig. 6 : *Pararotalia spinigera* (LE CALVEZ, 1952); ×100; Ka −257m; ventral side.

Fig. 7a-b : *Elphidium hiltermanni* HAGN, 1952; ×250; a, Tt −43,5m; b, Ka −242,5m; umbilical sides.

Fig. 8 : *Elphidium sp. E. costiferum* TERQUEM, 1882; ×150; Ka −280m.

Fig. 9a-b : *Elphidium ? latidorsatum* (REUSS, 1864); Ka −257m; a, ×150, frontal view; b, ×100, umbilical side; different specimens.

Fig. 10a-b : *Cribrononion subnodosum minor* (ELLERMAN, 1960); Ka −299m; a, ×195, umbilical side; b, ×173, frontal view; same specimen.

Fig. 11a-b : *Protelphidium hofkeri* HAYNES, 1956; Ka −283m; ×275, umbilical side; b, ×250, frontal view; same specimen.

Fig. 12a-b : *Protelphidium sublaevum* (TEN DAM, 1944); a, ×170, Me 5, umbilical side; b, ×263, Km −8,9m, frontal view; different specimens.

Fig. 13 : *Numulites planulatus* (de LAMARCK, 1804), ×25; Led −19,5m.

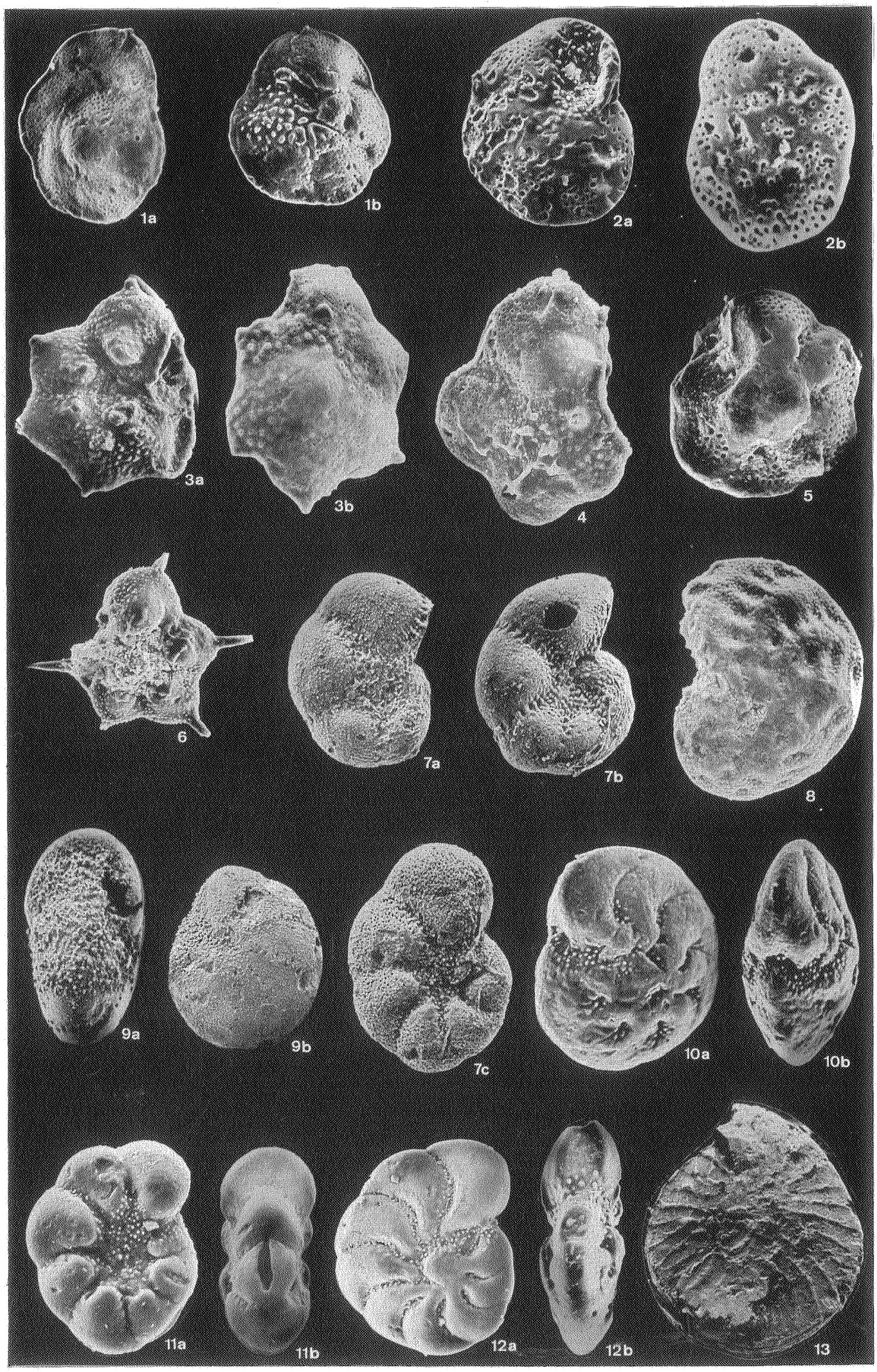
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PLATE 10

Fig. 1a-b : *Guembelitria triseriata* (TERQUEM, 1882); Ka −242,5m; a, ×350; b, ×190.

Fig. 2 : *Guembelitria sp. cf. G. columbiana* HOWE, 1939; ×325; Tt −20,5m.

Fig. 3 : *Globanomalina wilcoxensis* CUSHMAN & PONTON, 1932; ×300; Ka −264m; umbilical side.

Fig. 4 : *Globorotalia broedermanni* CUSHMAN, & BERMUDEZ 1949; a, b & c, same specimen; Ka −358,5m; a, ×200, dorsal side; b, ×263,frontal view; c, ×230, ventral side; d & e, same specimen; Ka −323,5m; d, ×250, dorsal side; e, ×200, ventral side.

Fig. 5a-d : *Globorotalia pseudoscitula* GLAESSNER, 1937; a & b, same specimen; Ka −264m; a, dorsal side; b, ventral side; c & d, same specimen; Ka −245m; c, ×190, dorsal side; d, ×170, ventral side.

Fig. 6a-c : *Turborotalia coalingensis* CUSHMAN & HANNA, 1927; a & b, same specimen; Me 5; a, ×160, dorsal side; b, ×210, ventral side; c, ×160, Ka −245m, dorsal side.

Fig. 7a-c : *Turborotalia esnaensis* (LEROY, 1953); Tt −24,5m; a, ×190, dorsal side; b, ×263, ventral side; c, ×325, frontal view; different specimens.

Fig. 8 : *Turborotalia pentacamerata* (SUBBOTINA, 1947); ×180; Ka −323,5m; dorsal side.

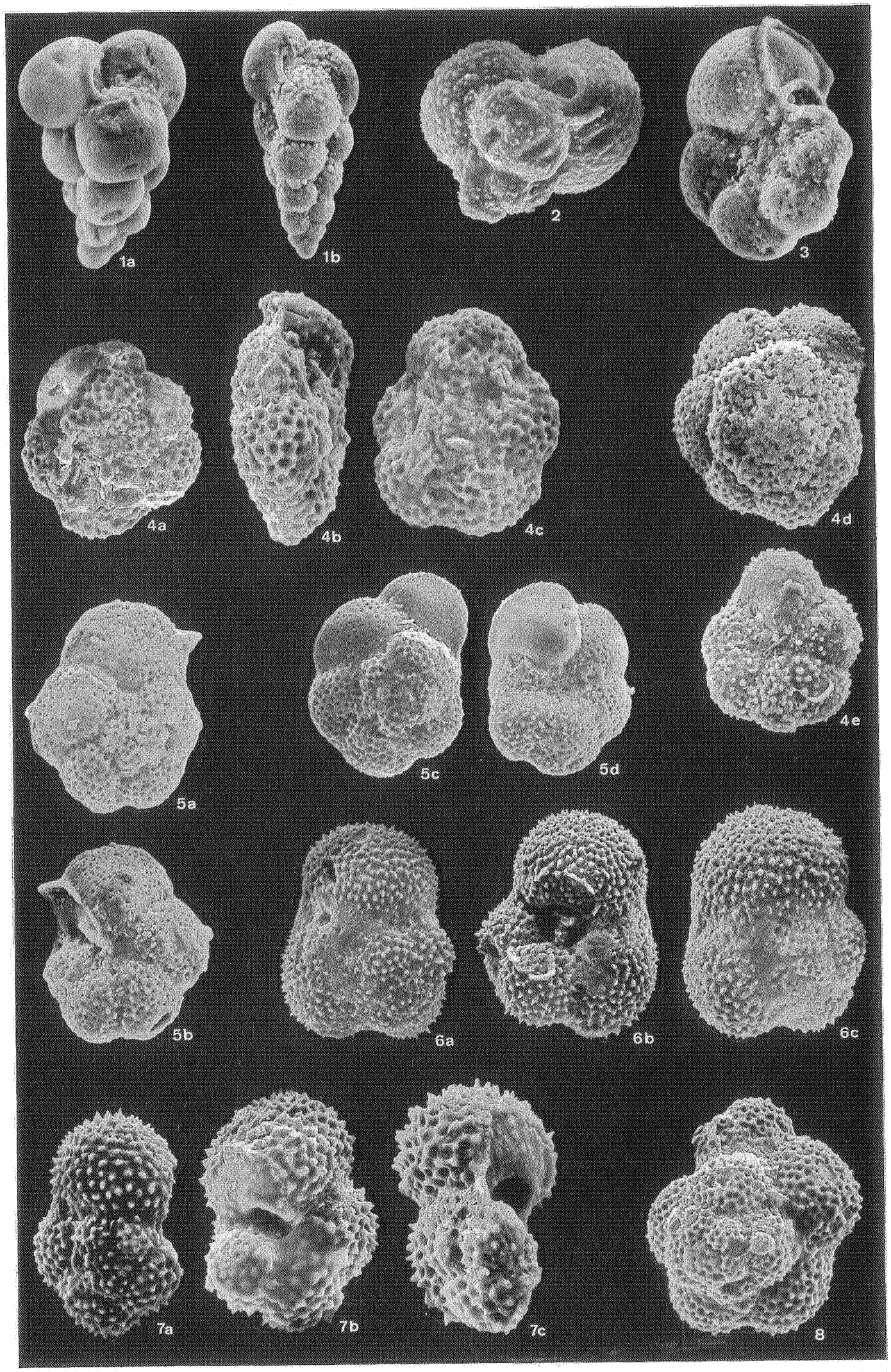
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PLATE 11

