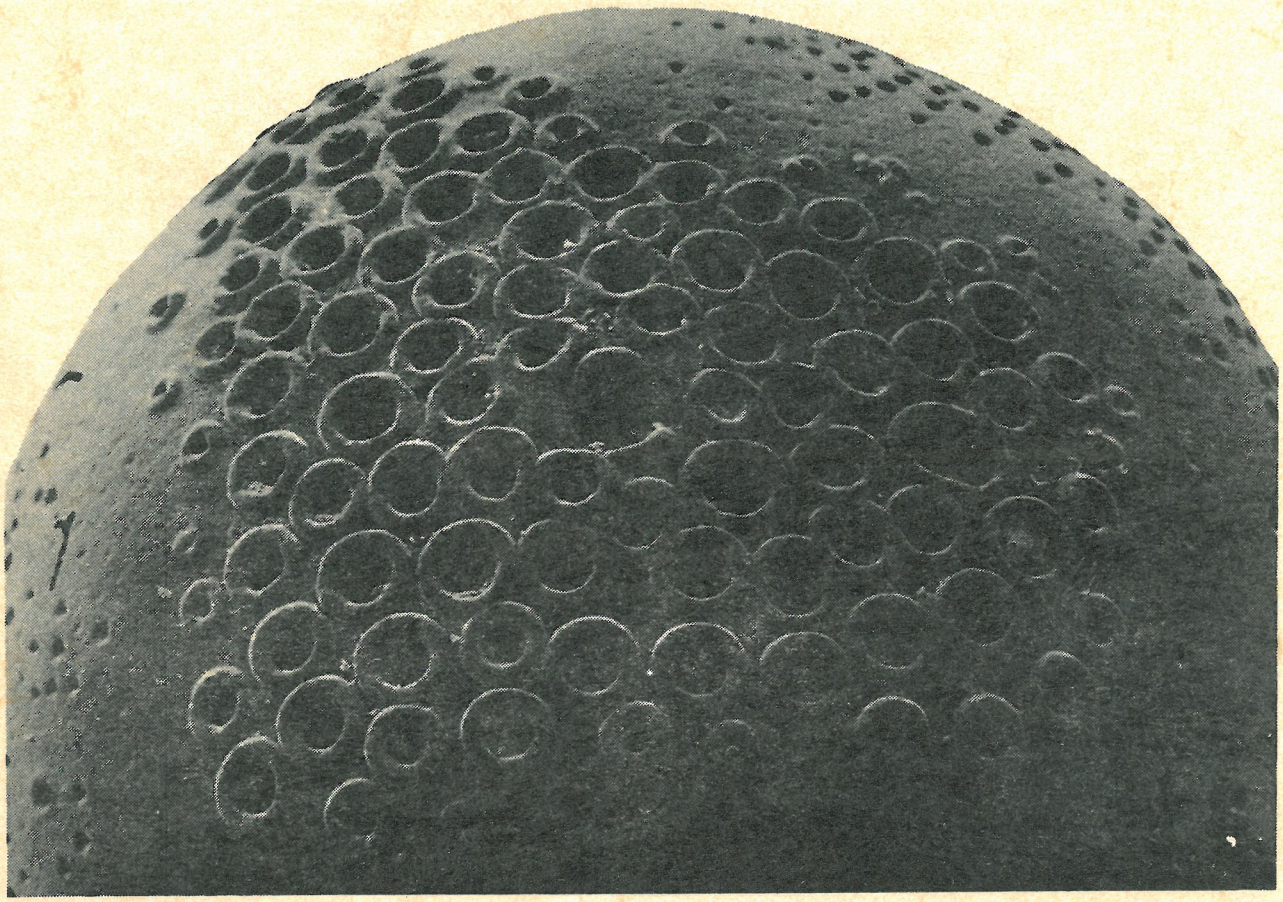
DISTRIBUTION PATTERNS AND TAXONOMY OF BENTHIC FORAMINIFERA IN THE LIZARD ISLAND REEF COMPLEX, NORTHERN GREAT BARRIER REEF, AUSTRALIA



3 ATLAS OF FORAMINIFERA

UNIVERSITE DE LIEGE - C.A.P.S. - LABORATOIRE DE BIOSEDIMENTOLOGIE

THESE DE DOCTORAT
EN SCIENCES GEOLOGIQUES ET MINERALOGIQUES, 1987

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INTRODUCTION

Pictures and plates of Lizard Island Foraminifera occurring in this Atlas have been arranged in systematical order and correspond with the figure references provided ahead of each taxon in the Systematical Part.
The legends of the plates often comment on particularities of the illustrated specimens and are, as such, complementary to the systematical taxonomic comments in the Systematical Part of this study.
All pictures are SEM-photographs realised in the K.B.I.N., Brussels, with the kind permission of Dr. X. MISONNE, Director, and with the assistance of Dr. K. WOUTERS and Dr. P. GROOTAERT.
Film development, photograph printing and preparation of plates have been the author's own work. Pictures were exposed on ILFORD HP4-film and were printed on ILFORD ILFOSPEED paper of different gradations. Original plate size is DIN A2; this large size has been chosen mainly to facilitate specimen contouring.

INTRODUCTION

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PLATE 1

Figs. 1 - 2 : Psammosphaera fusca SCHULZE

Fig. 1 : Lateral view of smaller, subsphaerical living specimen. Note the predominantly rounded grains and the cement containing smaller grains. The larger grains are Cliona-chips (as to MONTY, oral communication, 1982). No aperture visible. Lagoon (L 122) (X 324).
Fig. 2 : Lateral view of larger living specimen including angular grains in its test wall. No aperture visible. Lagoon (L 122) (X 271).

Figs. 3 - 6 : Reophax fusiformis (WILLIAMSON)

Figs. 3a-c : Living specimen, Northern Perireefal Area (L 54). Note heterogenous material used in test wall construction : larger and smaller calcareous flakes, Foraminifera (Pyrgo test visible on fig. 3a, Hauerina-test and soritid juvenarium visible on fig. 3b). Figs. 3a-b : Lateral views (X 68); fig. 3c : apertural view (X 85).
Figs. 4a-c : Living specimen, Eastern Perireefal Area (L 60). Test wall consists mainly of larger calcareous flakes (smaller grains are used to fill in the void spaces between these). Note large Halimeda-fragment visible on figs. 4a - 4c. Figs. 4a-b : Lateral view (X 91); fig. 4c : apertural view (note somewhat angular aperture and smaller grains in the apertural border) (X 112).
Fig. 5 : Living specimen, Eastern Perireefal Area (L 65), sectioned specimen. The section is slightly tangential and shows varying thickness of the test wall (depending upon the kind of grains used); foraminiferal fragments are predominant : note sectioned miliolid on the right and sectioned soritid test on the left; the rear wall of the last chamber includes an entire Amphistegina-test (the apertural pustules of which are still visible on the right). The septum separating the last two-formed chambers has broken away during sectioning but traces of the dried protoplasm can be ceen, narrowing at the space which the septal foramen occupied. Some sponge spicules are present in the interior of the test (X 86).
Fig. 6 : Living specimen, Eastern Perireefal Area (L 65) : detail of a sectioned specimen showing part of the septum between the two last chambers; the septum consists of one or a few, relatively thin calcareous flakes. Last chamber on the left, penultimate chamber on the right hand side of the photograph (X 257).

PLATE 1

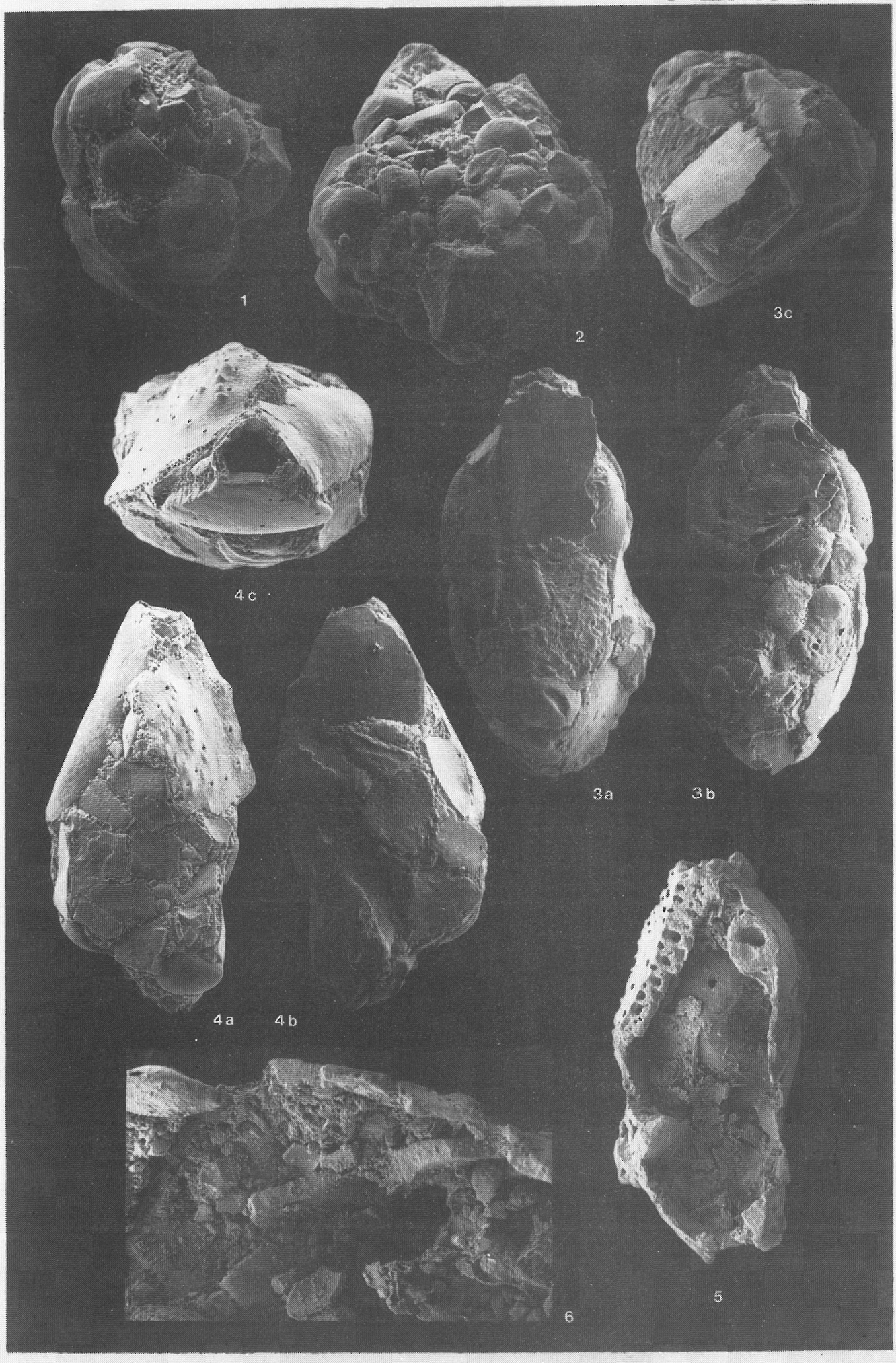

PLATE 2

Figs. 1a-b : Reophax scorpiurus MONTFORT

Fig. 1a : Lateral view of empty test, Eastern Perireefal Area (L 86), in front of the Windward Barrier. Note heterogenous material used in test wall construction; fig. 1b : same specimen, oblique view (note small, rounded aperture) (X 113).

Figs. 2 - 3 : Nouria harrisii H. ALLEN & EARLAND

Figs. 2a-c : Living specimen, Eastern Perireefal Area (L 65). Fig. 2a : Lateral view showing test being entirely constructed of sponge spicules; the polymorphinoid chamber arrangement can clearly be seen (X 134); fig. 2b : oblique view of same specimen (X 134); fig. 2c : same specimen, detail showing aperture being delimitated by sponge-spicule extremities; the suture separating last and penultimate chamber is visible in the lower left corner of the photograph; spicules are with astonishing accurateness selected to fit and finish the chamber outline (X 407).
Figs. 3a-b : Living specimen, Eastern Perireefal Area (L 81). Fig. 3a : Lateral view (note spicule extending from the aboral test extremity) (X 135); fig. 3b : Detail showing apertural end of the test (compare with fig. 2c). On the original photograph a coccosphere and coccoliths can be perceived in the interior of the aperture (X 562).

Figs. 4 - 7 : Nouria polymorphinoides H. ALLEN & EARLAND

Fig. 4 : Apertural view of empty test, Eastern Perireefal Area (L 63); note flattened test outline, some larger grains extruding from the (otherwise smooth) test wall, and oval, slightly curved aperture (X 94).
Fig. 5 : Lateral view of living specimen, Eastern Perireefal Area (L 56), showing flaky test wall and polymorphinoid chamber arrangement with strongly embracing last chamber (X 94).
Fig. 6 : Detail of apertural end of last chamber, living specimen, Eastern Perireefal Area (L 56), showing less compressed test and rounded aperture (X 266).
Fig. 7 : Id, living specimen (L 56), showing compressed test with almost slitlike aperture (X 231).

PLATE 2

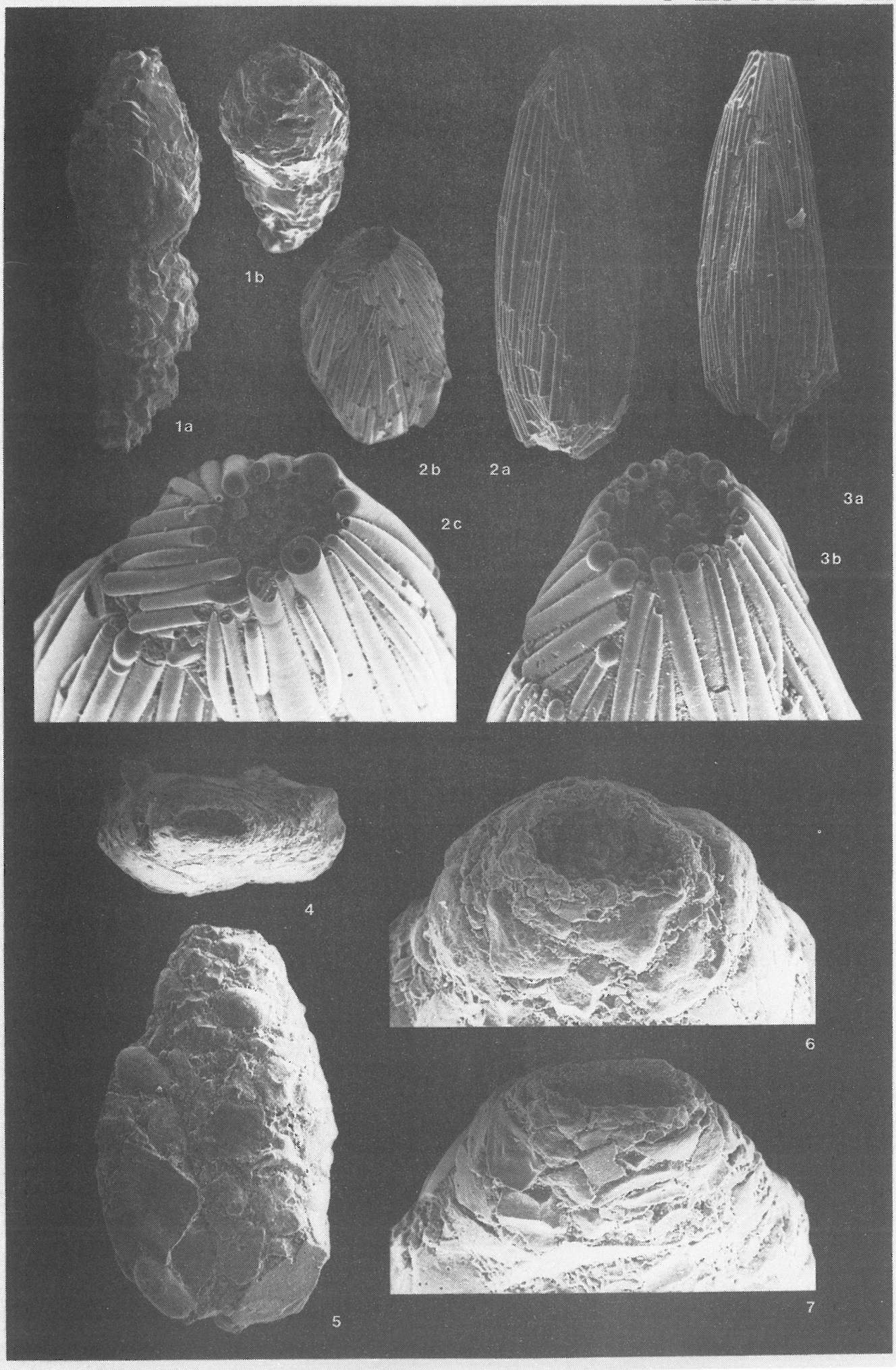

PLATE 3

Figs. 1a-c : Nouria tenuis HADA

Fig. 1a : Lateral view of empty test, Eastern Perireefal Area (L 81), showing thin, fragile, flaky test wall; the polymorphinoid chamber arrangement is obscured (X 89); fig. 1b : same specimen, oblique apertural view showing extremely compressed test and peripheral sponge spicules (X 89); fig. 1c : same specimen, enlargement of apertural area showing the narrow slitlike aperture between the sponge spicules (X 225).

Figs. 2a-b : Nouria textulariformis HADA, subsp. armata COLLINS

Fig. 2a : Lateral view of empty test, North Point, foot of fringing reef (L 292); the flaky test wall, polymorphinoid chamber arrangement and sponge spicules extending from the test periphery backwards from the aperture can be seen; the sutures are somewhat obscured (X 87); fig. 2b : same specimen, oblique view showing compressed test and oval aperture resembling that of Nouria polymorphinoides (X 87).

Figs. 3a-b : Discammina compressa (GOËS)

Empty test, Eastern Perireefal Area (L 90) (X 91). The photographs show the evolute planospire, the characteristic Discammina-aperture, and the rather coarsely agglutinated test wall including irregularly oriented sponge spicules. Fig. 3a : Lateral view; fig. 3b : oblique apertural view.

Figs. 4a-b : Ammobaculites sp. (TODD)

Living specimen, Leeward Patchreef Area, sandy channel between patches (L 153) (X 153). The coarsely agglutinated test wall, elongate apertural end of the last chamber and the small, rounded aperture can clearly be seen. The sutures are obscured throughout. Fig. 4a : Lateral view; fig. 4b : apertural view.

Figs. 5a-b : Haddonia minor CHAPMAN

Empty test from the foot of the Northern fringing reef front, North Point (L 292); immature specimen, biserial stage; eventual triserial initial stage not obvious. Note porosity of test wall, mainly rounded agglutinated grains of equal relative dimensions, small U-shaped toothless aperture at the periphery of the ultimate chamber and substrate impression upon penultimate chamber surface. Fig. 5a : Lateral view (X 590); fig. 5b : apertural view (X 590).

PLATE 3

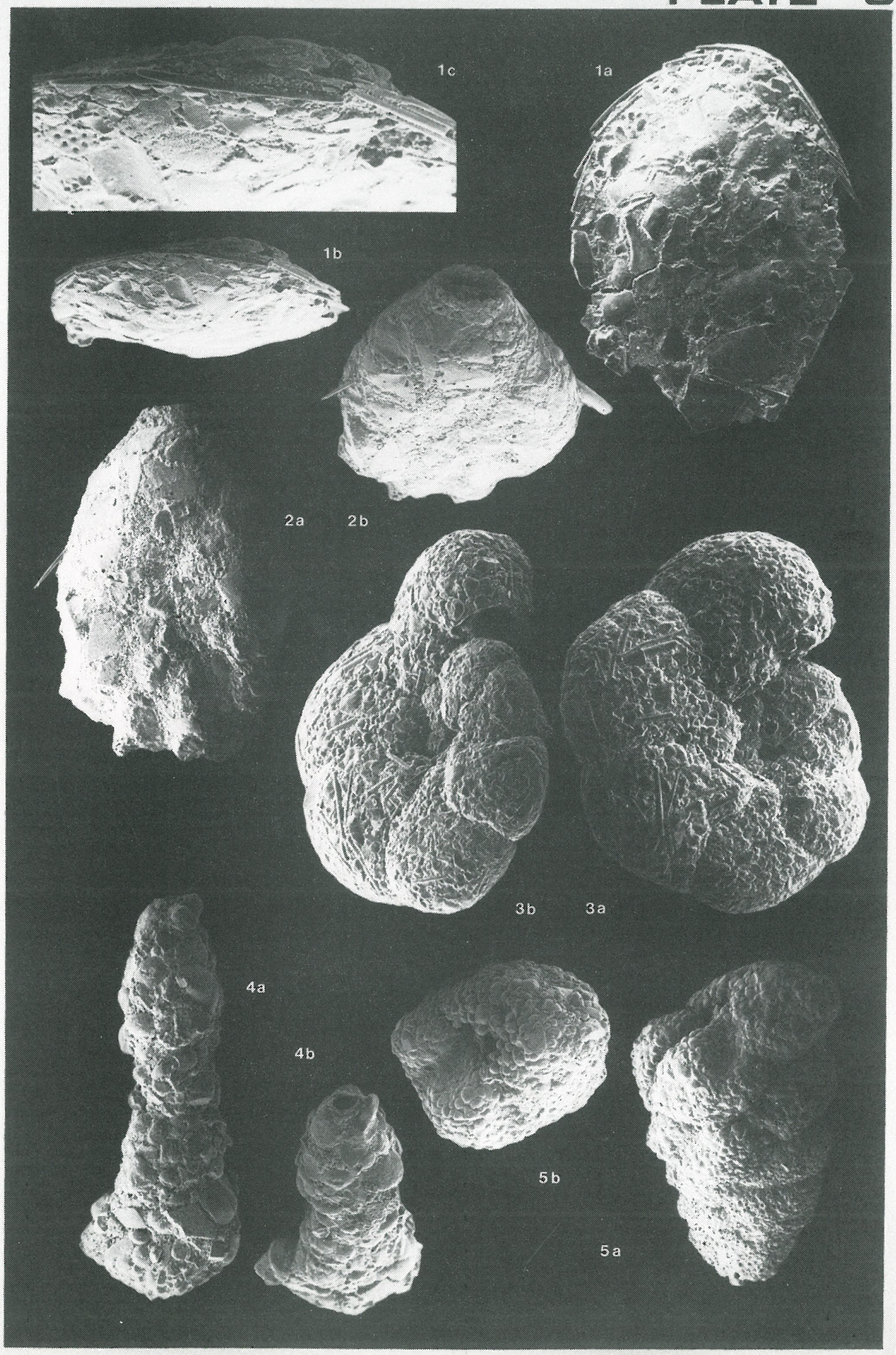

PLATE 4

Figs. 1 - 5 : Haddonia minor CHAPMAN

Figs. 1a-b : Adult specimen (empty test) from the foot of the Northern fringing reef front, North Point (L 292); note rounded agglutinated grains in the test wall. Fig. 1a : Lateral view showing biserial stage and sudden growth direction change at the onset of the uniserial, low-chambered stage (X 65); fig. 1b : apertural view showing substrate impression and small, rounded aperture (X 65).

Figs. 2a-b : Almost full-grown specimen, empty test, reef flat, Windward Barrier (L 260). Fig. 2a : Lateral view showing bi- and uniserial stages (X 73); fig. 2b : oblique apertural view showing small U-shaped sutural opening (traces of substrate impression are not obvious) (X 73).

Figs. 3a-b : Adult specimen, slightly abraded, empty test; reef flat, Windward Barrier (L 257). Fig. 3a : Lateral view showing (tri?), bi- and irregular uniserial stages, characteristic test-wall structure consisting of rounded grains and coarse porosity accentuated by abrasion of the test; two oval, elongate sutural apertures are visible, one in the middle of the test and another at the periphery of the ultimate chamber on top of the photography (X 60); fig. 3b : apertural view (X 60).

Fig. 4 : Lateral view of adult specimen, Coconut Fringing Reef Flat (L 244 b), showing perforated test wall, bi- and irregular uniserial stages and two apertures; the chambers of the uniserial stage are shaped around a substrate over which chamber growth proceeded; note terminal, oval, narrow aperture just beside substrate impression upon ultimate chamber; the somewhat angular aperture in the penultimate chamber wall seems to be formed by secondary dissolution of the test wall to ensure better fixation upon the substrate (the chamber wall in the vicinity of that aperture is extremely thinning towards the edges of that aperture) (X 37).

Fig. 5 : Juvenile specimen, probably living (?), reef flat, Windward Barrier (L 257); showing biserial stage attached to a calcareous sand grain; chamber deformations caused by former substrate fixations can be seen upon the earlier chambers (X 71).

PLATE 4

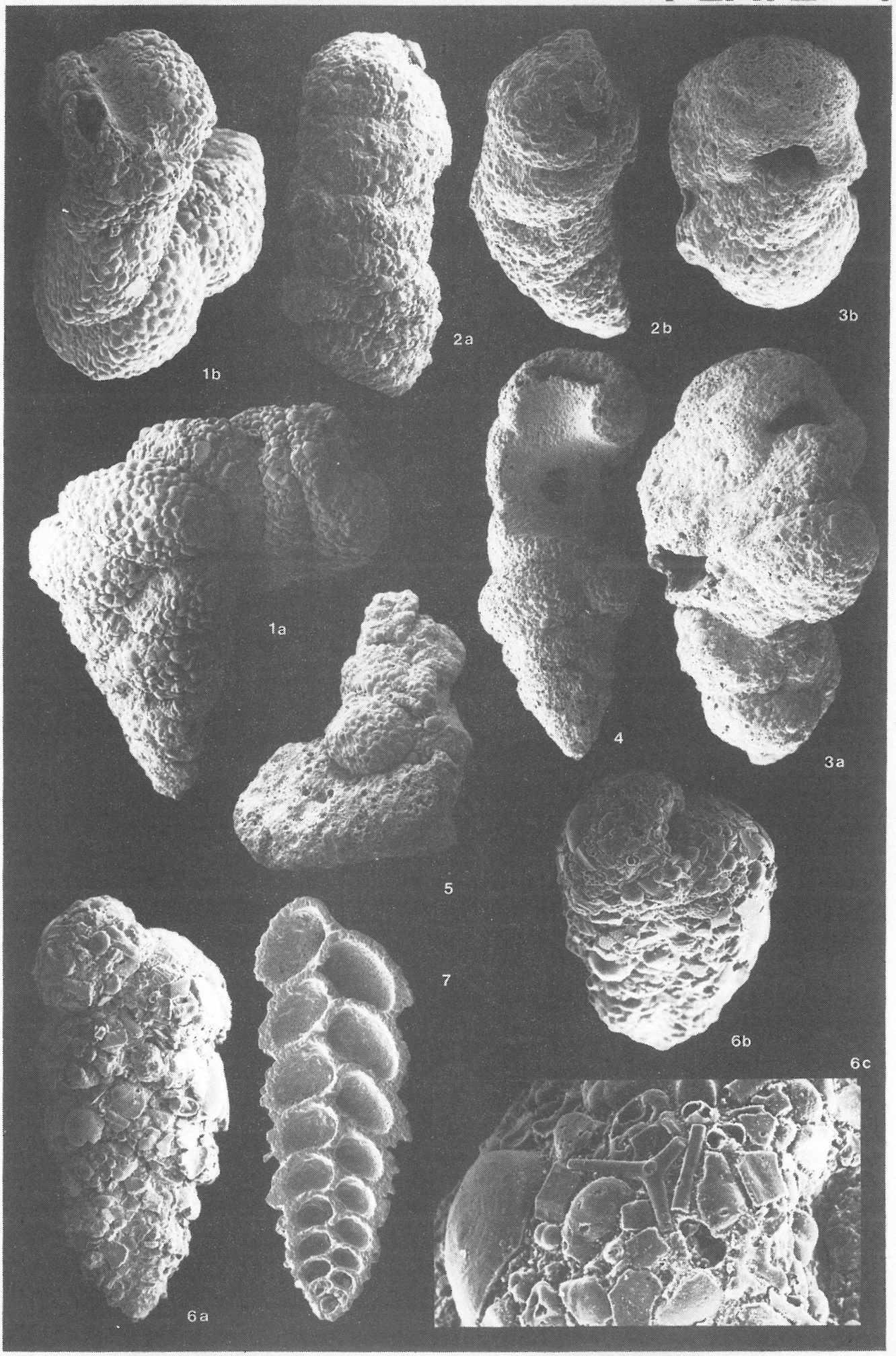

PLATE 4 (continued)

Figs. 6 - 7 : Textularia agglutinans d'ORBIGNY

Figs. 6a-c : Empty test, Eastern Perireefal Area (L 81).
Fig. 6a : Lateral view showing V-shape, moderately constricted, slightly curved sutures, very coarsely agglutinated test wall including small foraminiferal tests (X 115); fig. 6b : oblique apertural view showing more or less rounded test outline and curved aperture at the margin of the ultimate chamber (X 129); fig. 6c : id, detail of chamber wall of ultimate chamber, apertural face (the aperture can be seen on the right), showing coarsely agglutinated test wall made of heterogenous detrital grains (on the photograph : small foraminiferal tests, calcareous flakes and sponge spicules) (X 430).
Fig. 7 : Equatorial section through an empty test, adult megalospheric specimen, Eastern Perireefal Area (L 65), showing biserial chamber arrangement, relatively thick test wall, slightly curved septa (initial septa are more curved than later ones), traces of septal foramina and pseudopores (X 100).

PLATE 5

Figs. 1 - 2 : Textularia agglutinans d'ORBIGNY

Fig. 1 : Detail of sectioned specimen, fig. 7, pl. 4; showing initial chamber arrangement : proloculus and adventitious chamber immediately followed by biserially arranged chambers. Note organic lining (X 500).
Figs. 2a-b : Almost equatorially-sectioned, juvenile, megalospheric specimen, Eastern Perireefal Area (L 65). Fig. 2a : Lateral view showing curved septa, septal foramina, thick test walls and pseudopores (X 161); fig. 2b : detail of same section showing the septa separating three last-formed chambers, the septal foramina and the aperture (X 512).

Figs. 3 - 6 : Textularia barkeri HOFKER

Figs. 3a-b : Living specimen, Eastern Perireefal Area (L 84). Fig. 3a : Oblique lateral view showing low conical test outline, pagode-like chamber construction, thickened peripheral chamber rims, almost straight sutures and rather smoothly finished test walls (X 61).
Fig. 4 : Living specimen, Eastern Perireefal Area (L 65). Apertural view showing somewhat irregularly vaulted apertural face, slitlike aperture bordered by a faint lip (note progression of ultimate chamber over penultimate chamber at both ends of the aperture) and smoothly finished test wall consisting of mostly rounded grains and some sponge spicules (X 53).
Figs. 5a-b : Almost equatorial section through empty test, Eastern Perireefal Area (L 65). Fig. 5a : Entire section showing conical test outline, low chambers, rapidly thickening test wall with pseudopores, straight, parallel septa, septal foramina and irregular shape of the chamber lumen laterally of the septal foramina. Initial chambers are broken away (X 89); fig. 5b : detail of preceding section, upper right-hand corner of fig. 5a, showing thick test-wall with pseudopores; no connections with the exterior of the test are visible except where the test is damaged or abraded. Probably the pseudopores of the apertural face are filled up with cement when a new chamber covers up this face and turns it into a septum (X 267).
Figs. 6a-b : Almost equatorial section through an empty test, Eastern Perireefal Area (L 81). Fig. 6a : Entire section showing same features as fig. 5a but this specimen has extremely thickened test walls and very

PLATE 5

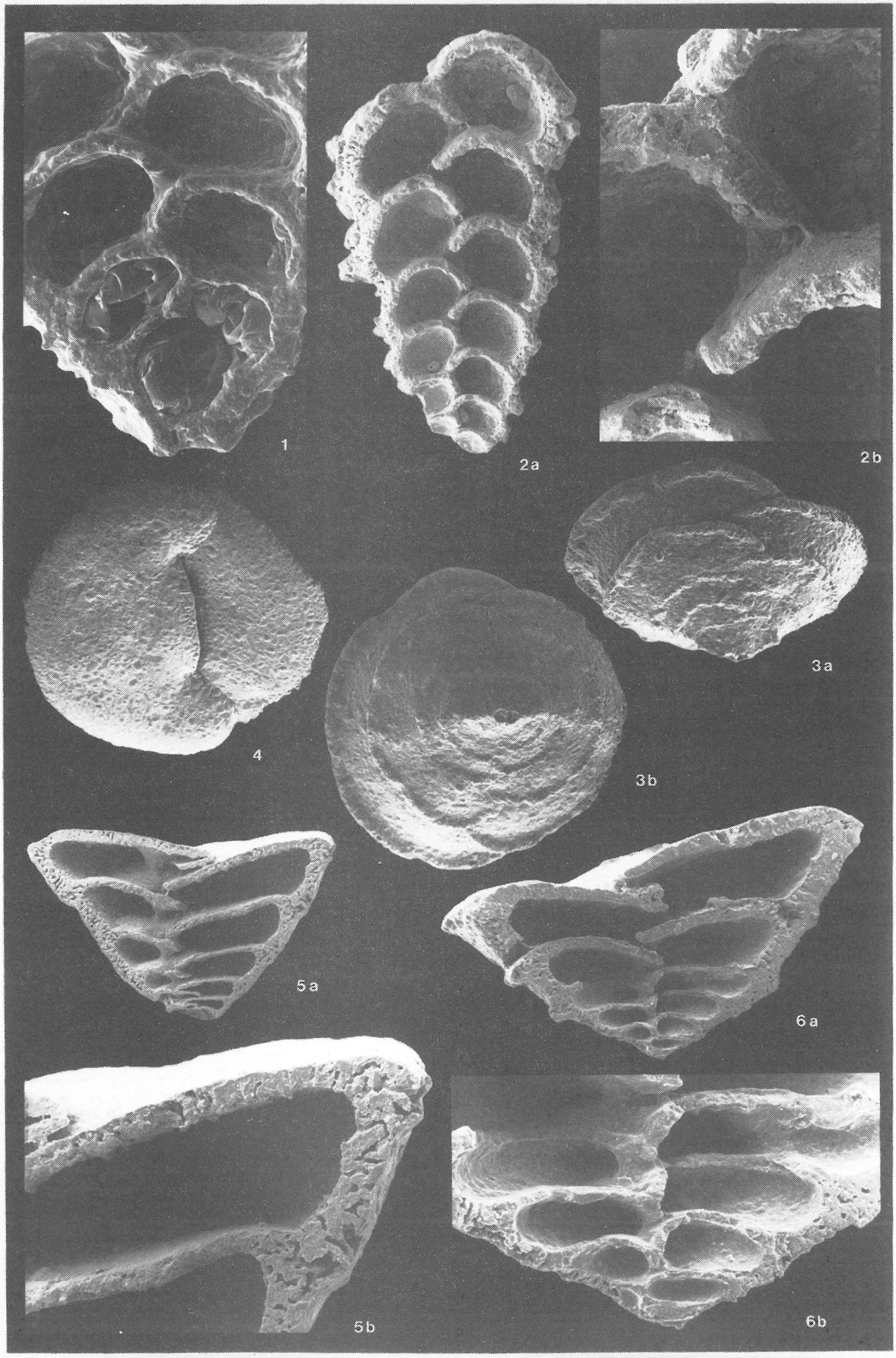

PLATE 5 (continued)

prominent peripheral thickened chamber rims whereas the septa are slightly curved; the septa of the earlier chambers, being very thin, are partially broken away (X 98); fig. 6b : initial, biserial chamber series of the same section showing extremely thin chamber walls of the first few chambers (X 254).

PLATE 6

Figs. 1 - 3 : Textularia candeiana d'ORBIGNY

Figs. 1a-b : Empty test, Eastern Perireefal Area (L 86). Fig. 1a : Lateral view showing general test outline with compressed early chambers, the sutures of which are obscured and not deeply incised; the strongly inflated, subglobular last chamber pair and the moderately roughened finish of the test wall (the grains are mainly rounded) (X 151); fig. 1b : same specimen, apertural view : note rounded test outline being caused by the inflation of the last chamber, wall texture and broad slitlike aperture (X 151).

Figs. 2a-b : Equatorially sectioned specimen, empty test, Eastern Perireefal Area (L 81). Fig. 2a : Entire section showing inflation of last chambers (these having thicker walls than the early part of the test), septa (being more strongly curved in the later part of the test), septal foramina, biserial chamber arrangement and pseudopores (X 138); fig. 2b : same section, detail of initial chambers which are biserially arranged throughout (X 293).

Fig. 3 : Equatorially sectioned specimen, empty test, leeward slope (L 100); showing less inflated, slightly irregular, flattened, last chambers; other features are as on fig. 2 (X 141).

Figs. 4 - 6 : Textularia corrugata H. ALLEN & EARLAND

Figs. 4a-b : Empty but fresh, not abraded test, Western Perireefal Area (L 98). Fig. 4a : Lateral view showing equilaterally triangular test outline, low chambers, straight sutures, very coarsely agglutinated test wall and smoothly finished apertural face (X 87); fig. 4b : same specimen, apertural view showing slitlike, straight aperture bordered with a faint lip; somewhat irregular apertural face with transverse depressions, and subangular test (X 87).

Figs. 5a-b : Empty, abraded test (reef flat, Windward Barrier) showing the same main features as the specimen on fig. 4 but due to the abrasion of the test, wall texture is less coarse whereas the pseudopore cavities of the test walls, normally not connecting with the exterior, become visible. Fig. 5a : Lateral view (X 78); fig. 5b : apertural view (X 78).

PLATE 6

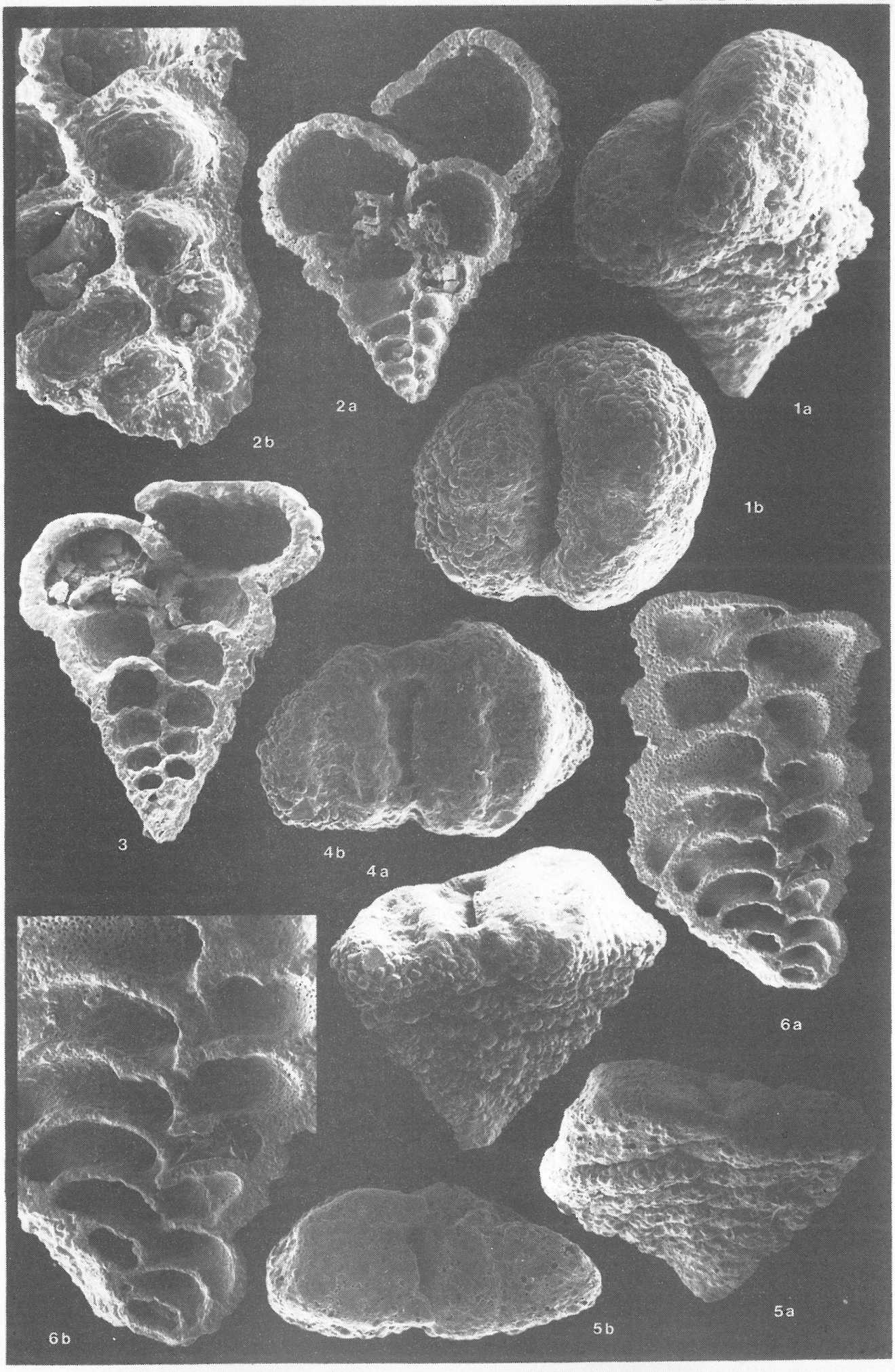

PLATE 6 (continued)

Figs. 6a-b : Oblique tangentially sectioned specimen, empty test, Eastern Perireefal Area (L 81). Fig. 6a : Entire section cutting through the early chambers but forming a slight angle with the equatorial plane : the later chambers are cut near to the lateral chamber wall; the complete test was much broader than this section. The chamber arrangement is clearly biserial throughout; the sutures are curved in the early test portion but become more straight near the last-formed portion of the test; the septal foramina are visible; the test walls show pseudopores (X 76); fig. 6b : same section, detail of early biseral chamber arrangement (X 127).

PLATE 7

Figs. 1 - 2 : Textularia foliacea H. ALLEN & EARLAND

Figs. 1a-b : Empty test, Eastern Perireefal Area (L 86). Fig. 1a : Lateral view showing characteristic chamber shape; oblique septa and coarsely arenaceous test wall (compare with T. agglutinans, pl. 4, fig. 6) (X 79); fig. 1b : oblique apertural view showing compressed test and narrow, curved aperture (X 79).

Figs. 2a-c : Equatorially sectioned specimen, empty test, Eastern Perireefal Area (L 81). Fig. 2a : Entire section showing septa being curved in the early test part and becoming straighter in the later part (compare with fig. 2, pl. 5); the section further shows the septal foramina, the aperture and the biserial chamber arrangement (X 73); fig. 2b : same section, detail of last four formed chambers and septa; note the pseudopores. In this case the secondary cementation of the septa seems to be incomplete in the later septa (X 127); fig. 2c : detail showing initial chamber arrangement of the same section. Note septal foramina, curved septa, completely biserial chamber arrangement and pseudopores (X 237).

Figs. 3 - 4 : Textularia foliacea H. ALLEN & EARLAND, subsp. oceanica CUSHMAN

Figs. 3a-b : Empty test, slightly compressed specimen; transition form between T. foliacea and T. foliacea oceanica. Note surface texture of intermediate roughness, and apertural features intermediate between the two forms. Western Slope (L 100). Fig. 3a : Lateral view (X 80); fig. 3b : oblique apertural view (X 84).

Figs. 4a-d : Empty test, Western Slope (L 100), typical specimen. Fig. 4a : Lateral view showing stout test, more smoothly finished than T. foliacea; note oblique sutures and porosity of test (X 62); fig. 4b : same specimen, apertural view : note rounded test outline and broad aperture (X 62); fig. 4c : same specimen, almost equatorially sectioned (the section cuts through the early chambers but then parts somewhat obliquely, forming a slight angle with the equatorial plane and cutting the later chambers tangentially). Entire section, showing oblique septa, relatively thick test wall and pseudopores (wall of last chamber partially broken away) (X 62); fig. 4d : detail of the same section showing initial biserial chamber arrangement and organic lining (X 503).

PLATE 7

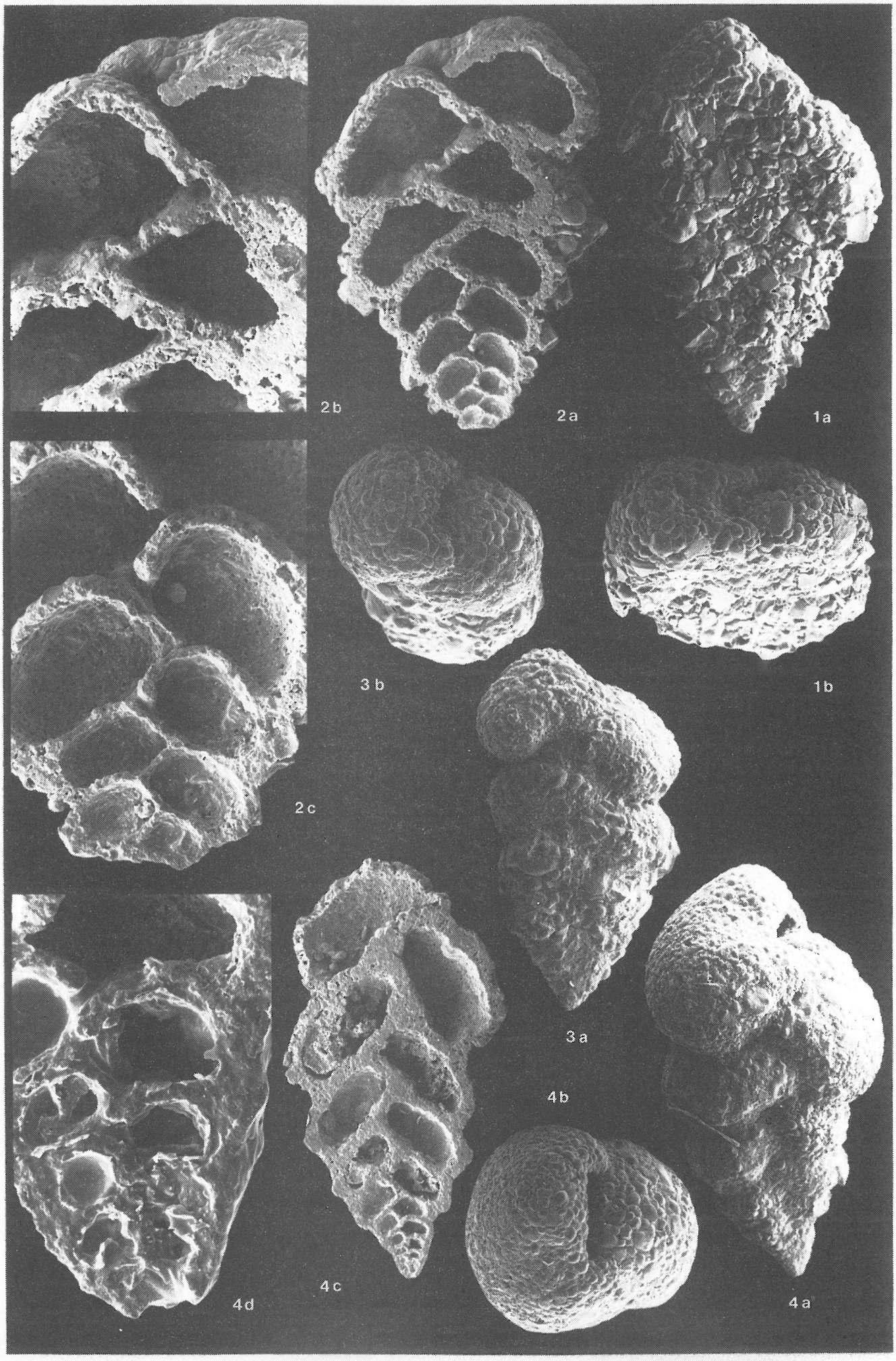

PLATE 8

Figs. 1 - 2 : Textularia porrecta BRADY

Figs. 1a-e : Adult specimen, empty test, Eastern Perireefal Area (L 86). Fig. 1a : Lateral view showing low chambers, straight sutures, truncate apertural face, gradually coarser test wall structure and median depression in the test wall (X 129); fig. 1b : apertural view showing curved aperture and 8-shape of transverse section (X 129); fig. 1c : equatorial section showing biserial chamber arrangement, hardly curved septa, and septal foramina (X 129); fig. 1d : detail, initial chambers of same section showing absence of any trace of planospiral initial coil (X 522); fig. 1e : detail of same section, antepenultimate chamber of the right-hand chamber series, showing pseudopores and coarse grains cemented into the test wall (X 914). Figs. 2a-b : Empty test, Eastern Perireefal Area (L 60), showing essentially the same features as fig. 1a-b but here the rather smooth finish of the early chambers is very clear as well as the median depression in the test wall. Fig. 2a : Lateral view (X 128); fig. 2b : apertural view (X 128).

Figs. 3 - 5 : Textularia pseudogramen CHAPMAN & PARR

Figs. 3a-b : Almost adult specimen, smooth form, empty test, Eastern Perireefal Area (L 81). Fig. 3a : Lateral view showing curved sutures and apertural face, smoothly finished test wall except where abrasion patches reveal coarse texture underneath (note such a patch on chamber wall of penultimate chamber) (X 135); fig. 3b : same specimen, apertural end view showing not very broad aperture bordered by a rim and lying in a depression, as well as subangular to angular shape of test in transverse section (X 135). Figs. 4a-b : Adult specimen, coarse form, empty and abraded test, Eastern Perireefal Area (L 81), showing essentially the same features as figs. 3a-b but here the smoothly finished cement layer has been abraded away, leaving a coarse-grained test surface and external pores behind. Fig. 4a : Lateral view (X 72); fig. 4b : apertural view (compare with fig. 3b) (X 72). Fig. 5 : Empty test, Eastern Perireefal Area (L 65); lateral view of slightly abraded, smooth-walled test; in this specimen the sutures are hardly curved and the test is higher than broad; the last chamber is damaged (X 125).

PLATE 8

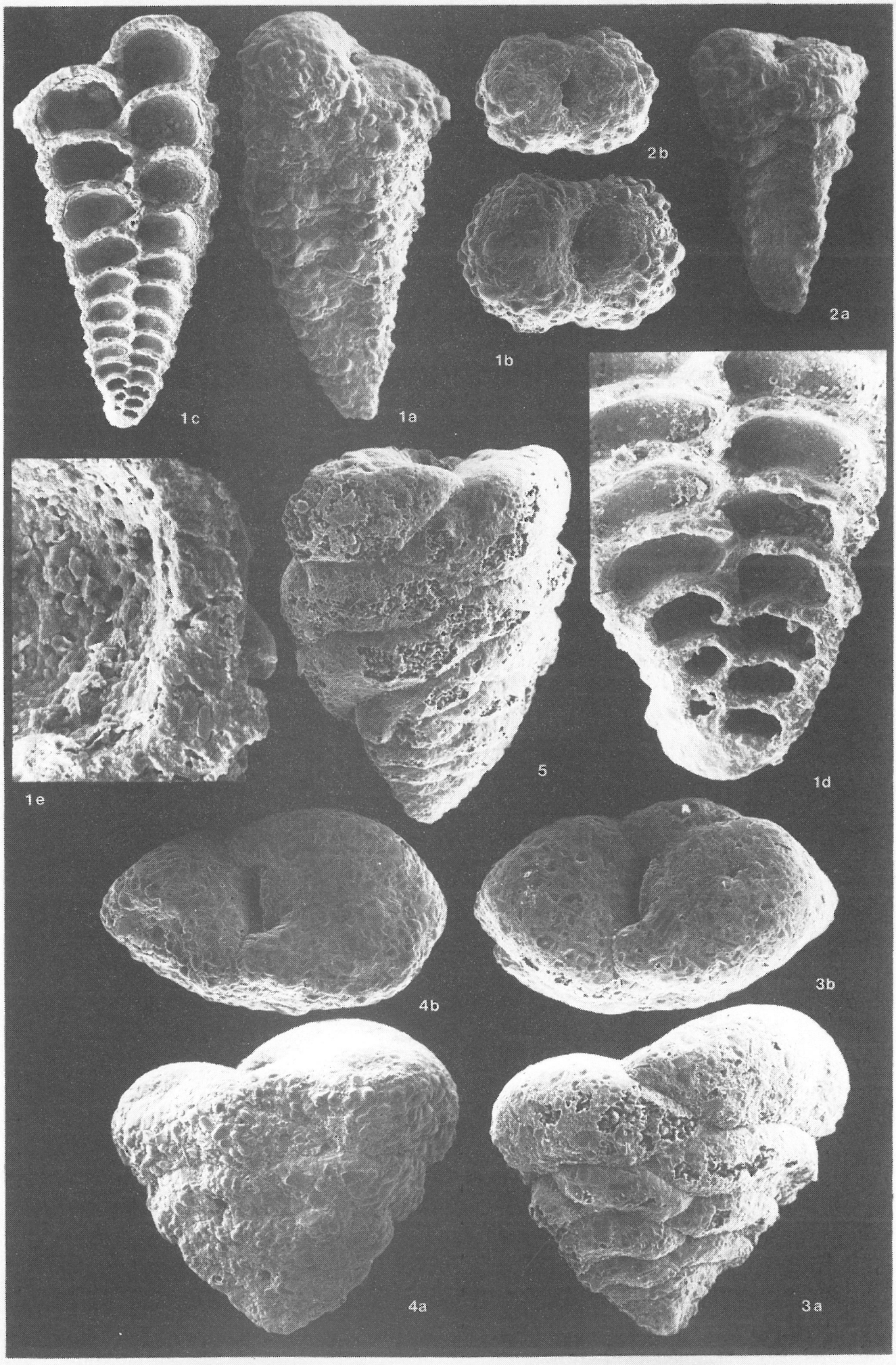

PLATE 9

Figs. 1a-c : Textularia pseudogramen CHAPMAN & PARR

Fig. 1a : Equatorial section of typical, adult specimen, empty test, leeward slope (L 100) : entire section, showing biserial chamber arrangement, low and broad chambers, curved septa and septal foramina (X 78); fig. 1b : detail of same section, chamber wall and septum separating ultimate and antepenultimate chamber : note pseudopores (X 457); fig. 1c : same section detail showing aperture, septal foramina (note upward nod in septa at septal foramina), pseudopores in inner chamber wall surfaces and non-porous septal surfaces (X 231).

Figs. 2 - 3 : Textularia pseudogramen CHAPMAN & PARR, subsp. kerimbaensis (SAID)

Figs. 2a-b : Adult, living (?), characteristic specimen, Eastern Perireefal Area (protoplasm coloration interpreted as such with some doubt; the test is fresh anyway but even such fresh tests already show slight abrasion signs (L 65). Fig. 2a : Lateral view showing V-shaped of test; low, strongly embracing chambers, sigmoidally-curved sutures, rounded apertural face and aperture lying in a depression, lateral chamber concavities just above the sutures. Note smooth finish of test wall, and some abrasion patches (X 77); fig. 2b : apertural view; note subangular test outline and apertural rim (X 77).

Fig. 3a-d : Empty (fresh) test, Eastern Perireefal Area (L 65). Fig. 3a : Lateral view showing same features as fig. 2a but here the apertural face is more truncated (X 111); fig. 3b : slightly tangential section showing biserial chamber arrangement, septal foramina and pseudopores (note pseudopore cavities being more pronounced near the sutures) (X 111); fig. 3c : detail of same section (right-hand initial chambers), showing non-porous septa, porous inner chamber wall surfaces (partly covered by organic lining), pseudopore structure consisting of radial canals and cavities (X 422); fig. 3d : detail of same section (chamber wall of fourth chamber on the left), clearly showing the radial pseudopore canals, the cavities near the outer surface of the chambers and the organic lining; no connections with the exterior are visible (X 976).

PLATE 9

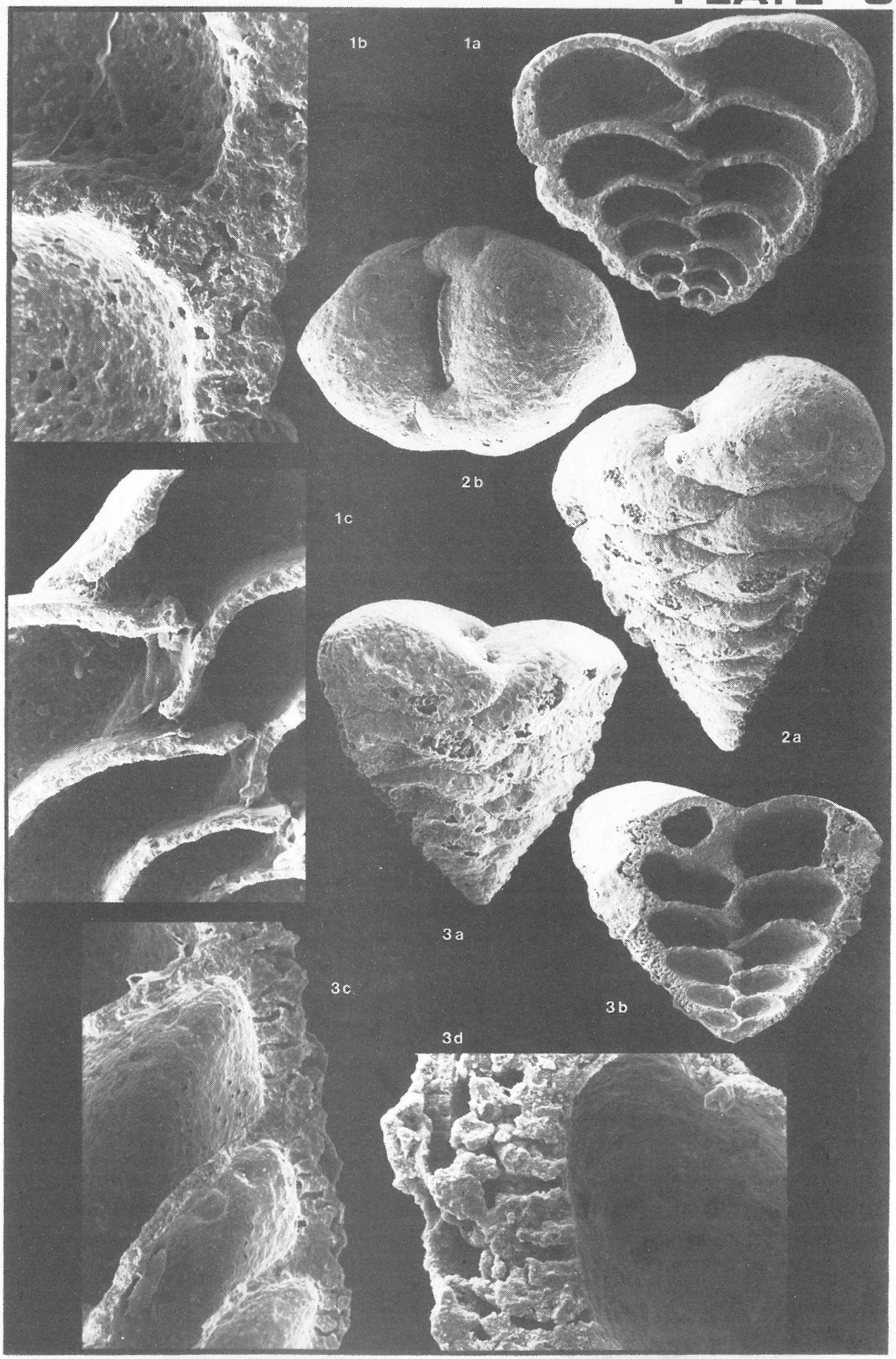

PLATE 10

Fig. 1 : Textularia pseudogramen CHAPMAN & PARR, subsp. kerimbaensis (SAID)

Figs. 1a-c : Adult, megalospheric specimen, empty test, Eastern Perireefal Area (L 81), oblique tangential section cutting through embryonic chambers. Fig. 1a : Entire section, showing moderately curved septa and truncated apertural face (X 92); fig. 1b : early chamber arrangement (note slightly damaged proloculus) (X 450); fig. 1c : oblique view into later chambers, showing successive foramina and final aperture with apertural rim as well as pseudopores, non-porous septa and porous inner chamber wall surfaces (X 215).

Figs. 2 - 3 : Textularia semialata CUSHMAN

Figs. 2a-b : Empty test, Eastern Perireefal Area (L 65). Fig. 2a : Lateral view showing chambers being low in the initial part of the test and more laterally elongated and inflated in the later-formed part, horizontal sutures, fold in the wall of the last-formed chamber, and aperture lying in a depression of the apertural face. Note smooth finish of test wall (X 164); fig. 2b : oblique apertural view showing compressed test and slightly curved aperture with overhanging lip (X 164).

Figs. 3a-c : Equatorial section through adult specimen, empty test, Eastern Perireefal Area (L 63). Fig. 3a : Entire section with biserial chamber arrangement, curved septa, septal foramina and pseudopores (X 69); fig. 3b : detail of same section with perforated inner chamber surface of penultimate chamber (X 214); fig. 3c : detail of same section, with initial (biserial) chamber arrangement, pseudopores and organic lining (X 220).

Figs. 4 - 6 : Trochammina squamata PARKER & JONES

Fig. 4 : Spiral view, adult specimen, empty test, Western slope (L 100) (X 155).

Fig. 5 : Umbilical view of another specimen, empty test, Western slope (L 100). Note embracing final chamber, occupying about half of the circumference of the test, and interiomarginal aperture (X 165).

Fig. 6 : Edge view, another specimen, empty test, Western slope (L 100), showing low trochospire and planoconvex to convex-concave test (X 263).

PLATE 10

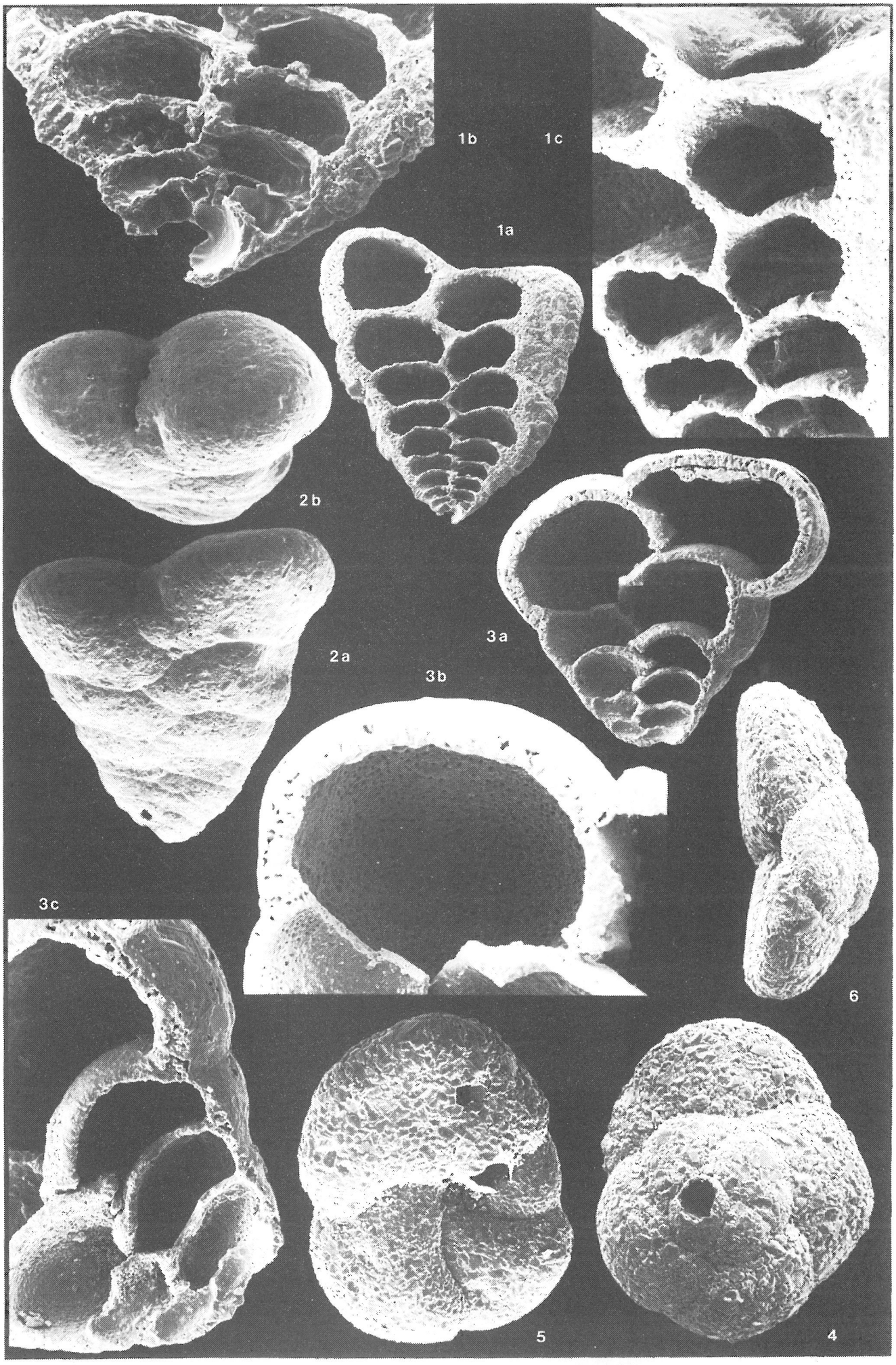

PLATE 11

Figs. 1a-c : Rotaliammina chitinosa (COLLINS)

Living (?) specimen, backreef area near Bird Islet, Windward Barrier (L 253). Fig. 1a : Spiral view showing evolute trochospire with strongly curved sutures, agglutinated surface and pseudochitinous keel covered with agglutinated material (X 292); fig. 1b : umbilical view showing semi-involute chamber arrangement and narrow, deep umbilicus in the center of which the proloculus remains visible. The test wall on this side is almost completely pseudochitinous, without noticeable agglutinated material; note limbate sutures "ending in a bulb short of the umbilicus". It is not clear whether the visible aperture(s) on the final chamber are naturally formed or caused by test damage (X 292); fig. 1c : edge view (note strongly compressed test) (X 292).

Figs. 2 - 3 : Gaudryina rugulosa CUSHMAN

Figs. 2a-b : Adult specimen, empty test, Coconut Fringing Reef flat (L 247 b); abraded and damaged specimen. Fig. 2a : Lateral view showing low chambers and straight sutures, and strongly lobed chamber walls. The externally visible (pseudo-)porosity is due to abrasion of the test (X 37); fig. 2b : apertural view (the two last-formed chambers are broken away). The photograph shows the non-porous septa, septal foramina and broken walls of ultimate and penultimate chambers; this wall-structure is comparable with the textulariid test wall structure (note fusing radial pseudopores and regular pseudopore pattern on the inner side of the chamber wall) (X 50).
Figs. 3a-b : Strongly abraded specimen, empty test, Coconut Fringing Reef flat (L 247 b). Fig. 3a : Lateral view showing chamber lobes being almost completely eroded and leaving the sutures and external (pseudo-)porosity visible (X 35); fig. 3b : oblique apertural view showing subangular transverse section outline, characteristic test-wall texture and low, straight aperture (X 35).

Figs. 4 - 6 : Clavulina multicamerata CHAPMAN

Fig. 4 : Juvenile specimen, empty test, Southern Perireefal Area (L 90), showing triserial stage and first chamber of the uniserial series. Note more or less rounded chambers from the early stages onward (compare with fig. 7) (X 149).

PLATE 11

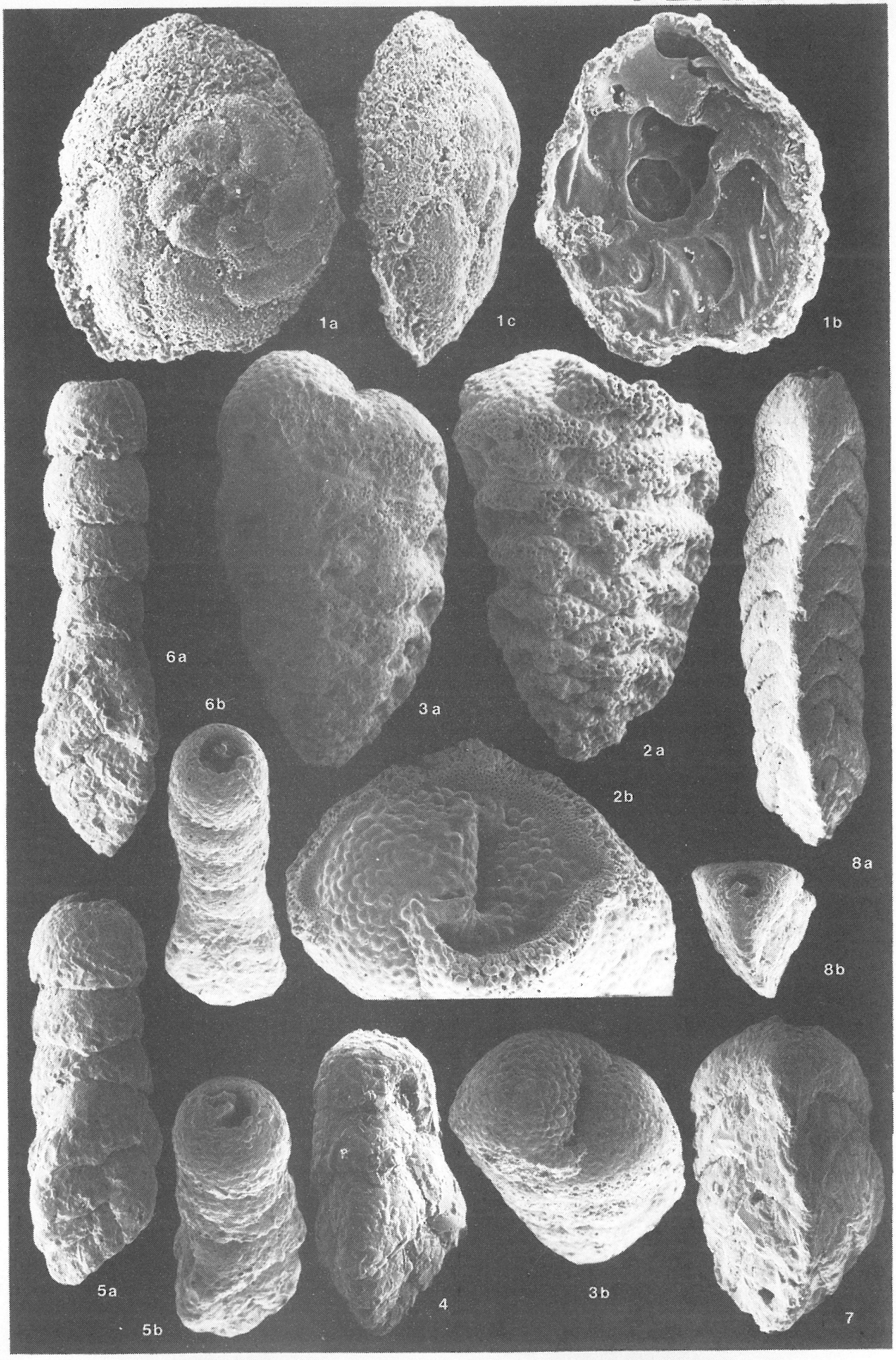

PLATE 11 (continued)

Figs. 5a-b : Larger specimen, empty test, Eastern Perireefal Area (L 60). Fig. 5a : Lateral view showing triserial and three-chambered uniserial stage; the suture between ultimate and penultimate chamber is completely straight and deeply constricted (X 94); fig. 5b : oblique view showing rounded test outline and terminal, rounded aperture with valvular tooth (X 94).

Figs. 6a-b : Adult specimen, empty test, Eastern Perireefal Area (L 56). Fig. 6a : Lateral view; note five-chambered uniserial stage with deeply constricted sutures and cup-shaped chambers (X 86); fig. 6b : oblique apertural view (compare with fig. 5b) (X 86).

Figs. 7 - 8 : Clavulina pacifica CUSHMAN

Fig. 7 : Juvenile specimen, empty test, Eastern Perireefal Area (L 56), showing triserial and two-chambered uniserial stages. Note angularity of the test (compare with fig. 4) (X 94).

Figs. 8a-b : Adult specimen, empty test, Eastern Perireefal Area (L 56). Fig. 8a : Lateral view showing triserial and 7-chambered uniserial stages. Note low chambers and curved septa (X 45); fig. 8b : apertural view showing triangular test cross-section and rounded terminal aperture with valvular tooth (X 45).

PLATE 12

Figs. 1 - 2 : Planispirinella exigua (BRADY)

Fig. 1 : Lateral view of empty test, Eastern Perireefal Area (L 65). Note embracing last chamber and slightly curved suture. Specimens seen under the light microscope are translucent and show early whorls in transparency (X 238).

Fig. 2 : Edge view of empty test, Eastern Perireefal Area (L 71). Note the strongly compressed test and the elongate, slitlike aperture which is quite different from the small, low aperture in COLLINS's Great Barrier Reef species Planispirinella involuta (X 266).

Figs. 3a-c : Edentostomina cultrata (BRADY)

Fig. 3a : Lateral view of empty test, Eastern Perireefal Area (L 81). Note smooth test surface, carinate periphery and apertural neck (X 184); fig. 3b : oblique apertural view (note compressed test) (X 184); fig. 3c : enlargement of apertural end of same specimen, showing toothless compressed aperture with pronounced peristome (X 500).

Figs. 4 - 6 : Edentostomina rupertiana (BRADY)

The three figured specimens are adults and illustrate the variation in test shape from narrow, biloculine (fig. 4) to broad, almost quinqueloculine tests (fig. 6) via an intermediate triloculine test (fig. 5). Note pitted test surface, more or less pronounced striation and compressed toothless aperture in the three specimens.

Fig. 4 : Empty test, Eastern Perireefal Area (L 81). Fig. 4a : Lateral view (X 85); fig. 4b : oblique apertural view (X 85).

Fig. 5 : Empty test, Eastern Perireefal Area (L 81). Fig. 5a : Lateral view (X 70); fig. 5b : oblique apertural view (X 70).

Fig. 6 : Empty test, Northern Perireefal Area (L 54). Fig. 6a : Lateral view (X 68); fig. 6b : oblique apertural view (X 68).

PLATE 12

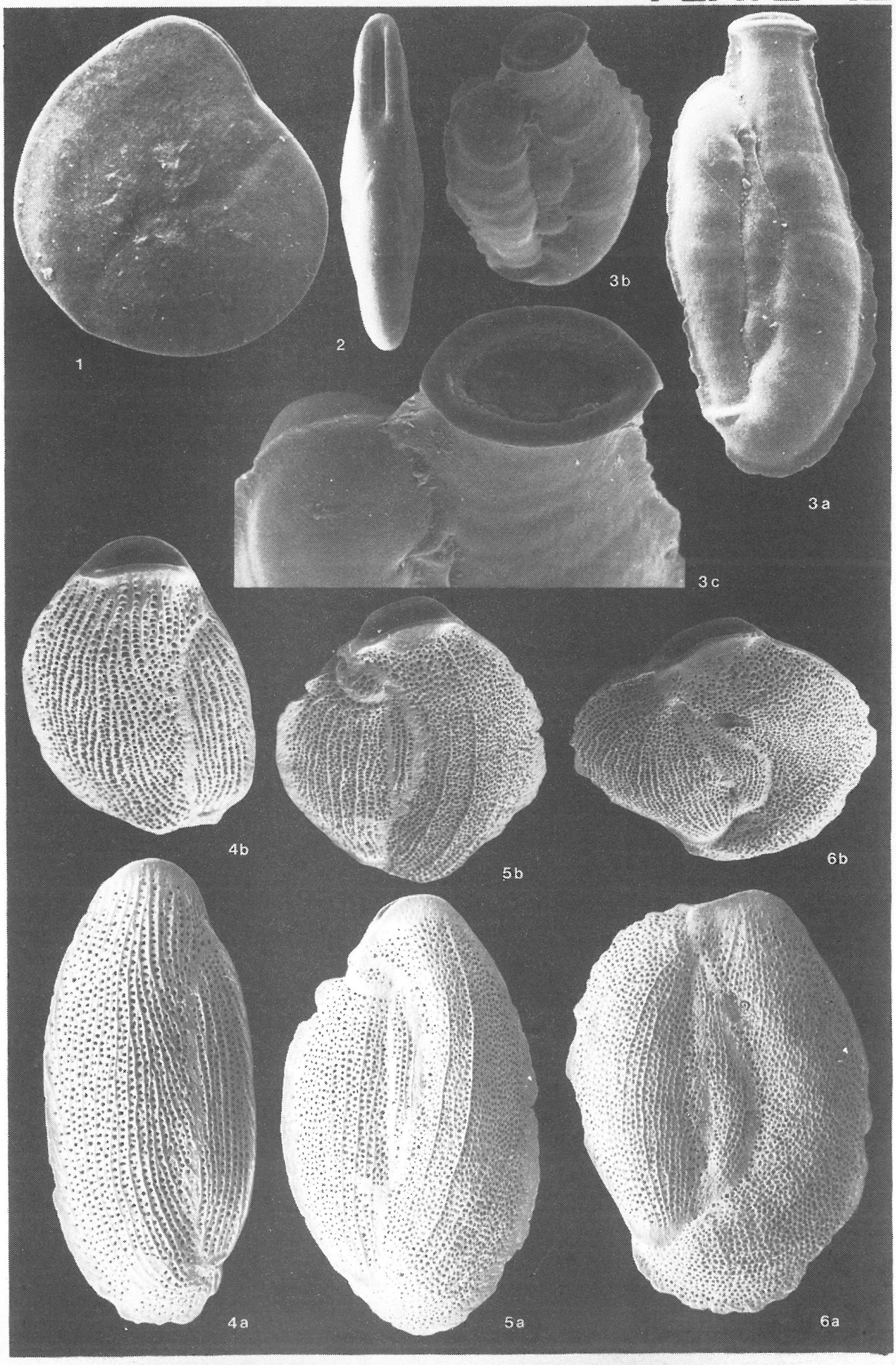

PLATE 13

Figs. 1 - 2 : Edentostomina durrandii (MILLETT)

Empty test, SW-part of the Lagoon (L 134). Fig. 1 : Lateral view (note straight suture, smooth test wall, ovate test outline and narrow keel) (X 111). Fig. 2 : Apertural view showing compressed test and large, toothless aperture (X 104).

Figs. 3 - 5 : Wiesnerella auriculata (EGGER)

Fig. 3 : Lateral view of empty test, Eastern Perireefal Area (L 59), showing ovate, keeled test with smooth test wall and assymmetrical toothless aperture surrounded by a pronounced peristomal collar (X 312).
Fig. 4 : Lateral view of opposite side, other specimen, Eastern Perireefal Area (L 94) (X 276).
Fig. 5 : Apertural view of other specimen, showing assymmetrical aperture and strongly compressed test. Eastern Perireefal Area (L 60) (X 360).

Figs. 6 - 8 : Nubeculina divaricata BRADY, var. advena CUSHMAN

The three specimens show the variation in size and nature of the grains adhering to the test wall. All kinds of mainly calcareous, badly sorted grains are used, including other foraminiferal tests and -fragments.
Figs. 6a-b : Empty test, Western Perireefal Area (L 98). Fig. 6a : Lateral view (X 67); fig. 6b : oblique apertural view (X 67).
Fig. 7 : Empty test, Eastern Perireefal Area (L 60), lateral view (X 65).
Fig. 8a-c : Empty test, Eastern Perireefal Area (L 60). Fig. 8a : Lateral view showing rather inflated ultimate chamber and obscured sutures (X 73); fig. 8b : oblique apertural view; note gastropod shell near the aperture (X 73); fig. 8c : detailed view of apertural area showing the rounded aperture with "inwardly pointing teeth", just beside the apex of the gastropod, on the right of the photograph (X 458).

PLATE 13

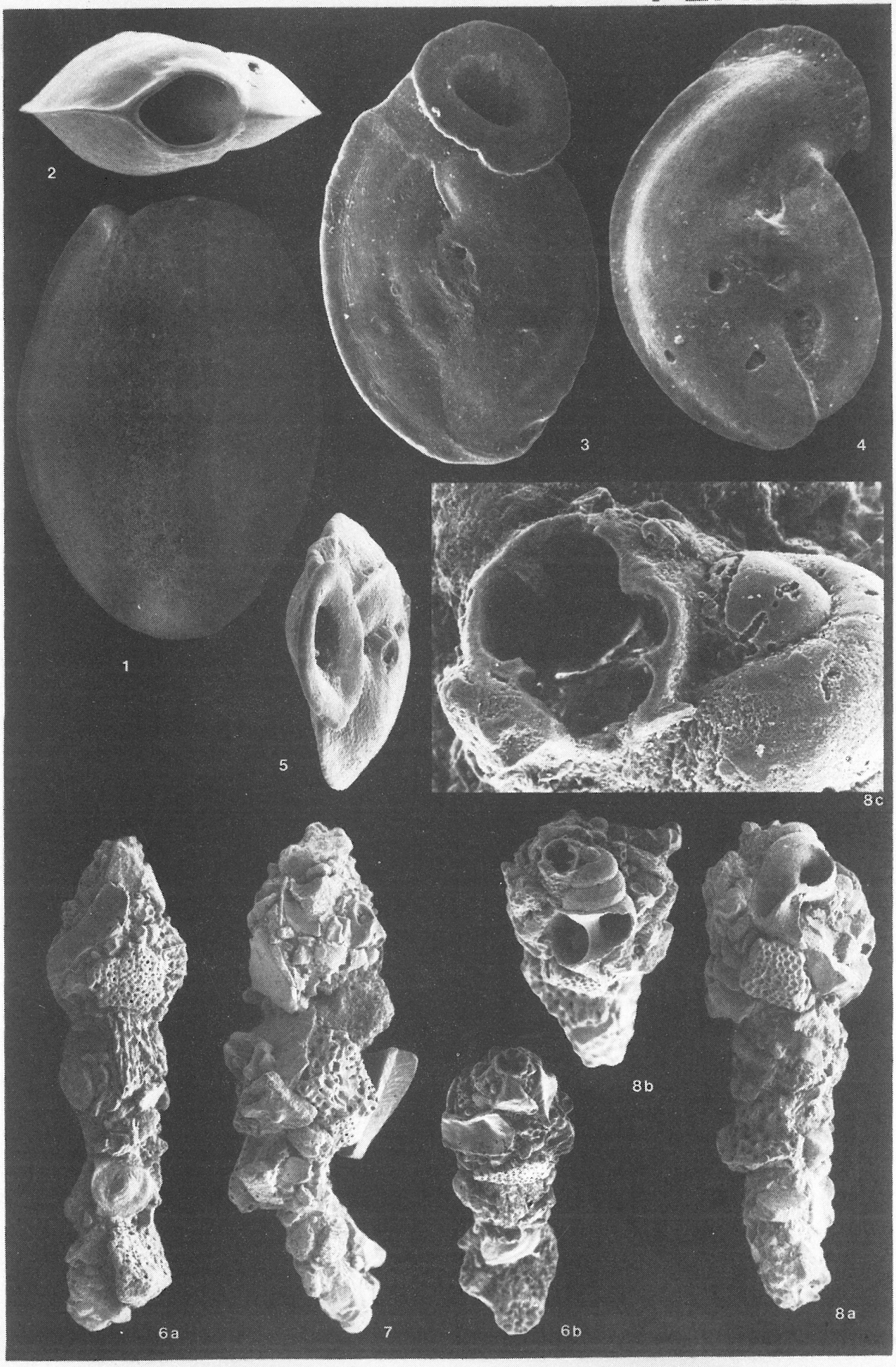

PLATE 14

Figs. 1 - 8 : Nodobacullariella japonica CUSHMAN & HANZAWA

Fig. 1 : Empty test, juvenile specimen ("N. convexiuscula"-type), Eastern Perireefal Area (L 82); lateral view, "involute" side (X 200). Fig. 2 : Id, Western Perireefal Area (L 98); lateral view of "evolute" side. Note assymmetrical aperture (X 154). Fig. 3 : Id, Eastern Perireefal Area (L 77); lateral view of somewhat larger specimen (X 144). Fig. 4 : Id, Eastern Perireefal Area (L 81), apertural view; note assymmetrical aperture and strong test compression (X 161). Fig. 5 : Empty test of juvenile specimen ("N. rustica"-type), Eastern Perireefal Area (L 81), lateral view of "evolute" side (X 152). Fig. 6 : Empty test of somewhat larger specimen ("N. convexiuscula"-type), Eastern Perireefal Area (L 81), lateral view; note broadly rounded test, strongly compressed, and narrow assymmetrical aperture (X 108). Fig. 7 : Empty test, adult specimen, Eastern Perireefal Area (L 81), lateral view; note uncoiling test and symmetrical aperture; the curved penultimate suture is indicative for an assymmetrical aperture in the juvenile stage (X 105). Fig. 8 : Adult, aberrant specimen, empty test, Eastern Perireefal Area (L 81), lateral view; growth has proceeded after test damage and the newly formed coil has left the main symmetry plane of the former coils (X 90).

Figs. 9 - 11 : Vertebralina striata d'ORBIGNY

Figs. 9a-b : Empty test, juvenile specimen, Eastern Perireefal Area (L 81). Fig. 9a : Lateral view (X 173); fig. 9b : apertural view of another specimen, same sample (L 81); note close-coiled test, assymmetrical aperture and moderately developed striation (X 141). Fig. 10 : Apertural view of other specimen, empty test, Eastern Perireefal Area (L 81) (specimen with almost symmetrical aperture) (X 154). Fig. 11 : Adult specimen, empty test, Eastern Perireefal Area (L 82); lateral view of "involute" side; note uncoiling test, ornamentation pattern developing from striate to more or less reticulate, and assymmetrical aperture (X 121).

PLATE 14



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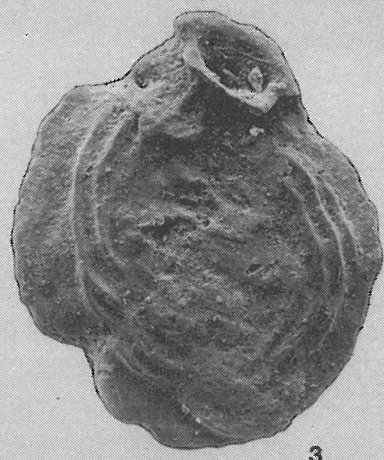

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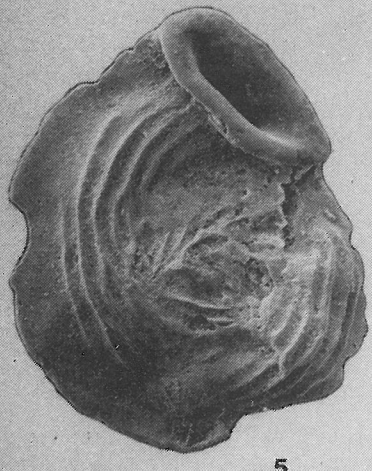

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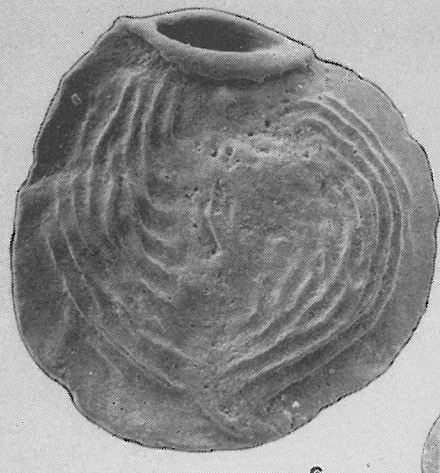

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8



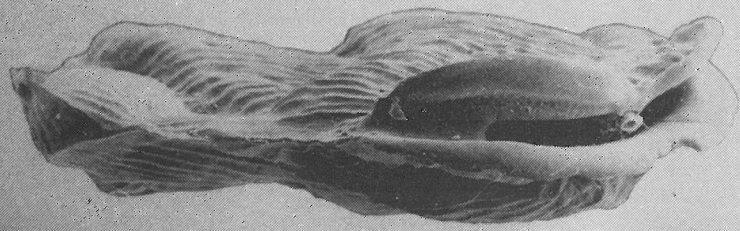
11



7



9b



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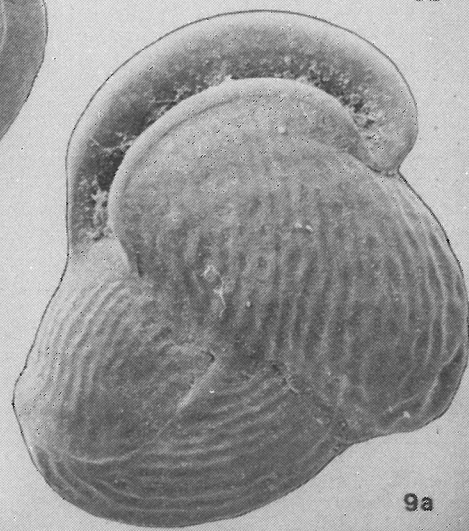


9a

PLATE 15

Fig. 1 : Vertebralina striata d'ORBIGNY

Empty test, adult specimen, Eastern Perireefal Area (L 71); lateral view of "involute" side; large specimen forming broad uncoiling chambers with complex, irregular striation patterns (X 113).

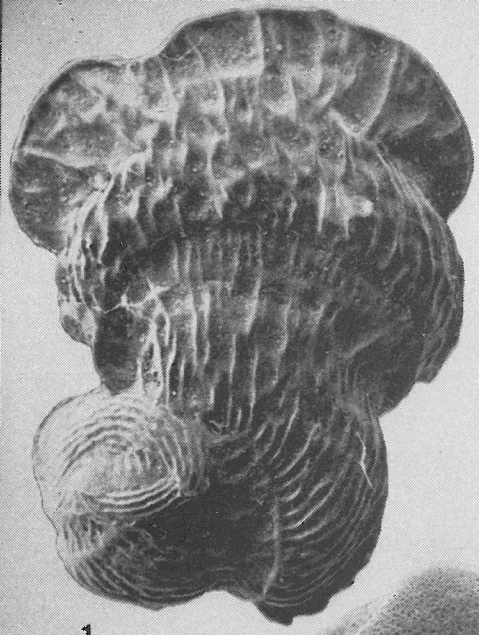
Figs. 2a-d : Monalysidium politum CHAPMAN

Empty test, adult (?) specimen, Western slope (L 110). Fig. 2a : Lateral view (broadly open end below, small aperture with "neck" on top) (X 188); fig. 2b : apertural view (X 188); fig. 2c : detail of last chamber : note rows of large pits in depressions on lateral chamber walls; smaller pits scattered over the apertural face; aperture on top of a short neck and provided with "flaps" (infolded parts of neck wall), and narrow peristome (X 852); fig. 2d : Detail of basal part of test (note broadly rounded opening provided with a grooved circumference) (X 642).

Figs. 3 - 4 : Peneroplis pertusus s.s. (FORSKÅL)

Figs. 3a-c : Empty test, Eastern Perireefal Area (L 86), typical example of the involute form. Fig. 3a : Oblique lateral view showing closed umbilicus and larger, shallow pits-in-rows surface ornamentation pattern (X 167); fig. 3b : edge-view showing broadly triangular apertural face with cribrate aperture (X 186); fig. 3c : detail of apertural face (note pattern of irregular small pits, cribrate aperture and narrow, smooth peristomes. Some diatoms are sticking to the test wall (X 458).
Figs. 4a-b : Equatorial section of an involute, megalospheric specimen, empty test, Eastern Perireefal Area (L 82). Fig. 4a : Complete section (note rather thick septa and successive apertures being conserved as stolons) (X 110); fig. 4b : detail showing embryonic apparatus consisting of globular proloculus and flexostyl, and early coils with apertures (stolons) remaining more or less simple (X 229).

