

TABLE 2

CALCAREOUS NANNOPLANKTON FROM THE YPRESIAN OF THE MOL WELL (31W-237, NORTHEAST BELGIUM)

CHRONOSTRATIGRAPHY		LITHOSTRATIGRAPHY		NANNOPLANKTON		SPECIES	
FORMATION	DEPTH (m)	LITHOLOGY (after GULICK, unpublished)	MEMBERS	FREQUENCY	PRESERVATION		
							MARTIN (1971)
Y P R E S I A N I E P E R F O R M A T I O N	not subdivided						
	350	Egem sand					
	352.0						
	355.80	Kortemark silt					
	358.50						
	361.25						
	362.80	Aalbeke clay					
	366.00						
	370						
	370.80						
	374.50						
	376.30						
	380						
	380.80	Mons-en-Pévèle sand					
	382.60						
	383.00						
	384.80						
	385.80						
	386.80						
	388.50						
	390						
	390.80						
	392.20						
	394.70						
	396.50						
398.80							
400							
406.50							
409.10							
415.20							
418.80							
422.50							
424.50	Orchies clay						
430							
434.50							
437.80							
439.50							
440.80							
442.20							
450	Grandglise sand						

LEGEND

heavy clay, silty clay, clayey fine sand, very fine sand and slightly clayey, very fine sand, stratified fine sand, sandstones, bioturbations, nummulites, phosporic nodules

P = poor, M = moderate, H = major hiatus, C = contamination (mostly Oligocene)

calcareous nodules

● = abundant: 5 to 10 specimens per field of view at x1000
○ = common: 1 specimen per field of view at x1000
○ = few: 1 specimen per 5 fields of view at x1000
○ = rare: 1 specimen per 20 to 25 fields of view at x1000

E.S.1988

TABLE 3

CALCAREOUS NANNOFOSSILS FROM THE BOSSUIT CANAL SECTION, LECTOSTROTOTYPE OF THE ROUBAIX CLAY MEMBER MOEN, W-FLANDERS BELGIUM.				CHRONOSTRATIGRAPHY		LITHOSTRATIGRAPHY		SECTION STUDIED IN STEURBAUT & NOLF, 1986		NANNOPLANKTON	
				HEIGHT in m.		LITHOLOGY		SAMPLES		MARTINI (1971) ZONE	

EXPLANATION OF THE PLATES

Plates, and figures within each plate, are ordered by first occurrence of species in the different lithostratigraphic units recognised. Sample locality, level or depth (see Fig. 2 for locations and STEURBAUT & NOLF, 1986 for sample descriptions) and biostratigraphic indications (nanno-zonation of STEURBAUT, 1986; refined in this paper) are given for each species. Dark-coloured figures are illustrated by cross-polarised light, others by transmitted light. Scale bar represents 5 μ m. Slides and negatives of micrographs are stored in the Laboratorium voor Paleontologie, Krijgslaan 281/S8, B-9000 Gent.

PLATE 1

Morlanwelz Argilite Member, Gouy-lez-Piéton, motorway cutting at junction E42-R3; top of nanno-zone I, NP11.

- Fig. 1 : *Discoaster multiradiatus* BRAMLETTE & RIEDEL, 1954
distal view.
Fig. 2 : *Pontosphaera fimbriata* (BRAMLETTE & SULLIVAN, 1961)
proximal view.
Fig. 3 : *Tribrachiatus orthostylus* SHAMRAI, 1963
plane view.
Fig. 7 : *Chiasmolithus consuetus* (BRAMLETTE & SULLIVAN, 1961)
proximal view.

Orchies Clay Member, Kallo borehole (27E-148); top nanno-zone I, NP11.

- Fig. 4 : *Discoaster diastypus* BRAMLETTE & SULLIVAN, 1961
337 m depth; side view.
Fig. 5 : *Pontosphaera fimbriata* (BRAMLETTE & SULLIVAN, 1961)
337 m depth; proximal view.
Fig. 6 : *Tribrachiatus orthostylus* SHAMRAI, 1963
360 m depth; plane view.
Fig. 8 : *Toweius magnicrassus* (BUKRY, 1971)
337 m depth; distal view.

Roubaix Clay Member, nanno-zones II and III.