Fig. 1a-i : *Turborotalia pentacamerata* (SUBBOTINA, 1947); a & b, same specimen; Ka – 358,5 m; a, × 200, ventral side; b, × 210, dorsal side; c & d, same specimen; Ka – 245 m; c, × 170; dorsal side; d, × 180, ventral side; e, × 200, Ka – 323,5 m, ventral side; f, × 180, Ka – 323,5 m, dorsal side; g, × 160, Ka – 323,5 m, ventral side; h, × 160, Ka – 323,5 m, frontal side; i, × 120, Ka – 323,5 m, dorsal side.

Fig. 2a-d : *Turborotalia perclara* (LOEBLICH & TAPPAN, 1957); a & b, same specimen; × 190; Ka – 358,5 m; a, dorsal side; b, ventral side; c & d, same specimen; × 250; Ka – 335,5 m; c, dorsal side; d, ventral side.

Fig. 3a-d : *Turborotalia soldadoensis* (BRONNIMANN, 1952); a & b, same specimen; Ka – 257 m; a, × 180, dorsal side; b, × 190, ventral side; c, × 210, Ka – 257 m, frontal view; d, × 170, Ka – 356 m, dorsal side.

Fig. 4a-c : *Globigerina aquiensis* LOEBLICH & TAPPAN, 1957; a & b, same specimen; Ka – 323,5 m; a, × 180, dorsal side; b, × 190, ventral side; c, × 160, Ka – 323,5 m, ventral side.

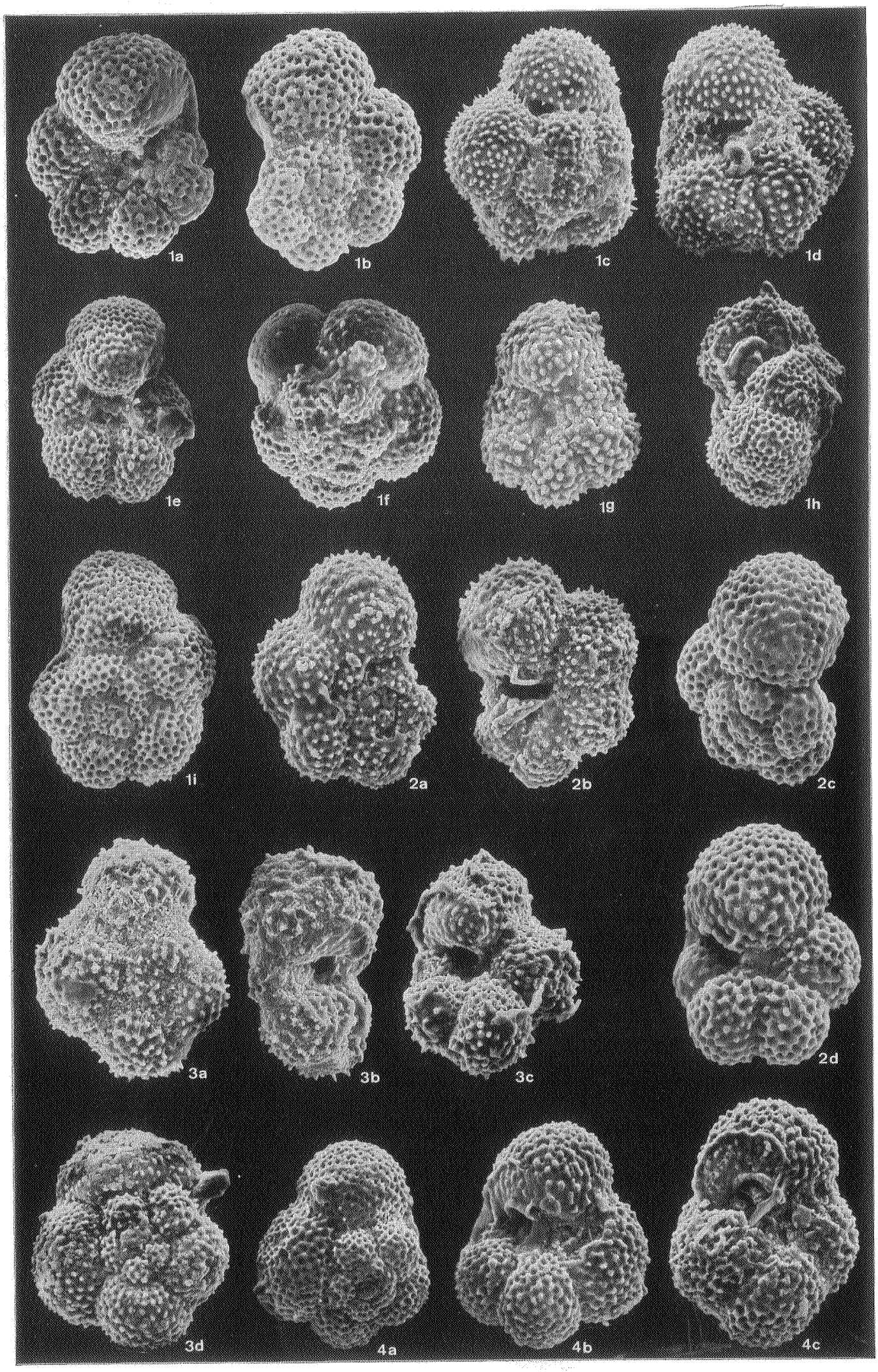
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PLATE 12

Fig. 1a-e : *Globigerina aquiensis* LOEBLICH & TAPPAN, 1957; Ka −323,5m; a, ×180, dorsal side; b, ×220, dorsal side; c, ×200, dorsal side; d, ×210, frontal view; e, ×170, ventral side; different specimens.

Fig. 2a-c : *Globigerina inaequispira* SUBBOTINA, 1953; Ka −261,5m; a, ×180, ventral side; b, ×170, frontal view; c, ×150, dorsal side; same specimen.

Fig. 3a-g : *Globigerina patagonica* TODD & KNIKER, 1952; a, ×170, Ka −310,8m, dorsal side; b, ×160, Ka −310,8m, frontal view; c, ×170, Ka −310,8m, frontal view; d&e, same specimen, Ka −245m; d, ×180, frontal view; e, ×170, ventral side; f, ×200, Ka −234m, dorsal side; g, ×250, Tt −41,5m, frontal view.

Fig. 4a-e : *Globigerina ex gr. praebulloides* BLOW, 1959; Tt −95,5m; a, ×140, ventral side; b, ×250, ventral side; c, ×250, frontal view; d, ×165, dorsal side; e, ×250, frontal view; different specimens.