PLATE 15



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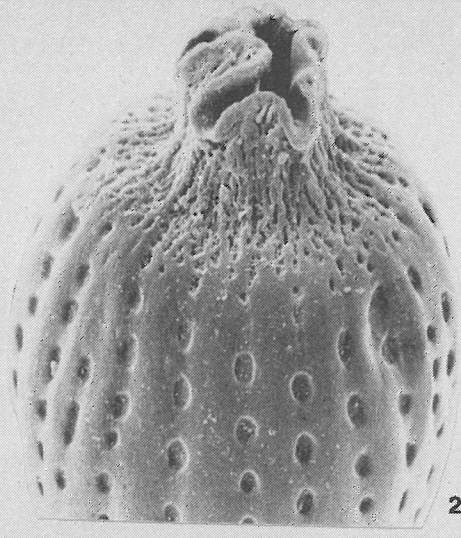

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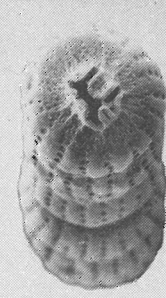

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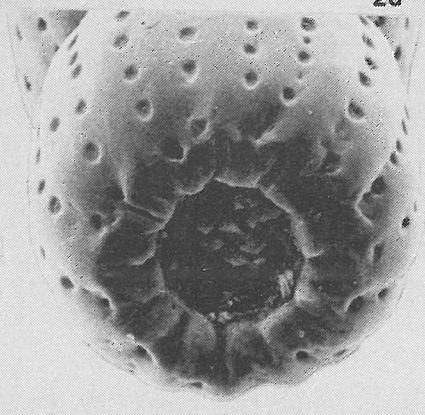

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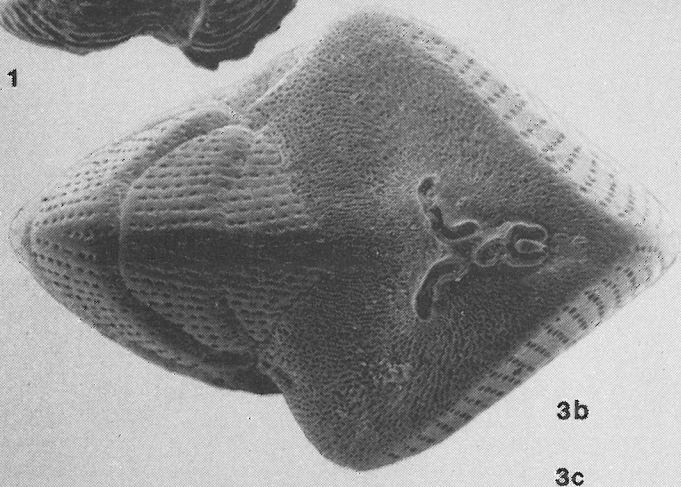

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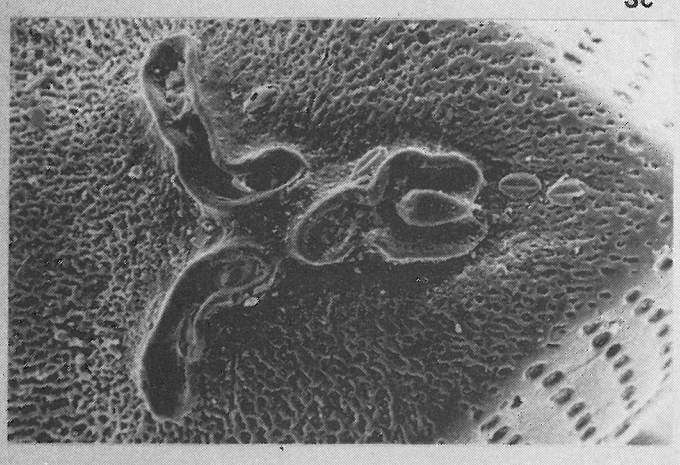

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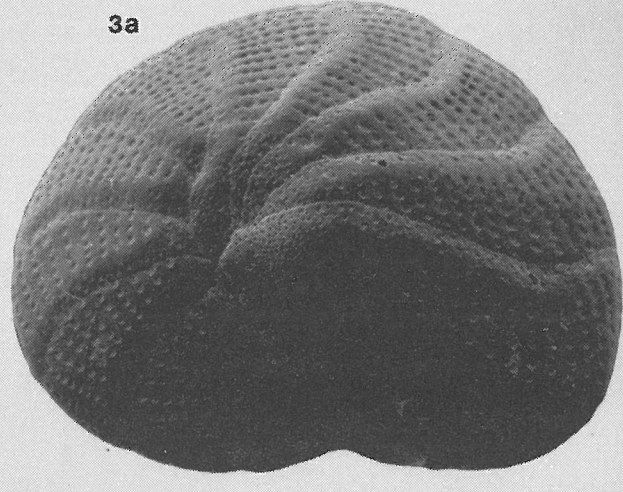

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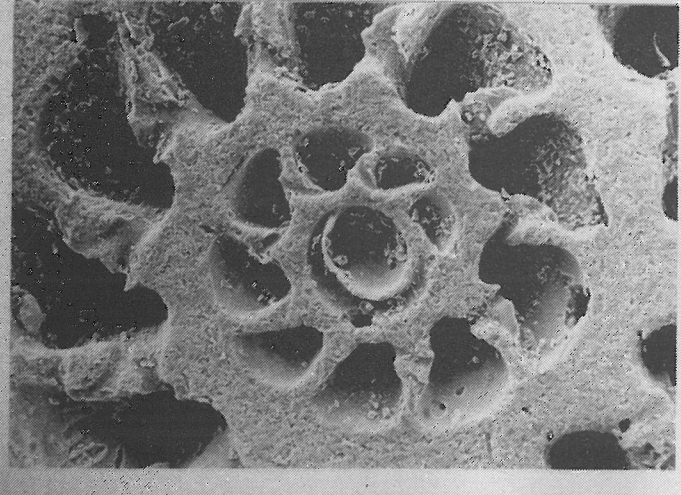

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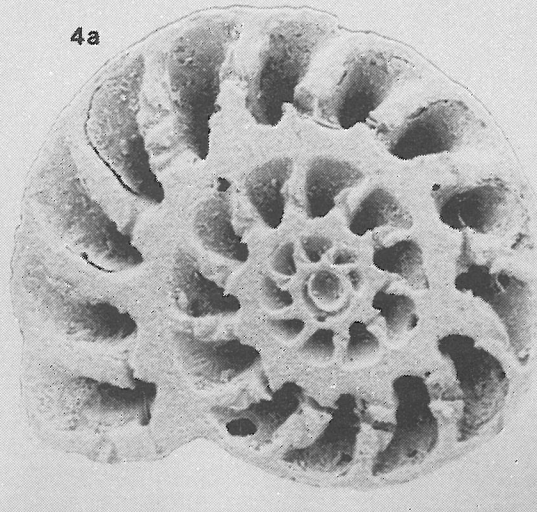


4a

PLATE 16

Figs. 1 - 4 : Peneroplis pertusus s.s. (FORSKÅL)

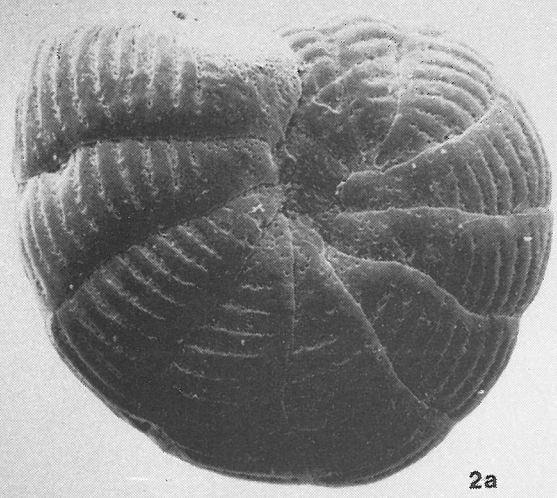
Fig. 1 : Detail showing last chambers, stolons and aperture of sectioned specimen figured on pl. 15, fig. 4 (X 259).

Figs. 2a-c : Empty test, evolute specimen, Eastern Perireefal Area (L 63). Fig. 2a : Lateral view (X 240); fig. 2b : oblique apertural view; note open umbilicus and single, invaginated aperture (X 270); fig. 2c : detail showing last chamber and apertural face of same specimen : note small pits-in-grooves surface ornamentation pattern, pitted and more or less ovate apertural face, and aperture with narrow, smooth peristome (X 489).

Figs. 3a-b : Empty test, evolute specimen, Eastern Perireefal Area (L 84). Fig. 3a : Oblique apertural view; note deep, open umbilicus and small pits-in-grooves surface ornamentation pattern; near the sutures however, larger, shallow pits appear (cf. specimen fig. 3, pl. 15) and the shape of the apertural face is intermediate between triangular and ovate (X 236); fig. 3b : lateral view (X 216).

Figs. 4a-b : Equatorial (slightly tangential) section of an evolute megalospheric specimen, empty test, Eastern Perireefal Area (L 82). Fig. 4a : Complete section showing same features as fig. 4, pl. 15 except for the more numerous, somewhat narrower chambers and thinner septa (X 106); fig. 4b : detail of embryonic apparatus and early coils; note the development of the successive apertures from simple rounded holes to more complex and larger apertures (stolons) with invaginating peristomes which are quite prominent from the 4th-5th chamber onwards. Due to the slightly tangential section the flexostyl has not been cut open (X 222).

PLATE 16



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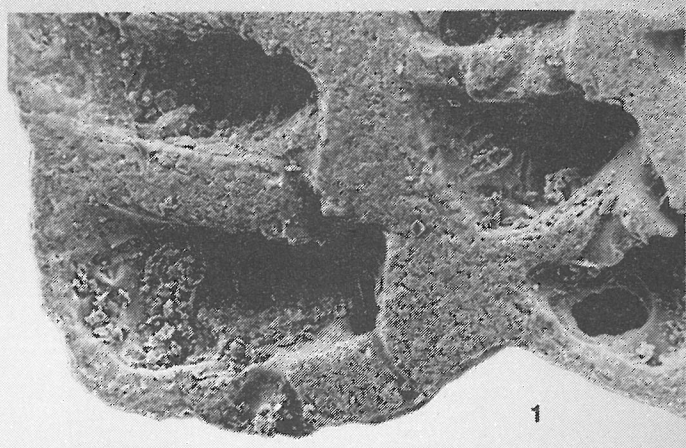

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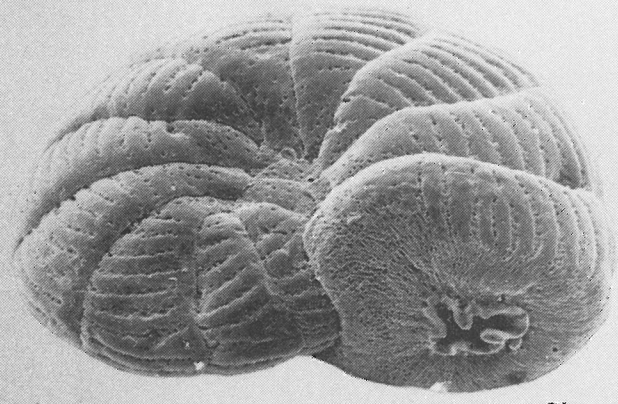

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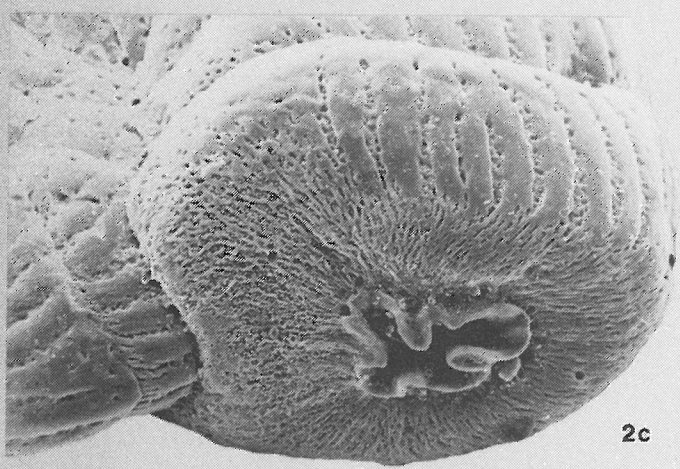
3a



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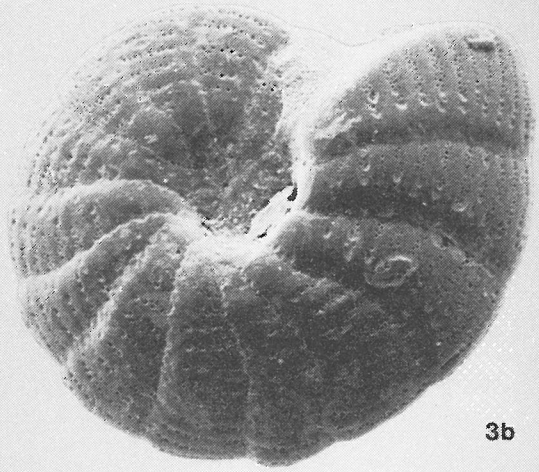

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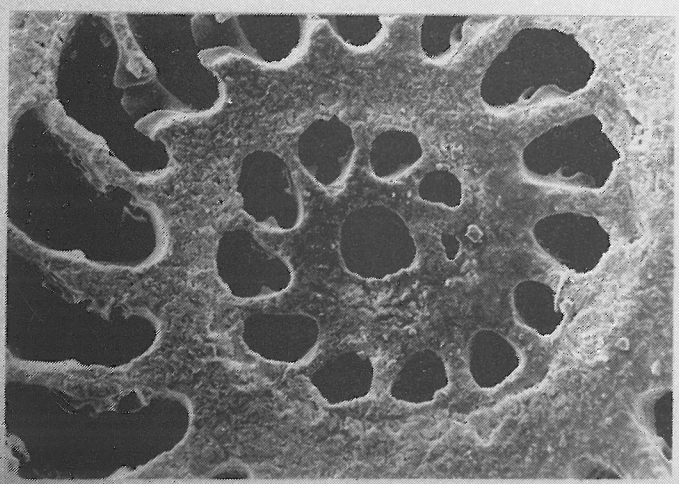

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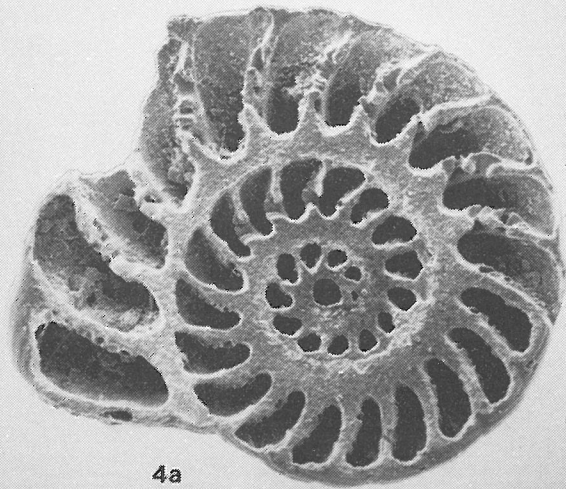


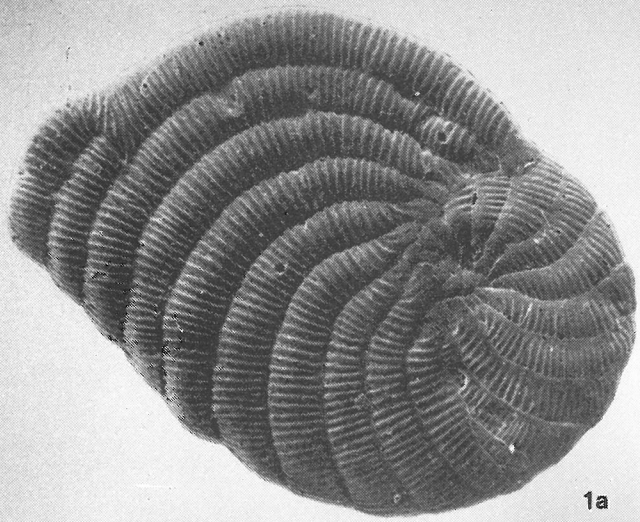
4a

PLATE 17

Figs. 1 - 4 : Peneroplis pertusus (FORSKÅL), subsp. planatus (FICHTEL & MOLL)

Figs. 1a-b : Empty test, reef flat, Windward Barrier (L 254); specimen with strongly flaring chambers. Fig. 1a : Lateral view (X 70); fig. 1b : oblique apertural view (note elongated apertural face with row of single, 8-shaped or doubled openings constituating the cribrate aperture) (X 70).
Fig. 2 : Lateral view of numerous-chambered, strongly flaring specimen, empty test, Northern Perireefal Area (L 56) (X 67).
Figs. 3a-b : Empty test of smaller specimen, North Point, foot of Fringing Reef (L 292). Fig. 3a : Lateral view (X 86); fig. 3b : oblique apertural view; here the cribrate aperture consists of single, elongated to 8-shaped openings (X 86).
Figs. 4a-d : Equatorial (slightly tangential) section of a megalospheric, living specimen, Coconut Fringing Reef flat (L 245). Fig. 4a : Complete section showing embryonic apparatus, numerous chambers and septa, and stolons; note thickening of the septa in the last half whorl where the chamber walls are extremely thin; within the chamber lumina, except for the three last-formed chambers, remnants of dried protoplasm can be seen (X 89); fig. 4b : detail showing ultimate and penultimate chambers with extremely smooth (very finely porous ?) inner surfaces (organic lining ?), and rows of apertures and stolons with hardly visible peristomes (X 224); fig. 4c : detail showing early-formed part of test; note features being perfectly comparable with those of P. pertusus s.s. (see pls. 15-16), except for the aperture becoming rapidly cribrate in planatus (X 214); fig. 4d : detail showing globular proloculus with rounded entrance to the flexostyl which has not been cut open because of the tangential sectioning; note extended peristomes (collars) around the stolons connecting the early chambers; these early stolons are somewhat tube-like and are placed in a peripheral septal position in the prolongation of the flexostyl. Later on they tend to migrate towards a mid-septal position (X 1026).

PLATE 17



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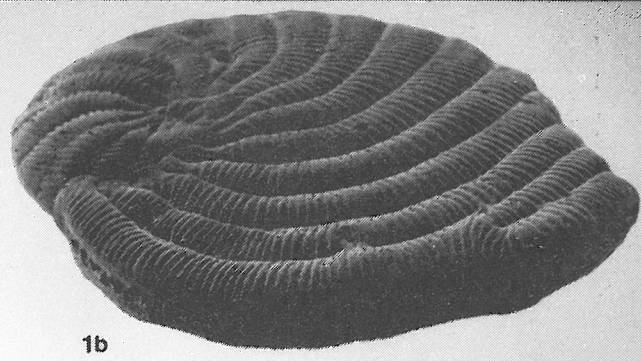

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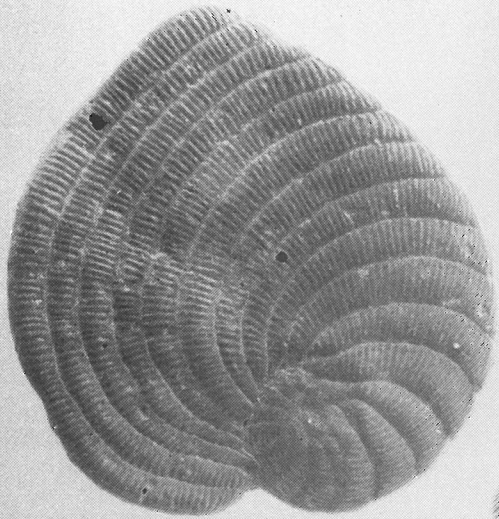

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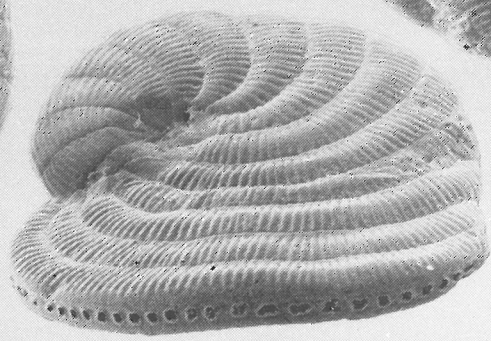

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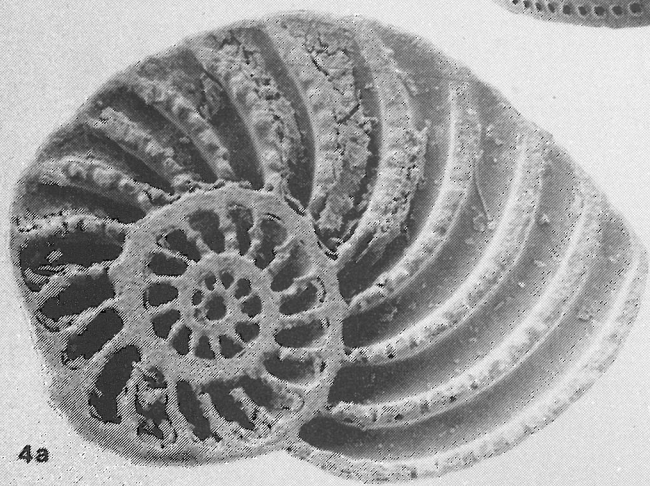

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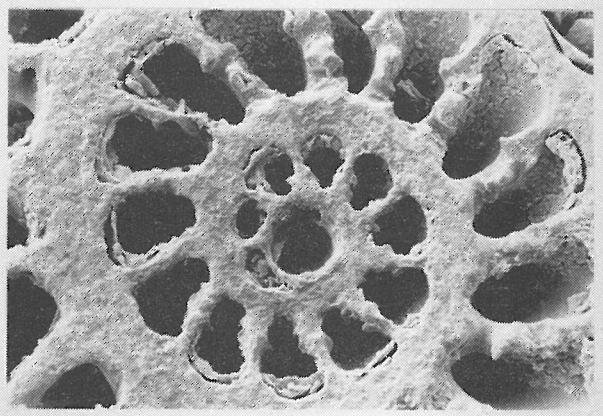

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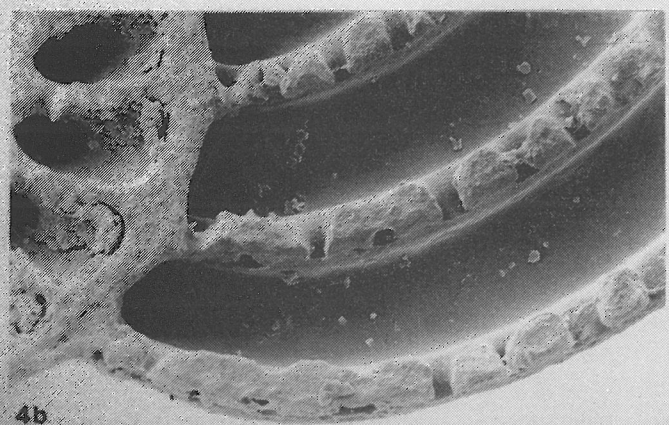

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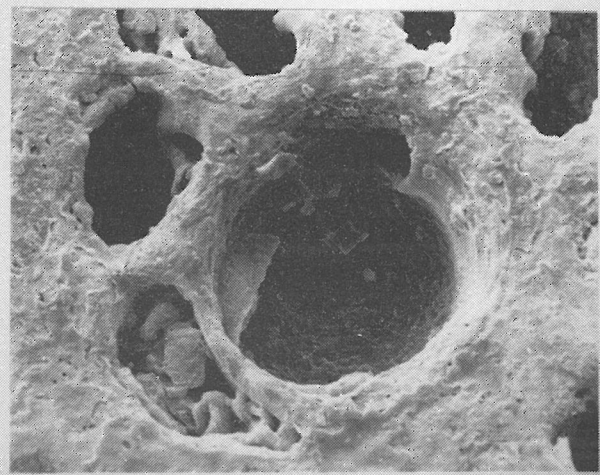


4d

PLATE 18

Fig. 1 : Peneroplis pertusus (FORSKÅL), subsp. planatus (FICHTEL & MOLL)

Lateral view of fused specimens; empty tests, Northern Perireefal Area (L 56) (X 97).

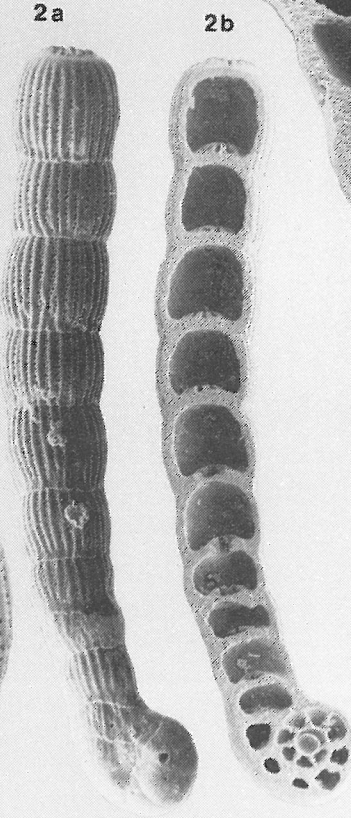
Figs. 2 - 3 : Peneroplis pertusus (FORSKÅL), subsp. acicularis (BATSCH)

Figs. 2a-f : Empty test; adult, megalospheric specimen, intertidal form, Sandy Shoal (L 144). Fig. 2a : Lateral view (X 81); fig. 2b : tangential section. The section is slightly oblique as to produce a tangential cut in the uniserial test portion and an almost equatorial cut in the planispiral test portion. It shows the thick, solid test walls and septa typical for the intertidal form. Note the long uniserial test portion, the few chambers in the planispiral test portion and the unaltered conservation of the successive apertures as stolons (X 81); fig. 2c : oblique apertural view of section, showing the "ontogeny" of the successive apertures evolving from a single rounded hole in the planispiral test portion via invaginated, irregular holes towards the rounded star-like pattern persisting throughout the major part of the uniserial test portion. Note the presence of several clumps of larger and smaller pyrite framboids adhering to the inner chamber wall surfaces (X 176); fig. 2d : close-up of such a pyrite framboid cluster sticking to the inner chamber wall surface, the microstructure of which can be perceived in the background (X 2269); figs. 2e-f : views of sectioned and non-sectioned last chamber and apertural face; note the star-like aperture with narrow, smooth peristome, the pitted surface of the apertural face and the smaller pits-in-grooves surface ornamentation pattern. The section of the chamber wall (fig. 2e) shows the surface pits penetrating sometimes as deep as half the thickness of the wall. Fig. 2e : X 287, fig. 2f : X 312; fig. 2g : same section, planispiral test portion showing globular proloculus with completely sectioned flexostyl (note the latter to enlarge slightly in the coiling direction), the few chambers in this portion and the single, tube-like stolons with pronounced collars. Some pyrite framboids can be seen in the chamber lumina (X 264).
Fig. 3 : Empty test, juvenile specimen of the intertidal form, Lagoon (slope towards Sandy Shoal) (L 151). Note involute coil (X 250).

PLATE 18



1



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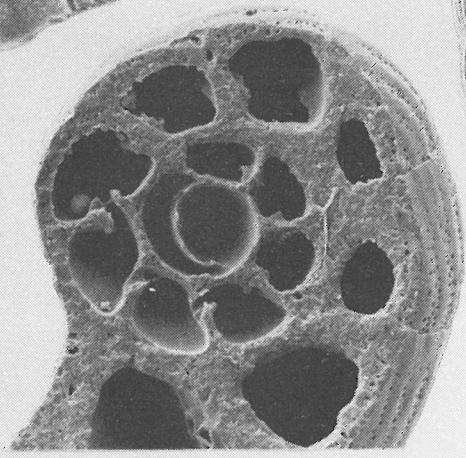

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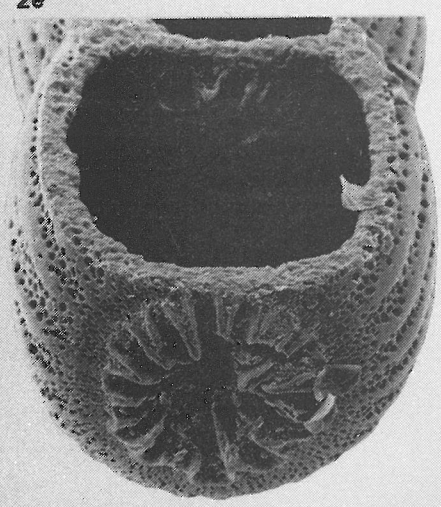

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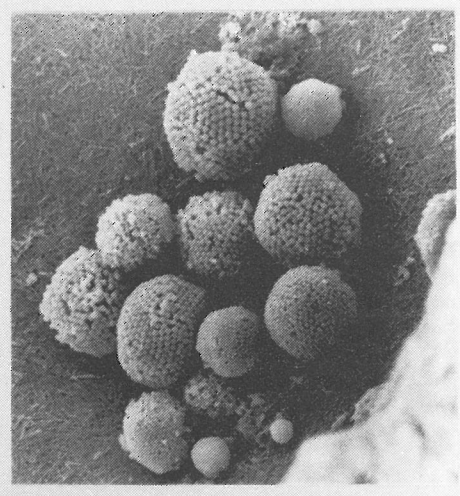

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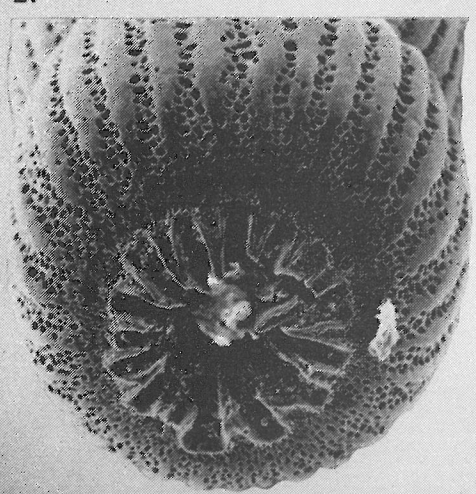

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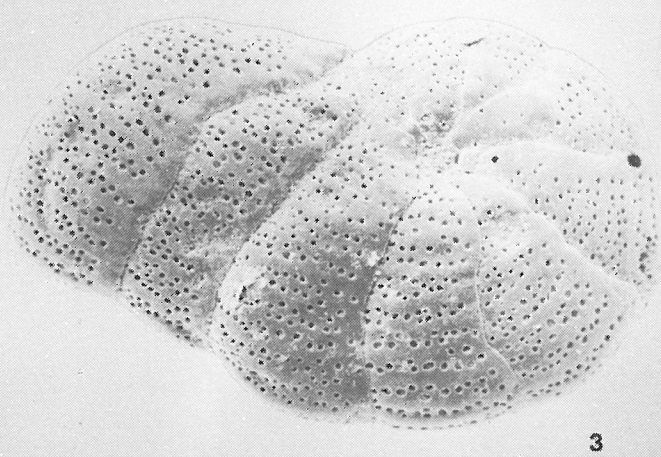


3

PLATE 19

Figs. 1 - 2 : Peneroplis pertusus (FORSKÅL), subsp. acicularis (BATSCH)

Figs. 1a-g : Empty test; adult, megalospheric specimen, subtidal form, leeward slope (L 100). Fig. 1a : Lateral view (note small, involute initial planospire) (X 94); fig. 1b : oblique apertural view, (note test compression) (X 94); fig. 1c : detail of last chamber and apertural face showing characteristic though slightly compressed acicularis-aperture (compare with fig. 2f, pl. 18 (X 481); fig. 1d : same specimen, equatorial section (slightly oblique : the planospire has been tangentially cut); the structure is identical with that of the intertidal form (see pl. 18) but the test is more fragile (litterally : the test has been broken during sectioning); the chamber walls as well as the septa are very thin, at least in the uniserial test portion (X 102); fig. 1e : same section, oblique view upon planispiral and part of the uniserial test portion (compare with fig. 2c, pl. 18) (X 157); fig. 1f : same section, detailed view upon the tangentially-cut initial planospire (compare with fig.2g,pl. 18) (X 444); fig. 1g : oblique view upon part of the planispiral portion of the same section : the proloculus can be seen in the upper left hand corner of the photograph. Note simple, rounded stolons in the first coil and the more invaginated ones in the second one (lower right hand corner of the photograph) (X 818).
Figs. 2a-c : Living specimen, same sample (L 100). Fig. 2a : lateral view; note pronounced grooves in test wall, limbate sutures and twinned planispiral test portion (X 157); fig. 2b : detailed view upon last chamber (note characteristic but compressed and less complexly invaginated aperture, smaller pits-in-grooves test surface ornamentation and pit-less sutures) (X 487); fig. 2c : oblique apertural view; note compressed test (X 173).

Figs. 3a-b : Peneroplis pertusus (FORSKÅL), subsp. arietinus (BATSCH)

Empty test, adult specimen, Eastern Perireefal Area (L 84). This specimen, showing traces of perforation and abrasion, shows the largest number of chambers (5) in the uniserial portion I have met in this variant in the Lizard Island samples. Fig. 3a : Lateral view (note numerous chambers and evolute planospire) (X 94); fig. 3b : oblique apertural view (note strong test compression except for the ultimate chamber showing a tendency to be less compressed; the aperture is the characteristic arietinus-aperture (double row of elongate- to 8-shaped openings) (X 94).

PLATE 19

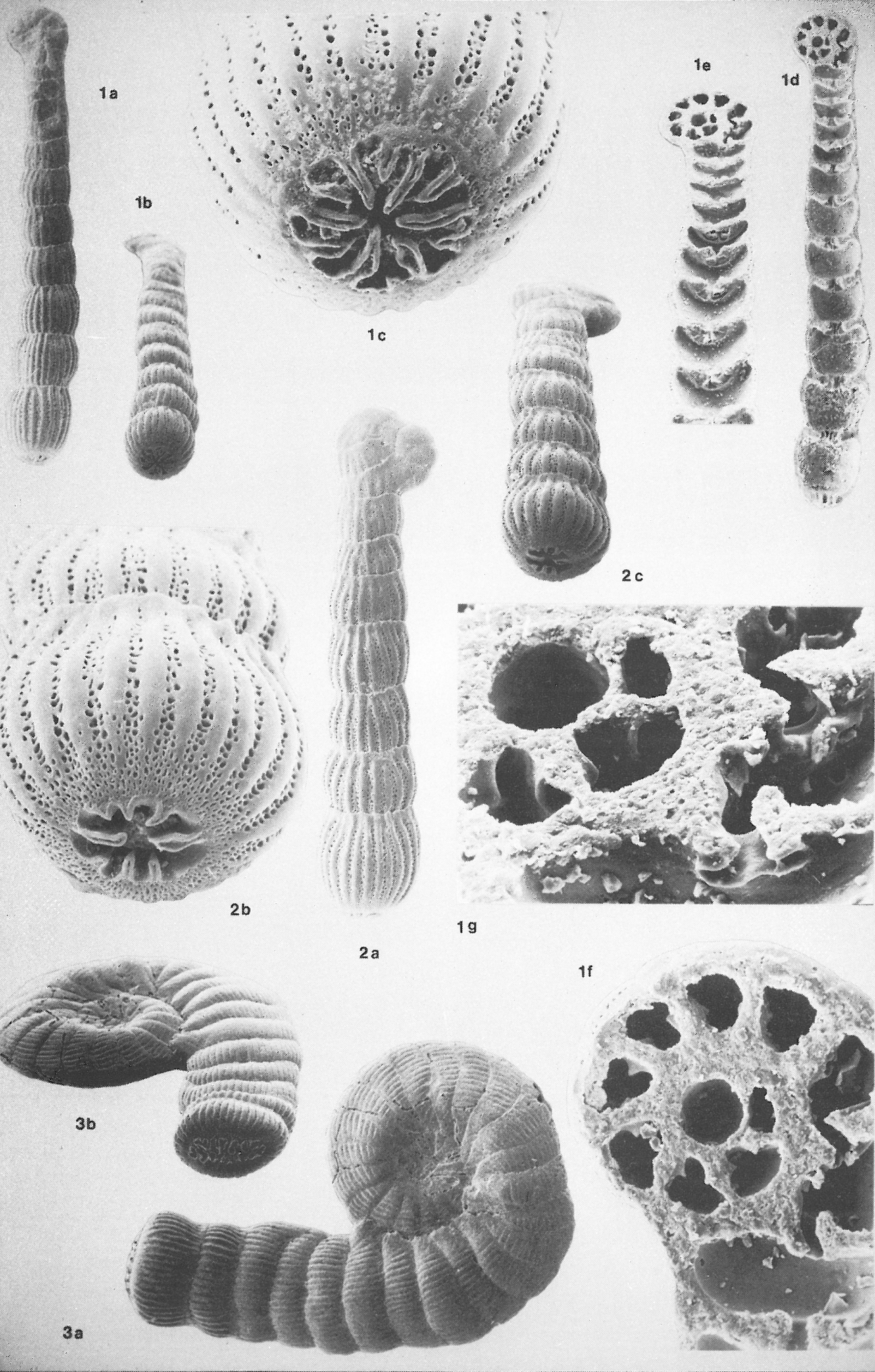


PLATE 20

Figs. 1 - 4 : Peneroplis pertusus (FORSKÅL), subsp. arietinus (BATSCH)

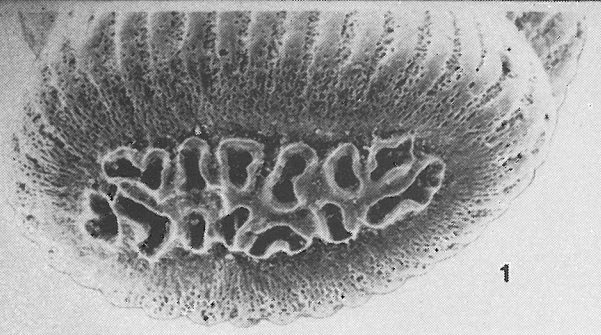
Fig. 1 : Close-up of apertural face of the specimen figured on pl. 19, fig. 3; note pitting, and openings in a double row, surrounded by narrow, smooth peristomes (X 290).

Figs. 2a-b : Empty test of close-coiled specimen, Eastern Perireefal Area (L 84). Fig. 2a : Lateral view (note evolute test and numerous chambers) (X 85); fig. 2b : oblique apertural view (note test compression and characteristic arietinus-aperture with openings in a double row) (X 85).

Figs. 3a-c : Empty test, adult specimen, Eastern Perireefal Area (L 82). Fig. 3a : Lateral view showing less evolute test with uncoiling chambers (X 77); fig. 3b : oblique apertural view (note strong test compression throughout) (X 77); fig. 3c : close-up of final chamber of same specimen showing compressed apertural face and aperture (double rows of elongate single openings, reminiscent of planatus) (X 205).

Figs. 4a-d : Equatorial section of empty test, Eastern Perireefal Area (L 82). Fig. 4a : Complete section; note numerous chambers and apparition of the typical arietinus-aperture from about the third volution onwards (successive apertures conserved as stolons) (X 73); fig. 4b : oblique view showing stolon development and thin chamber walls (X 73); fig. 4c : detail showing embryonic apparatus (protoconch with flexostyl) and early coils of planispiral test portion (note stolon development) (X 232); fig. 4d : close-up of proloculus and flexostyl (note very thin wall separating them) (X 909).

PLATE 20



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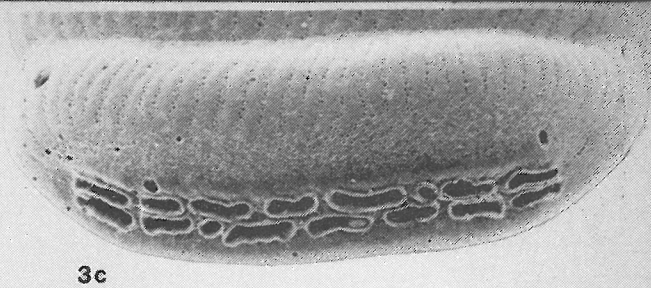
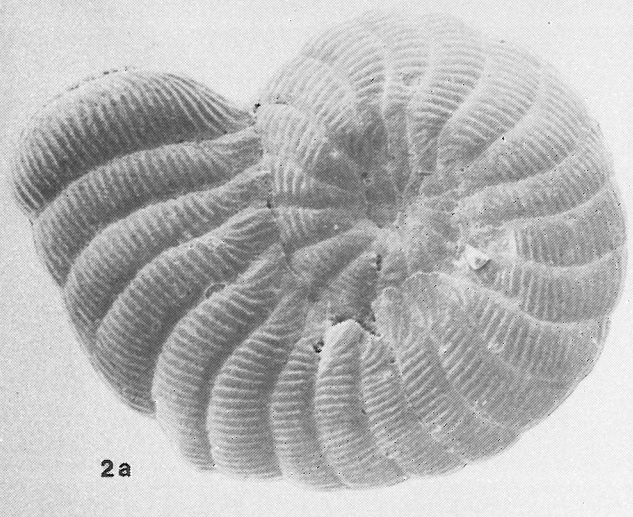


3c



3b

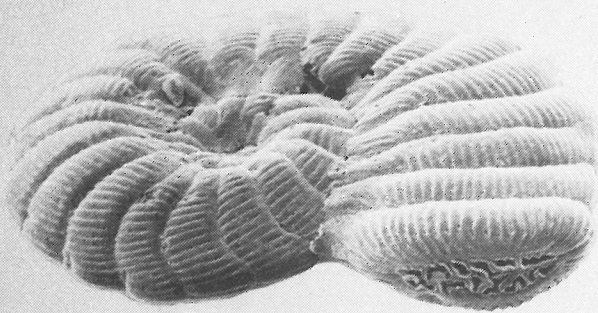


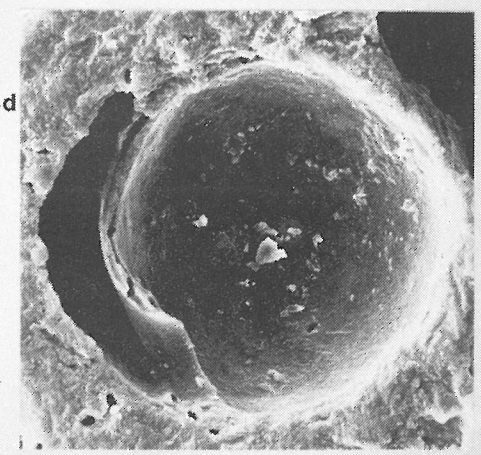
2a

3a



2b



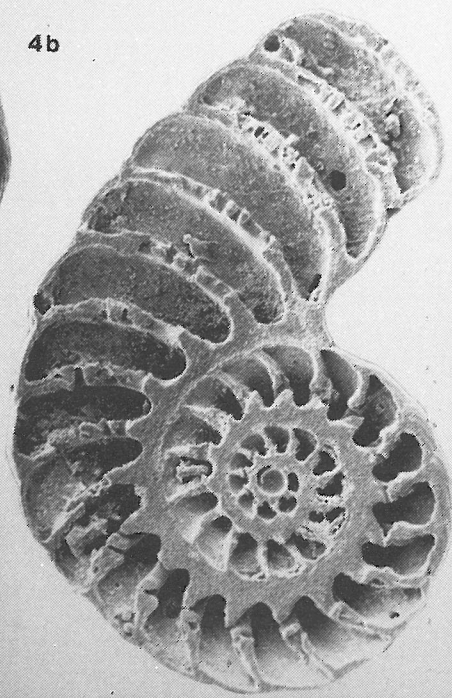


4d

4b



4a



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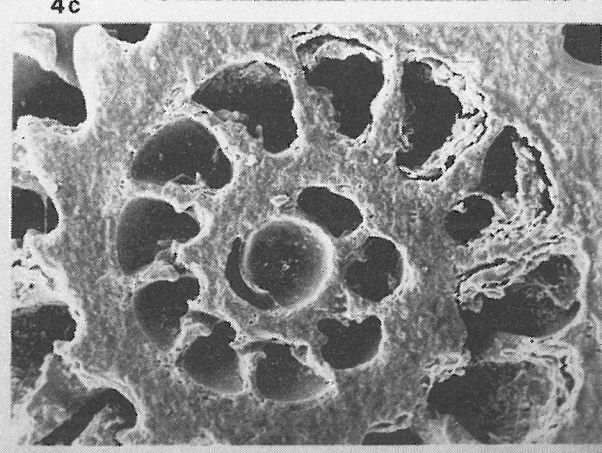


PLATE 21

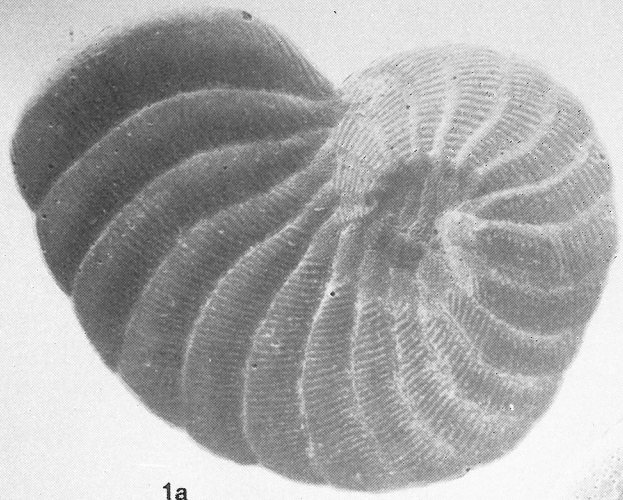
Figs. 1a-b : Peneroplis pertusus (FORSKÅL), subsp. arietinus (BATSCH)

Empty test, Eastern Perireefal Area (L 84). Specimen intermediate between subsp. planatus and subsp. arietinus, showing only a tendency towards uncoiling.
Fig. 1a : Spiral view (X 66); fig. 1b : oblique apertural view (X 70).

Figs. 2 - 3 : Sorites discoideus (FLINT)

Figs. 2a-b : Juvenile specimen, empty test, North Point (foot of fringing reef - L 292), showing only a spiral chamber series. Fig. 2a : Spiral view (X 210); fig. 2b : oblique edge view (X 226).
Figs. 3a-e : Larger specimen, empty test, transitional facies Windward Barrier - Lagoon (backreef structures - L 253).
Fig. 3a : Lateral view showing spiral chamber series and one complete annular chamber (X 105); fig. 3b : id, detail showing early part of spiral chamber series (note involute early coil, embracing chambers, pitting of the chamber walls and somewhat limbate, pit-less sutures) (X 231); fig. 3c : detail of edge view (note pitting of chamber walls, rounded periphery and single row of oval apertures) (X 253); fig. 3d : detail of early coil showing rough pitting, smooth sutures and embracing chambers (X 975); fig. 3e : detail of margin showing pitted marginal face and oval apertures surrounded by peristome-like pit-less areas (X 1067).

PLATE 21



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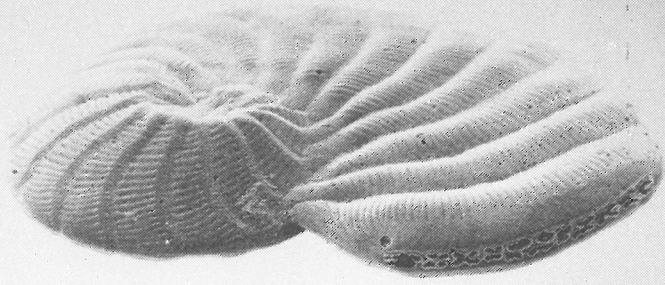

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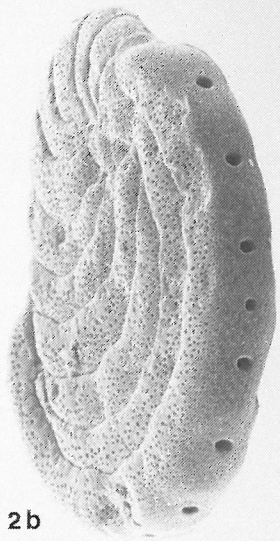

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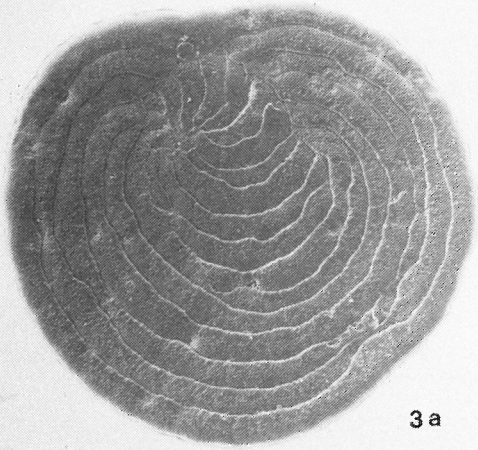

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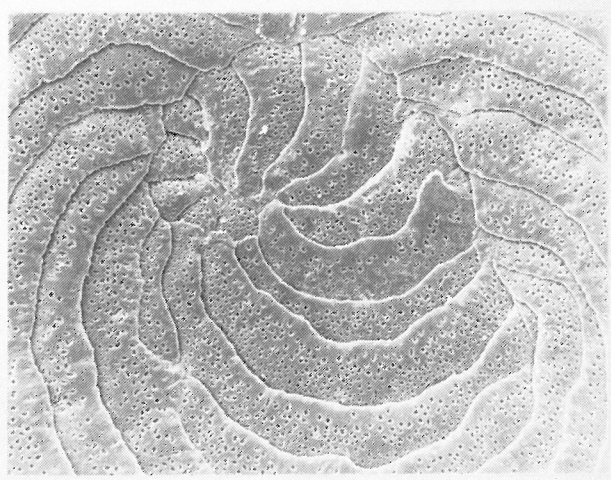
3b



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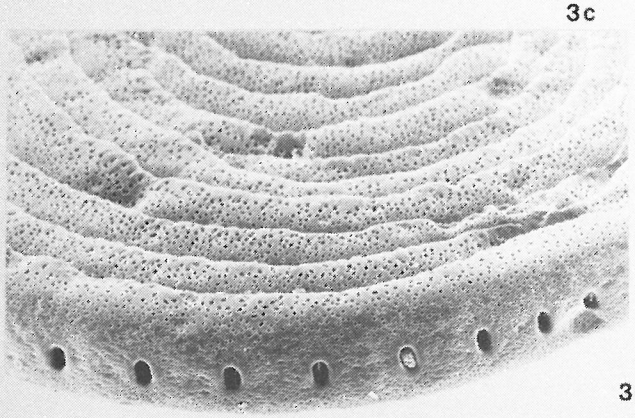

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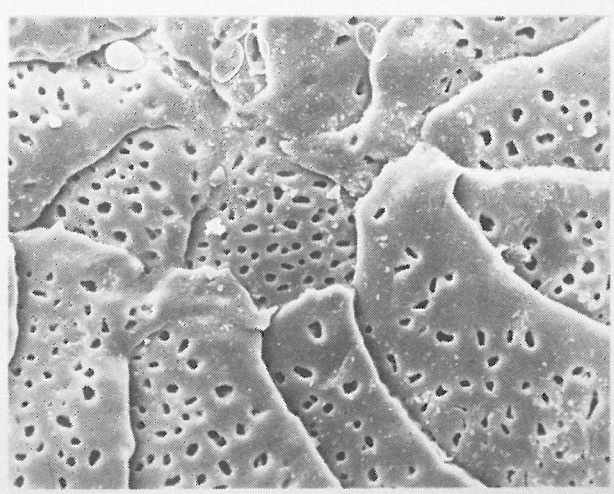

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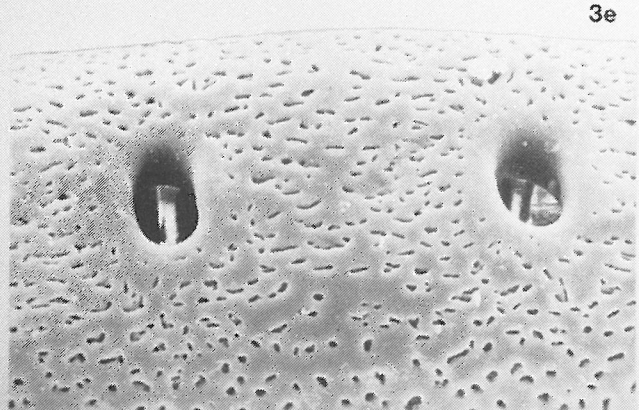
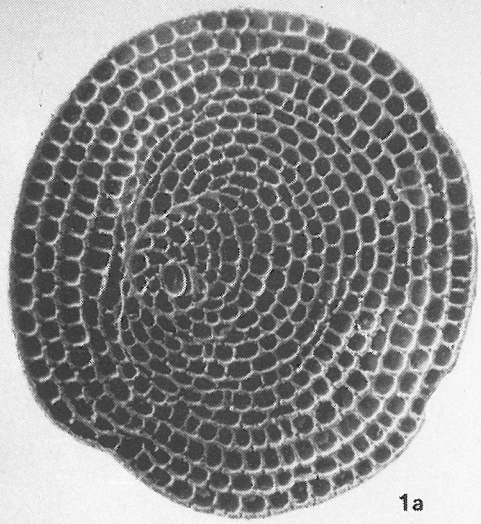


PLATE 22

Figs. 1 - 2 : Sorites discoideus (FLINT)

Figs. 1a-d : Equatorial section of empty test, A-form, transitional area between patchreefs and leeward slope (L 105).
Fig. 1a : Entire section showing embryonic apparatus, peneropline-, spiral-, and annular stages. Note regular structure, thin septa and septula (X 62); fig. 1b : close-up of early coil (note stolon system) (X 242); fig. 1c : close-up of embryonic apparatus showing proloculus, compressed flexostyle and two peneropline chambers. Note stolons with peristome, and typical T-pattern formed by septum partition with thickened ends (peristomes) and septulum (X 517); fig. 1d : detail of margin showing apertures and some chamberlets of two last-formed annular chambers. Note stolons and peristomal thickenings of septa in centripetal direction. There is no visible trace of eventual pores passing completely through the test wall (X 472).
Figs. 2a-d : Empty test, specimen from the Bahamas (Andros Island, sample GCX, reefal barrier off Fresh Creek - coll. MONTY).
Fig. 2a : Lateral view showing spiral- and annular chamber series (compare with fig. 3a, pl. 21) (X 46); fig. 2b : id, enlargement showing spiral chambers. Note involute coil and chamber wall pitting (X 140); fig. 2c : part of edge view. Note rounded periphery : the apertures are stretched out and flattened (contrary to our Pacific specimens) and lie in a median depression (X 234); fig. 2d : detail of margin; note elongate, flattened apertures with more pronounced peristomes, and pitting of the apertural face (X 1076).

PLATE 22



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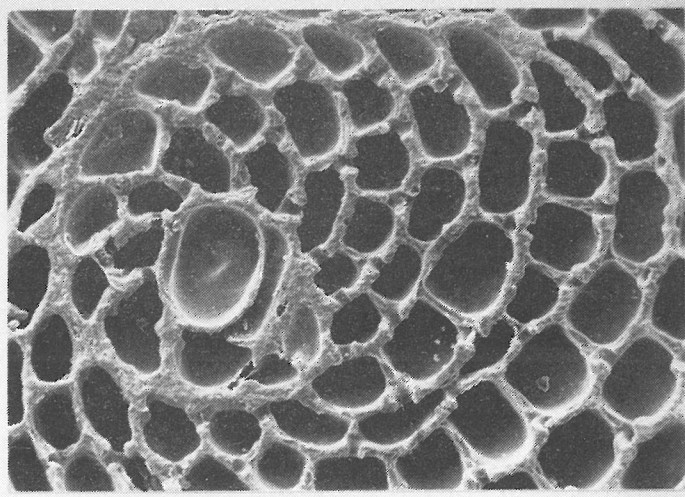
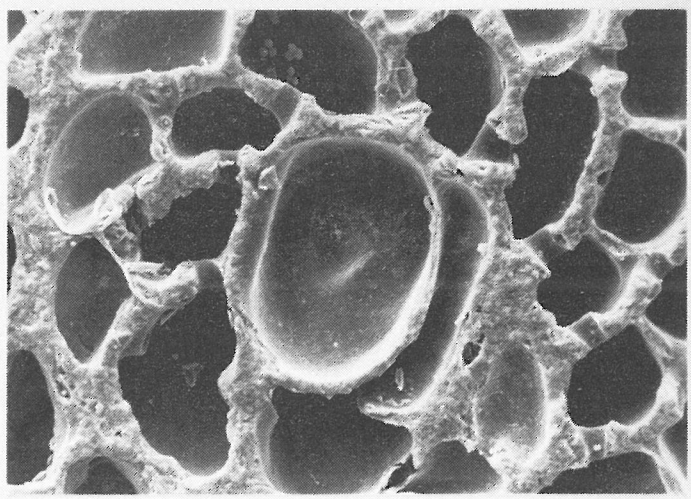


1b



2a

1c



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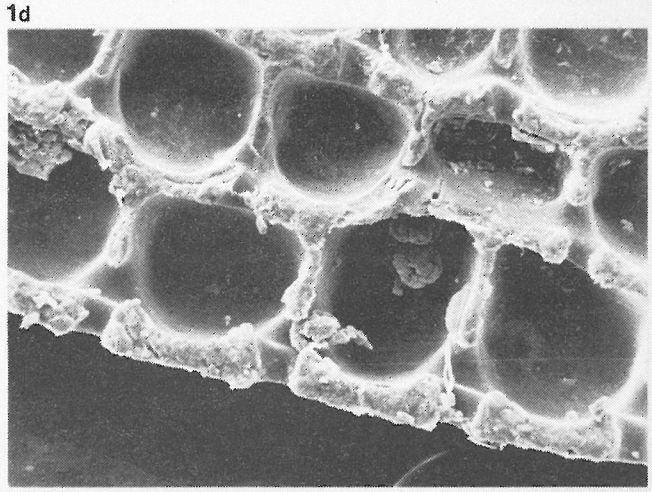

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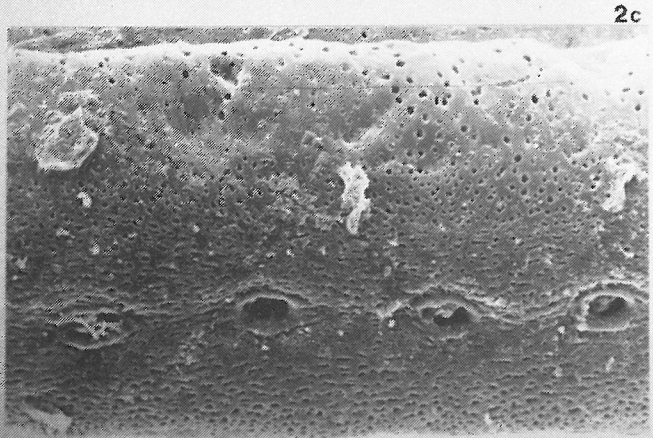

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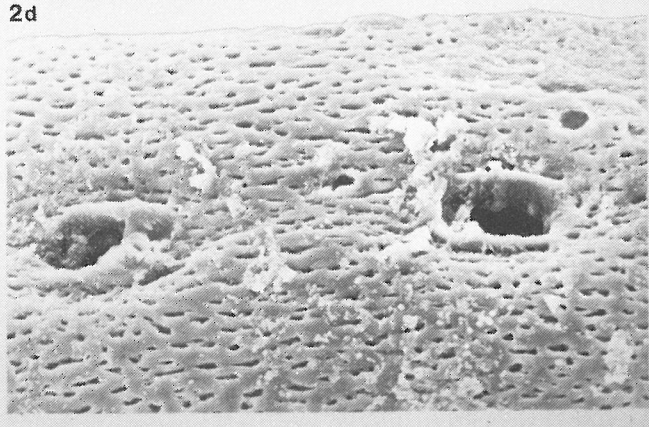


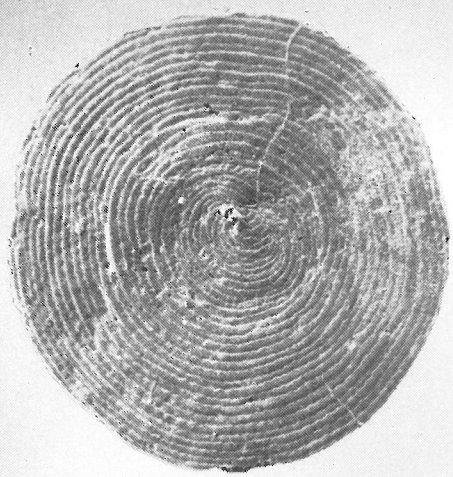
PLATE 23

Figs. 1a-i : Sorites discoideus (FLINT)

Large, adult specimen, empty test, transitional zone patchreefs - leeward slope (L 105).

Fig. 1a : Lateral view showing spiral- and annular chamber series (X 28); fig. 1b : part of edge view showing rounded periphery and oval apertures (X 225); fig. 1c : close-up of central part of test, showing early coil (note embracing chambers and chamber wall pitting (X 247); fig. 1d : same specimen, (more or less) equatorially sectioned; part of the test has broken away and due to undulation of test, some parts of the lateral chamber walls have not been removed by the sectioning process (X 27); fig. 1e : same section, central part of test showing peneropline- and part of spiral chamber series; the embryonic apparatus is slightly out of the spiral coiling plane (X 227); fig. 1f : close-up of central part of same section, tilted to show elongate stolons (annular connection). Note peristomes in centripetal direction only (X 446); fig. 1g : close-up of embryonic apparatus of same section, showing proloculus, flexostyle channel (normal to the section plane - note stolon connecting protoconch and flexostyle), and five peneropline chambers (X 477); fig. 1h : same section, close-up of part of the annular chamber series (centripetal view); note septa, septula and oval stolons without peristomes seen from this side (X 512); fig. 1i : id, centrifugal view; note stolons with peristomes seen from this side; here the section has cut through the stolons and the formation of the T-pattern is shown (X 461).

PLATE 23



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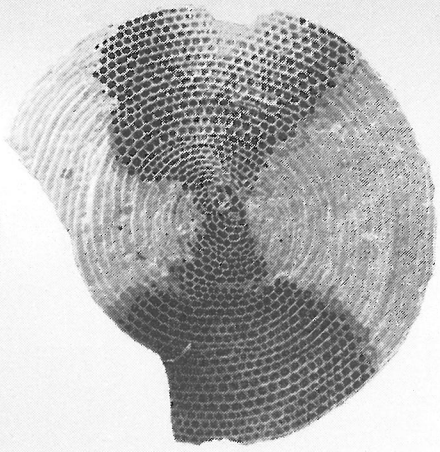

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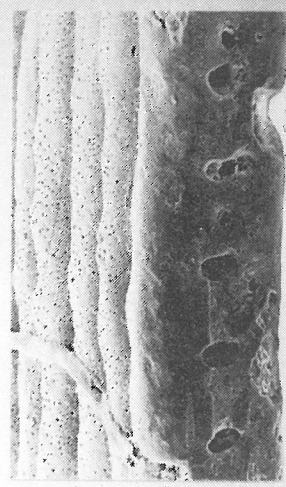
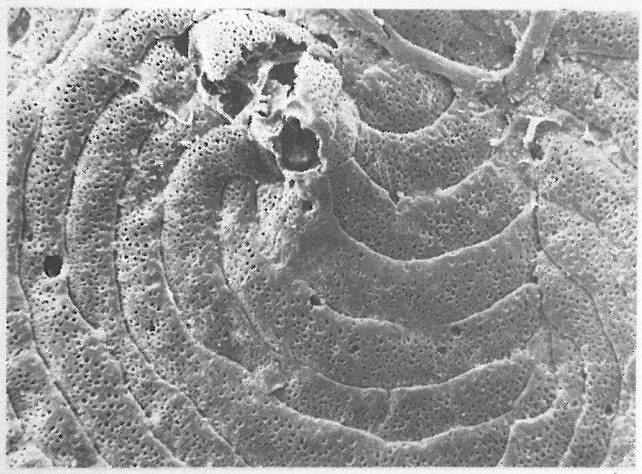


1b



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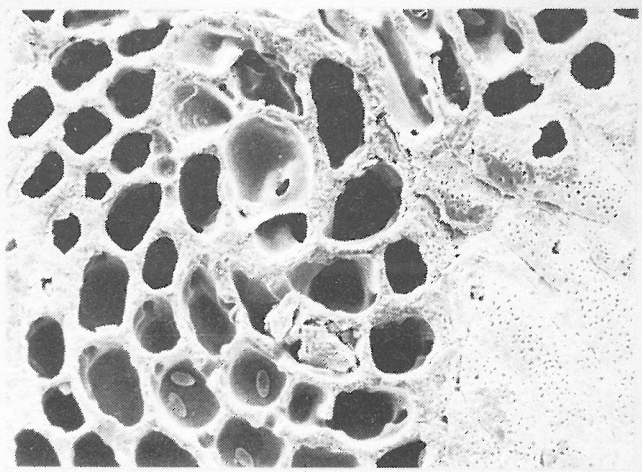

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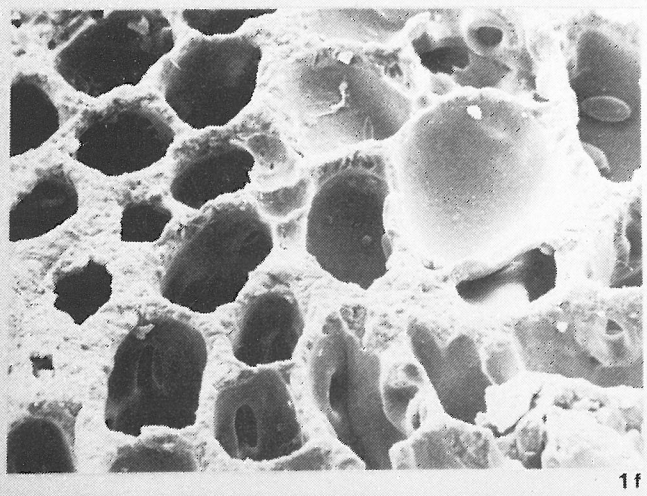

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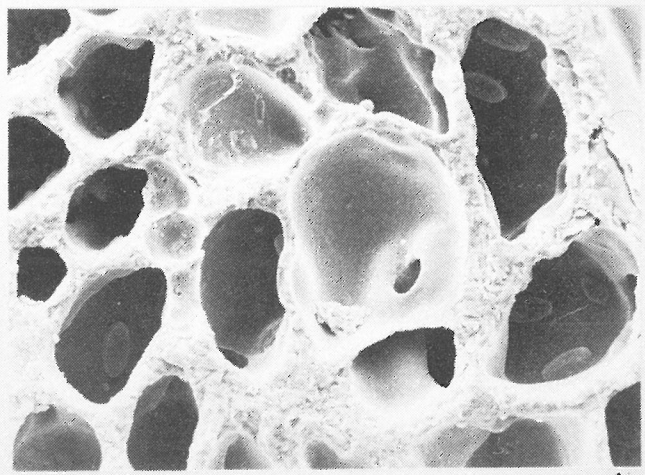

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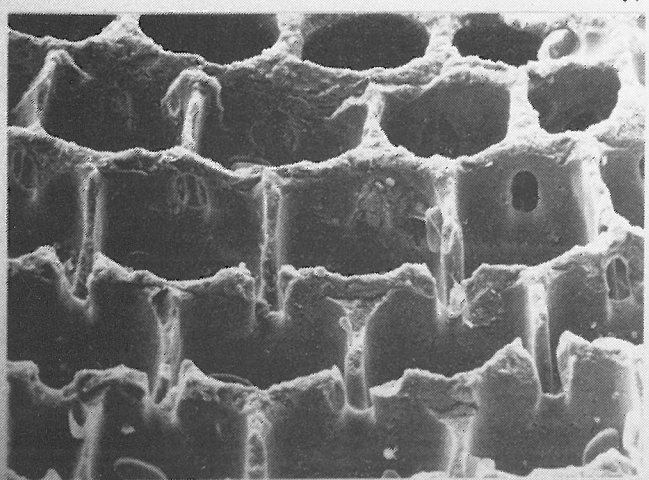

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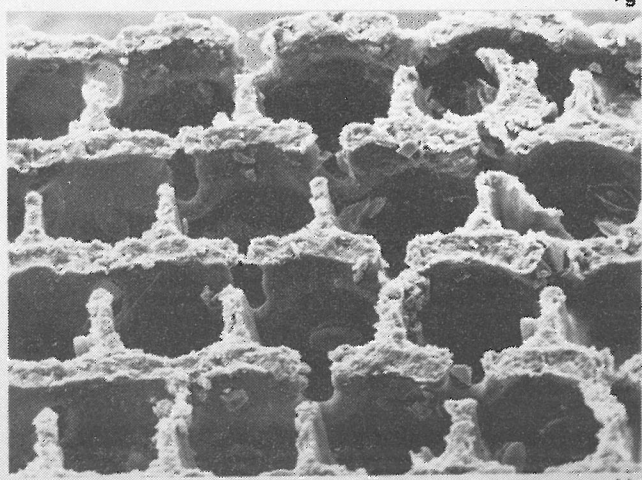


1i

PLATE 24

Figs. 1a-f : Sorites discoideus (FLINT)

Empty test, microspheric specimen (B-form) with traces of broken-off breeding chambers. Transitional zone patchreefs-leeward slope (L 105). Fig. 1a : Lateral view, showing spiral- and annular chamber series. The last-formed (breeding) chambers are broken-off. Note slight inflation of chamberlets in the 3-4 last-formed annular chambers (X 45); fig. 1b : close-up of lateral test wall near the edge, showing sutures and pitting of the test wall (X 237); fig. 1c : close-up of part of edge showing traces of chamberlets of breeding-chambers; here the stolons are large and irregular (X 218); fig. 1d : detail showing early, involute coil (X 254); fig. 1e : same specimen equatorially sectioned; the section shows essentially the same features as fig. 1a, pl. 22 except for the embryonic apparatus (X 45); fig. 1f : same section; detailed view upon early chamber arrangement; the section does not cut completely through the small proloculus but the first peneropline chambers (± 10 à 13) can be seen as well as the well-developed spiral chamber series (X 273).

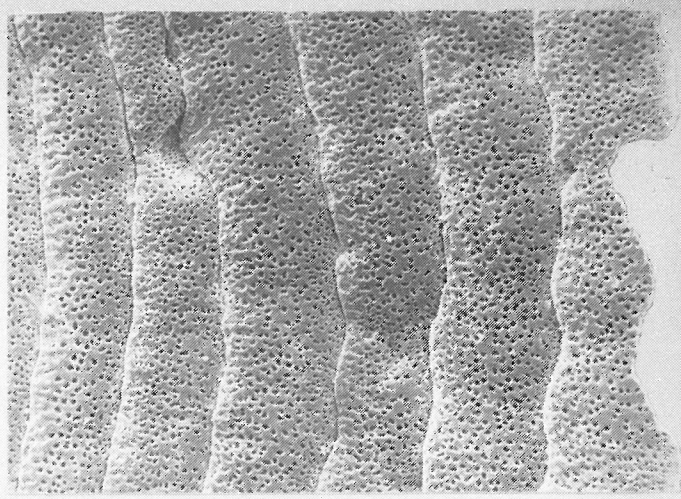
Figs. 2a-b : Sorites orbitolitoides (HOFKER)

Empty test, juvenile specimen (A-form), North Point (foot of fringing reef), L 292.
Fig. 2a : Lateral view showing embryonic apparatus and spiral chamber series. Note inflation of chamberlets (X 161); fig. 2b : part of edge view showing rounded margin, oval apertures of the discoideus-type, and pitting of marginal face (X 938).

PLATE 24



1a



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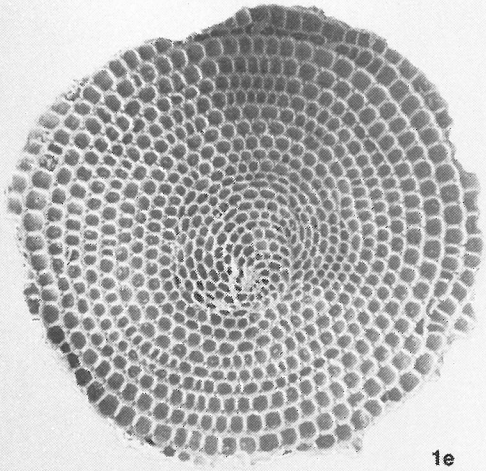

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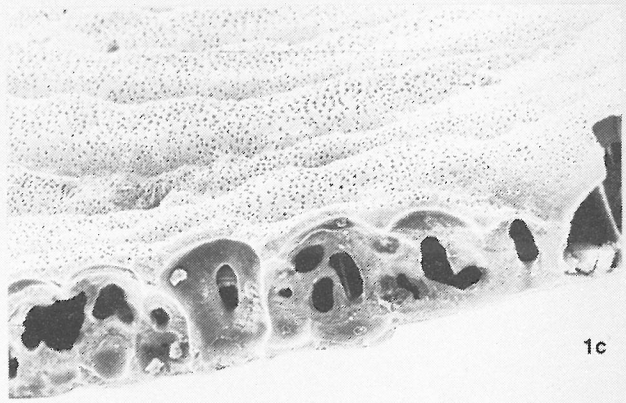

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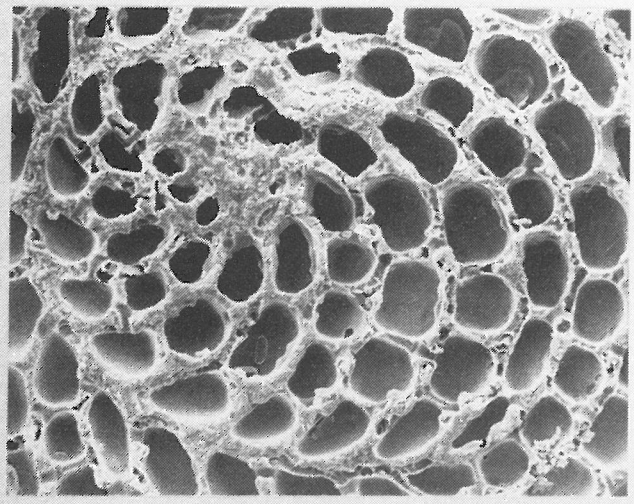


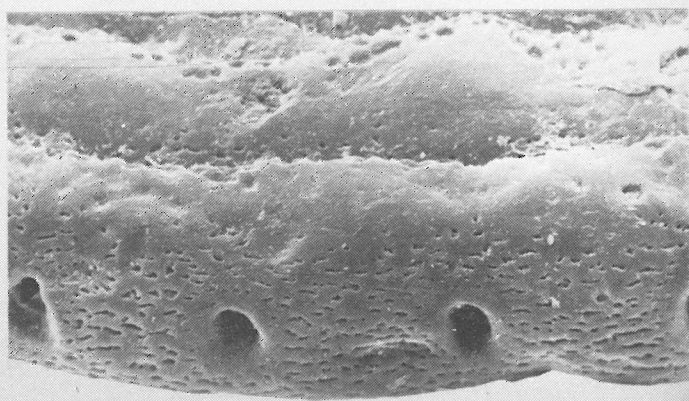
1f



1d



2a



2b

PLATE 25

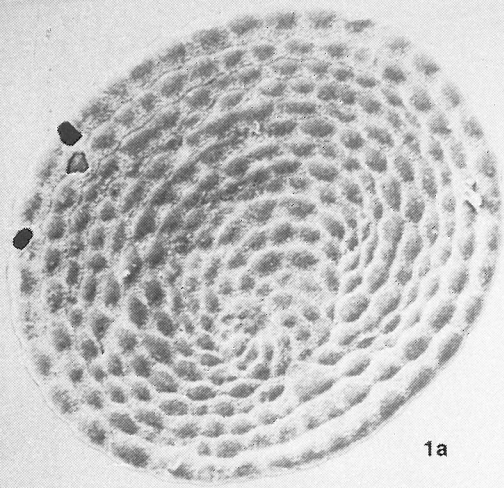
Figs. 1a-e : Sorites orbitolitoides (HOFKER)

Living specimen, A-form, North Point (foot of fringing reef), L 292. Fig. 1a : Lateral view showing spiral- and annular chamber series. Note clearly visible chamberlets (X 102); fig. 1b : part of edge view showing rounded periphery, pitting of marginal face and of somewhat limbate sutures and "chamberlet sutures". Note oval apertures in front of the septula and supplementary, flattened opening where a new chamberlet will be intercalated in the next annulus (on the right of the photograph) (X 494); fig. 1c : close-up of spiral chamber series. Note chamberlets and pitted sutures (X 214); fig. 1d : same specimen, equatorially sectioned (part of the test has been broken away during sectioning). Note the septula being slightly shorter than in discoideus (X 107); fig. 1e : same section, close-up of early chamber arrangement. The embryonic apparatus with proloculus and flexostyle is visible, as well as the (5) first peneropline chambers. Note stolons with peristomes at the centripetal side of septa. The chamberlets are partly filled up with dried and shrunken protoplasm (X 500).

Figs. 2a-c : Sorites marginalis (CARPENTER)

Empty test, adult specimen, A_2-form, Eastern Perireefal Area (L 81). Fig. 2a : Lateral view showing large, inflated embryonic apparatus and numerous annular chambers divided into chamberlets. Note abrasion of thin lateral chamber walls (X 37); fig. 2b : part of edge view showing chamberlets, rounded periphery, faint pitting of marginal face except for the peristomal areas, and elongate to slightly 8-shaped apertures (X 234); fig. 2c : same specimen, equatorially sectioned. Note very large proloculus and broad, enveloping flexostyle broadening towards its distal end in a "peneropline" way. The first chamber is already divided into 3 chamberlets. Note very regular overall structure (X 39).

PLATE 25



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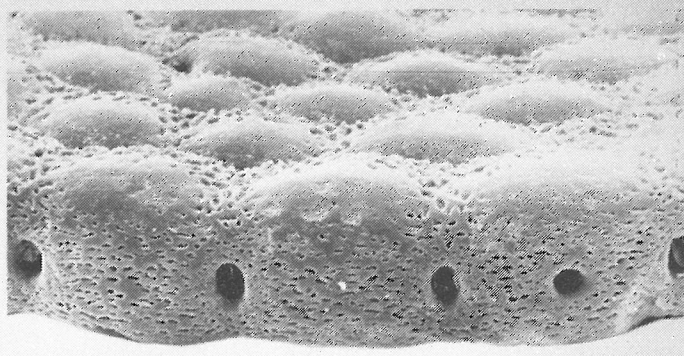

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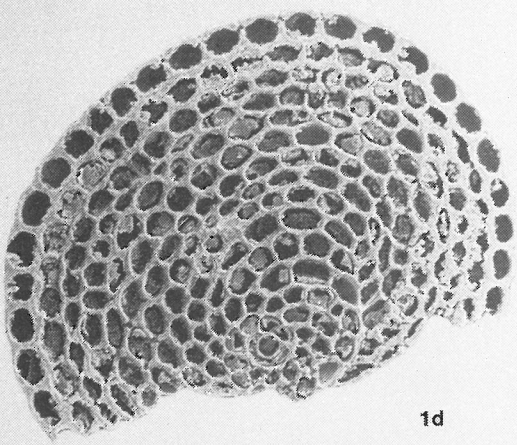

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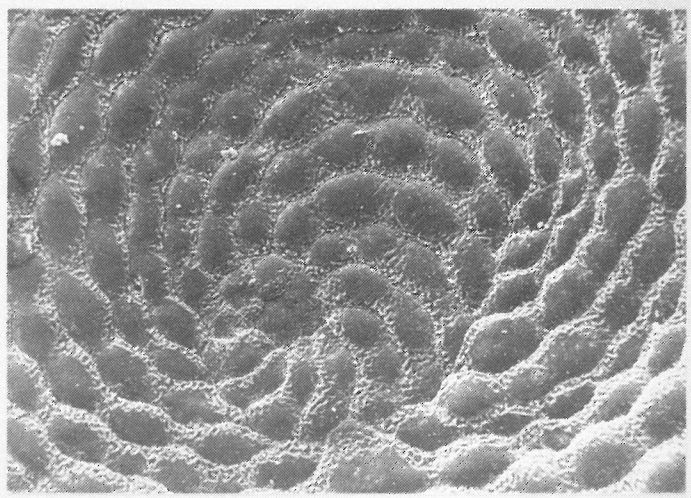

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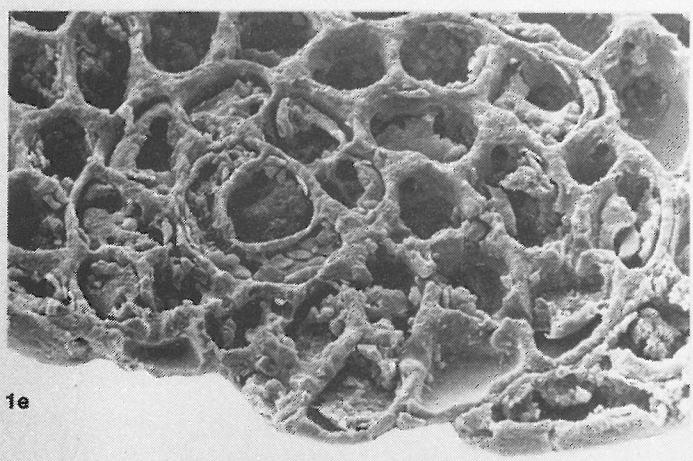

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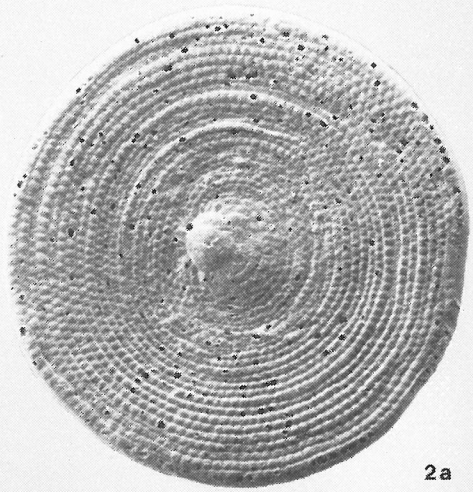

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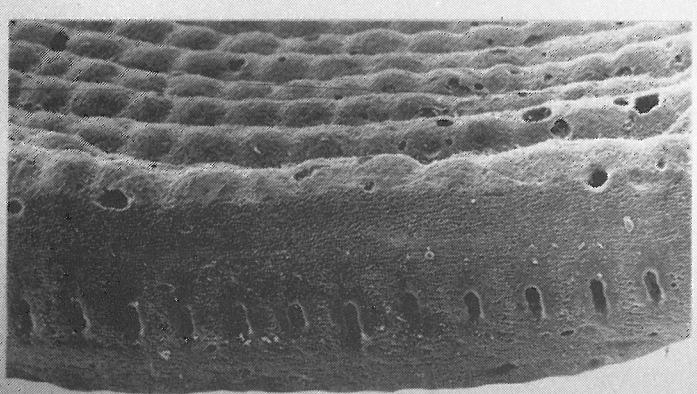

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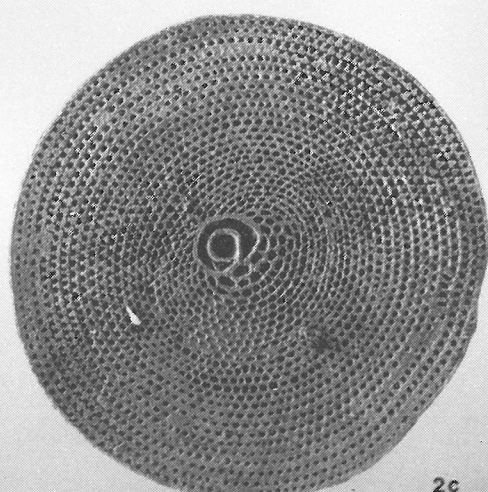

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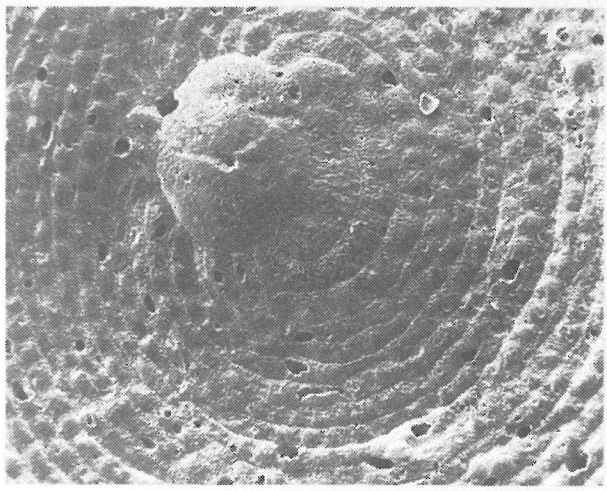
PLATE 26

Figs. 1 - 2 : Sorites marginalis (CARPENTER)

Figs. 1a-d : Details of the specimen figured on fig. 2, pl. 25.
Fig. 1a : Close-up of central test area showing large, inflated embryonic apparatus, spiral and first annular chambers. Note pitting of lateral walls of embryonic apparatus, and of sutures. The chamberlets are slightly inflated and are visible from the exterior (X 144); fig. 1b : id, part of the equatorial section. Note drop-shaped proloculus, flaring flexostyle, absence of peneropline (s.s.) chambers, and thick septa (X 120); fig. 1c : same, tilted to show rounded section of flexostyle, stolon connecting proloculus and flexostyle, and flattened stolons (lying in a depression) connecting flexostyle and first spiral chamber (X 267); fig. 1d : detailed view of part of the section near the edge : note thick septa and septula and the thickened T-pattern formed by septal partition, septulum and stolons in perfectly equatorial part of section (2 last-formed annular chambers) (X 247).
Figs. 2a-e : Empty test, microspheric specimen (B-form), Eastern Perireefal Area (L 65).
Fig. 2a : Lateral view (X 20); fig. 2b : close-up of early chamber arrangement; note long peneropline - spiral chamber series (the pitting of the walls has been obscured by abrasion) (X 303); fig. 2c : part of edge view; note blunt, flattened marginal face and single, elongate openings at this place (X 137); fig. 2d : close-up of some apertures which are inclined over 45°; note pitting of apertural face and pit-less peristomal areas (X 494); fig. 2e : detailed view of another part of edge, sectioned to show strongly thickened septa and septula near the lateral sides of the test (chamberlet lumina are reduced in respect to the calcareous volume of test structures). Note "wrenching" over 45° and doubling of apertures in this marginal area (X 124).

PLATE 26



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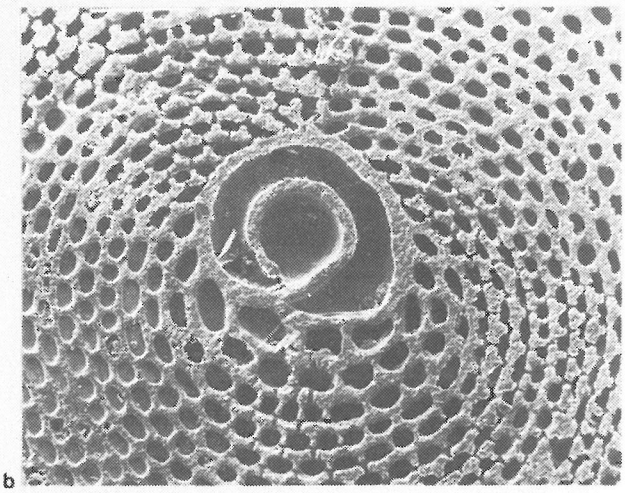

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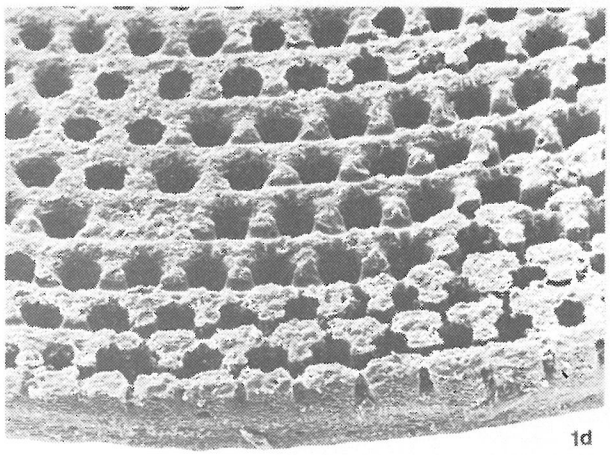

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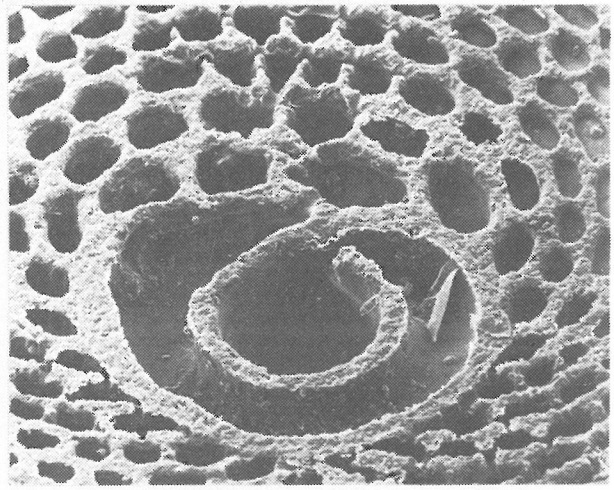

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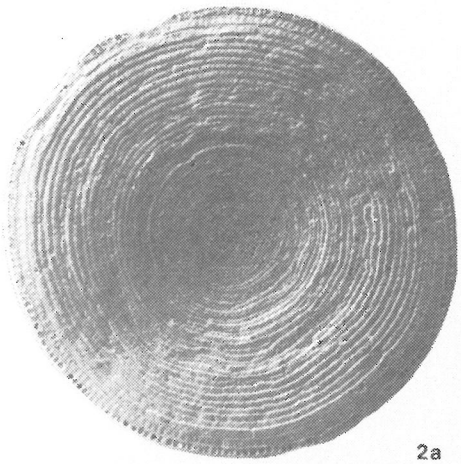

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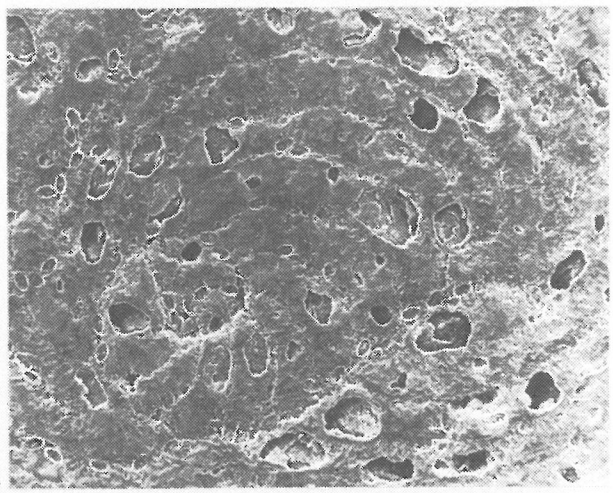

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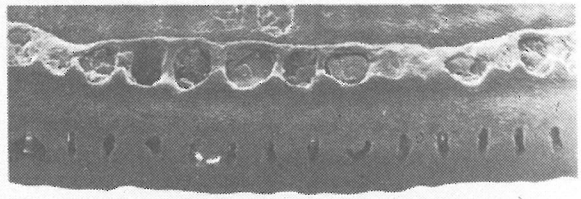

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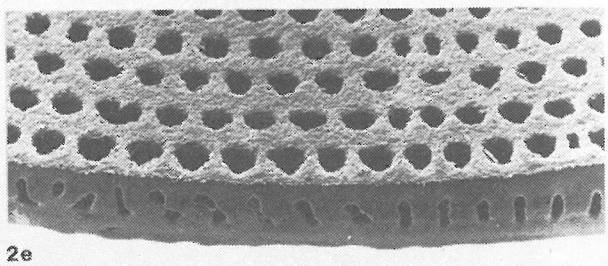


2e

PLATE 27

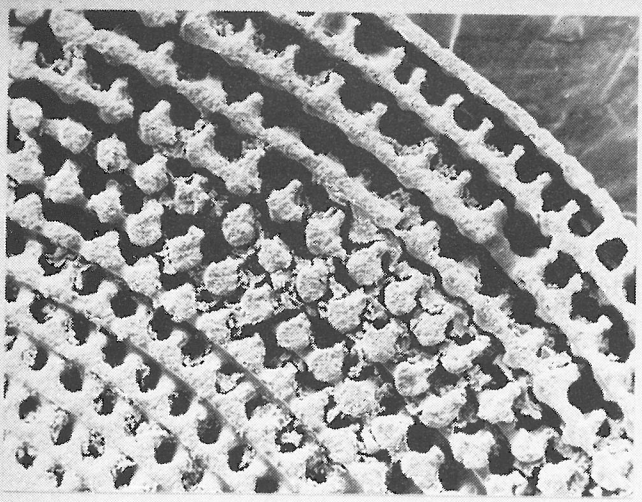
Figs. 1a-b : Sorites marginalis (CARPENTER)

Same specimen (B-form) as figured on figs. 2a-c, pl. 26.
Fig. 1a : Part of more or less equatorial (slightly oblique) section near the edge, showing annular passages in three last-formed annular chambers, and modified T-structures in previous chambers (X 131); fig. 1b : part of same section showing modified T-structures and sectioned marginal apertures. Note solidity and regularity of structures (X 239).

Figs. 2a-f : Sorites orbiculus EHRENBERG

Empty test, not full-grown specimen, A (A_2 ?)-form, Coconut Fringing Reef flat (L 249).
Fig. 2a : Lateral view (note lobed periphery and strongly oscillating sutures) (X 87); fig. 2b : detailed view upon central test area; note pitting of embryonic apparatus-wall (reticulate pattern), and of chamber walls (except for the sutures) (X 254); fig. 2c : part of edge view showing blunt margin with vertical depressions in which the 8-shaped apertures lie, provided with pronounced peristomes (note pitting of marginal face) (X 288); fig. 2d : equatorial section of same specimen showing large proloculus with broad flexostyle and large undivided first chamber (peneropline chamber), reminiscent of the "Vorhof" in Amphisorus and Marginopora. Note thick septa (X 89); fig. 2e : central area of same section, tilted to show rounded section of flexostyle, stolon connecting flexostyle and peneropline chamber and several slitlike stolons connecting peneropline and first spiral (divided into 4 chamberlets) chamber. Note typical bow-shape of septal partitions with peristomal thickenings at their ends (X 231); fig. 2f : same section, detailed view upon part of the outer annular chambers; note very short septula, bow-shaped septum partitions and stolons with peristomes visible on the centrifugal sides (X 484).