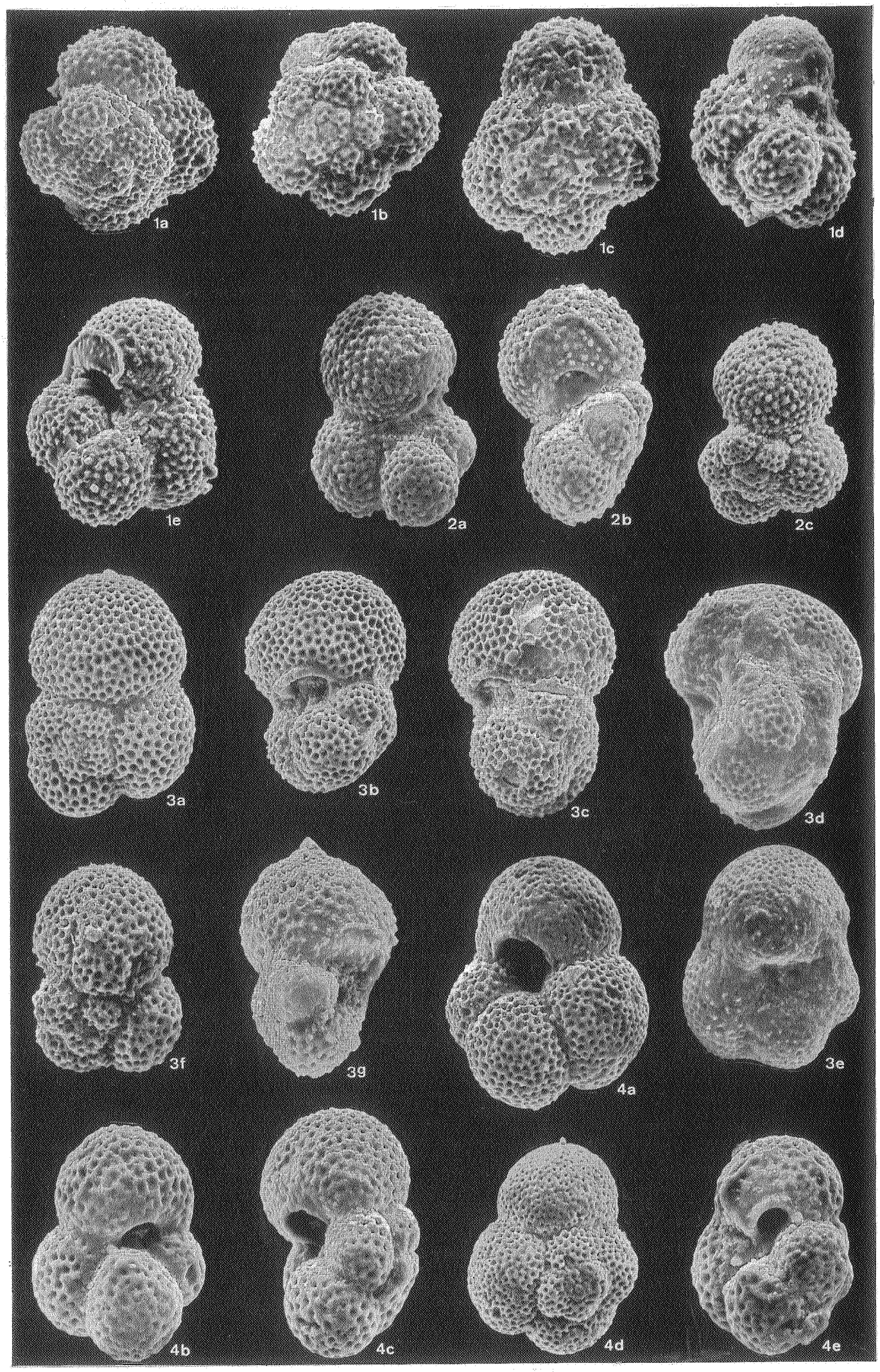
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PLATE 13

Fig. 1a-c : *Eponides gracillima* TEN DAM, 1944; ×200; Ka −324m; a, dorsal side; b, frontal view; c, ventral side; same specimen; drawings.

Fig. 2a-c : *Eponides lunata* BROTZEN, 1948; ×300; Ka −347m; a, dorsal side; b, frontal view; c, ventral side; same specimen; drawings.

Fig. 3a-c : *Eponides polygona* LE CALVEZ, 1949; ×200; Ka −248m; a, dorsal side; b, frontal view; c, ventral side; same specimen; drawings.

Fig. 4a-c : *Eponides plummerae* CUSHMAN, 1948; ×200; Ka −356m; a, ventral side; b, frontal view; c, dorsal side; same specimen; drawings.

Fig. 5a-b : *Cibicidina burlingtonensis* (JENNINGS, 1936); Ka −283m; a, ×135, dorsal side; b, ×120, ventral side; same specimen.

Fig. 6a-d : *Cibicidina ekblomi* (BROTZEN, 1948); Ka −254,5m; a, ×200, ventral side; b, ×195, dorsal side; c, ×200, ventral side; d, ×200, dorsal side; different specimens.

Fig. 7a-b : *Cibicidina producta* (TERQUEM, 1882); ×170; Ka −250m; a, dorsal side; b, ventral side; same specimen.

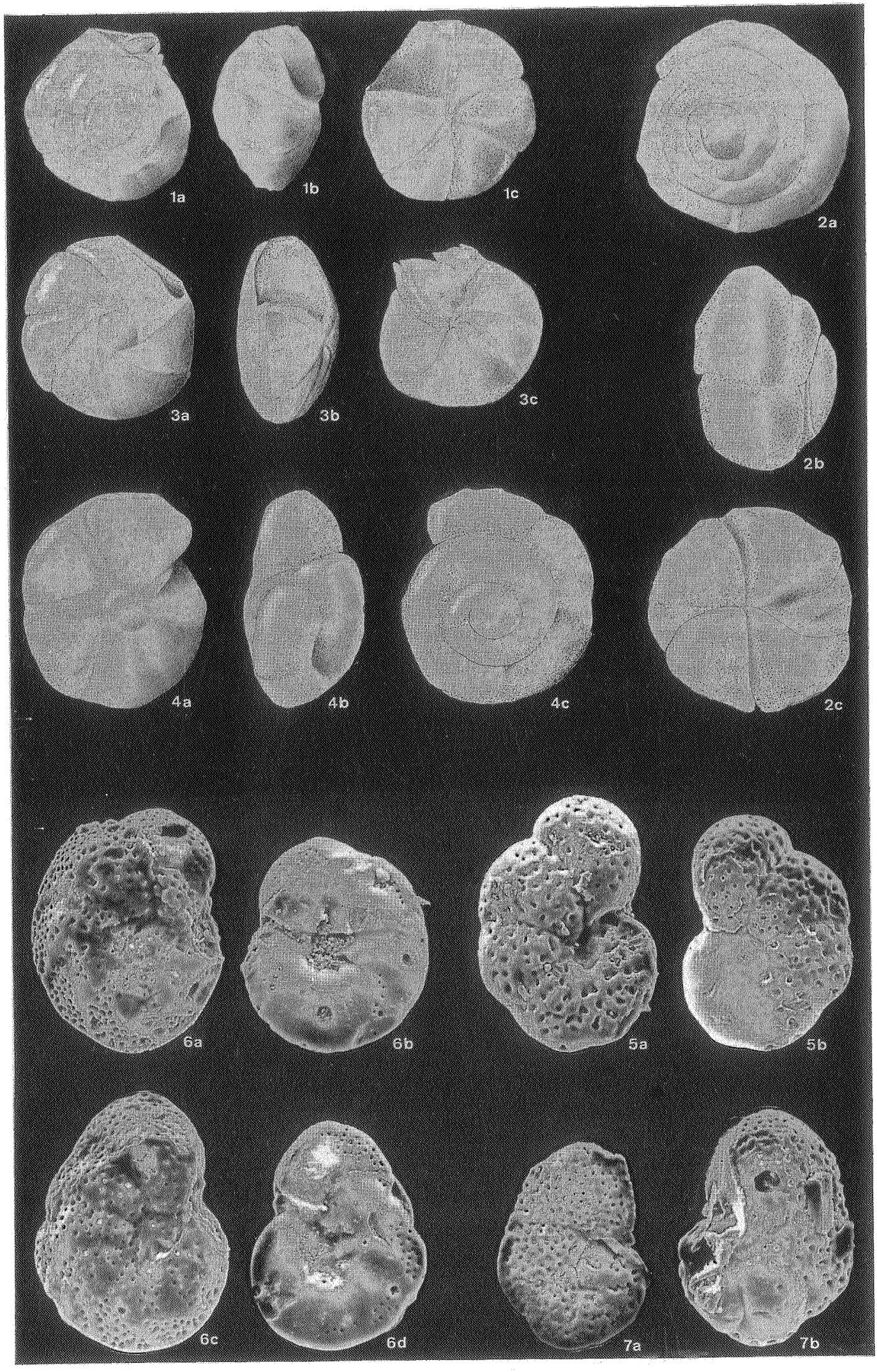
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PLATE 14

Fig. 1a-f : *Cibicidina mauricensis* (HOWE & ROBERTS, 1939); Ka −259 m; a, ×220, dorsal side; b, ×170, ventral side; c, ×170, ventral side; d, ×170, dorsal side; e, ×170, ventral side; f, Ka −245 m, ×100, dorsal side; different specimens.

Fig. 2a-d : *Cibicidina newmanae* (PLUMMER, 1926); Ka −254,5 m; a & b, same specimen; a, ×130, ventral side; b, ×150, dorsal side; c, ×150, dorsal side; d, ×150, ventral side.

Fig. 3a-d : *Cibicidina tendami* (KAASSCHIETER, 1961); Ka −303,9 m; a, ×65, dorsal side; b, ×85, ventral side; c, ×65, ventral side; d, ×75, dorsal side; different specimens.

Fig. 4 : *Cibicides ex gr. carinata* (TERQUEM, 1882); ×150; Ka −257 m; dorsal side.

Fig. 5a-b : *Cibicides tallahatensis* BANDY, 1949; ×250; Ka −29,5 m; dorsal side; b, ventral side; same specimen.

Fig. 6a-c : *Cibicides westi* HOWE, 1939; ×100; Ka −350 m; a, ventral side; b, frontal view; c, dorsal side; same specimen.