PLATE 27



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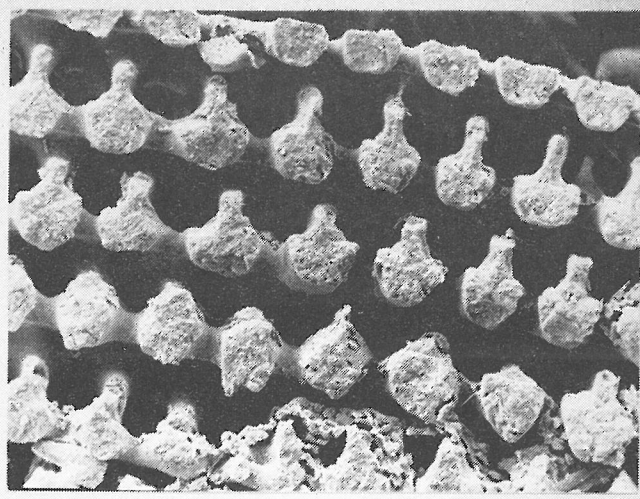

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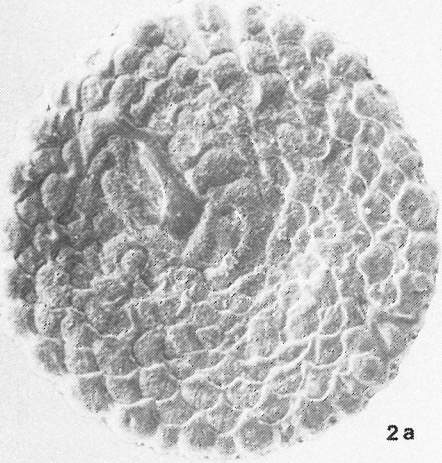

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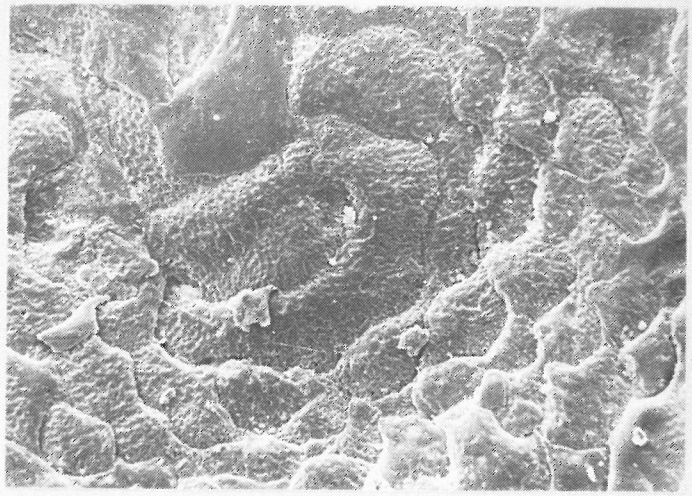

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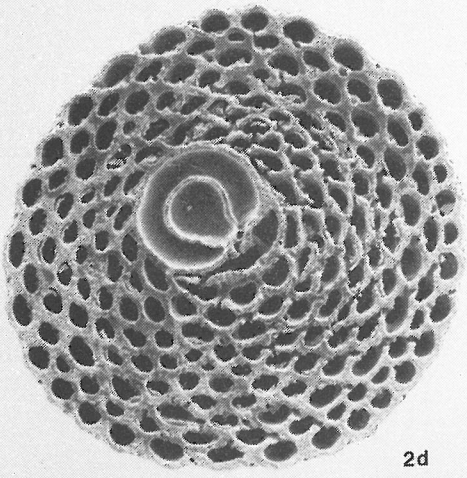

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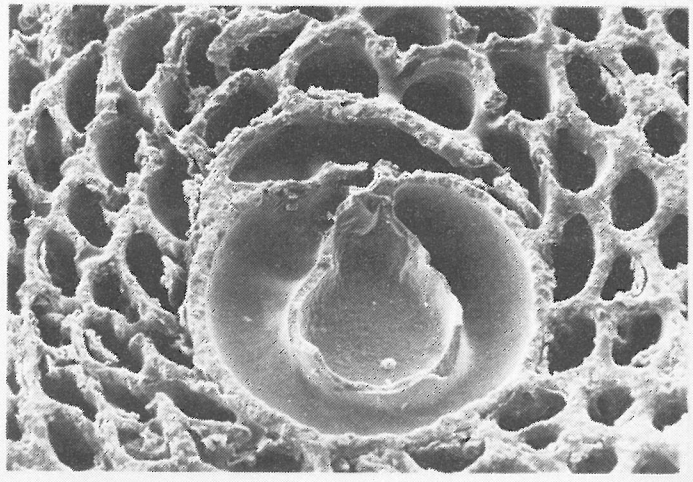

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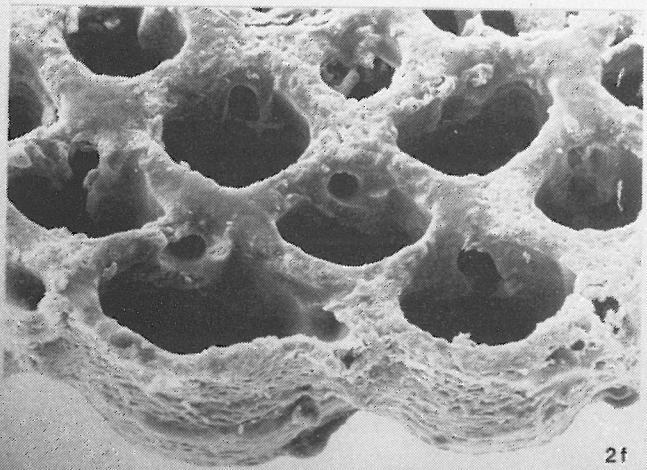

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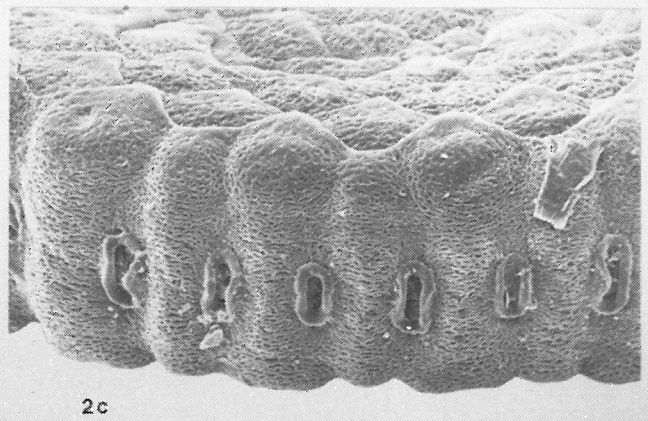


2c

PLATE 28

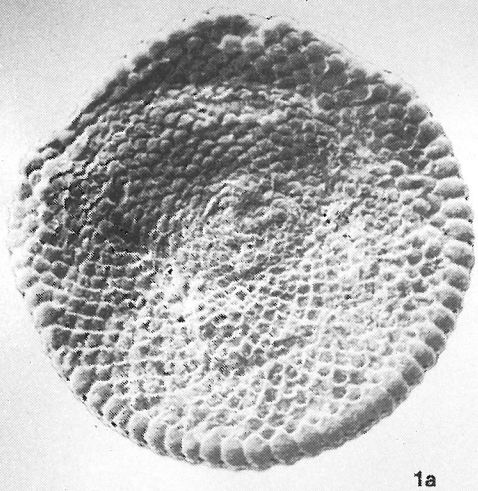
Figs. 1 - 2 : Sorites orbiculus EHRENBERG

Figs. 1a-f : Larger specimen, empty test, A-form, Windward Barrier (L 260). Fig. 1a : Lateral view showing somewhat irregular test (X 38); fig. 1b : close-up of part of test wall, showing strongly embracing and oscillating sutures; the chamber walls are finely pitted except for the chalky bosses on the "chamberlet sutures" (at the emplacement of the septula) (X 239); fig. 1c : part of edge view showing same features as fig. 2c, pl. 27 but here the apertures are definitely doubled; supplementary apertures appear in the middle of the septum partition facing the places where new chamberlets will be intercalated in the next annular chamber (X 250); fig. 1d : equatorial section of same specimen (X 38); fig. 1e : same section, part of edge showing thick and solid septa and stolons with peristomes (X 235); fig. 1f : same section, detailed view upon part of test : note relatively small, rounded chamberlet lumina and bow-shaped septum partitions; in the second septum from the right edge of the photograph (on top), a supplementary stolon is visible, facing an intercalated chamberlet on the right (X 488).

Figs. 2a-b : Empty test of large, adult specimen (A-form), Coconut Fringing Reef flat (L 246).

Fig. 2a : Lateral view, showing irregular and substratum-conditioned test shape (X 23); fig. 2b : part of edge view showing single 8-shaped as well as "bridged" apertures. On these big specimens no pitting of the marginal face can be seen (X 140).

PLATE 28



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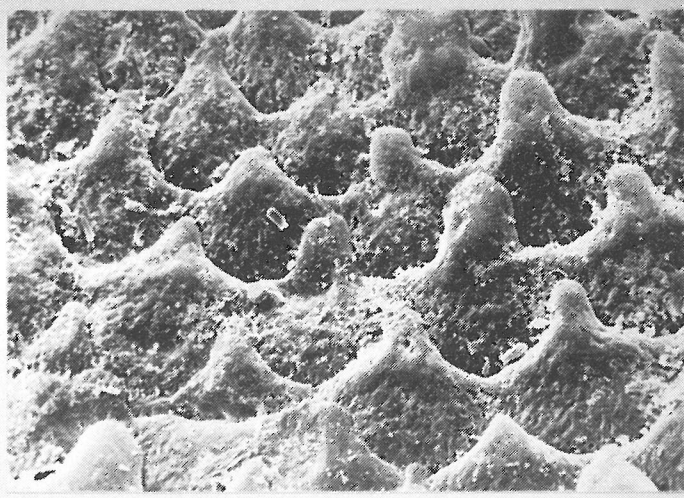

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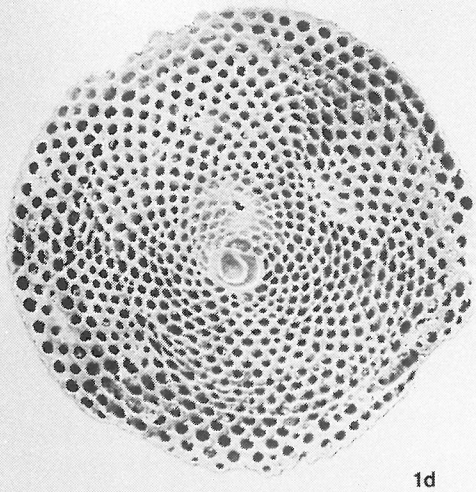

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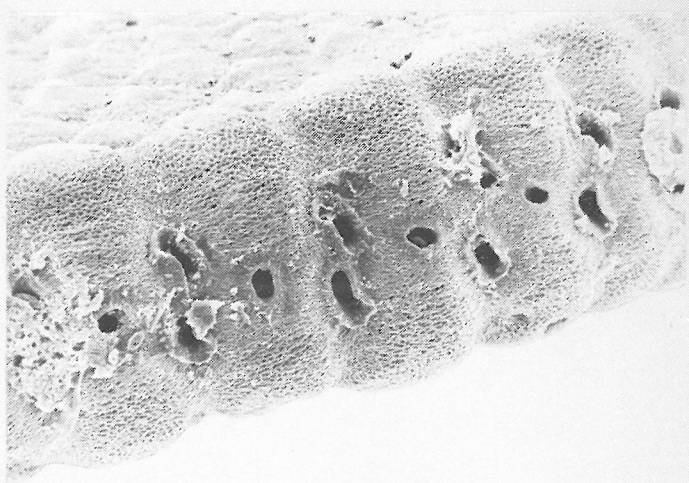

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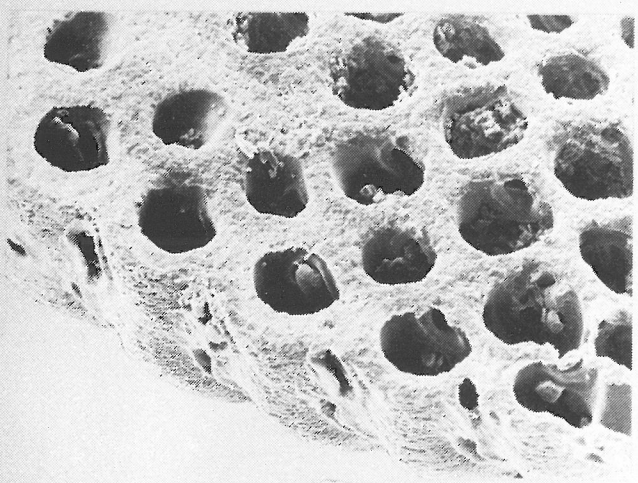
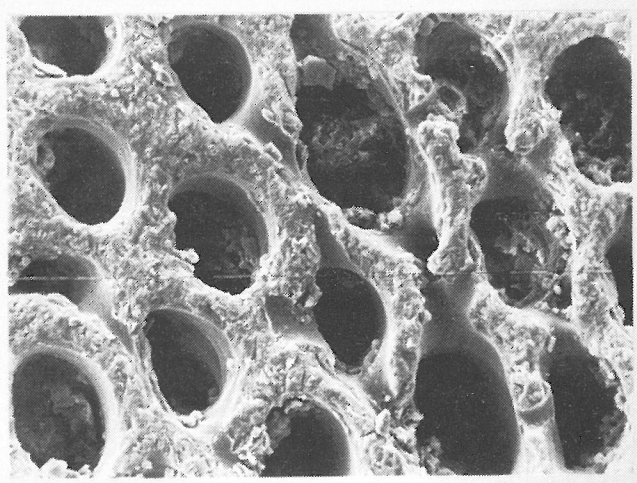


1e



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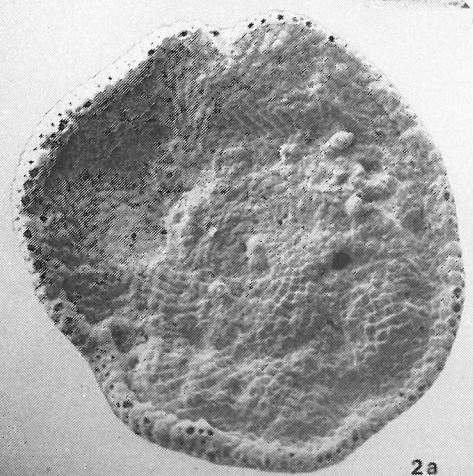

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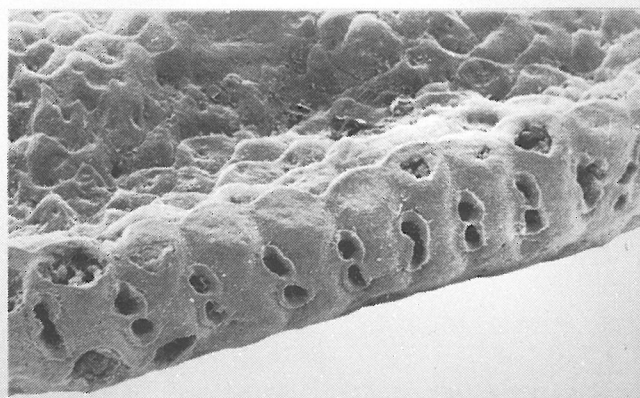


2b

PLATE 29

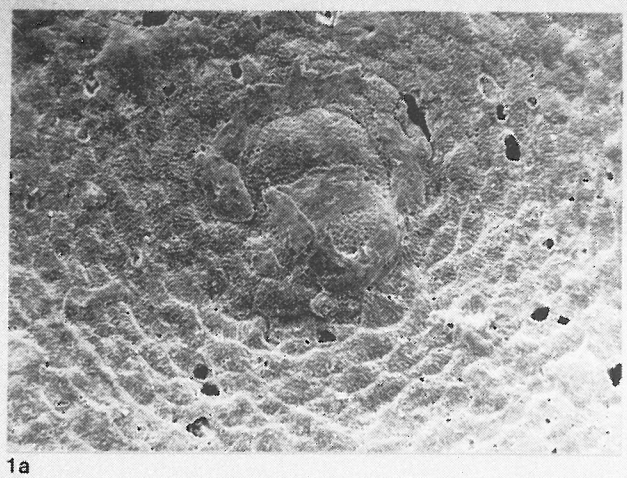
Figs. 1a-b : Sorites orbiculus EHRENBERG

Same specimen as shown on pl. 28, fig. 2.
Fig. 1a : Close-up of early chamber arrangement showing pitted, large lateral wall of embryonic apparatus and pitted chamber walls (X 119); fig. 1b : detail of preceding view showing reticulate pattern of pitting on embryonic apparatus (X 967).

Figs. 2a-g : Amphisorus hemprichii EHRENBERG

Empty test of large, adult specimen (A-form), Eastern Perireefal Area (L 82). Fig. 2a : Lateral view showing numerous annular chambers and well-visible chamberlets, regularly structured. Note abrasion of thin chamberlet walls (X 26); fig. 2b : close-up of central part of test showing reticulate pitting pattern on the wall of the embryonic apparatus (X 232); fig. 2c : part of margin showing double row of chamberlets and obliquely placed, 8-shaped apertures with pronounced peristomes. Note pitting of marginal face (X 224); fig. 2d : same specimen, equatorial section; note very regular structure and rather thick septa (though thinner than in S. marginalis) (X 25); fig. 2e : detailed view of central area of section showing embryonic apparatus consisting of drop-like proloculus, broad flexostyle directly opening up into the "Vorhof" (deuteroconch, or HOFKER's "reniform chamber"). After four chambers the annular stage is reached (X 123); fig. 2f : detail of edge of same section; on the right the annular channel can be seen whereas on the left the section remained in the "mushroom" structure as the section runs somewhat obliquely (X 138); fig. 2g : detail of another part of the edge of same section; here the section remained entirely in the annular channel (note thick septa) (X 125).

PLATE 29



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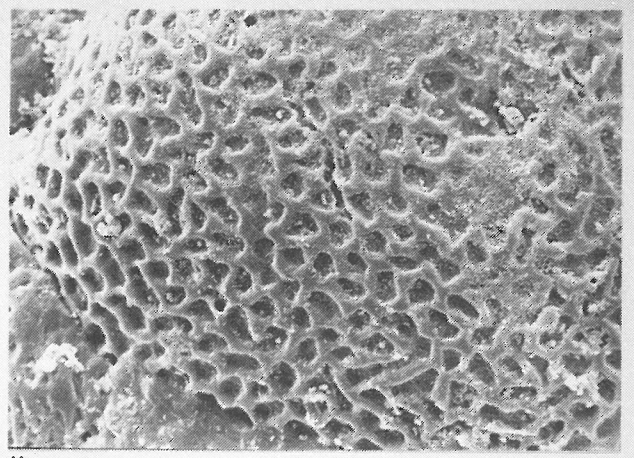

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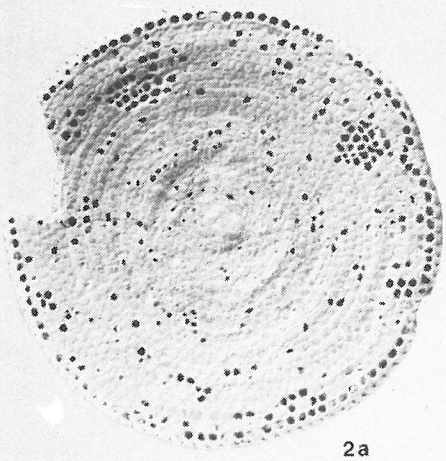

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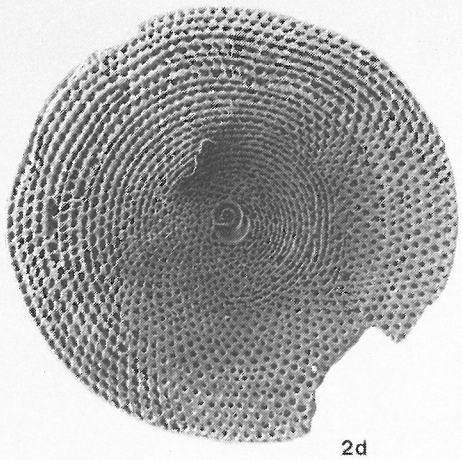

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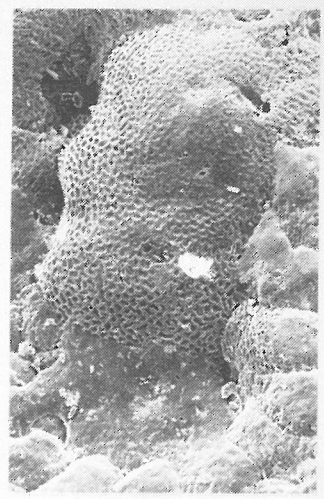

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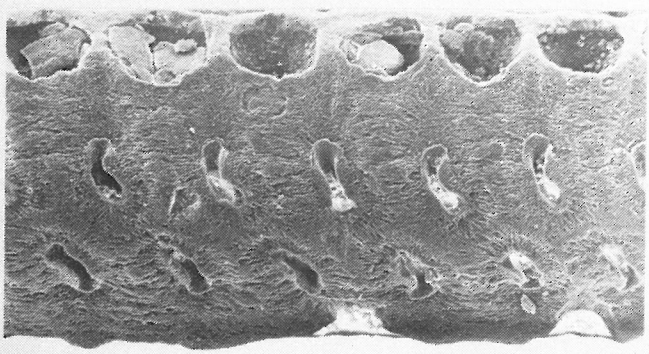

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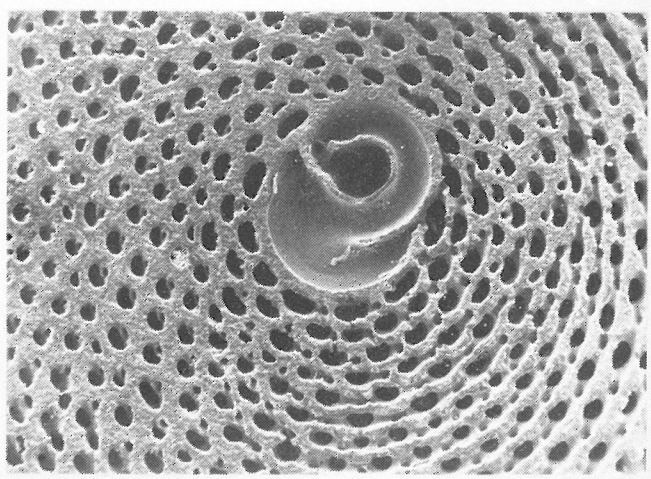

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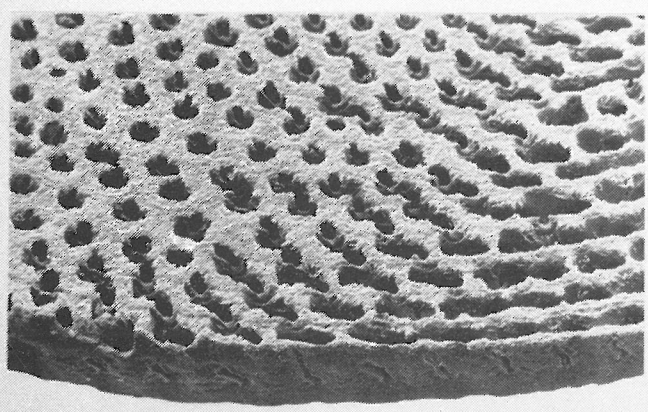

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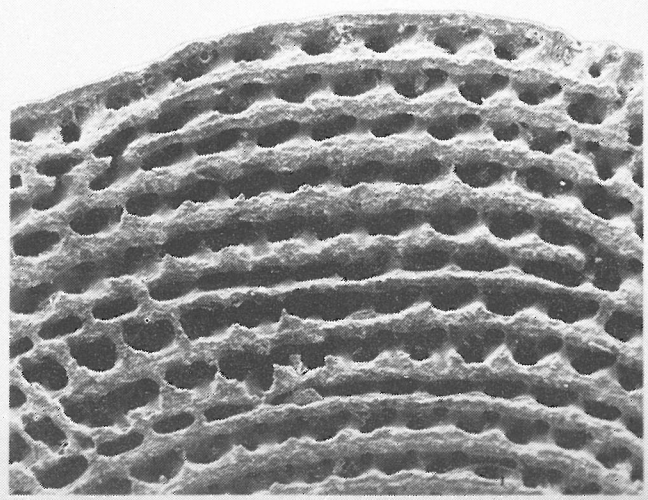


2g

PLATE 30

Figs. 1 - 2 : Amphisorus hemprichii EHRENBERG

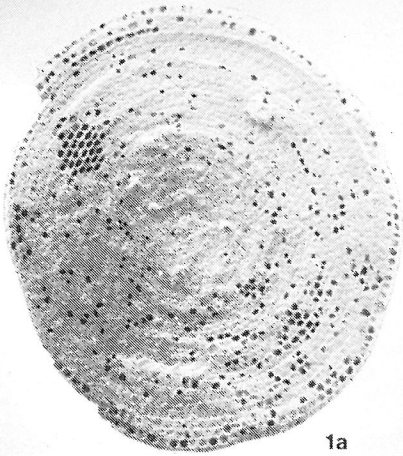
Figs. 1a-g : Empty test of large, adult specimen, Eastern Perireefal Area (L 82).

Fig. 1a : Lateral view (X 23); fig. 1b : part of edge view : note double row of apertures and small, rounded supplementary aperture (in the middle on top of a lower principal aperture) where a new chamberlet will be intercalated in the next annular chamber (X 233); fig. 1c : same specimen, equatorially sectioned (X 23); fig. 1d : central part of same section showing embryonic apparatus. The "Vorhof" is more irregularly formed than in the preceding specimen (compare with fig. 2e, pl. 29) (X 231); fig. 1e : id, tilted; note rather straight protoconch- and flexostyle-walls, somewhat as in M. vertebralis; stolon connecting proloculus and flexostyle, and multiple stolons connecting "Vorhof" and first divided chamber. The stolons are flattened, slitlike as in S. orbiculus (X 449); fig. 1f : part of edge of same section showing structure (X 232); fig. 1g : detail of same section showing somewhat more laterally-cut-structure; note rounded chamberlet lumina and curved stolons (X 464).

Figs. 2a-b : Empty test of large, adult specimen, A-form, Eastern Perireefal Area (L 82).

Fig. 2a : Equatorial section showing "Vorhof" being larger than in the preceding specimens (X 30); fig. 2b : close-up of embryonic apparatus, tilted to show flexostyle-flexure in lateral wall of test, and stolons connecting "Vorhof" and first divided chamber; these stolons are slitlike near the proloculus but become more rounded, Marginopora-like in the remaining part of the "Vorhof" wall (X 140).

PLATE 30



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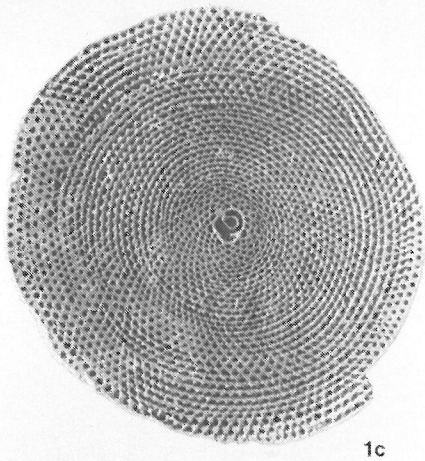

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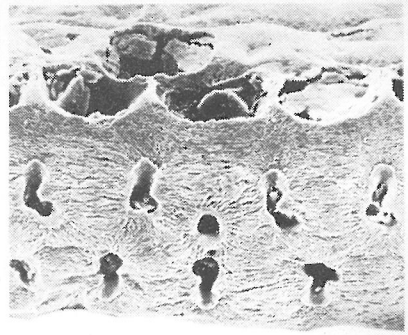

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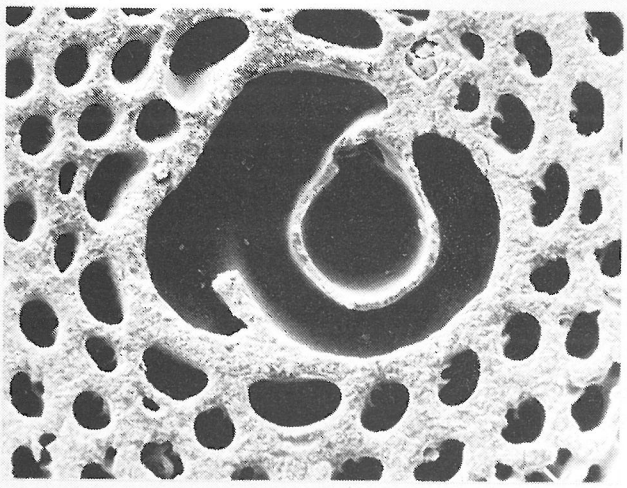

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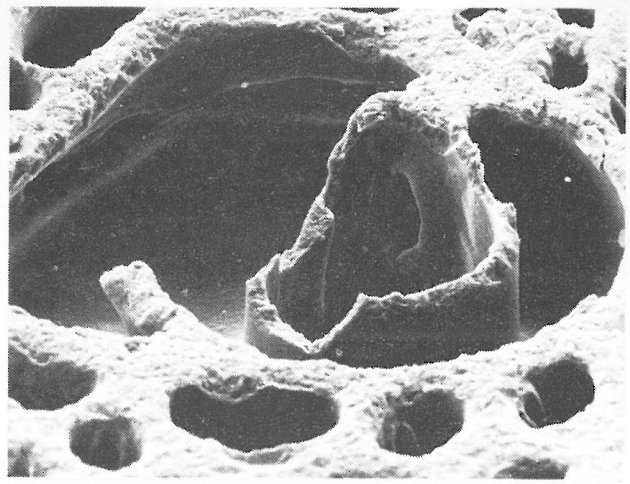

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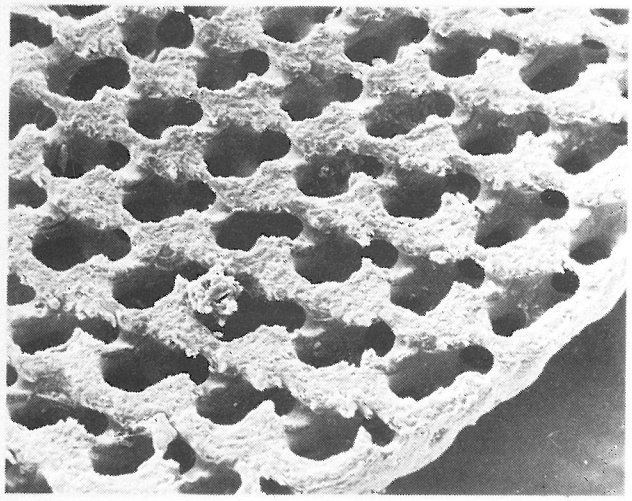

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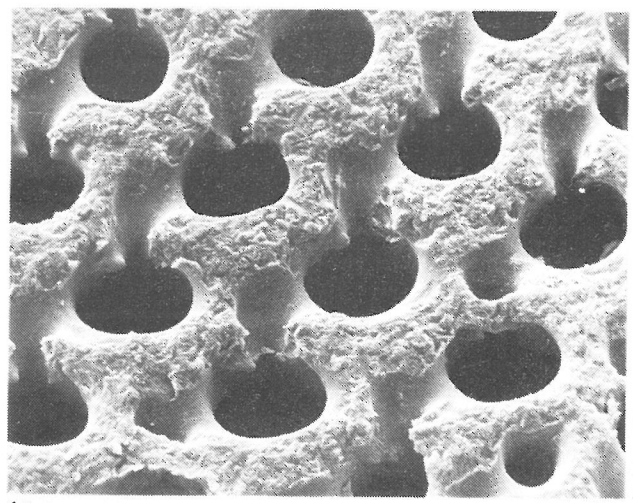

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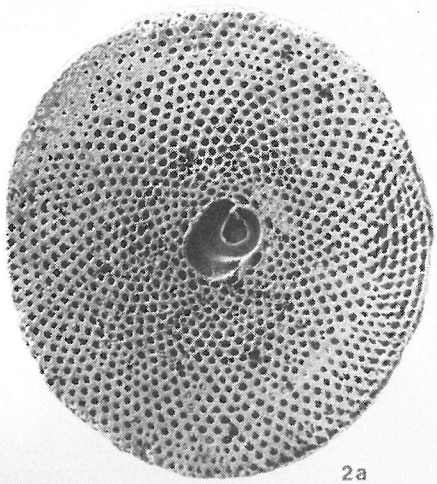

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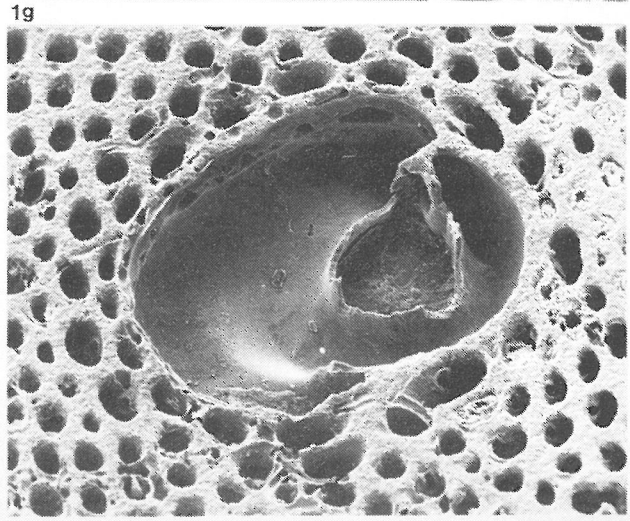


2b

PLATE 31

Figs. 1 - 5 : Amphisorus hemprichii EHRENBERG

Fig. 1 : Detail of section figured on fig. 2, pl. 30; showing characteristic "mushroom"-structure (note cut stolons with peristomes forming the "stem" of the mushroom) (X 250).

Figs. 2a-c : Small specimen, empty test, A-form (A_2-form ?), Eastern Perireefal Area.

Fig. 2a : Lateral view showing abraded test and Amphisorus-margin (X 39); fig. 2b : equatorial section of same specimen; note very large embryonic apparatus and abnormally large chamberlets of first annular chambers. "Mushroom"- and crosswise-oblique stolon structure can be seen at the edges of the section (X 39); fig. 2c : close-up of large embryonic apparatus; the "Vorhof" is very large and somewhat rectangular as in M. vertebralis (the flexostyle seems reduced) (X 116).

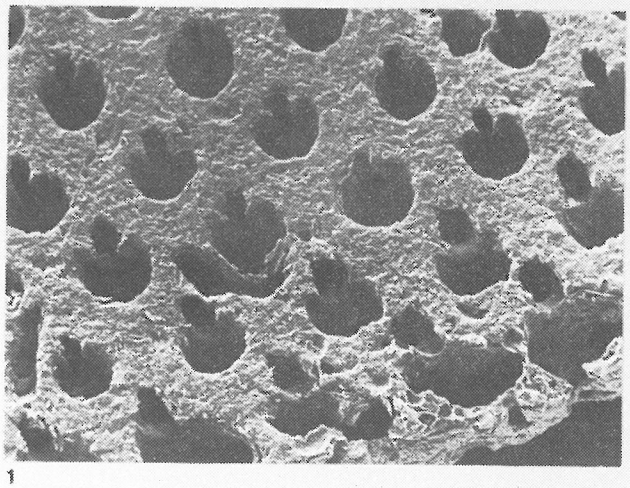
Fig. 3 : Example of the regeneration potential in A. hemprichii : fragment of a specimen which regenerated at least three times (Eastern Perireefal Area - L 65) (X 140).

Fig. 4 : Regenerated specimen, Eastern Perireefal Area (L 82) (X 17).

Figs. 5a-c : Fragment of a specimen with breeding chambers containing gamonts; Western slope (L 109).

Fig. 5a : Entire fragment; note breeding chambers being much more voluminous than "ordinary" chambers. There is an apparent subdivision of the chamber into chamberlets but the septula are incomplete (X 20); fig. 5b : close-up of part of marginal face of same fragment, showing irregular and scattered apertures. The peristomes are no longer pronounced and the walls are very thin. Note fine pitting of wall (X 238); fig. 5c : detail of part of edge view showing rounded periphery and scattered apertures of breeding chambers (X 68).

PLATE 31



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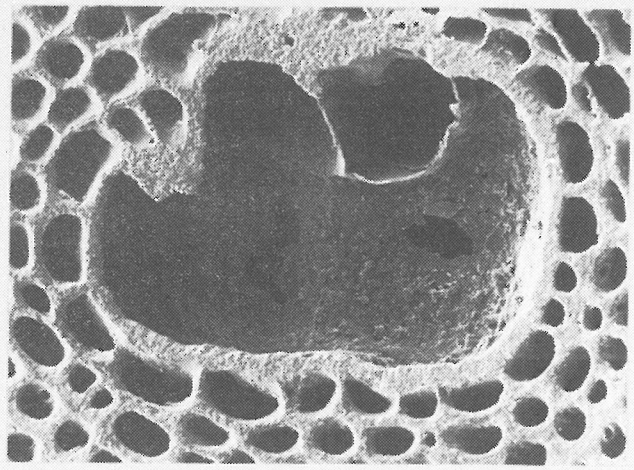

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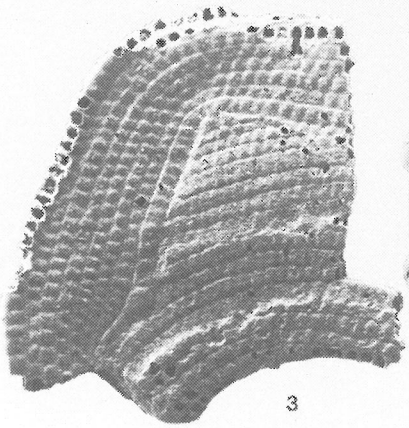

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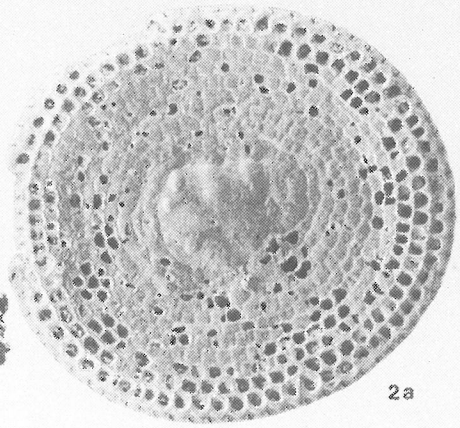

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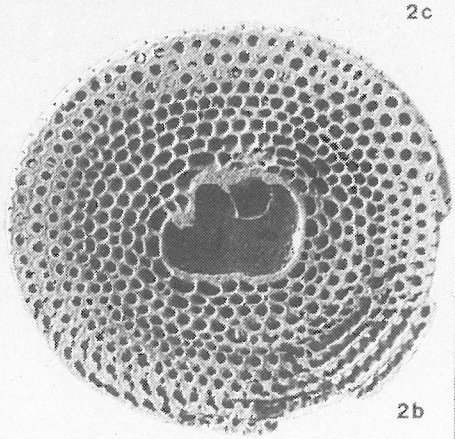

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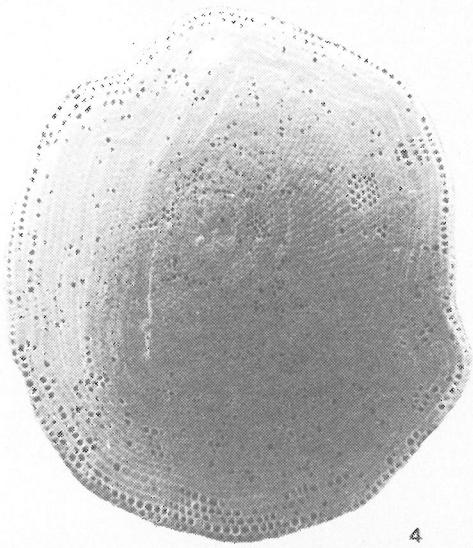

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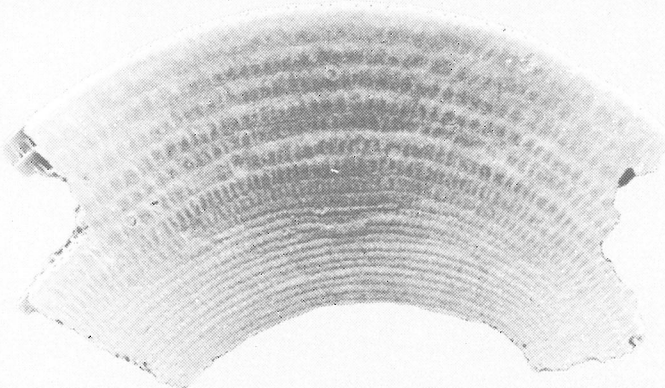

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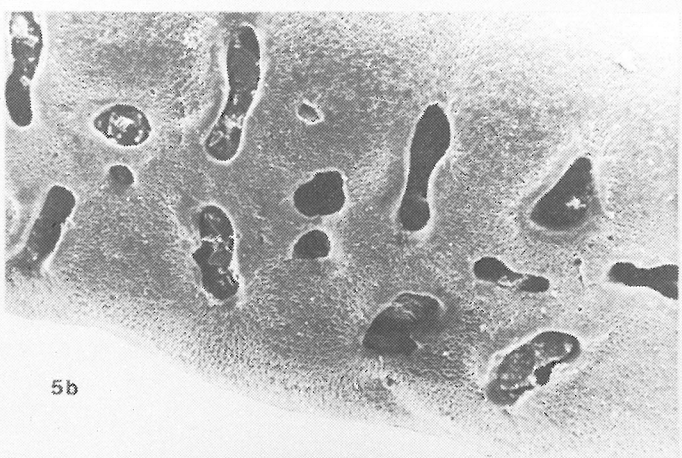

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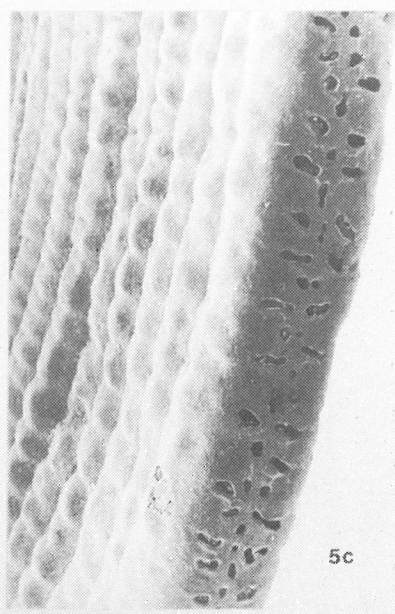


5c

PLATE 32

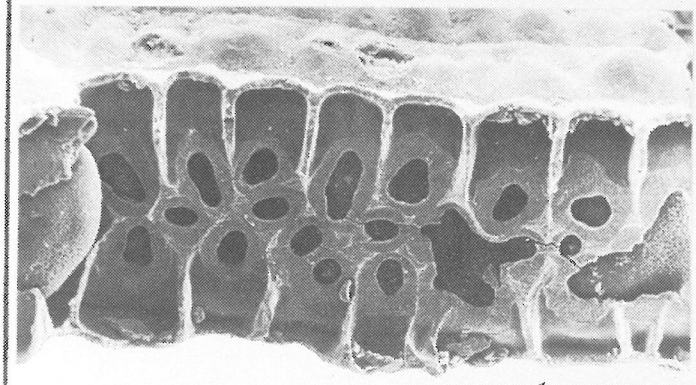
Figs. 1a-b : Amphisorus hemprichii EHRENBERG

Details of fragment shown on figs. 5a-c, pl. 31.
Fig. 1a : Internal structure of breeding chambers as shown in broken-off portion. The stolons are very large, irregular and surrounded by broad peristomal areas where the septum is apparently thinner than outside these areas (secondary dissolution); the septula are present but are considerably reduced in thickness as well as in surface; the Amphisorus-structure (alternating chamberlets displaced over the width of half a chamberlet) is clearly visible. Gamonts can be perceived at the utmost left and right hand sides of the photograph (X 115); fig. 1b : view upon axial fracture zone showing voluminous chamber lumina of breeding chambers. Note the latter being filled up with gamonts (on the left); note also septula and annular passages visible in earlier chambers (on the right of the photograph) (X 63).

Figs. 2a-g : Marginopora vertebralis BLAINVILLE

Megalospheric specimen (A_2-form ?) of the flat, regular type; empty test, Eastern Perireefal Area (L 63).
Fig. 2a : Lateral view (note abrasion of thin walls of secondary chamber layer) (X 14); fig. 2b : detailed view upon central area of test : note absence of inflation of embryonic apparatus, pitting of the lateral walls of the latter and rectangular, regularly formed chamberlets of the secondary chamber layer (X 60); fig. 2c : part of edge view showing thick, broadly flattened margin with numerous apertures (primary chamber layer), surrounded by peristomes and lying in faint depressions, as well as aperture rows of the secondary chamber layers, lying in a groove near the margin's edges (X 69); fig. 2d : close-up of part of the margin showing flattened apertures surrounded by pronounced peristomes; note pitting of marginal face (except for peristomes) (X 221); fig. 2e : equatorial section of same specimen : note structure of principal chamber layer, and large embryonic apparatus (X 14); fig. 2f : close-up of central area of section showing embryonic apparatus consisting of drop-like proloculus, short and broad flexostyle and very large, irregularly formed"Vorhof" with numerous stolons giving access to the first annular chamber (X 58); fig. 2g : id, tilted to show straight walls of proloculus and flexostyle (X 121).

PLATE 32



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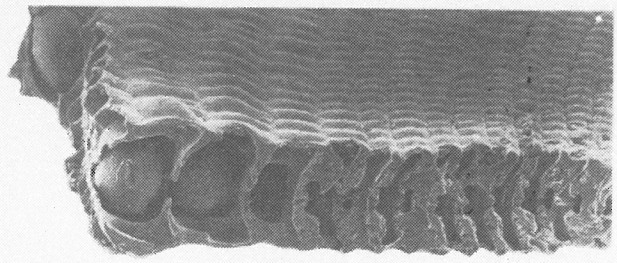

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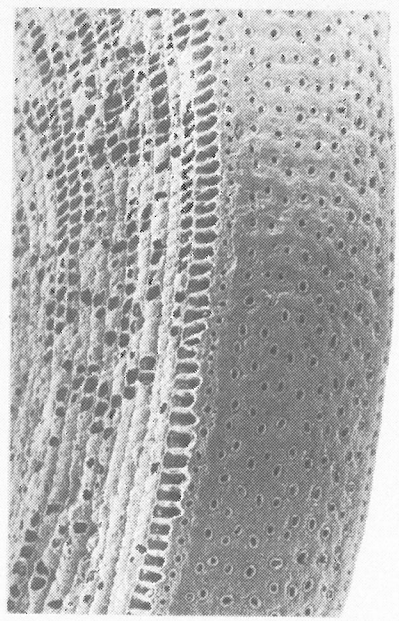
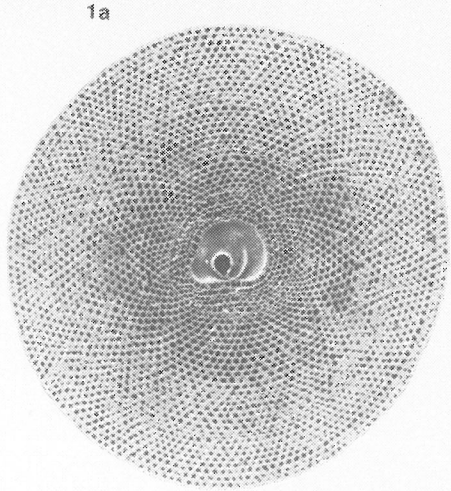


2c



2a



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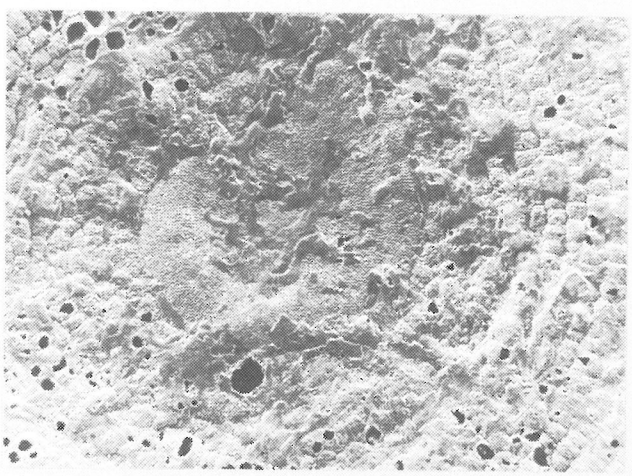

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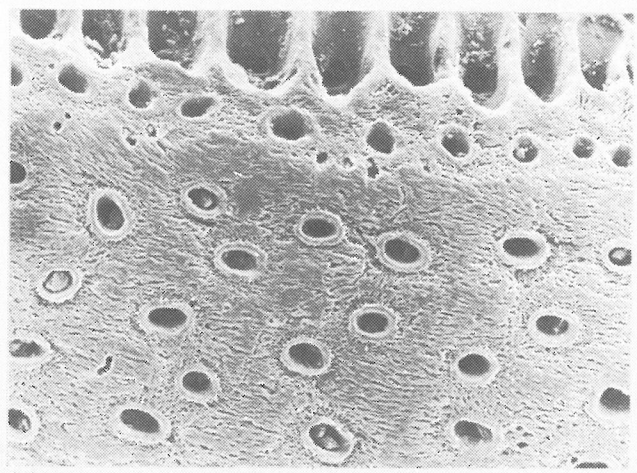

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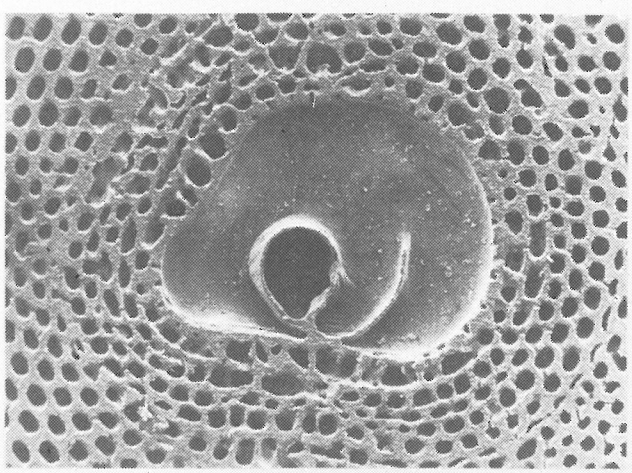

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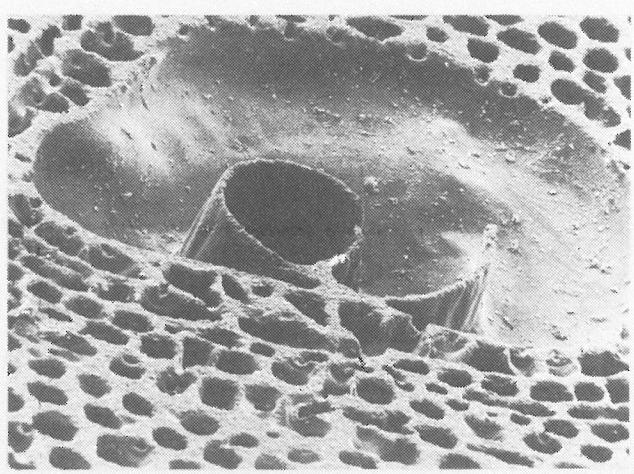


2g

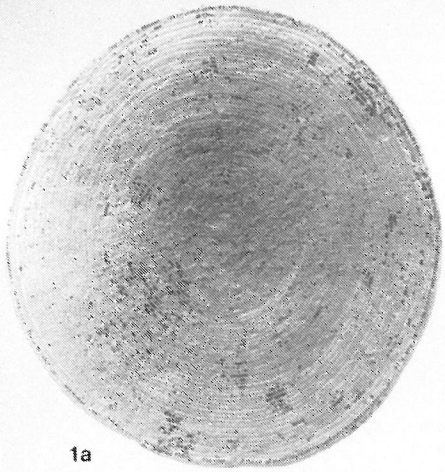
PLATE 33

Figs. 1 - 2 : Marginopora vertebralis BLAINVILLE

Figs. 1a-d : Very large, discoidal, megalospheric (A_1-form ?) specimen of the regular, flattened type; empty test, Eastern Perireefal Area (L 63). Fig. 1a : Lateral view (X 9); fig. 1b : equatorial section of same specimen showing essentially the same features as fig. 2e, pl. 32 except for the relatively smaller embryonic apparatus (X 9); fig. 1c : close-up of central area of section, showing embryonic apparatus consisting of drop-like proloculus, relatively long flexostyle and relatively small, rounded "Vorhof" (A_1-form ?) (X 114); fig. 1d : detail of edge of section showing marginal face with scattered apertures and obliquely-cut secondary chamber layer : note regular rectangular shape of the latter, and stolons giving access to the primary chamber layer (upper annular passage, visible on top left of the photograph) (X 130).

Figs. 2a-d : Large, flattened, discoidal, microspheric (B-form) specimen (regular, flattened type); empty test, Eastern Perireefal Area (L 82). Fig. 2a : lateral view (note chalky bosses up on lateral walls) (X 21); fig. 2b : close-up of central test area showing early chamber arrangement visible from the exterior (the early coil is somewhat involute) (X 239); fig. 2c : id, close-up of early coil; note embracing chambers and reticulate pitting-pattern upon lateral chamber walls (X 485); fig. 2d : same specimen, equatorial section (compare with fig. 2e, pl. 32) (X 21).

PLATE 33



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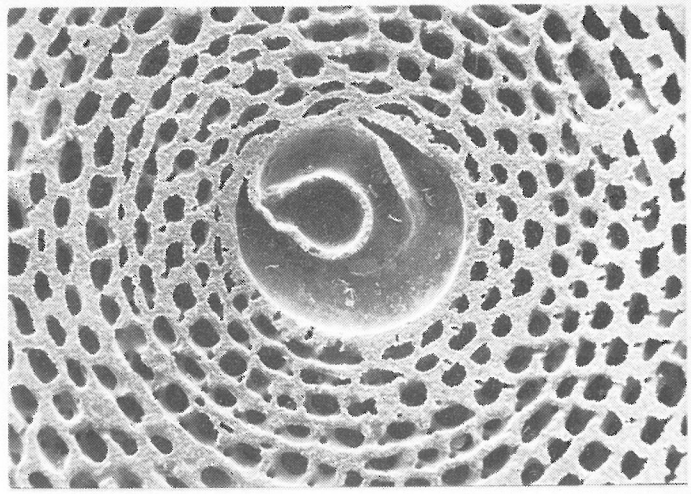

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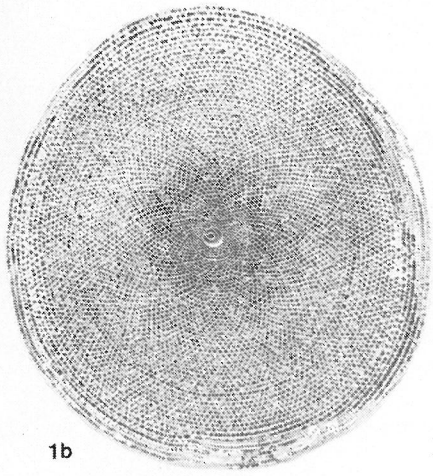

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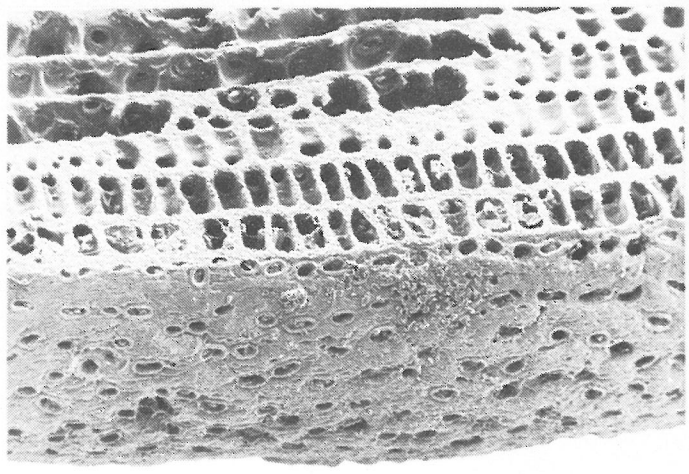

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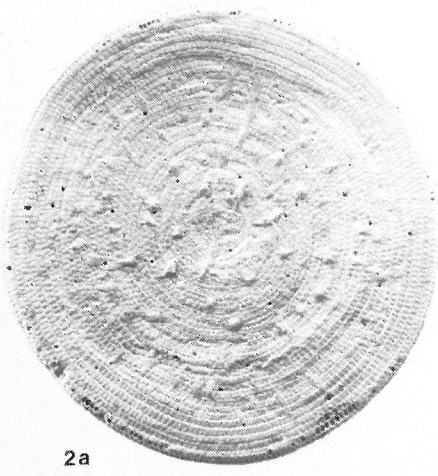

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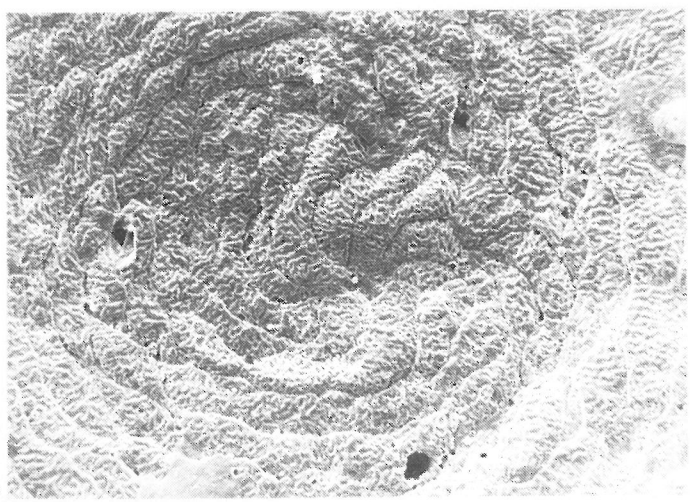

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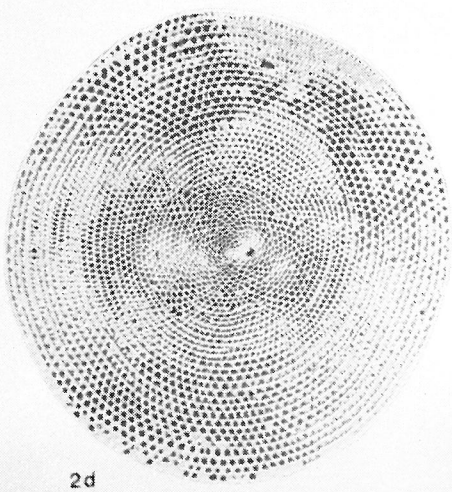

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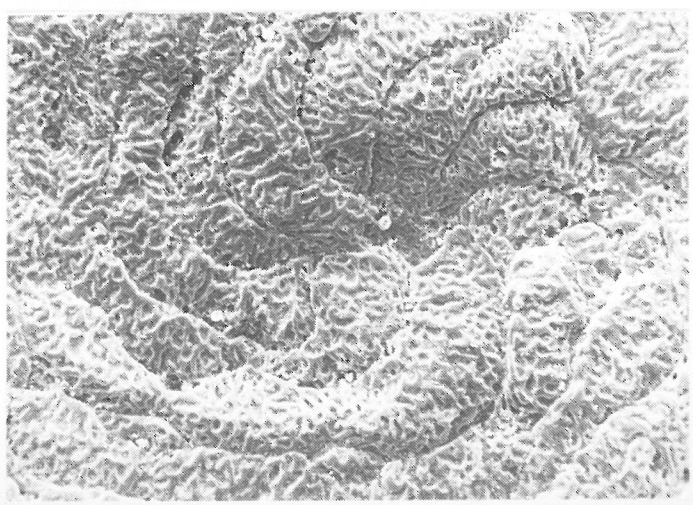


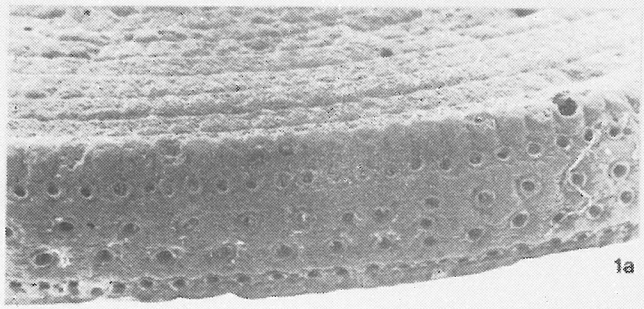
2c

PLATE 34

Figs. 1 - 3 : Marginopora vertebralis BLAINVILLE

Figs. 1a-d : Details of B-form figured on fig. 2, pl. 33.
Fig. 1a : Part of marginal view showing flattened marginal face and reduced primary chamber layer (X 135); fig. 1b : id, detailed view showing lobed edge of secondary chamber layer (as in Amphisorus), apertures of the primary chamber layer essentially reduced to a double row, and pitting of the marginal face (X 238); fig. 1c : close-up of central part of equatorial section of same specimen, showing early chamber arrangement (note stolons and septal partitions comparable with the image yielded by Sorites orbiculus) (X 196); fig. 1d : detailed view upon early coil, showing globular proloculus and peneropline chambers (X 444).
Figs. 2a-b : Details of equatorial section of another B-form of the same type as described before (fig. 1); empty test, Eastern Perireefal Area (L 65).
Fig. 2a : Close-up of part of section showing crosswise-oblique stolon structure (X 208); fig. 2b : id, photograph showing an area where the section has cut through the annular channels at one side of the test. Note pillar-structure (X 203).
Figs. 3a-c : Note completely full-grown specimen of the thick, intertidal, irregular form; living specimen, Patchreef Area (L 278 a) (in these smaller specimens the structure is generally less complicated than in the larger specimens).
Fig. 3a : Oblique edge view showing thick margin and depressed central test area (X 18); fig. 3b : lateral view (X 16); fig. 3c : equatorial section of same specimen showing essentially the same features as sectioned specimens of the regular form (X 16); fig. 3d : close-up of part of margin showing apertures of primary- and secondary chamber layers (X 118); fig. 3e : close-up of central test area showing embryonic apparatus (compare with pls. 32-33) (X 59).

PLATE 34



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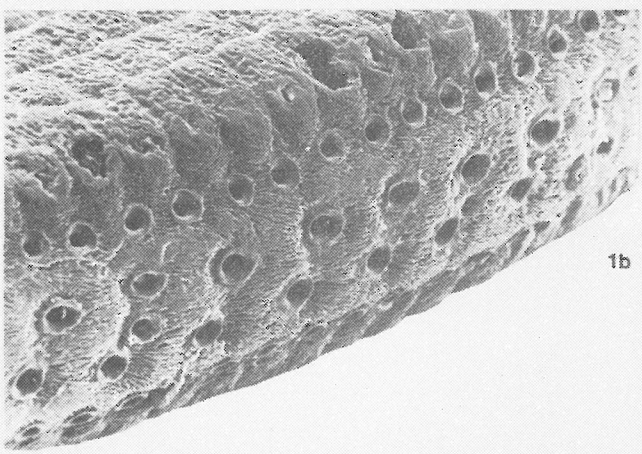

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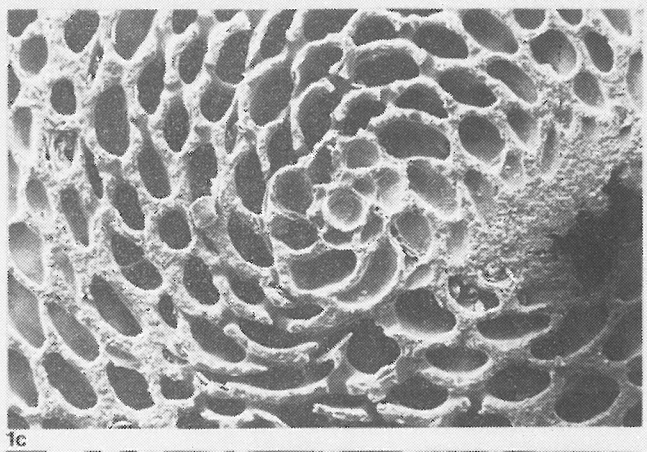

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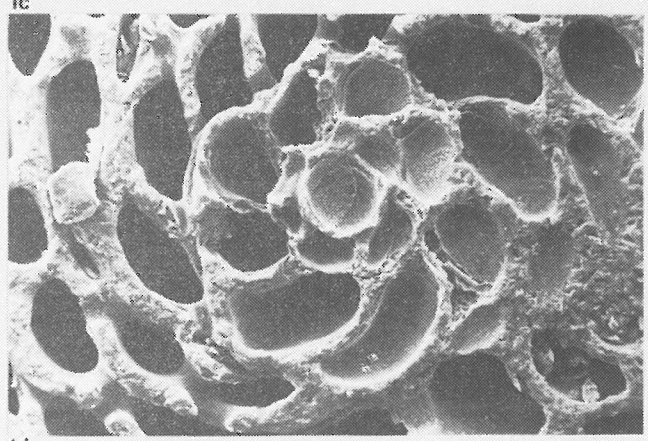

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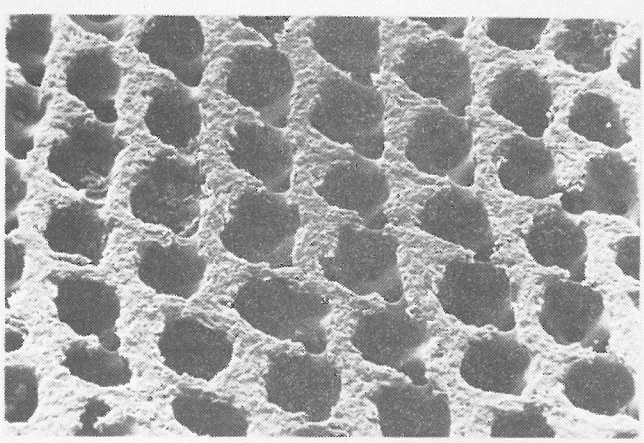

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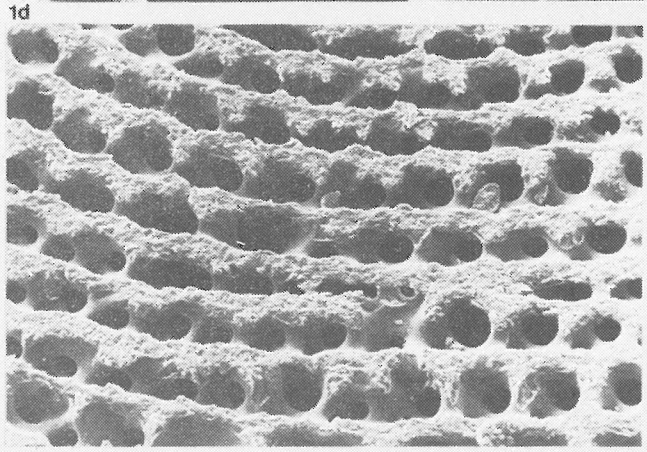

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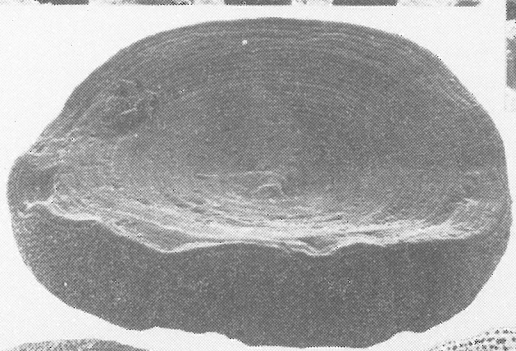

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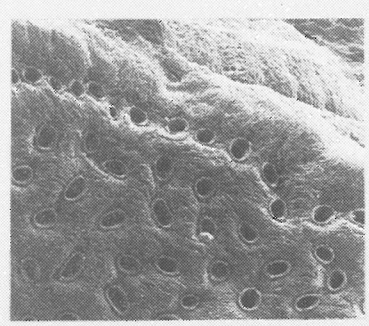

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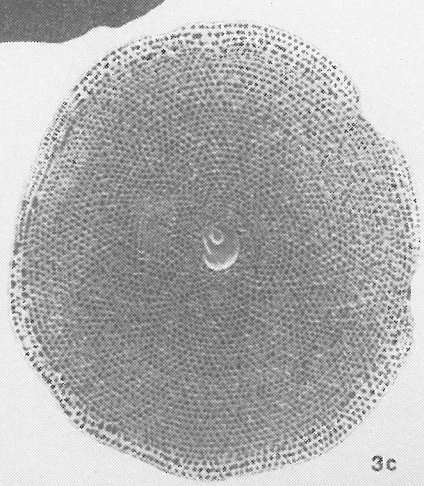

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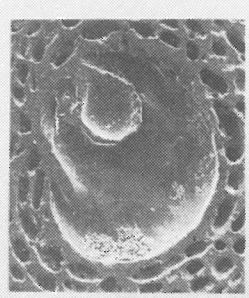


3e

PLATE 35

Figs. 1 - 2 : Marginopora vertebralis BLAINVILLE

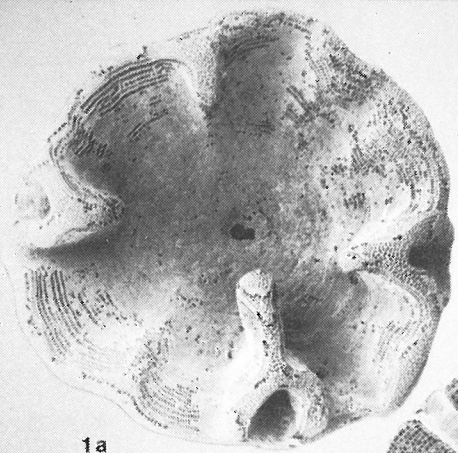
Figs. 1a-e : Adult specimen of the thick, irregular form, showing plications and doubling of margin; empty test, Coconut Fringing Reef flat (L 241).

Fig. 1a : Lateral view (X 9); fig. 1b : oblique edge view showing complicated structure of test edge, and rapid abrasion of lateral walls of chamberlets of the secondary chamber layer, as in the regular form (X 11); fig. 1c : id, detailed view (note thick margins with scattered apertures lying in depressions, and marginal isolation of parts of the secondary chamber layer) (X 15); fig. 1d : equatorial section of same specimen; note compact structure (X 9); fig. 1e : close-up of central area of same section, showing embryonic apparatus with large "Vorhof" (compare with figs. 2f-g, pl. 32) (X 64).

Figs. 2a-d : Smaller specimen(s) of the irregular, thick form, showing phenomenon of intergrowth of several specimens; empty test, Coconut Fringing Reef flat (L 244 b).

Fig. 2a : Lateral view (note thick margins, abrasion of chamberlet walls in last-formed annulus of the secondary chamber layer, and two embryonic apparatuses above and below the median transverse "margin") (X 42); fig. 2b : close-up of upper embryonic apparatus; note reticulate pit-pattern on lateral walls of embryonic apparatus, as well as shallow pitting of lateral walls in this specimen (X 114); fig. 2c : close-up of lower embryonic apparatus (X 122); fig. 2d : detail showing test edge and connections between main test and transversal"bridge" showing its principal chamber layer narrowing towards its furthest extension on the left (X 124).

PLATE 35



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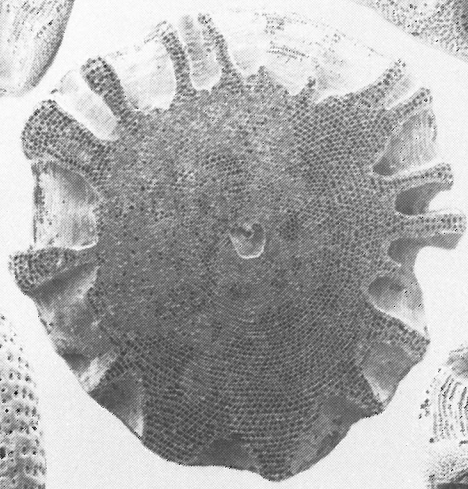

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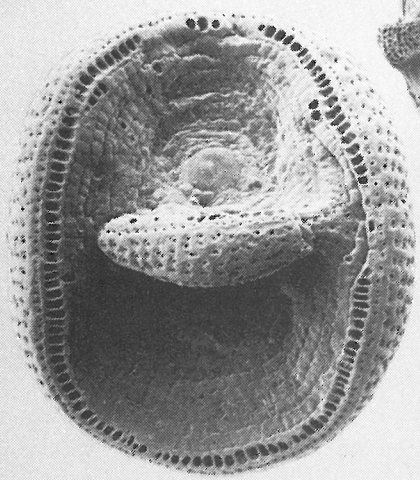

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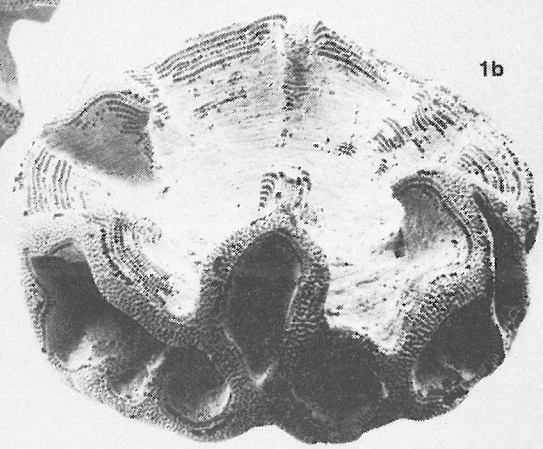
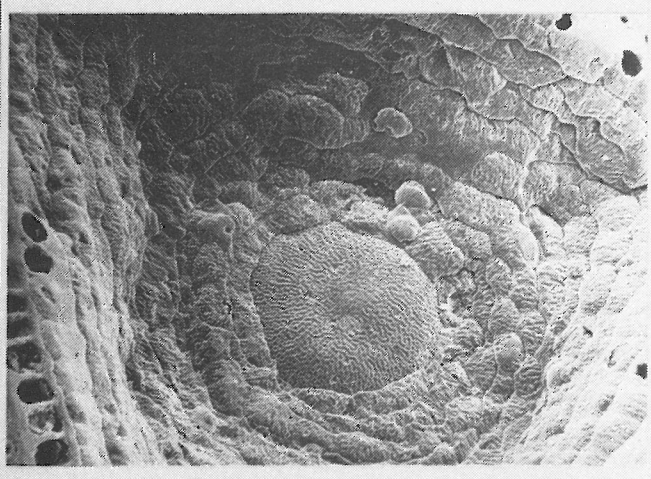
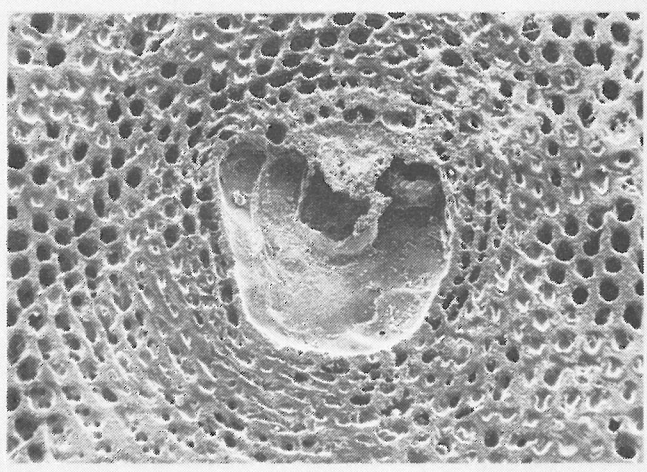


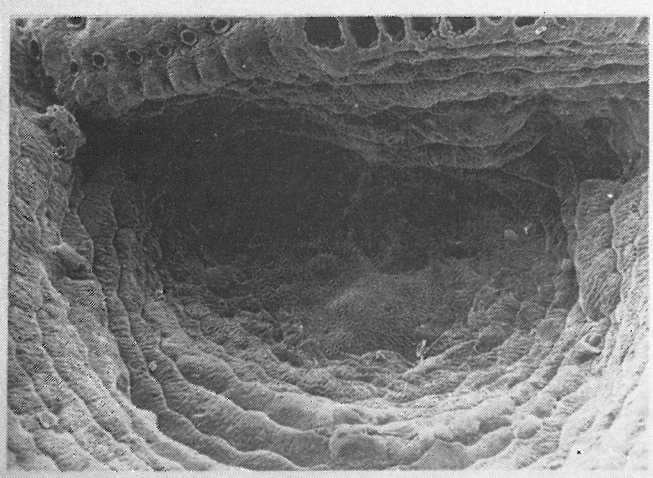
1b

2b

1e







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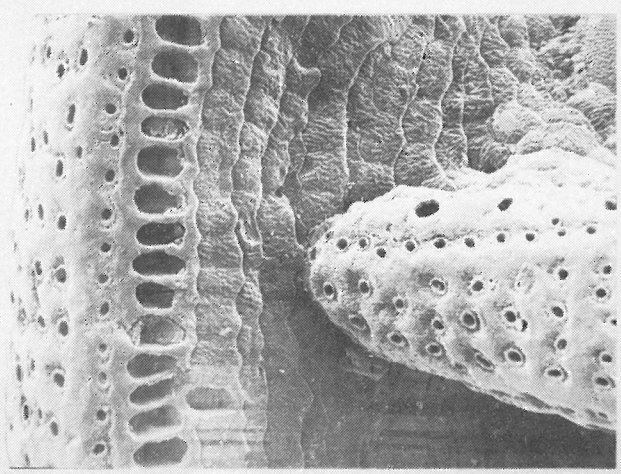


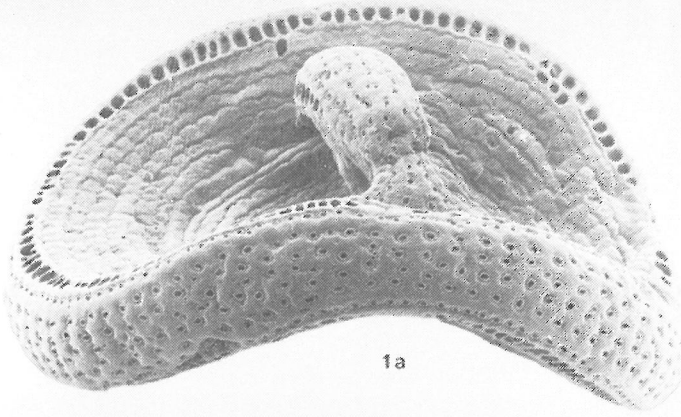
2d

PLATE 36

Figs. 1 - 4 : Marginopora vertebralis BLAINVILLE

Figs. 1a-c : Details of specimen shown on figs. 2a-d of pl. 35.
Fig. 1a : Oblique edge view showing thick margin with apertures; note continuity of secondary chamber layer in the passage towards the supplementary median test "bridge"; the two original individuals have completely fused and act as one single animal (X 62); fig. 1b : part of margin showing smooth surface of the marginal face; the pitting pattern has been removed by abrasion (X 460); fig. 1c : another part of margin where the pit-pattern has been conserved; note smooth, pronounced peristomes (X 917).
Fig. 2 : Regenerated, empty test fragment; Southern Barrier (L 265 b) (X 22).
Figs. 3a-b : Heavily abraded and perforated test of thick, irregular form, Southern Barrier (L 263).
Fig. 3a : Lateral view (note lateral walls of chamberlets of the secondary chamber layer being almost completely removed) (X 9); fig. 3b : detail showing large, rounded perforations in test, presumably caused by parasitic Rosalina sp. (X 59).
Fig. 4 : Adult, empty test; intergrowth of several specimens of the irregular form (reef flat, Windward Barrier, specimen collected during the DE MOOR-expedition by dr. MONTY) (X 6).

PLATE 36



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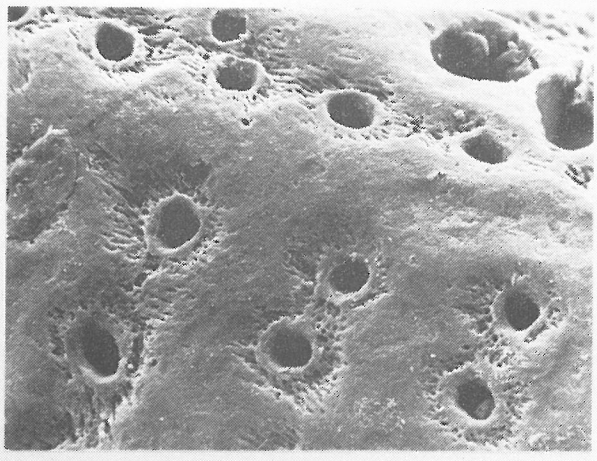

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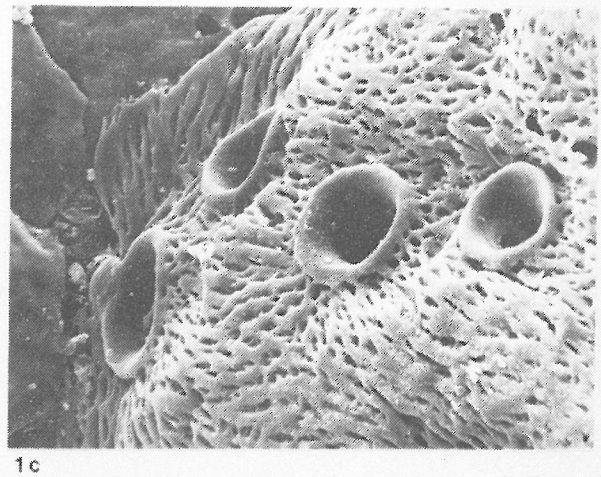

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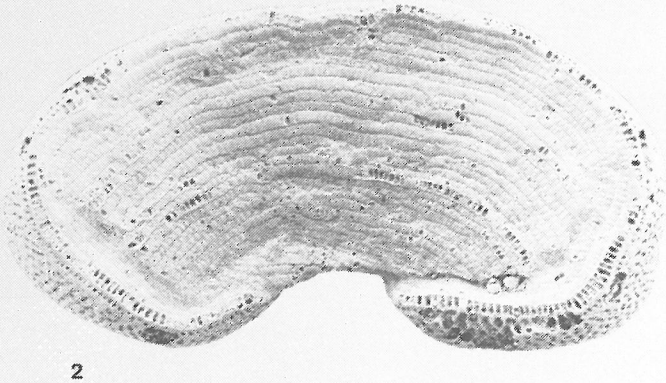

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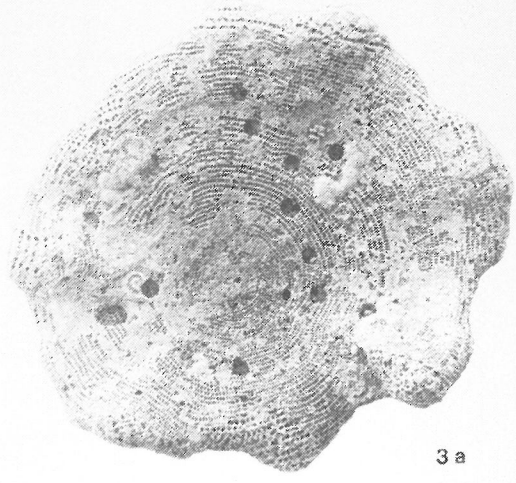

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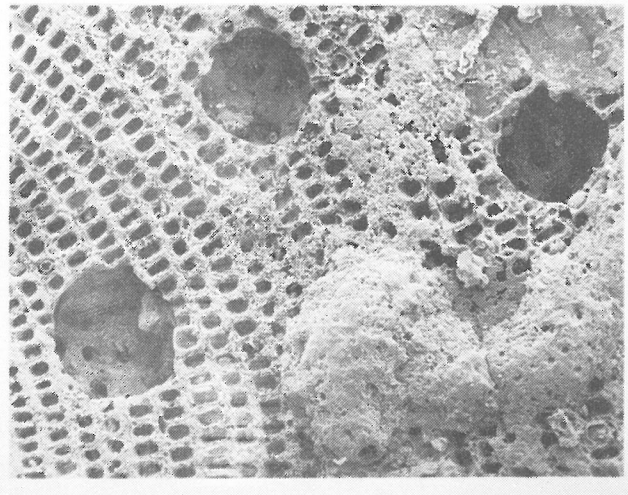
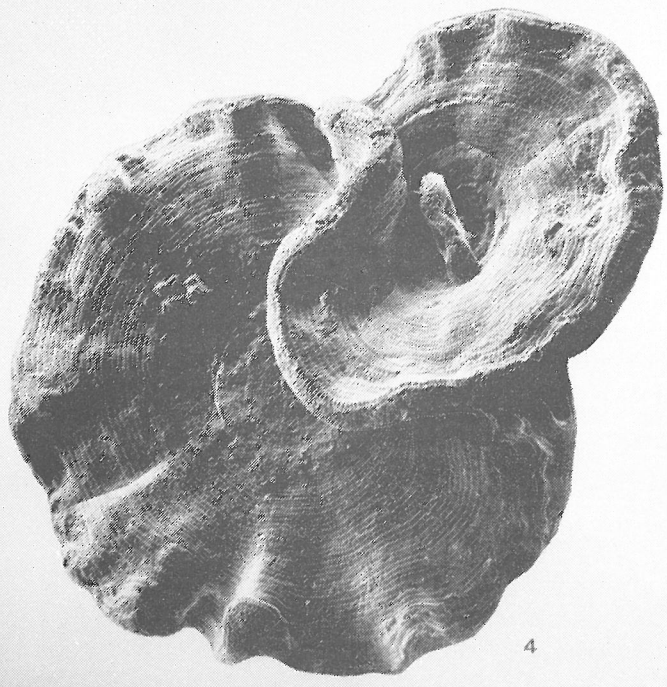




4

PLATE 37

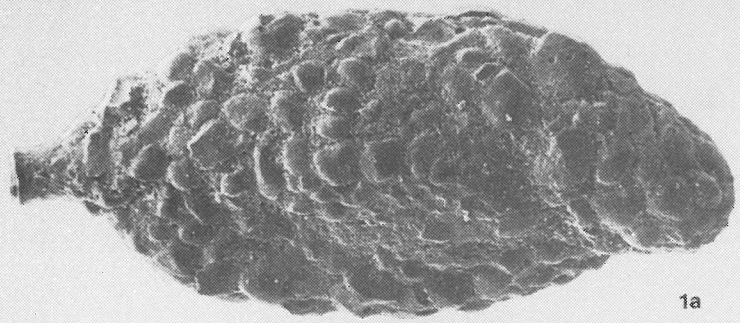
Figs. 1 - 5 : Quinqueloculina anguina TERQUEM, var. arenata SAID

Figs. 1a-b : Empty test, Western slope (L 109).
Fig. 1a : Lateral view (note elongated neck and evenly textured, coarsely agglutinated test wall) (X 149); fig. 1b : same specimen, apertural view (note small bifid tooth and slightly compressed test (X 182).
Fig. 2 : Lateral view of opposite side of empty test, Eastern Perireefal Area (L 81) (X 91).
Fig. 3 : Lateral view of very large test showing tendency towards spiroloculine growth; Lagoon entrance (L 120) (X 95).
Fig. 4 : Lateral view of irregular, uncoiling test; Eastern Perireefal Area (L 63) (X 99).
Fig. 5 : Lateral view of irregularly agglutinated test (note badly sorted and relatively large grains; Eastern Perireefal Area) (L 63) (X 148).

Figs. 6a-c : Quinqueloculina bidentata d'ORBIGNY, subsp. subagglutinata ASANO

Living specimen, Lagoon entrance (L 120) (X 142).
Fig. 6a : Lateral view (note short, smooth neck and coarsely agglutinated test wall; 4 chambers visible);fig. 6b : opposite side (3 chambers visible); fig. 6c : apertural view; note truncated periphery, ovate aperture with bifid tooth and small single apertural tooth at the opposite side of the aperture.

PLATE 37



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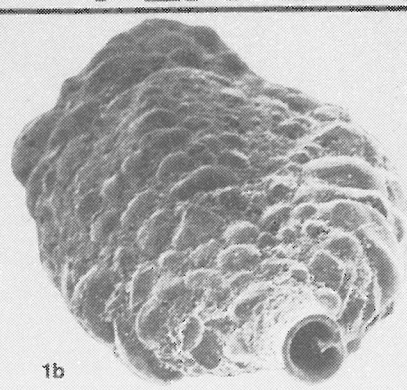

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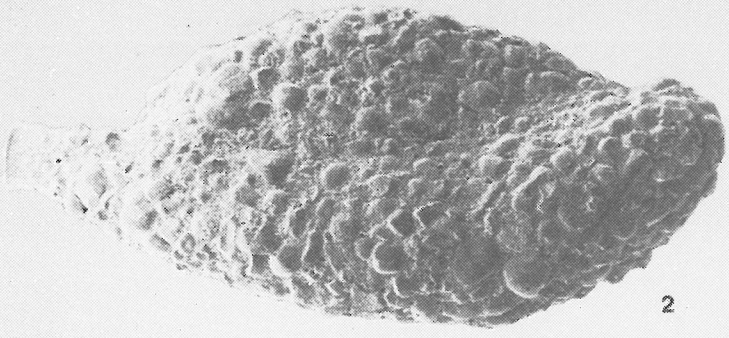

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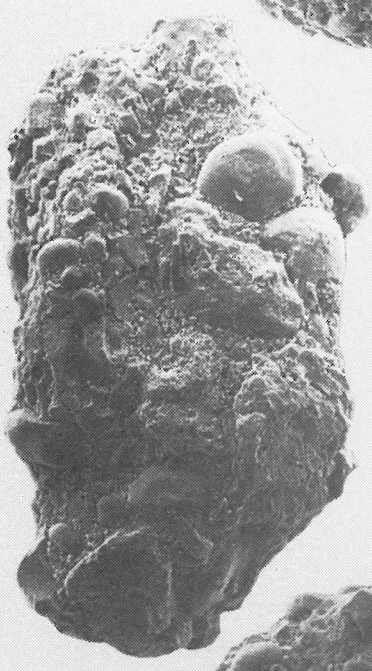

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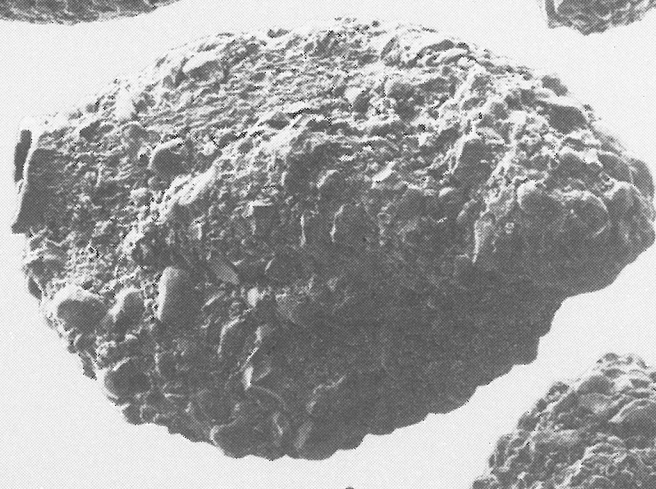

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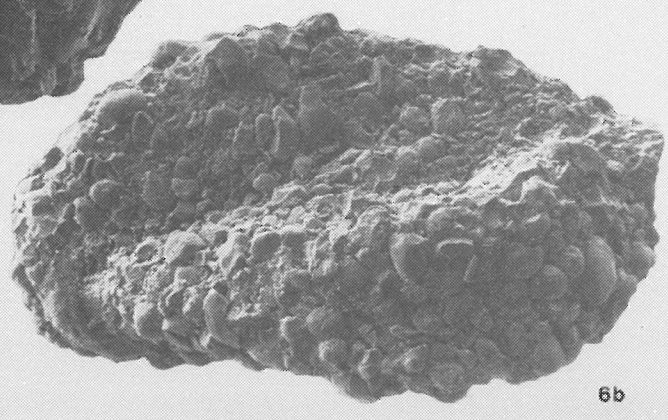

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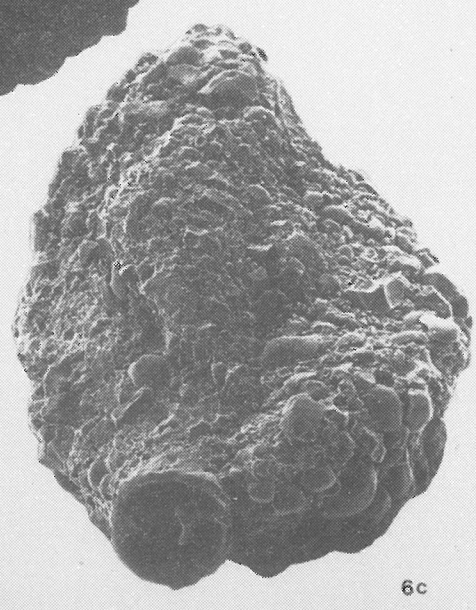


6c

PLATE 38

Figs. 1 - 3 : Quinqueloculina bidentata d'ORBIGNY, subsp. subagglutinata ASANO

Figs. 1a-c : Specimen transitional towards subsp. bidentata s.s.; living specimen, Lagoon entrance (L 120).
Fig. 1a : Lateral view (4 chambers visible); note moderately incised sutures, coarse agglutination and elongate test shape (X 137); fig. 1b : opposite side (3 chambers visible) (X 137); fig. 1c : apertural view showing truncate periphery, compressed test and "Lachlanella"-aperture with elongate tooth (X 150).
Fig. 2 : Smaller specimen, equally transitional towards subsp. bidentata but less elongate and more coarsely agglutinated. Eastern Perireefal Area (L 65) (X 128).
Figs. 3a-b : Specimen showing more inflated test with less truncate periphery and rounded aperture; Patchreef Area (L 155). Fig. 3a : Lateral view (4 chambers visible) : note hardly pronounced neck (X 105); fig. 3b : apertural view showing small, rounded aperture with low, broadly bifid tooth (X 136).

Figs. 4 - 6 : Quinqueloculina bidentata s.s. d'ORBIGNY

Fig. 4 : Lateral view of typical, adult specimen (4 chambers visible); note rather finely agglutinated test walls, elongation of test and well-pronounced sutures; Western slope (L 100) (X 96).
Figs. 5a-b : Another typical specimen, same locality (Western slope, L 100).
Fig. 5a : Lateral view, side opposite to the one shown in fig. 4 (3 chambers visible) (X 91); fig. 5b : apertural view showing truncate periphery and compressed "Lachlanella"-aperture with elongate tooth (X 91).
Figs. 6a-b : Abraded specimen (the agglutinated layer has been removed almost completely) showing some resemblance with "S. cooki"; Lagoon (L 123).
Fig. 6a : Lateral view (4 chambers visible) (X 90); fig. 6b : apertural view showing "Lachlanella"-aperture and periphery less truncate than the one of the preceding specimen (compare with fig. 5b) (X 116).

PLATE 38

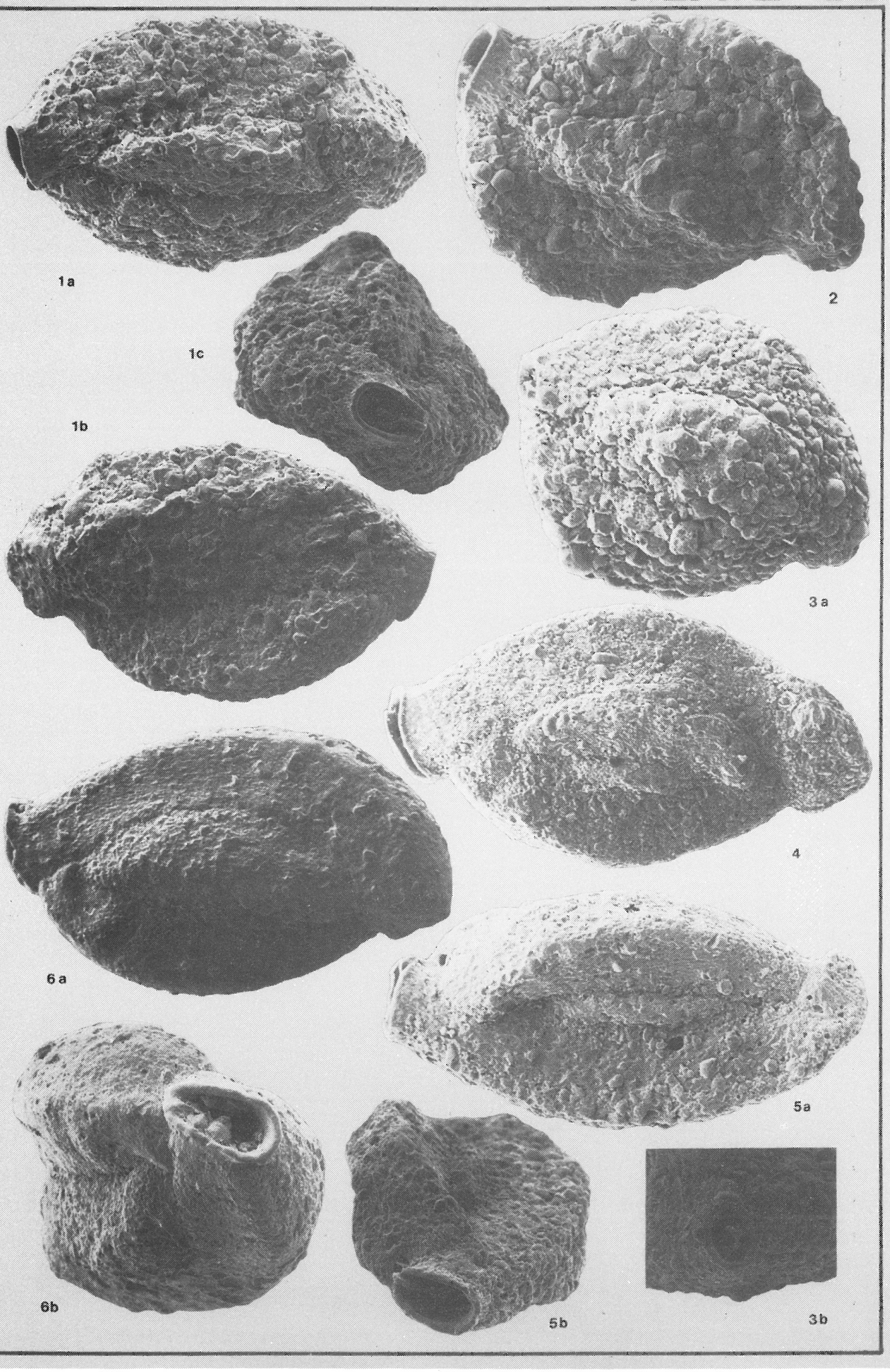


PLATE 39

Figs. 1 - 2 : Quinqueloculina berthelotiana d'ORBIGNY

Fig. 1 : Lateral view of heavily abraded specimen (4 chambers visible); Eastern Perireefal Area (L 63) (X 391).
Fig. 2a : Lateral view of opposite side of fresh specimen (3 chambers visible), empty test, Eastern Perireefal Area (L 71) (X 283); fig. 2b : apertural view; note extreme test compression, small ovate aperture with modest tooth and bifurcating peripheral keel (X 393).

Figs. 3 - 5 : Quinqueloculina crassicarinata COLLINS

Figs. 3a-b : Full-grown specimen, empty test, Eastern Perireefal Area (L 84).
Fig. 3a : Lateral view (4 chambers visible); note short recurved neck, prominent aboral test end and broad test (X 110); fig. 3b : apertural view (note thick, rounded chamber edges and small aperture with modestly bifid tooth) (X 122).
Fig. 4 : Lateral view of opposite side (3 chambers visible) of another specimen, empty test, Eastern Perireefal Area (L 65) (X 124).
Figs. 5a-b : Abraded specimen, empty test, Eastern Perireefal Area (L 65).
Fig. 5a : Lateral view (note more elongate test shape and abrasion transforming the rounded chamber edges into blunt keels) (X 110); fig. 5b : apertural view (X 128).

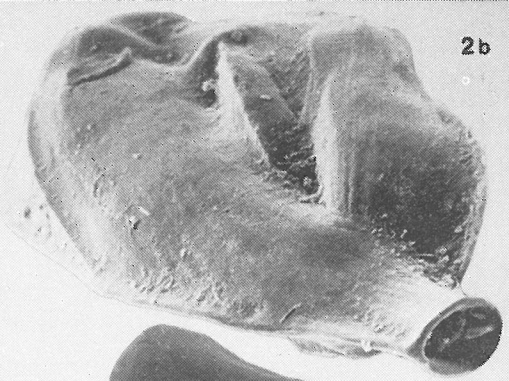
Figs. 6 - 7 : Quinqueloculina curta CUSHMAN

Fig. 6a : Lateral view of empty test (3 chambers visible), Western slope, (L 100) (X 148); fig. 6b : apertural view; note inflated test, nearly flush sutures, rounded periphery, faint ribbing of the median chamber area and large horseshoe-shaped aperture with solid tooth (X 148).
Figs. 7a-b : Other, smoother test, Western slope (L 100); the test ribbing is hardly developed. Fig. 7a : Lateral view (3 chambers visible) (X 95); fig. 7b : apertural view (X 95).

PLATE 39


1


2a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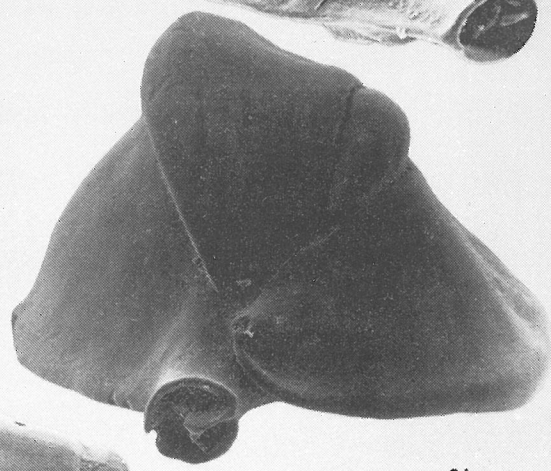
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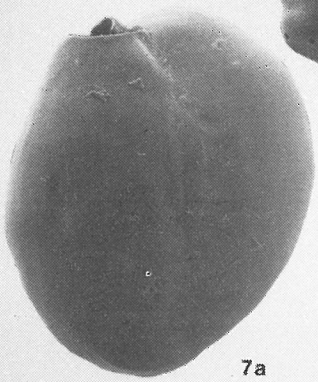
5a


5b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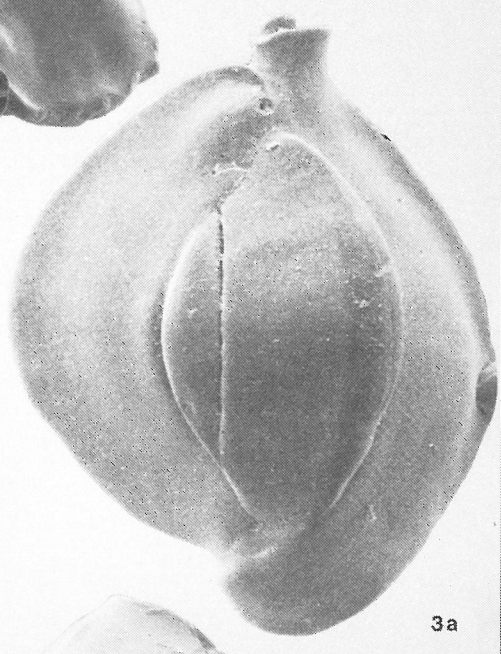
4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7b


6b

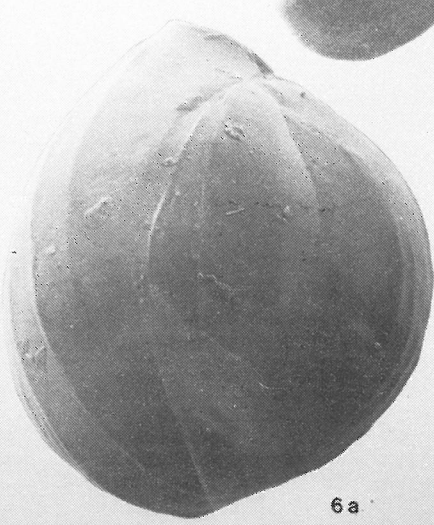

6a

PLATE 40

Figs. 1 - 3 : Quinqueloculina curta CUSHMAN

Figs. 1a-b : Compressed specimen, empty test, Western slope (L 100).
Fig. 1a : Lateral view (4 chambers visible); note numerous peripheral striae and incised sutures (X 137); fig. 1b : apertural view showing compressed test and large aperture without definite peristome (X 148).
Fig. 2 : Empty test, Western slope (L 100), lateral view showing prominent aboral test end and a tendency towards a "Lachlanella"-apertural type (X 141).
Fig. 3 : Apertural view of triloculine empty test, showing more rounded aperture with definite peristome, and faint ribbing; Eastern Perireefal Area (L 84) (X 120).

Figs. 4 - 7 : Quinqueloculina distorquaeata CUSHMAN

Figs. 4a-c : Empty test, Western Perireefal Area (L 98).
Fig. 4a : Lateral view (4 chambers visible) showing distorted, sinuous chamber shape, prominent aboral test end and short apertural neck (X 153); fig. 4b : apertural view; note irregularly truncate periphery and formation of blunt "keels" (X 153); fig. 4c : close-up of rounded aperture showing solid T-shaped bifid tooth with thickened and somewhat recurved tips (X 598).
Fig. 5 : Lateral view of opposite side of another empty test (3 chambers visible), Western Perireefal Area (L 98) (X 162).
Fig. 6 : Empty test, irregular specimen showing less chamber distortion and bifurcating of peripheral keels; Northeastern Perireefal Area (L 56) (X 145).
Fig. 7 : Empty test, juvenile specimen, lateral view (Western Perireefal Area, L 98); note early chamber distortion and corrugated test surface (X 229).

PLATE 40

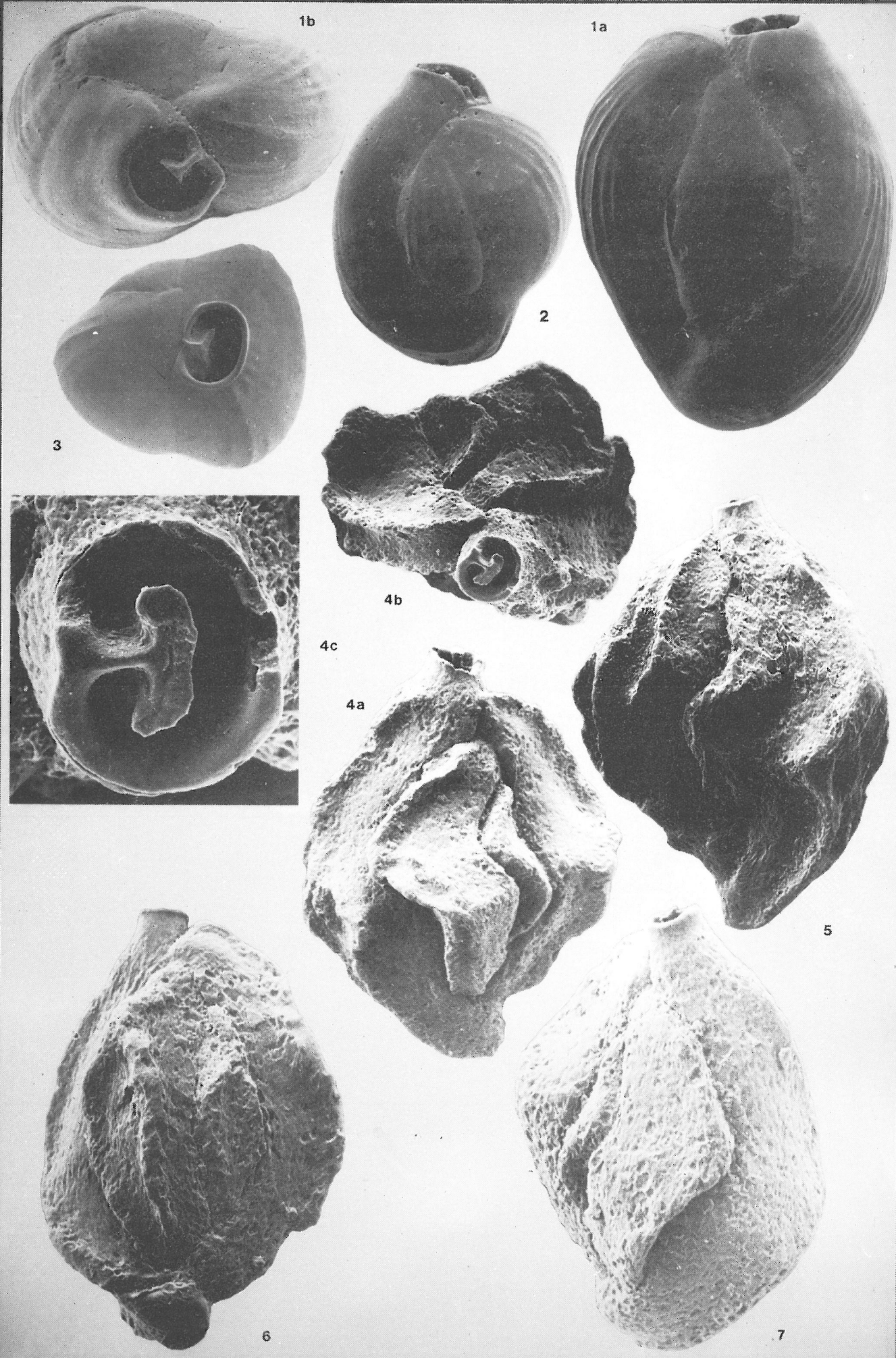


PLATE 41

Figs. 1 - 6 : Quinqueloculina granulocostata GERMERAAD

Fig. 1 : Juvenile specimen of the "sulcata"-type, empty test, lateral view; Patchreef Area (L 154) (X 135).

Figs. 2a-c : Empty test of the "sulcata"-type, Eastern Perireefal Area (L 81). Fig. 2a : Lateral view (4 chambers visible); note bladelike chamber edges (keels), prominent aboral test end and short neck somewhat constricted at its base (X 84); fig. 2b : apertural view (note small aperture) (X 92); fig. 2c : close-up of keyhole-shaped aperture provided with solid, strongly bifid tooth and small peristome (X 474).

Figs. 3a-b : Empty test of specimen intermediate between the "sulcata"- and "ferrussacii"-types, Eastern Perireefal Area (L 65). Fig. 3a : Lateral view (3 chambers visible); note elongate chamber shape, blunt, straight costae, neck and prominent aboral test end (X 82); fig. 3b : apertural view (X 98).

Figs. 4a-b : Empty test of the "ferrussacii"-type, Southern Perireefal Area (L 94). Fig. 4a : Lateral view (4 chambers visible), showing regularly curved chambers with reduced keels (costae) and less prominent aboral test end (X 89); fig. 4b : apertural view (the keyhole-shaped aperture is identical with the one of the "sulcata"-type) (X 89).

Fig. 5 : Empty (slightly damaged) test, Eastern Perireefal Area (L 81); specimen intermediate between the "ferrussacii"- and the "granulocostata s.s."-types; lateral view (4 chambers visible). Note shorter neck, broader test shape with more strongly curved chambers and less pronounced costae; the aboral test end is not prominent (X 100).

Figs. 6a-c : Empty test, specimen intermediate between the "ferrussacii"- and "granulocostata s.s."-types; Western slope (L 100). This specimen strongly resembles "S. rebeccae" VELLA. Fig. 6a : Lateral view (4 chambers visible); note ovate test shape and hardly pronounced, blunt costae (X 115); fig. 6b : apertural view (X 115); fig. 6c : close-up of ovate aperture intermediate between the "ferrussacii"-type aperture and the subquadrate "Lachlanella"-type aperture which is characteristic for Q. rebeccae. Note elongate, hardly bifid tooth (X 239).

PLATE 41

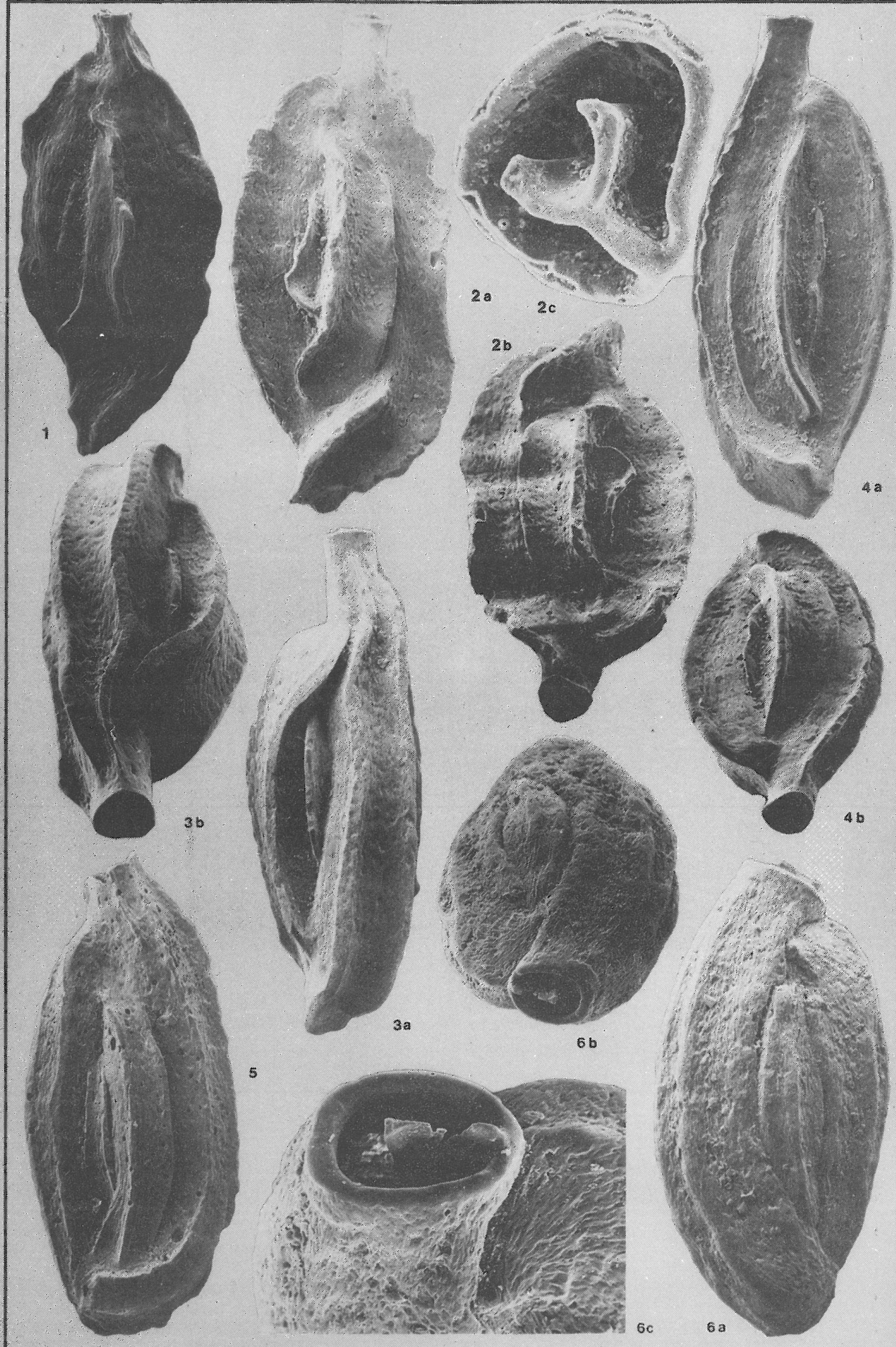


PLATE 42

Figs. 1 - 2 : Quinqueloculina granulocostata GERMERAAD

Figs. 1a-b : Empty test, large specimen, typical "granulocostata s.s."-form; Eastern Perireefal Area (L 65). Fig. 1a : Lateral view (3 chambers visible); note solid subovate test and heavy, irregularly bifurcating costae (X 83); fig. 1b : apertural view; note somewhat compressed test and narrow "Lachlanella"-aperture (X 83).
Figs. 2a-c : Empty test, large specimen, typical "granulocostata s.s."-type; Eastern Perireefal Area (L 65). Fig. 2a : Lateral view of opposite side, (4 chambers visible); the costae are straight and somewhat more in relief in this case, whereas the aboral test end is slightly prominent (X 74); fig. 2b : apertural view (X 74); fig. 2c : close-up of extremely compressed "Lachlanella"-aperture provided with an elongate tooth and having conserved a flattened keyhole-shape characteristic for the sulcata-ferrussacii forms. A peristome is hardly developed (X 250).

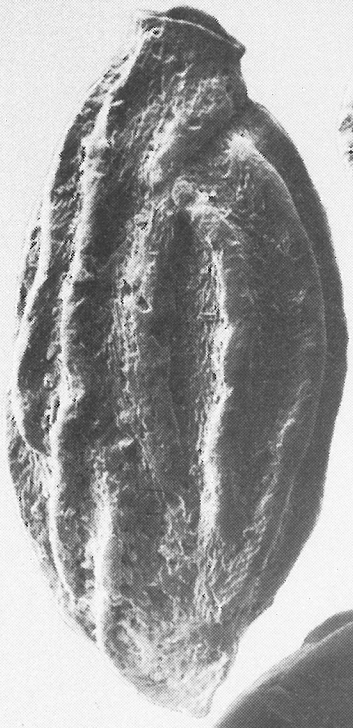
Figs. 3 - 4 : Quinqueloculina lamarckiana s.s. d'ORBIGNY

Figs. 3a-b : Empty test, Eastern Perireefal Area (L 65).
Fig. 3a : Lateral view (4 chambers visible); note rounded to subovate test outline and lack of neck or prominent aboral end (X 193); fig. 3b : apertural view; note sharp-angular chamber edges and subrounded aperture with T-shaped tooth; a peristome is hardly or not visible (X 193).
Fig. 4 : Opposite side of another empty test, lateral view (3 chambers visible); Western slope (L 106) (X 174).

Fig. 5 : Quinqueloculina lamarckiana d'ORBIGNY, subsp. queenslandica COLLINS

Empty test, Patchreef Area (transition towards Western slope - L 105).
Fig. 5a : Lateral view (compare with fig. 3a); note truncation of chamber edges, forming a narrow rim bordered by two faint costae (X 158); fig. 5b : apertural view (compare with fig. 3b) (X 158); fig. 5c : close-up of aperture with T-shaped tooth (compare with fig. 3b) (X 553).

PLATE 42



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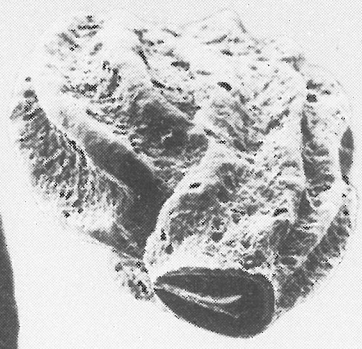
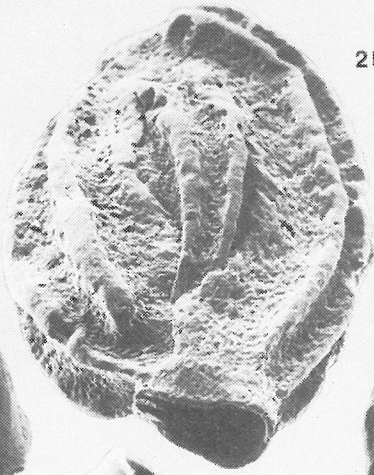


1b



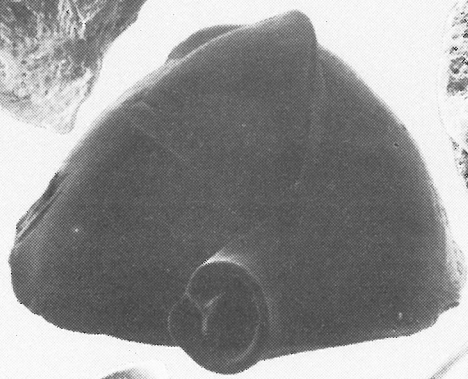
2c



2b



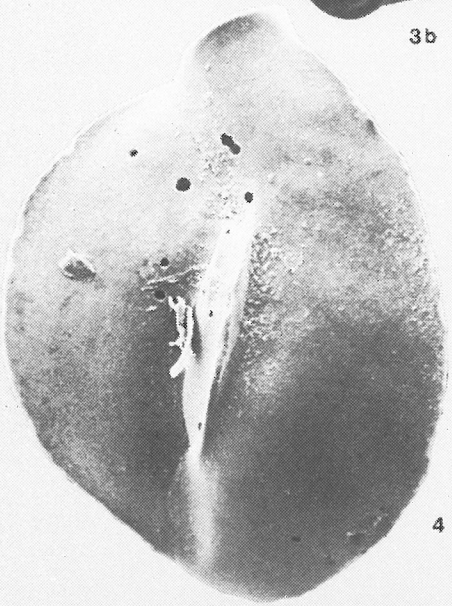
2a



3b



3a



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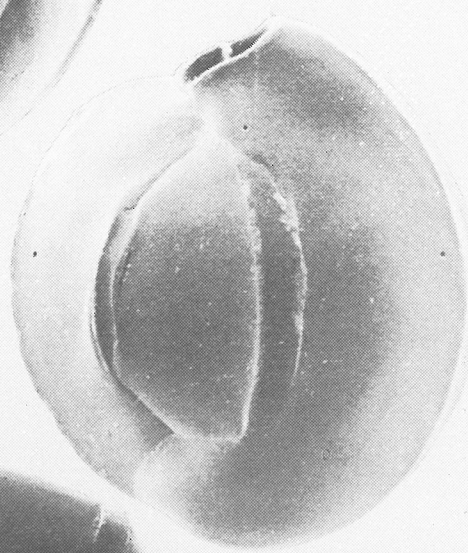

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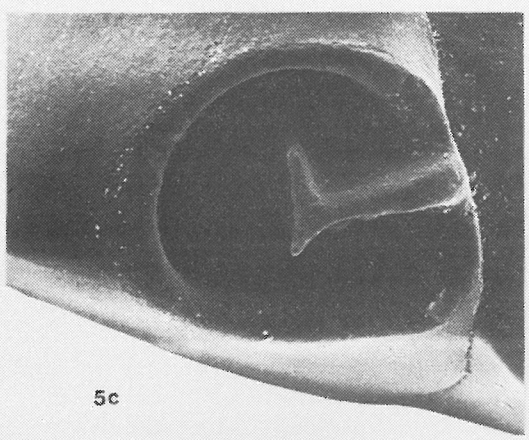

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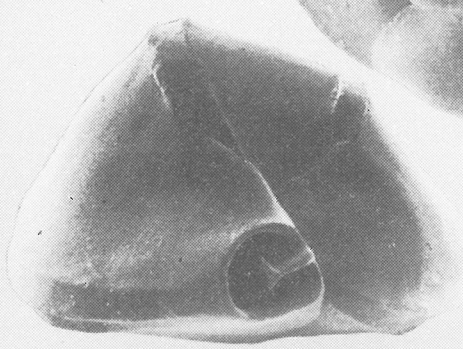


5b

PLATE 43

Figs. 1 - 6 : Quinqueloculina neostriatula THALMANN

Fig. 1 : Lateral view of living specimen (4 chambers visible) of the inflated form; Lagoon, leeward backreef structures (L 122); note ovate test shape without apertural neck (X 205).

Fig. 2 : Other specimen of the same form, empty test, lateral view of opposite side (3 chambers visible); same locality (L 122) (X 215).

Figs. 3a-c : Empty test of inflated, large and very broad specimen of the same form, displaced towards the Perireefal Area (L 65).

Fig. 3a : Lateral view (4 chambers visible); note rounded test shape and somewhat flaring apertural rim (X 100); fig. 3b : apertural view; note rounded chamber cross-section (X 100); fig. 3c : close-up of very large crescentic aperture with platelike tooth (X 240).

Fig. 4 : Lateral view of empty test of the inflated form, showing growth irregularities and transverse undulations; Lagoon (L 122) (X 177).

Figs. 5a-b : Empty test, adult specimen of the compressed deeper-water form; Eastern Perireefal Area (L 65). Fig. 5a : Lateral view (4 chambers visible); compare with fig. 3a. Note some growth irregularities (X 117); fig. 5b : apertural view; note compressed test and almost subangular chamber outline. The aperture too is slightly compressed and the tooth is relatively small, low bifid (X 117).

Figs. 6a-b : Empty test, compressed form, Eastern Perireefal Area (L 65).

Fig. 6a : Lateral view (3 chambers visible) of side opposite to the one shown in fig. 5a (X 105); fig. 6b : close-up of aperture, being of the compressed type but now showing a platelike tooth (X 236).

PLATE 43

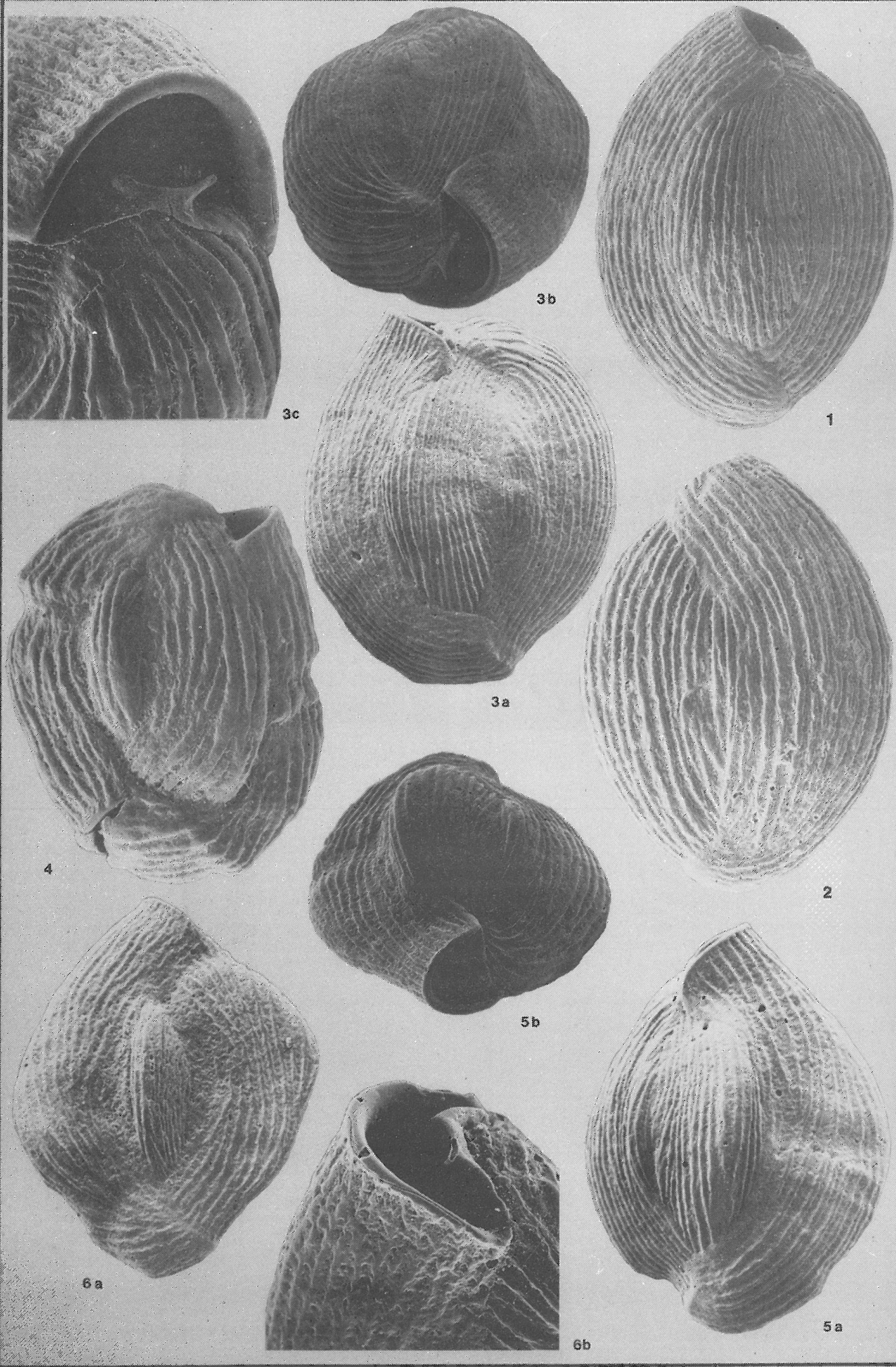


PLATE 44

Figs. 1 - 5 : Quinqueloculina oblonga s.s. (MONTAGU)

Figs. 1a-d : Living specimen of the elongate, thin-walled central form; Eastern Perireefal Area (L 63).

Fig. 1a : Lateral view (4 chambers visible); note elongate test, curved and nondepressed sutures (X 190); fig. 1b : lateral view of opposite side (3 chambers visible) (X 196); fig. 1c : apertural view; note slightly compressed test and small ovate aperture not reaching the ultimate suture (X 190); fig. 1d : close-up of aperture, showing hardly bifid, rather short tooth; note absence of a peristome (the aperture is filled up with dried protoplasm) (X 1006).

Figs. 2a-b : Living specimen transitional towards the incisa-form; Lagoon (L 123). Fig. 2a : Lateral view (4 chambers visible); the test shape is still elongate but the sutures are more deeply incised and the aperture enlargens (X 190); fig. 2b : lateral view, opposite side (3 chambers visible) (X 190).

Fig. 3 : Empty test, apertural view of a specimen of the stouter and thicker variant; Sandy Shoal (behind recolonised front - L 150); note thick-walled, solid test and larger rounded aperture provided with a distinctly bifid tooth (X 268).

Figs. 4a-b : Empty test of the stouter and thicker variant, Windward Barrier, backreef area (L 253). Fig. 4a : Lateral view (4 chambers visible) (X 134); fig. 4b : close-up of elongate aperture (reaching the ultimate suture) provided with an elongate, prominent and distinctly bifid tooth (X 467).

Figs. 5a-c : Empty test of the stouter and thicker variant; specimen transported towards the Eastern Perireefal Area (L 65). Fig. 5a : Lateral view (3 chambers visible); note embracing chambers (X 210); fig. 5b : apertural view (X 210); fig. 5c : close-up of large aperture with aberrant, solid, prominent, triangular tooth (X 452).

PLATE 44

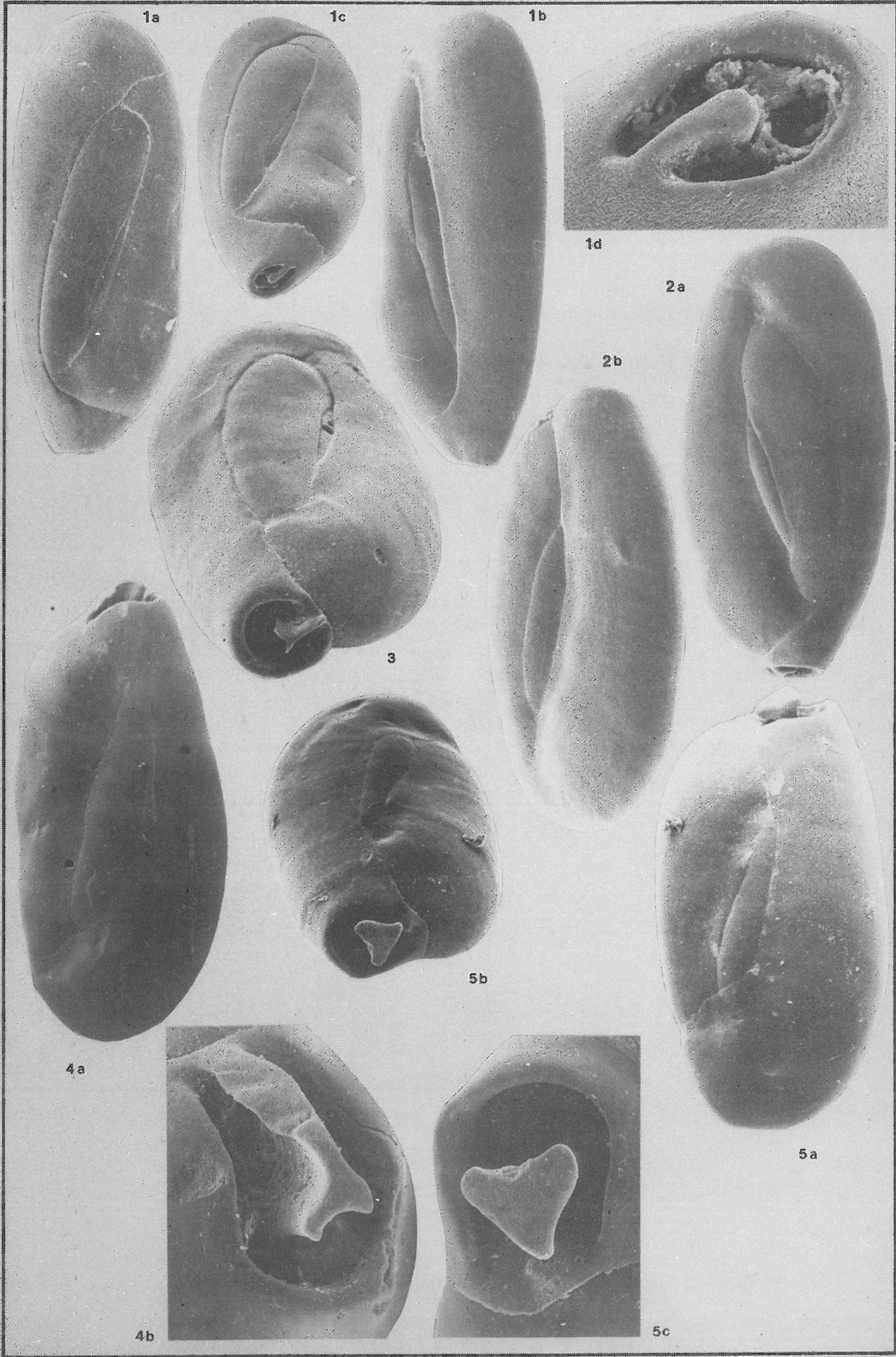


PLATE 45

Figs. 1 - 2 : Quinqueloculina oblonga (MONTAGU), subsp. incisa VELLA

Figs. 1a-b : Thick-walled, solid specimen, empty test, Eastern Perireefal Area (L 63). Fig. 1a : Lateral view (3 chambers visible) (X 197); fig. 1b : apertural view (X 197).
Figs. 2a-c : Thin-walled fragile specimen, empty test, Eastern Perireefal Area (L 65). Fig. 2a : Lateral view (4 chambers visible); note resemblance with Q. seminulum (X 212); fig. 2b : opposite side (3 chambers visible) (X 188); fig. 2c : apertural view; note deeply incised sutures, large semi-circular aperture and apertural tooth with "arcuate platform" (modified oblonga s.s.-tooth) (X 212).

Figs. 3 - 5 : Quinqueloculina oblonga (MONTAGU), subsp. segersi (New Name)

Figs. 3a-c : Empty test, triloculine specimen intermediate between oblonga s.s. and segersi, Northern Perireefal Area (L 50). Fig. 3a : Lateral view (3 chambers visible); note broadening of apertural area (X 229); fig. 3b : apertural view; note test- and aperture compression (X 258); fig. 3c : close-up of narrow, compressed peristome-less aperture (not reaching the ultimate suture), provided with simple elongate tooth (X 920).
Figs. 4a-b : Typical triloculine segersi-specimen, empty test, Watson's Bay (L 110). Fig. 4a : Lateral view (3 chambers visible); note suture pattern being basically the same as in the other oblonga-variants (X 194); fig. 4b : apertural view, note strongly compressed test and slitlike aperture (X 194).
Figs. 5a-b : Empty test, Eastern Perireefal Area (L 60).
Fig. 5a : Lateral view of opposite side (2 chambers visible); note strongly embracing chambers (X 188); fig. 5b : apertural view showing extremely compressed, angular to keeled periphery, and compressed slitlike aperture provided with a hardly - to non-bifid tooth exactly identical with that of oblonga s.s. (X 188).

PLATE 45

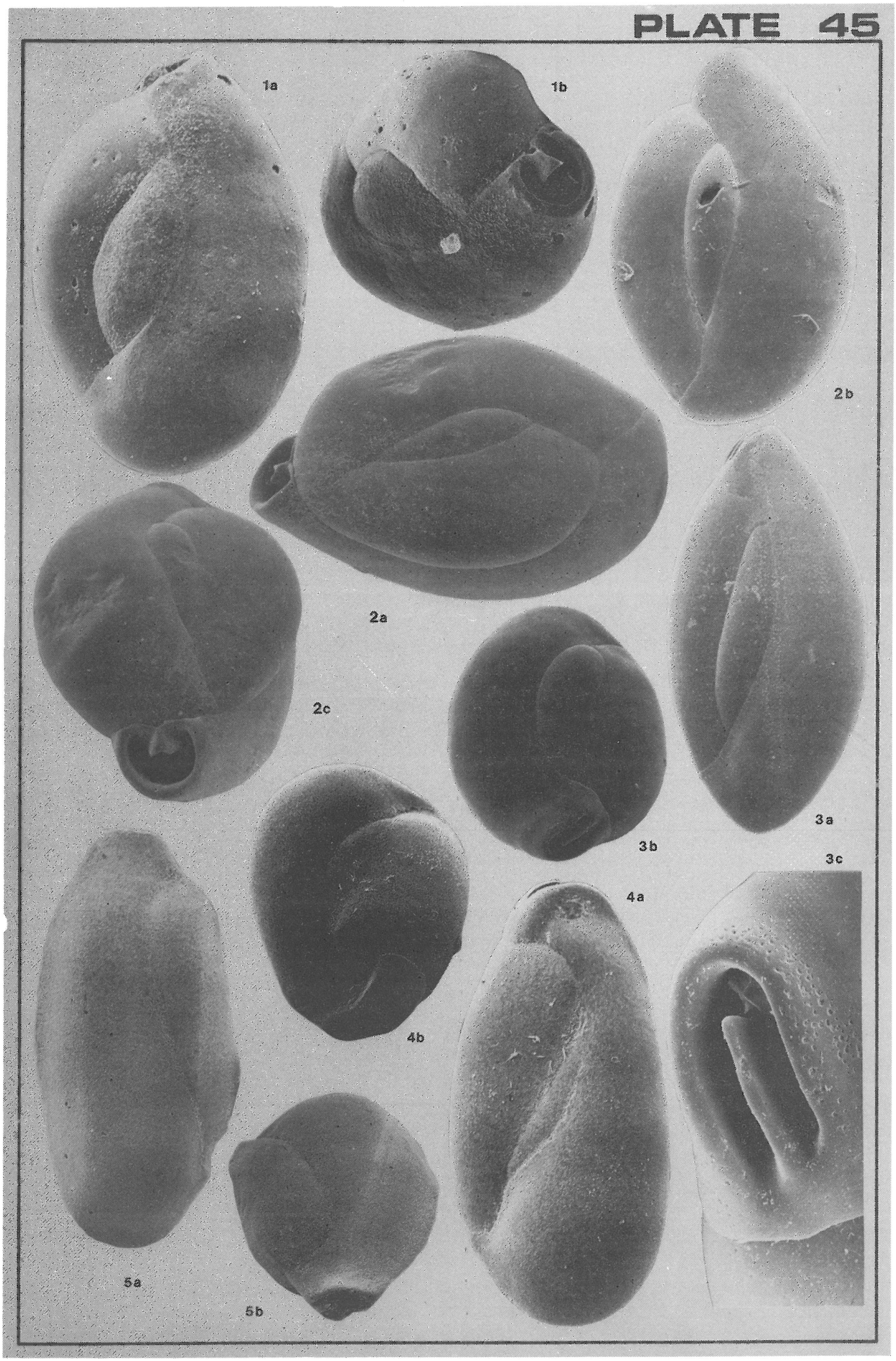


PLATE 46

Figs. 1 - 2 : Quinqueloculina oblonga (MONTAGU), subsp. transversestriata (BRADY)

Fig. 1 : Lateral view (4 ! chambers visible) of immature empty test, Watson's Bay (L 110); note poorly developed transverse undulations (compare with fig. 4, pl. 45) (X 284).
Figs. 2a-b : Empty test, specimen showing fully developed transverse undulations; transition Patchreef Area - Western slope (L 102). Fig. 2a : Lateral view of side opposite to the one shown by the preceding specimen (3 chambers visible) (X 162); fig. 2b : apertural view showing compressed test, angular periphery and aperture identical with the one of the segersi-subsp. (X 177).

Figs. 3 - 5 : Quinqueloculina oblonga (MONTAGU), forma eburnea (d'ORBIGNY)

Figs. 3a-c : Quadriloculine living specimen, Eastern Perireefal Area (L 75). Fig. 3a : Lateral view (4 chambers visible); note general test outline and suture pattern being perfectly comparable with that of oblonga s.s. (X 215); fig. 3b : lateral view, opposite side (2 chambers visible) (X 215); fig. 3c : apertural view; note elongate slitlike aperture completely filled up with an arcuate tooth, enlarged and rounded at the tip (X 215).
Figs. 4a-c : Triloculine (almost biloculine) empty test, Eastern Perireefal Area (L 81). Fig. 4a : Lateral view (2 chambers visible); note embracing chambers (X 207); fig. 4b : apertural view (X 207); fig. 4c : close-up of slitlike aperture and curved prominent tooth; note the "toothplate" being perforated by relatively large rounded openings; this seems to be a constant feature in most of the encountered eburnea-specimens (X 465).
Figs. 5a-b : Triloculine, elongate specimen, empty test, Windward Barrier (L 254). Fig. 5a : Lateral view (3 chambers visible) (X 134); fig. 5b : apertural view; note forked sutural toothbase (X 134).

Figs. 6a-b : Quinqueloculina oblonga (MONTAGU), subsp. lizardi nov. subsp.

Empty test, Northern Perireefal Area (L 50).
Fig. 6a : Lateral view (4 chambers visible); note general test aspect being identical with that of oblonga s.s., except for the surface pitting (X 228); fig. 6b : apertural view (X 266).

PLATE 46

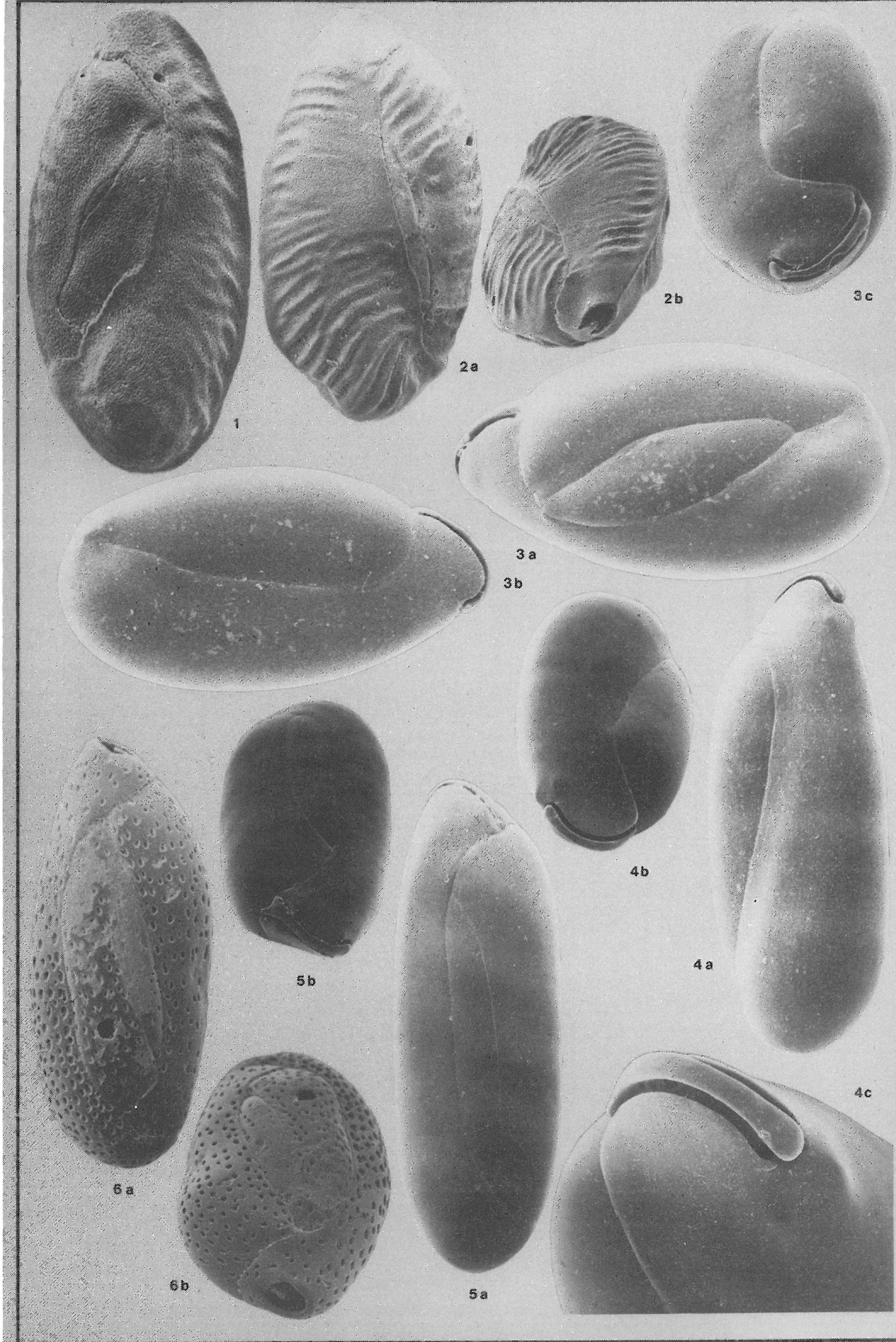


PLATE 47

Fig. 1 : Quinqueloculina oblonga (MONTAGU), subsp. lizardi nov. subsp.

Lateral view, close-up of apertural test end, of specimen figured on fig. 6, pl. 46; note shallow pitting of test surface, except where these pits have been removed by abrasion (X 469).

Figs. 2 - 3 : Quinqueloculina pittensis ALBANI

Figs. 2a-b : Empty test, Eastern Perireefal Area (L 65). Fig. 2a : Lateral view (4 chambers visible); note corrugated test surface, short recurved neck and prominent aboral test end (X 126); fig. 2b : apertural view; note rounded aperture and T-shaped tooth (X 126).
Fig. 3 : Opposite side (3 chambers visible); lateral view of another empty test, same locality (L 65); note inclusion of larger crystals in test wall (X 208).

Figs. 4 - 5 : Quinqueloculina poeyana carinata ALBANI

Figs. 4a-b : Empty test, one of the rare relatively large specimens showing an inflated and hardly compressed test which cannot be distinguished from Atlantic Q. poeyana s.s.; Patchreef Area (L 278 d).
Fig. 4a : Lateral view (4 chambers visible); note short apertural neck and ovate test outline (X 188); fig. 4b : apertural view (note inflated test and subrounded aperture (X 188).
Figs. 5a-c : Example of the more common, smaller, compressed and carinate form; living specimen, Lagoon (L 121). Fig. 5a : Lateral view (4 chambers visible); note elongate test shape and apertural neck (X 207); fig. 5b : apertural view; note compressed ovate aperture with single tooth (X 207); fig. 5c : lateral view of opposite side (3 chambers visible) (X 207).

Figs. 6 - 7 : Quinqueloculina pseudoreticulata PARR

Figs. 6a-b : Living, compressed specimen, Eastern Perireefal Area (L 86).
Fig. 6a : Lateral view (4 chambers visible); note disappearing of reticulate pattern near the sutures, short recurved neck and prominent aboral test end (X 103); fig. 6b : apertural view; note subangular periphery and subquadrate "Lachlanella"-aperture (X 103).
Fig. 7 : Lateral view of opposite side (3 chambers visible) of a specimen which is more inflated and rounded; Eastern Perireefal Area (L 65) (X 92).

PLATE 47

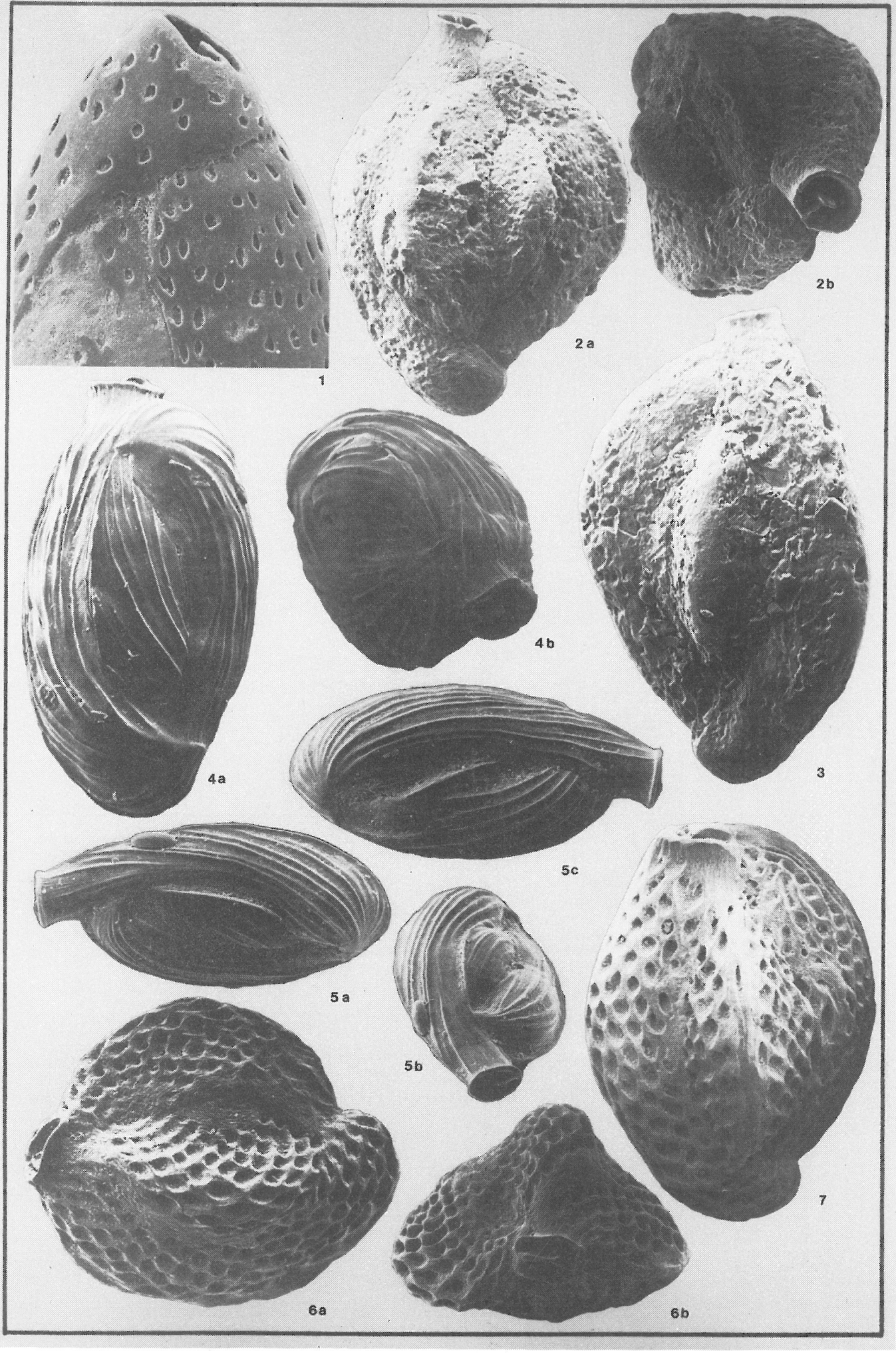


PLATE 48

Figs. 1 - 2 : Quinqueloculina quinquecarinata COLLINS

Figs. 1a-b : Smaller, living specimen; Eastern Perireefal Area (L 60). Fig. 1a : Lateral view (4 chambers visible); note narrow blunt keels and smooth test surface (X 323); fig. 1b : id, opposite side (3 chambers visible) (X 323).

Figs. 2a-b : Empty test, larger specimen, Western slope (L 109). Fig. 2a : Lateral view (4 chambers visible); note somewhat broader test, shorter neck and corrugated test surface (X 204); fig. 2b : apertural view (X 204).

Figs. 3 - 4 : Quinqueloculina tropicalis CUSHMAN

Figs. 3a-b : Empty test, Patchreef Area (L 153). Fig. 3a : Lateral view (4 chambers visible); note smooth peristome (X 255); fig. 3b : apertural view (note large rounded aperture with bifid tooth) (X 255).

Fig. 4 : Lateral view of opposite side (3 chambers visible) of another empty test; transition Lagoon - Sandy Shoal (L 151) (X 253).

Figs. 5 - 7 : Quinqueloculina montyi nova species

Figs. 5a-b : Holotype; empty test, large specimen with irregular striation; Western slope (L 100). Fig. 5a : Lateral view (4 chambers visible); note irregular, anastomosing striae fading out towards the chamber extremities; somewhat prominent aboral test end, and slightly recurved peristome (X 167); fig. 5b : apertural view; note deeply incised sutures, subrounded aperture with peristome and low bifid T-shaped tooth (X 167).

Fig. 6 : Lateral view of opposite side (3 chambers visible) of a smaller paratype, empty test, same locality (L 100); note fewer, more regular striae (X 193).

Figs. 7a-b : Empty test, costate juvenile; Patchreef Area (L 153). Fig. 7a : Lateral view (5 chambers visible) (X 220); fig. 7b : apertural view; note 3-5 low costae pro chamber and aperture not showing any trace of a tooth (not broken-off either) (X 207).

PLATE 48

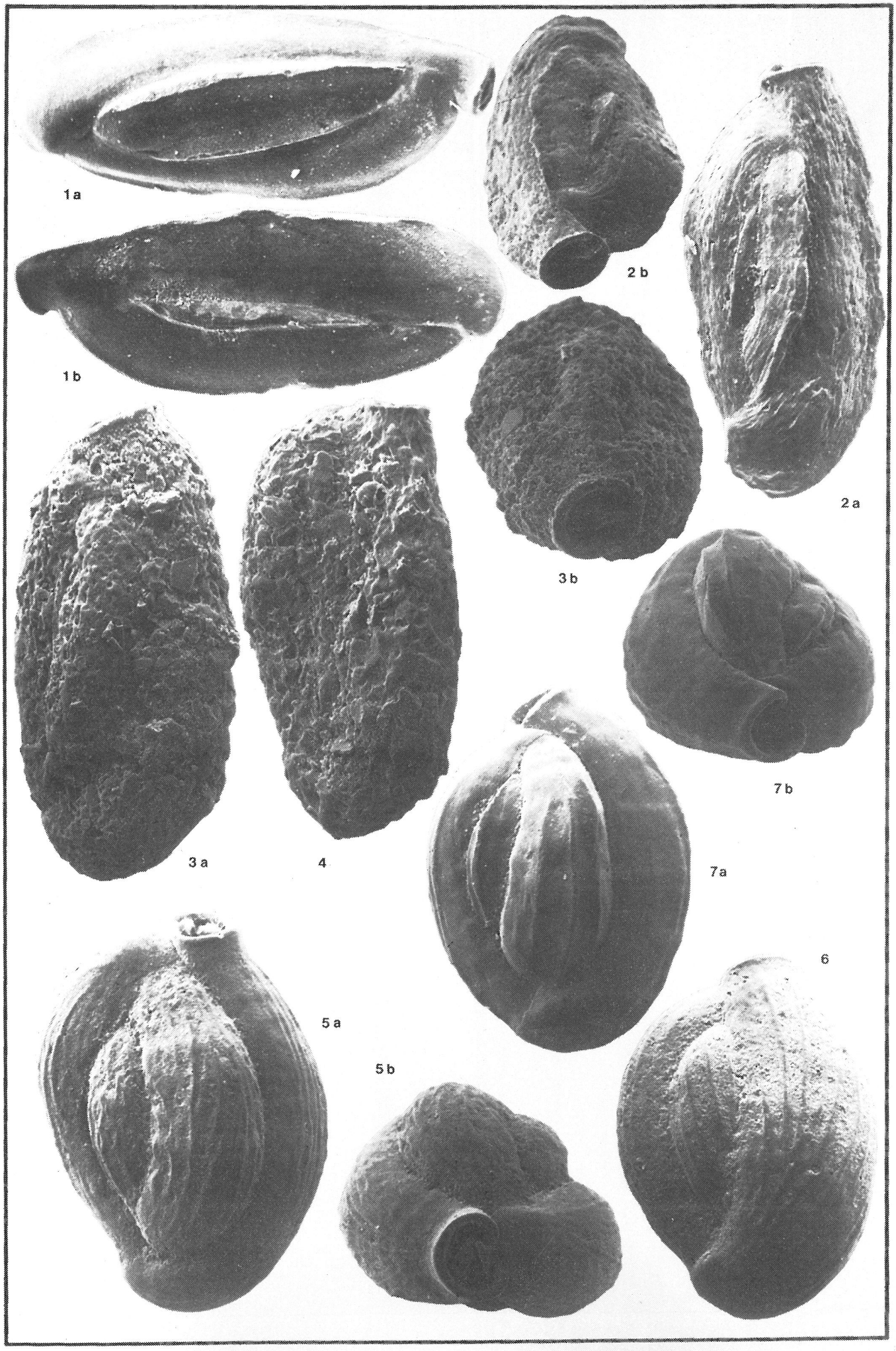


PLATE 49

Figs. 1 - 2 : Massilina corrugata COLLINS

Fig. 1 : Lateral view of empty test, 4 chambers visible; slightly abraded specimen. Eastern Perireefal Area (L 65) (X 133).
Figs. 2a-b : Empty test, leeward slope (L 100). Fig. 2a : Lateral view (3 chambers visible); note numerous transverse undulations and prominent aboral test end (X 140); fig. 2b : apertural view; note elongate aperture with nonbifid tooth and truncate-to angled periphery (X 140).

Figs. 3 - 5 : Massilina inaequalis CUSHMAN

Figs. 3a-b : Empty test, Internal Platform (L 170). Fig. 3a : Lateral view (4 chambers visible) (X 141); fig. 3b : apertural view : note truncate, sharply angled to keeled chambers and double T-shaped tooth (X 141).
Figs. 4a-b : Empty test, transition Lagoon - Sandy Shoal (L 151). Fig. 4a : Lateral view, opposite side of test (3 chambers visible); note hardly developed neck and nonprominent aboral test end (X 152); fig. 4b : apertural view (X 152).
Figs. 5a-b : Empty test, slightly aberrant specimen, Eastern Perireefal Area (probably transported specimen). Fig. 5a : Lateral view (note stronger neck development) (X 148); fig. 5b : apertural view (note flat, compressed test and development of a triple apertural tooth) (X 148).

Figs. 6 - 7 : Massilina subrugosa COLLINS

Figs. 6a-b : Empty test, Sandy Shoal (near to recolonised front - L 150). Fig. 6a : Lateral view (note agglutinated surface layer) (X 191); fig. 6b : apertural view (note large, compressed, elongate aperture with elongate single tooth) (X 191).
Fig. 7 : Lateral view of empty test, juvenile specimen, Northern Perireefal Area (L 50); the sandgrain layer has apparently been removed by abrasion, the grains leaving their imprints upon the test (X 189).

PLATE 49

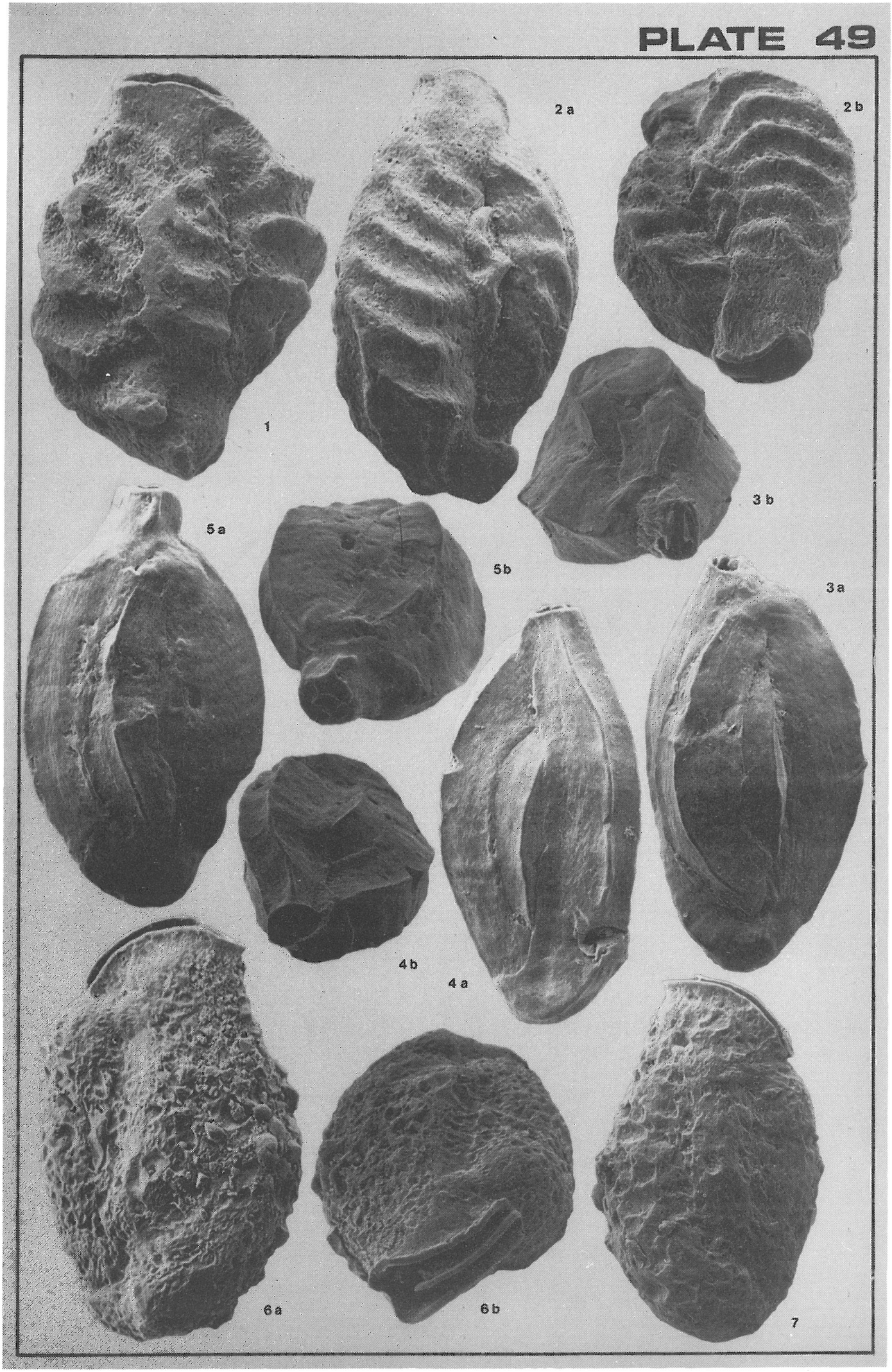


PLATE 50

Figs. 1 - 5 : Pseudomassilina australis s.s. (CUSHMAN)

Figs. 1a-c : Empty test; flattened, evolute specimen showing some costae in the early-formed chambers, as in subsp. macilenta; Eastern Perireefal Area (L 63).
Fig. 1a : Lateral view (note pitted test surface) (X 89); fig. 1b : apertural view (note compressed test and large, compressed, elongate, toothless aperture) (X 89); fig. 1c : close-up showing rounded surface pits (note some coccoliths sticking to the wall) (X 1917).
Figs. 2a-b : Slightly more thickened (abraded) empty test, Eastern Perireefal Area (L 60). Fig. 2a : Lateral view (X 105); fig. 2b : apertural view (X 105).
Fig. 3a-b : Smaller, completely quinqueloculine juvenile test, Southern Perireefal Area (L 90). Fig. 3a : Lateral view (4 chambers visible) (X 227); fig. 3b : apertural view (note shorter toothless aperture) (X 227).
Figs. 4a-b : Thick, involute test, Eastern Perireefal Area (L 63).
Fig. 4a : Lateral view (X 93); fig. 4b : apertural view (note rounded periphery and hardly visible sutures) (X 93).
Figs. 5a-b : Thick, involute empty test showing a reticulate-to chevron-shaped surface ornamentation pattern; Eastern Perireefal Area (L 60).
Fig. 5a : Lateral view (note large pits between the nonpitted ribs) (X 195); fig. 5b : apertural view (X 195).

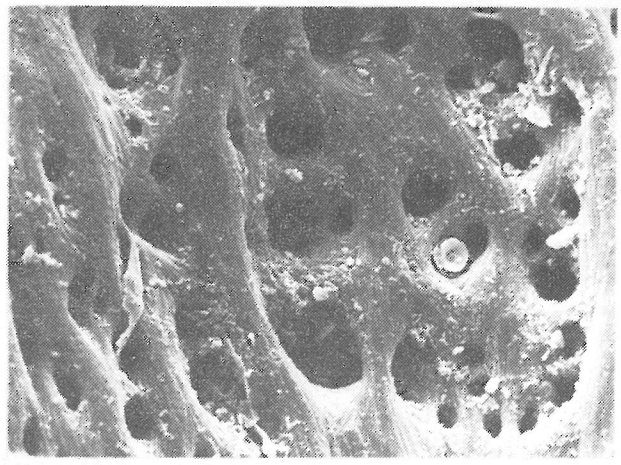
PLATE 50



1b



1a



1c



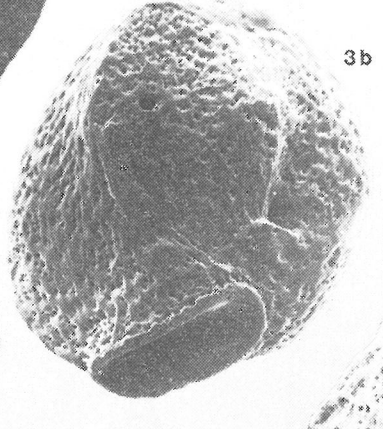
3a



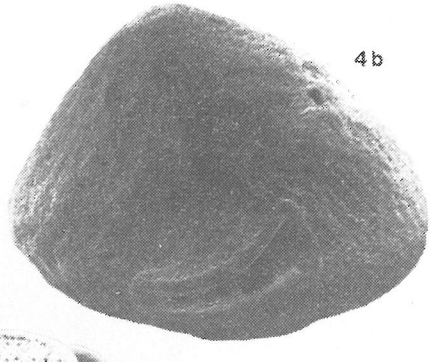
4a



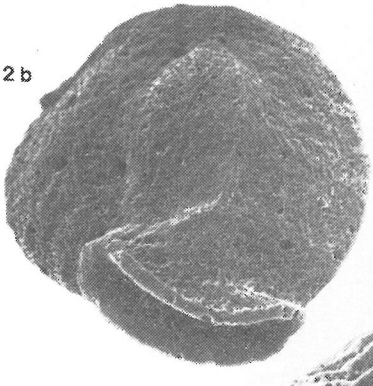
2a



3b



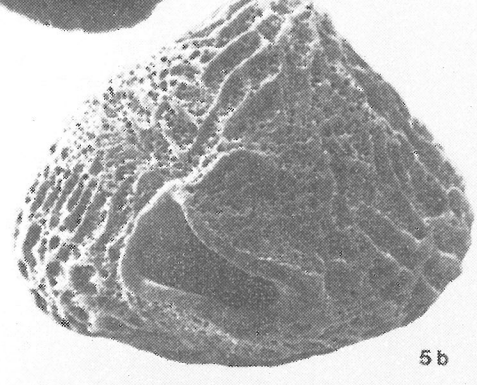
4b



2b



5a



5b

PLATE 51

Fig. 1 : Pseudomassilina australis s.s. (CUSHMAN)

Lateral view of empty test showing transverse undulations upon chamber walls; Eastern Perireefal Area (L 60) (X 143).

Fig. 2 : Pseudomassilina australis (CUSHMAN), subsp. reticulata (H. ALLEN & EARLAND)

Large, adult specimen, empty test, Eastern Perireefal Area (L 60).
Fig. 2a : Lateral view (note evolute test and oblique, somewhat reticulate striation pattern) (X 88); fig. 2b : apertural view showing extremely compressed test with elongated aperture (X 88).

Figs. 3 - 4 : Pseudomassilina australis (CUSHMAN), subsp. macilenta (BRADY)

Figs. 3a-b : Large, typical, flattened empty test, Eastern Perireefal Area (L 60). Fig. 3a : Lateral view : note evolute test, few prominent oblique costae and slightly recurved periphery at the apertural test end (X 102); fig. 3b : apertural view showing extremely compressed test and flaring aperture (X 102).
Figs. 4a-b : Smaller juvenile test showing relatively numerous, less oblique costae; Southern Perireefal Area (L 94). Fig. 4a : Lateral view (X 190); fig. 4b : apertural view (X 190).

Figs. 5 - 6 : Pyrgo denticula s.s. (BRADY)

Figs. 5a-b : Empty test, Eastern Perireefal Area (L 84). Fig. 5a : Lateral view (1 chamber visible); note completely smooth test surface and hardly pronounced denticulations at aboral test end (X 104); fig. 5b : apertural view showing low compressed aperture with peristome and low, broadly bifid tooth (X 104).
Figs. 6a-b : Empty test, Eastern Perireefal Area (L 84), showing opposite side of test. Fig. 6a : Lateral view (2 chambers visible) : note smooth test and slightly more pronounced aboral denticulations (X 108); fig. 6b : apertural view (note solid, low, outwardly projecting tooth) (X 108).

PLATE 51

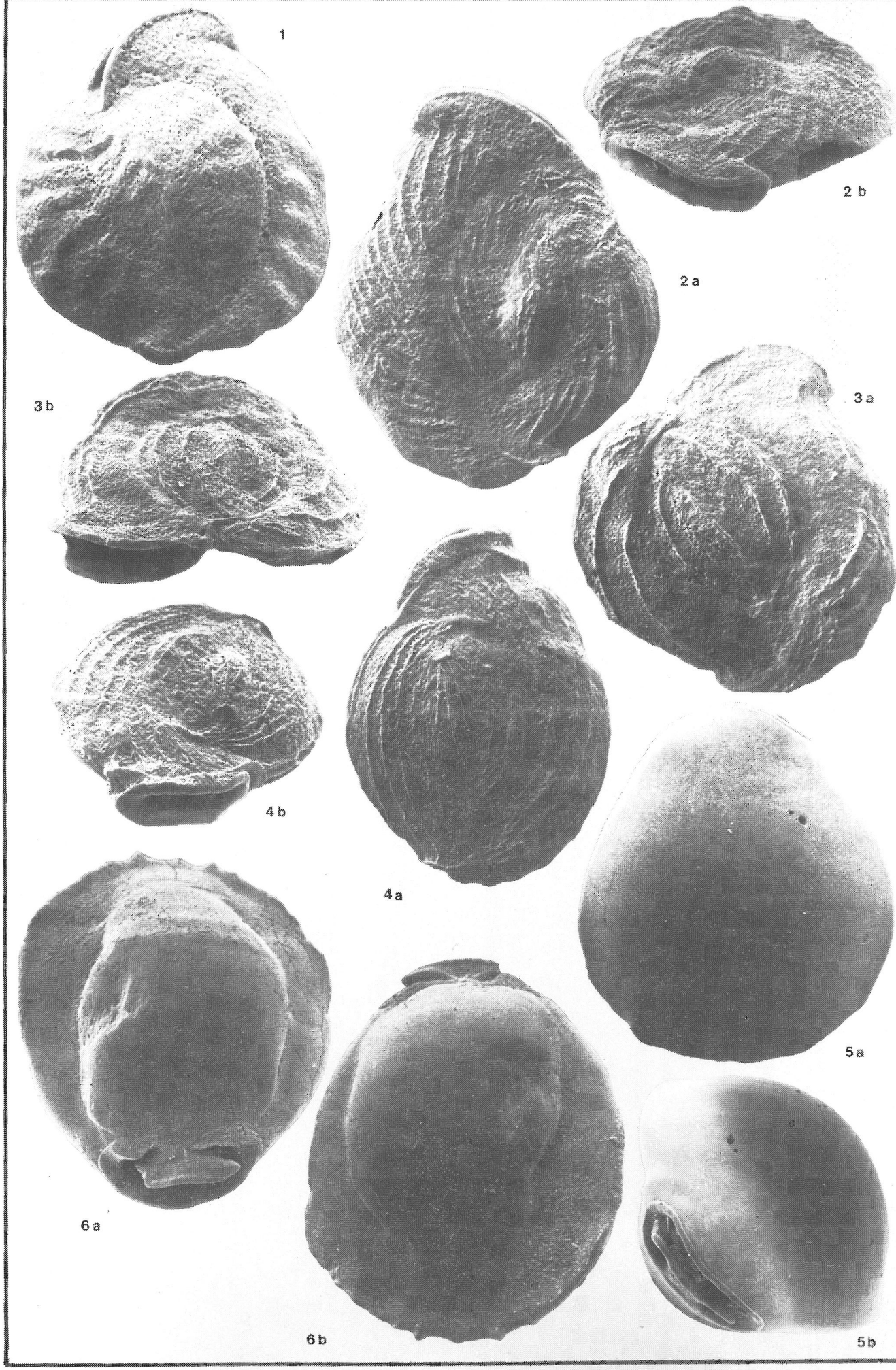


PLATE 52

Fig. 1 : Pyrgo denticula s.s. (BRADY)

Juvenile specimen, empty test, Eastern Perireefal Area (L 60). Note absence of aboral denticulations.
Fig. 1a : Lateral view (X 210); fig. 1b : apertural view (X 210).

Figs. 2 - 5 : Pyrgo denticula (BRADY), var. striolata (BRADY)

Fig. 2 : Lateral view of rounded, juvenile, faintly striate empty test, Eastern Perireefal Area (L 86) (X 183).
Fig. 3 : Lateral view of elongate, juvenile, faintly striate empty test; Eastern Perireefal Area (L 77) (X 198).
Figs. 4a-b : Views upon 2-chambered side of moderately striate empty test, adult specimen, Eastern Perireefal Area (L 65). Fig. 4a : Lateral view (note absence of aboral denticulations) (X 132); fig. 4b : apertural view (note broad aperture with platelike development of tooth) (X 132).
Fig. 5 : Lateral view upon 2-chambered test side of adult specimen, empty test, Eastern Perireefal Area (L 65). Note well-developed striation and aboral denticulations, as well as extremely broad aperture (X 110).

Figs. 6 - 8 : Pyrgo lundgreni nova species

Figs. 6a-b : Holotype; large, adult specimen, empty test, Eastern Perireefal Area (L 63).
Fig. 6a : Lateral view upon 2-chambered side; note evenly rounded periphery and suture (X 47); fig. 6b : apertural view; note rounded periphery of almost perfectly globular test, and complicated apertural tooth (X 49).
Figs. 7a-b : Paratype, empty test, Eastern Perireefal Area (L 65). Fig. 7a : Lateral view showing globular 2-chambered test with suture slightly bent when seen from this angle (X 49); fig. 7b : close-up of aperture with peristome and complex tooth apparatus (note the "symphysis-like" connection of the plates on top of the bifid toothpartitions being less completely intergrown as in the holotype, fig. 6a) (X 88).
Fig. 8 : Part of broken, adult, empty test, Eastern Perireefal Area (L 65), showing structure and development of successive apertural tooth apparatuses. Note aperture in antepenultimate chamber being narrower keyhole-shaped and the tooth being more or less bifid whereas the ultimate tooth apparatus

PLATE 52

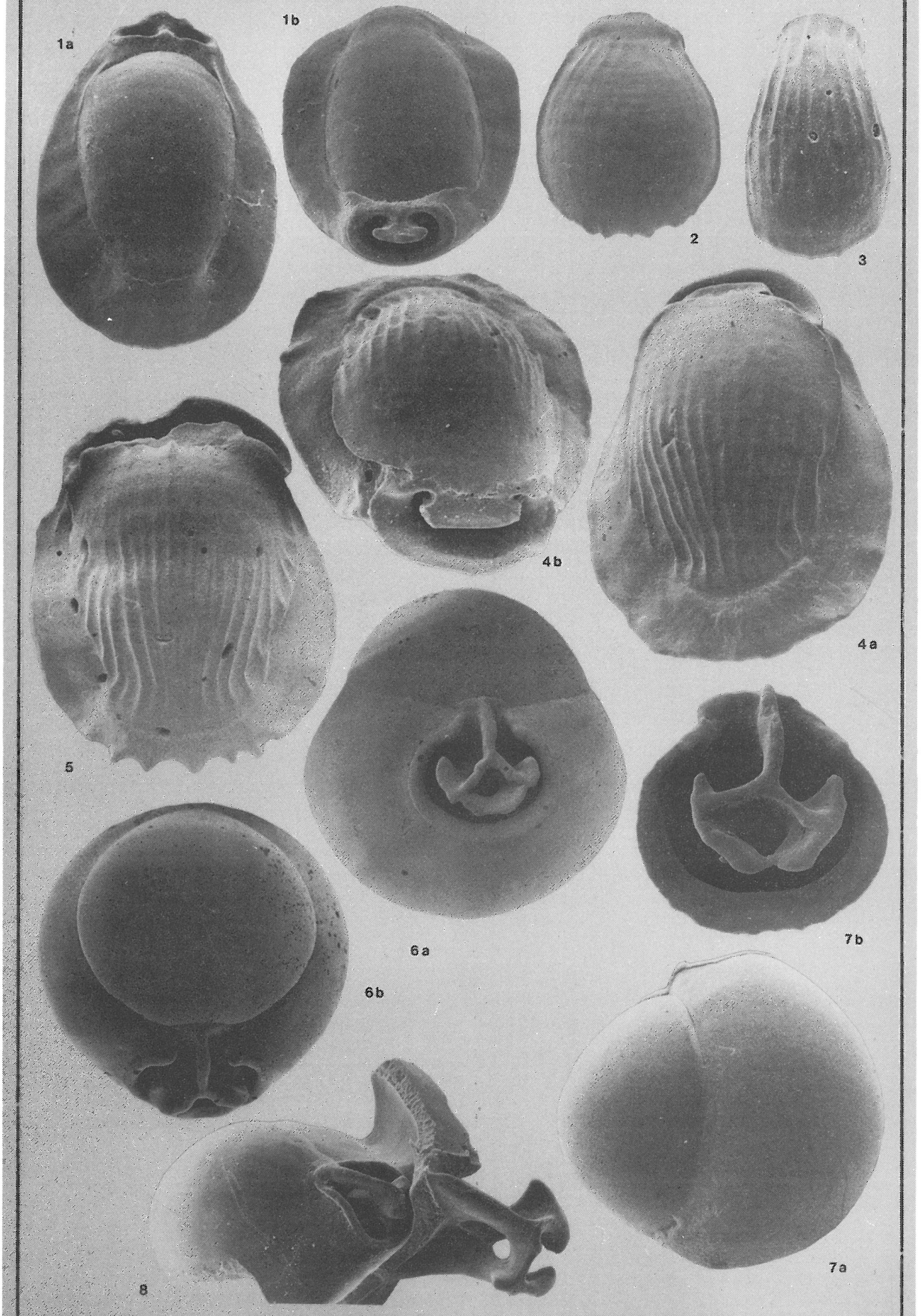


PLATE 52 (continued)

shows strongly supporting connection with penultimate chamber wall; the "symphysis-like" structure has not been completed in this case (compare with figs. 6a, 7b) (X 155).

PLATE 53

Figs. 1 - 3 : Spiroloculina communis s.s. CUSHMAN & TODD

Figs. 1a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 1a : Lateral view (note neck, moderately pronounced aboral test end and slightly rough wall surface) (X 86); fig. 1b : apertural view (note truncate periphery with keeled angles, concave test and double apertural tooth) (X 86).
Figs. 2a-b : Very broad and relatively flat, compressed specimen, empty test, Eastern Perireefal Area (L 84). Fig. 2a : Lateral view (X 91); fig. 2b : apertural view (X 91).
Figs. 3a-c : Corrugated specimen with pronounced, somewhat nodulous keels. Empty test, Eastern Perireefal Area (L 81). Fig. 3a : Lateral view (X 105); fig. 3b : apertural view (X 109); fig. 3c : close-up of subtriangular aperture with double tooth (X 450).

Figs. 4 - 5 : Spiroloculina communis CUSHMAN & TODD, subsp. attenuata CUSHMAN & TODD

Fig. 4 : Specimen intermediate between communis s.s. and subsp. attenuata; the test is very narrow but the overall habitus is that of communis s.s.; empty test, Eastern Perireefal Area (L 84). Fig. 4a : Lateral view (X 100); fig. 4b : apertural view (X 100).
Fig. 5 : Extremely narrow specimen with long slender neck and deeply concave test which is translucent in the central area; this specimen could eventually be attributed to S. communis var polita. Empty test, Eastern Perireefal Area (L 65). Fig. 5a : Lateral view (X 168); fig. 5b : apertural view (X 168).

PLATE 53

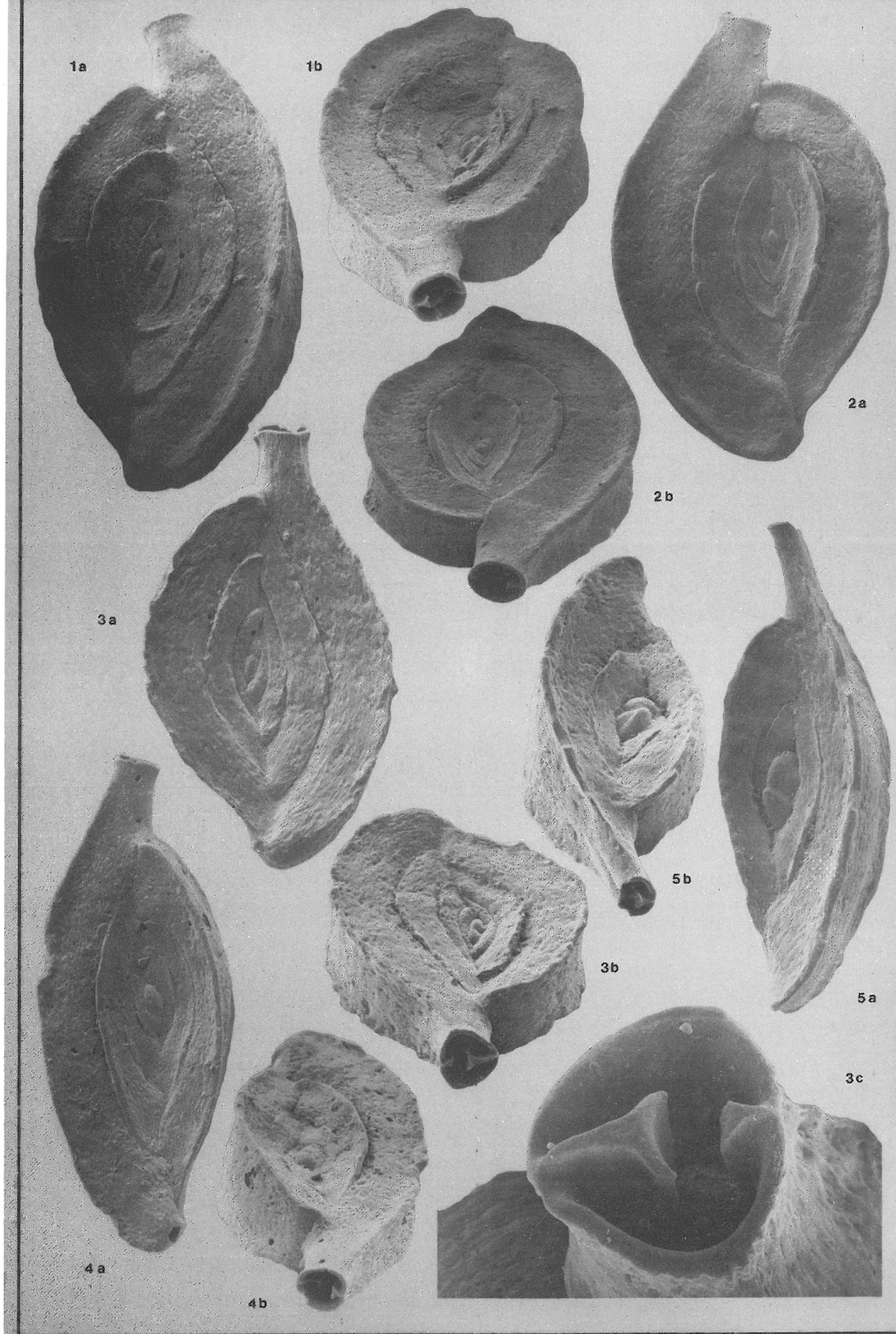


PLATE 54

Figs. 1 - 3 : Spiroloculina corrugata CUSHMAN & TODD

Figs. 1a-b : Elongate specimen with somewhat anastomosing striae. Living specimen, Coconut Fringing Reef flat (L 245). Fig. 1a : Lateral view (X 90); fig. 1b : apertural view (note rounded aperture with single tooth and rounded periphery (X 94).

Figs. 2a-b : Moderately broadened specimen with periphery slightly truncate at one side of the test. Empty test, Coconut Fringing Reef flat (L 245). Fig. 2a : Lateral view (X 91); fig. 2b : apertural view (X 91).

Figs. 3a-b : Large and very broad specimen of the type occurring in large numbers upon the algal cover of the reef flats. Empty test, Coconut Fringing Reef flat (L 245). Fig. 3a : Lateral view (X 74); fig. 3b : apertural view (note slightly truncate periphery) (X 74).

Figs. 4 - 5 : Spiroloculina foveolata EGGER

Figs. 4a-b : Large, adult specimen, empty test, foot of Northern Fringing Reef, North Point (L 292). Fig. 4a : Lateral view (note reticulate ornamentation pattern and rhomboidal test shape) (X 68); fig. 4b : apertural view (note double apertural tooth) (X 68).

Fig. 5 : Smaller, empty test, lateral view; Eastern Perireefal Area (L 56) (X 72).

Figs. 6a-b : Spiroloculina rugosa CUSHMAN & TODD, var. curvatura CUSHMAN & TODD

Illustrations of the single specimen found in our material; empty test, leeward slope (L 108).

Fig. 6a : Lateral view (note corrugated wall surface, somewhat irregular chamber disposition and broad apertural neck (X 150); fig. 6b : apertural view (note broadly rounded aperture with double tooth) (X 150).