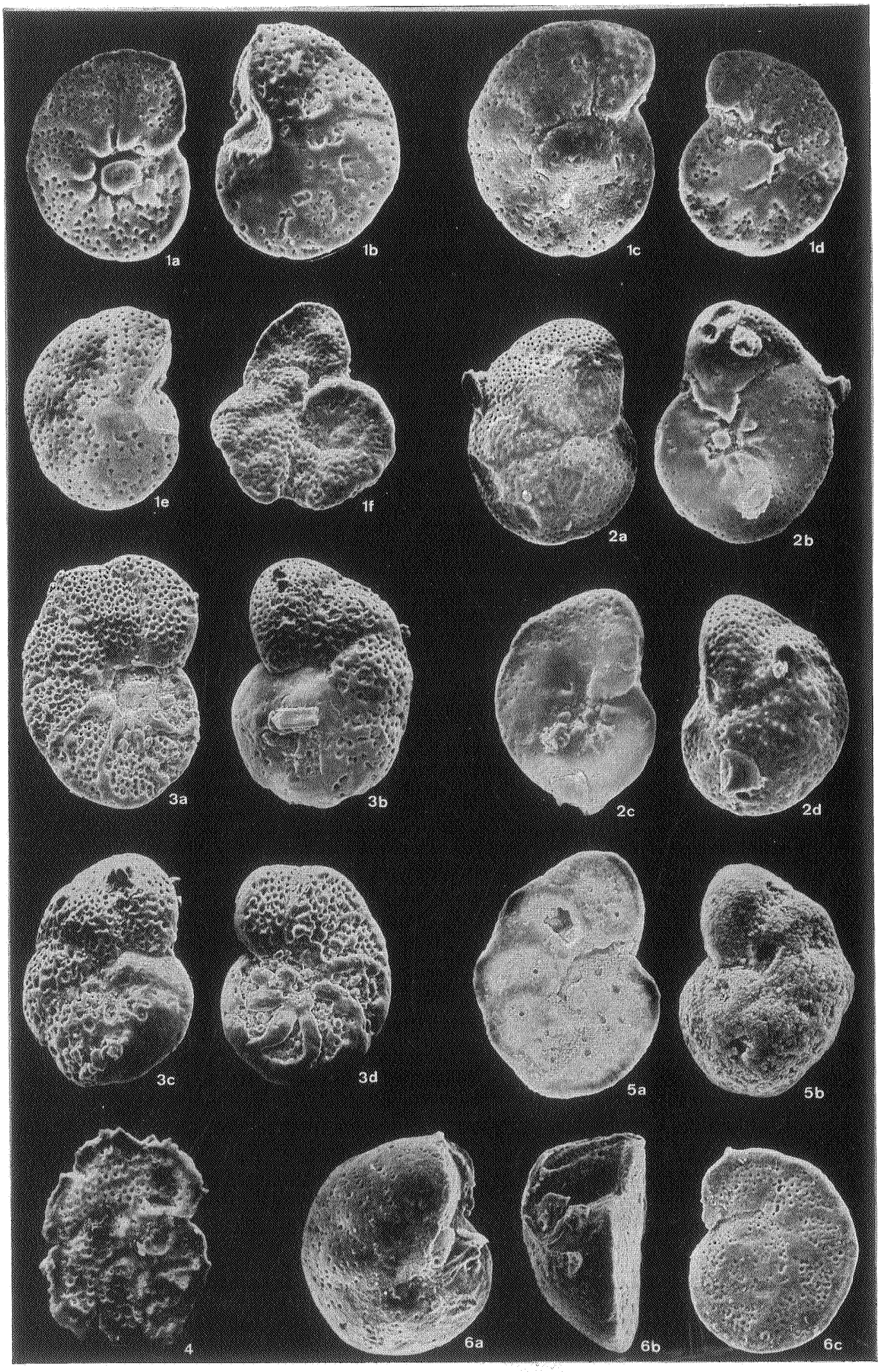
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PLATE 15

Fig. 1 : *Fursenkoina schreibersiana* (CZJZEK, 1848); ×85; Ka −281,5m.

Fig. 2 : *Fursenkoina sp.*; ×90; Ka −303,9m.

Fig. 3a-c : *Nonion graniferum* (TERQUEM, 1882); a, ×165, Ka −245m, umbilical side; b & c, same specimen; Ka −242,5m; b, ×300, umbilical side; c, ×375, frontal view.

Fig. 4a-c : *Florilus communis* (d'ORBIGNY, 1846); a, ×150, Ka −245m; b, ×100, Ka −245m; c, ×108, Ka −321m; umbilical sides; different specimens.

Fig. 5 : *Nonion laevum* (d'ORBIGNY, 1826); ×160; Ka −242,5m; umbilical sides.

Fig. 6a-b : *Nonionella spissa* CUSHMAN, 1931; Me 5; a, ×108; b, ×110; umbilical sides; same specimen.

Fig. 7a-c : *Alabamina obtusa* (BURROWS & HOLLAND, 1897); ×120; Ka −323,5m; a, ventral side; b, frontal view; c, dorsal side; same specimen; drawings.

Fig. 8a-c : *Alabamina wilcoxensis* TOULMIN, 1941; ×180; Ka −283m; a, ventral side; b, frontal view; c, dorsal side; same specimen; drawings.

Fig. 9a-b : *Gyroidinoides danvillensis* (HOWE & WALLACE, 1932); ×110; Ka −358,5m; a, dorsal side; b, ventral side; different specimens.

Fig. 10a-b : *Gyroidinoides octocameratus* (CUSHMAN & HANNA, 1927); ×110; Ka −310,8m; a, dorsal side; b, ventral side; different specimens.

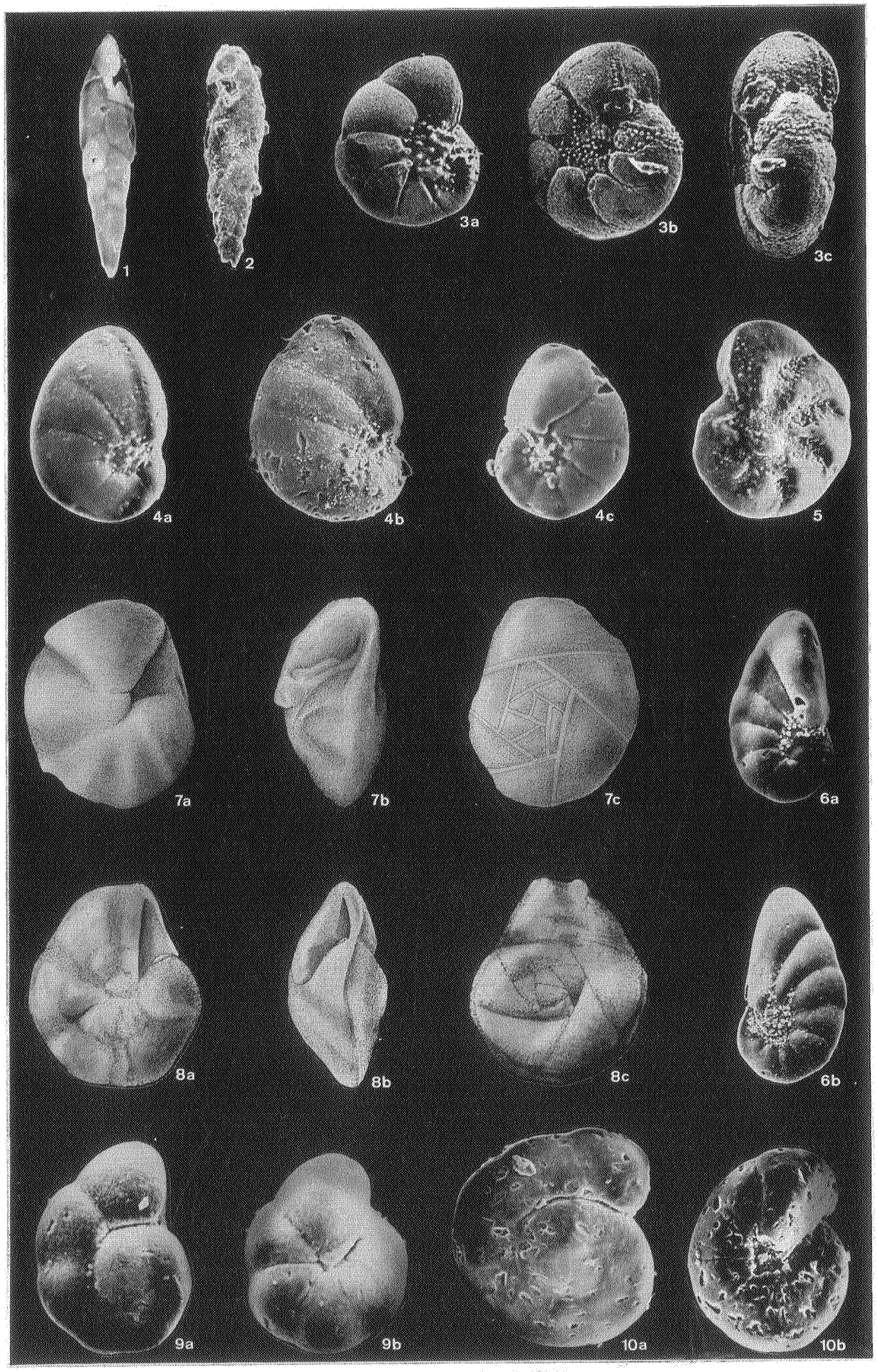
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PLATE 16

Fig. 1a-c : *Anomalinoides acutus* (PLUMMER, 1926); ×100; Ka −308,6m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 2a-c : *Anomalinoides cunobelini* (HAYNES, 1957); ×100; Ka −352,5m; a, ventral side; b, frontal view; c, dorsal side; same specimen.

Fig. 3a-c : *Anomalinoides ypresiensis* (TEN DAM, 1944); ×140; Ka −312,5m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 4a-c : *Anomalinoides sp. cf. A. danicus* (BROTZEN, 1940); ×180; Ka −354,5m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 5a-c : *Anomalinoides anomalinoides* (TEN DAM, 1944); ×128; Ka −318,5m; a, dorsal side; b, frontal view; c, ventral side; same specimen; drawings.