PLATE 54

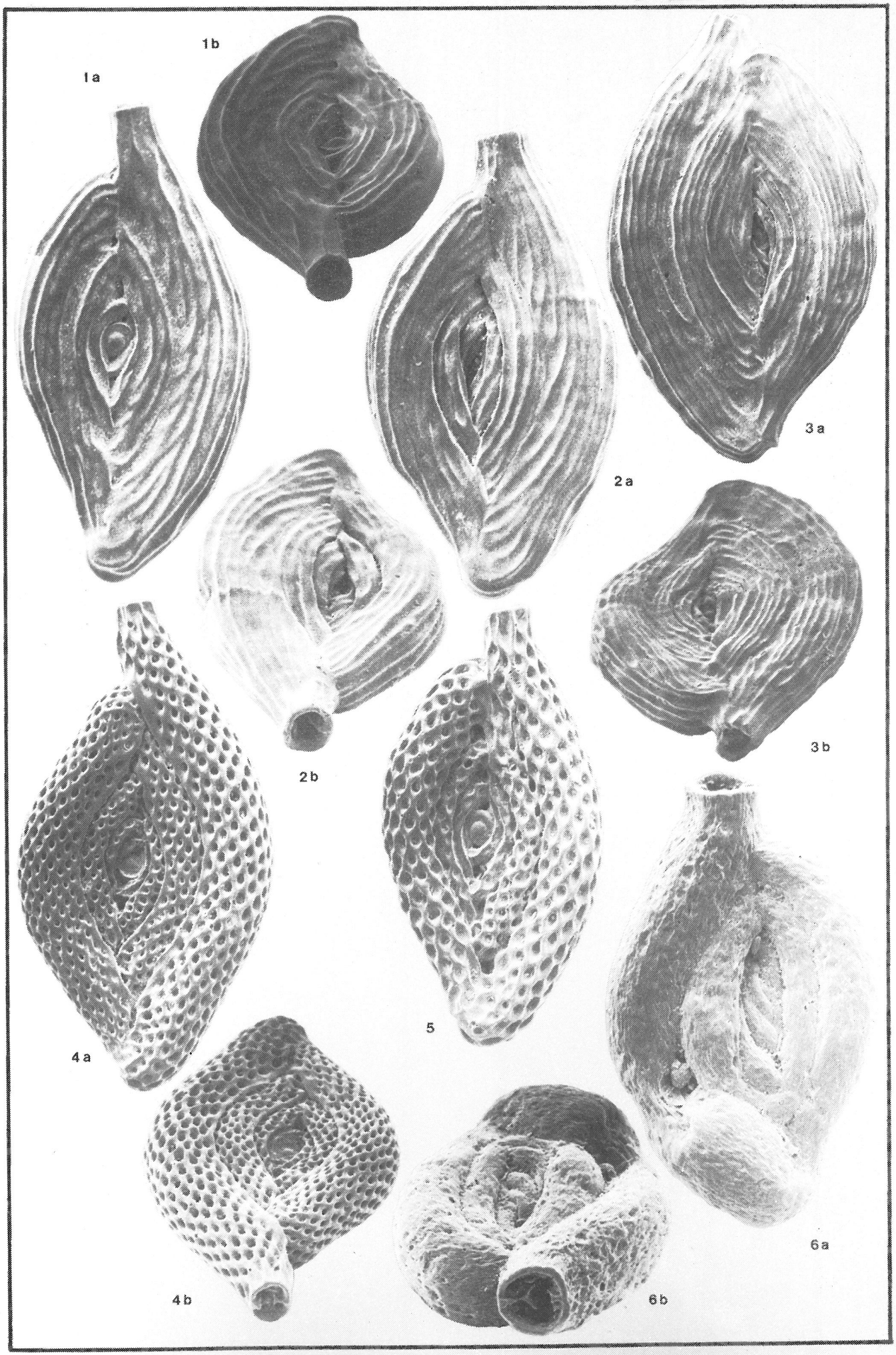


PLATE 55

Figs. 1 - 3 : Spiroloculina samoaensis s.s. CUSHMAN

Figs. 1a-b : Hardly ornate, compressed specimen with truncate periphery; empty test, Eastern Perireefal Area (L 56). Fig. 1a : Lateral view (X 106); fig. 1b : apertural view (note ovate, compressed aperture) (X 106).
Figs. 2a-b : Larger, ornate specimen, empty test, Western slope (L 100). Fig. 2a : Lateral view (note irregular striation pattern) (X 81); fig. 2b : apertural view (note single bifid apertural tooth) (X 81).
Figs. 3a-b : Large, strongly ornate specimen, empty test, Eastern Perireefal Area (L 56). Fig. 3a : Lateral view; note pronounced, anastomosing, irregular striae (X 86); fig. 3b : apertural view; note peripheral truncation obscured by irregular striae (X 86).

Figs. 4a-b : Spiroloculina samoaensis CUSHMAN, subsp. aperta CUSHMAN & TODD

Empty test, Eastern Perireefal Area (L 84). Fig. 4a : Lateral view; note smooth test with long narrowing neck, pronounced aboral test end and sutural "gaps" (short subtriangular areas where no contact is ensured between ultimate and antepenultimate chambers) (X 97); fig. 4b : apertural view; note double-keeled periphery (X 122).

Figs. 5 - 6 : Spiroloculina samoaensis CUSHMAN, subsp. acescata CUSHMAN

Figs. 5a-b : Strongly compressed empty test, Eastern Perireefal Area (L 81). Fig. 5a : Lateral view (at about the middle of the periphery of the penultimate chamber the keel shifts from double to single) (X 97); fig. 5b : apertural view showing periphery being sharply carinate on the left and double-keeled (as in subsp. aperta) on the right (compare with figs. 4b, 1b) (X 97).
Figs. 6a-b : Strongly compressed, costate empty test; reef flat, Windward Barrier (L 254). Fig. 6a : Lateral view (X 100); fig. 6b : apertural view; note carinate periphery (X 100).

PLATE 55



PLATE 56

Figs. 1 - 2 : Spirosigmoilina parri COLLINS

Figs. 1a-b : Empty test, Eastern Perireefal Area (L 75).
Fig. 1a : Lateral view (X 358); fig. 1b : close-up of aperture (note relatively thick peristome and short single tooth) (X 1808).
Figs. 2a-c : Empty test, Eastern Perireefal Area (L 86). Fig. 2a : Lateral view (note narrow chambers, numerous sutures and corrugated test surface) (X 398); fig. 2b : apertural view (note compressed test and sigmoiline chamber arrangement) (X 398); fig. 2c : close-up of aperture being compressed and elongate, with elongate single tooth and less pronounced peristome (when compared with fig. 1b) (X 921).

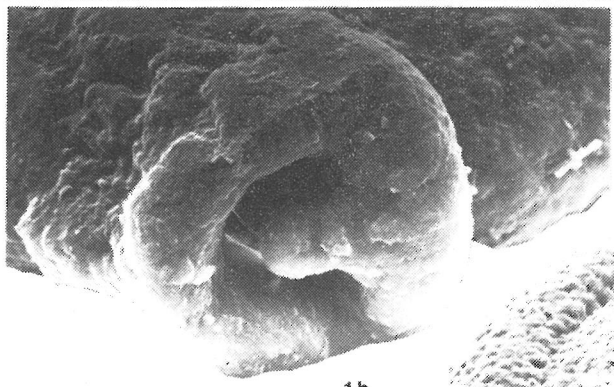
Figs. 3a-b : Triloculina costifera TERQUEM

Empty, abraded and perforated test, Eastern Perireefal Area (L 63). Fig. 3a : Lateral view (note thick and short test shape) (X 195); fig. 3b : apertural view (note pronounced costae) (X 195).

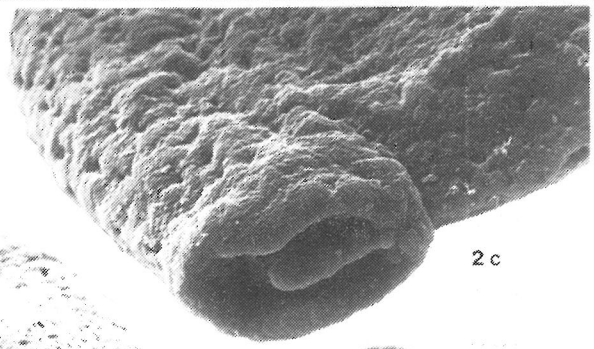
Figs. 4a-c : Triloculina earlandi CUSHMAN

Figs. 4a-b : Living specimen, Lagoon (L 121). Fig. 4a : Lateral view (3 chambers visible); note pronounced regular striae and rapidly narrowing neck (X 233); fig. 4b : apertural view (note subtriangular test shape and rounded aperture with bifid tooth, at the end of a triangular neck with concave sides) (X 233); fig. 4c : opposite side (2 chambers visible) of empty test, lateral view, Patchreef Area (L 153) (X 275).

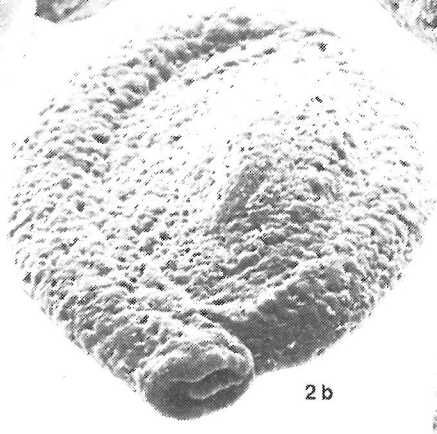
PLATE 56



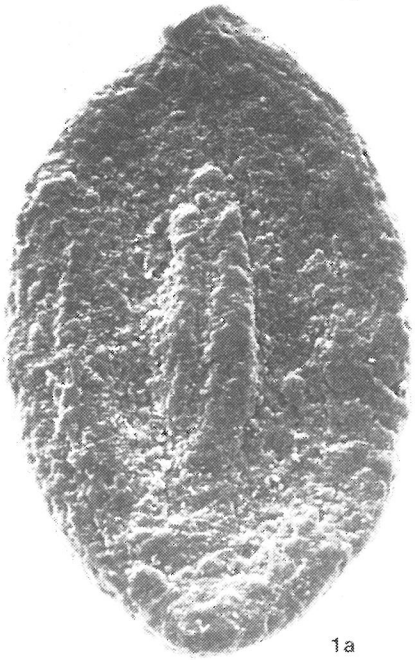
1b



2c



2b



1a



2a



3b



3a



4b



4a



4c

PLATE 57

Figs. 1a-c : Triloculina irregularis (d'ORBIGNY)

Figs. 1a-b : Empty test, Windward Barrier (L 254). Fig. 1a : Lateral view (3 chambers visible) (X 121); fig. 1b : apertural view (note elongate "Lachlanella"-aperture with elongate bifid tooth) (X 121).
Fig. 1c : Empty test, Coconut Fringing Reef flat (L 242); lateral view, opposite side showing 2 chambers; note subquadrate, costate, truncate chamber shape and reflexed apertural rim (X 172).

Figs. 2a-c : Triloculina bicarinata d'ORBIGNY

Figs. 2a-b : Empty test, reef flat, Windward Barrier (L 254). Fig. 2a : Lateral view (3 chambers visible) (note reticulate ornamentation pattern) (X 121); fig. 2b : apertural view; note rounded (to slightly subquadrate) periphery and elongate "Lachlanella"-aperture with elongate, prominent, bifid tooth (X 121).
Fig. 2c : Lateral view of opposite side (2 chambers visible) of empty test, Western slope (L 100) (X 134).

Figs. 3 - 4 : Triloculina linneiana s.s. d'ORBIGNY

Figs. 3a-b : Empty test of moderately striate specimen; reef flat, Windward Barrier (L 254). Fig. 3a : Lateral view (3 chambers visible); note somewhat swollen aboral test end and granular test surface (X 102); fig. 3b : apertural view (note keyhole-shaped apertural with strong, bifid tooth and thick peristome) (X 96).
Figs. 4a-b : Opposite side of more strongly striate specimen, empty test, reef flat, Windward Barrier (L 254). Fig. 4a : Lateral view (note swollen aboral end of ultimate chamber) (X 100); fig. 4b : apertural view (note smaller, narrower aperture when compared with fig. 3b) (X 100).

PLATE 57

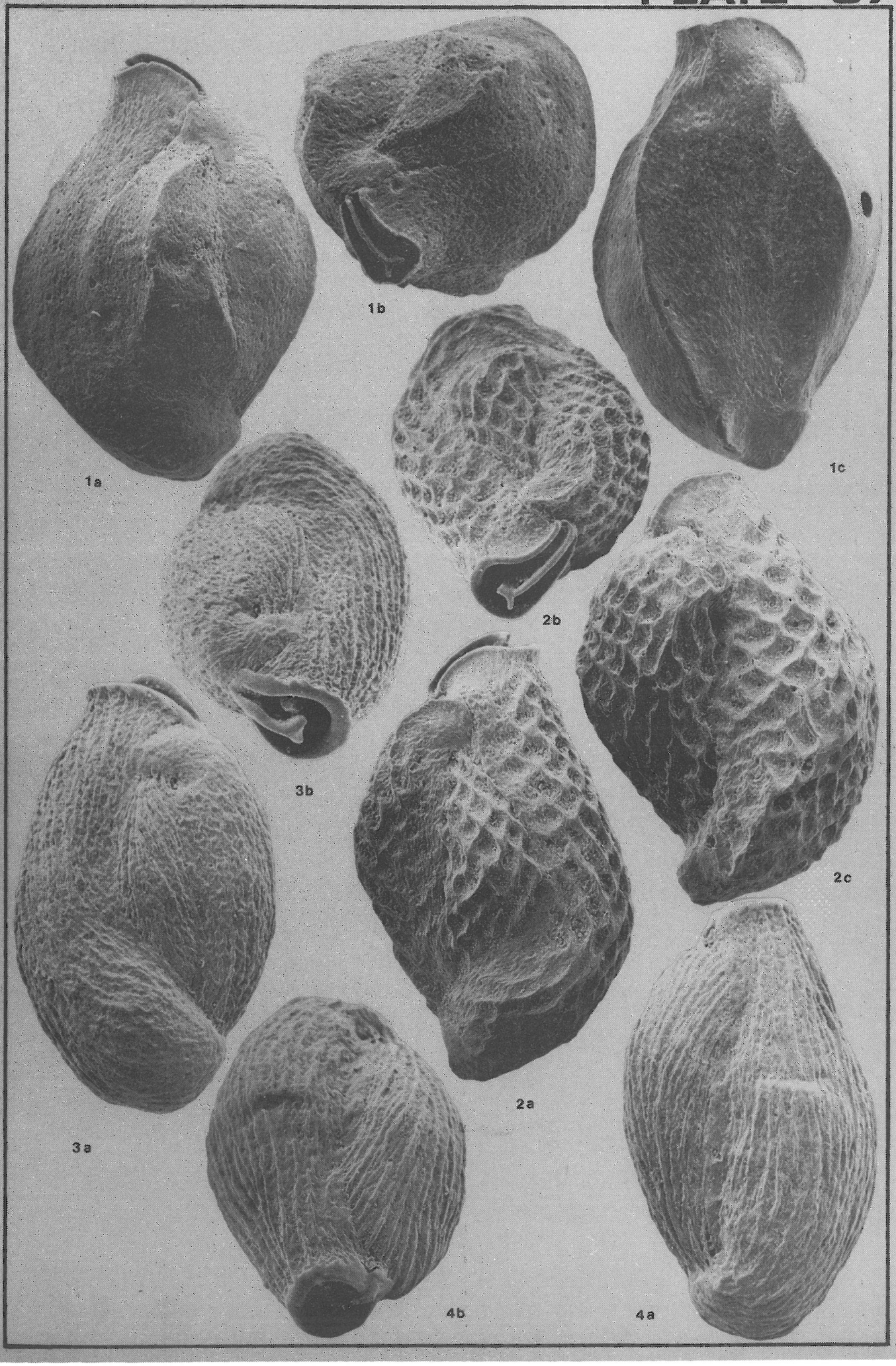


PLATE 58

Figs. 1 - 2 : Triloculina linneiana d'ORBIGNY, subsp. subgranulata CUSHMAN

Fig. 1 : Lateral view of empty test (3 chambers visible); reef flat, Windward Barrier (L 254) (X 101).
Figs. 2a-b : Empty test, reef flat, Windward Barrier (L 254). Fig. 2a : Lateral view showing 2-chambered side; note granular test surface (X 115); fig. 2b : apertural view showing apertural features being identical with those of linneiana s.s.; note faint traces of longitudinal striation upon the ultimate chamber wall near the aperture (X 115).

Figs. 3a-b : Triloculina littoralis COLLINS

Living specimen, Lagoon (L 134). Fig. 3a : Lateral view (3 chambers visible); note coarse bifurcating striae (X 303); fig. 3b : apertural view; note rounded periphery, large aperture with relatively small bifid tooth and prominent peristome (X 303).

Figs. 4 - 6 : Triloculina trigonula s.s. (LAMARCK)

Figs. 4a-b : "Normal" specimen with subtriangular periphery and rounded edges; empty test, Western slope (L 106). Fig. 4a : Lateral view showing 3 chambers and evenly curved sutures. There is no trace of a neck (X 151); fig. 4b : apertural view (X 151).
Figs. 5a-b : "Aberrant" specimen showing compressed chambers, a more subangular periphery, a broad Pyrgo-like aperture and faint traces of longitudinal striation; empty test, Western slope (Watson's Bay) (L 110). Fig. 5a : Lateral view (3 chambers visible) (X 78); fig. 5b : apertural view (note broad aperture with short and broad platelike tooth as in many Pyrgo-species) (X 74).
Figs. 6a-b : Specimen transitional towards subsp. tricarinata; empty test, Western slope (L 110). Fig. 6a : Lateral view (3 chambers visible) showing a tendency towards neck development (X 160); fig. 6b : apertural view; note subangular- to angular periphery and somewhat deformed aperture with damaged tooth (X 149).

PLATE 58

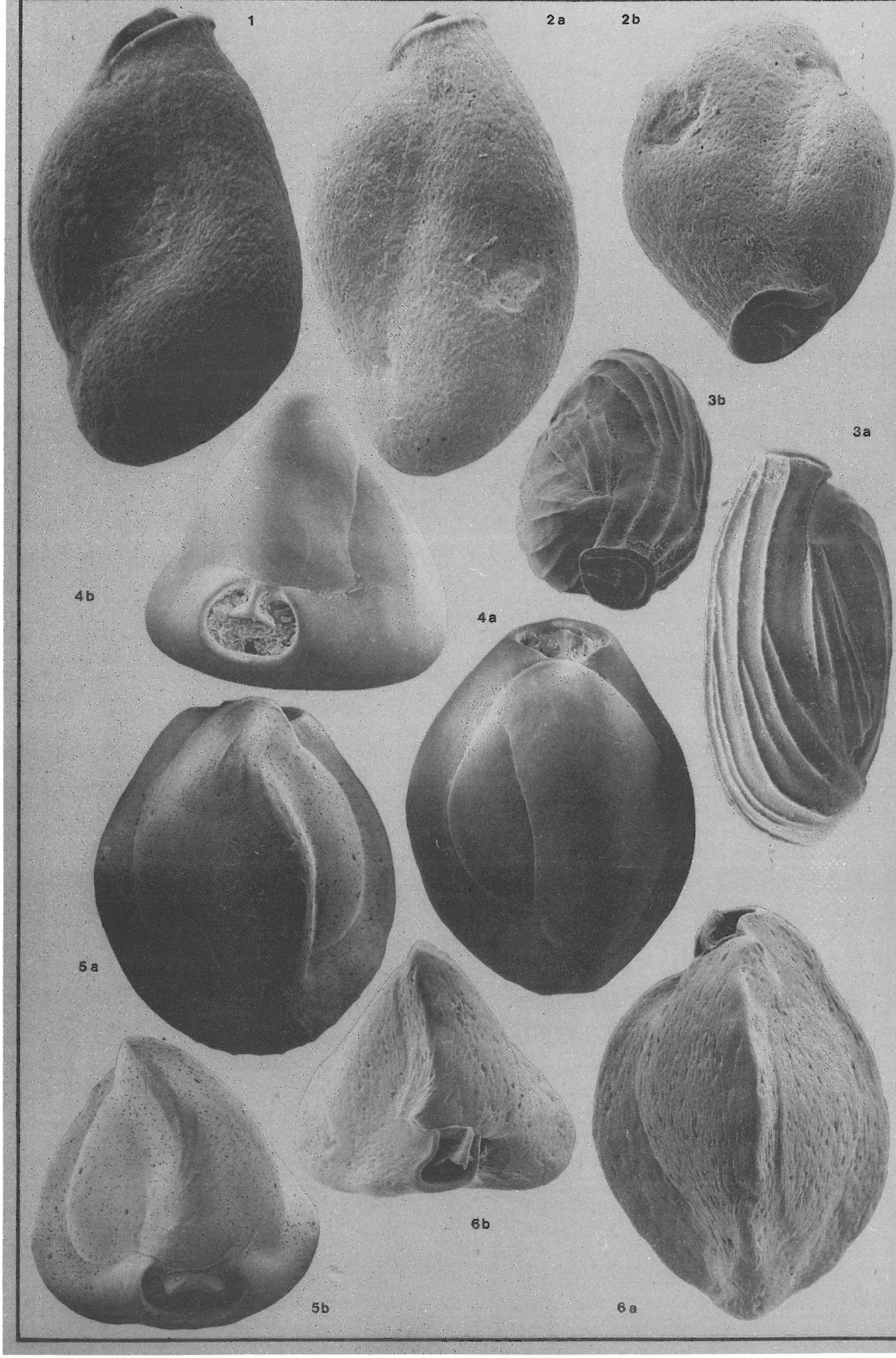


PLATE 59

Figs. 1 - 3 : Triloculina trigonula (LAMARCK), subsp. tricarinata d'ORBIGNY

Figs. 1a-b : Empty test, Western slope (L 100). Fig. 1a : Lateral view (3 chambers visible); note elongate test with neck and recurved apertural rim; the antepenultimate chamber shows traces of striae (X 163); fig. 1b : apertural view; note angular periphery and subtriangular aperture with hardly bifid tooth (X 156).

Figs. 2a-b : Living specimen, Lagoon (L 121); elongate specimen showing sharply angled periphery and a short neck; note remnants of (turbellarian ?) cyst upon wall of antepenultimate chamber. Fig. 2a : Lateral view (X 149); fig. 2b : apertural view (note development of carinae) (X 149).

Figs. 3a-b : Living specimen, Lagoon (L 121). Fig. 2a : Lateral view (3 chambers visible); note elongated test with prominent, sharply pointed aboral test end (X 155); fig. 3b : apertural view; note periphery of last-formed chamber being subrounded as in trigonula s.s. (X 155).

Figs. 4a-b : Triloculina trigonula (LAMARCK), subsp. bertheliniana (BRADY)

Empty test, Eastern Perireefal Area (L 72). Fig. 4a : Lateral view (3 chambers visible); note pitted test surface (X 153); fig. 4b : apertural view; note keyhole-shaped aperture with bifid tooth, and overall test aspect similar to that of trigonula s.s. (X 153).

Figs. 5 - 6 : Triloculina trigonula (LAMARCK), subsp. terquemiana (BRADY)

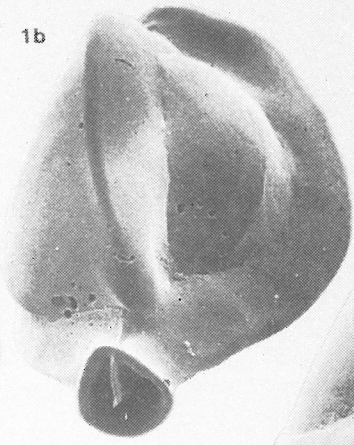
Figs. 5a-b : Empty test, Coconut Fringing Reef flat (L 249).

Fig. 5a : Lateral view (3 chambers visible); the general test aspect is similar to the one of subsp. tricarinata but is slightly more inflated than that of trigonula s.s.; note short neck and sharply pointed aboral test end, and longitudinal striae (X 181); fig. 5b : apertural view; note subangular periphery and subtriangular periphery (X 181).

Figs. 6a-b : Juvenile specimen, empty test with epibiontic algal cyst; Sandy Shoal (behind the recolonised front) (L 150). Fig. 6a : Lateral view (2 chambers visible); note algal cyst which has caused a growth deformation in the ultimate chamber (X 173); fig. 6b : close-up of the algal cyst (antheridium or oogonium of charophyte ?) (X 1362).

PLATE 59


1a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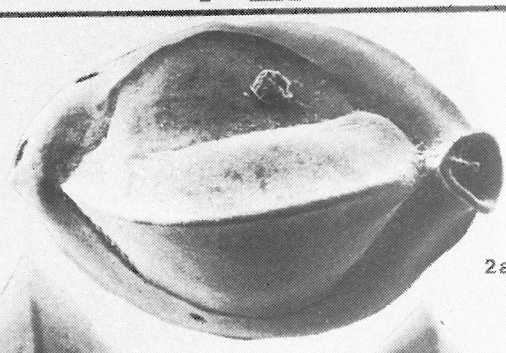
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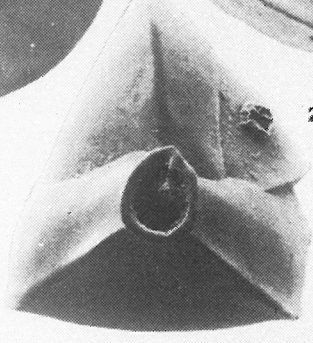
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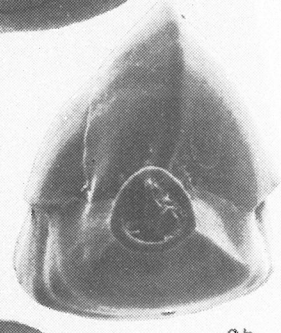
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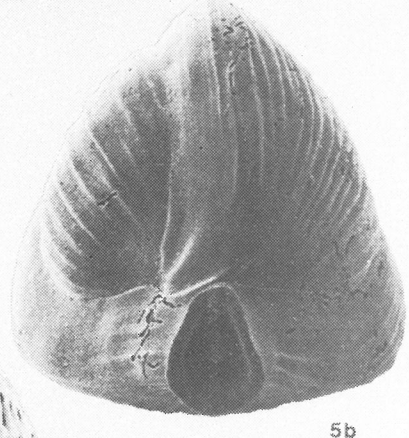
3a


4b


6a

6b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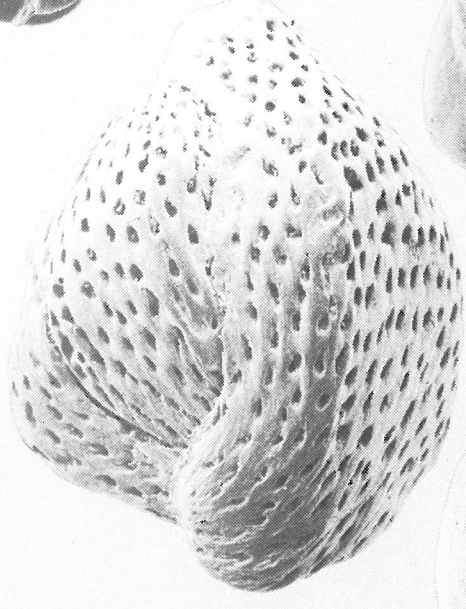
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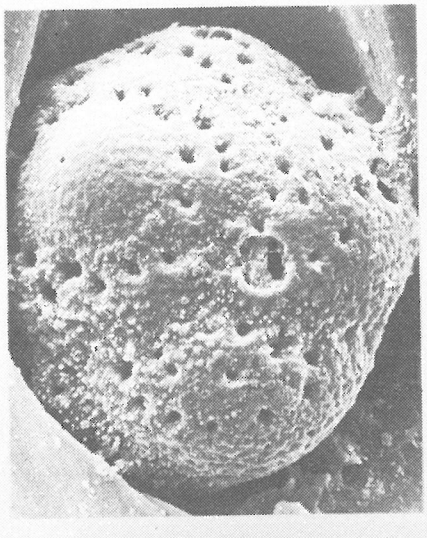



5a

PLATE 60

Figs. 1 - 3 : Miliolinella albatrossi new name

Figs. 1a-b : Views of lectotype, empty test, Eastern Perireefal Area (L 71). Fig. 1a : Lateral view, 3 chambers visible; note almost circular, striate test and slightly limbate sutures (X 137); fig. 1b : apertural view; note compressed test with rounded periphery and large semicircular aperture with flaring peristome and large concave miliolinelline flap (X 168).
Fig. 2 : Opposite side of paratype, empty test, Eastern Perireefal Area (L 81); lateral view (2 chambers visible) (X 141).
Figs. 3a-b : Aberrant specimen showing 3 chambers in the last coil; empty test, Eastern Perireefal Area (L 84). Fig. 3a : Lateral view (X 82); fig. 3b : apertural view (note small regenerated aperture which apparently has been formed during chamber damage repair of the ultimate chamber; the original fracture can still be perceived (X 79).

Figs. 4 - 5 : Miliolinella baragwanathi (PARR)

Figs. 4a-b : Empty test, Lagoon (L 131). Fig. 4a : Lateral view (3 chambers visible); note corrugated test surface and undulating costae (X 303); fig. 4b : apertural view; note truncate chambers and narrow apertural flap (X 303).
Figs. 5a-b : Empty test, Windward Barrier (L 254), specimen showing nodulous test surface and sharply pointed aboral test end . Fig. 5a : Lateral view (3 chambers visible); note very finely rounded, smooth costae which are a very characteristic feature when viewed through the binocular microscope (X 171); fig. 5b : apertural view (note truncate chambers with concave sides) (X 171).

Figs. 6 - 8 : Miliolinella australis s.s. (PARR)

Fig. 6 : Narrow-chambered, compressed, quinqueloculine specimen, empty test, Windward Barrier (L 254). Lateral view (4 chambers visible) (X 226).
Figs. 7a-c : Quinqueloculine, less compressed specimen with broader, more embracing chambers; empty test, Western slope (L 100). Fig. 7a : Lateral view (4 chambers visible); note large diatom apparently incorporated in the test wall (X 163); fig. 7b : apertural view (note rounded periphery and large miliolinelline aperture with low crescentic flap) (X 163); fig. 7c : close-up of incorporated diatom (X 2500).
Fig. 8 : Opposite side (3 chambers visible) of a specimen of the same type; Eastern Perireefal Area (L 56); lateral view (X 183).

PLATE 60

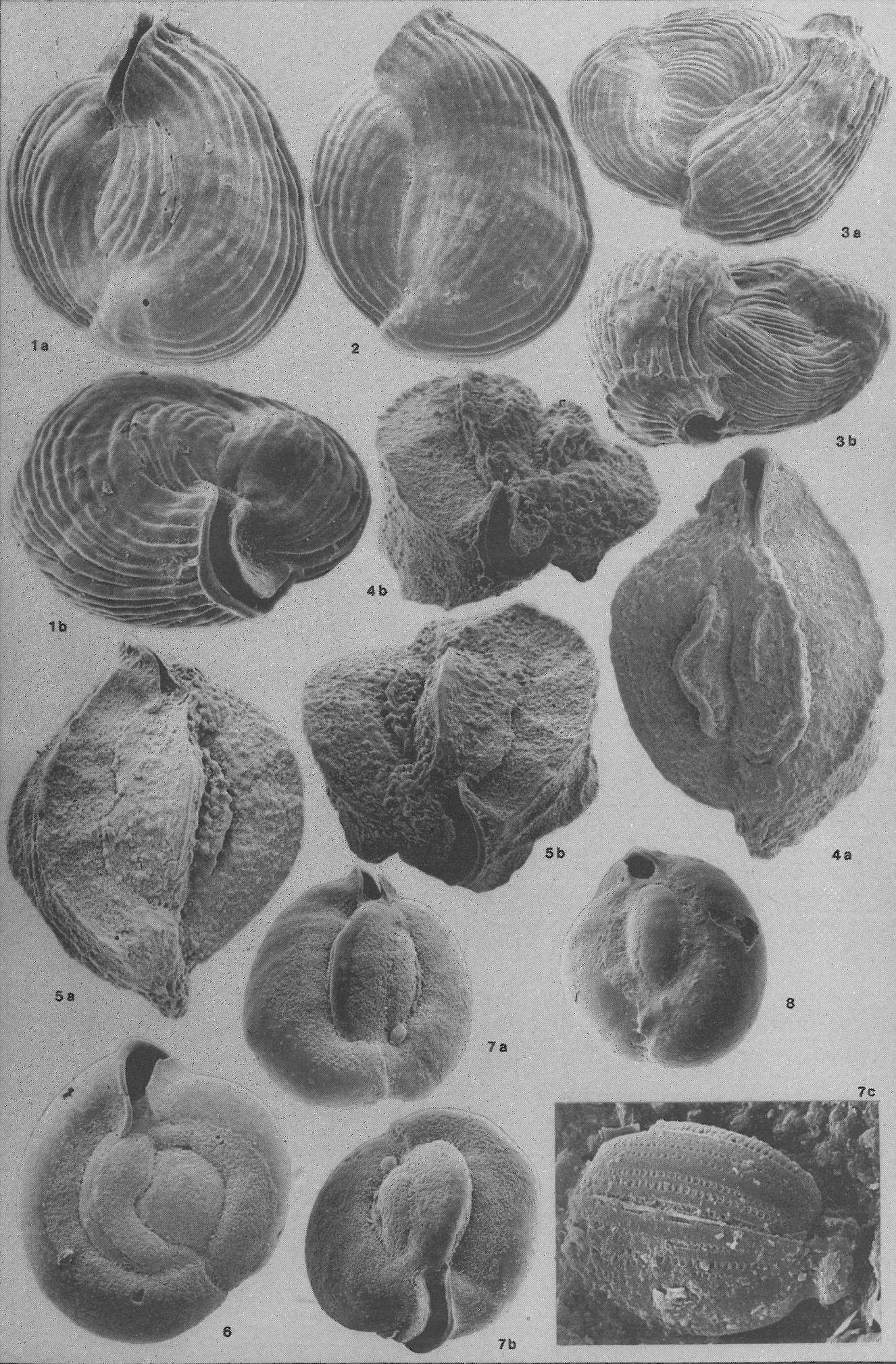


PLATE 61

Figs. 1 - 3 : Miliolinella australis (PARR), subsp. circularis (BORNEMANN)

Fig. 1 : Lateral view of empty, triloculine test; note embracing chambers and low aperture approaching slitshape; Western slope (L 100) (X 167).
Fig. 2 : Empty test showing essentially the same features but possessing a "normal" miliolinelline aperture with well-developed flap; reef flat, Windward Barrier (L 254) (X 127).
Figs. 3a-b : Slightly deformed triloculine empty test showing a low, broadly elongated slitlike aperture; reef flat, Windward Barrier (L 254). Fig. 3a : Lateral view (3 chambers visible) (X 131); fig. 3b : apertural view (note first traces of chamber inflation as in subsp. labiosa and bradyi) (X 131).

Figs. 4 - 6 : Miliolinella australis (PARR), subsp. labiosa (d'ORBIGNY)

Figs. 4a-b : Empty test, specimen showing the characteristic irregularly elongated, embracing chambers and an aberrant compressed "eburnea"-like aperture with single tooth; Eastern Perireefal Area (L 82). Fig. 4a : Lateral view (3 chambers visible) (X 233); fig. 4b : apertural view (X 233).
Figs. 5a-b : Empty test, specimen with extremely elongated chambers and somewhat slitlike aperture; Eastern Perireefal Area (L 60). Fig. 5a : Lateral view (3 chambers visible) (note flat-lying apertural flap) (X 193); fig. 5b : apertural view (X 198).
Figs. 6a-b : Empty test, specimen with extremely elongated but only moderately embracing last-formed chambers, and deformated apertural flap; Eastern Perireefal Area (L 60). Fig. 6a : Lateral view; note change in coiling direction, and extremely elongated ultimate and penultimate chambers (X 160); fig. 6b : apertural view showing a regularly coiled initial stage (quinqueloculine as in australis s.s.) and a deformation of the apertural flap resulting in a T-shaped invagination forming the stage intermediate between labiosa and bradyi (X 160).

Figs. 7a-b : Miliolinella australis (PARR), subsp. bradyi (MILLETT)

Empty test, specimen showing the same features as the labiosa-specimen illustrated on fig. 6 (including the australis s.s. early stage) except for the apertural rims and the invaginated apertural flap having partly fused and leaving a short deformed miliolinelline slit and two smaller rounded

PLATE 61

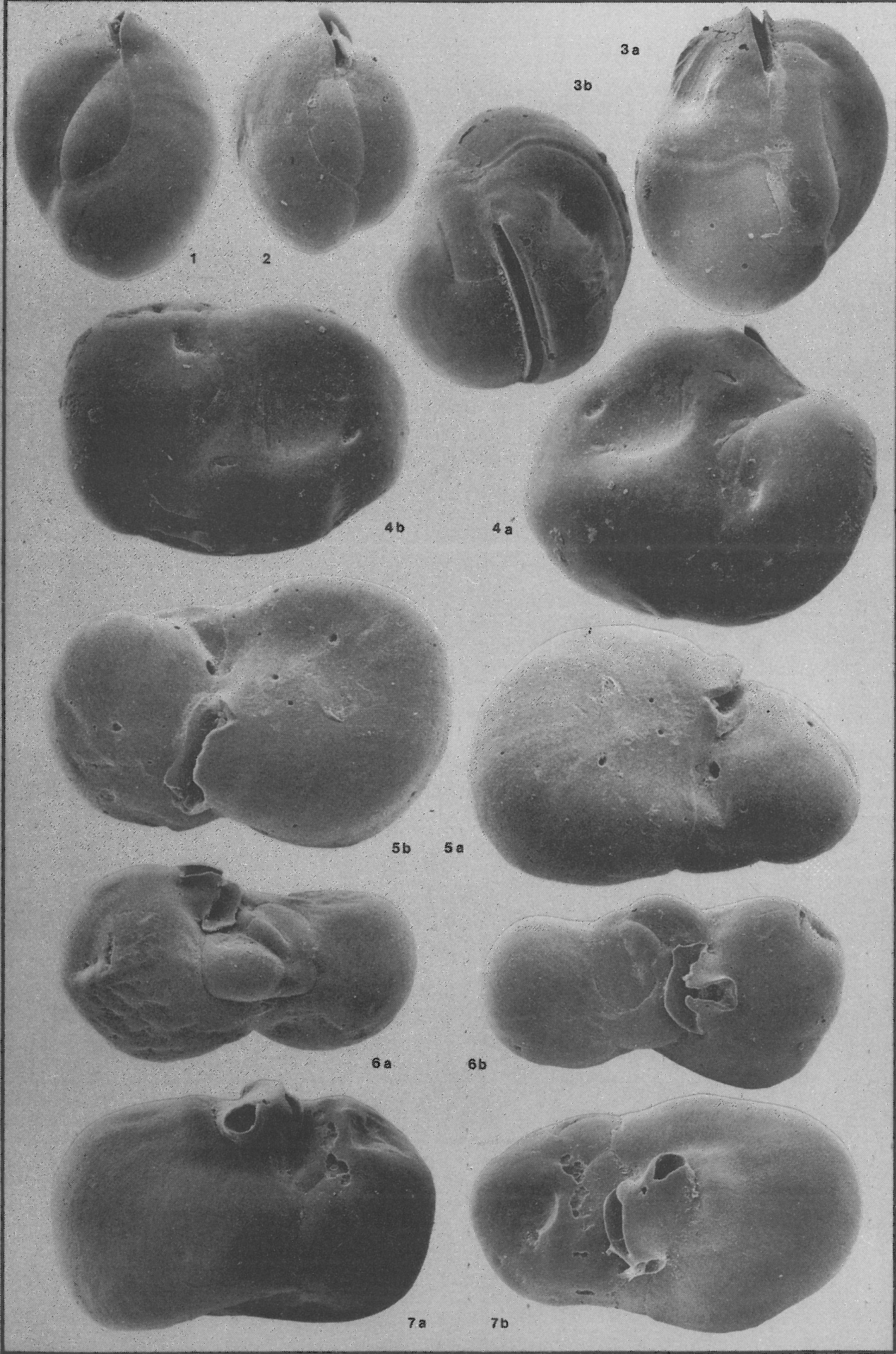


PLATE 61 (continued)

openings. Patchreef Area, leeward of Internal Platform (L 162). Fig. 7a : Lateral view (X 235); fig. 7b : apertural view (note embracing chambers partially masking the early regularly-coiled stage (X 235).

PLATE 62

Figs. 1a-b : Miliolinella australis (PARR), subsp. bradyi (MILLETT)

Empty test, irregular specimen showing a completely formed "Parrina"- aperture consisting of several rounded holes formed in the same way as in the specimen shown on fig. 6, pl. 61; reef flat, Windward Barrier (L 254). Fig. 1a : Lateral view (X 188); fig. 1b : apertural view (X 188).

Figs. 2 - 3 : Ammomassilina alveoliniformis (MILLETT)

Fig. 2 : Lateral view of immature specimen, empty test, Northern Perireefal Area (L 54); note coarse agglutination upon test walls (X 106).
figs. 3a-b : Adult specimen, empty test, Eastern Perireefal Area (L 82). Fig. 3a : Lateral view (note sigmoiline chamber arrangement) (X 79); fig. 3b : apertural view (the trematophore has been partially broken away) (X 79).

Figs. 4 - 7 : Hauerina circinata BRADY, emend. PONDER

Figs. 4a-b : Small, involute specimen (3 chambers in the last coil), "diversa"-type. Empty test, Eastern Perireefal Area (L 60). Fig. 4a : Lateral view (X 113); fig. 4b : apertural view (X 113).
Figs. 5a-b : Larger, involute specimen ("diversa"-type) showing 3 chambers in the last coil. Empty test, Eastern Perireefal Area (L 60). Fig. 5a : Lateral view (X 90); fig. 5b : apertural view (note test compression and elongation of aperture) (X 90).
Figs. 6a-c : Larger, evolute specimen (5 chambers in the last coil) belonging to the "circinata s.s."-type; empty test, Eastern Perireefal Area (L 60). Fig. 6a : Lateral view (X 73); fig. 6b : apertural view (note extreme test compression) (X 97); fig. 6c : close-up of elongate aperture with trematophore (note remnant of ring tooth in center - see PONDER 1975) (X 226).
Figs. 7a-b : Empty, damaged test of the "circinata s.s."-type (the largest specimen of that type present in our material and being more or less complete); Eastern Perireefal Area (L 60). Fig. 7a : lateral view showing 7 chambers in the last coil (note sutural constrictions at the chamber bases, showing as incomplete longitudinal striae). Note evolute - to semi-involute coiling (X 65); fig. 7b : oblique edge view; note extreme test compression and septum (relict trematophore) partially visible where chamber walls have been broken away (X 80).

PLATE 62

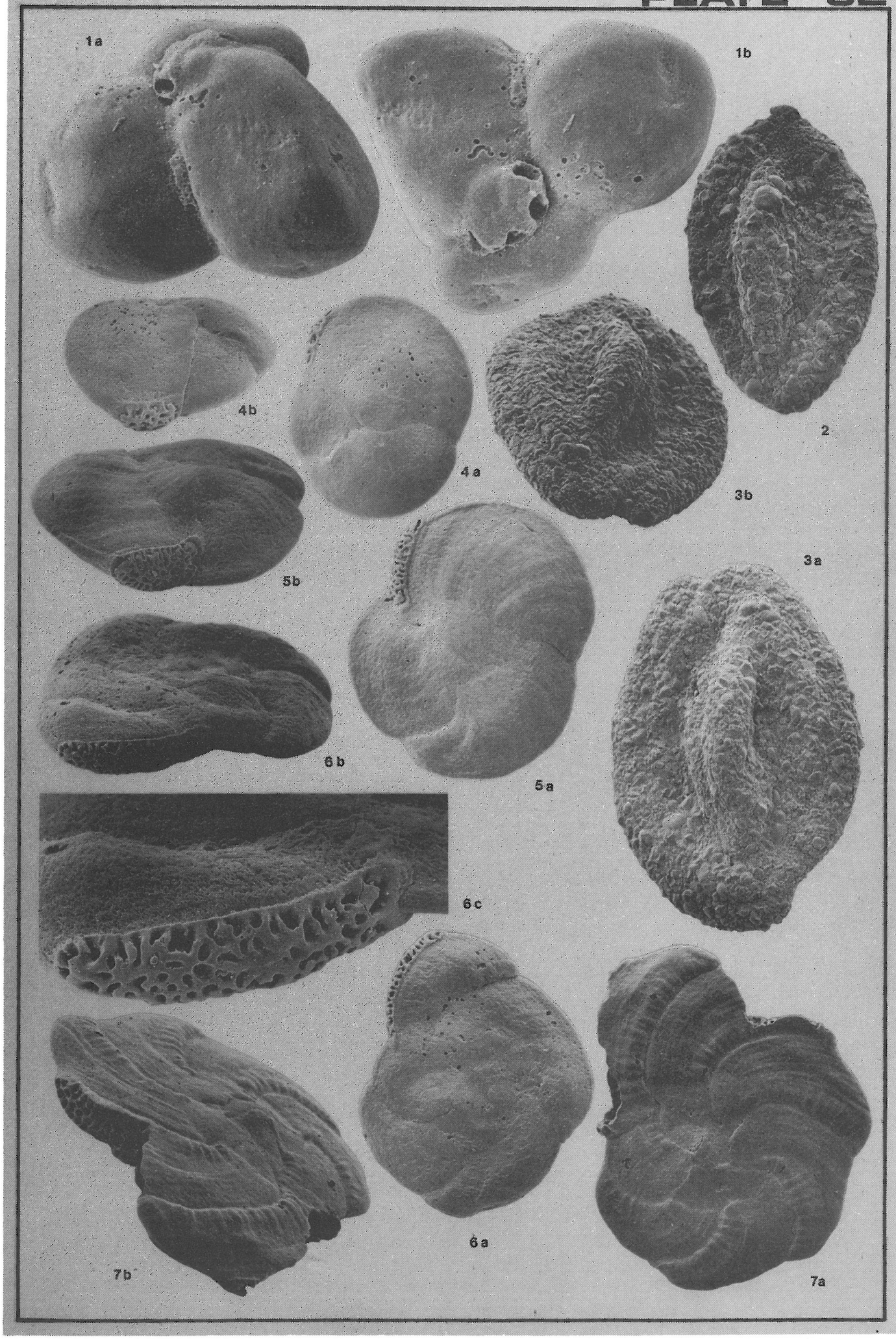


PLATE 63

Figs. 1 - 3 : Hauerina fragilissima (BRADY), emend. PONDER

Figs. 1a-b : Empty test, large specimen showing 3-chambered final coil. Eastern Perireefal Area (L 84). Fig. 1a : Lateral view showing evolute coiling, final 3-chambered coil and earlier 2-chambered coils (X 72); fig. 1b : apertural view showing extremely compressed test and aperture similar to the one of H. circinata (X 72).

Fig. 2 : Empty test, smaller specimen showing 2 chambers/coil throughout; Eastern Perireefal Area (L 60) (X 122).

Figs. 3a-b : Empty test, juvenile specimen, Eastern Perireefal Area (L 59). Fig. 3a : Lateral view (X 124); fig. 3b : apertural view (note small aperture with ring tooth) (X 145).

Figs. 4 - 6 : Hauerina pacifica CUSHMAN, emend. PONDER

Figs. 4a-b : Empty test, specimen with smooth test surface, rounded outline in transverse section and quinqueloculine chamber arrangement; Eastern Perireefal Area (L 60). Fig. 4a : Lateral view (4 chambers visible) (X 176); fig. 4b : apertural view (note short, U-shaped aperture with trematophore) (X 176).

Figs. 5a-c : Empty test, slightly more compressed specimen with subangular periphery and quinqueloculine chamber arrangement; Eastern Perireefal Area (L 60). Fig. 5a : Lateral view (3 chambers visible) (X 176); fig. 5b : apertural view (note subtriangular aperture with trematophore otherwise identical with that of the specimen illustrated on fig. 4) (X 176); fig. 5c : close-up of aperture (X 472).

Figs. 6a-b : Empty test, quinqueloculine specimen with sharply angled to carinate periphery, corrugated surface and crenulated earlier-formed chamber edges; Eastern Perireefal Area (L 60). Fig. 6a : Lateral view (4 chambers visible) (X 180); fig. 6b : apertural view (note sharply angled periphery, undulating sutures and aperture identical with the one illustrated on figs. 5b-5c) (X 180).

Figs. 7a-b : Pseudohauerina occidentalis involuta (CUSHMAN), emend. PONDER

Empty test, involute specimen with three chambers in the last coil; Western Perireefal Area (L 98). Fig. 7a : Lateral view (X 87); fig. 7b : apertural view showing large elongated aperture with trematophore (X 82).

PLATE 63

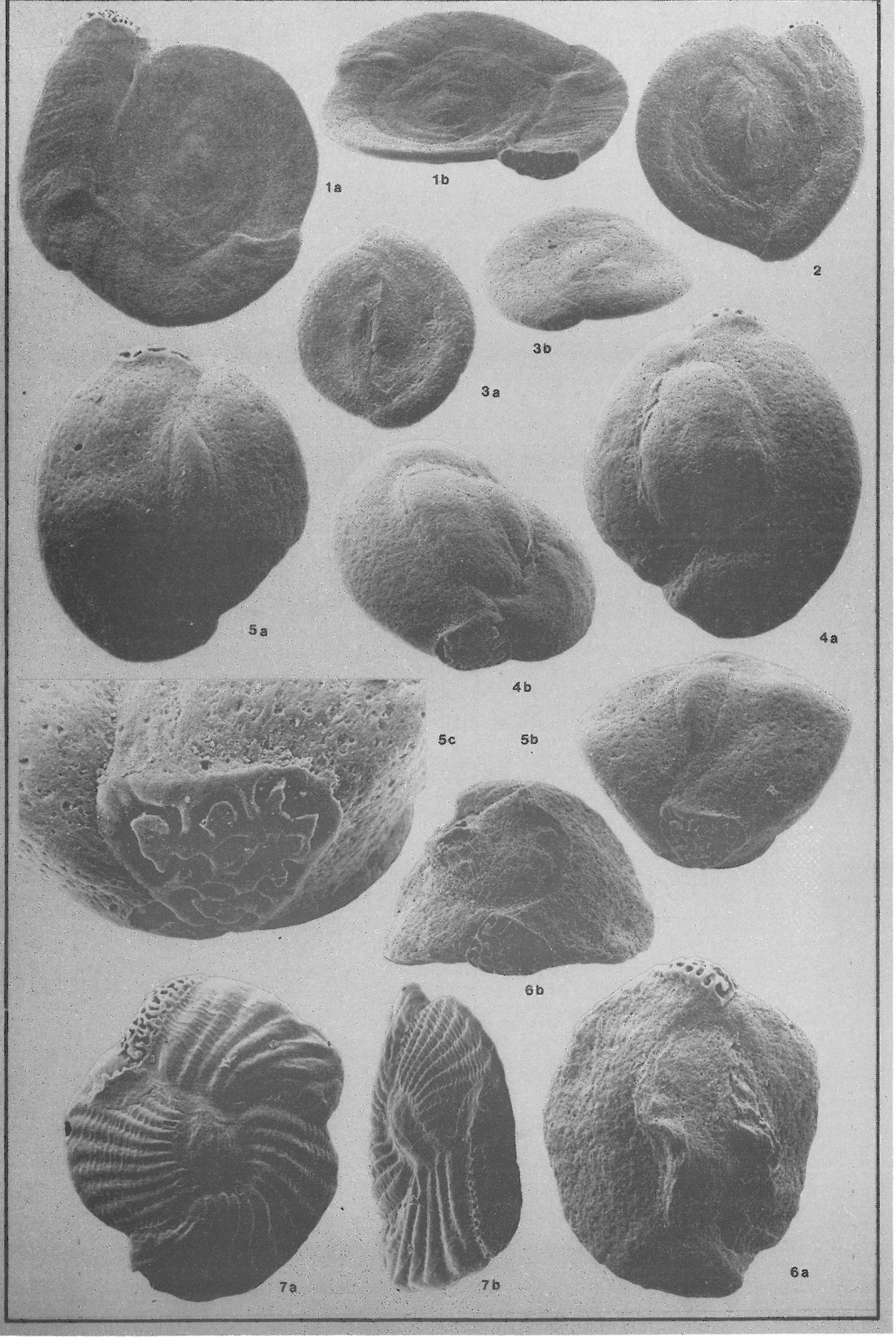


PLATE 64

Figs. 1 - 2 : Pseudohauerina occidentalis involuta (CUSHMAN), emend. PONDER

Fig. 1 : Close-up of the aperture with trematophore of the specimen illustrated on fig. 7, pl. 63; note ring tooth (X 408).
Figs. 2a-b : Empty test, specimen showing 2 chambers in the last coil; Eastern Perireefal Area (L 56). Fig. 2a : Lateral view (note more evolute coiling compared with the preceding specimen) (X 133); fig. 2b : apertural view showing shorter subtriangular aperture with trematophore (X 133).

Figs. 3 - 4 : Pseudohauerina howelli (BERMUDEZ), emend. PONDER

Evolute specimen showing 2 chambers/coil throughout. Empty test, Eastern Perireefal Area (L 60). Fig. 3a : Lateral view (X 125); fig. 3b : apertural view (note extreme test compression) (X 125).
Fig. 4 : Empty test, lateral view of more involute specimen, Eastern Perireefal Area (L 60) (X 150).

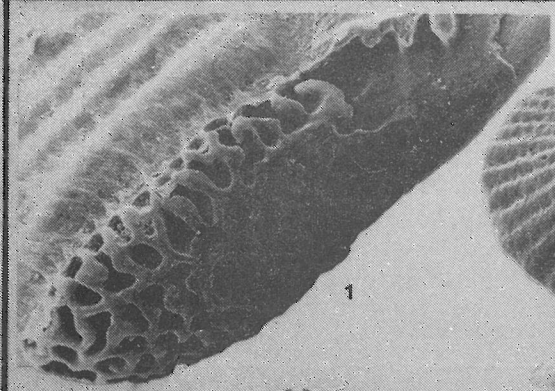
Figs. 5a-c : Pseudohauerina orientalis (CUSHMAN), emend. PONDER

Empty test, Eastern Perireefal Area (L 60). Fig. 5a : Lateral view (note broad test, crenulated periphery and oscillating longitudinal striae) (X 140); fig. 5b : apertural view (note extreme test compression) (X 140); fig. 5c : close-up of the relatively small subtriangular aperture with trematophore (note ring tooth) (X 448).

Figs. 6 - 7 : Heterillina cribrostoma (H. ALLEN & EARLAND)

Figs. 6a-b : Empty test of the broadly rounded, triloculine type, Eastern Perireefal Area (L 63). Fig. 6a : Lateral view (X 205); fig. 6b : oblique apertural view; note large, irregular (damaged) aperture with trematophore showing equally-dimensioned rounded holes (X 205).
Figs. 7a-b : More elongate, almost biloculine specimen; Lagoon entrance(L 121). Fig. 7a : Lateral view showing 3 chambers (X 212); fig. 7b : apertural view (note irregular protruding trematophore) (X 212).

PLATE 64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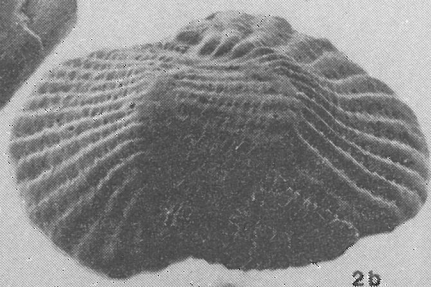
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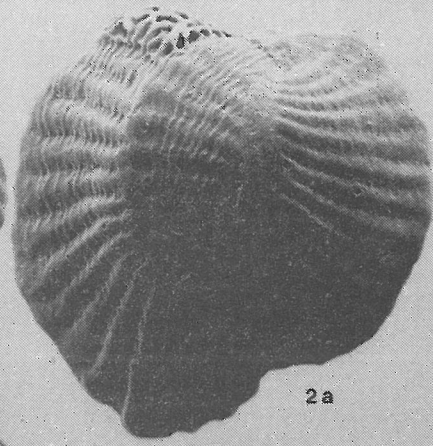
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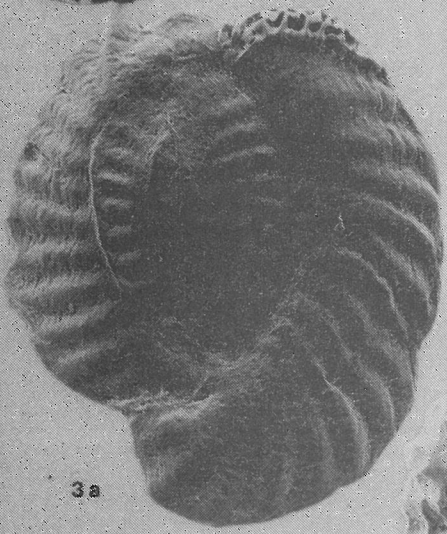
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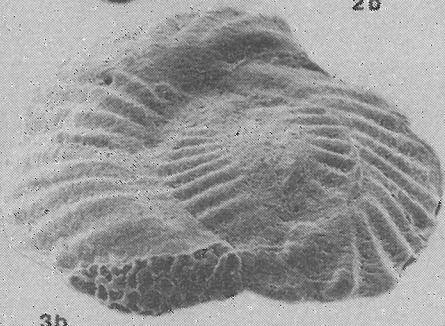
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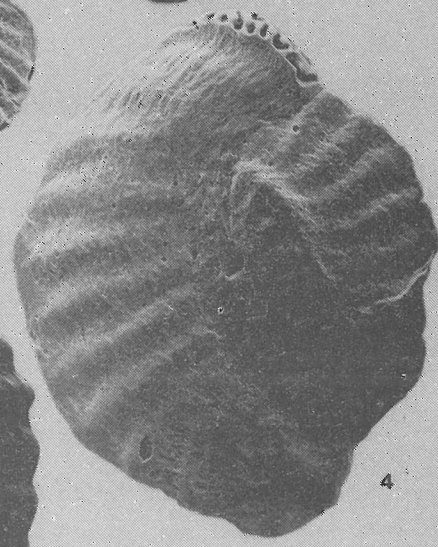
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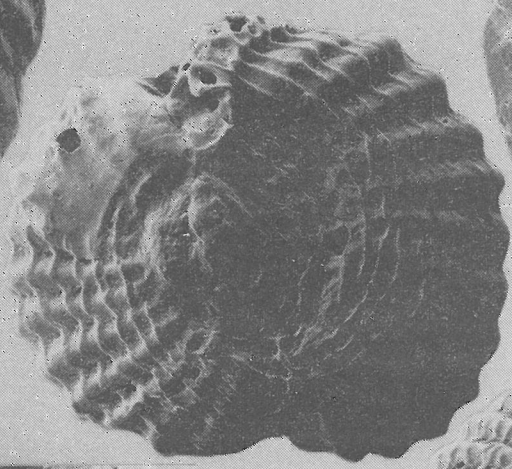
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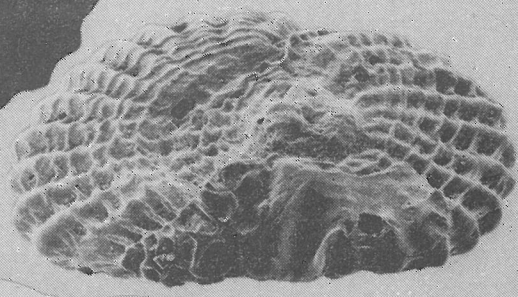
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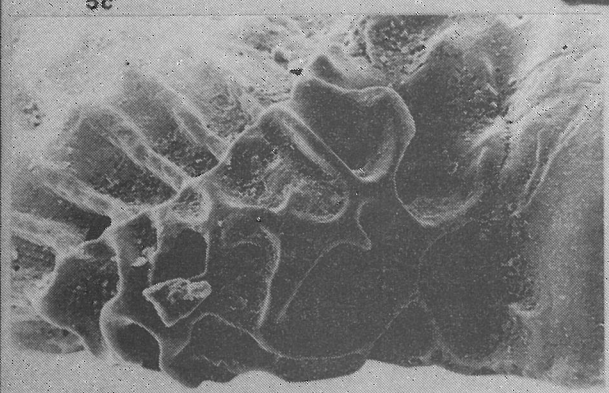
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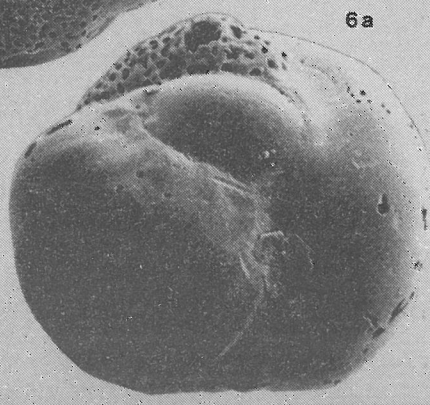
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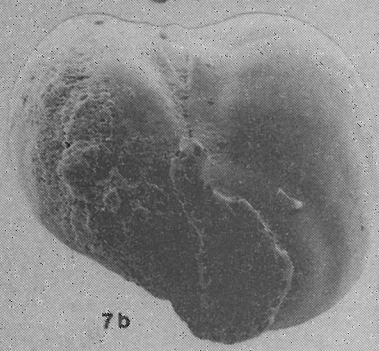
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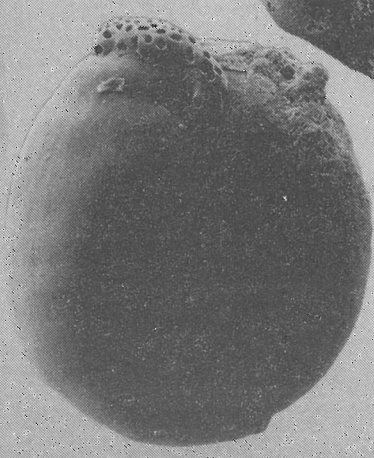
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PLATE 65

Figs. 1 - 2 : Miliola sublineata (BRADY)

Figs. 1a-b : Large, adult specimen, empty test, Eastern Perireefal Area (L 56). Fig. 1a : Lateral view (X 92); fig. 1b : apertural view (note U-shaped aperture with slightly damaged trematophore) (X 92).
Figs. 2a-b : Juvenile living specimen, Western slope (L 100). Fig. 2a : Lateral view (4 chambers visible) (X 223); fig. 2b : apertural view (note weaker development of U-shaped peristome) (X 223).

Figs. 3a-b : Nevillina coronata (MILLETT)

Empty test, backreef area, Windward Barrier (L 253). Fig. 3a : Lateral view (X 84); fig. 3b : apertural view (note large conical trematophore) (X 84).

Figs. 4 - 5 : Schlumbergerina alveoliniformis (BRADY)

Figs. 4a-b : Empty test, Southern Perireefal Area (L 94). Fig. 4a : Lateral view (X 136); fig. 4b : apertural view (note lobed peripheral outline and small trematophore) (X 136).
Figs. 5a-b : Large, adult, somewhat irregularly coiled specimen; empty test, Lagoon entrance (L 120).Fig. 5a : Lateral view (X 56); fig. 5b : apertural view (note trematophore) (X 56).

PLATE 65

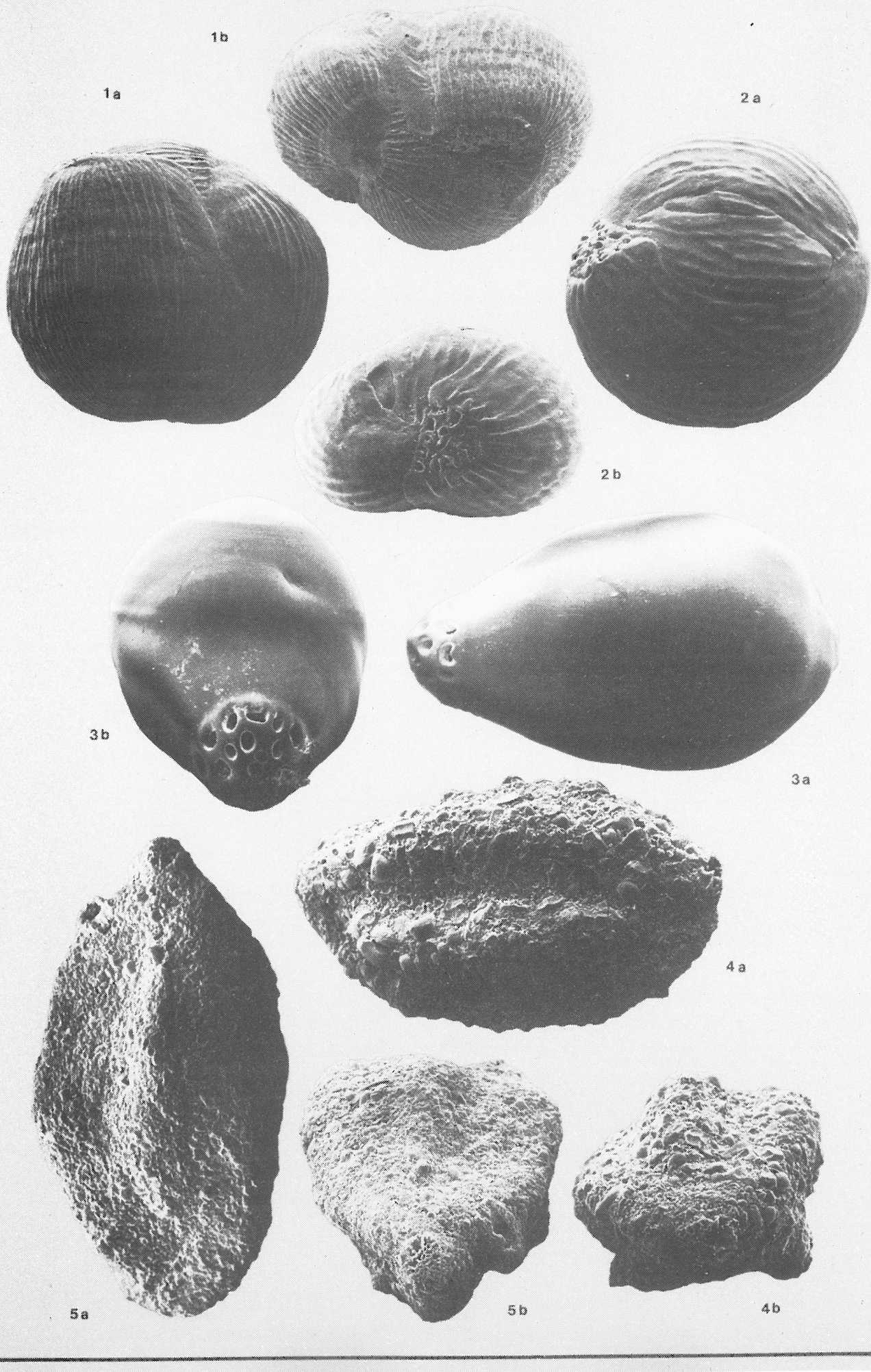


PLATE 66

Figs. 1a-c : Schlumbergerina alveoliniformis (BRADY)

Empty test, adult specimen with broad, embracing chambers; Eastern Perireefal Area (L 63). Fig. 1a : Lateral view (5 chambers visible) (X 48); fig. 1b : apertural view (X 48); fig. 1c : close-up of trematophore (note central larger opening) (X 225).

Figs. 2 - 3 : Articulina pacifica CUSHMAN

Figs. 2a-b : Empty test, milioline stage (megalospheric form ?); Eastern Perireefal Area (L 60). Fig. 2a : Lateral view (note recurved apertural rim) (X 163); fig. 2b : apertural view showing ovate toothless aperture (X 163).
Figs. 3a-b : Empty test, adult specimen with three-chambered uniserial stage, (microspheric form ?); North Point, foot of fringing reef (L 292). Fig. 3a : Lateral view (X 103); fig. 3b : apertural view (note large, compressed, ovate toothless aperture) (X 103).

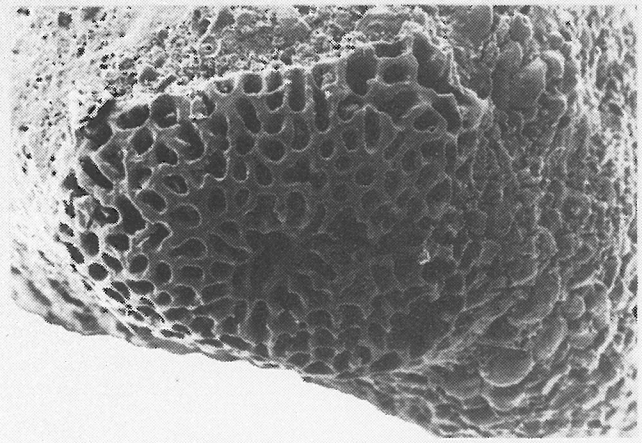
Figs. 4 - 5 : Articulina queenslandica COLLINS

Figs. 4a-b : Adult specimen with two-chambered uniserial stage; Eastern Perireefal Area (L 65). Fig. 4a : Lateral view (note increasing number of costae in last-formed chamber) (X 130); fig. 4b : apertural view (note rounded toothless aperture) (X 130).
Figs. 5a-b : Empty test, one-chambered uniserial stage; Western slope (L 109). Fig. 5a : Lateral view showing costate uncoiling chamber (compare with fig. 4a) and early milioline stage (X 214); fig. 5b : apertural view (X 214).

Figs. 6 - 7 : Alveolinella quoyi (d'ORBIGNY)

Fig. 6 : Smaller juvenile specimen; living specimen, Western Perireefal Area (L 106); apertural view (X 57).
Figs. 7a-b : Adult, living specimen, Western slope (L 100). Fig. 7a : Apertural view (note apertures in several rows) (X 25); fig. 7b : close-up of lateral extremity of the apertural face showing single apertures in several rows, with pronounced peristomes (X 130).

PLATE 66



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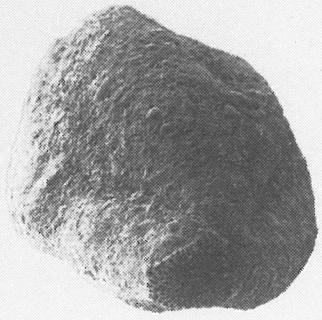

1b



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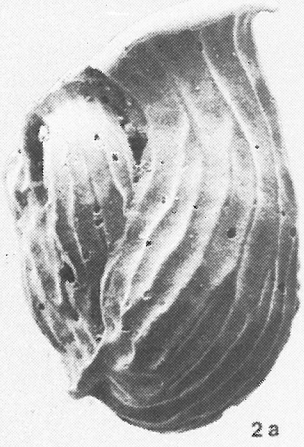

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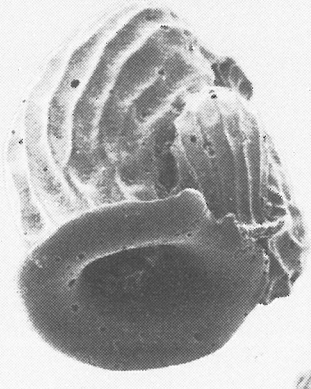

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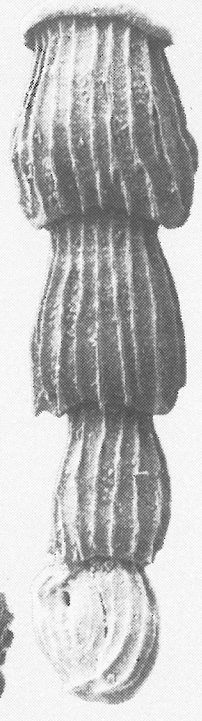

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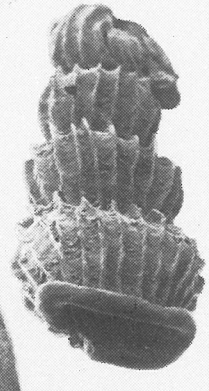

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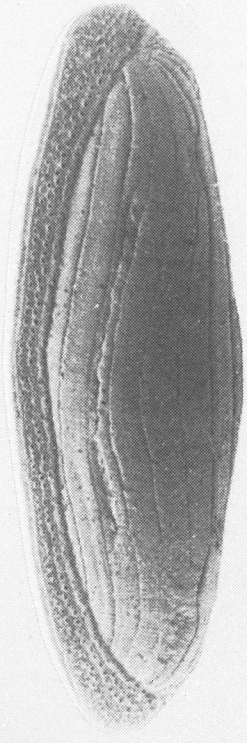

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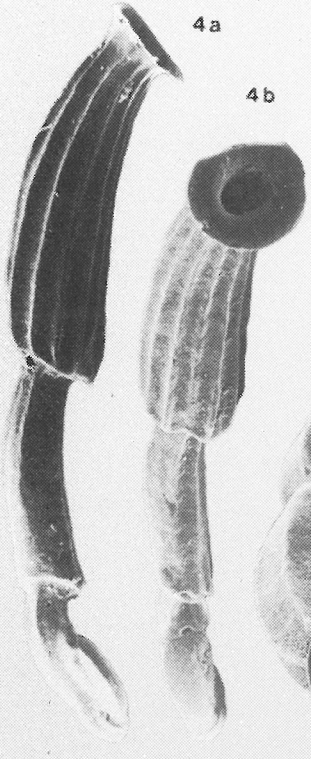

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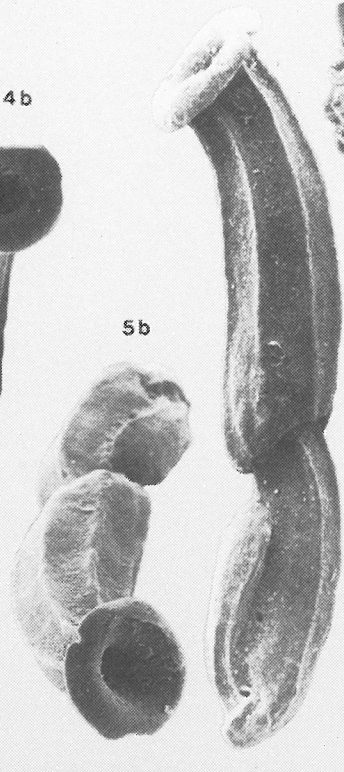

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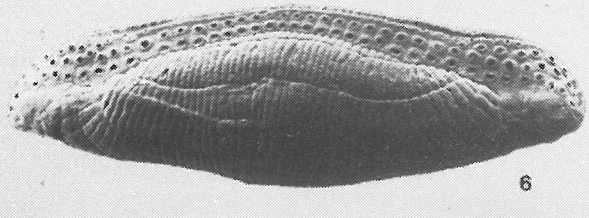

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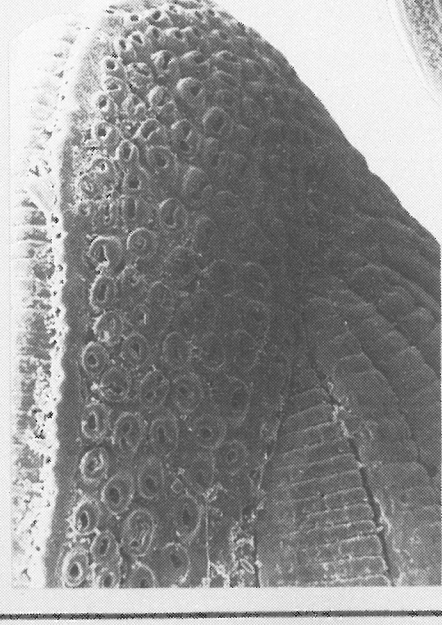


7b

PLATE 67

Fig. 1 : Nodosaria catesbyi d'ORBIGNY

Figs. 1a-c : Empty test, Eastern Perireefal Area (L 84). Fig. 1a : Lateral view (X 253); fig. 1b : apertural view (X 253); fig. 1c : close-up of apertural neck showing radially-bridged aperture (X 886).

Fig. 2 : Lagena gracillima (SEGUENZA)

Figs. 2a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 2a : Lateral view (X 191); fig. 2b : apertural view (X 191).

Figs. 3 - 4 : Lagena laevis (MONTAGU)

Figs. 3a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 3a : Lateral view (X 333); fig. 3b : apertural view (X 333).
Fig. 4 : Empty test, Eastern Perireefal Area (L 86); slightly more swollen, abraded test; lateral view (X 341).

Figs. 5 - 6 : Lagena strumosa REUSS

Figs. 5a-b : Striate specimen with well-developed basal spine and almost smooth, slightly nodulous neck; note spiral pattern upon basal spine; empty test, Eastern Perireefal Area (L 84). Fig. 5a : Lateral view (X 272); fig. 5b : apertural view (X 272).
Figs. 6a-c : Almost smooth specimen (basal spine broken-off) showing annulated neck provided with strongly developed longitudinal costae (almost carinae); empty test, Eastern Perireefal Area (L 81). Fig. 6a : Lateral view (X 315); fig. 6b : apertural view (X 315); fig. 6c : close-up of ornamented neck; note toothed peristome (X 952).

PLATE 67

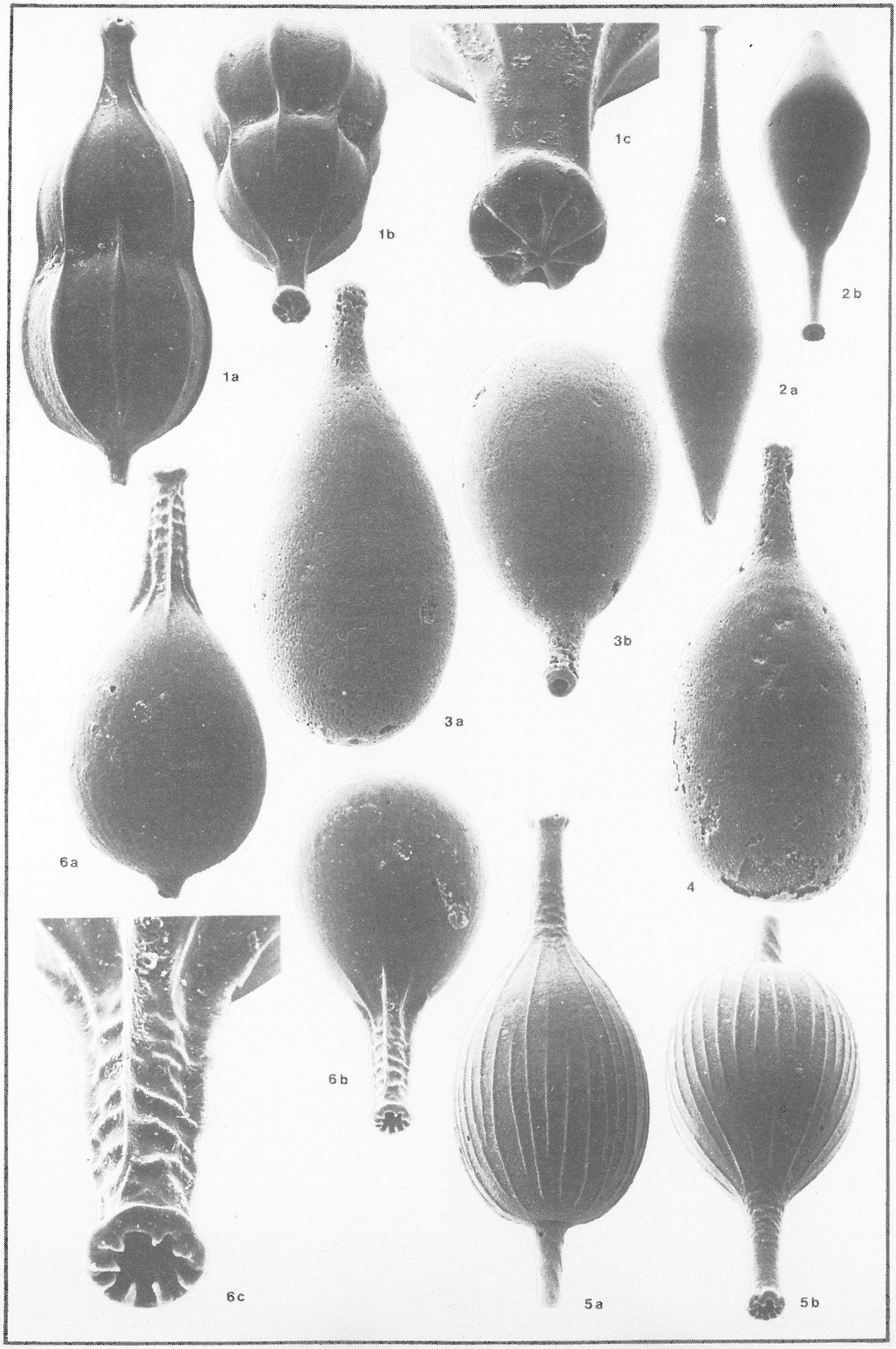


PLATE 68

Fig. 1 : Lagena strumosa REUSS

Figs. 1a-c : Specimen close to L. striata; empty test, Eastern Perireefal Area (L 81). Fig. 1a : Lateral view (note absence of basal spine) (X 341); fig. 1b : apertural view (note very small - Oolina (?) - aperture) (X 341); fig. 1c : close-up of apertural neck showing spiral costae-pattern (X 1000).

Fig. 2 : Lagena sp. 1

Figs. 2a-c : Single specimen encountered in the Lizard Island material; empty test, Eastern Perireefal Area (L 84). Fig. 2a : Lateral view (X 337); fig. 2b : close-up showing one of the lateral auricles (note doubled, hollow structure of keels) (X 516); fig. 2c : apertural view (note damaged, lagenid aperture) (X 337).

Fig. 3 : Lenticulina cf. L. australis PARR

Figs. 3a-b : Empty test, juvenile specimen; Western Perireefal Area (L 98). Fig. 3a : Lateral view (X 201); fig. 3b : apertural view; note "slightly depressed apertural face with a limbate margin on each side" (X 201).

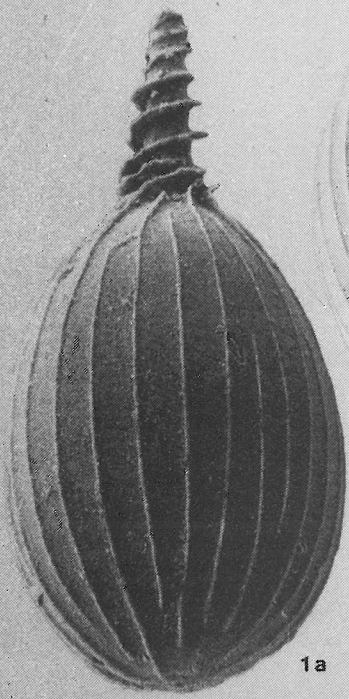
Fig. 4 : Guttulina cf. G. irregularis (d'ORBIGNY)

Figs. 4a-b : Empty test, Eastern Perireefal Area (L 84). Fig. 4a : Lateral view (X 229); fig. 4b : apertural view (note cribrate (!) aperture) (X 229).

Fig. 5 : Glandulina laevigata (d'ORBIGNY)

Figs. 5a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 5a : Lateral view (note slight corrugation of the test wall in the early-formed test portion, particularly on the level of the - badly visible - sutures) (X 192); fig. 5b : apertural view (X 192).

PLATE 68



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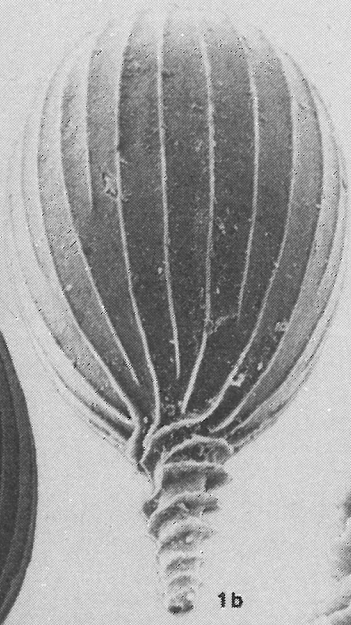

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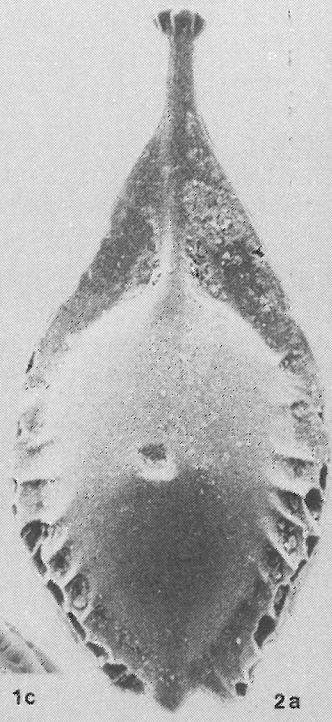

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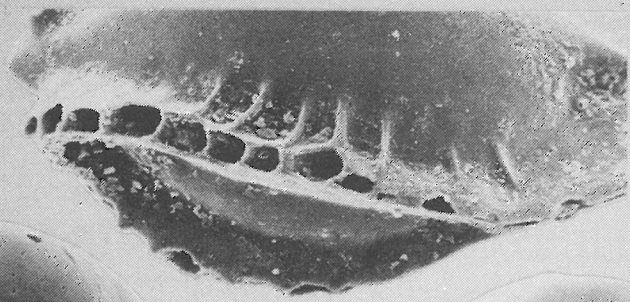


2b



2c

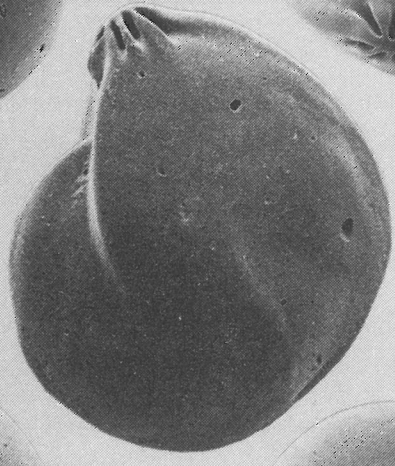


4b

4a



3b



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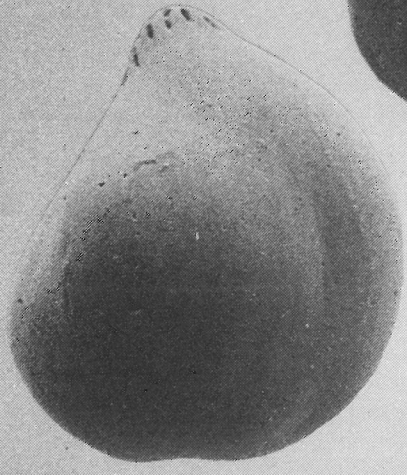
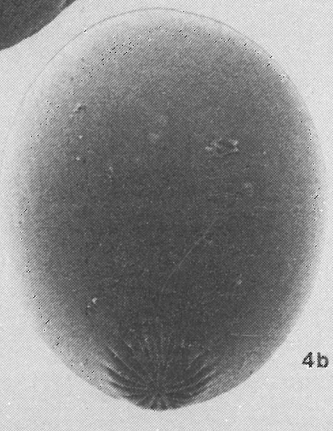




4b



4a

PLATE 69

Fig. 1 : Oolina cf. O. desmophora (RYMER JONES)

Figs. 1a-b : The single specimen in the Lizard Island material; empty, slightly damaged test; Eastern Perireefal Area (L 81). Fig. 1a : Lateral view (X 357); fig. 1b : apertural view (X 357).

Fig. 2 : Oolina cf. O. spiralis (BRADY)

Figs. 2a-b : The single specimen occurring in the Lizard Island material; empty damaged test; Eastern Perireefal Area (L 65). Fig. 2a : Lateral view (X 250); fig. 2b : apertural view (X 250).

Fig. 3 : Oolina hexagona (WILLIAMSON)

Figs. 3a-c : The single specimen occurring in the Lizard Island material; empty, slightly abraded test; Eastern Perireefal Area (L 84). Fig. 3a : Lateral view showing characteristic hexagonal ornamentation pattern (X 507); fig. 3b : apertural view (X 507); fig. 3c : close-up of the test wall showing very fine porosity between nonperforate thickened ribs (X 4250).

Fig. 4 : Fissurina contusa PARR

Figs. 4a-c : The single specimen occurring in the Lizard Island material; empty, slightly damaged test; Eastern Perireefal Area (L 81). Fig. 4a : Lateral view (note characteristic shallow pits on test surface) (X 202); fig. 4b : apertural view (note extremely large aperture and small spike at aboral test end) (X 202).

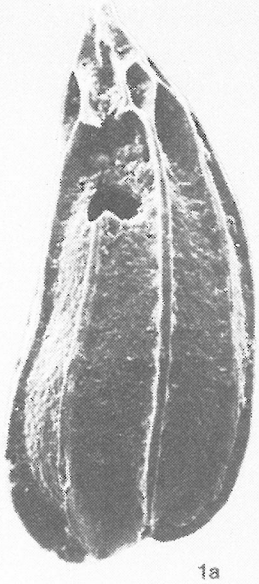
Fig. 5 : Fissurina laevigata REUSS

Figs. 5a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 5a : Lateral view (X 300); fig. 5b : apertural view (note compressed test and small aperture bordered by subtriangular lips (X 300).

Fig. 6 : Fissurina marginata (WALKER & BOYS)

Figs. 6a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 6a : Lateral view (X 358); fig. 6b : apertural view (X 358).

PLATE 69



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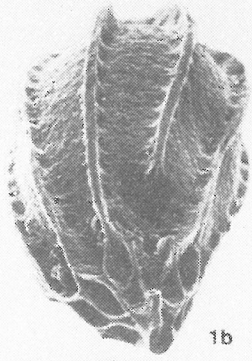

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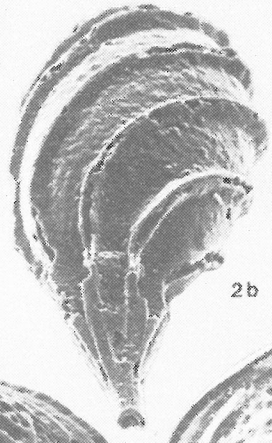

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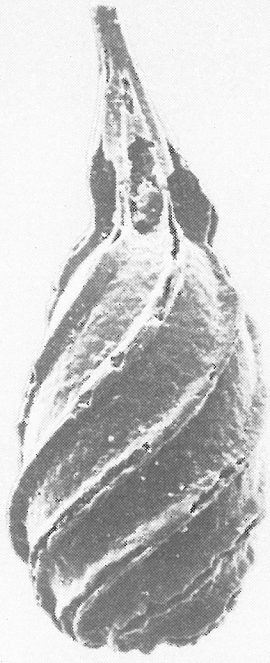

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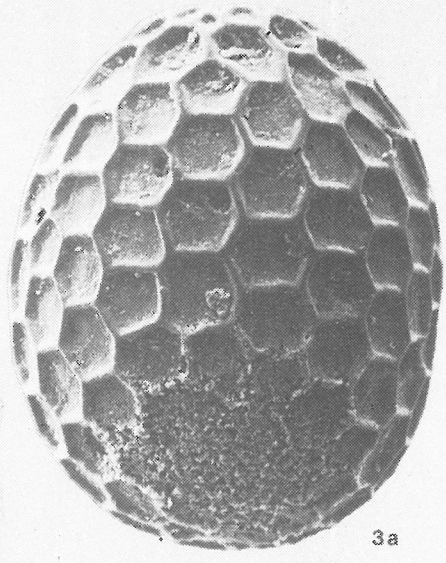

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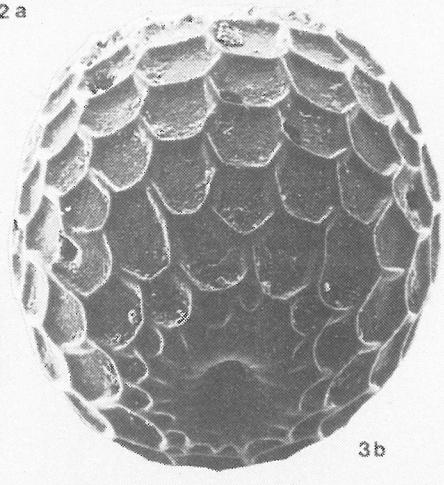

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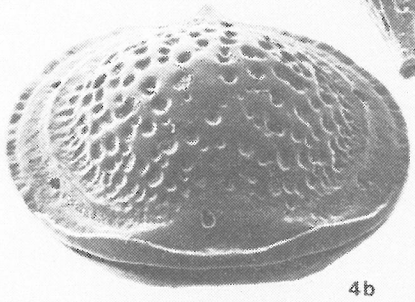

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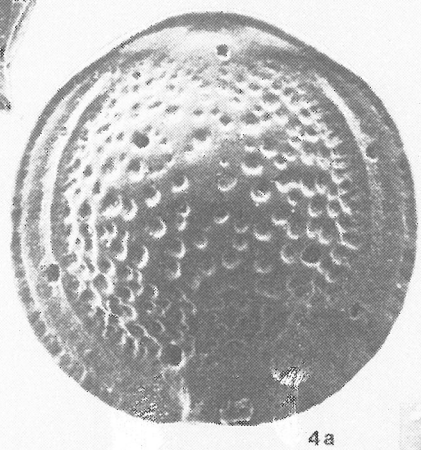

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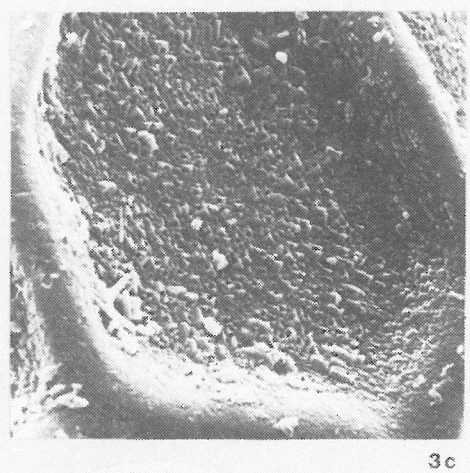

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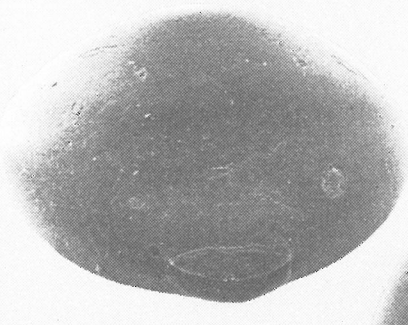

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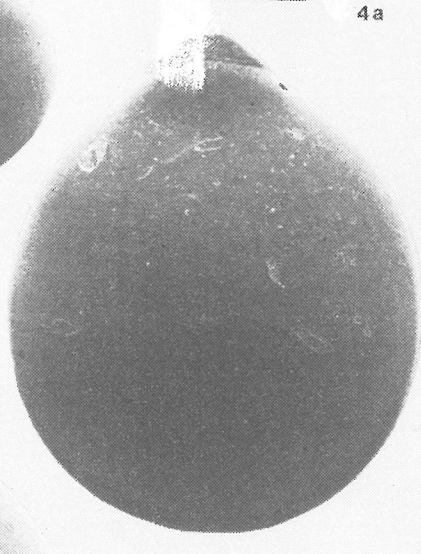

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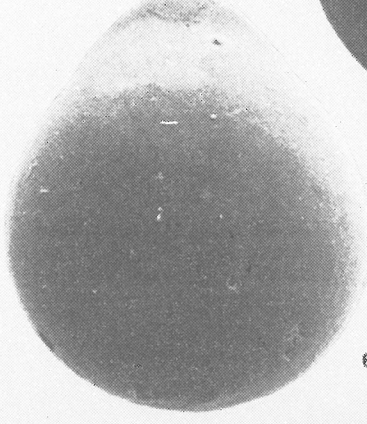

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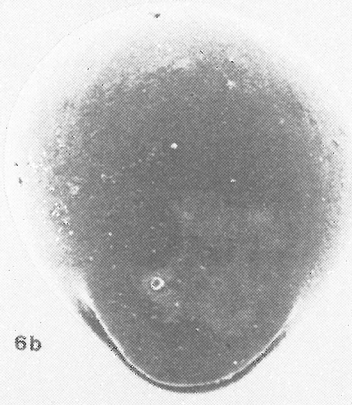


6b

PLATE 70

Fig. 1 : Fissurina marginata (WALKER & BOYS)

Figs. 1a-b : Slightly more compressed and more elongate specimen; empty test, Eastern Perireefal Area (L 81). Fig. 1a : Lateral view (note blunt nods at aboral test end) (X 445); fig. 1b : apertural view (X 445).

Fig. 2 : Fissurina marginato-perforata (SEGUENZA)

Figs. 2a-d : Living specimen, backreef area, Windward Barrier (L 253). Fig. 2a : Lateral view (note coarse perforations) (X 345); fig. 2b : apertural view (X 345); fig. 2c : close-up of test wall showing a few perforations containing thread-like organic structures of unknown origin (X 3400); fig. 2d : close-up of single perforation with bluntly ending organic filaments (X 7000).

Fig. 3 : Fissurina orbignyana s.s. SEGUENZA

Figs. 3a-b : Slightly damaged test, Eastern Perireefal Area (L 84). Fig. 3a : Lateral view (note slight traces of test wall pitting) (X 443); fig. 3b : apertural view (X 443).

Fig. 4 : Fissurina orbignyana SEGUENZA, subsp. lacunata (BURROWS & HOLLAND)

Figs. 4a-b : Empty test, Eastern Perireefal Area (L 84). Fig. 4a : Lateral view (X 317); fig. 4b : apertural view (X 317).

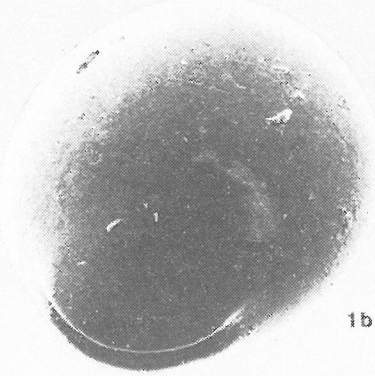
Fig. 5 : Fissurina cf. F. semistriata (UCHIO)

Figs. 5a-b : Empty test, Eastern Perireefal Area (L 82). Fig. 5a : Lateral view (note more or less spinous basal ornamentation pattern) (X 521); fig. 5b : apertural view (X 492).

PLATE 70



1a



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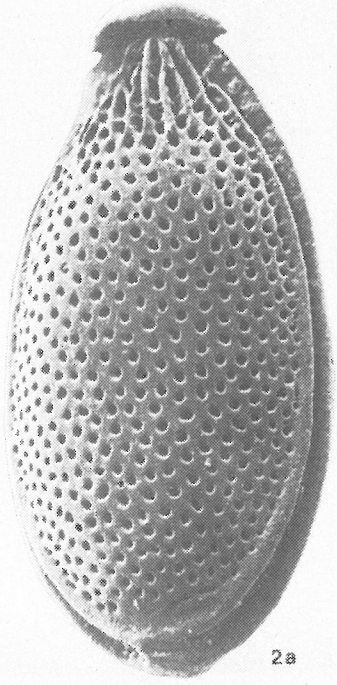

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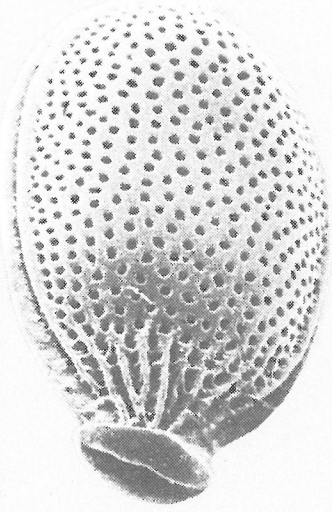

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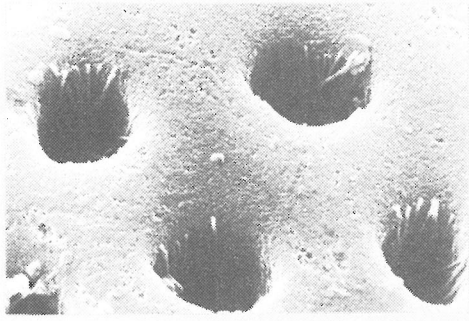

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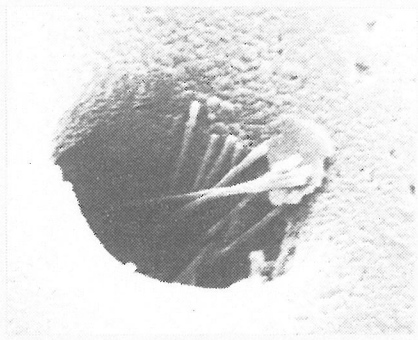

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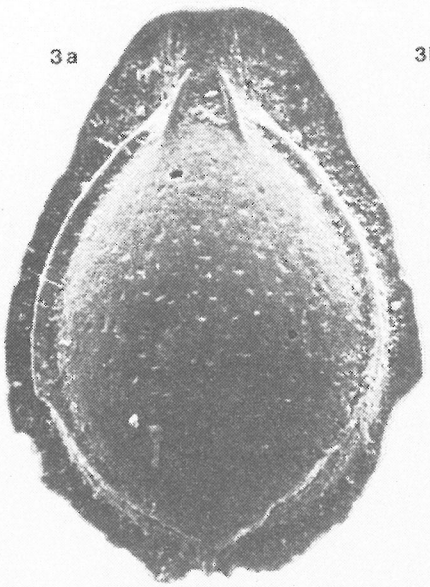

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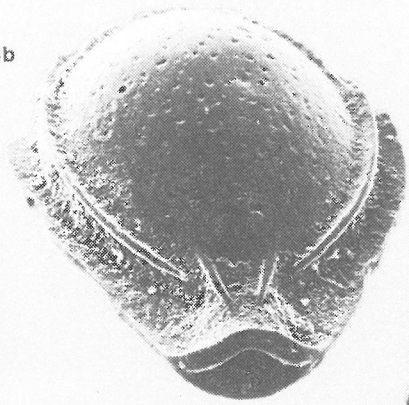

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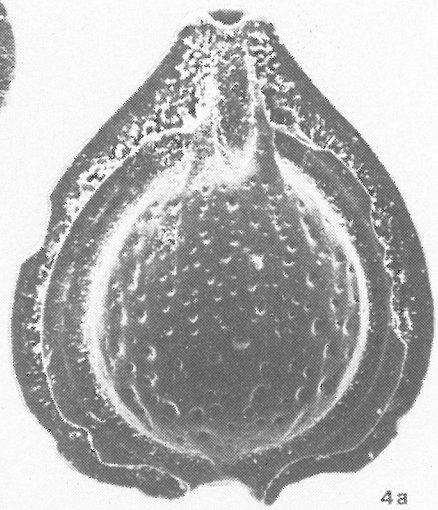

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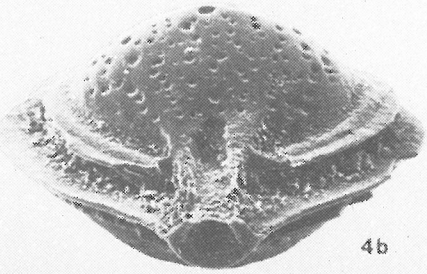

4b



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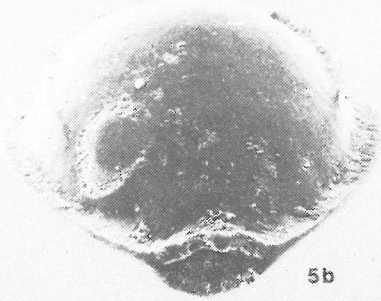


5b

PLATE 71

Fig. 1 : Parafissurina pseudauriculata (EARLAND)

Figs. 1a-b : The single specimen occurring in the Lizard Island material; empty, slightly damaged test, Eastern Perireefal Area (L 67). Fig. 1a : Lateral view (X 276); fig. 1b : close-up of apertural area in lateral view showing dissymmetry of apertural lips (X 482).

Figs. 2 - 3 : Spirillina vivipara EHRENBERG

Figs. 2a-b : Living specimen; Lagoon (L 131). Fig. 2a : Lateral view of coarsely perforated evolute side (X 193); fig. 2b : edge view showing compressed test, subrounded periphery and assymmetrical aperture (X 193).
Figs. 3a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 3a : Lateral view of opposite, more involute, less coarsely perforated side; note aperture and nonperforate initial spire (X 183); fig. 3b : apertural view (X 183).

Figs. 4 - 5 : Spirillina vivipara EHRENBERG, subsp. revertens RHUMBLER

Figs. 4a-b : Empty test, Western Perireefal Area (L 106). Fig. 4a : Lateral view (X 276); fig. 4b : edge view (X 276).
Fig. 5 : Opposite side of another empty test, Lagoon (L 130); recurved distal end of spiral chamber partly visible (X 244).

Fig. 6 : Spirillina sp. 1

Figs. 6a-b : The single specimen occurring in the Lizard Island material. Empty test, Coconut Fringing Reef flat (L 249). Fig. 6a : Lateral view (X 292); fig. 6b : apertural view (note slight test dissymmetry) (X 313).

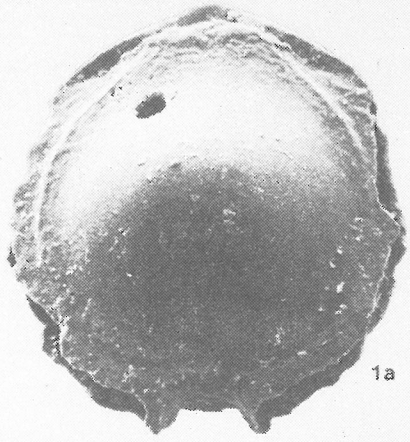
Fig. 7 : Spirillina sp. 2

Figs. 7a-b : The single specimen occurring in the Lizard Island material. Empty; damaged test; Lagoon (L 122). Fig. 7a : Lateral view (X 238); fig. 7b : apertural view (X 238).

Fig. 8 : Alliatina translucens (CUSHMAN)

Figs. 8a-c : Immature living specimen, Northern Perireefal Area (L 54).

PLATE 71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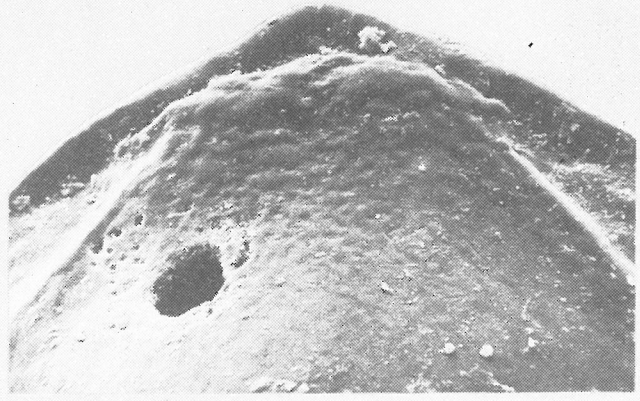
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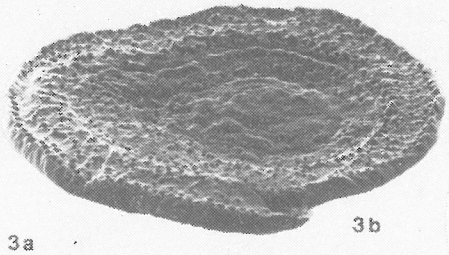
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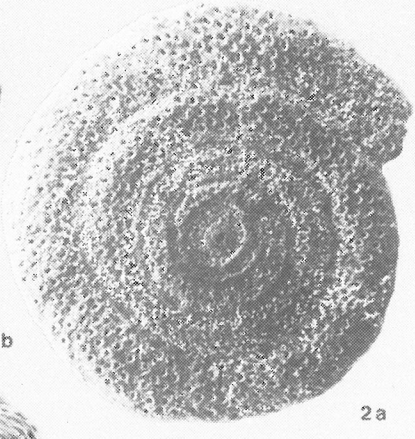
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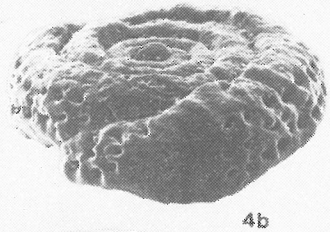
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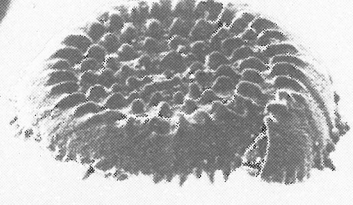
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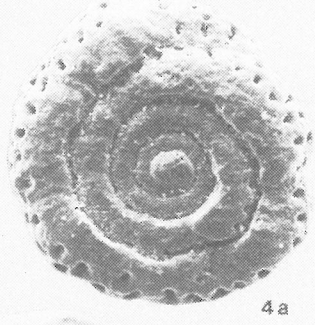
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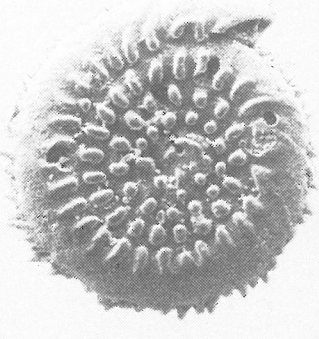
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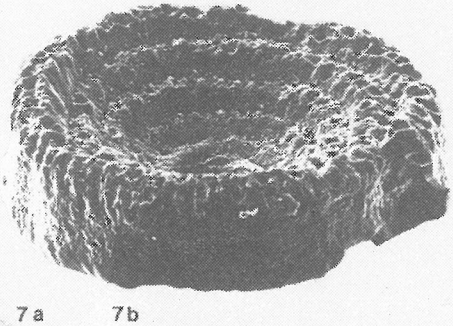
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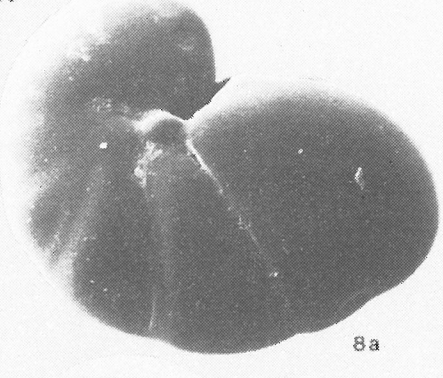
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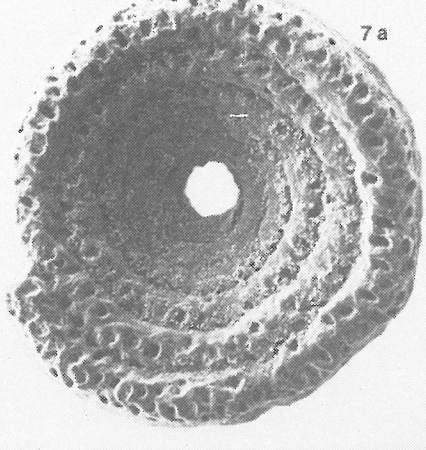

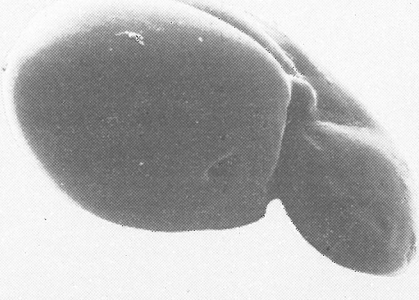
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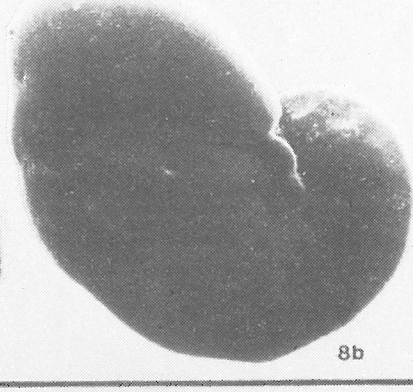

8b

PLATE 71 (continued)

Fig. 8a : Lateral view (note supplementary chamberlet in umbilical area) (X 242); fig. 8b : id, opposite side (X 242); fig. 8c : apertural view; note slight test dissymmetry and rounded supplementary aperture on apertural face (X 242).

PLATE 72

Fig. 1 : Alliatina translucens (CUSHMAN)

Figs. 1a-c : Larger specimen, empty test, backreef area, Windward Barrier (L 253). Fig. 1a : Lateral view showing well-developed supplementary chamberlets in umbilical area (X 173); fig. 1b : apertural view; note larger, comma-shaped supplementary aperture (X 173); fig. 1c : close-up of umbilical area showing supplementary chamberlets and -aperture (X 465).

Figs. 2 - 3 : Buliminoides madagascariensis s.s. (d'ORBIGNY)

Fig. 2 : Plastogamic pair, reef flat, Windward Barrier (L 254); lateral view; note moderate chamber inflation and bluntly rounded aboral test end (X 370).

Fig. 3 : Specimen intermediate between madagascariensis s.s. and subsp. parallela; empty test, Sandy Shoal (L 150); lateral view; note nodulous test surface in early coils, well-developed grooves upon apertural face, small plastogamic plate and bluntly rounded aboral test end (X 351).

Fig. 4 : Buliminoides madagascariensis (d'ORBIGNY), subsp. parallela (CUSHMAN & PARKER)

Figs. 4a-b : Empty test, Patchreef Area near West Point (L 105). Fig. 4a : Lateral view; note narrow test, nodulous test surface and hardly inflated chambers (X 364); fig. 4b : apertural view; note small aperture, smaller grooved circumapertural area and bluntly rounded aboral test end (X 364).

Fig. 5 : Buliminoides madagascariensis (d'ORBIGNY), subsp. spicatus (CUSHMAN & PARKER)

Figs. 5a-b : Empty test, Western Perireefal Area (L 98). Fig. 5a : Lateral view (note inflated chambers, nodulous early-formed test surface and initial spine) (X 325); fig. 5b : apertural view; note large grooved apertural face and large plastogamic plate (X 325).

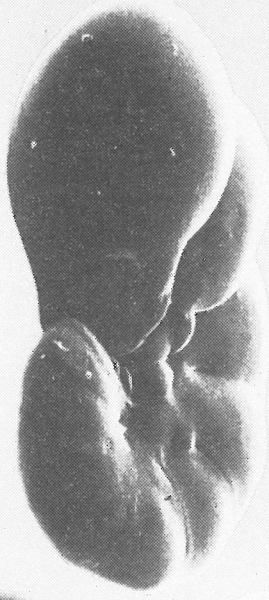
Fig. 6 : Buliminoides williamsonianus (BRADY)

Figs. 6a-b : Empty test, Northern Perireefal Area (L 50). Fig. 6a : Lateral view (X 171); fig. 6b : apertural view (X 171).

PLATE 72



1a



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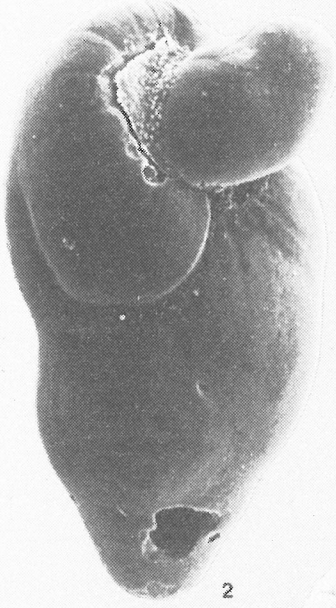

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3



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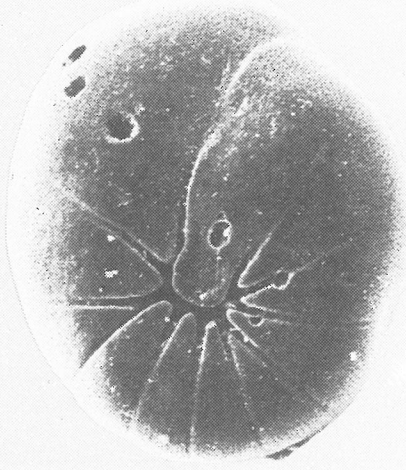

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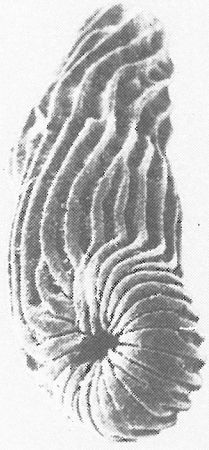

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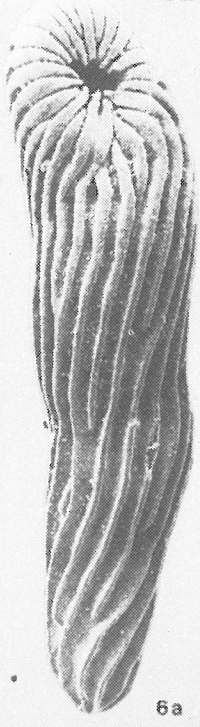

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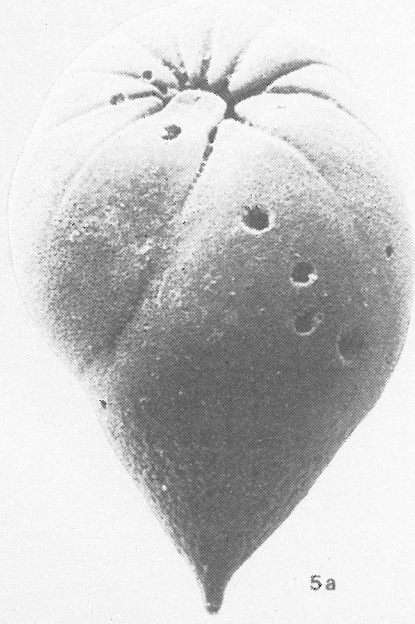


5a

PLATE 73

Figs. 1 - 2 : Bolivina compacta SIDEBOTTOM

Figs. 1a-b : Empty test, Eastern Perireefal Area (L 75). Fig. 1a : Lateral view (note coarse porosity and secondary chalk formation) (X 282); fig. 1b : apertural view (X 282).
Fig. 2 : Lateral view of smaller specimen already showing secondary chalk formation; empty test, Eastern Perireefal Area (L 59) (X 298).

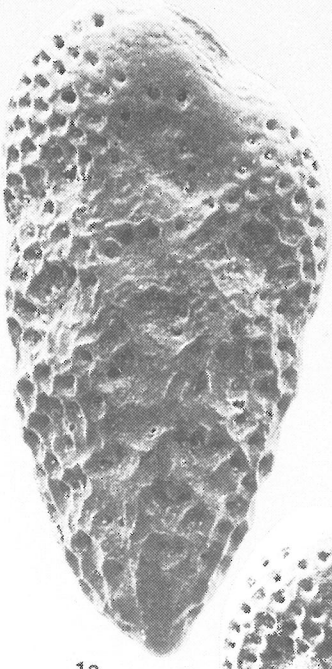
Figs. 3 - 4 : Bolivina rhomboidalis (MILLETT)

Figs. 3a-b : Specimen with pronounced rhomboidal outline (in apertural view), strongly excavated lateral faces and rather deeply incised sutures in younger chambers; empty test, Coconut Fringing Reef flat (L 249). Fig. 3a : Lateral view (note coarse porosity) (X 321); fig. 3b : apertural view (note rough test surface) (X 321).
Figs. 4a-b : Specimen close to B. quadrilatera; empty test, Lagoon entrance (L 120). Fig. 4a : Lateral view (note sharply angled chambers and secondary chalk formation) (X 317); fig. 4b : apertural view showing less rhomboidal, more or less rectangular test outline and hardly excavated lateral faces; note toothplate and surface structure identical with that of the specimen illustrated on fig. 3 (X 317).

Figs. 5 - 6 : Bolivina spinea CUSHMAN

Figs. 5a-b : Hardly spinous, slightly abraded empty test; Eastern Perireefal Area (L 82). Fig. 5a : Lateral view; note coarse pores, deeply incised sutures, short initial spine and considerable chamber inflation (X 398); fig. 5b : apertural view (note smooth apertural face) (X 394).
Figs. 6a-b : Fresh, empty test showing a very dense spinosity and less inflated chambers; backreef area, Windward Barrier (L 253). Fig. 6a : Lateral view; note strong initial spine, spines pointing away from the aperture, and smooth apertural face (X 352); fig. 6b : close-up of test portion showing very delicate and varied spinosity, and large pores hardly visible between the spines (X 450).

PLATE 73



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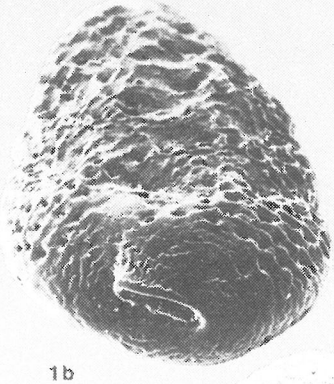

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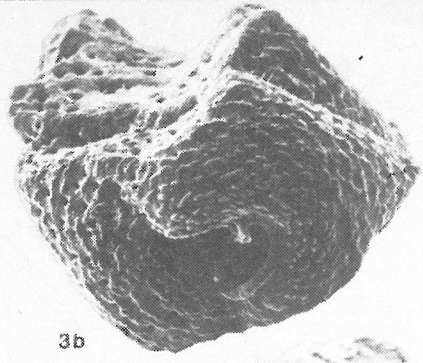

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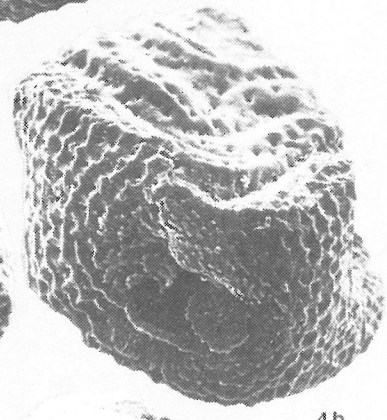

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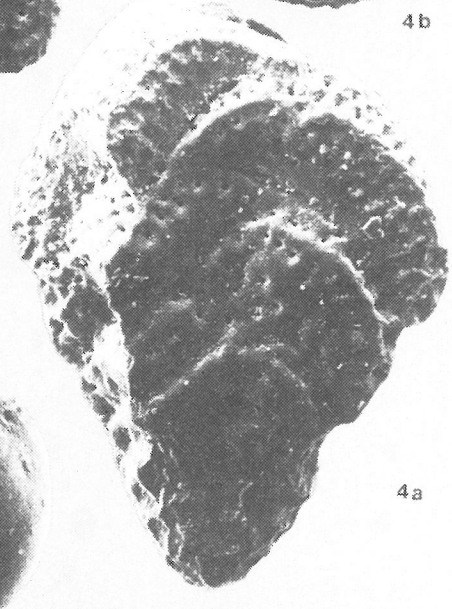

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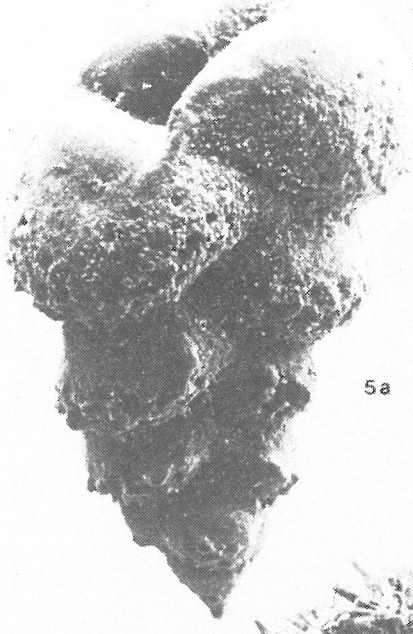

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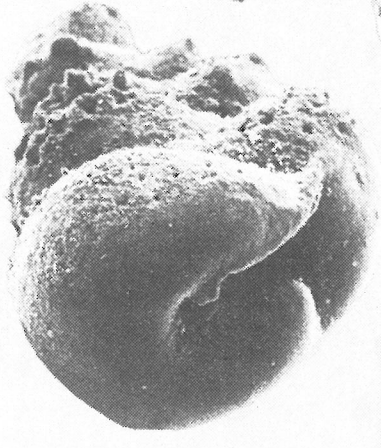

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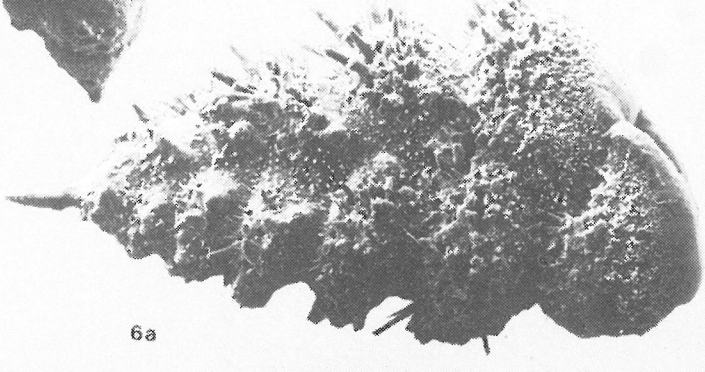

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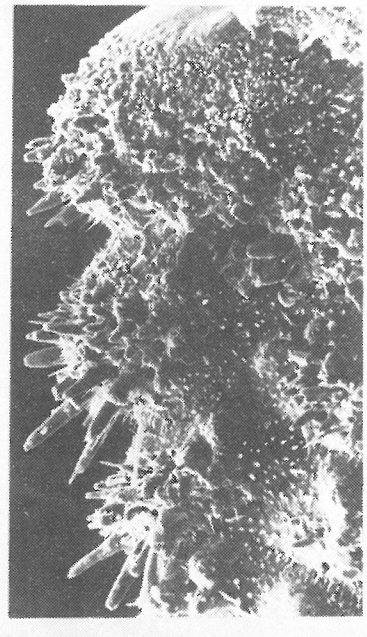


6b

PLATE 74

Figs. 1 - 2 : Brizalina pacifica (CUSHMAN & McCULLOCH)

Figs. 1a-b : Empty test, rather narrow specimen with slightly inclined sutures; Eastern Perireefal Area (L 60). Fig. 1a : Lateral view showing strongly limbate early sutures and depressed younger ones; note coarse porosity of test (X 192); fig. 1b : apertural view (X 192).
Fig. 2 : Empty test, broader specimen with hardly inclined sutures and inflated younger chambers; Lagoon entrance(L 120); lateral view showing essentially the same features as fig. 1a (X 234).

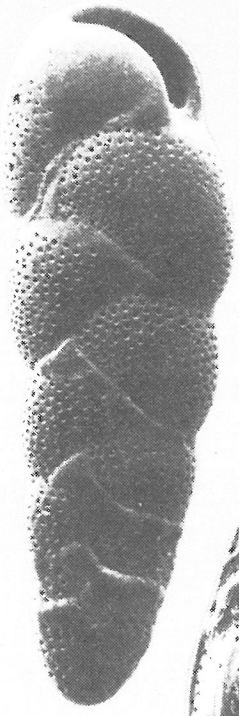
Figs. 3 - 5 : Brizalina (?) striatula (CUSHMAN)

Fig. 3 : Lateral view of empty test; Southern Perireefal Area (L 90) (X 254).
Fig. 4 : Variant, empty test, lateral view, Southern Perireefal Area (L 90) (X 260).
Fig. 5 : Apertural view of another empty test, Southern Perireefal Area (L 90) (X 300).

Figs. 6 - 8 : Brizalina convallaria (MILLETT)

Figs. 6a-b : Empty test, megalospheric ("durandii")-form; Eastern Perireefal Area (L 60). Fig. 6a : Lateral view showing costate early portion of test, lateral spines and scattered pores in earlier-formed chambers (X 290); fig. 6b : apertural view; note strongly compressed youngest chambers and slitlike aperture (X 290).
Figs. 7a-c : Empty test, microspheric ("convallaria")-form; Eastern Perireefal Area (L 84). Fig. 7a : Lateral view; note narrow test, strongly cut-off chamber shoulders in later-formed chambers, downward-pointing spines and few, scattered pores; note resemblance of early-formed test portion with homologous part of test shown in fig. 6a (X 221); fig. 7b : apertural view (note rounded test outline and relatively large, rounded aperture) (X 221); fig. 7c : close-up of test portion showing already-mentioned features (X 619).
Fig. 8 : Empty test, microspheric form showing growth irregularity; Eastern Perireefal Area (L 84) (X 158).

PLATE 74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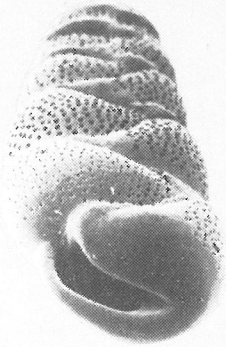
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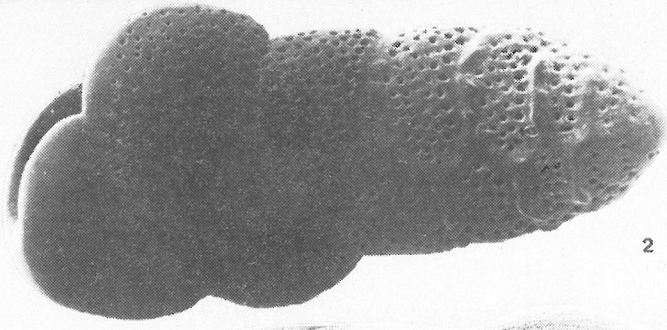
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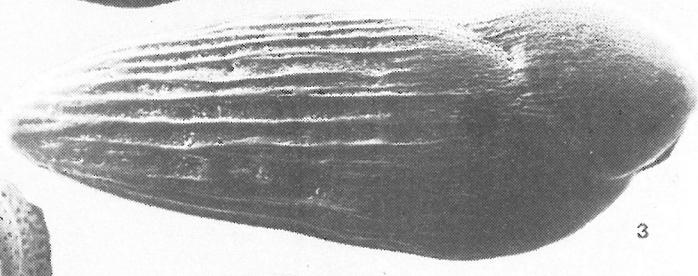
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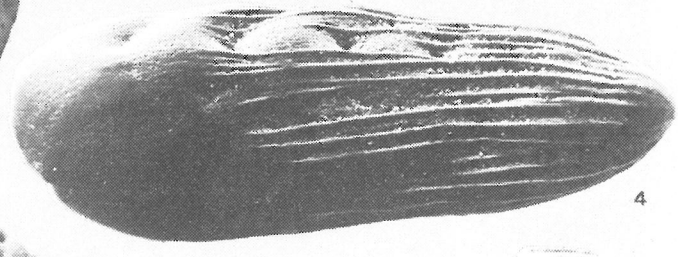
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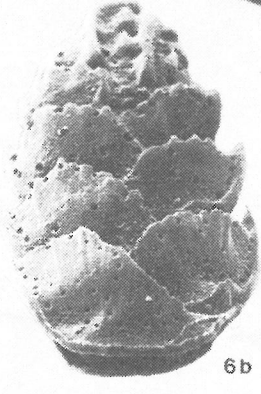
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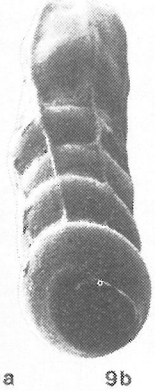
7b


9a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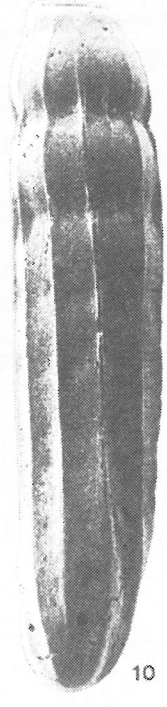
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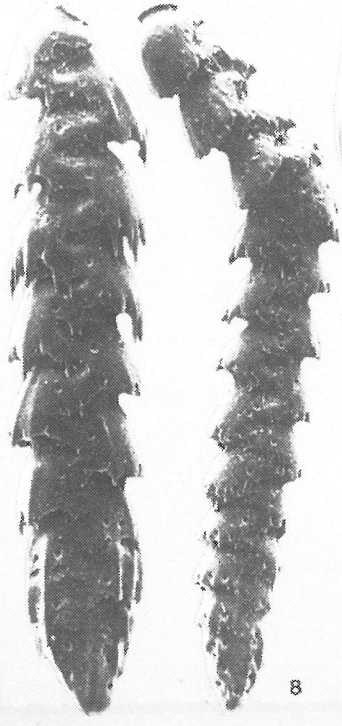
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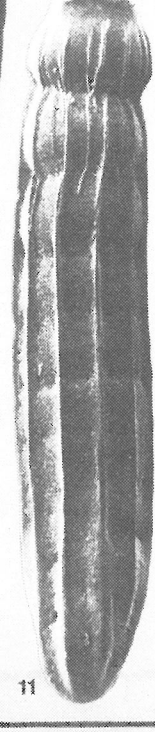

11


12

PLATE 74 (continued)

Figs. 9 - 12 : Rectobolivina raphana (PARKER & JONES)

Figs. 9a-b : Smaller specimen with 8 costae; empty test, Patchreef Area (limit of Internal Platform) (L 162). Fig. 9a : Lateral view (X 140); fig. 9b : apertural view (note toothplate) (X 140).
Fig. 10 : Larger specimen possessing 10 costae; empty test, reef flat, Windward Barrier (L 254); lateral view (X 96).
Figs. 11-12 : Largest specimen found in the Lizard Island material; empty test, reef flat, Windward Barrier (L 254). Fig. 11 : Lateral view (note addition of costae in penultimate and antepenultimate chamber) (X 80); fig. 12 : apertural view (note toothplate) (X 76).

PLATE 75

Figs. 1 - 2 : Mimosina echinata H. ALLEN & EARLAND

Fig. 1a : Larger specimen, empty test, Western slope (L 100). Lateral view (X 204).

Figs. 1b-c : Larger specimen, empty test, Western slope (L 100). Fig. 1b : Lateral view (note spines and striae) (X 234); fig. 1c : apertural view (note strongly embracing ultimate chamber, denticulate rim of sutural aperture, and partially closed areal aperture) (X 234).

Figs. 2a-b : Smaller living specimen; Lagoon (L 122). Fig. 2a : Lateral view (note well-developed costae, strongly spinous surface and prominent basal spine (X 306); fig. 2b : apertural view (note less embracing ultimate chamber - compare with fig. 1c - as well as open, elongate areal aperture) (X 306).

Figs. 3 - 5 : Reussella "simplex" (CUSHMAN)

Figs. 3a-b : Relatively short and broad, smaller specimen, empty test, Western slope (L 100). Fig. 3a : Lateral view showing strongly developed basal spine and limbate sutures (X 177); fig. 3b : apertural view showing pavoninid apertural features (X 177).

Figs. 4a-b : Larger, elongate and slightly abraded specimen; empty test, Eastern Perireefal Area (L 60). Fig. 4a : Lateral view (note obscured earlier sutures and coarse porosity) (X 173); fig. 4b : apertural view (note denticulate toothplate rim) (X 173).

Figs. 5a-b : Large, well-preserved specimen, empty test, Eastern Perireefal Area (L 60). Fig. 5a : Lateral view (note somewhat finer porosity and limbate sutures) (X 151); fig. 5b : apertural view (note sharply angled periphery and concave sides) (X 165).

Figs. 6a-b : Trimosina milletti CUSHMAN, subsp. multispinata COLLINS

Juvenile specimen, empty test, Eastern Perireefal Area (L 63). Fig. 6a : Lateral view (X 300); fig. 6b : apertural view (note sutural and areal apertures hardly separated from each other by toothplate (X 300).

PLATE 75

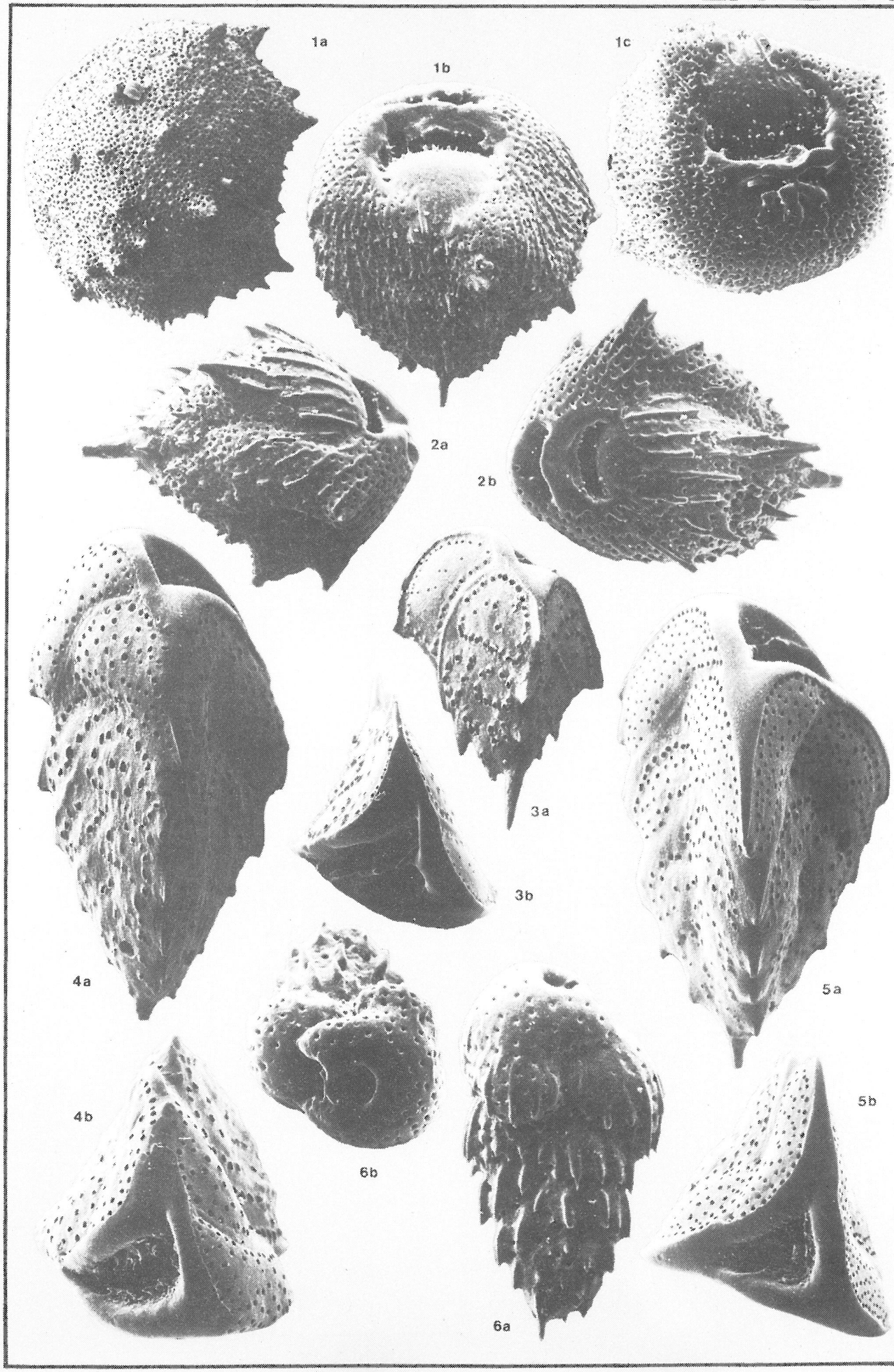


PLATE 76

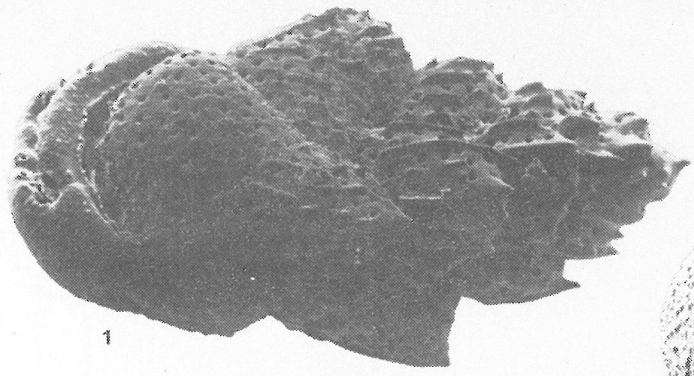
Figs. 1 - 2 : Trimosina milletti CUSHMAN, subsp. multispinata COLLINS

Fig. 1 : Large, living specimen, Patchreef Area (L 153); lateral view (note elongate test, coarse pores, costae and "spine fringes" as prolongations of costae, and crescentic sutural and areal apertures (X 230).
Figs. 2a-b : Smaller, damaged specimen (ultimate chamber broken away); such specimens often occur and are easily confused with Reussella in routine counting work; empty test, Western slope (L 100). Fig. 2a : Lateral view (X 286); fig. 2b : apertural view showing part of toothplate (X 286).

Figs. 3 - 5 : Siphouvigerina ampullacea (BRADY)

Figs. 3a-b : Empty test, Eastern Perireefal Area (L 84); medium-hispid specimen. Fig. 3a : Lateral view (note relatively long apertural neck) (X 271); fig. 3b : apertural view (X 271).
Figs. 4a-c : Empty test, Eastern Perireefal Area (L 65); more finely hispid specimen. Fig. 4a : Lateral view of opposite side (vs. fig. 3a) (note short and broad apertural neck) (X 272); fig. 4b : apertural view (X 272); fig. 4c : close-up of aperture showing pronounced smooth peristome and spiral, denticulate toothplate rim (X 974).
Figs. 5a-c : Single specimen in our materal showing a coarsely granulated surface (if considered solely this specimen should be attributed to U. (S.?) asperula or U. (S.?) proboscidea); living specimen, Western slope (L 110). Fig. 5a : Lateral view (note coarse granularity - secondary calcification-on earlier-formed test portion and peristome, and elongate ultimate chamber) (X 213); fig. 5b : apertural view (X 213); fig. 5c : close-up of aperture showing granularity of outer peristome rim and smooth spiral toothplate with denticulate rim (compare with fig. 4c) (X 1278).

PLATE 76



1

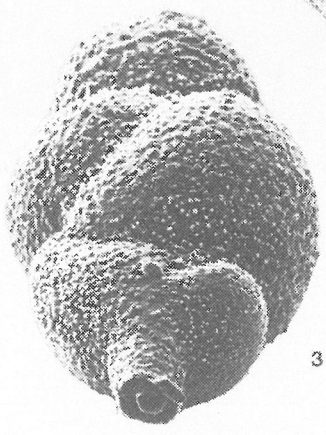


3a

4a



2a



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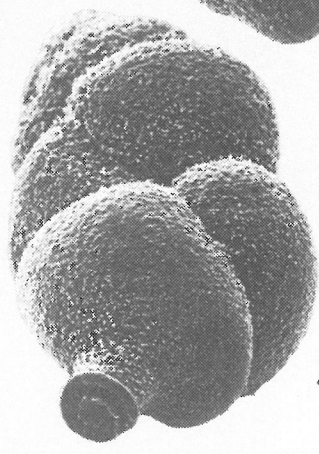

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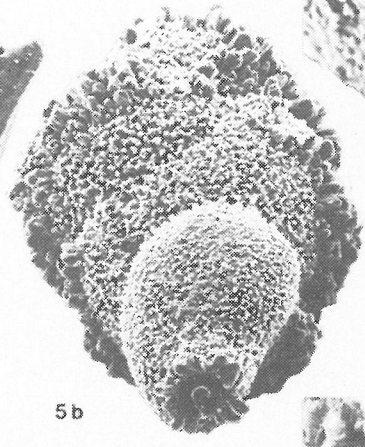
4c



2b



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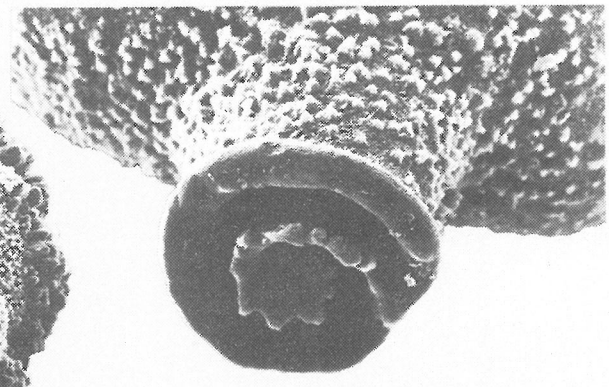

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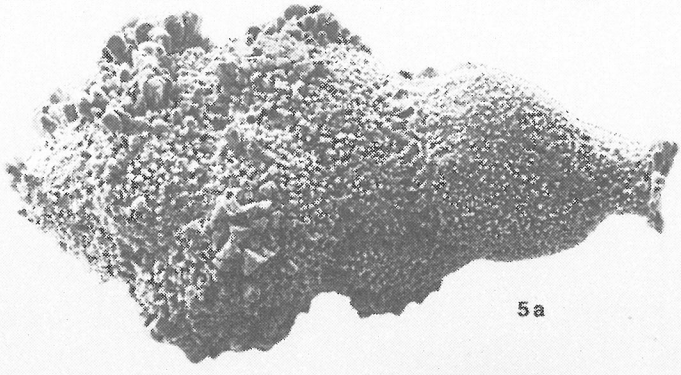

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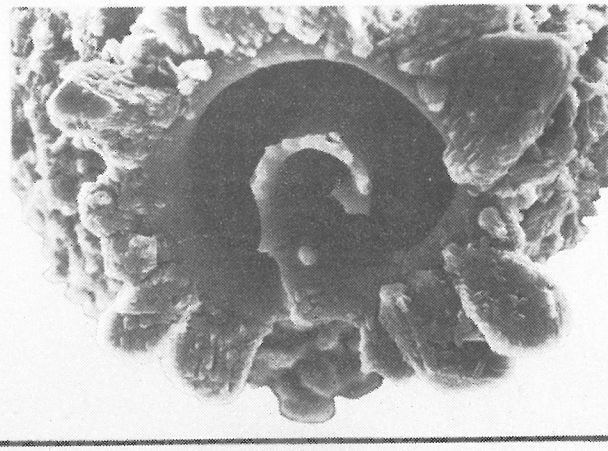


PLATE 77

Figs. 1 - 3 : Siphogenerina virgula (BRADY)

Fig. 1 : Lateral view of completely intact specimen; empty test, Eastern Perireefal Area (L 82) (X 178).
Fig. 2 : Id, large specimen with pearshaped chambers and broken-off spines; empty test, Eastern Perireefal Area (L 81) (X 111).
Fig. 3 : Id, large specimen (L 81); fig. 3a : Lateral view (X 91); fig. 3b : apertural view (note absence of any visible toothplate) (X 91); fig. 3c : close-up of test wall and suture; note short spines with triangular section, long, rounded, smooth spines and coarse pores (X 424).

Figs. 4 - 8 : Neoconorbina sp. aff. N. pacifica HOFKER

Fig. 4 : Spiral view of living specimen, Western slope (L 110) (X 164).
Figs. 5a-c : Other specimen, spiral side; empty test, Eastern Perireefal Area (L 65). Fig. 5a : Spiral view (note strongly oblique sutures and very coarse "deuteropores" concentrated along the sutures) (X 162); fig. 5b : edge view (note irregular test outline) (X 162).
Figs. 6 - 7 : Larger specimen, umbilical side; empty test, edge of Patchreef Area (L 105). Fig. 6 : Edge view (X 153); fig. 7 : Id, umbilical view showing narrow umbilicus, sigmoidally-curved sutures with apertural plates partly masked by secondary lamination, and large "deuteropores" scattered over almost the entire ventral surface (X 153).
Fig. 8 : Umbilical view of another specimen showing larger umbilicus, sutures and apertural plates somewhat resembling those of Rosalina orientalis; small, hardly visible, "deuteropores" can be seen developing upon ultimate- and penultimate chambers (X 144).

Figs. 9 - 11 : Neoconorbina terquemi (RHEZAK)

Figs. 9a-b : Smaller specimen, empty test, Patchreef Area (L 153). Fig. 9a : Spiral view (note smooth test surface and flush, strongly curved sutures) (X 175); fig. 9b : edge view (note conical shape and definite peripheral keel) (X 175).
Fig. 10 : Umbilical side of another empty test; Lagoon (L 124); note narrow umbilicus and almost straight sutures (X 243).
Fig. 11 : Umbilical side of larger specimen; empty test, Lagoon entrance (L 120); note pronounced apertural flap covering almost the entire umbilicus (X 182).

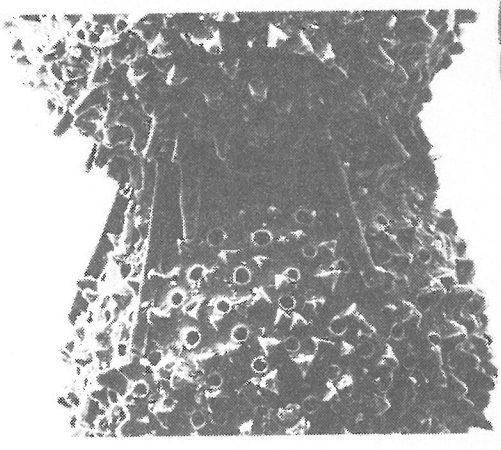
PLATE 77


1


2


3a


3b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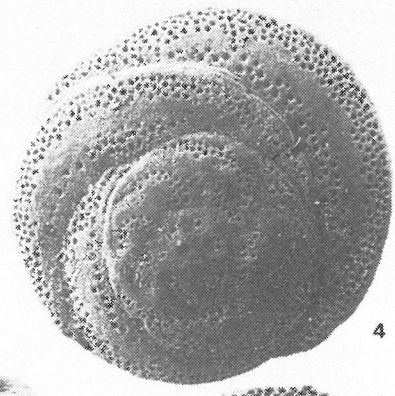
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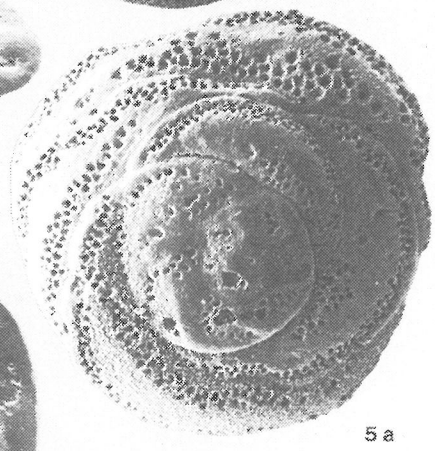
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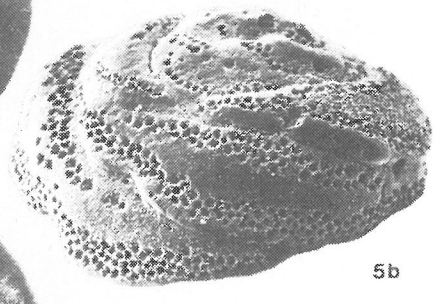
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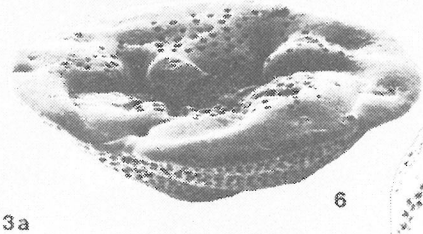
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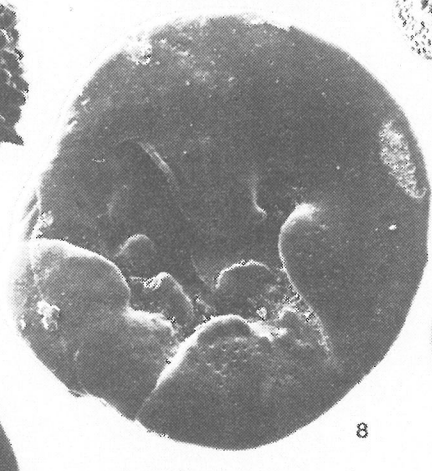
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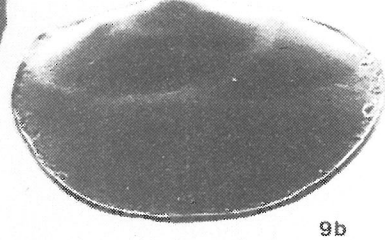
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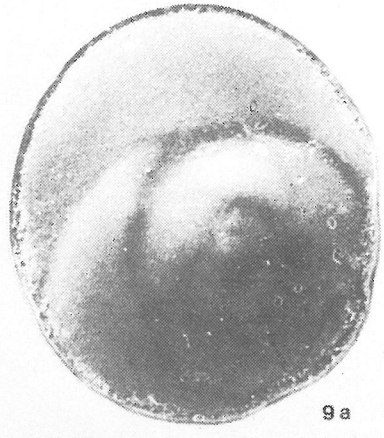
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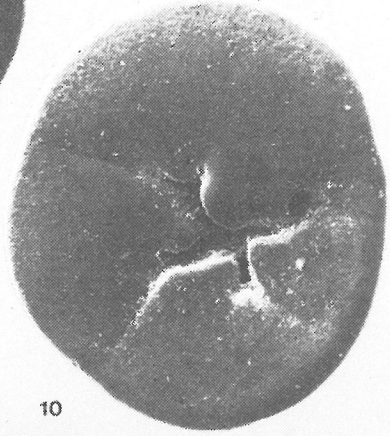

10


11

PLATE 78

Figs. 1a-d : Cancris auriculus (FICHTEL & MOLL)

Living specimen, Southern Perireefal Area (L 90).
Fig. 1a : Spiral view (note limbate sutures) (X 135); fig. 1b : umbilical view (X 126); fig. 1c : edge (apertural) view showing compressed test and carinate periphery (X 135); fig. 1d : close-up of umbilical area showing secondarily laminated structures and poreless area above apertural lip on ultimate chamber (X 218).

Figs. 2-5 : Discorbis mira CUSHMAN

Fig. 2 : Spiral side of smaller specimen; empty test, reef flat, Windward Barrier (L 254); note coarse porosity of test and strongly curved sutures (X 143).
Fig. 3 : Umbilical side of empty test, Coconut Fringing Reef flat (L 249); note umbilical chalk plug reminiscent of Gavelinopsis (X 114).
Figs. 4a-b : Larger specimen, empty test, Coconut Fringing Reef flat (L 246).
Fig. 4a : Umbilical view; note nonporous periphery and umbilicus completely filled up with secondary chalk (remnants of apertural structures of previous chambers) (X 104); fig. 4b : edge view (X 104).
Fig. 5 : Spiral side of larger specimen; empty test, Coconut Fringing Reef flat (L 246). Edge view showing sharp periphery and bluntly conical test outline; note nonporous apex (due to secondary lamination) (X 99).

Figs. 6 - 7 : Discorbis subvesicularis COLLINS

Fig. 6 : Spiral side of larger, damaged specimen lacking the ultimate chamber; empty test, reef flat, Windward Barrier (L 254); edge view (X 165).
Fig. 7 : Umbilical view of somewhat smaller specimen, empty test, reef flat, Windward Barrier (L 254); edge view (X 170).

PLATE 78

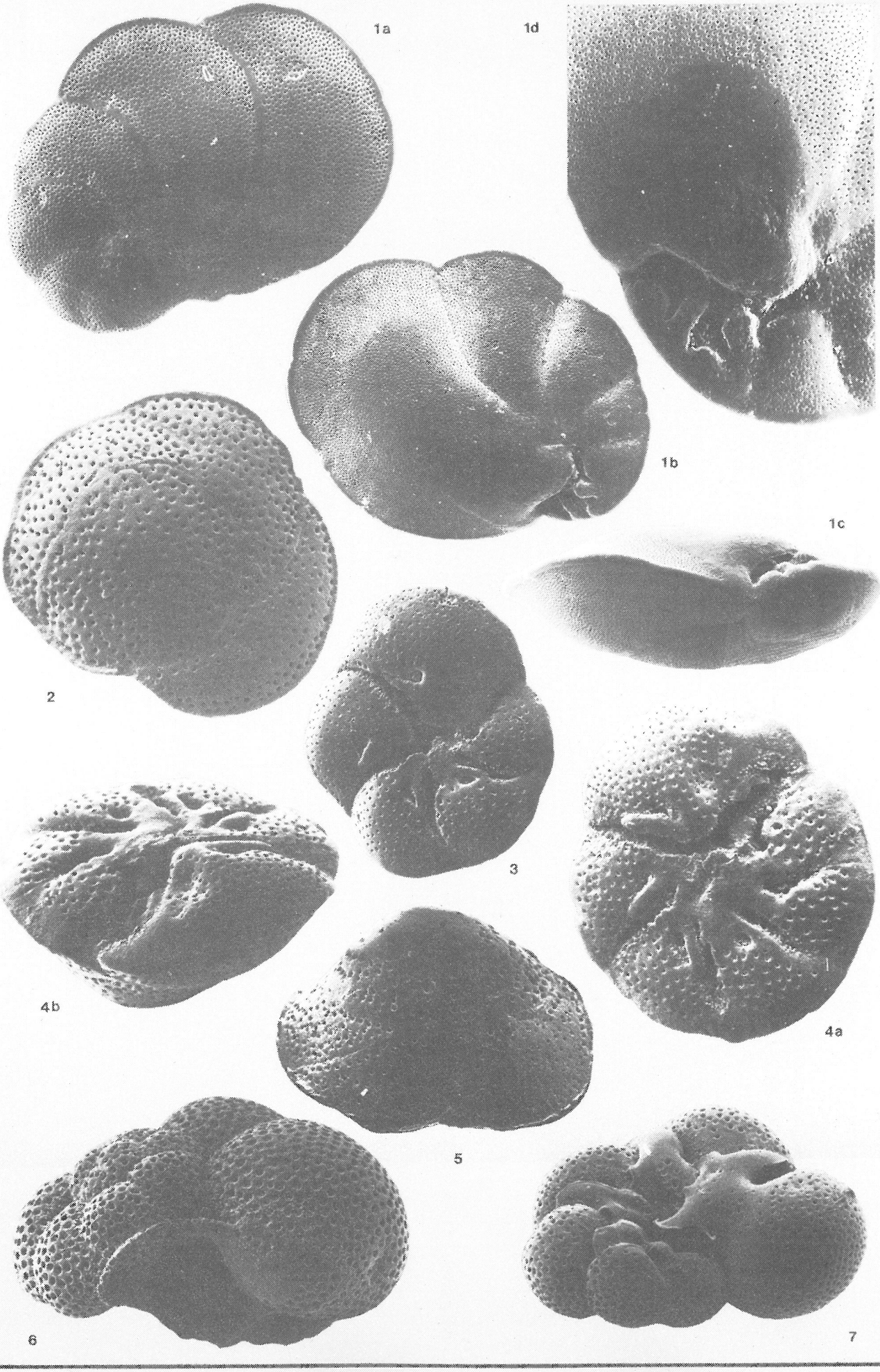


PLATE 79

Figs. 1 - 2 : Discorbis subvesicularis COLLINS

Figs. 1a-b : Views of the specimen figured on pl. 78, fig. 7. Fig. 1a : Lateral view, umbilical side, showing characteristic successive apertural flaps extending almost as far as the test periphery (X 170); fig. 1b : close-up of central part of fig. 7, pl. 78, showing umbilical structures (X 458).
Fig. 2 : Spiral view of the specimen figured on pl. 78, fig. 6; note incised sutures, inflated chambers and coarse porosity of test wall (X 165).

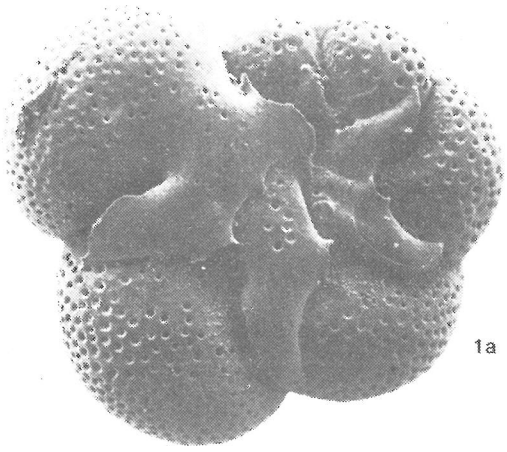
Figs. 3 - 4 : Gavelinopsis sp. aff. G. lobatulus (PARR)

Figs. 3a-b : Spiral side of damaged specimen (ultimate chamber lacking); Eastern Perireefal Area (L 60). Fig. 3a : Spiral view showing smooth test wall; sutures (except last few ones) are flush and masked as a result of secondary lamination. Protopores are not visible at this magnification (X 266); fig. 3b : id, edge view (X 266).
Figs. 4a-b : Umbilical side of intact test; Eastern Perireefal Area (L 77). Fig. 4a : Umbilical view showing incised sutures, deuteropores and umbilical Gavelinopsis-plug (compare with D. mira !) (X 206); fig. 4b : id, edge view; note elongate aperture provided with narrow peristome and reaching the periphery (X 206).

Figs. 5 - 6 : Rosalina orientalis (CUSHMAN)

Figs. 5a-b : Spiral side of slightly damaged empty test; Eastern Perireefal Area (L 60). Fig. 5a : Spiral view showing coarse porosity and strongly curved sutures (X 129); fig. 5b : edge view (X 142).
Figs. 6a-b : Umbilical side of slightly perforated specimen; empty test, reef flat, Windward Barrier. Fig. 6a : Umbilical view showing large umbilicus with the "nontubulate blebs" inside (X 176); fig. 6b : edge view; note elongate aperture and noncompressed test with rounded periphery (X 176).

PLATE 79



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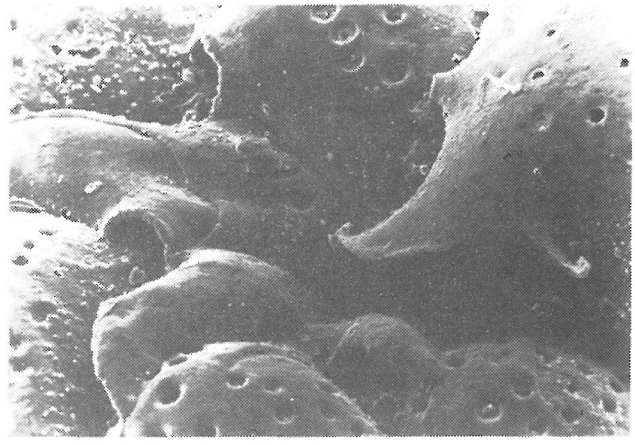

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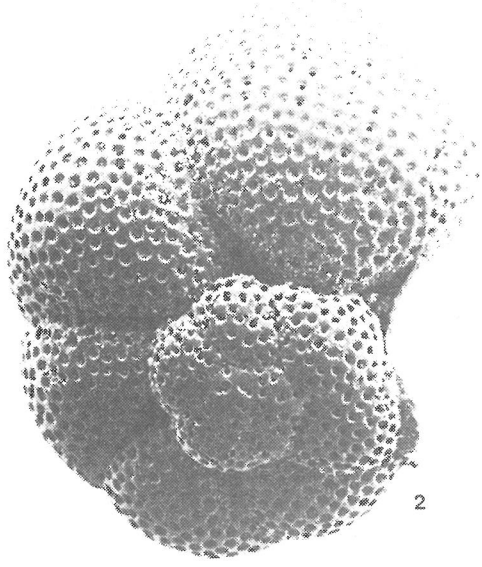

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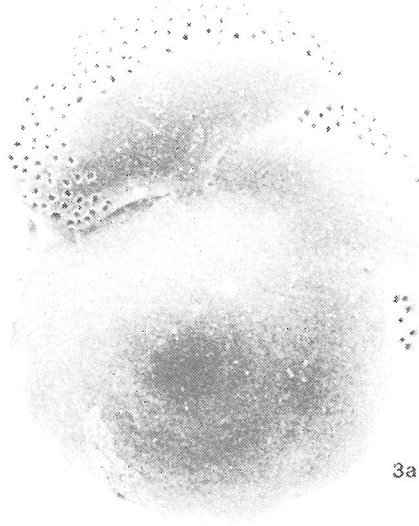
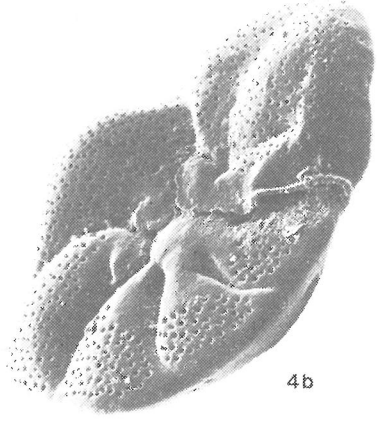


3a



6b



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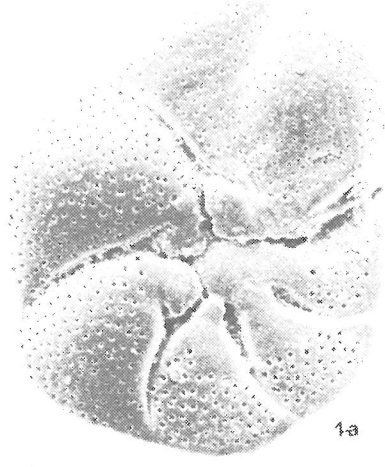

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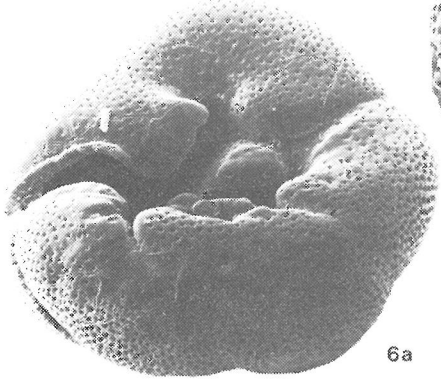

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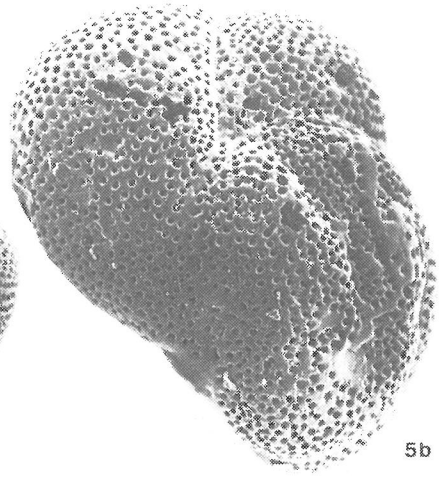

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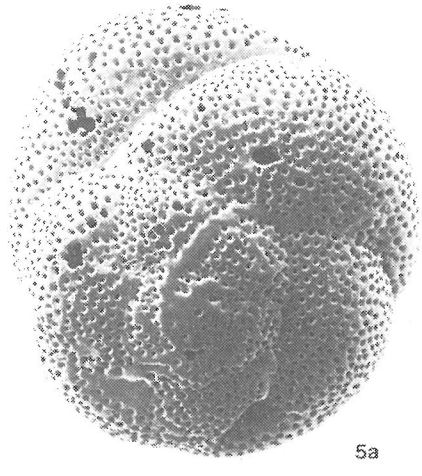


5a

PLATE 80

Figs. 1 - 5 : Poroeponides lateralis (TERQUEM), subsp. cribrorepandus ASANO & UCHIO

Fig. 1 : Spiral view of smaller, heavily built test; Eastern Perireefal Area (L 67); note traces of secondary chalk between the sutures (e.g. antepenultimate chamber) (X 131).

Figs. 2a-b : Umbilical side of similar specimen, Eastern Perireefal Area (L 67). Note resemblance with E. repandus. Fig. 2a : Umbilical view (note strong secondary lamination) (X 144); fig. 2b : edge view showing narrow elongate aperture with denticulate apertural rim and some deuteropores on apertural face (X 144).

Fig. 3 : Spiral side of larger specimen; empty test, Eastern Perireefal Area (L 67); note prominent limbate sutures and Rotalipora-reminiscent overall test shape (X 91).

Figs. 4a-b : Umbilical side of similar specimen; empty test, Eastern Perireefal Area (L 67). Fig. 4a : Umbilical view showing more modest secondary lamination and a larger apertural face covered with deuteropores (X 84); fig. 4b : edge view (note sharper periphery) (X 84).

Figs. 5a-b : Umbilical side of a specimen with larger, more elongate and embracing ultimate chamber showing a large apertural face covered with relatively large deuteropores. Empty test, Eastern Perireefal Area (L 67). Fig. 5a : Umbilical view (note more modest secondary chalk and sutures more deeply incised than e.g. in the specimen fig. 2) (X 88); fig. 5b : edge view (compare with figs. 4b-2b) (X 94); fig. 5c : close-up of part of apertural face, showing periphery, aperture (on the right), relatively large deuteropores and excessively fine protopores (in the lower left corner) (X 241).

Figs. 6-7 : Poroeponides lateralis s.s. (TERQUEM)

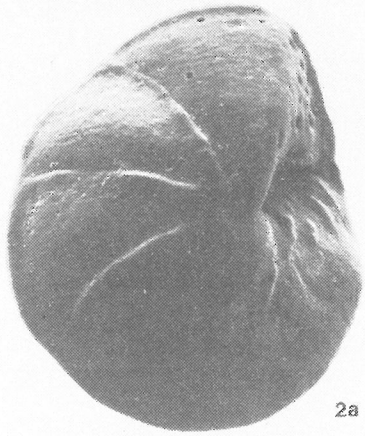
Figs. 6a-b : Spiral side of smaller specimen, empty test, Eastern Perireefal Area (L 65). Fig. 6a : Spiral view (compare with figs. 1-3) (X 84); fig. 6b : edge view showing compressed test and bluntly keeled periphery (X 84).

Figs. 7a-b : Umbilical side of large specimen; empty test, Eastern Perireefal Area (L 65). Fig. 7a : Umbilical view; note modest secondary lamination, thin and fragile test and narrow, open umbilicus (compare with figs. 2a, 4a, 5a) (X 57); fig. 7b : close-up of apertural face of ultimate chamber showing very large deuteropores, elongate aperture and crenulated apertural rim (X 114).

PLATE 80



1



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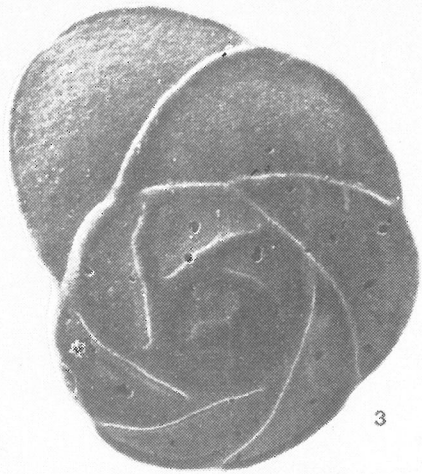
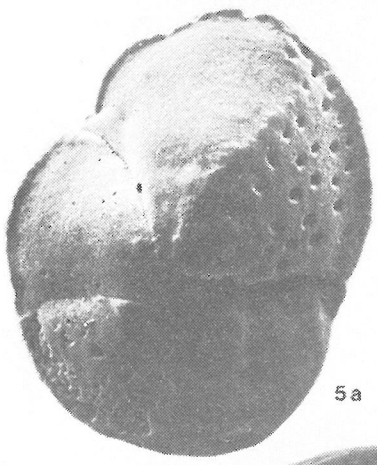


3



2b



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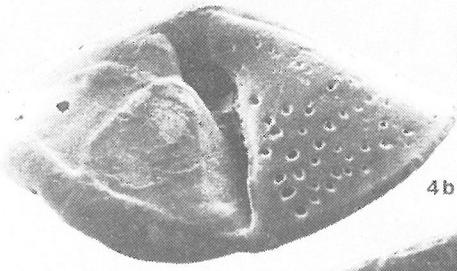

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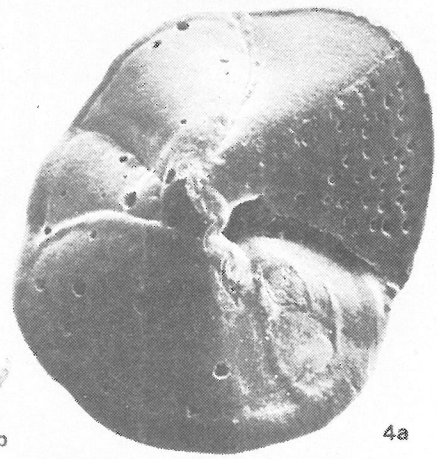
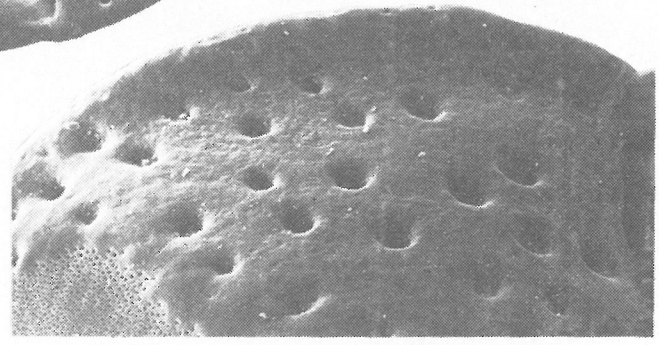


4a



5b 5c

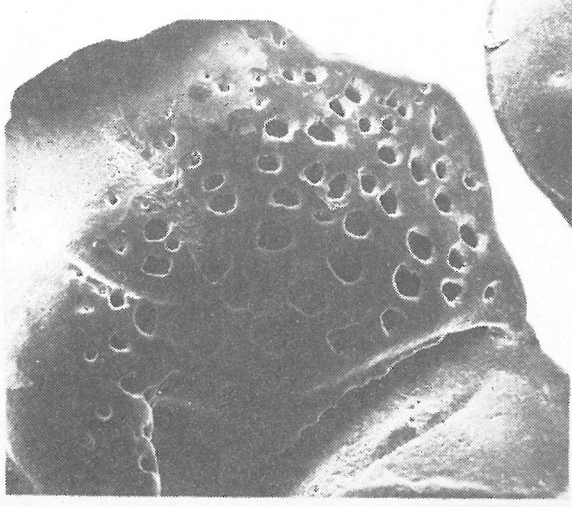




6a



6b



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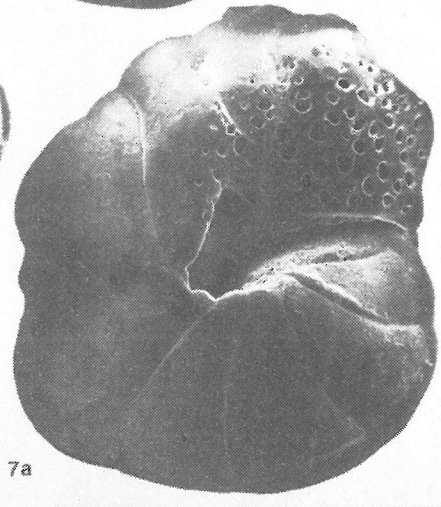


7a

PLATE 81

Figs. 1a-c : Neoeponides sp. aff. N. berthelotianus (d'ORBIGNY)

Abraded empty test, single specimen present in the Lizard Island material; Eastern Perireefal Area (L 82). Fig. 1a : Spiral view (X 84); fig. 1b : edge view (X 84); fig. 1c : umbilical view (ultimate chamber is lacking) (X 91).

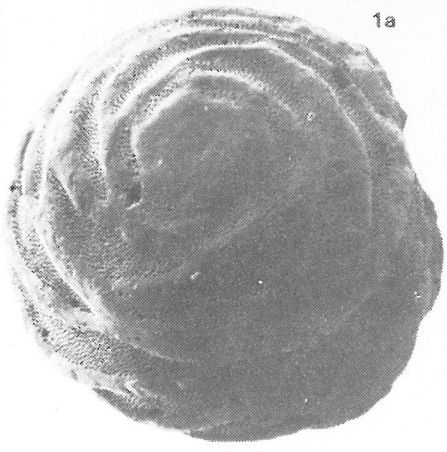
Figs. 2 - 3 : Glabratella hexacamerata SEIGLIE & BERMUDEZ

Fig. 2 : Spiral view of empty test, Lagoon (L 134); note hexa- to pentagonal ornamentation pattern (X 418).
Figs. 3a-b : Empty test, Lagoon (L 134). Fig. 3a : Umbilical view (X 353); fig. 3b : edge view (note coarse surface sculpture being restricted to spiral side of test) (X 353).

Figs. 4 - 8 : Glabratella (?) patelliformis (BRADY)

Fig. 4 : Small specimen, empty test, Eastern Perireefal Area (L 60); spiral view (X 413).
Figs. 5a-b : Small, flattened specimen; empty test, reef flat, Windward Barrier (L 255 b). Fig. 5a : Umbilical view (note groove pattern) (X 433); fig. 5b : edge view (X 433).
Fig. 6 : Lateral view of larger specimen; note transition porous dorsal side - nonporous ventral side. Empty test, Lagoon (L 124) (X 324).
Fig. 7 : Lateral view of postplastogamic specimen; empty test, Eastern Perireefal Area (L 72) (X 278).
Fig. 8 : Lateral view of plastogamic pair; living (?) specimens, reef flat, Windward Barrier (L 259 b) (X 271).

PLATE 81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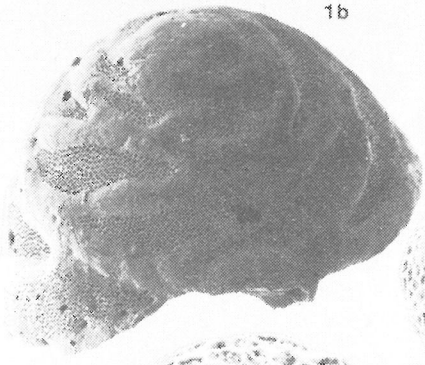
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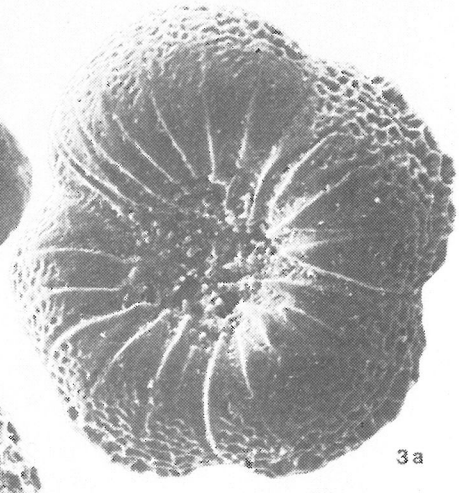
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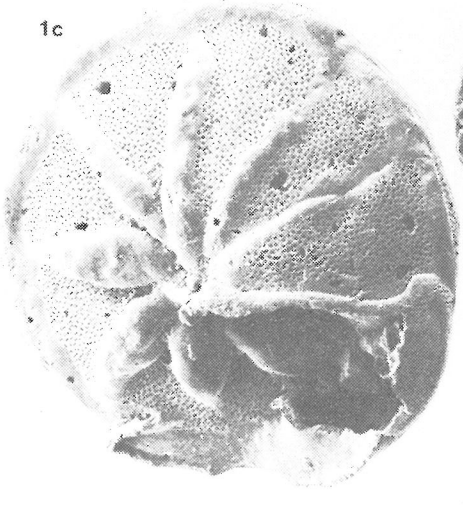
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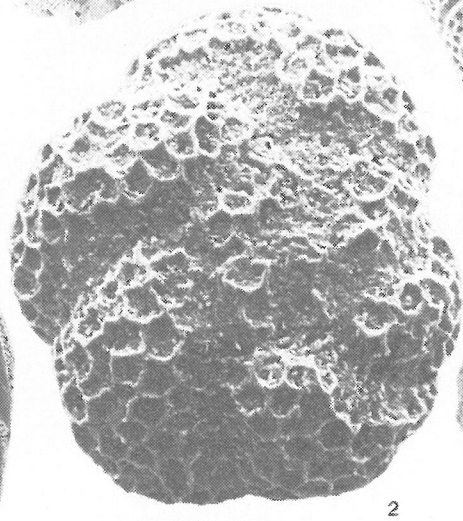
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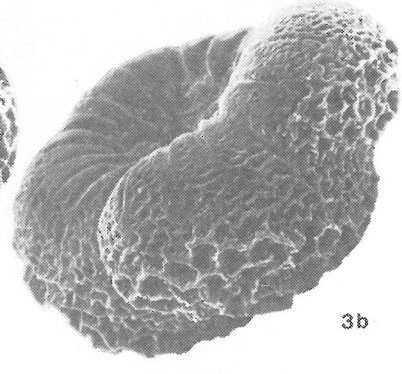
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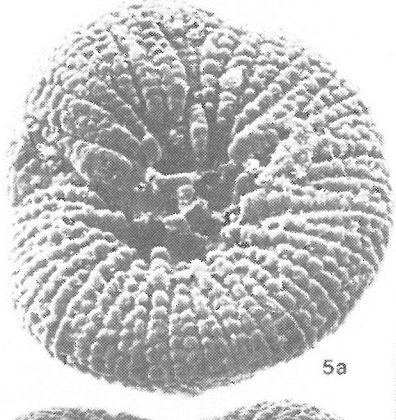
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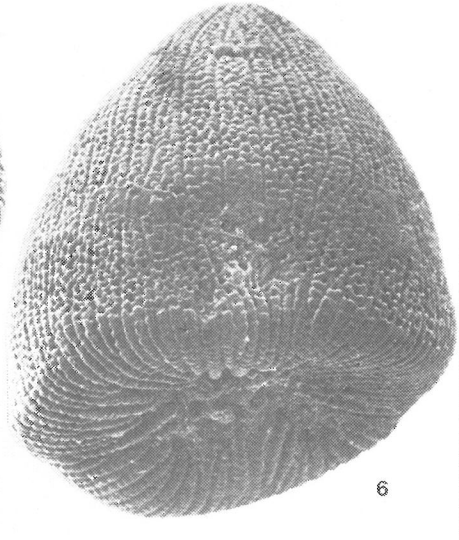
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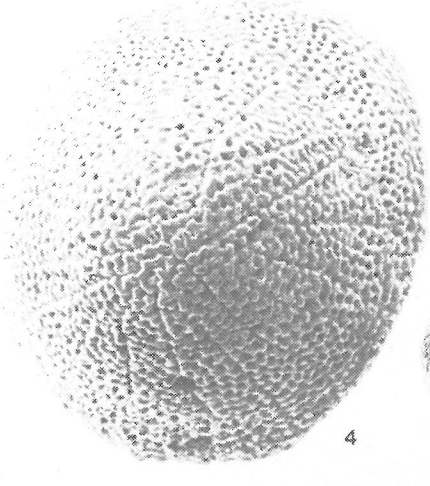
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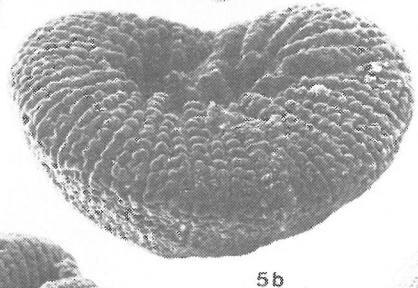
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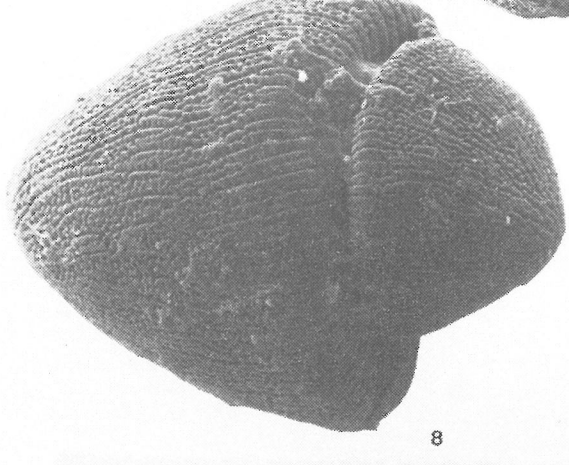
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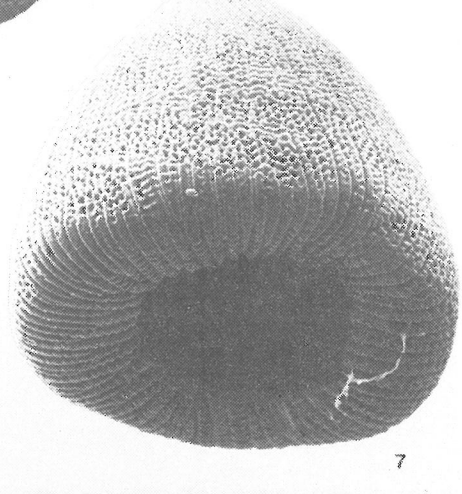
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PLATE 82

Fig. 1 : Glabratella (?) patelliformis (BRADY)

Apertural view of the specimen illustrated on fig. 7, pl. 81; note partial resorption of earlier septa visible through large postplastogamic aperture (X 278).

Figs. 2 - 3 : Angulodiscorbis quadrangularis UCHIO

Figs. 2a-c : Empty test, reef flat, Windward Barrier (L 254). Fig. 2a : Oblique view (X 322); fig. 2b : apertural view (compare with G. patelliformis) (X 322); fig. 2c : lateral view (note irregular pattern of coarse pores) (X 322).
Fig. 3 : Lateral view of specimen showing more angular last-formed chambers; living specimen, Coconut Fringing Reef flat (X 333).

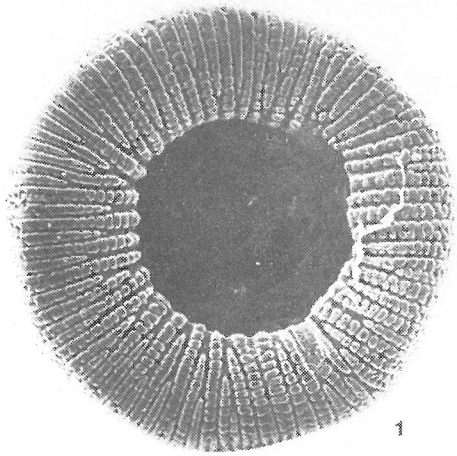
Figs. 4 - 5 : Epistomaroides polystomelloides (PARKER & JONES), subsp. punctatus (SAID)

Fig. 4 : Lateral view of empty test, umbilical side; juvenile specimen, reef flat, Windward Barrier (L 260) (X 89).
Fig. 5 : Lateral view of empty test, spiral side; reef flat, Windward Barrier (L 260) (X 78).

Figs. 6 - 7 : Epistomaroides polystomelloides s.s. (PARKER & JONES)

Fig. 6 : Lateral view of living specimen, spiral side; Eastern Perireefal Area (L 71) (X 79).
Figs. 7a-b : Living specimen; Eastern Perireefal Area (L 71). Fig. 7a : Umbilical view (X 78); fig. 7b : apertural view (X 70).