Fig. 6a-c : *Anomalinoides nobilis* BROTZEN, 1948; ×140; Ka −323,5m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 7a-d : *Karreria fallax* RZEHAK, 1891; a, ×85; Ka −315,9m, dorsal side; b, ×110, Ka −312,5m; c, ×85, Ka −312,5m; ventral sides; different specimens.

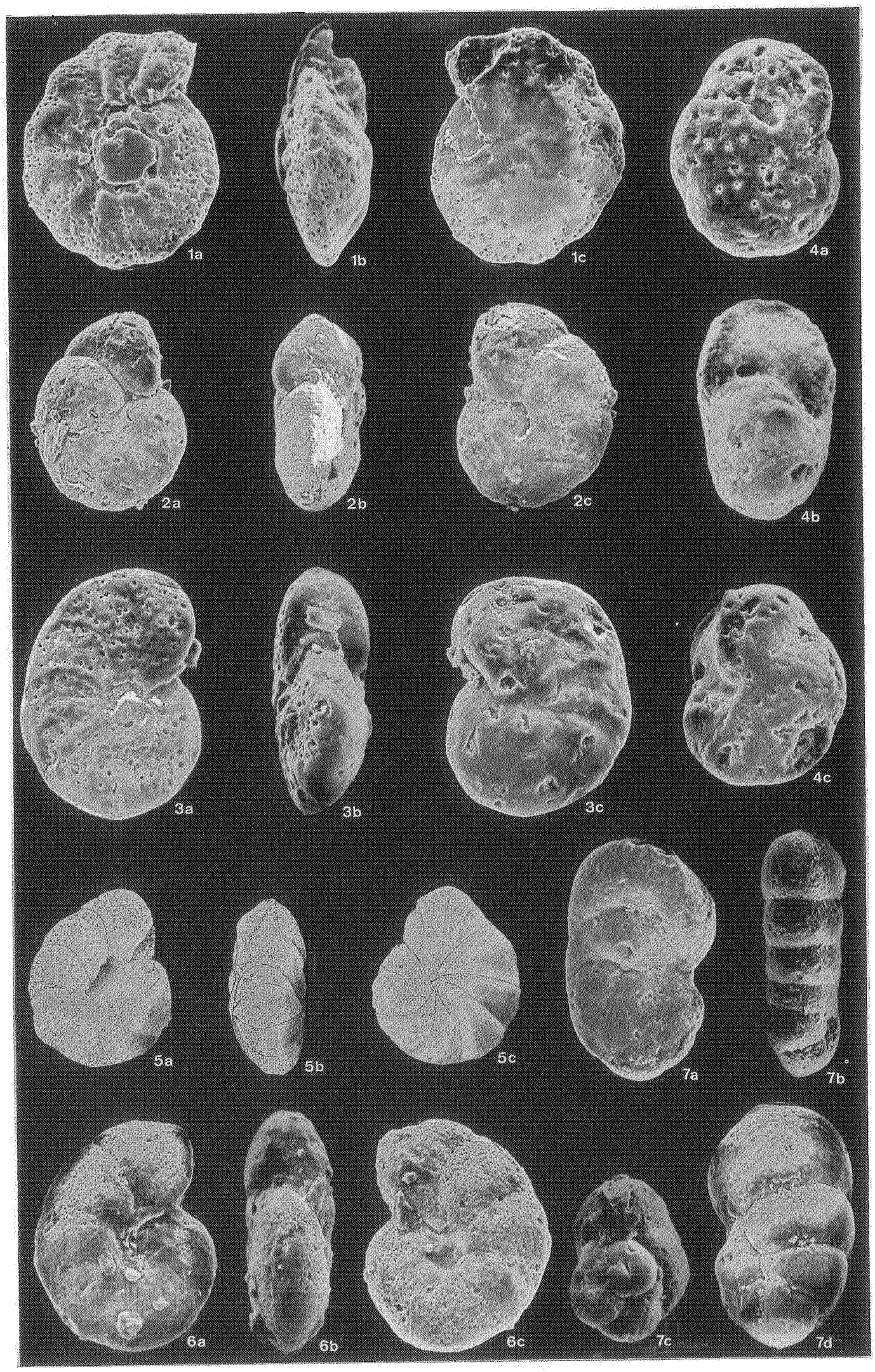
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PLATE 17

Fig. 1a-c : *Cibicidoides acutimargus* (TEN DAM, 1944); ×85, Ka −257m; a, ventral side; b, frontal view; c, dorsal side; same specimen.

Fig. 2a-c : *Cibicidoides crassus* (TEN DAM, 1944); ×160; Ka −354,5m; a, ventral side; b, frontal view; c, dorsal side; same specimen.

Fig. 3a-c : *Cibicidoides proprius* BROTZEN, 1948; ×100; Ka −323,5m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 4a-c : *Cibicidoides sulzensis* (HERMANN, 1917); ×150; Ka −318,5m; a, ventral side; b, frontal view; c, dorsal side; same specimen.

Fig. 5a-c : *Cibicidoides pseudoungerianus* (CUSHMAN, 1922); ×100; Ka −283m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 6a-c : *Cibicidoides succedens* (BROTZEN, 1948); ×190; Ka −339,5m; a, dorsal side; b, frontal view; c, ventral side; same specimen.

Fig. 7a-c : *Pulsiphonina prima* (PLUMMER, 1926); ×180; Ka −303,9m; a, dorsal side; b, frontal view; c, ventral side; same specimen; drawings.

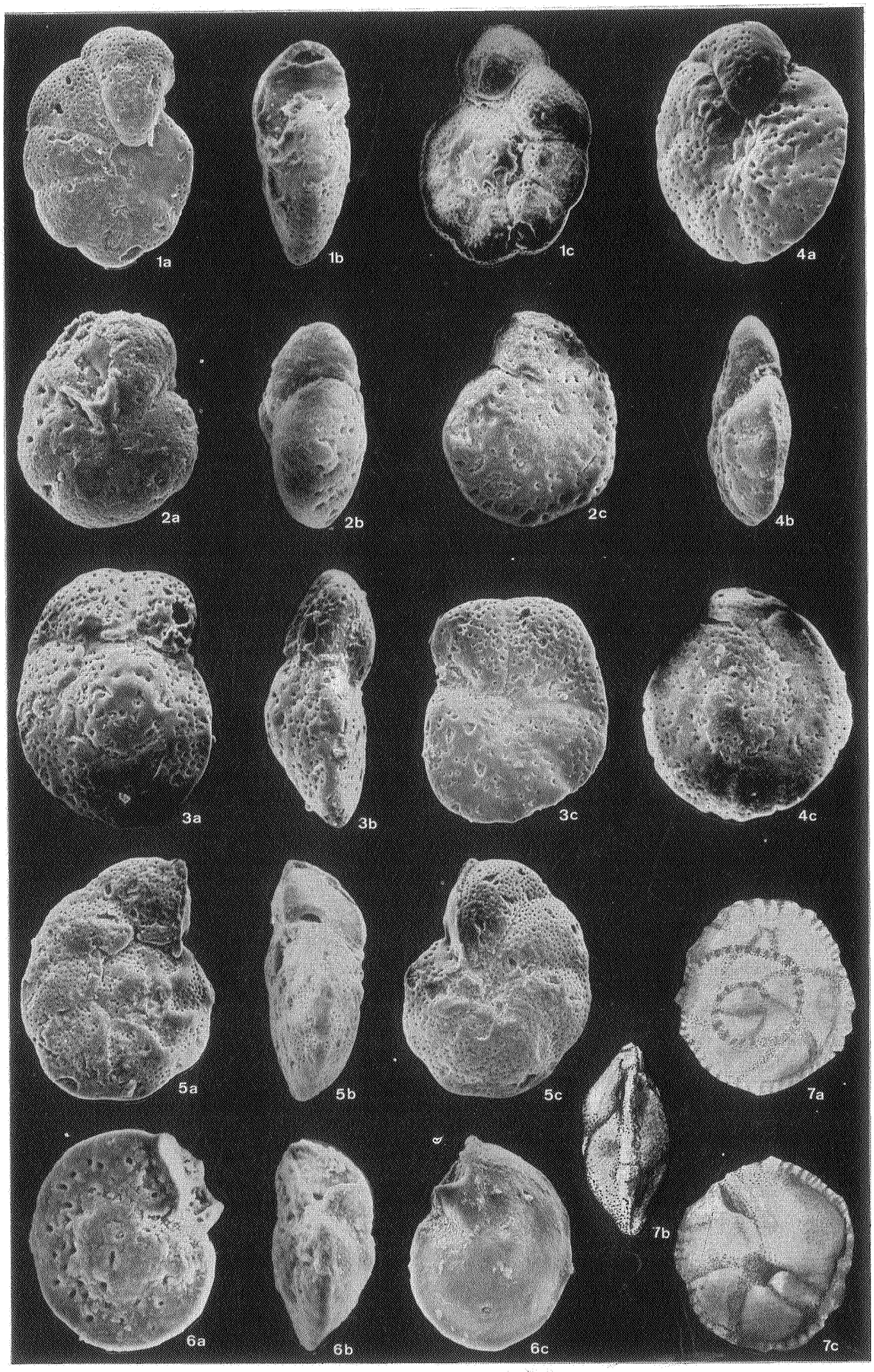
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PLATE 18

Fig. a-d : *Ammodiscus siliceus* (TERQUEM, 1862); × 128; a, Ka – 372 m; specimen with diamond-shaped outline resembling representatives of the genus *Psamminopelta* TAPPAN, 1957; b, Ka – 378 m, specimen of which the whorls are not planispirally wound up; c & d, Ka – 366 m, compressed specimens.

Fig. e-h : *Miliammina paleocenica* KIESEL, 1970; × 128; e, Ka – 347 m; specimen resembling *M. biobscura* STELCK & WALL, 1954; f, Tt – 137,5 m; g, Tt – 137,5 m, specimen of which the whorls are out of the spiral plane; h, Tt – 137,5 m.

Fig. i-l : *Haplophragmoides burrowsi* HAYNES, 1958; × 128; Tt – 140,5 m; deformed specimens.

Fig. m-p : *Dorothia fallax* HAGN, 1954; × 64; Ka – 303,9 m; m-n, specimens with a rounded initial part; o-p, specimens with a more pointed initial part.

Fig. q-t : *Verneuilina subeocaena* WICK, 1943; × 128; deformed specimens (q & r represent the same individual).

PL.18

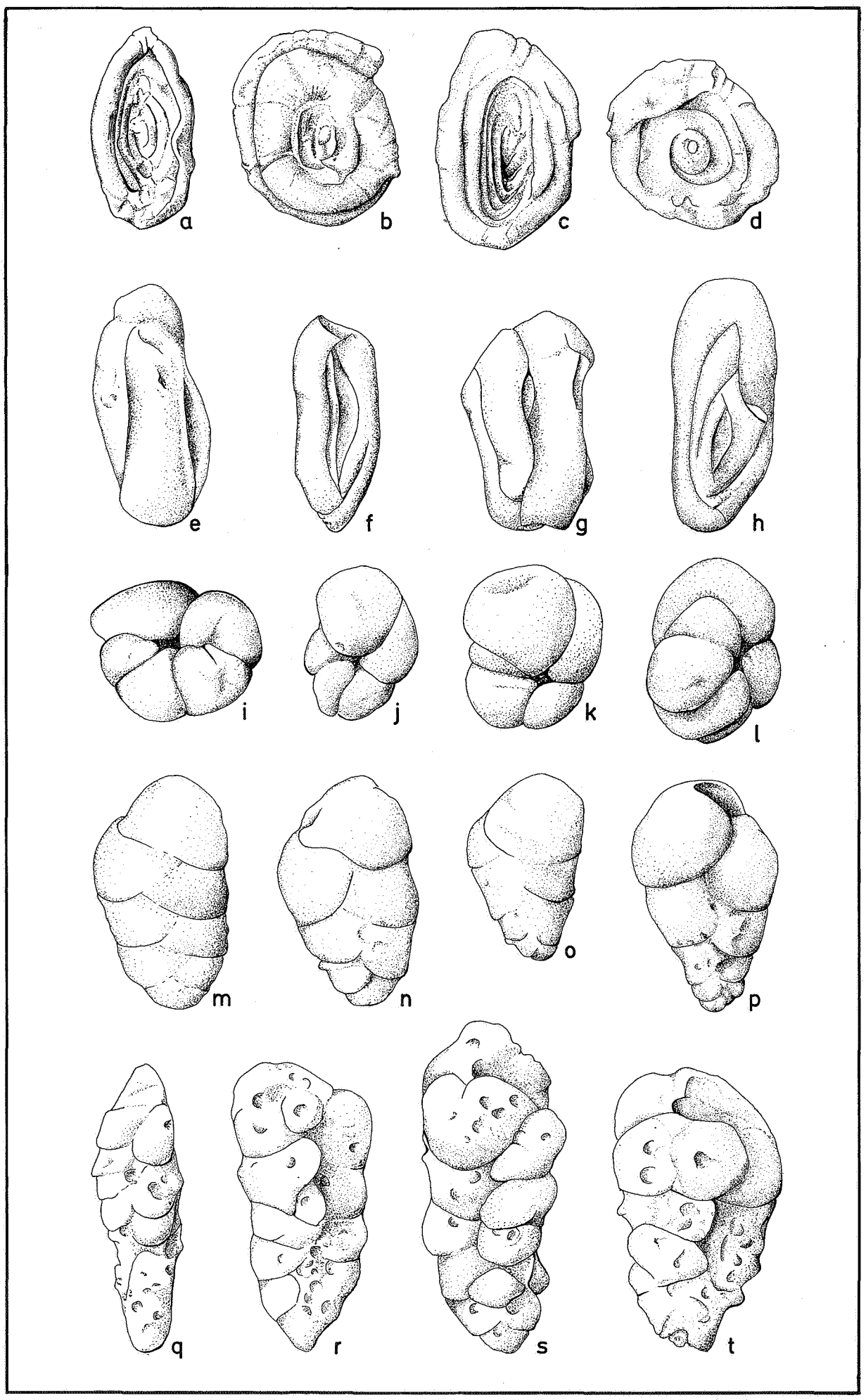

PLATE 19

Fig. a-b : *Nodosaria acuminata* von HANTKEN, 1875; ×40; a, Ka −298,5m, specimen with a large initial chamber; b, Ka −306m, specimen with a small initial chamber.

Fig. c-d : *Nodosaria sp. cf. N. ewaldi* (REUSS, 1851); ×128; c, Ka −325,5m, cylindrical chamber; d, Ka −350m, bottle-like chamber.

Fig. e : *Nodosaria minor* von HANTKEN, 1875; ×40; Ka −323,5m; specimen resembling *Dentalina multilineata* BORNEMANN, 1855.

Fig. f-i : *Nodosaria sp. cf. N. pyrula* d'ORBIGNY, 1826; ×128; Ka −352,5m

Fig. j-m : *Nodosaria latejugata* GUMBEL, 1868; ×40; Ka −323,5m; j-k, megalospheres; l-m, single chambers.

Fig. n-p : *Nodosaria manifesta* (REUSS, 1851); ×128; Ka −310,8m; n-p, megalospheres; o, microsphere.

Fig. q-s : *Lagena? sp. cf. L. cookei* CUSHMAN, 1923; ×128; a-b, Ka −328m; c, Ka −325,5m.

Fig. t-w : *Lagena cf. laevis* von MONTAGU, 1808; ×128; a, Ka −321m; b, Ka −318,5m; c, Ka −360m; d, Ka −297m.