PLATE 82



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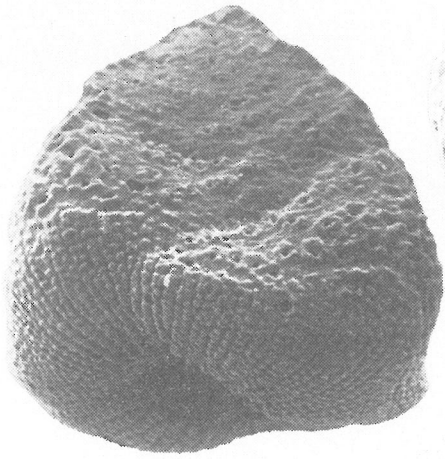

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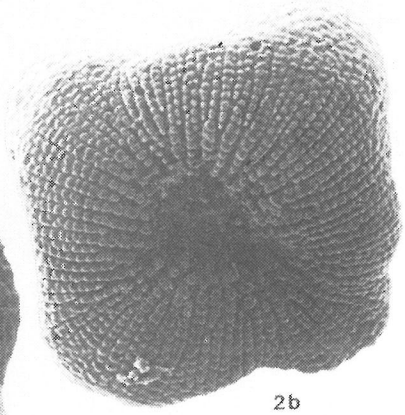

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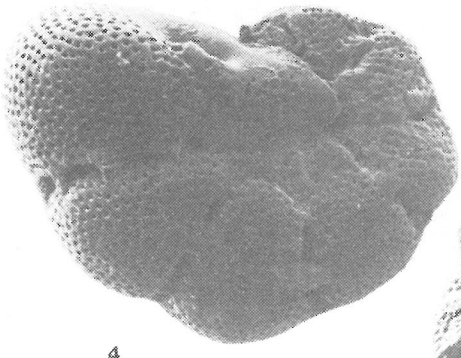

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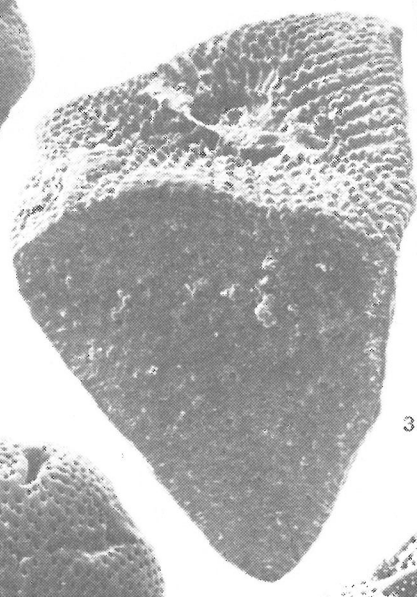

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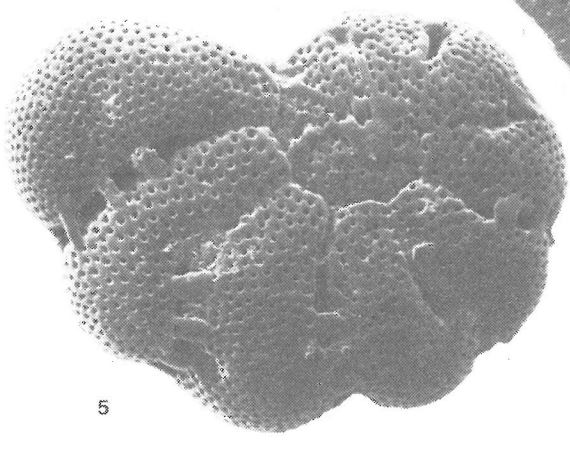

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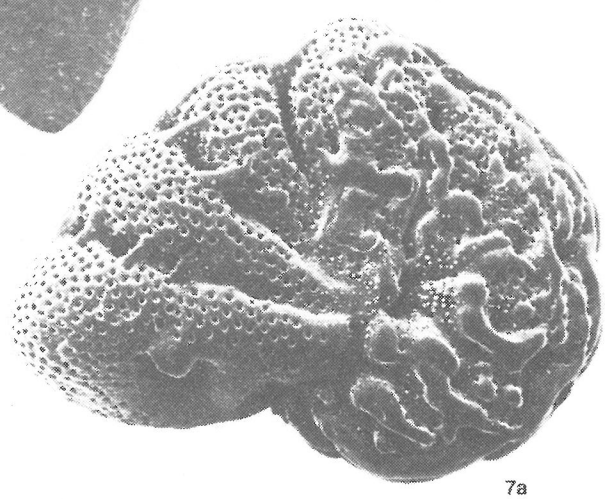

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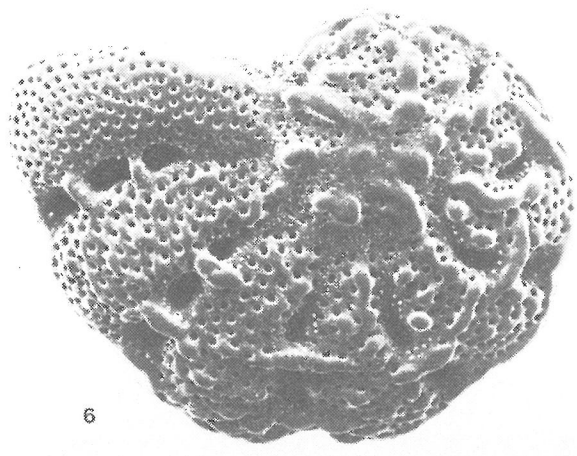

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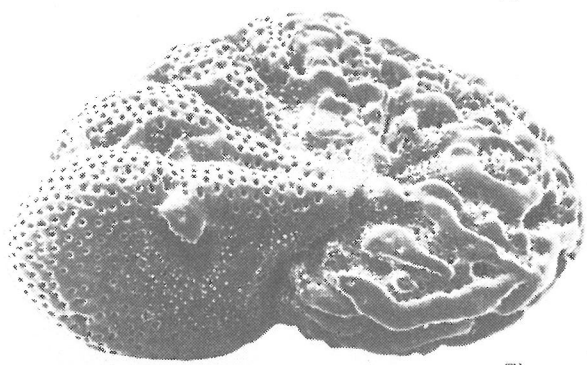

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PLATE 83

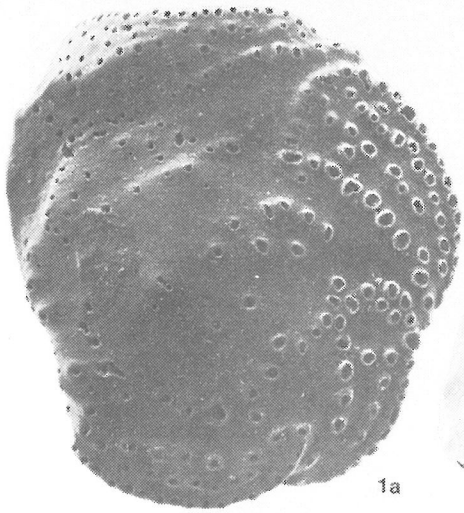
Figs. 1 - 4 : Siphonina tubulosa CUSHMAN

Figs. 1a-b : Empty test, Eastern Perireefal Area (L 63). Fig. 1a : Spiral view (X 221); fig. 1b : apertural view (X 221). As to HOTTINGER (personal communication, 1983) this specimen would probably not be a Siphonina at all but would rather belong to Svratkina tuberculata (BALKWILL & WRIGHT).
Figs. 2a-b : Empty test showing a well-developed primary aperture and sutural pores; Eastern Perireefal Area (L 63). Fig. 2a : Spiral view (X 206); fig. 2b : apertural view (X 206).
Fig. 3 : Ventral side of a similar specimen, showing only a few, scattered pores (and perforations ?); empty test, Western slope in front of Watson's Bay (X 274).
Fig. 4 : Ventral side of a smaller specimen showing regular sutural and peripheral pores; the apertural area is damaged; empty test, Eastern Perireefal Area (L 84) (X 402).

Figs. 5 - 7 : Siphoninoides echinatus (BRADY)

Figs. 5a-b : Spinose specimen, empty test, Eastern Perireefal Area (L 65); note large, closed "aperture" with peristome, and elevated pore rims somewhat as in S. tubulosa. Fig. 5a : Lateral view (X 153); fig. 5b : apertural view (X 164).
Figs. 6a-b : "Apertural" features of an empty test, spinose form, Eastern Perireefal Area (L 60). Fig. 6a : Close-up of "aperture" being closed by permeable wall (X 448); fig. 6b : highly enlarged portion of apertural "wall", close-up of preceding view, showing an aragonitic needle-structure strongly reminiscent of the one found in some smaller Algae (MONTY, personal communication, 1983) (X 6989).
Fig. 7 : Lateral view of specimen intermediate between the echinatus- and glabrus-forms (the spines are reduced to blunt bosses); empty test, Coconut Fringing Reef flat (L 249) (X 283).

PLATE 83



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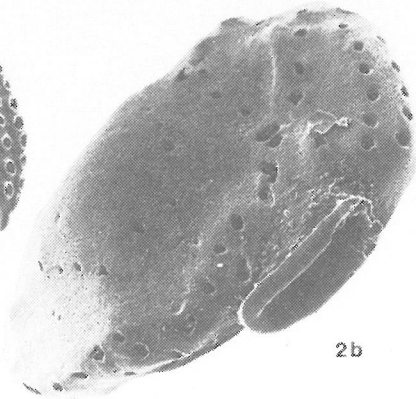

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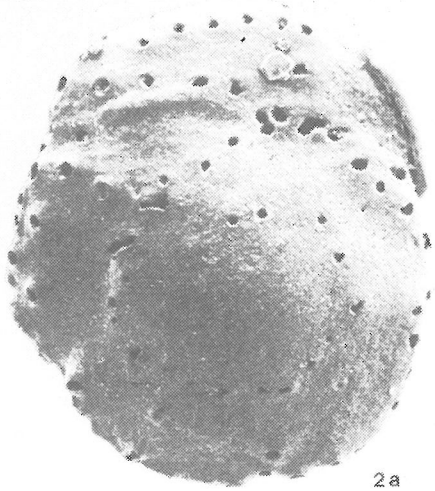

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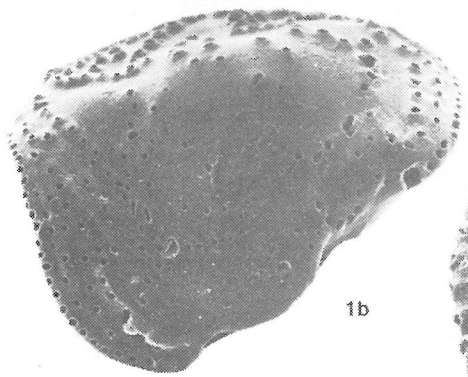

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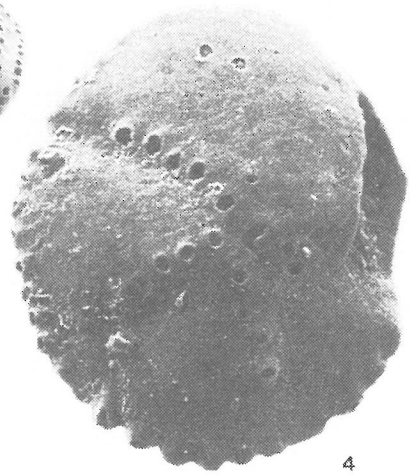

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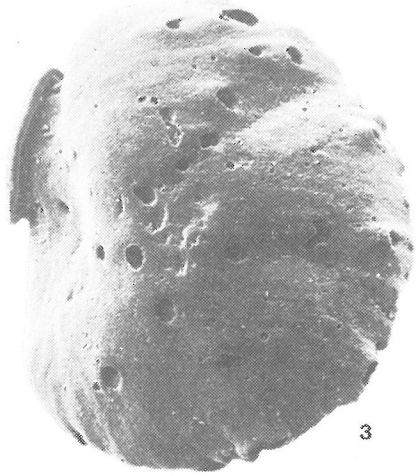

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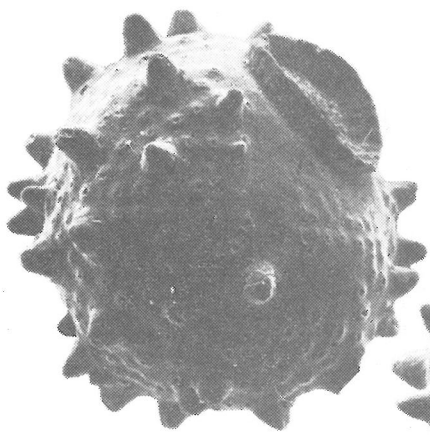

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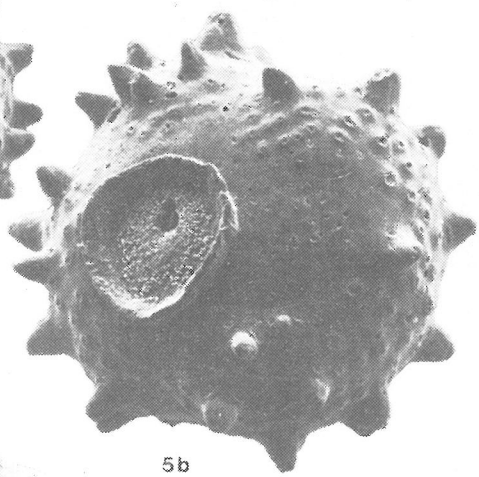

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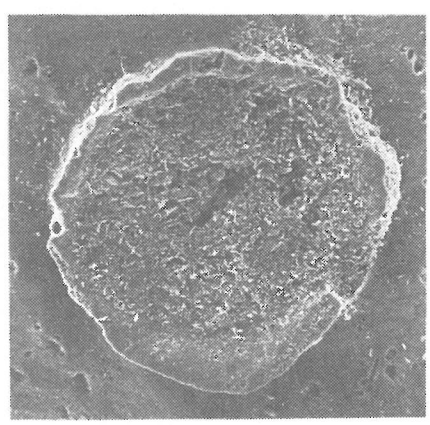

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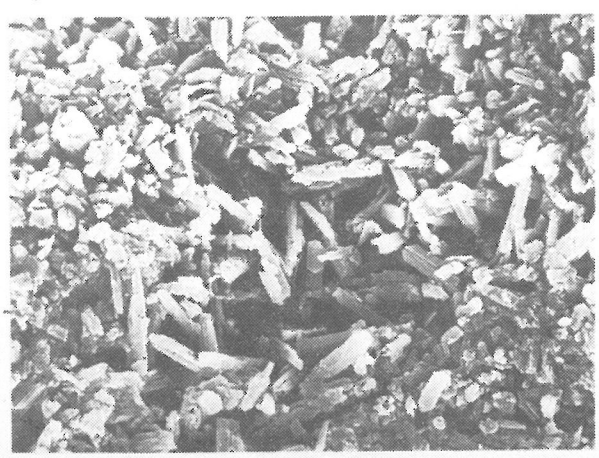

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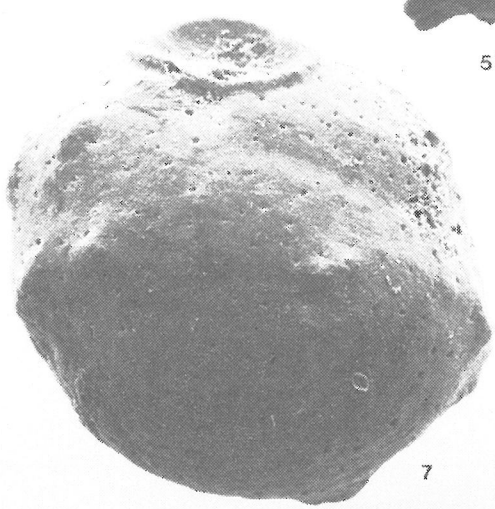

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PLATE 84

Fig. 1 : Siphoninoides echinatus (BRADY)

Lateral view of empty test, glabrus-form; Sandy Shoal (L 150) (X 200).

Figs. 2 - 4 : Amphistegina lessonii d'ORBIGNY, emend. LARSEN

Fig. 2 : Spiral view of living specimen, Lagoon entrance (L 120) (X 73).
Fig. 3 : Spiral view of larger specimen, empty test, Eastern Perireefal Area (L 65) (X 60).
Figs. 4a-c : Living specimen, Eastern Perireefal Area (L 56). Fig. 4a : Umbilical view (X 68); fig. 4b : apertural view (X 68); fig. 4c : close-up showing apertural area (X 115).

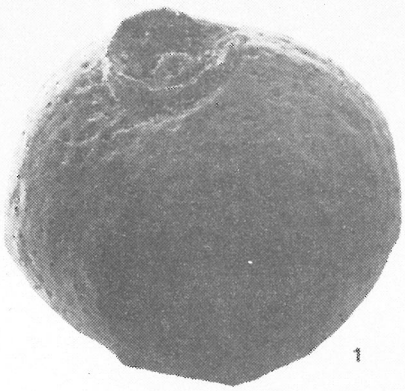
Figs. 5 - 6 : Amphistegina lobifera LARSEN

Figs. 5a-b : Empty test, Coconut Fringing Reef flat (L 243 b). Fig. 5a : Spiral view (X 39); fig. 5b : apertural view (X 39).
Figs. 6a-b : Living, very large specimen, Coconut Fringing Reef flat (L 241). Fig. 6a : Umbilical view (X 30); fig. 6b : apertural view (X 30).

Figs. 7 - 9 : Amphistegina cf. papillosa SAID, emend. LARSEN

Fig. 7 : Lateral view of living specimen, Western slope (L 106) (X 66).
Fig. 8 : Lateral view of empty test, Eastern Perireefal Area (L 56) (X 73).
Fig. 9 : Lateral view of living specimen, Eastern Perireefal Area (L 82) (X 79).

PLATE 84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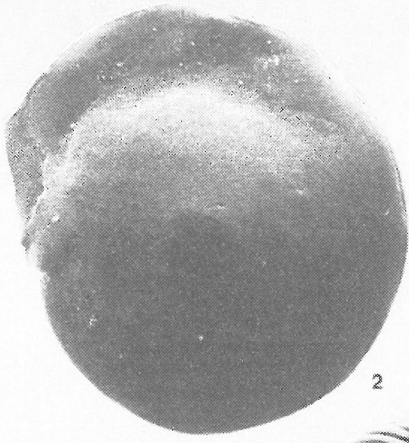
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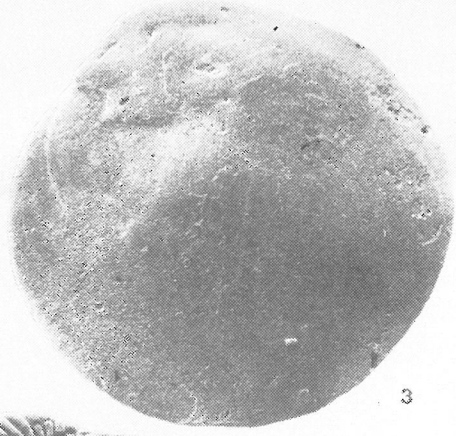
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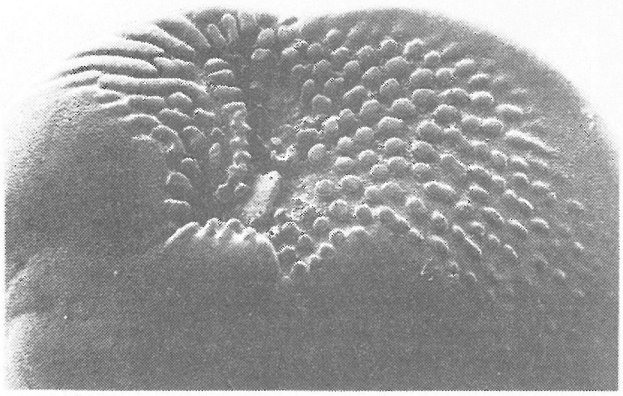
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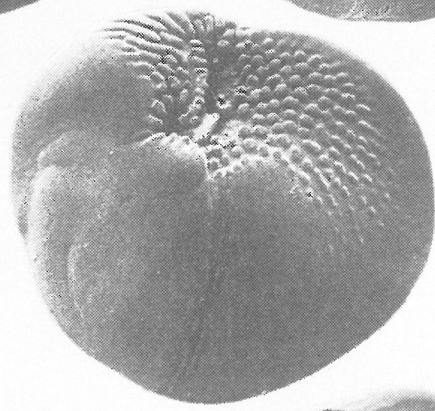
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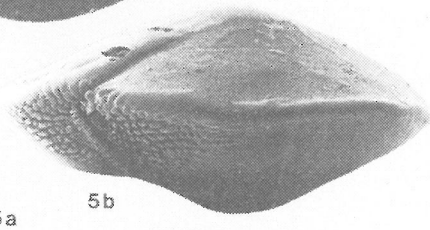
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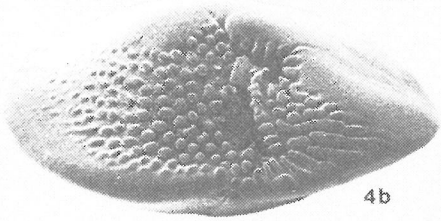
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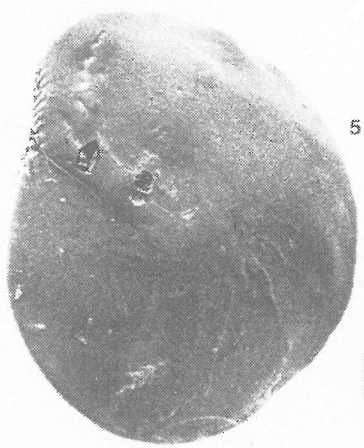
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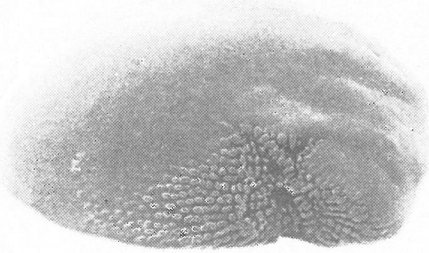
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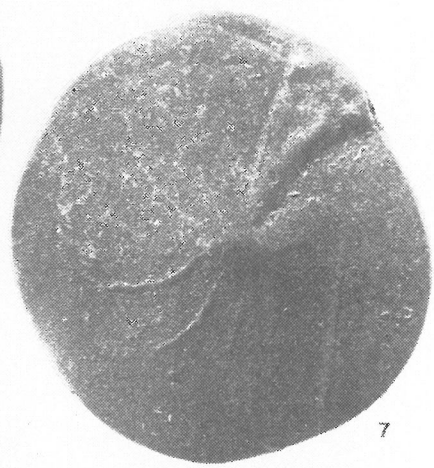
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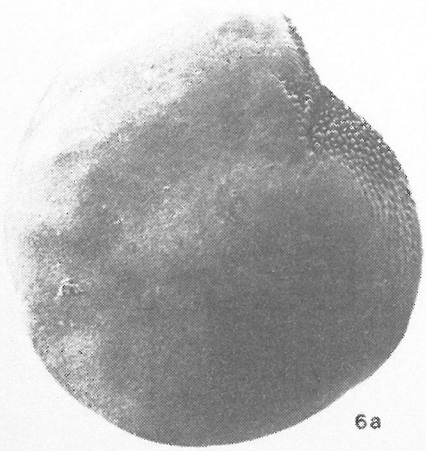
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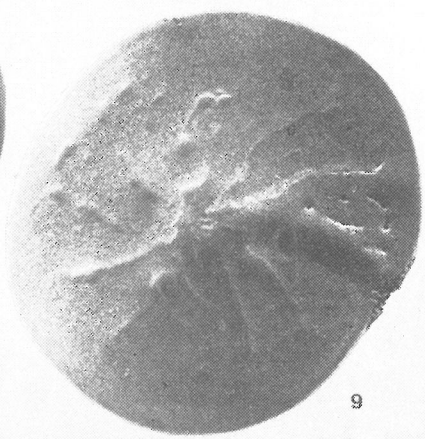
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PLATE 85

Figs. 1 - 2 : Amphistegina radiata (FICHTEL & MOLL), emend. LARSEN

Fig. 1 : Lateral view, empty test, Eastern Perireefal Area (L 81) (X 24).
Figs. 2a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 2a : Lateral view (X 42); fig. 2b : edge view (X 41).

Figs. 3 - 4 : Planulina plana BELFORD

Figs. 3a-b : Empty test, Eastern Perireefal Area (L 65). Fig. 3a : Spiral view; note fine porosity and nonlimbate last-formed sutures (X 178); fig. 3b : edge view (note compressed test and peripheral angularity) (X 178).
Figs. 4a-b : Empty test, Eastern Perireefal Area (L 65). Fig. 4a : Umbilical view; note successive apertures remaining open, more strongly limbate sutures and nonporous sutural, umbilical and peripheral areas (X 225); fig. 4b : apertural view; note subangular test and nonporous apertural face (X 225).

Figs. 5 - 6 : Cibicides cf. aravaensis PERELIS & REISS

Figs. 5a-b : Empty test, Southern Perireefal Area (L 91). Fig. 5a : Edge view; note convexity of spiral side (X 212); fig. 5b : spiral side; note coarse perforations and limbate sutures (X 202).
Figs. 6a-b : Empty test, Eastern Perireefal Area (L 81). Fig. 6a : Umbilical view; note closed umbilicus with chalky knob, and scarce, scattered pores (X 195); fig. 6b : apertural view; note angular periphery and convex umbilical side (X 195).

Figs. 7a-b : Cibicides lobatulus (WALKER & JACOB)

Slightly deformed specimen, empty test, Eastern Perireefal Area (L 65). Fig. 7a : Spiral view (X 79); fig. 7b : edge (apertural) view (X 79).

PLATE 85

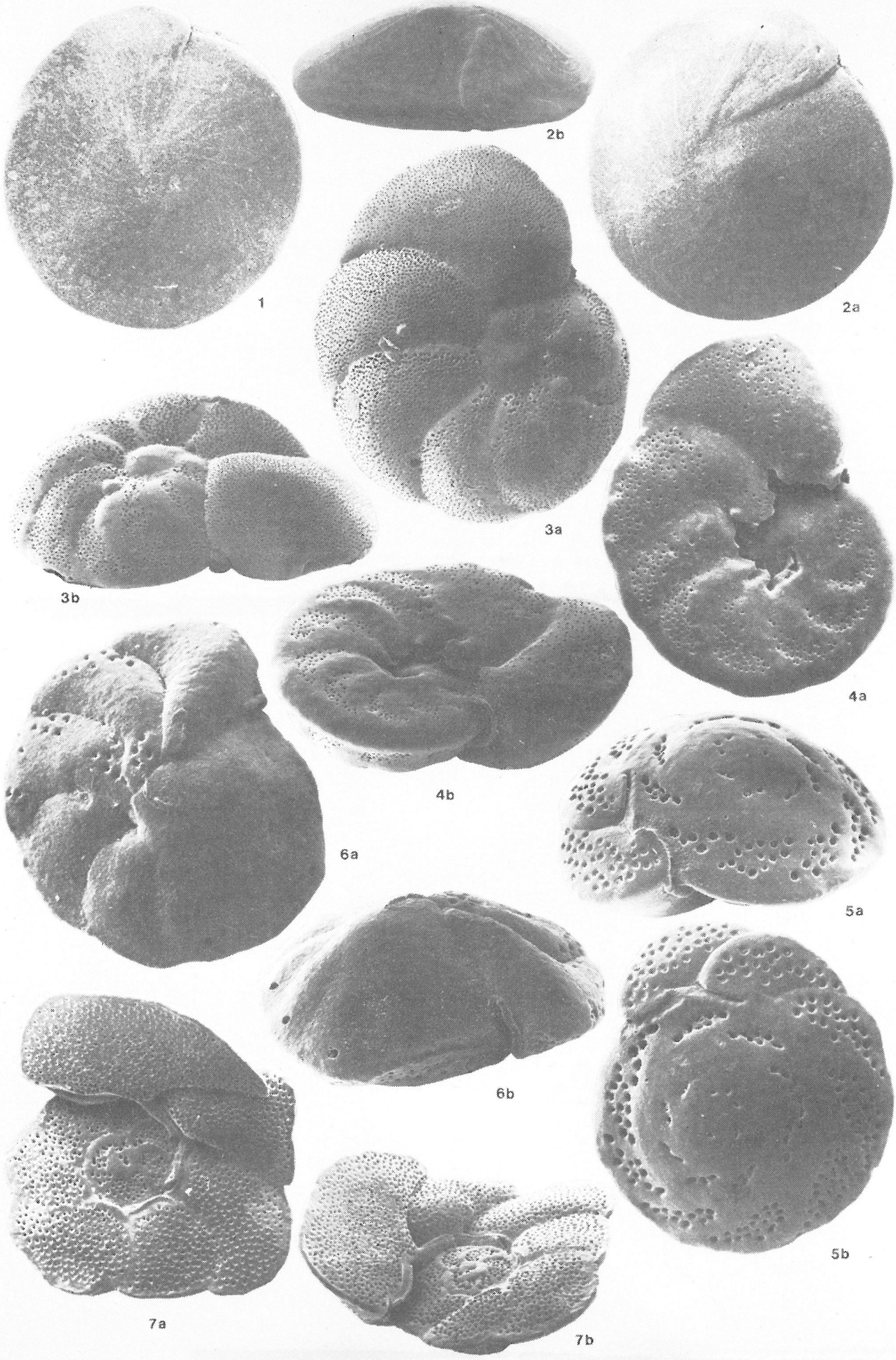


PLATE 86

Figs. 1 - 4 : Cibicides lobatulus (WALKER & JACOB)

Figs. 1a-b : Empty test, "normal" specimen, Eastern Perireefal Area (L 65). Fig. 1a : Umbilical side; note porosity and limbate earlier-formed sutures (X 92); fig. 1b : apertural view (X 92).

Fig. 2 : Edge view of empty test showing strong substratum-induced deformation; Eastern Perireefal Area (L 60) (X 93).

Figs. 3a-b : Empty test, very flat specimen; Eastern Perireefal Area (L 60). Fig. 3a : Spiral view (X 85); fig. 3b : apertural view (note overall porosity) (X 85).

Figs. 4a-c : Empty test of juvenile specimen attached to Halimeda-fragment; Eastern Perireefal Area (L 65). Fig. 4a : Entire fragment (X 56); fig. 4b : close-up showing umbilical side of specimen fixed upon fragment (X 125); fig. 4c : edge (apertural) view of fixed specimen, showing deformation of algal thallus caused by the fixed foraminifer; note cellular Halimeda-structure visible on fracture (X 117).

Figs. 5 - 6 : Cibicides pseudolobatulus PERELIS & REISS

Figs. 5a-b : Empty test, Southern Perireefal Area (L 91). Fig. 5a : Spiral view (X 198); fig. 5b : edge (apertural) view (X 198).

Figs. 6a-b : Empty test, Eastern Perireefal Area (L 84). Fig. 6a : Umbilical view (note finer and irregularly distributed perforation) (X 204); fig. 6b : edge (apertural) view (X 204).

PLATE 86

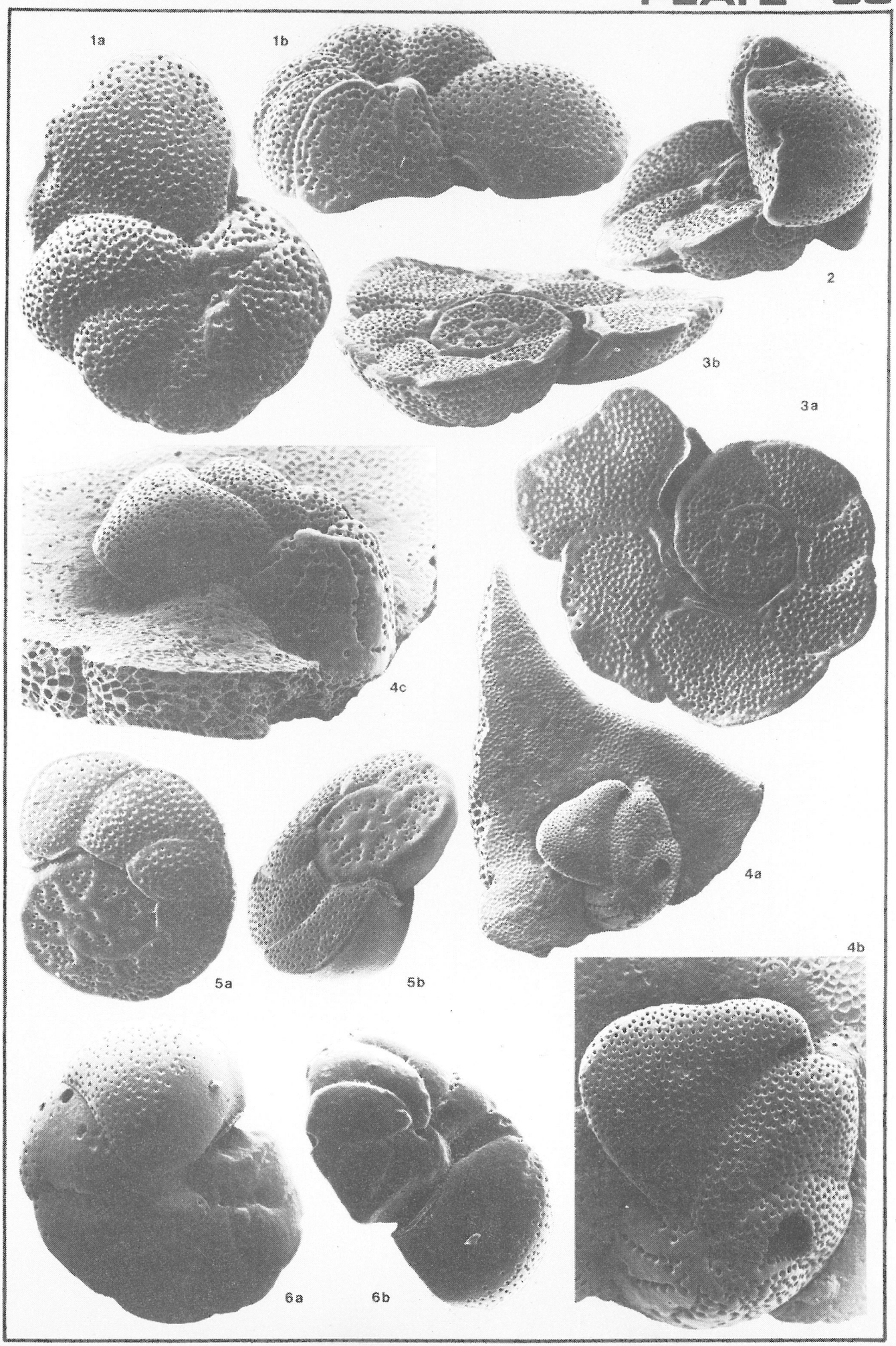


PLATE 87

Figs. 1 - 2 : Cibicides pseudolobatulus PERELIS & REISS

Figs. 1a-b : Empty test, dorsal side showing (cellular) remnants of Halimeda-thallus upon which the foraminifer has been fixed, Eastern Perireefal Area (L 84). Fig. 1a : Spiral view (X 216); fig. 1b : edge (apertural) view (X 216).

Figs. 2a-b : Empty test, specimen showing umbilical features intermediate between C. pseudolobatulus and C. aravaensis; Eastern Perireefal Area (L 84). Fig. 2a : Umbilical side (note irregular porosity) (X 248); fig. 2b : edge (apertural) view (X 248).

Figs. 3 - 6 : Caribbeanella elatensis PERELIS & REISS

Figs. 3a-b : Empty test, Eastern Perireefal Area (L 84). Fig. 3a : Spiral view showing substratum-induced deformations (X 167); fig. 3b : edge (apertural) view (X 167).

Fig. 4 : Umbilical view of smaller specimen; Eastern Perireefal Area (L 84) (X 173).

Figs. 5a-b : More evolute specimen with strongly embracing chambers and narrow umbilicus; empty test, Eastern Perireefal Area (L 84). Fig. 5a : Umbilical view (5 chambers visible) (X 102); fig. 5b : edge (apertural) view (note rounded to subangular periphery) (X 102).

Figs. 6a-c : More evolute specimen with less embracing chambers and larger umbilicus; empty test, Eastern Perireefal area (L 60). Fig. 6a : Umbilical view (X 123); fig. 6b : edge (apertural) view (note supplementary peripheral apertures) (X 123); fig. 6c : edge view, opposite side; note accessory apertures (X 123).

PLATE 87

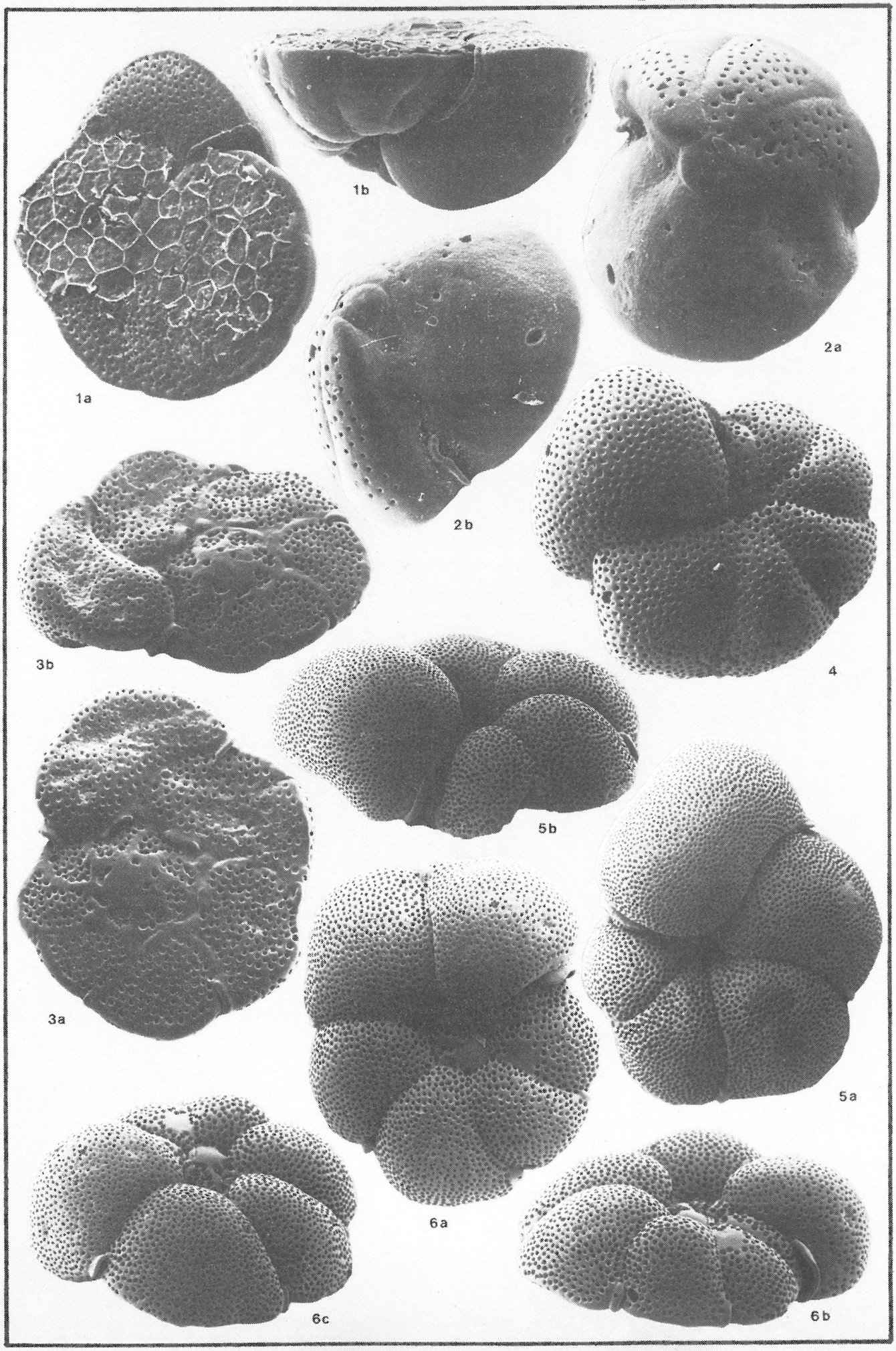


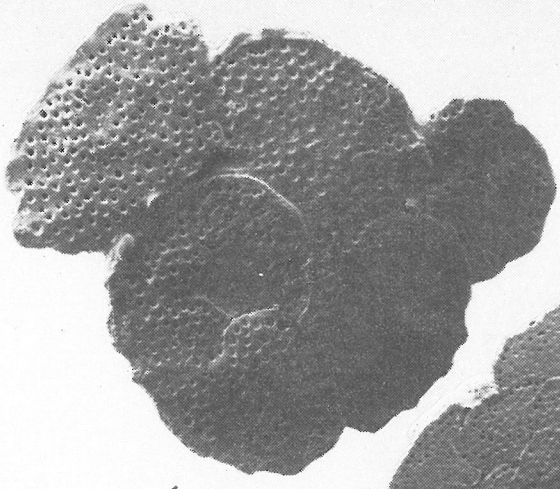
PLATE 88

Figs. 1 - 3 : Planorbulina acervalis BRADY

Fig. 1 : Empty test, "spiral" side of juvenile specimen in the "Caribbeanella"-stage; Western slope (L 106) (X 158).
Fig. 2 : "Spiral" (substratum-fixed) side of larger specimen, empty test, Eastern Perireefal Area (L 60) (X 79).
Figs. 3a-d : Large specimen, empty test, Eastern Perireefal Area (L 60).
Fig. 3a : "Umbilical" view showing irregular chamber addition; seen from this side, the present specimen shows some resemblance with P. mediterranensis (X 54); fig. 3b : edge view (X 61); fig. 3c : close-up of part of preceding view, showing multiple apertures of chambers (X 267); fig. 3d : close-up of peripheral chambers showing crescentic sutural apertures and rounded peripheral ones (X 222).

Figs. 4 - 5 : Planorbulinella larvata (PARKER & JONES)

Fig. 4 : "Dorsal" side of empty test, Southern Perireefal Area (L 90) (X 47).
Fig. 5a : "Umbilical" view (X 63); fig. 5b : close-up showing part of peripheral chambers; note bilateral sutural apertures on protruding chambers (X 132).



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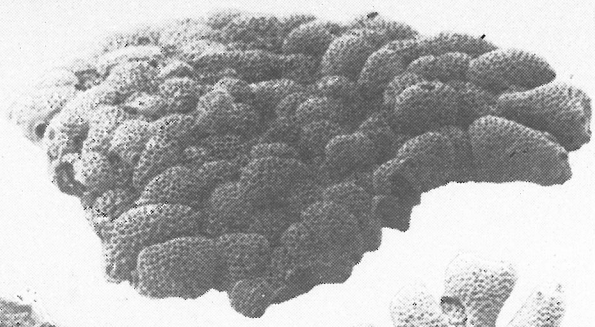

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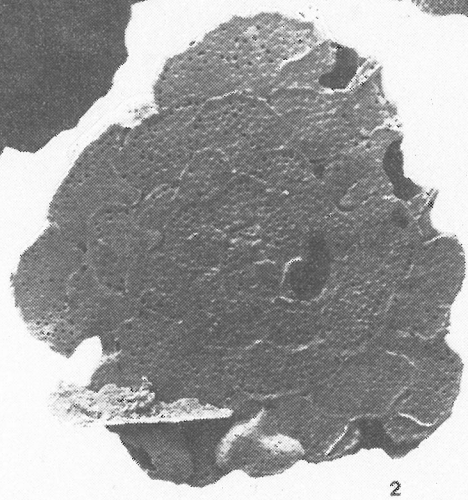

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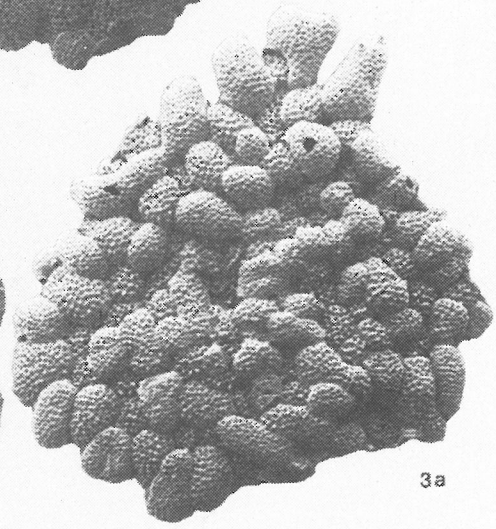

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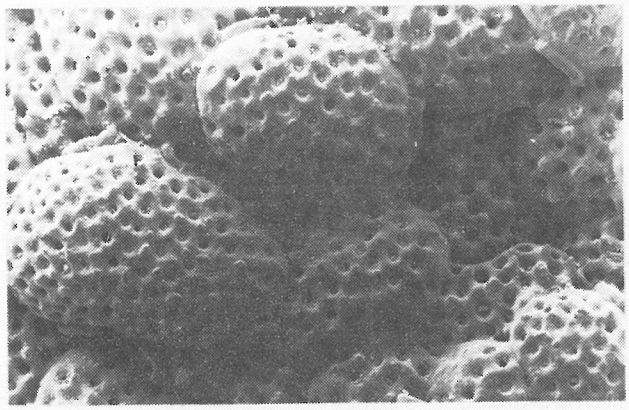

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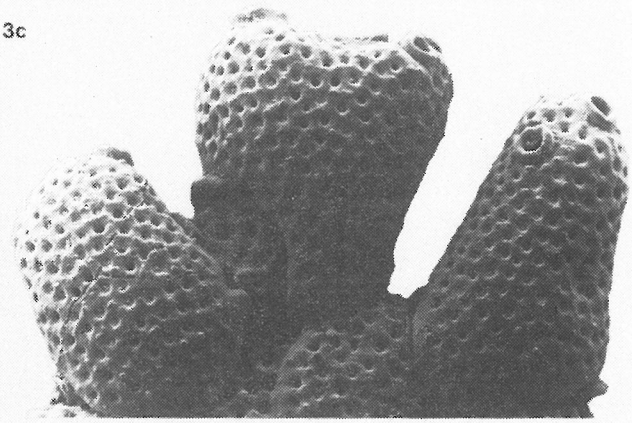

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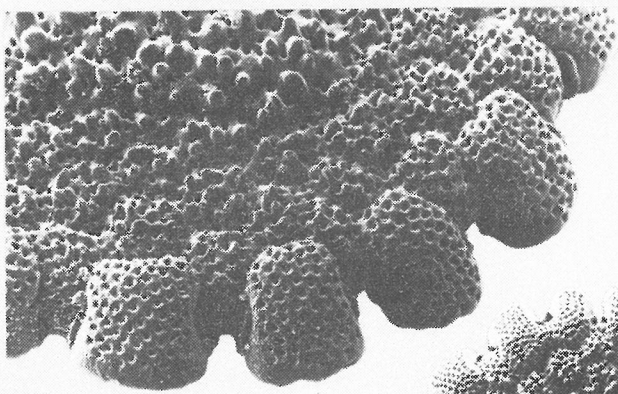

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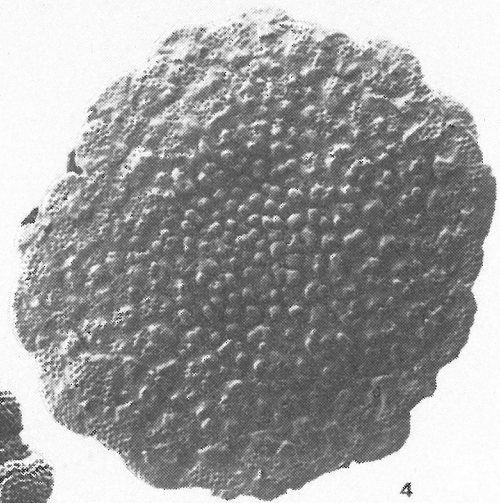

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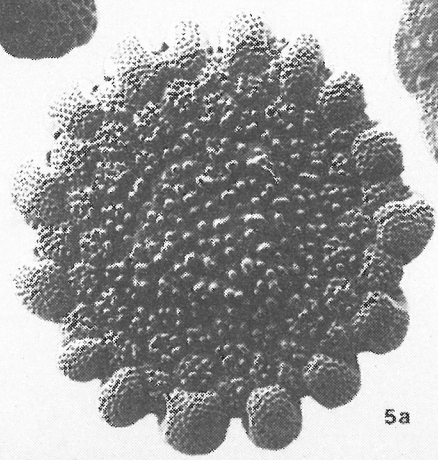


5a

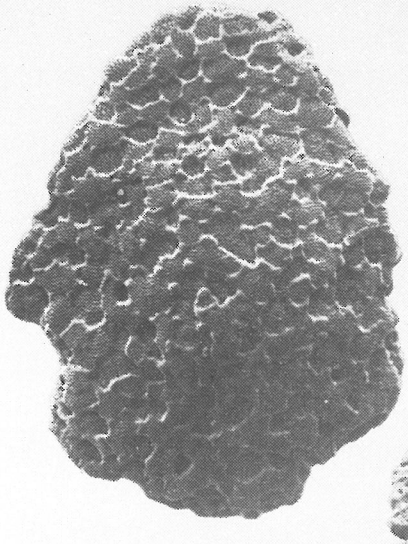
PLATE 89

Figs. 1 - 4 : Gypsina globulus (REUSS)

Complete series of specimens showing transition from flattened vesicularis-test towards spherical globulus-test.

Figs. 1a-c : Empty, flat test, Eastern Perireefal Area (L 81). Fig. 1a : Lateral view (X 50); fig. 1b : edge view (X 50); fig. 1c : close-up showing chamber pattern consisting of lower- and higher-level hexagonal chamber surfaces, the higher-level ones being surrounded by poreless, elevated sutures with chalky knobs at each corner of the hexagones (X 236).
Figs. 2a-c : Empty, hat-shaped test, Eastern Perireefal Area (L 81). Fig. 2a : Lateral view (X 42); fig. 2b : edge view (X 42); fig. 2c : close-up showing hexagonal chamber pattern (X 109).
Figs. 3a-c : Empty, dome-shaped test, Eastern Perireefal Area (L 84). Fig. 3a : Lateral view (X 44); fig. 3b : edge view (X 44); fig. 3c : close-up showing hexagonal chamber pattern (X 216).
Figs. 4a-b : Empty, completely spherical, slightly abraded test, Western slope (L 100). Fig. 4a : Lateral view (X 69); fig. 4b : close-up showing hexagonal chamber pattern; note abrasion of elevated chamber sutures (X 228).

PLATE 89



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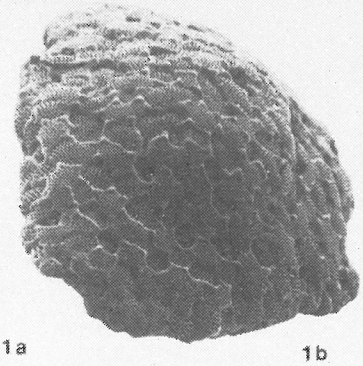

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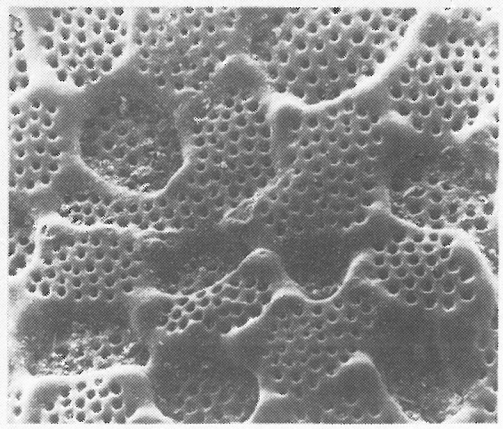

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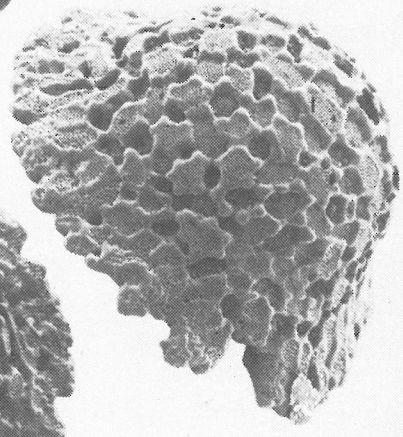

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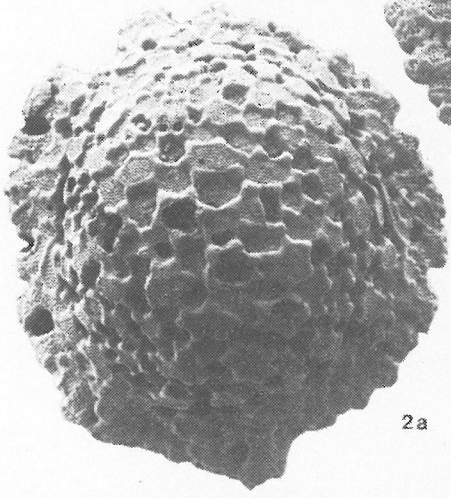

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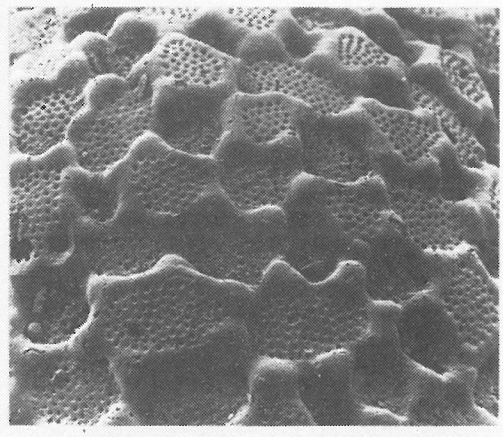

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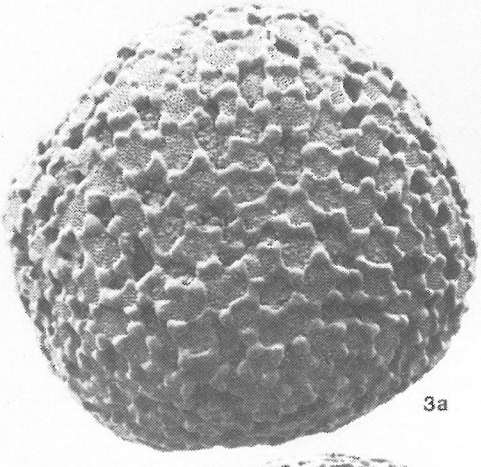

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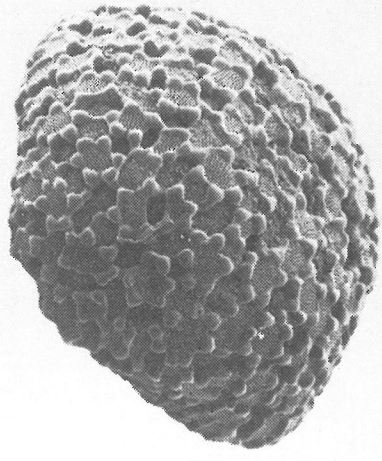

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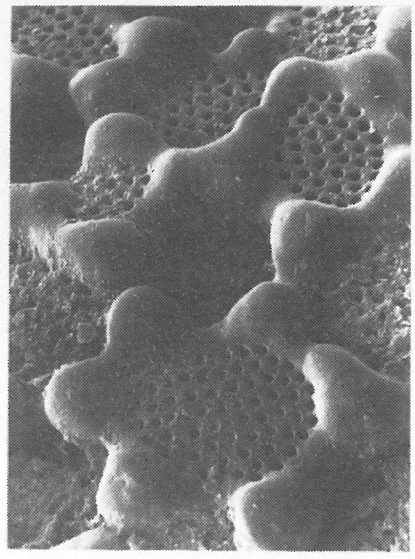

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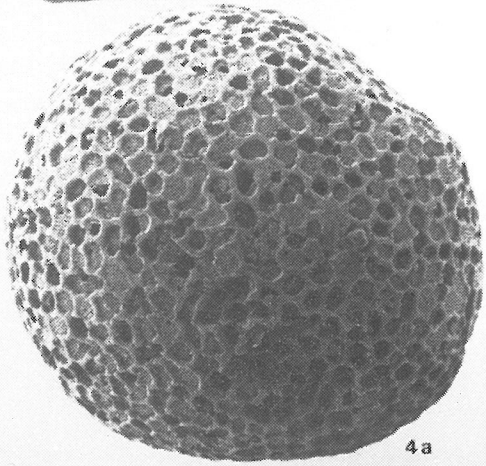

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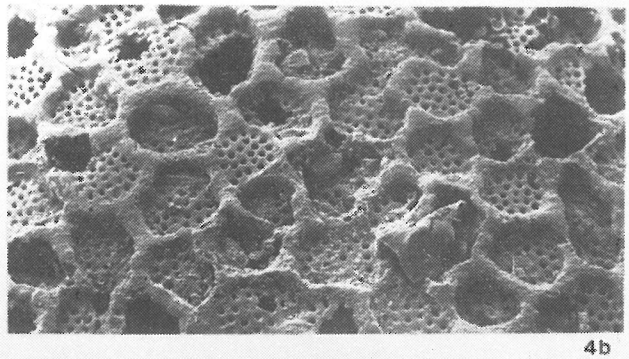


4b

PLATE 90

Figs. 1 - 5 : Cymbaloporella tabellaeformis (BRADY)

Figs. 1a-b : Smaller, relatively flat specimen; empty test, Northern Perireefal Area (L 54). Fig. 1a : Spiral view (X 140); fig. 1b : edge view (X 140).

Figs. 2a-b : Similar specimen; empty test, reef flat, Windward Barrier (L 254). Fig. 2a : Umbilical side showing (almost) intact chambers; note poreless umbilical area and rows of multiple lateral accessory apertures on chamber sutures (X 146); fig. 2b : edge view (note flattened test) (X 152).

Figs. 3a-b : Thicker specimen, empty test, reef flat, Windward Barrier (L 254). Fig. 3a : Spiral view (X 145); fig. 3b : edge view (X 145).

Figs. 4a-b : Thick specimen showing inner septa as the last-formed chambers are almost completely broken away; empty test, Eastern Perireefal Area (L 81). Fig. 4a : Umbilical view (X 158); fig. 4b : close-up showing umbilicus with tips of pear-shaped chambers provided with rounded apertures at their ends (X 474).

Figs. 5a-c : Extremely thick specimen, last-formed chambers partly broken away; empty test, reef flat, Windward Barrier (L 254). Fig. 5a : Umbilical view (X 133); fig. 5b : edge view showing septa of inner chambers (center of photograph); note multiple sutural apertures with their peristomes (X 133); fig. 5c : close-up of preceding view showing detail of septa and apertures (X 445).

PLATE 90

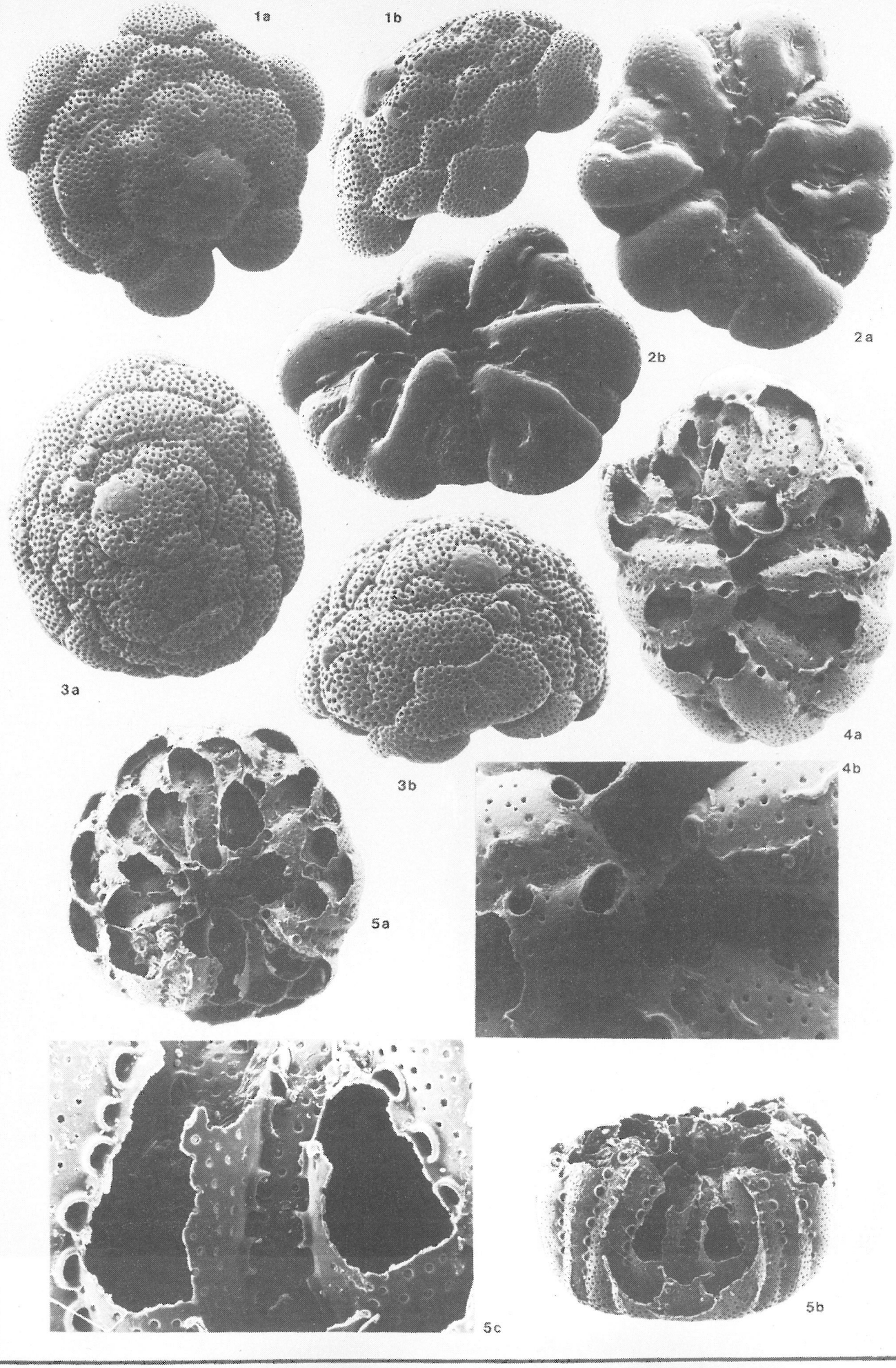


PLATE 91

Figs. 1 - 6 : Cymbaloporetta gr. bradyi (CUSHMAN)

Fig. 1 : Small, living specimen attached to sand grain; reef flat, Windward Barrier (L 253); spiral view (X 71).

Figs. 2 - 3 : bradyi-forms (without float chamber). Figs. 2a-b : Empty test, reef flat, Windward Barrier (L 254). Fig. 2a : Spiral view (X 133); fig. 2b : edge view (X 133).

Fig. 3 : Living specimen, Patchreef Area (L 102); umbilical view (X 157).

Figs. 4 - 6 : "Tretomphalus"-forms (with float chamber).

Fig. 4 : Lateral view of empty test; Western slope (L 100) (X 139).

Figs. 5a-b : Empty test, Leeward slope (Watson's Bay - L110). Fig. 5a : Spiral view (X 195); fig. 5b : lateral view (note small supplementary apertures on suture of float chamber) (X 195).

Figs. 5c-d : Empty test, Reef flat, Windward Barrier (L 254). Fig. 5c : Frontal view of float chamber (X 168); fig. 5d : close-up of preceding view showing larger apertures with peristomes, narrow central depression, poreless zone surrounding central apertural area and faint porosity of lateral wall of float chamber (X 254).

Figs. 6a-b : Empty test, "concinnus"-form; Western slope (L 100). Fig. 6a : Oblique apertural view (X 201); fig. 6b : lateral view (note supplementary apertures along sutures) (X 201).

PLATE 91

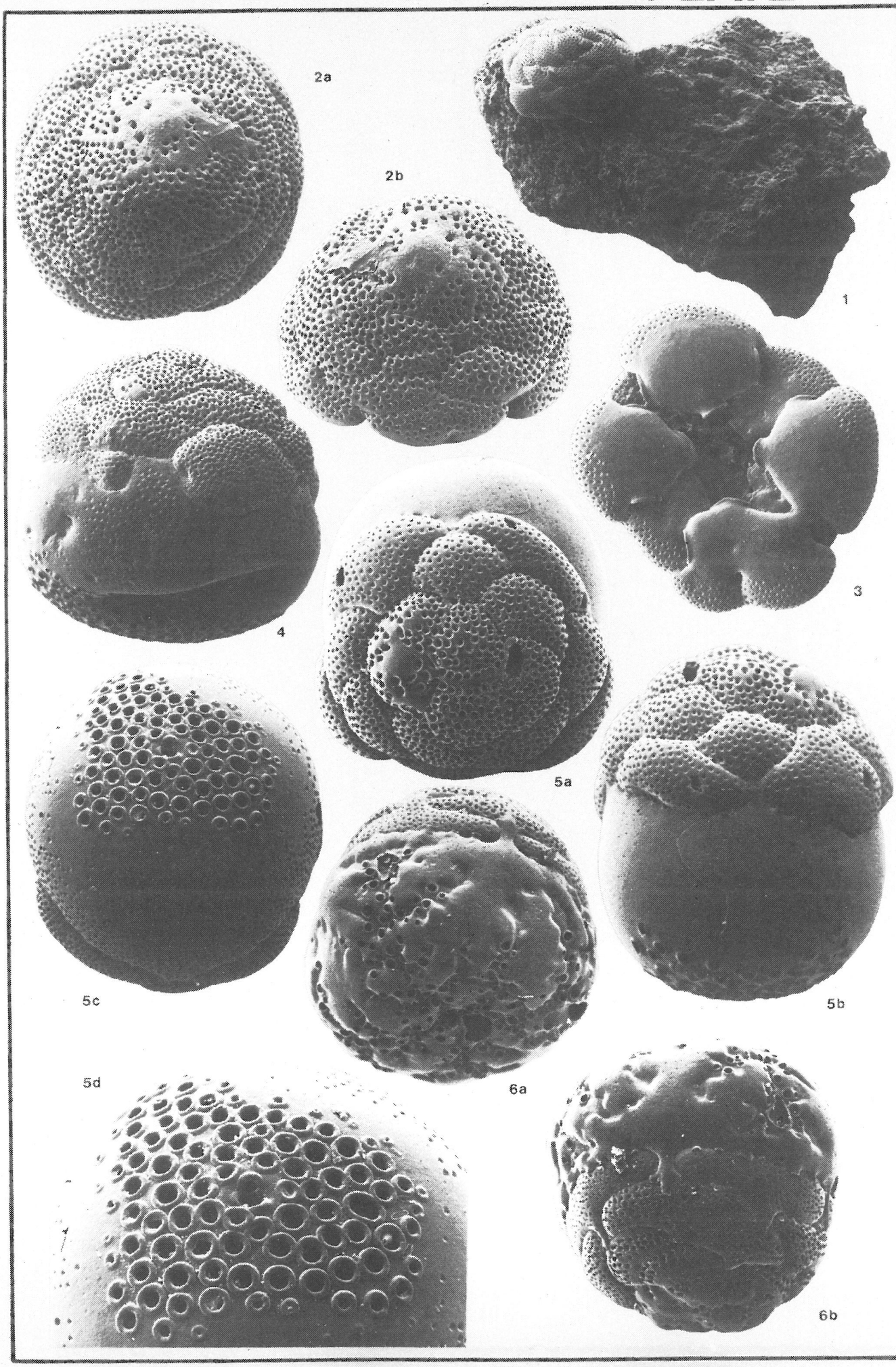


PLATE 92

Figs. 1a-b : Cymbaloporetta gr. bradyi (CUSHMAN)

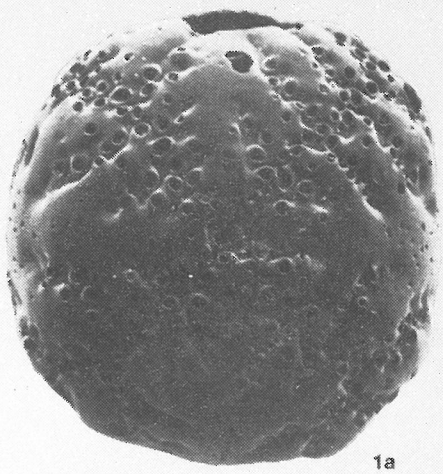
Empty test, reef flat, Windward Barrier (L 254). Fig. 1a : Frontal view of float chamber; note irregularly folded chamber surface and more or less crosswise arrangement of apertural areas (X 197); fig. 1b : close-up of preceding view showing wall folds, aperture with less pronounced peristomes (compare with fig. 5d, pl. 91) and narrow central depression (lower right hand corner of photograph) (X 430).

Figs. 2 - 4 : Cymbaloporetta squammosa (d'ORBIGNY)

Figs. 2a-b : Large, slightly worn empty test; Coconut Fringing Reef flat (L 242). Fig. 2a : Spiral view (X 68); fig. 2b : oblique edge view (X 68).
Figs. 3a-b : Smaller specimen, empty test, reef flat, Windward Barrier (L 254). Fig. 3a : Umbilical view (note disposition of supplementary apertures, partly broken umbilical plate partially covering umbilical depression, faint deuteropores and subtriangular shape of the 4 visible chambers) (X 137); fig. 3b : edge view (note more or less subtriangular periphery) (X 137).
Fig. 4 : Umbilical view of large specimen exceptionally showing 6 chambers; empty test, Coconut Fringing Reef flat (L 242); note porosity (X 85).

Figs. 5a-c : Asterorotalia gaimardii (d'ORBIGNY)

Large, slightly damaged, heavily ornamented specimen; empty test, Eastern Perireefal Area (L 82). Fig. 5a : Spiral view (ultimate chamber is lacking) (X 71); fig. 5b : edge view (note ornate sutures and keel) (X 71); fig. 5c : close-up of part of spiral surface showing finely perforated wall between thick nonperforate chalky knobs (X 462).



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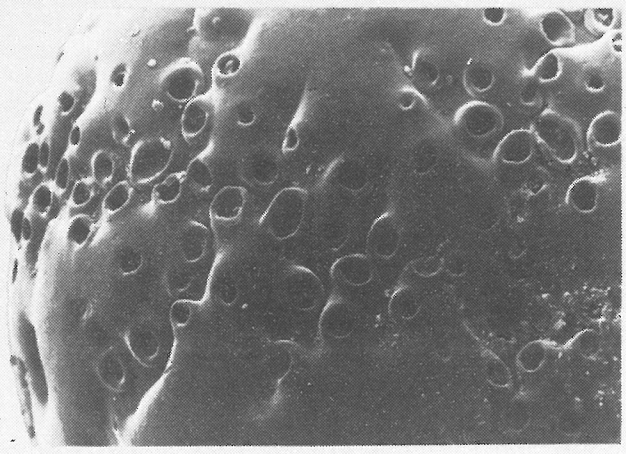

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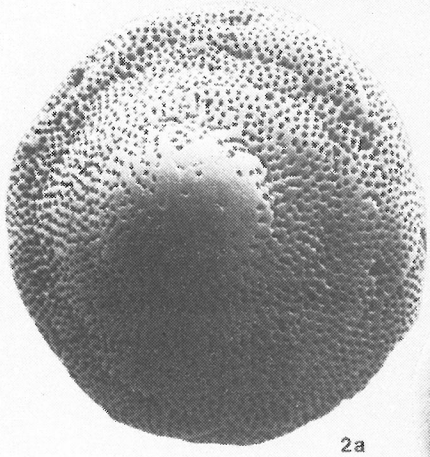

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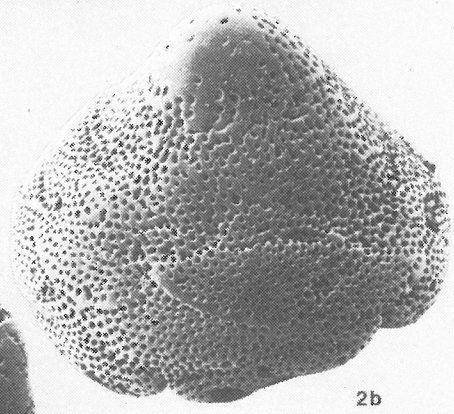

2b



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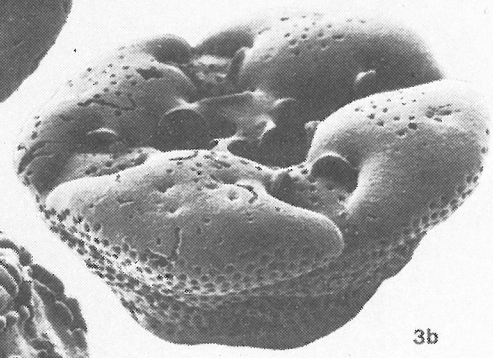

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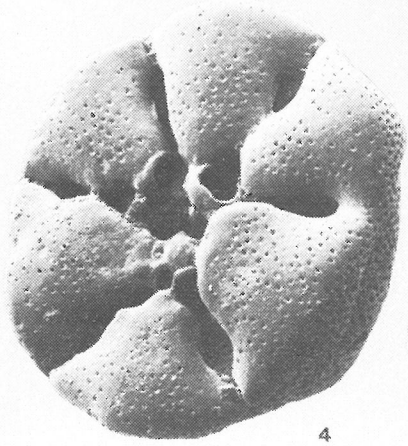

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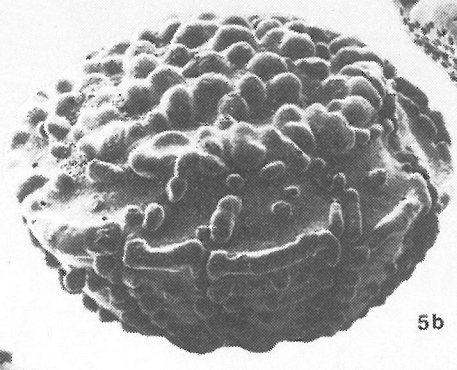

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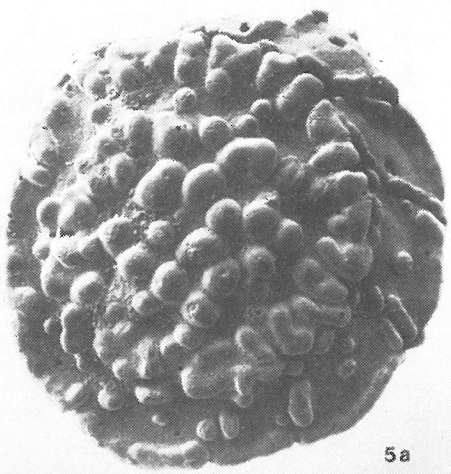


5a



5c

PLATE 93

Figs. 1 - 2 : Asterorotalia gaimardii (d'ORBIGNY)

Figs. 1a-b : Large, slightly damaged empty test; Southern Perireefal Area (L 94). Fig. 1a : Umbilical view (ultimate chamber is lacking) (X 49); fig. 1b : edge (apertural) view; note sutural openings of canal system (X 49).

Figs. 2a-c : Large, intact, less ornate specimen; empty test, Eastern Perireefal Area (L 82). Fig. 2a : Spiral view (X 50); fig. 2b : edge view (X 50); fig. 2c : close-up of part of spiral view showing very fine porosity of chamber walls, and openings of canal system (slightly hispid inside) (X 104).

Figs. 3 - 6 : Pararotalia venusta (BRADY)

Fig. 3 : Spiral view of strongly ornate specimen; empty test, Western Perireefal Area (L 109) (note poreless ridges and papillae upon chamber walls) (X 183).

Figs. 4a-b : Slightly damaged empty test; Western slope (L 100). Fig. 4a : Spiral view; note granularity of test walls, and short peripheral spines upon earlier-formed chambers (X 173); fig. 4b : apertural view; note subangular-to keeled, granular periphery and short aperture with peristome (X 173).

Fig. 5 : Edge view of juvenile empty test, Western Perireefal Area (L 109); note short peripheral spines (X 294).

Figs. 6a-b : Larger specimen, empty test, Western slope (L 100). Fig. 6a : Umbilical view showing radial, deeply incised sutures and irregular chalky knob (X 133); fig. 6b : apertural view (X 133).

PLATE 93

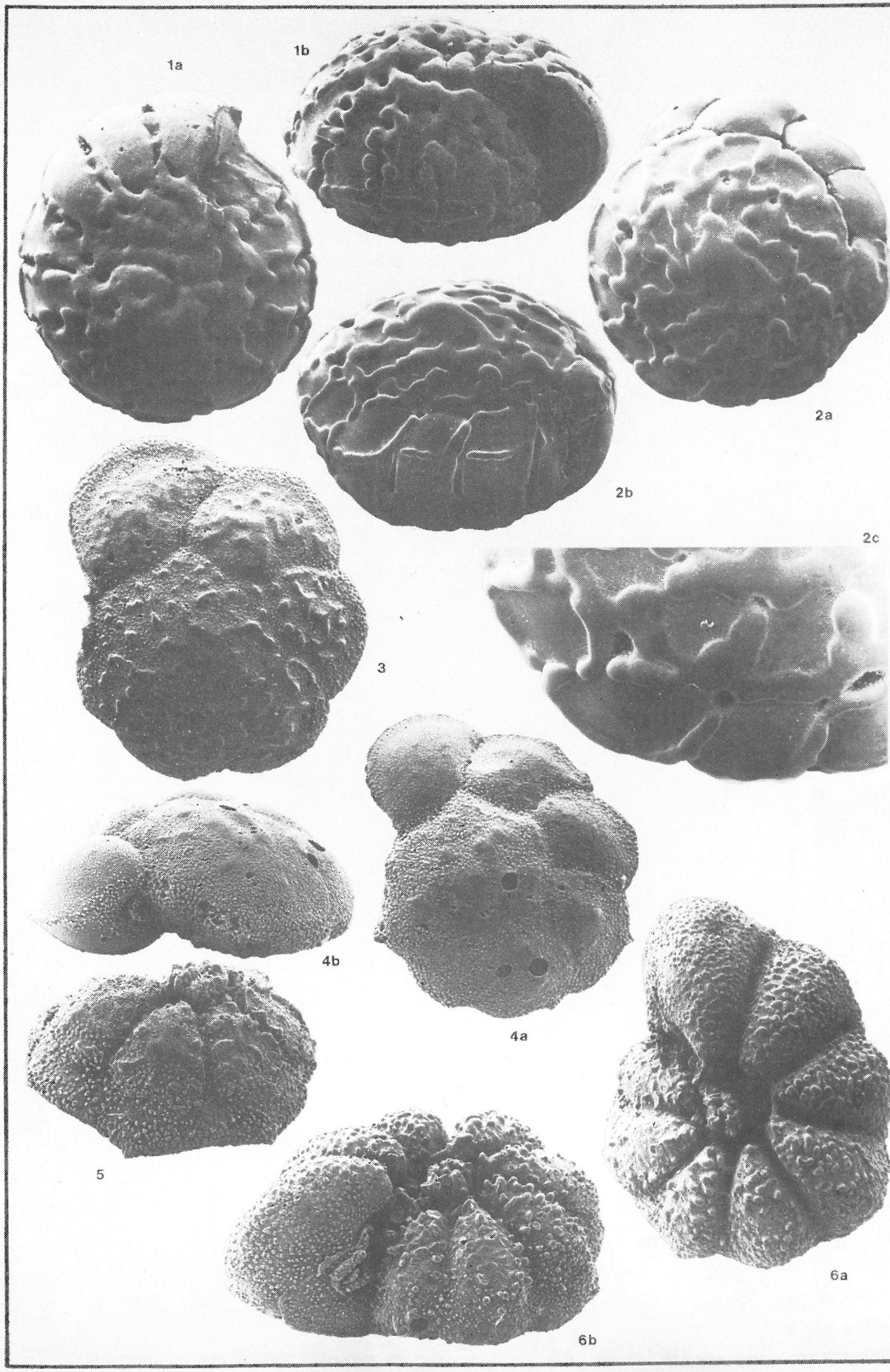


PLATE 94

Fig. 1 : Pararotalia venusta (BRADY)

Close-up of the aperture of the specimen shown on figs. 6a-b, pl. 93 (note toothplate and very fine porosity of test wall) (X 454).

Figs. 2 - 3 : Pseudorotalia (?) cf. schroeteriana (PARKER & JONES)

Figs. 2a-b : Slightly damaged empty test, Coconut Fringing Reef flat (L 243 b). Fig. 2a : Spiral view (X 84); fig. 2b : edge view; note sharp, keeled periphery (X 84).
Figs. 3a-b : Intact empty test, Coconut Fringing Reef flat (L 243 b). Fig. 3a : Umbilical view showing straight, ornate sutures and prominent umbilical chalky bosses (X 76); fig. 3b : apertural view (X 76).

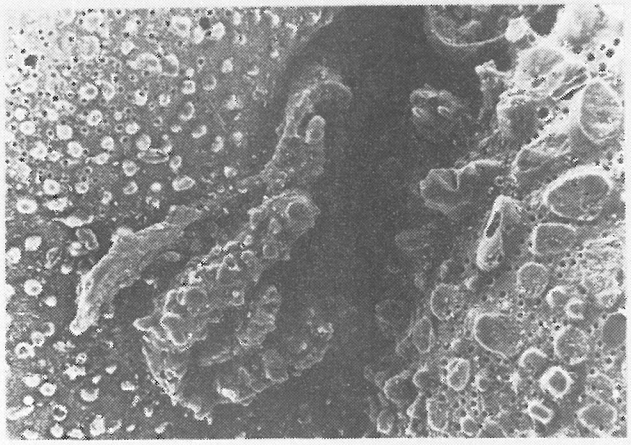
Figs. 4 - 6 : Ammonia convexa (COLLINS)

Figs. 4a-b : Empty test, damaged specimen (ultimate chamber is lacking); Patchreef Area (L 278 d). Fig. 4a : Spiral view (X 98); fig. 4b : edge (apertural) view (X 98).
Figs. 5a-b : Empty test, damaged specimen (ultimate and penultimate chambers are lacking); Sandy Shoal (L 271). Fig. 5a : Umbilical view (note large, flat-topped umbilical plug) (X 158); fig. 5b : edge view (X 158).
Fig. 6 : Slightly smaller specimen, almost intact test; Eastern Perireefal Area (L 65); umbilical view (note smaller umbilical plug, and umbilical features somewhat as in A. aoteanus) (X 198).

Fig. 7 : Ammonia (?) tepida (CUSHMAN)

Spiral side of empty test, Eastern Perireefal Area (L 71) (X 399).

PLATE 94



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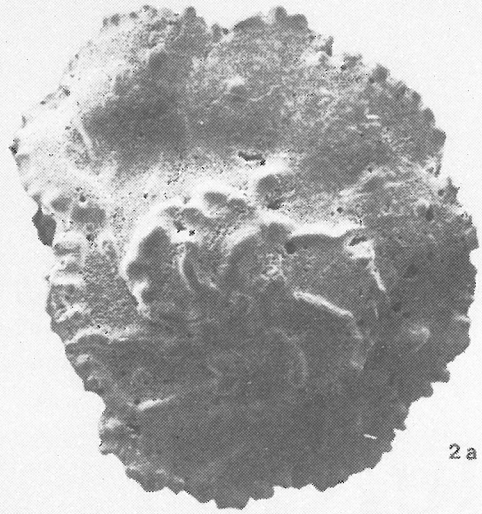

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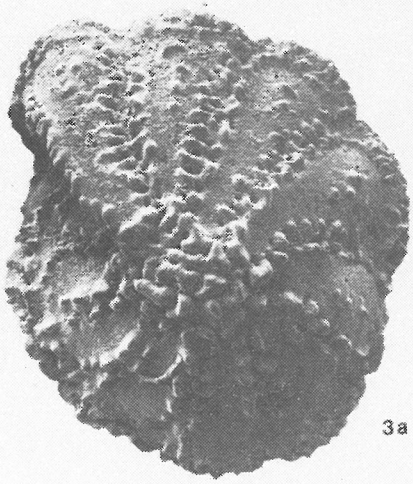

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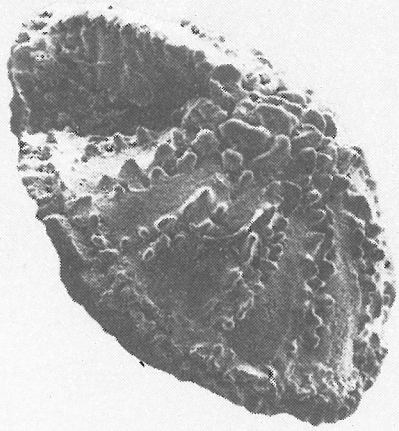

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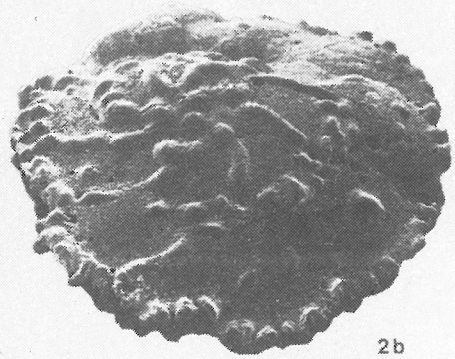

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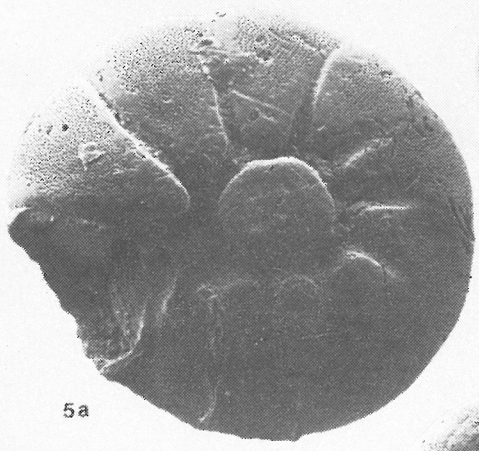

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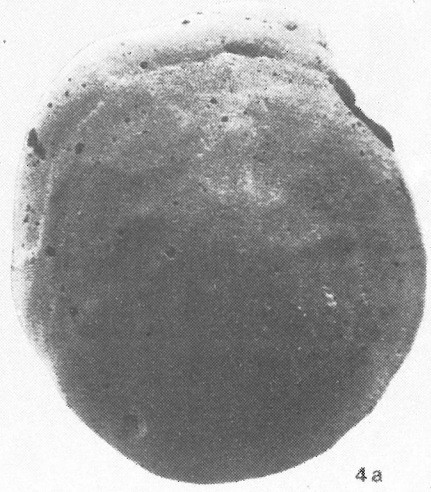

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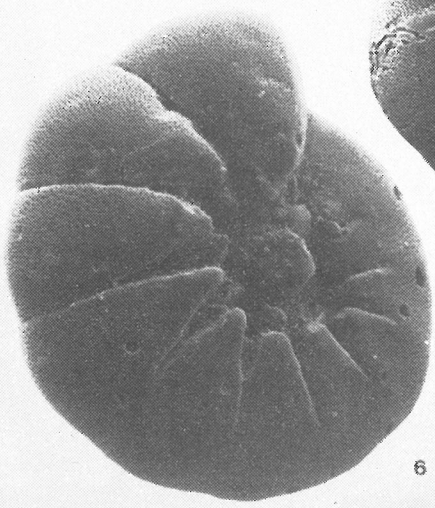

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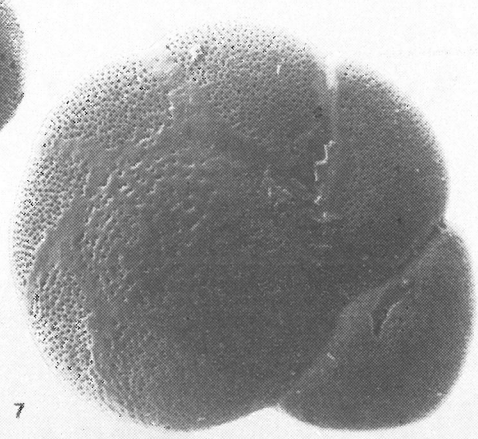


7

PLATE 95

Figs. 1 - 3 : Ammonia (?) tepida (CUSHMAN)

Fig. 1 : Spiral side of empty test; Lagoon (L 123) (X 341).

Fig. 2 : Oblique view upon umbilical side of empty test; Lagoon (L 122) (X 356).

Figs. 3a-b : Living specimen; Lagoon (L 122). Fig. 3a : Spiral view (X 379); fig. 3b : umbilical view (X 379).

Figs. 4 - 5 : Ammonia (?) sp. aff. A. moroensis HOFKER

Figs. 4a-b : Empty test, Southern Perireefal Area (L 94). Fig. 4a : Spiral view (X 288); fig. 4b : edge view (note inflated test) (X 288).

Figs. 5a-b : Empty test, Eastern Perireefal Area (L 82). Fig. 5a : Umbilical view; note strong development of irregular chalky knobs in the umbilical area (X 234); fig. 5b : apertural view (note more compressed test) (X 234).

Figs. 6 - 7 : Monspeliensina japonica (UCHIO)

Figs. 6a-c : Juvenile, living specimen, Eastern Perireefal Area (L 71). Fig. 6a : Umbilical view (X 256); fig. 6b : close-up of preceding view; note large umbilicus with small chalky knob present in this development stage, and umbilical flanges (X 614); fig. 6c : apertural view; note flat test with rounded outline (X 256).

Figs. 7a-b : Larger, empty test; Eastern Perireefal Area (L 81). Fig. 7a : Spiral view; note incised sutures and subtriangular sutural supplementary apertures (X 130); fig. 7b : edge view (X 130).

PLATE 95

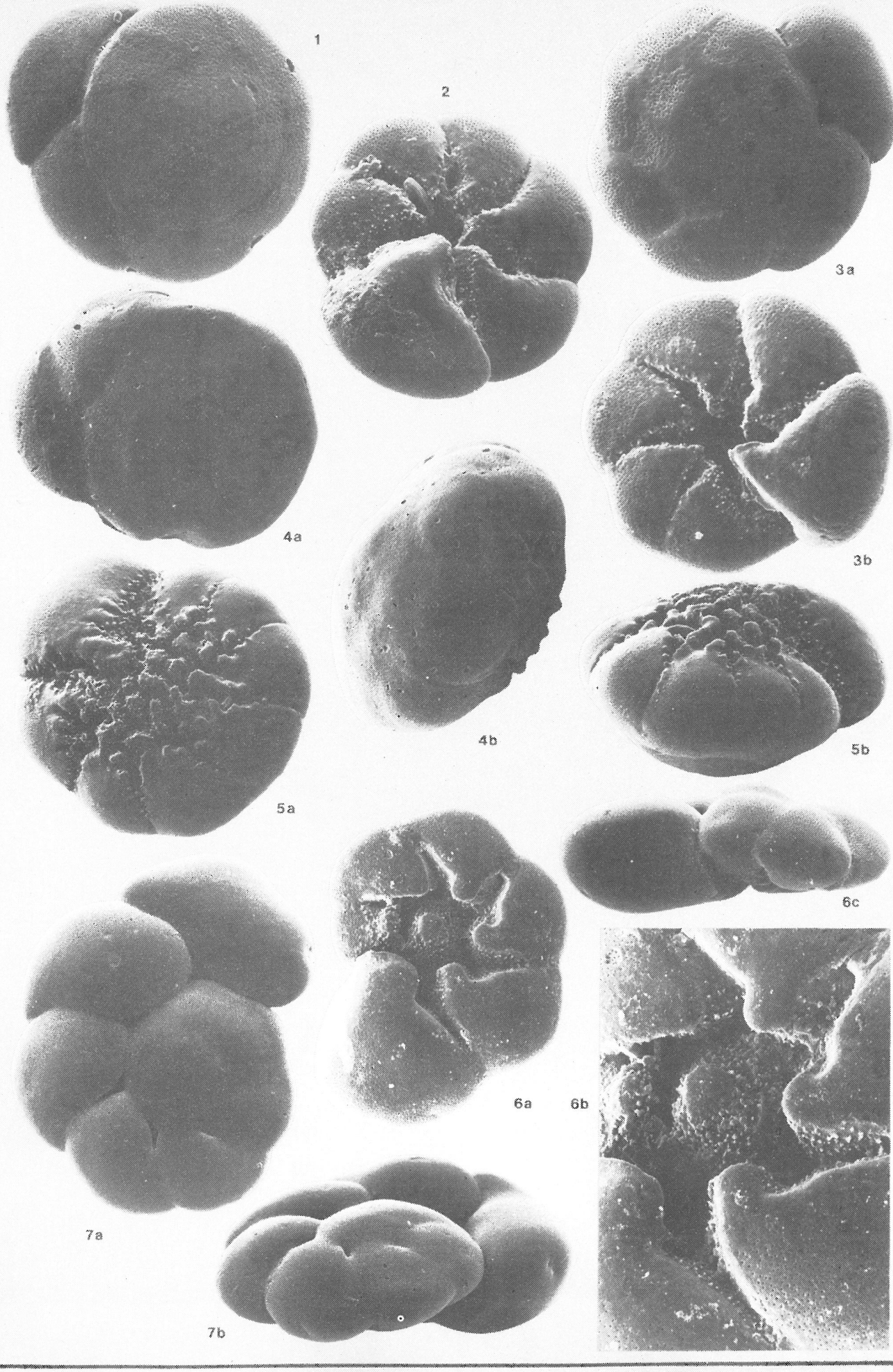


PLATE 96

Figs. 1 a - c : Monspeliensina japonica (UCHIO)

Larger, living specimen; Western slope (L 100). Fig. 1a : Umbilical view showing depressed sutures, well-developed, nonfused umbilical flaps and rounded "protoforamina" at umbilical ends of sutures (X 140); fig. 1b : apertural view; note flat, compressed test (X 140); fig. 1c : close-up showing detail of preceding view (umbilical flanges - aperture) (X 448).