PL.19

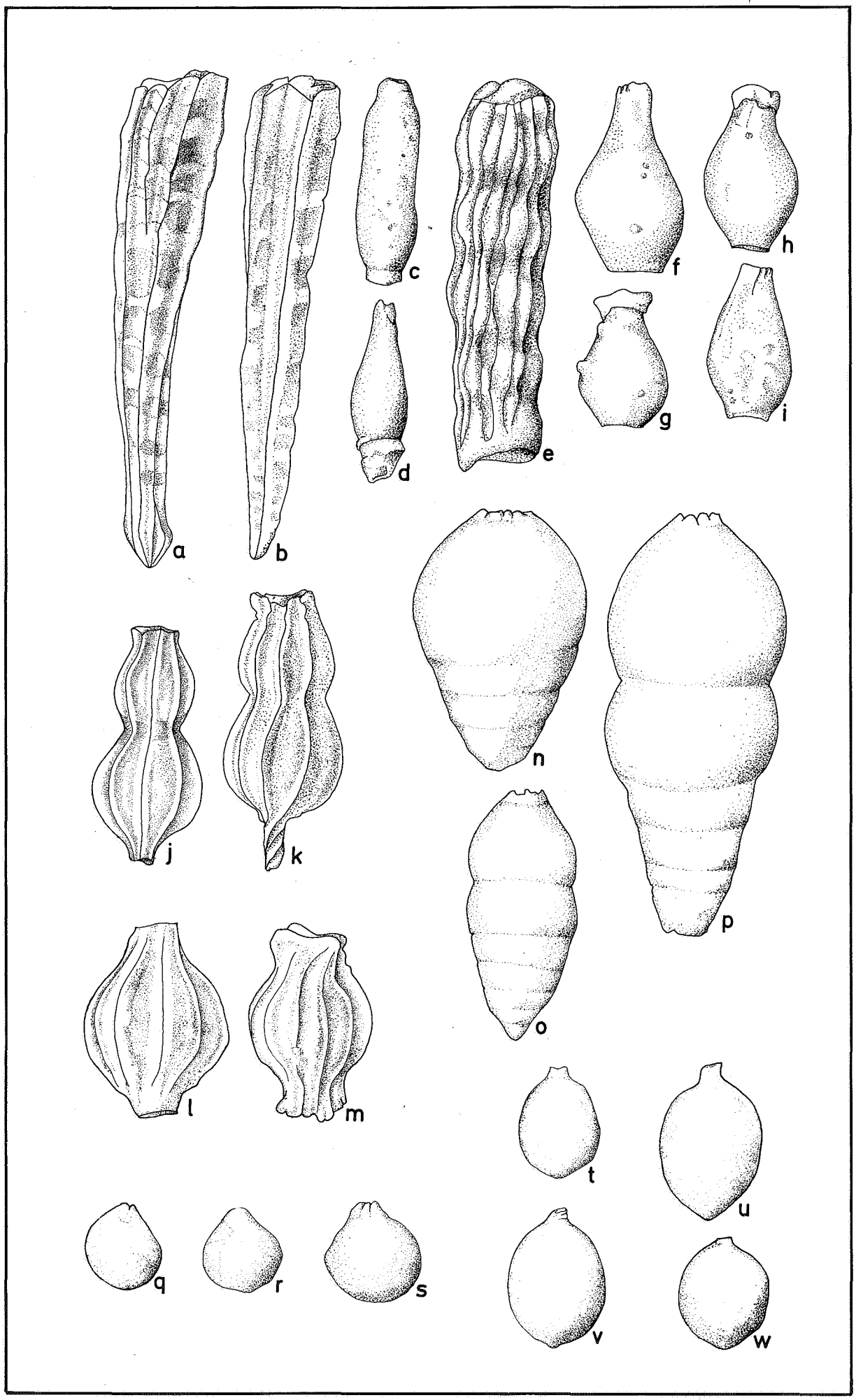

PLATE 20

Fig. a-b : *Lenticulina (Darbyella) sp.*; ×40; Ka −303,9m; specimen resembling *Lenticulina (D.) articulata* (BRADY, 1884).
Fig. c-e : *Lenticulina (R.) inornata* (d'ORBIGNY, 1846); ×40; c and e, Ka −310,8m; d, Ka −323,5m.
Fig. f-i : *Lenticulina (R.) sp. cf. L. (R.) degolyeri* (PLUMMER, 1926); ×128; Ka −261,5m.
Fig. j-n : *Marginulinopsis decorata* (REUSS, 1855); ×128; Ka −323,5m.
Fig. o-r : *Marginulinopsis wetherelli* (JONES, 1854); ×40, Ka −325,5m.

PL.20

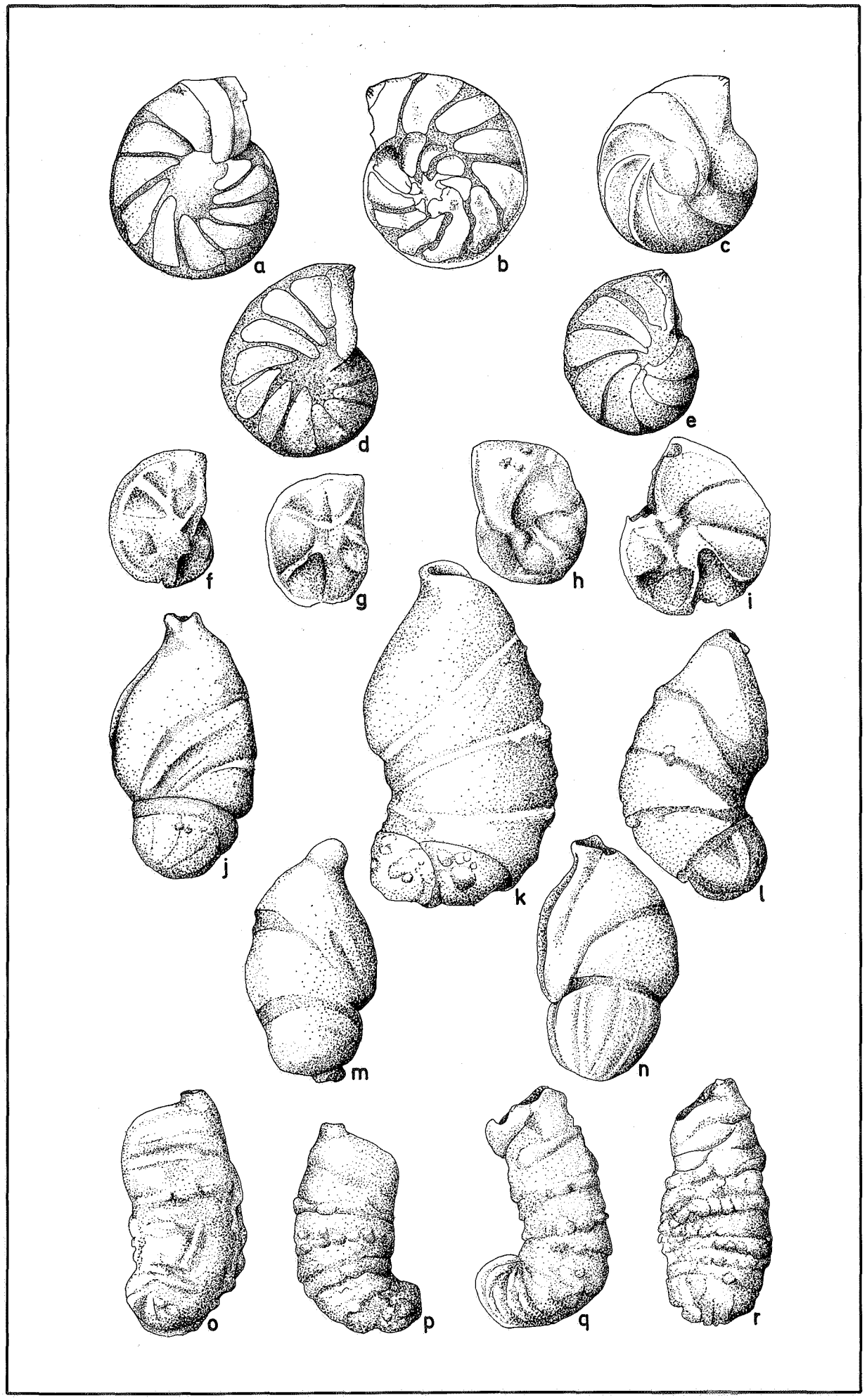

PLATE 21

Fig. a-e : *Guttulina parisiensis* LE CALVEZ (1950); ×128; Ka −252m; different growth stades.
Fig. f-i : *Glandulina ? tumida* (BOWEN, 1954); ×128; Ka −254m.
Fig. j-k : *Stilostomella ? sp.*; ×128; Ka −318,5m.
Fig. l-o : *Eurycheilostoma ? globospira n. sp.*; ×300; Ka −315,9m; different growth stades; specimens with a globular initial part (l,o); specimens with a pointed initial part (m,n).
Fig. p-q : *Pijpersia kalloensis n. sp.*; ×300; Ka −292,5m; variation in number of chambers.

PL.21

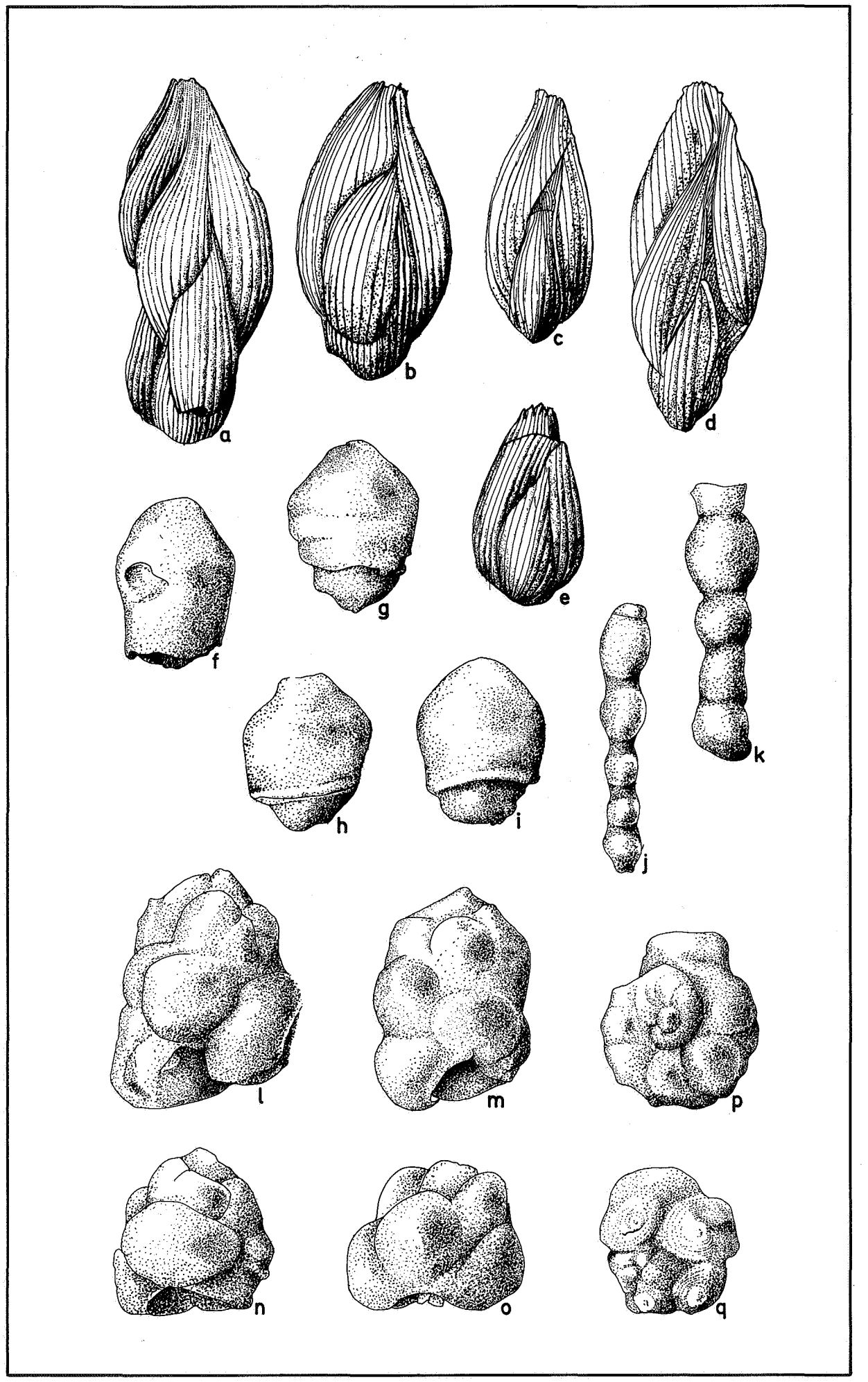

PLATE 22

Fig. a-i : *Asterigerina bartoniana kaasschieteri* ZANEVA, 1972; ×64; Ka −310,8m; a-c, convex spiral side, flat umbilical side; d-f, flat spiral side, convex umbilical side; g-i, bi-convex specimen.

Fig. j-n : *Cibidides ex gr. carinata* (TERQUEM, 1882); ×200, Ka −254,5m.

PL.22

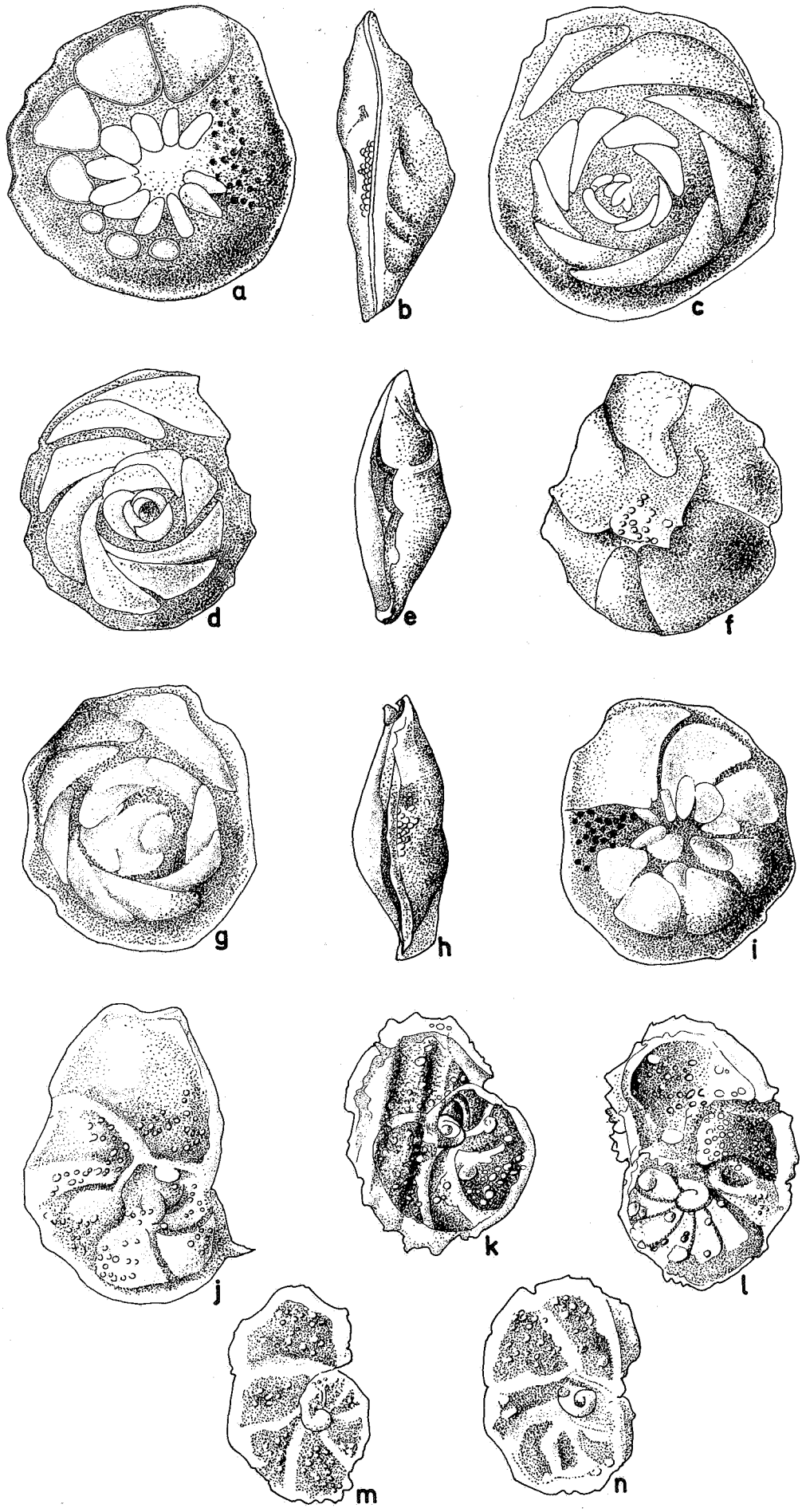

PLATE 23

Fig. a-h : *Floribus communis* (d'ORBIGNY, 1846); ×200; Ka −245m (a-b, c-d); Ka −323,5m (g-h).
Fig. i-n : *Pullenia quinqueloba* (REUSS, 1851); ×200; Ka −323,5m (i-k); Ka −318,5m (l); ×128; Ka −358,5m (m).

PL.23

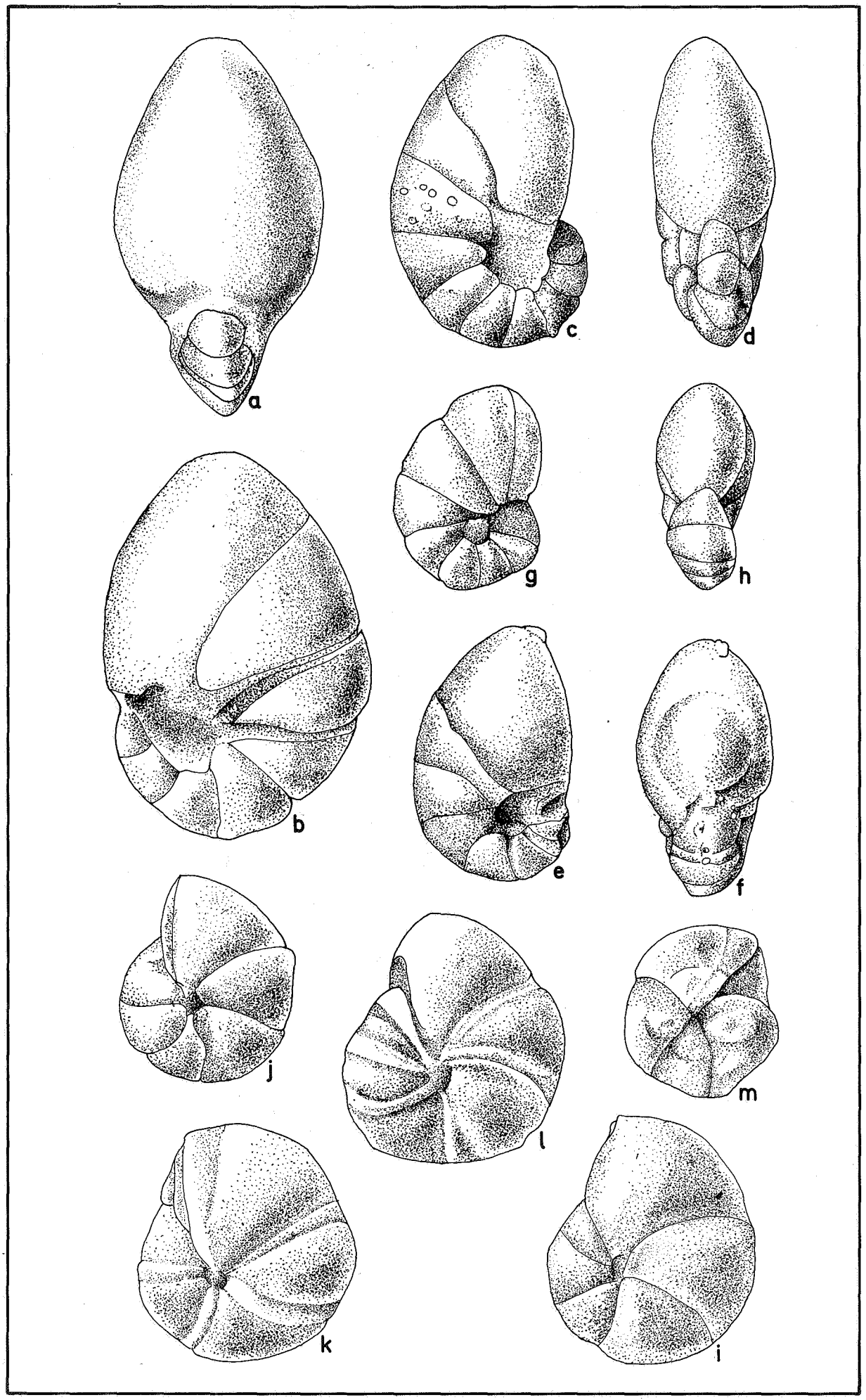

PLATE 24

Fig. a-c : *Anomalinoides sp.*; ×192; Ka −364m; specimen with compressed chambers.
Fig. d-f : *Cibicidoides proprius* BROTZEN, 1948; ×128; Ka −318,5m.
Fig. g-i : *Cibicidoides sp.*; ×192; SJ14.
Fig. j-l : *Heterolepa sp.*; ×192; Tl −24,5m.
Fig. m-o : *Heterolepa sp.*; Km −8,9m.

PL.24