Figs. 2 - 5 : Monspeliensina dubuissoni n.sp.

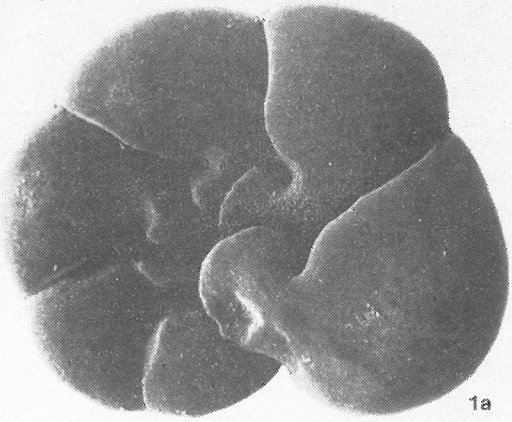
Figs. 2a-c : Living specimen; Eastern Perireefal Area (L 72). Fig. 2a : Spiral view; note sutural grooves (X 156); fig. 2b : close-up of sutural groove; note narrow poreless groove rim and hispid inner sides of groove (X 903); fig. 2c : umbilical view; note sutural grooves and absence of umbilical plug in this specimen (X 156).

Fig. 3 : Apertural view of similar specimen; empty test, Western Perireefal Area (L 98) (X 170).

Figs. 4a-b : Empty test, Western Perireefal Area (L 98). Fig. 4a : Spiral view; note shortening of earlier-formed sutural grooves due to secondary lamination (X 184); fig. 4b : apertural view (X 184).

Figs. 5a-c : Holotype; large specimen, empty test, Eastern Perireefal Area (L 86). Fig. 5a : Umbilical view; note umbilical chalky knob and fused apertural flanges (X 140); fig. 5b : oblique spiral view (X 140); fig. 5c : edge (apertural) view (note test assymmetry) (X 140).

PLATE 96



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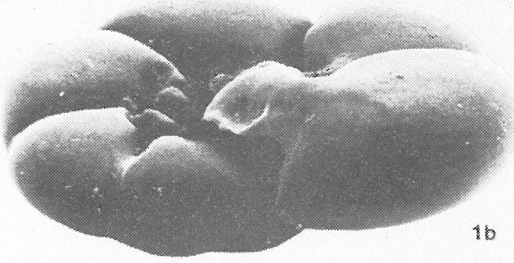

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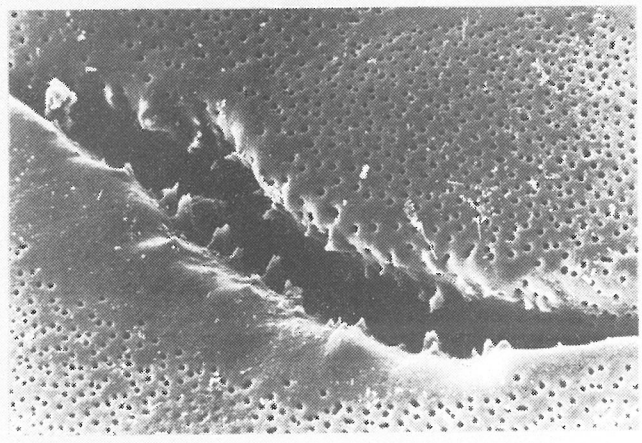

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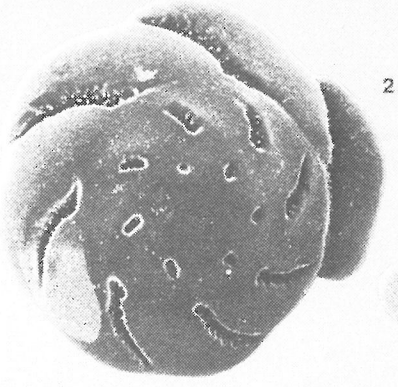

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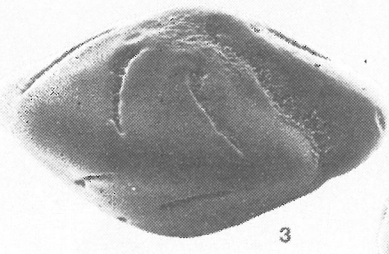

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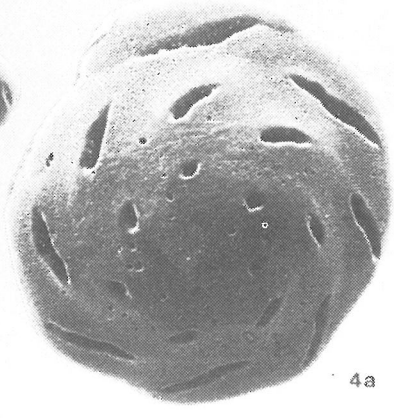

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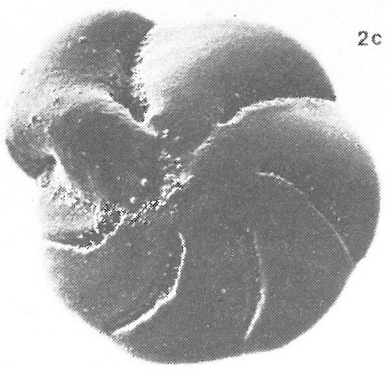

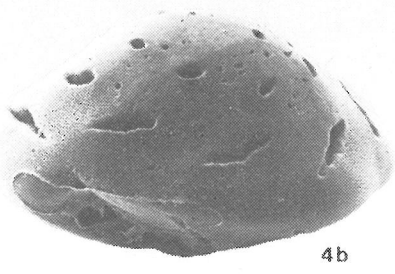

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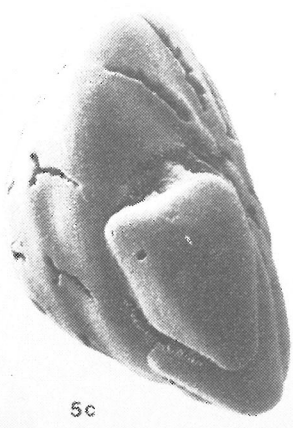

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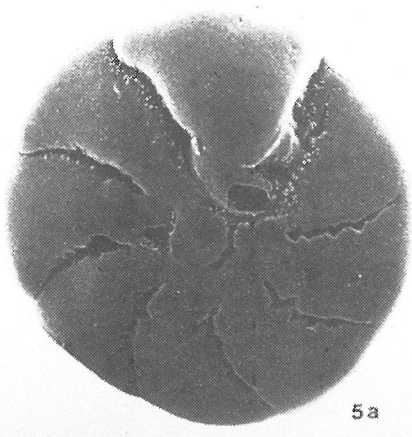

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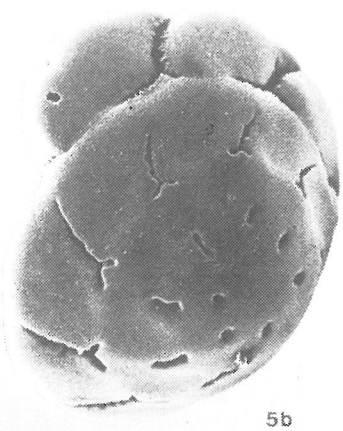


5b

PLATE 97

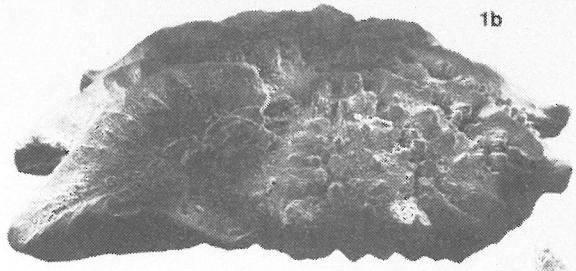
Figs. 1 - 2 : Calcarina calcar d'ORBIGNY

Figs. 1a-b : Empty test, Patchreef Area (L 105). Fig. 1a : Umbilical view (X 80); fig. 1b : apertural view (X 86).
Fig. 2 : Spiral view of other, damaged specimen; Patchreef Area (L 102) (X 65).

Figs. 3 - 5 : Calcarina spengleri s.s. (GMELIN)

Figs. 3a-d : Living, coarsely hispid reef-flat specimen; Coconut Fringing Reef flat (L 241). Fig. 3a : Spiral view (X 36); fig. 3b : edge view (X 36); fig. 3c : close-up of delicately ornamented test wall (central area of fig. 3a) (X 207); fig. 3d : close-up showing complicate peripheral spine pattern (X 214).
Figs. 4a-b : Similar, living specimen; Coconut Fringing Reef flat (L 241). Fig. 4a : Umbilical view (X 35); fig. 4b : edge view (X 35).
Figs. 5a-b : Less ornate living specimen; reef flat, Windward Barrier (L 255b). Fig. 5a : Spiral view (X 34); fig. 5b : edge view (X 33).

PLATE 97



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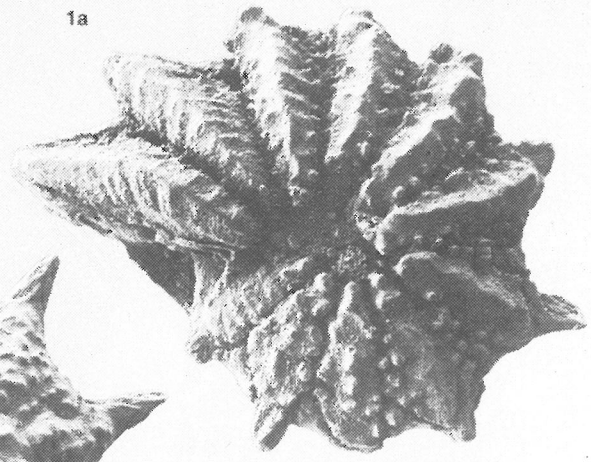

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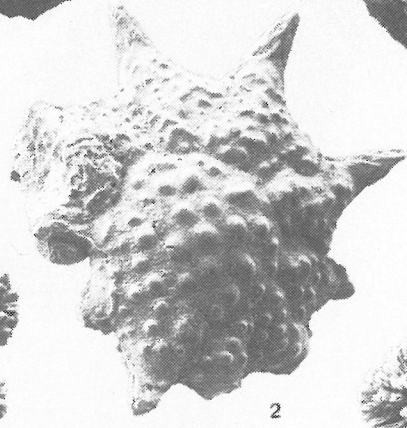

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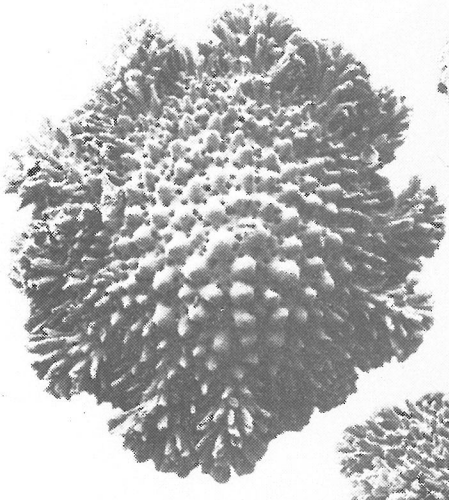

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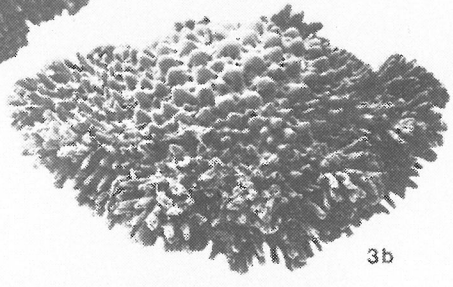

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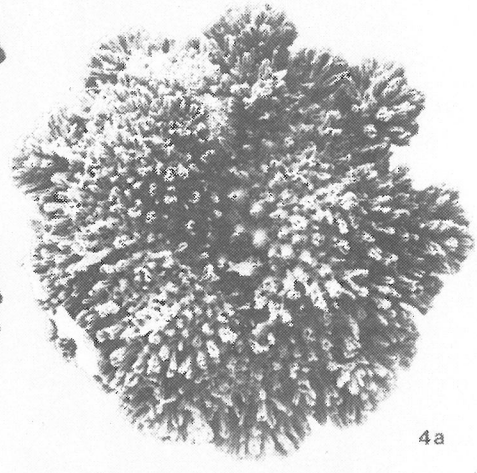

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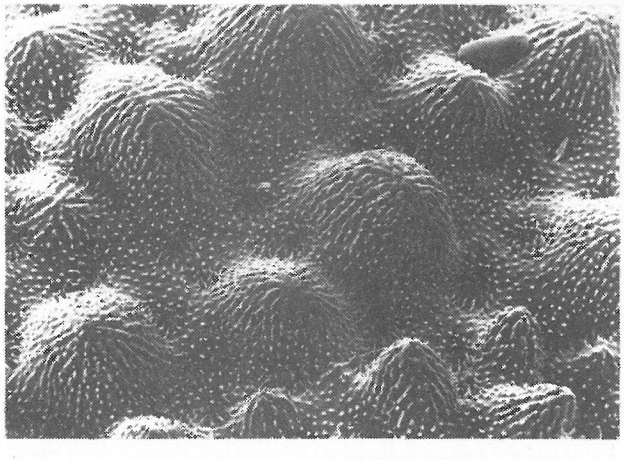

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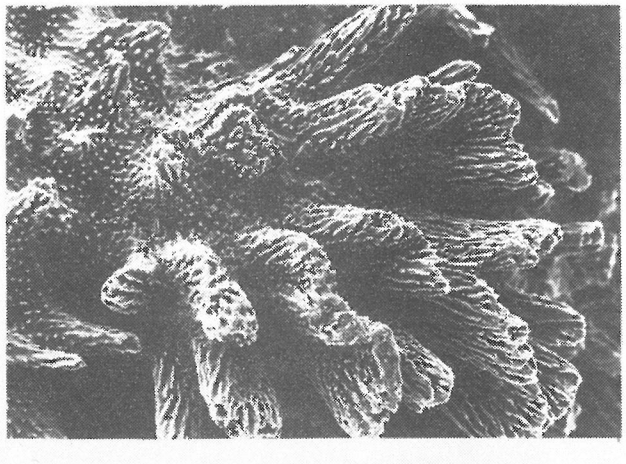

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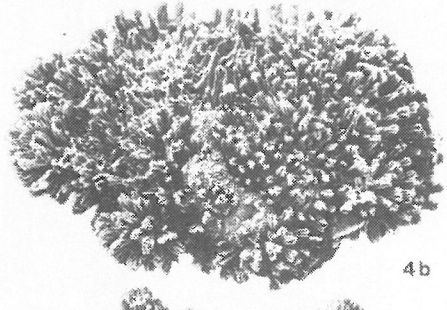

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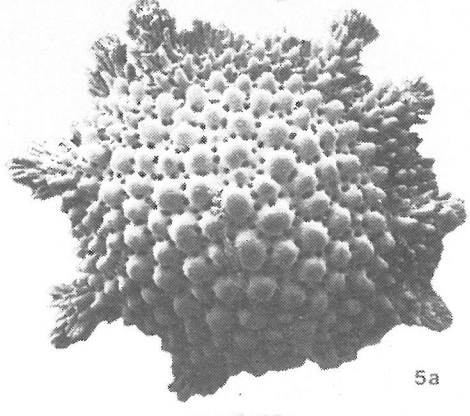

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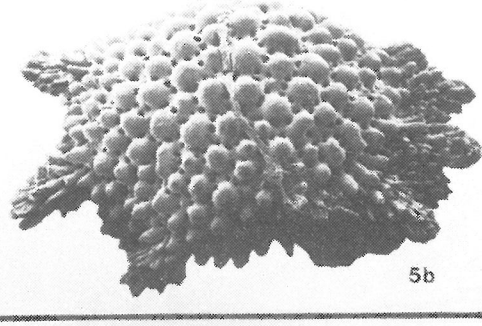


5b

PLATE 98

Figs. 1 - 2 : Calcarina spengleri s.s. (GMELIN)

Fig. 1 : Heavily abraded empty test; Coconut Fringing Reef flat (L 242); the spines are almost completely removed but the general test outlook still permits identification (X 46).

Figs. 2a-b : Extremely abraded empty test; Coconut Fringing Reef flat (L 242); spines and outer layers of test wall are removed by abrasion; canal system aperture pattern still permits identification (X 51). Fig. 2a : Spiral view; fig. 2b : edge view.

Figs. 3 - 7 : Calcarina spengleri (GMELIN), subsp. mayori CUSHMAN

Figs. 3a-b : Empty test, Eastern Perireefal Area (L 59). Fig. 3a : Spiral view (X 46); fig. 3b : edge view (X 46).

Figs. 4a-b : Living (?) specimen, Eastern Perireefal Area (L 82). Fig. 4a : Umbilical view (X 37); fig. 4b : edge view (X 37).

Fig. 5 : Spiral side of juvenile specimen; empty test, Eastern Perireefal Area (L 82); note length of spines (X 74).

Figs. 6a-b : Empty test, specimen showing complex spine pattern; Eastern Perireefal Area (L 84). Fig. 6a : Spiral view (X 45); fig. 6b : oblique edge view (X 45).

Figs. 7a-b : Empty test, specimen showing features (test wall, spines) intermediate between spengleri s.s. and spengleri subsp. mayori; Eastern Perireefal Area (L 81). Fig. 7a : Spiral view (X 41); fig. 7b : edge view (X 41).

PLATE 98

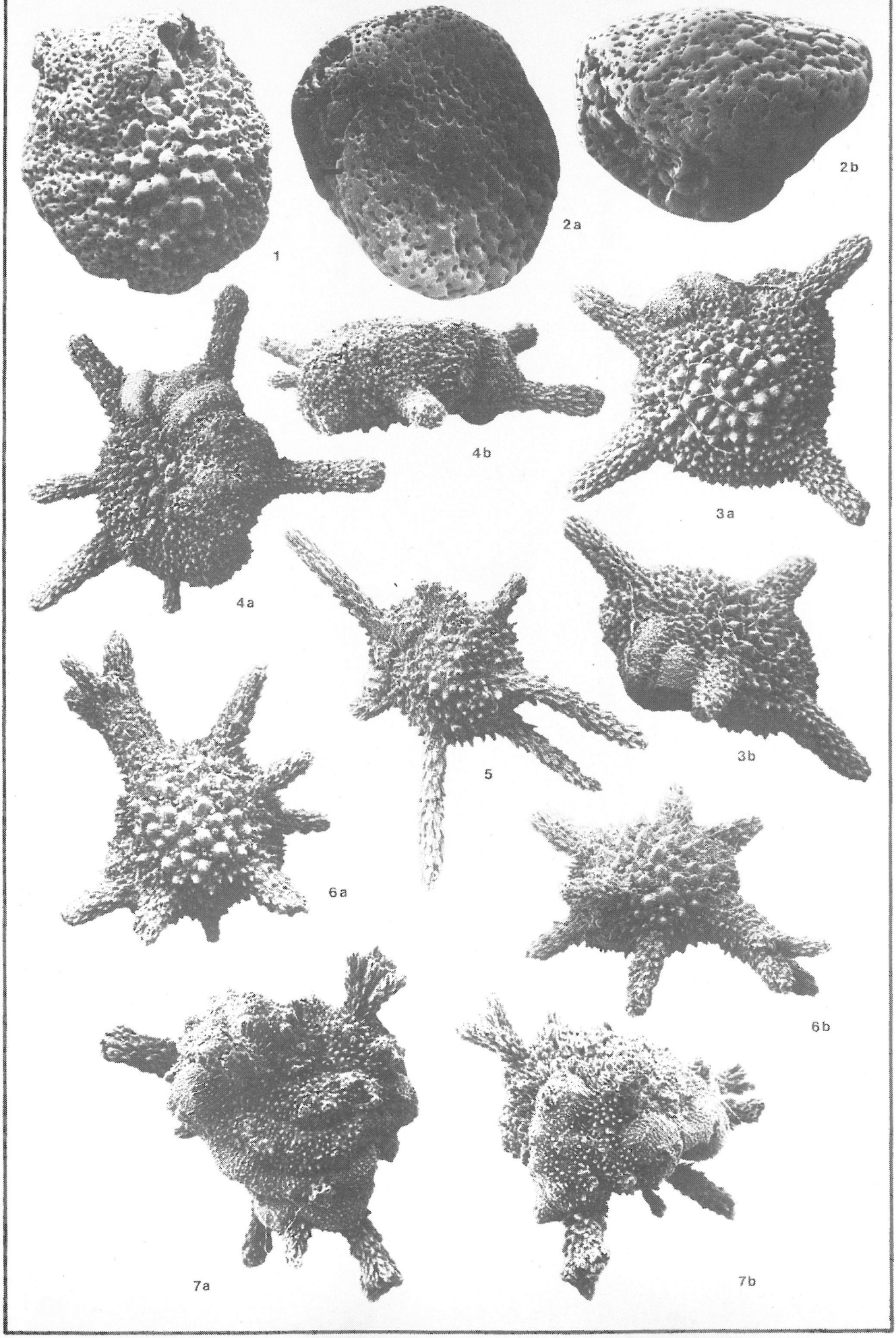


PLATE 99

Fig. 1 : Calcarina spengleri (GMELIN), subsp. mayori CUSHMAN

Close-up showing finely hispid chamber surface (apertural face) and porosity of test wall, of the specimen figured on pl. 98, fig. 7 (X 250).

Figs. 2 - 4 : Baculogypsina sphaerulata (PARKER & JONES)

Fig. 2 : Lateral view of medium-sized empty test with long spines; Coconut Fringing Reef flat (L 243 b) (X 41).

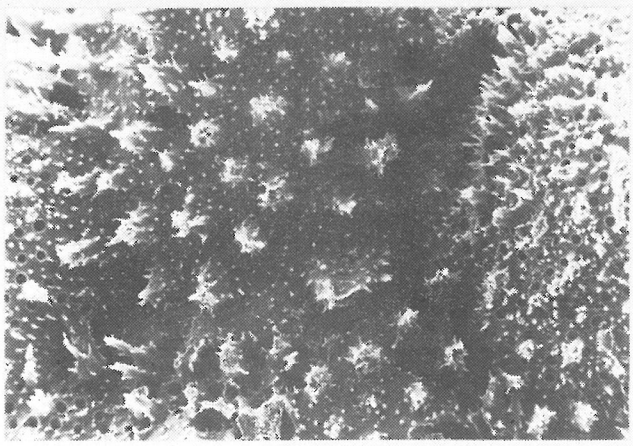
Figs. 3a-e : Large, strongly inflated living (?) specimen; reef flat, Windward Barrier (L 255 b). Fig. 3a : Lateral view (X 33); fig. 3b : edge view (X 33); fig. 3c : close-up of a spine; note overall hispidity (X 239); fig. 3d : detail of test surface showing hispid perforate lateral walls of lateral chamberlets and imperforate pillars (X 222); fig. 3e : id, detail at higher magnification (X 460).

Fig. 4 : Large, heavily abraded empty test (spines completely removed by abrasion); such specimens frequently occur in the coarse reef-flat sediments together with Amphistegina and abraded Calcarina; Reef flat, Windward Barrier (L 261) (X 36).

Figs. 5a-b : Parrellina hispidula (CUSHMAN)

Empty test, Eastern Perireefal Area (L 84). Fig. 5a : Lateral view (X 106); fig. 5b : edge view showing apertural (?-no apertures visible) face (X 94).

PLATE 99



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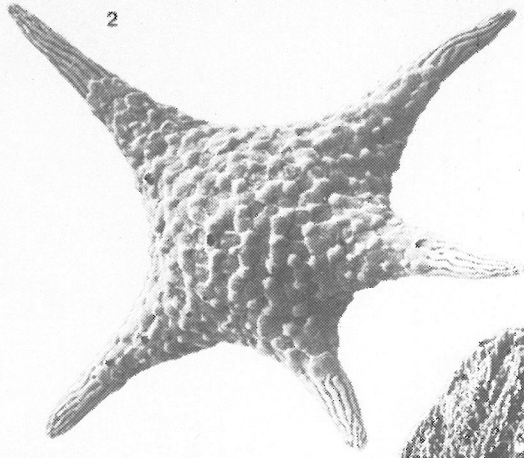

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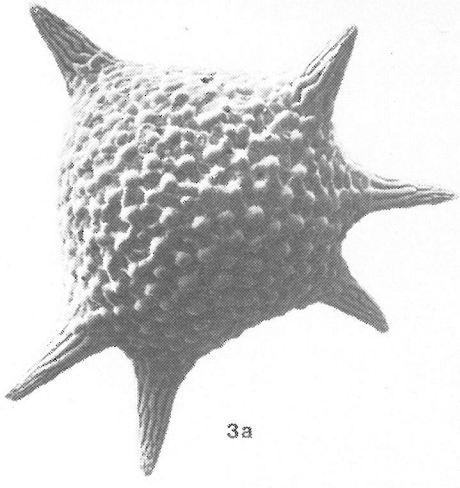

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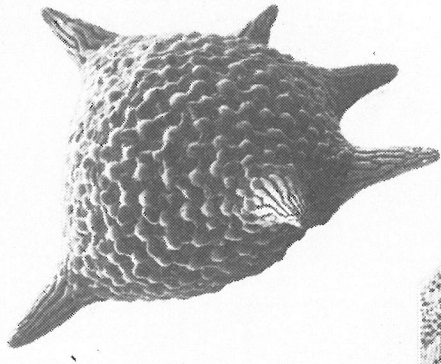

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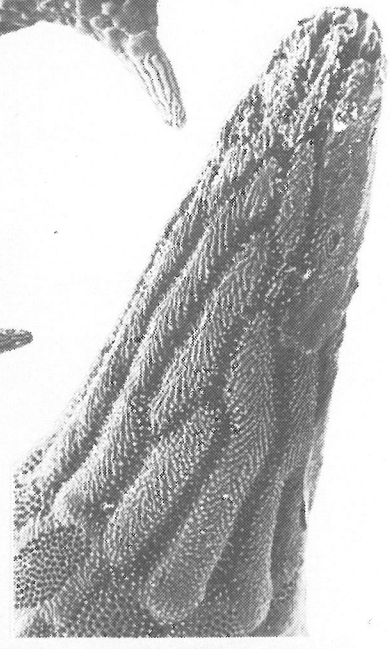

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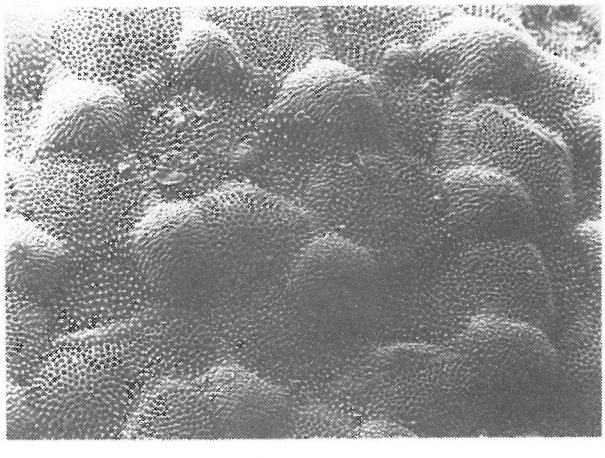

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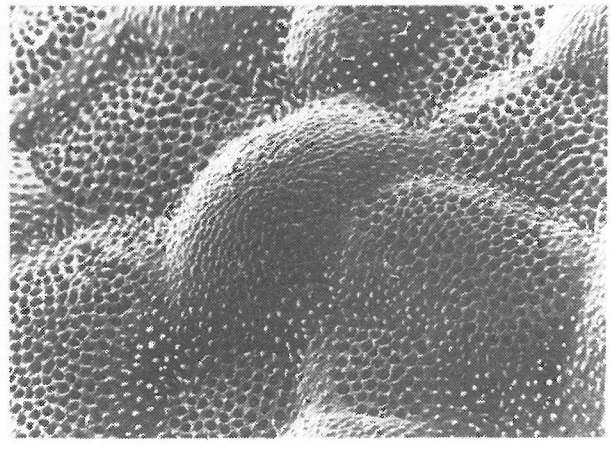

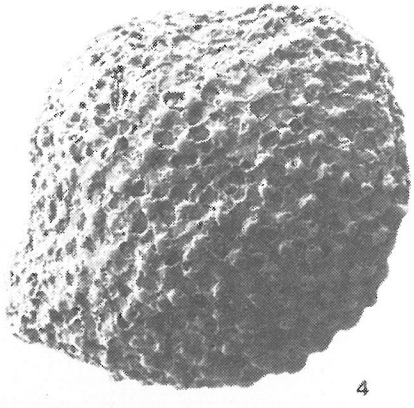

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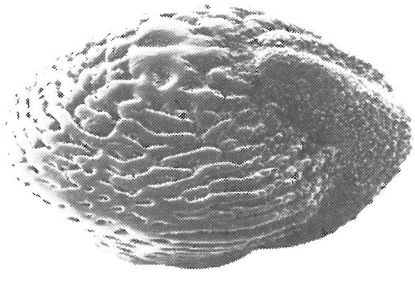

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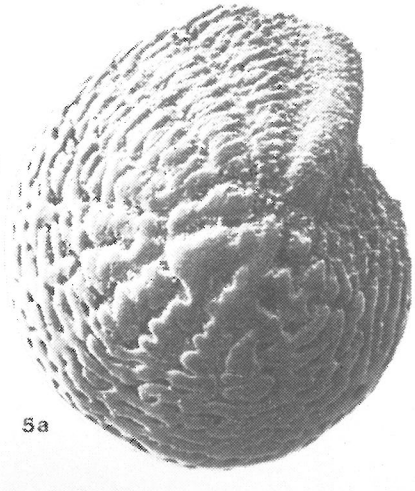


5a

PLATE 100

Figs. 1a-c : Parrellina hispidula (CUSHMAN)

Opposite side of smaller specimen; empty test; Southern Perireefal Area (L 91). Fig. 1a : Lateral view (X 121); fig. 1b : edge view showing strongly hispid final chamber (X 121); fig. 1c : close-up of preceding view showing umbilical expansions of "apertural" face and opening of canal system (black patch in the upper right hand corner of photography) (X 461).

Figs. 2 - 3 : Parrellina pacifica (COLLINS)

Figs. 2a-b : Empty test, heavily corrugated specimen; Eastern Perireefal Area (L 84). Fig. 2a : Lateral view (note lobulate periphery, coarse corrugated wall schulpture pattern and coarse porosity) (X 133); fig. 2b : apertural view (X 139).

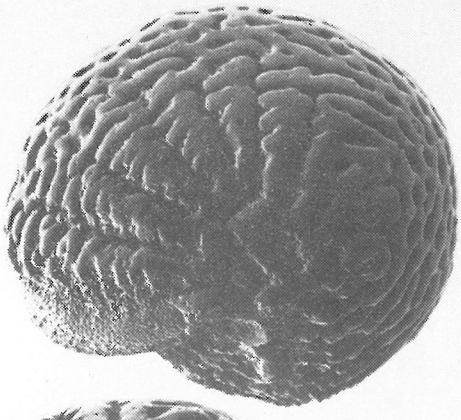
Figs. 3a-b : Less corrugated empty test showing less constricted sutures; Eastern Perireefal Area (L 59). Fig. 3a : Lateral view (X 119); fig. 3b : close-up of test surface showing coarse pores and finely hispid test wall (X 446).

Figs. 4 - 5 : Parrellina milletti (H. ALLEN & EARLAND)

Figs. 4a-b : Smaller specimen showing test wall granularity, surface schulpture resembling elphidiid ponticuli and openings of canal system; empty test, Western slope (L 100). Fig. 4a : Lateral view (X 167); fig. 4b : apertural view (X 167).

Figs. 5a-b : Somewhat larger, empty test showing complication of test wall schulpture pattern and first traces of developing "chevron"-pattern; Western slope (L 100). Fig. 5a : Lateral view (X 140); fig. 5b : edge view (X 132).

PLATE 100



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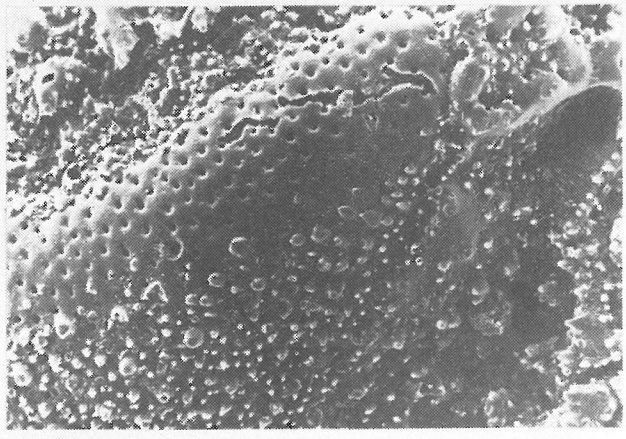

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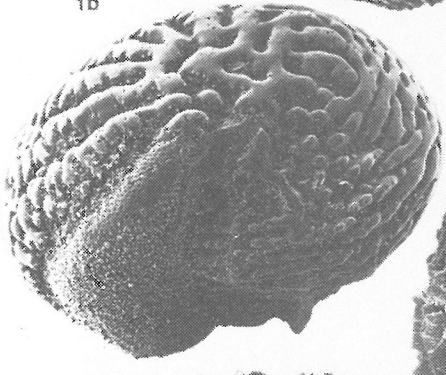

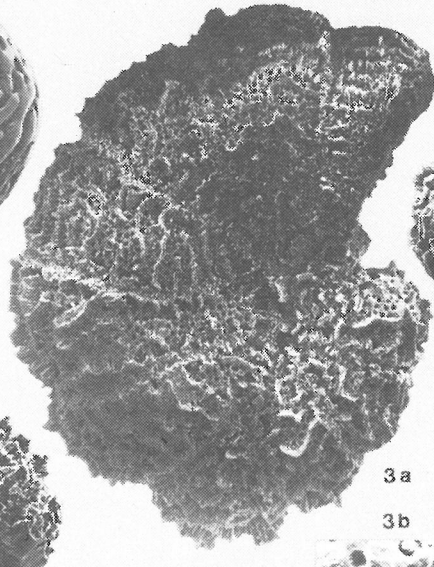

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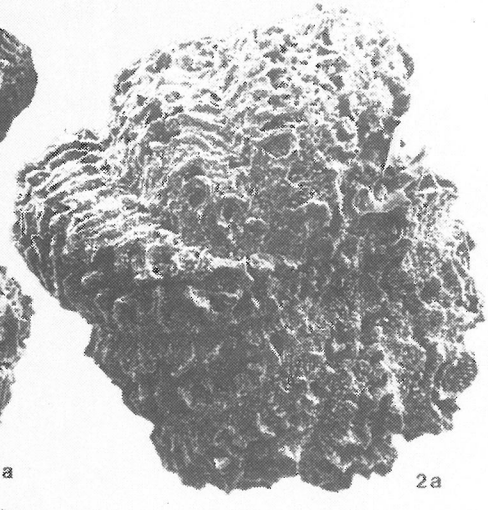

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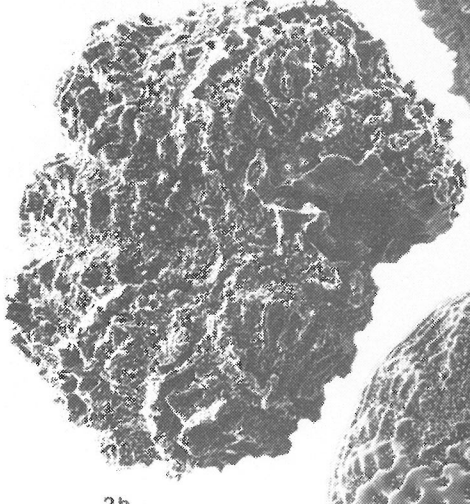

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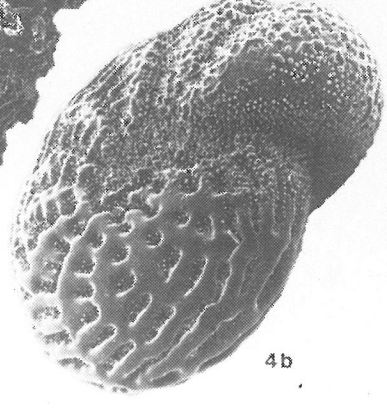

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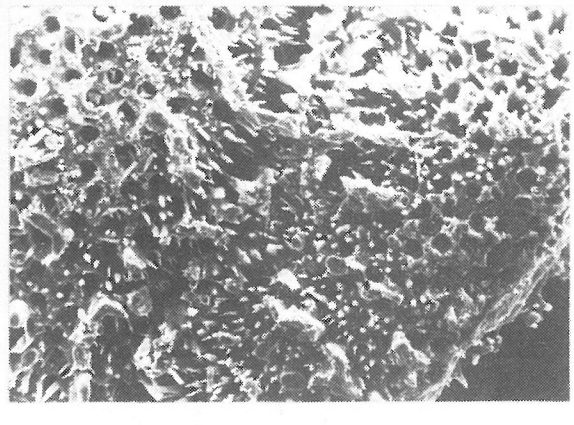

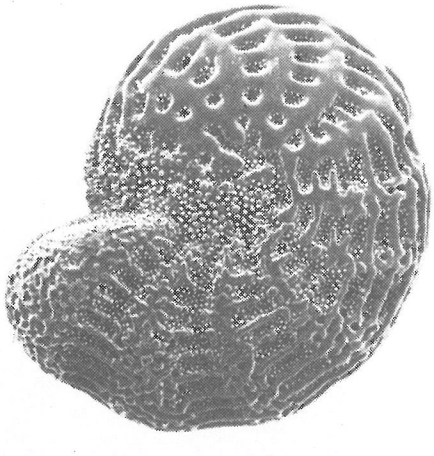

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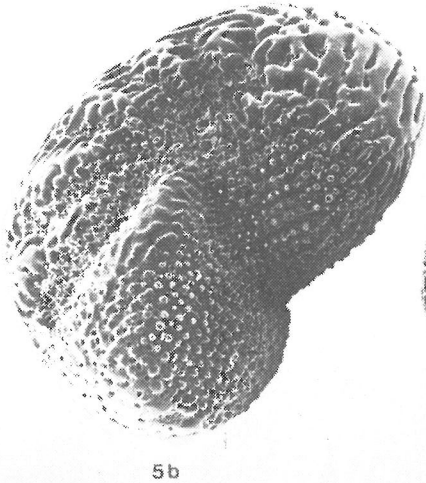

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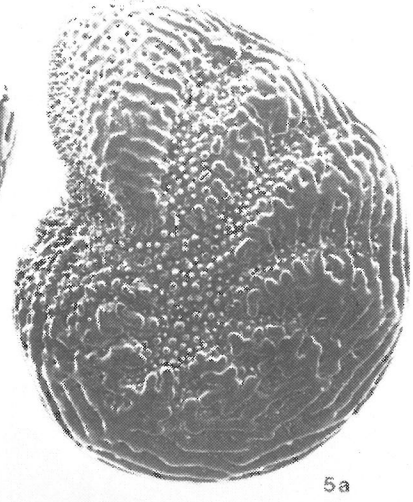


5a

PLATE 101

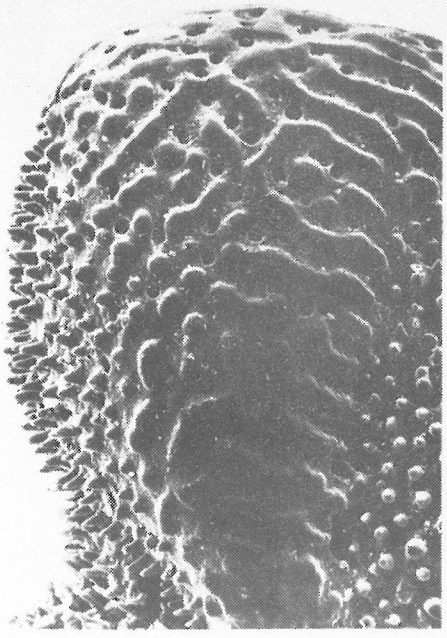
Figs. 1 - 2 : Parrellina milletti (H. ALLEN & EARLAND)

Fig. 1 : Close-up of fig. 5a, pl. 100, showing last-formed chamber with coarse pores and canal system openings (X 406).
Figs. 2a-b : Larger specimen showing fully-developed "chevron"-textural pattern; empty test (damaged); Western slope (L 100). Fig. 2a : Lateral view (X 135); fig. 2b : edge view showing penultimate septum (last chamber has been broken away); note septal foramina near septal base (X 135).

Figs. 3 - 6 : Haynesina depressula (WALKER & JACOB), emend. (MURRAY)

Figs. 3a-b : Empty, damaged test, juvenile specimen, presumably of H. depressula; Eastern Perireefal Area (L 86). Fig. 3a : Lateral view (X 358); fig. 3b : apertural view (final chamber is lacking) (X 358).
Figs. 4a-b : Slightly larger, strongly compressed specimen; empty test, Lagoon (L 121). Fig. 4a : Lateral view; note traces of ponticuli (3 ?) upon ultimate suture (X 306); fig. 4b : apertural view (X 306).
Fig. 5 : Lateral view of empty test; specimen showing large, granulated umbilici and 8,5 chambers in the final volution; Lagoon (L 139) (X 246).
Figs. 6a-d : Large specimen ("N. germanicum") showing umbilici partially closed by secondary lamination, and having 11-12 chambers in final volution; Eastern Perireefal Area (L 60). Fig. 6a : Lateral view (X 230); fig. 6b : id, detail showing last-formed sutures(X 460); fig. 6d : apertural view (X 230); fig. 6c : id, close-up of ultimate suture showing separate openings and porosity of chamber wall (X 977).

PLATE 101



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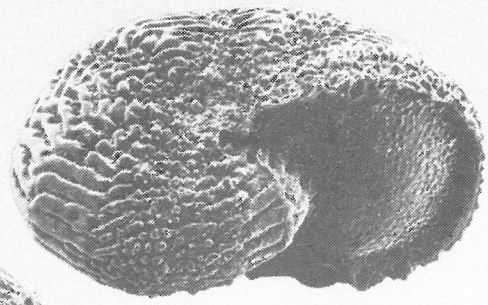

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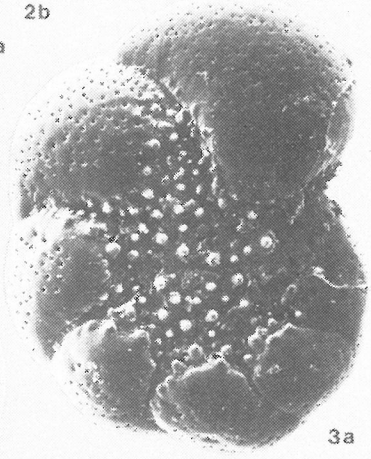

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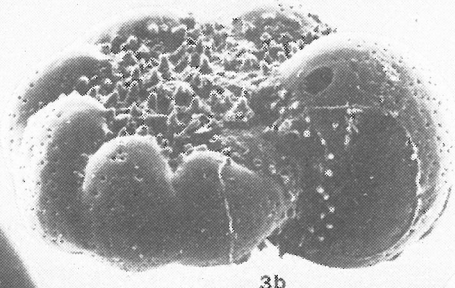

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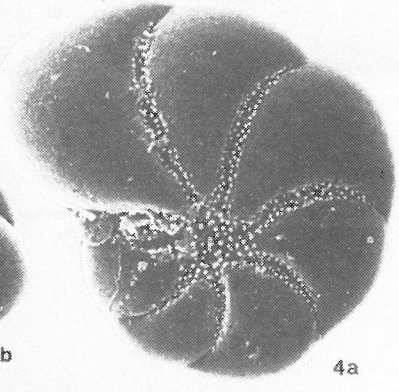

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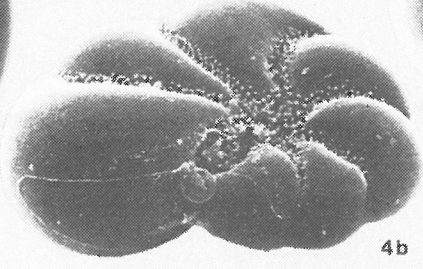

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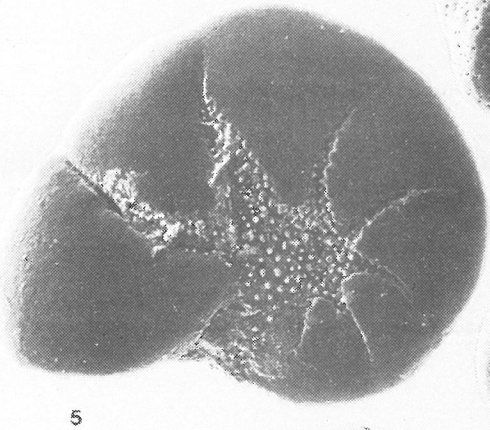

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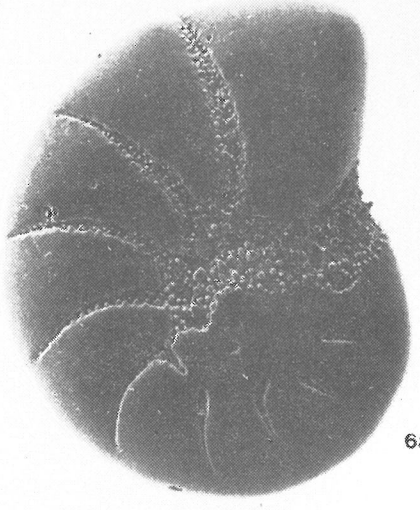

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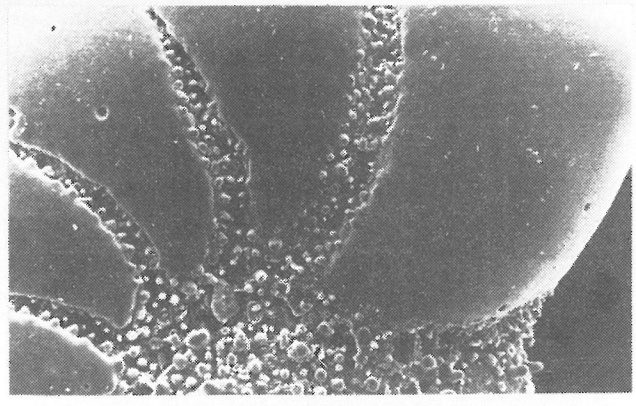

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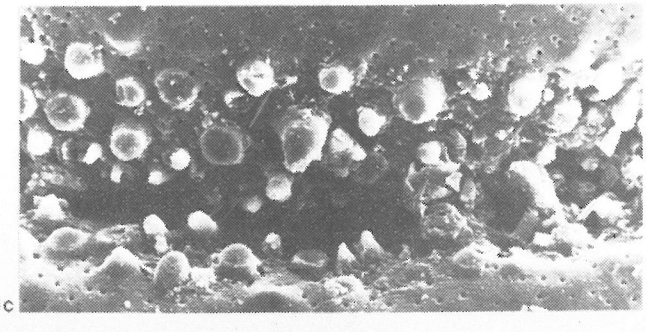

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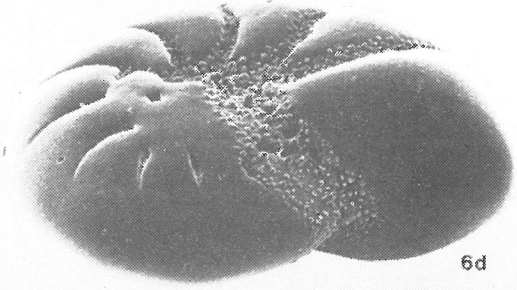


6d

PLATE 102

Figs. 1 - 3 : Elphidium advenum s.s. (CUSHMAN)

Figs. 1a-b : "charlottensis"-like specimen; empty test, Western slope (L 100). Fig. 1a : Lateral view (X 155); fig. 1b : apertural view (note granular protuberances upon apertural face) (X 155).
Figs. 2a-b : "Classical" advenum-form; empty test, Eastern Perireefal Area (L 89). Fig. 2a : Lateral view (X 146); fig. 2b : apertural view (X 146).
Fig. 3 : Empty test; specimen showing umbilical "depressulum"-features; lateral view; Eastern Perireefal Area (L 81) (X 149).

Figs. 4 - 6 : Ozawaia (?) sp. aff. O. tongaensis CUSHMAN

Figs. 4a-b : Empty test, Patchreef Area (L 102). Fig. 4a : Lateral view (X 203); fig. 4b : apertural view (note depressed umbilicus) (X 203).
Fig. 5 : Living specimen, Lagoon (L 130); lateral view showing narrow earlier sutures, distinct parafossettes and prominent peristomes (X 219).
Figs. 6a-b : The single (damaged) specimen in our materal showing growth irregularity (uncoiling tendency); empty test, Patchreef Area (L 102).
Fig. 6a : Lateral view (X 204); fig. 6b : edge view (X 204).

Fig. 7 : Elphidium batavum HOFKER

Empty test, Coconut Fringing Reef flat (L 243 b). Fig. 7a : Lateral view (X 73); fig. 7b : apertural view (X 73).

Fig. 8 : Elphidium craticulatum (FICHTEL & MOLL)

Lateral view of very large empty test; North Point (L 98) (X 31).

PLATE 102

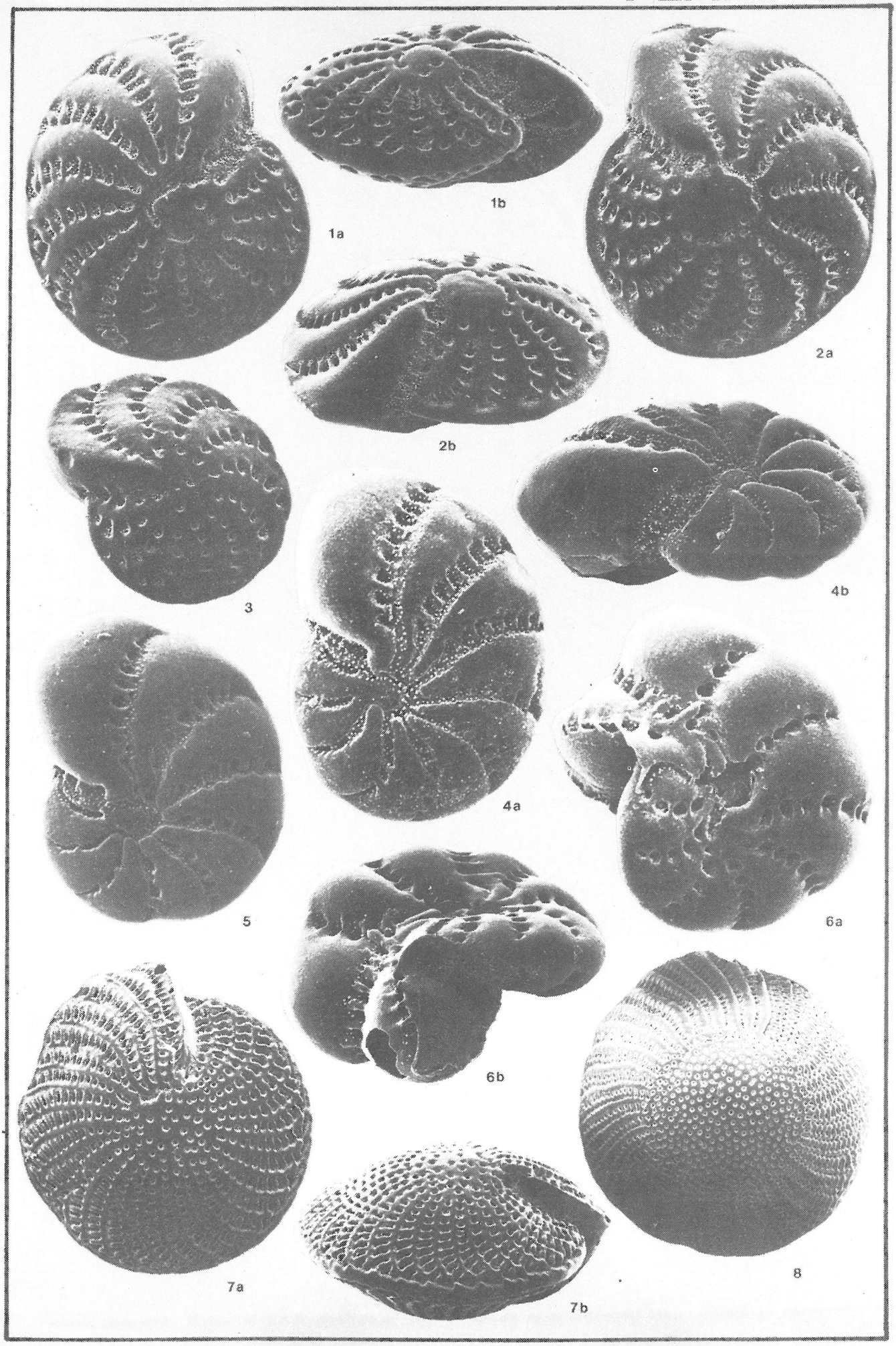


PLATE 103

Fig. 1 : Elphidium craticulatum (FICHTEL & MOLL)

Living, smaller specimen; Eastern Perireefal Area (L 82). Fig. 1a : Lateral view (note extension of umbilical area - compare with E. batavum and E. crispum) (X 49); fig. 1b : apertural view (X 49).

Figs. 2 - 5 : Elphidium crispum (LINNE)

Figs. 2a-b : Juvenile, living specimen; Eastern Perireefal Area (L 56). Fig. 2a : Lateral view (X 159); fig. 2b : apertural view (X 159).
Fig. 3 : Lateral view of slightly larger empty test; Eastern Perireefal Area (L 81) (X 155).
Figs. 4a-b : Full-grown specimen, empty test, Coconut Fringing Reef flat (L 243 b). Fig. 4a : Lateral view (note small, prominent, perforated umbilical boss) (X 128); fig. 4b : apertural view (X 128).
Figs. 5a-b : Skeleton consisting of three fused specimens; Empty test, Coconut Fringing Reef flat (L 243 b). Fig. 5a : (X 78); fig. 5b : another view (X 81).

Fig. 6 : Elphidium jenseni CUSHMAN

Empty test, Eastern Perireefal Area (L 81). Fig. 6a : Lateral view (note elongate ponticuli) (X 173); fig. 6b : apertural view (note strongly compressed test) (X 172).

Fig. 7 : Elphidium limbatum (CHAPMAN)

Empty test, Coconut Fringing Reef flat (L 252). Fig. 7a : Lateral view (note smooth lateral ridges) (X 165); fig. 7b : apertural view (note characteristic shape of apertural face) (X 165).

PLATE 103

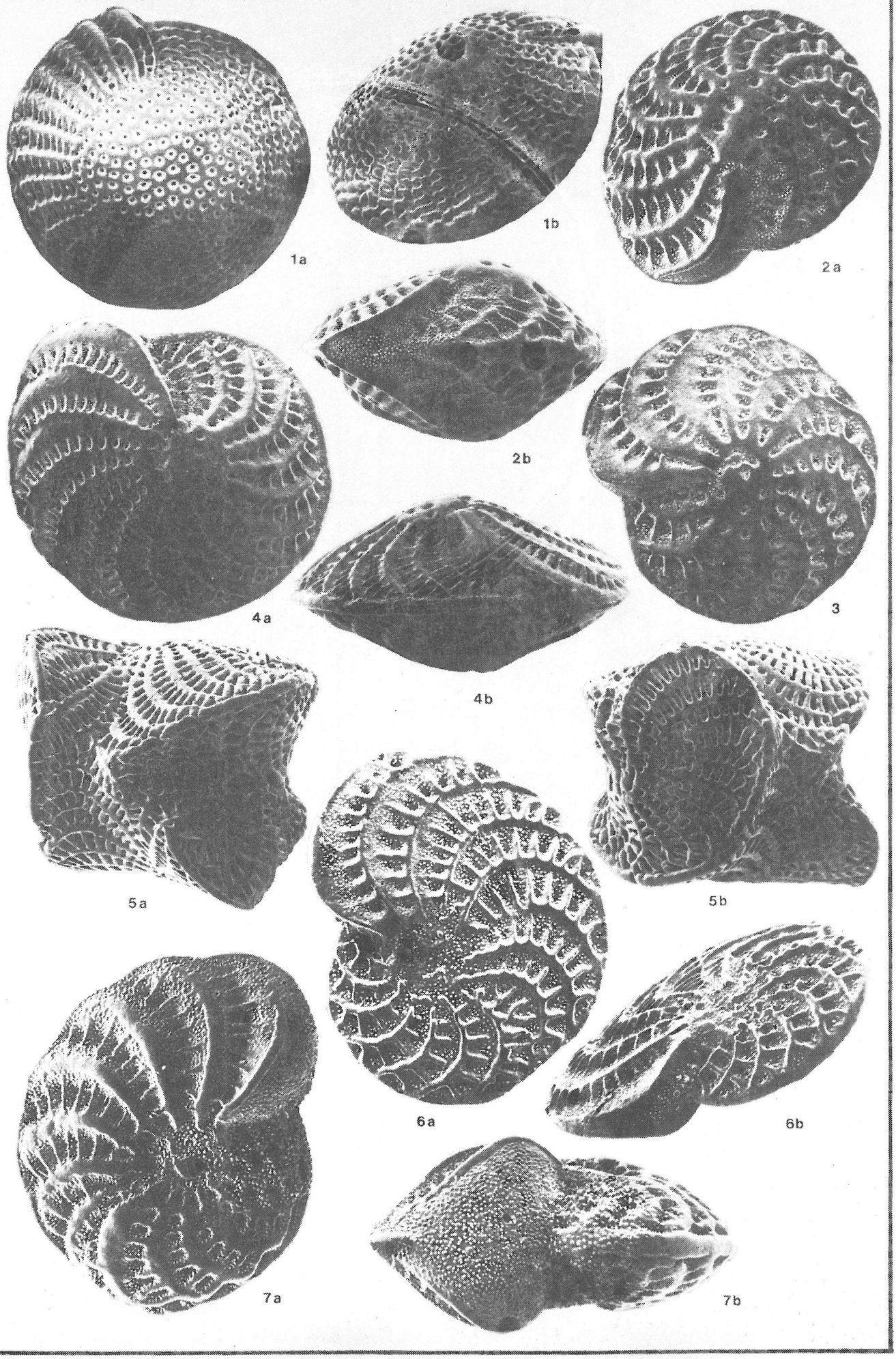


PLATE 104

Fig. 1 : Elphidium limbatum (CHAPMAN)

Oblique view of the specimen illustrated on pl. 103, fig. 7 (X 165).

Figs. 2 - 3 : Elphidium poeyanum (d'ORBIGNY)

Figs. 2a-b : Living specimen, Patchreef Area (L 274). Fig. 2a : Lateral view (X 181); fig. 2b : apertural view (note narrow depressed umbilicus) (X 181).
Figs. 3a-b : Slightly larger empty test; Western slope (L 100). Fig. 3a : Lateral view (X 130); fig. 3b : apertural view (note partially closed umbilicus) (X 123).

Figs. 4 - 6 : Elphidium galeraensis n.sp.

Figs. 4a-b : Paratype; empty test showing unusually low degree of secondary lamination; Eastern Perireefal Area (L 65). Fig. 4a : Lateral view (note umbilical chamber extensions being partially visible; note open parafossettes) (X 170); fig. 4b : apertural view (X 170).
Fig. 5 : Lateral view of paratype; empty test, Eastern Perireefal Area (L 83) (X 177).
Figs. 6a-d : Holotype; empty test, Eastern Perireefal Area (L 71). Fig. 6a : Lateral view (X 189); fig. 6b : apertural view (note test being completely smoothened by, and umbilical and sutural features being obscured by strong secondary lamination) (X 189); fig. 6c : close-up of test margin showing finely perforated chamber walls, narrow suture and ponticuli (X 980); fig. 6d : close-up showing part of apertural face and earlier-formed sutures almost completely filled up with secondary shell materal (X 385).

PLATE 104

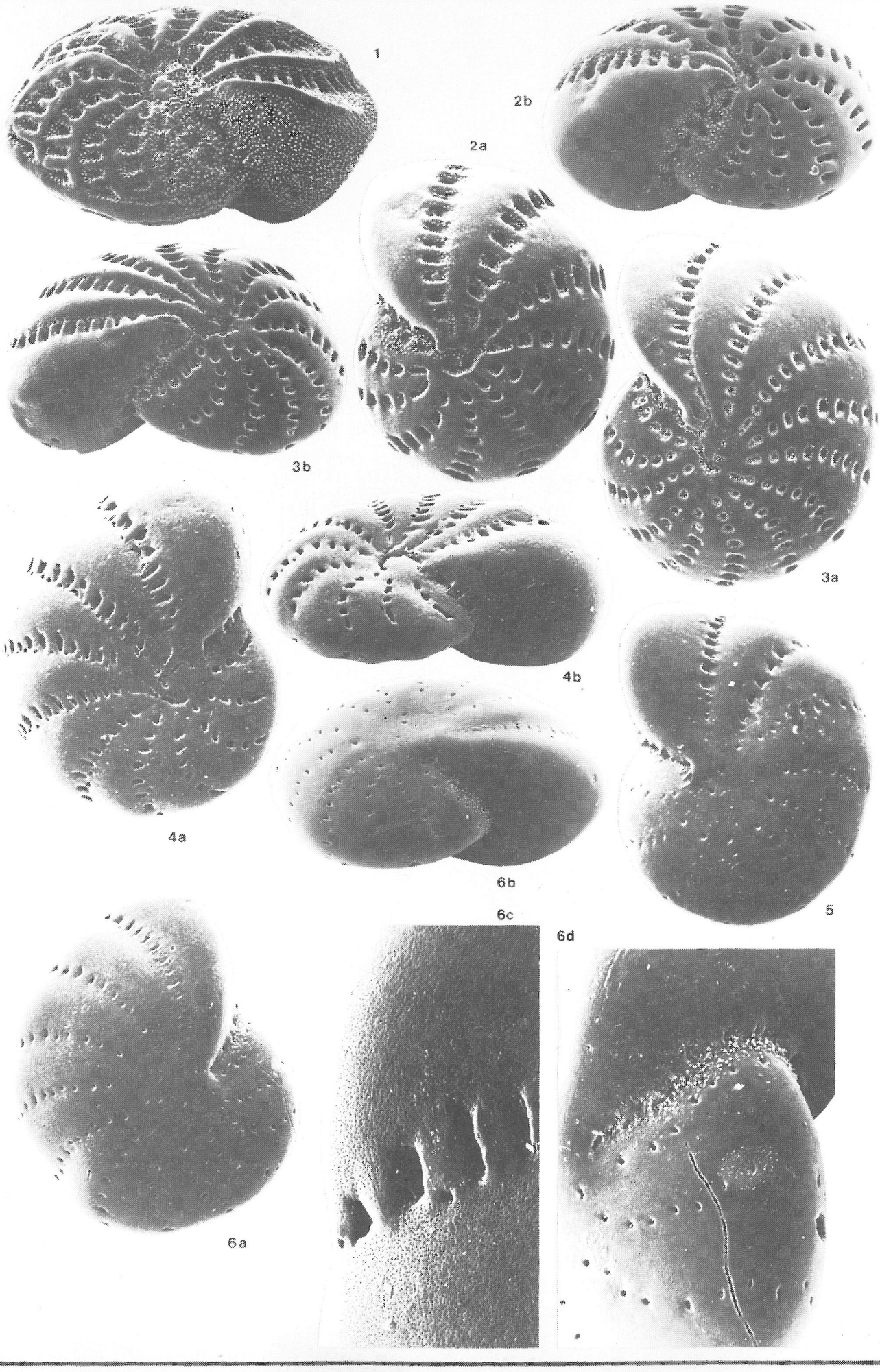


PLATE 105

Figs. 1 - 3 : Operculina ammonoides (GRONOVIUS)

Fig. 1 : Lateral view of living specimen; note oblique, depressed sutures of last few chambers; Eastern Perireefal Area (L 63) (X 23).

Fig. 2 : Edge view upon irregularly coiled, slightly damaged empty test (transition towards straighter, limbate sutures); Eastern Perireefal Area (L 65) (X 70).

Figs. 3a-b : Empty test, completely evolute specimen with almost straight, strongly limbate sutures; Eastern Perireefal Area (L 82).

Fig. 3a : Lateral view (note surface schulpture) (X 38); fig. 3b : edge view (note test compression) (X 37).

Figs. 4 - 6 : Nummulites cumingii (CARPENTER)

Fig. 4 : Empty test, slightly worn specimen; Eastern Perireefal Area (L 63) (X 20).

Fig. 5 : Lateral view of living specimen; Western Perireefal Area (L 106) (X 39).

Figs. 6a-b : Damaged, living specimen; Western Perireefal Area (L 109). Fig. 6a : Lateral view (note involute, poorly ornate test and limbate sutures) (X 46); fig. 6b : edge view (note broad marginal cord and septal openings of canal system) (X 46).

Figs. 7 - 8 : Heterostegina depressa d'ORBIGNY

Figs. 7a-b : Large, slightly damaged specimen; empty test, Eastern Perireefal Area (L 67). Fig. 7a : Lateral view (X 21); fig. 7b : edge view (X 21). Note involuteness of test.

Fig. 8 : Empty test, juvenile specimen; Coconut Fringing Reef flat (X 42).

PLATE 105

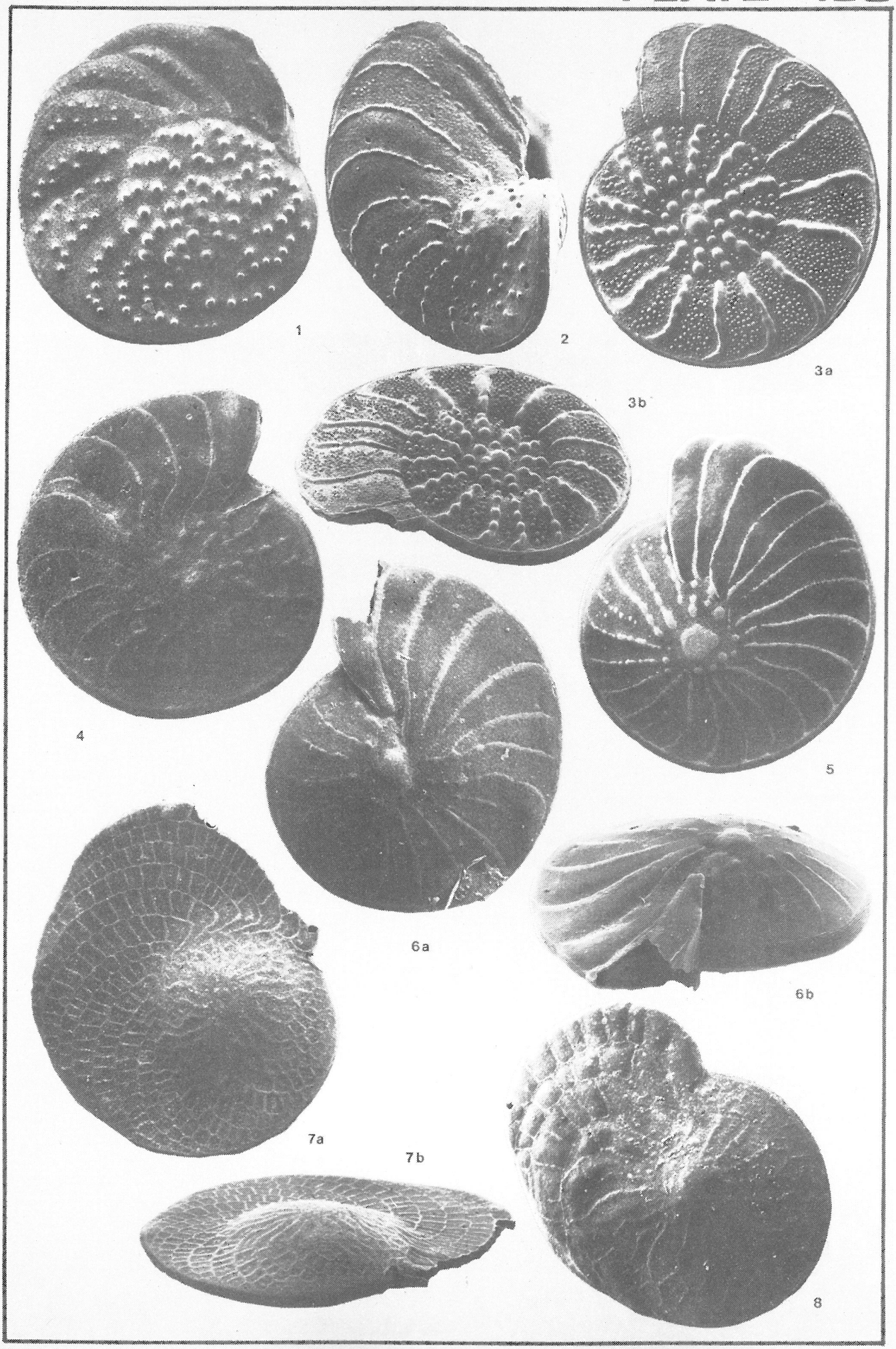


PLATE 106

Figs. 1 - 7 : Fursenkoina pauciloculata (BRADY)

Series of specimens illustrating variability ranging from elongate chambers, with or without a basal spike (figs. 1 to 4), to shorter chambers and a test shape close to F. schreibersiana (figs. 5 - 6). All specimens are empty tests from Eastern perireefal samples.

Fig. 1 : Lateral view (L 63) (X 287).

Fig. 2 : Lateral view of more ovate test (L 65) (X 428).

Fig. 3 : Lateral view (L 60) (X 431).

Fig. 4 : Lateral view (L 71) (X 265).

Fig. 5 : Lateral view (megalospheric specimen) (L 83) (X 317).

Figs. 6a-b : Microspheric (?) specimen with prominent basal spike (L 81).

Fig. 6a : Lateral view (X 174); fig. 6b : apertural view (X 174).

Fig. 7 : Apertural view of another specimen (note curved toothplate) (L 56) (X 396).

Figs. 8 - 9 : Sigmavirgulina tortuosa (BRADY)

Figs. 8a-b : Empty, slightly abraded test; Eastern Perireefal Area (L 63).

Fig. 8a : Lateral view (X 309); fig. 8b : apertural view (X 313).

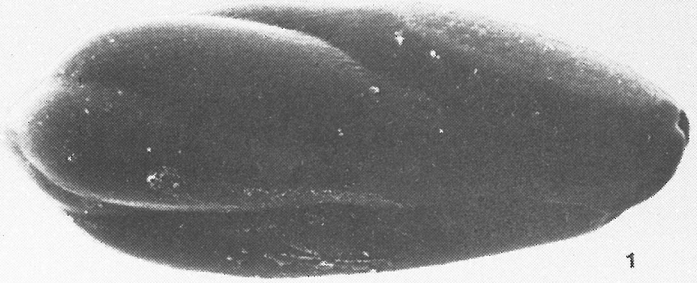
Fig. 9 : Lateral view of empty test, Coconut Fringing Reef flat (X 300).

Figs. 10 - 11 : Loxostomum (?) limbatum (BRADY)

Fig. 10 : Lateral view of empty test; Eastern Perireefal Area (L 60)(X 234).

Fig. 11 : Lateral view of empty, more irregularly striate-costate test; Eastern Perireefal Area (L 82) (X 177).

PLATE 106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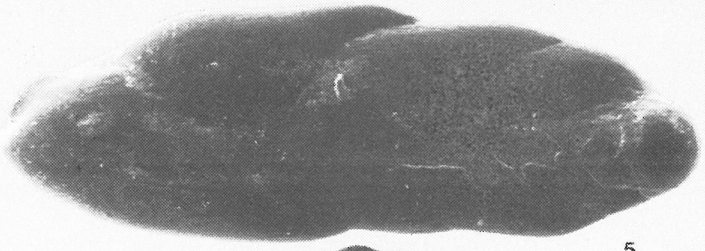
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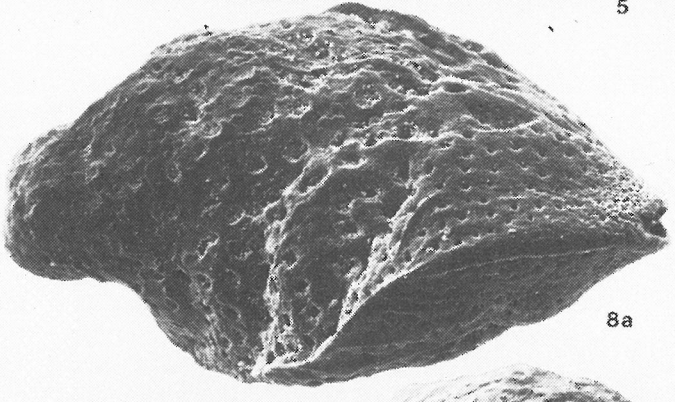
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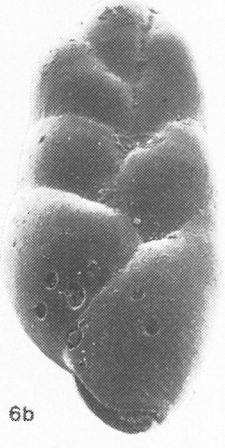
6a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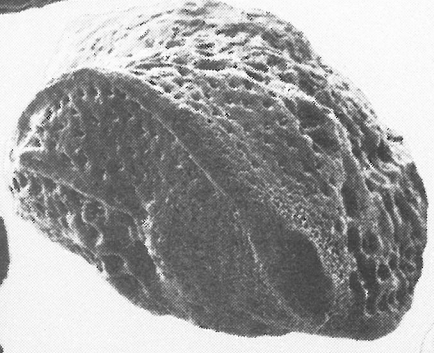
8b


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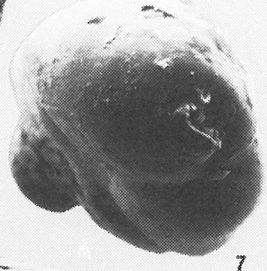
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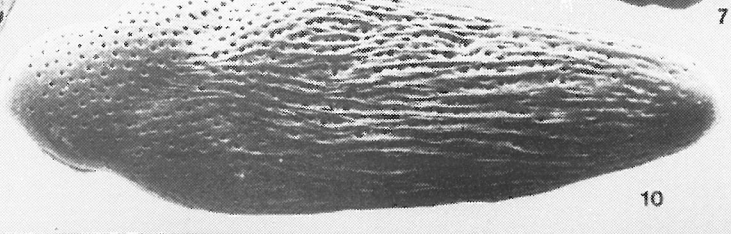
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PLATE 107

Figs. 1a-c : Globocassidulina oriangulata BELFORD

Figs. 1a, c : Empty test, Eastern Perireefal Area (L 90). Fig. 1a : Lateral view (X 375); fig. 1c : apertural view (X 375); fig. 1b : opposite side of another specimen; Eastern Perireefal Area (L 71) (X 575).

Figs. 2 - 3 : Nonion (?) gr. scaphum (FICHTEL & MOLL)

Figs. 2a-c : Empty test; asymmetrical specimen close to Nonionella bradyi with incised, almost straight sutures; Eastern Perireefal Area (L 50). Fig. 2a : Lateral, spiral view (X 389); fig. 2b : opposite, umbilical view (note narrow, deep umbilicus) (X 389); fig. 2c : apertural view (X 389).
Figs. 3a-c : Empty test; more or less symmetrical specimen with shorter last-formed chambers and somewhat limbate sutures. Lagoon (L 122). Fig. 3a : Lateral view (X 390); fig. 3b : lateral view of opposite side (X 390); fig. 3c : apertural view (X 390); fig. 3d : close-up of apertural-umbilical area; note relatively small, crescentic aperture (X 819).

PLATE 107

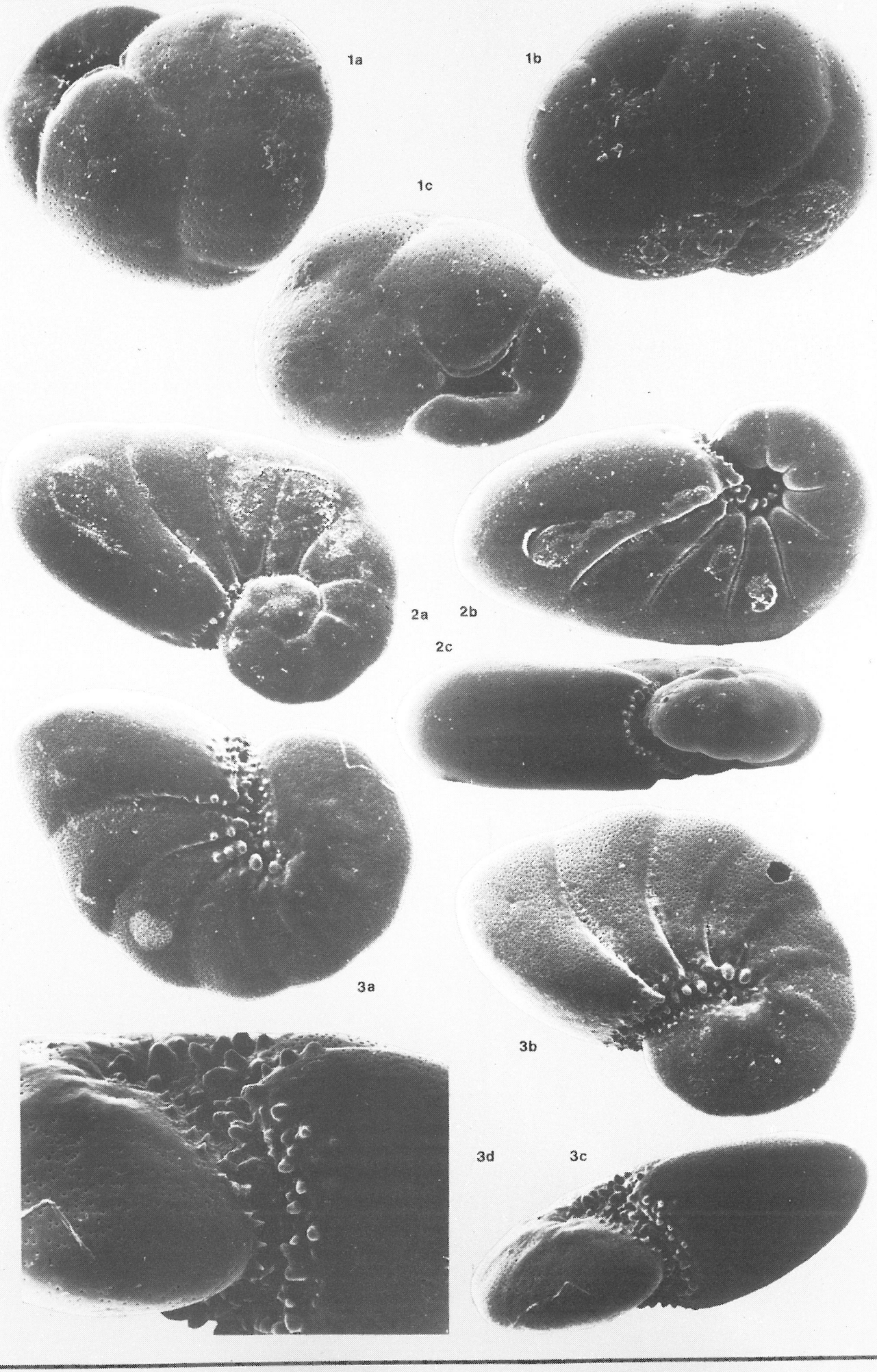


PLATE 108

Figs. 1 - 2 : Nonion subturgidum (CUSHMAN)

Fig. 1 : Lateral view of empty test; Eastern Perireefal Area (L 82) (X 150). Figs. 2a-b : Living specimen, Lagoon entrance (L 120). Fig. 2a : Lateral view showing traces of dried protoplasm in umbilical area (X 147); fig. 2b : apertural view (X 147).

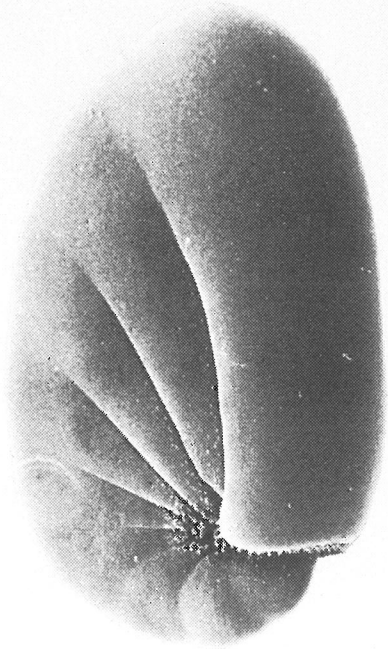
Figs. 3a-c : Nonionella amplilabrata BELFORD

Empty test, Eastern Perireefal Area (L 60). Fig. 3a : Lateral view, spiral side (X 365); fig. 3b : apertural view (X 365); fig. 3c : lateral view of umbilical side showing voluminous extension of final chamber (X 365).

Figs. 4a-b : Heterolepa praecincta (KARRER)

Fig. 4a : Spiral view of empty test, Eastern Perireefal Area (L 86) (X 64); fig. 4b : view upon umbilical side of another specimen; note thickened and raised sutures (final chamber has been broken away); Eastern Perireefal Area (L 67) (X 56).

PLATE 108



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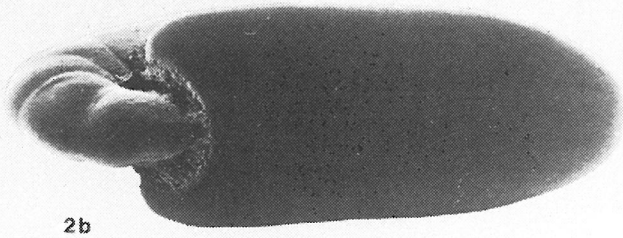
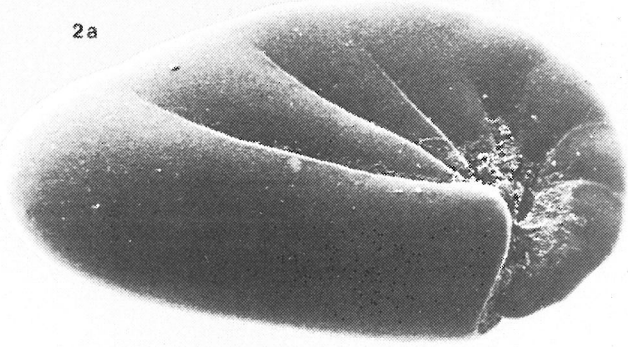


2b

2a





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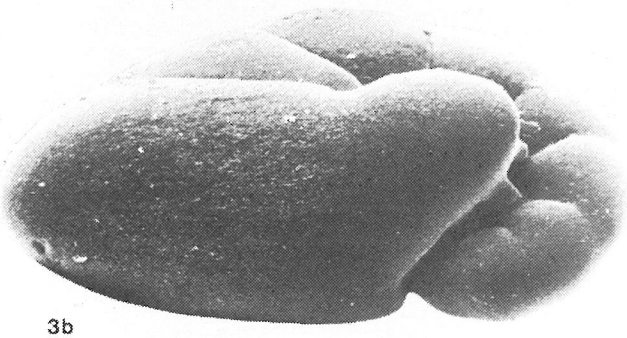

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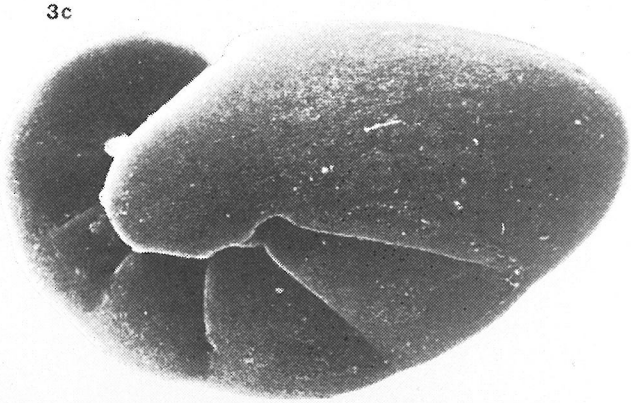

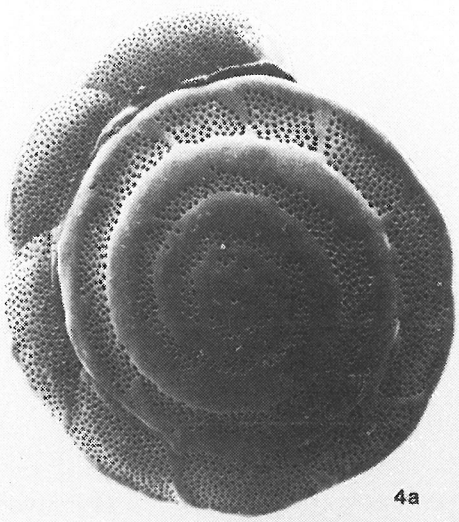

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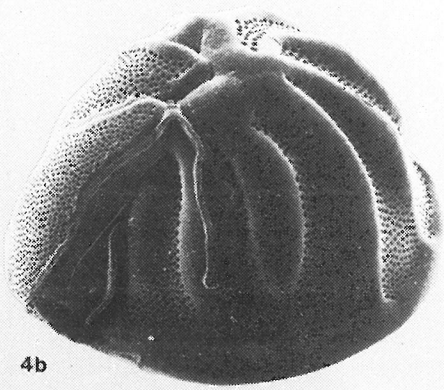


4b

PLATE 109

Figs. 1a-b : Anomalinella rostrata (BRADY)

Empty test, Eastern Perireefal Area (L 63). Fig. 1a : Lateral view (X 77); fig. 1b : apertural view (note areal apertures between primary- and peripheral apertures) (X 77).

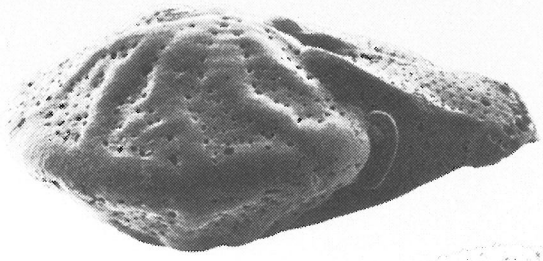
Figs. 2 - 4 : Globigerina bulloides d'ORBIGNY

Fig. 2 : Empty test, Western Perireefal Area (L 106); spiral view (X 367).
Figs. 3a-b : Empty test, Eastern Perireefal Area (L 60). Fig. 3a : Umbilical view (X 197); fig. 3b : oblique view (X 219).
Fig. 4 : Umbilical view of smaller, juvenile specimen; empty test, Eastern Perireefal Area (L 50) (X 278).

Figs. 5 - 6 : Globigerinoides ruber (d'ORBIGNY)

Fig. 5 : Empty test, Eastern Perireefal Area (L 60); oblique view (X 179).
Fig. 6 : Empty test, Eastern Perireefal Area (L 65); spiral view (X 190).

PLATE 109



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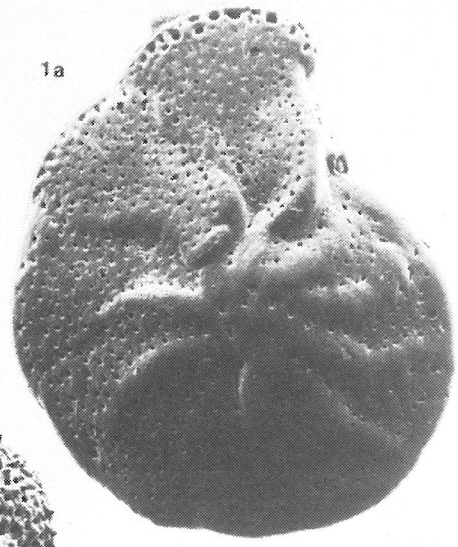

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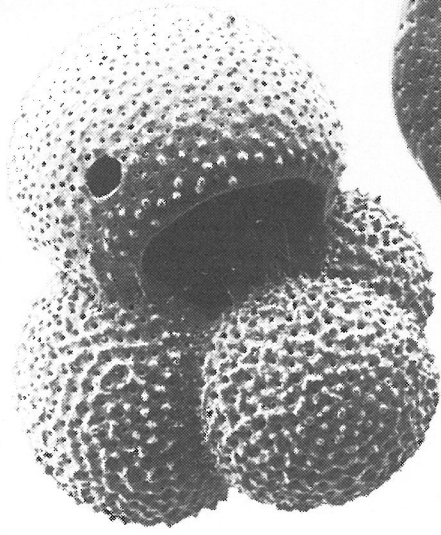

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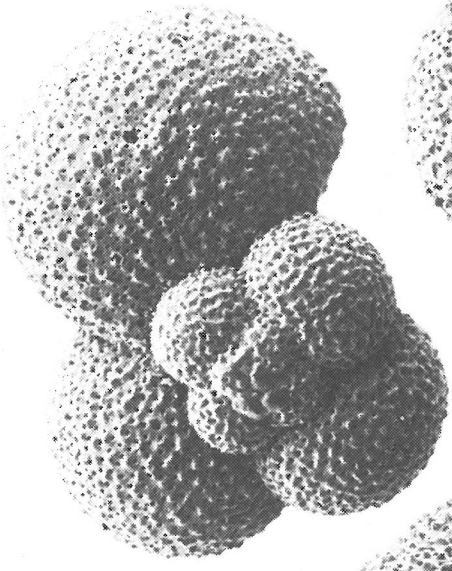

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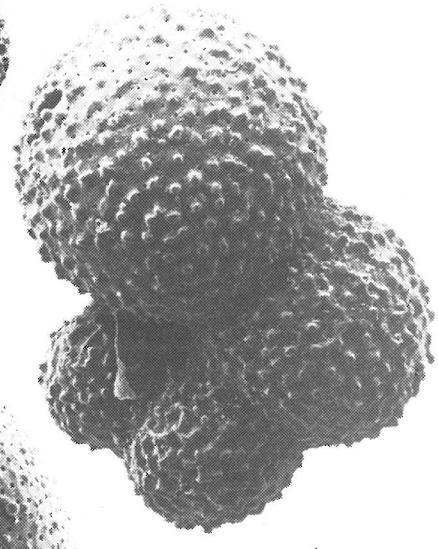

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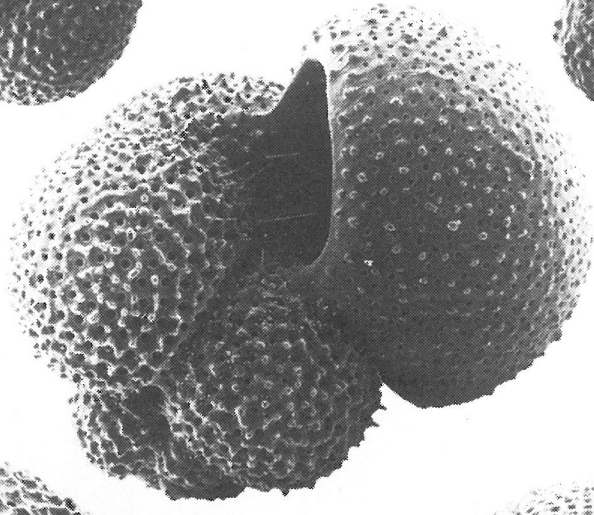

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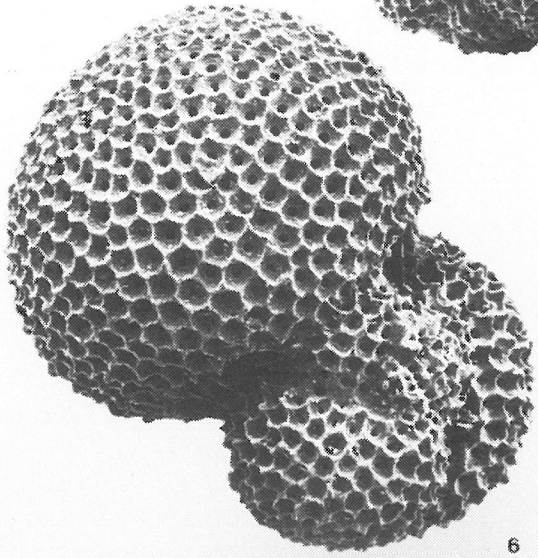

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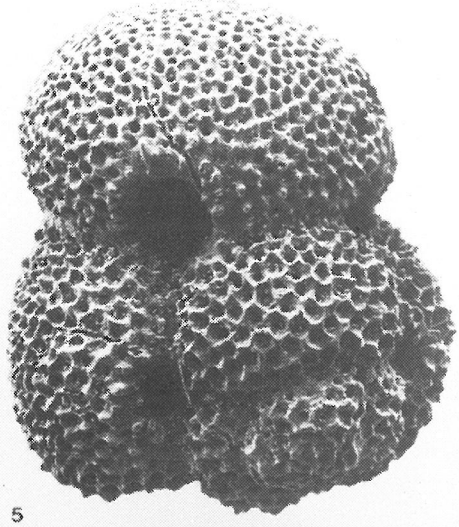

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