- Fig. 9 : *Semihololithus kerabyi* PERCH-NIELSEN, 1971
Kallo borehole (27E-148), 318.50 m depth; nanno-zone IIb, NP11; side view.
Fig. 10-11 : *Rhabdosphaera sola* PERCH-NIELSEN, 1971
10. Bossuit Canal section, Moen, sample N3; nanno-zone IIIa1, upper part NP11; side view.
11. Kallo borehole (27E-148), 318.50 m depth; nanno-zone IIb, NP11; side view.
Fig. 12 : *Chiasmolithus consuetus* (BRAMLETTE & SULLIVAN, 1961)
Kallo borehole (27E-148), 314.15 m depth; nanno-zone IIIa1, NP11; distal view.
Fig. 13-14 : *Zygrhablithus bijugatus* subsp. *nolfii* n. subsp.
Kallo borehole (27E-148); side view.
13. 314.15 m depth; nanno-zone IIIa1, NP11; paratype.
14. 318.50 m depth; nanno-zone IIb, NP11; paratype.
Fig. 15 : *Holodiscolithus* sp.
Bossuit Canal Section, Moen, Sample N3; nanno-zone IIIa1, NP11; proximal view.
Fig. 16-22 : *Aubryosphaera deconinckii* n. sp.
16. Kruishoutem borehole (84E-1362I), sample 8, 41.50 m depth; nanno-zone IIIb2, base NP12; paratype; a. low focus, basal face; b. high focus, upper face.
17. Lauwe, sample 1, lowermost part of quarry "Céramique et Briqueteries du Littoral"; nanno-zone IIIb2, base NP12; paratype; a. high focus, upper face; b. low focus, basal face.
18. Lauwe, ibidem; upper face; paratype.
19. Kruishoutem borehole (84E-1362I), sample 8 (see Fig. 16); side view, parallel to central axis; paratype.
20. Lauwe, sample 1 (see Fig. 17); side view, perpendicular to central axis; paratype.
21. Kruishoutem borehole (84E-1362I), sample 8 (see Fig. 16); paratype; a. high focus, upper face; b. low focus, basal face.
22. Kruishoutem borehole (84E-1362I), sample 8; 41.50 m depth; nanno-zone IIIb2, base NP12; holotype; a. & b. high focus, upper face; c. low focus, basal face.
Fig. 24 : *Aubryosphaera deconinckii* n. sp.
Kruishoutem borehole (84E-1362I), sample 8, 41.50 m depth; nanno-zone IIIb2, base NP12; upper face; paratype.

Mons-en-Pévèle Sand Member, Steenhuize-Wijnhuize (Herzele) borehole (86W-142 VII, C), 18 m depth; nanno-zone IIIb2, base NP12.

- Fig. 23 : *Aubryosphaera deconinckii* n. sp.
upper face; paratype.

Pl.1

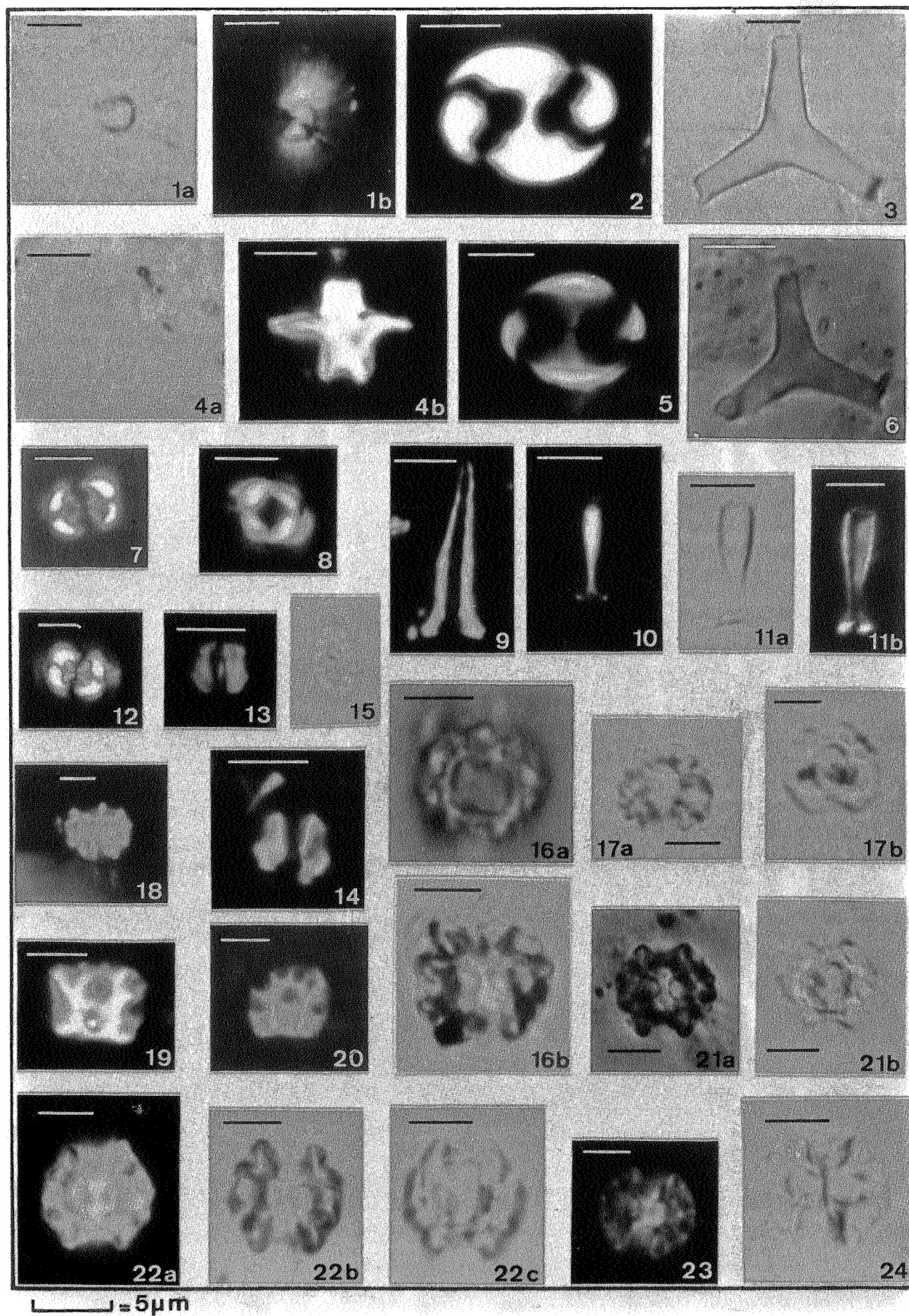
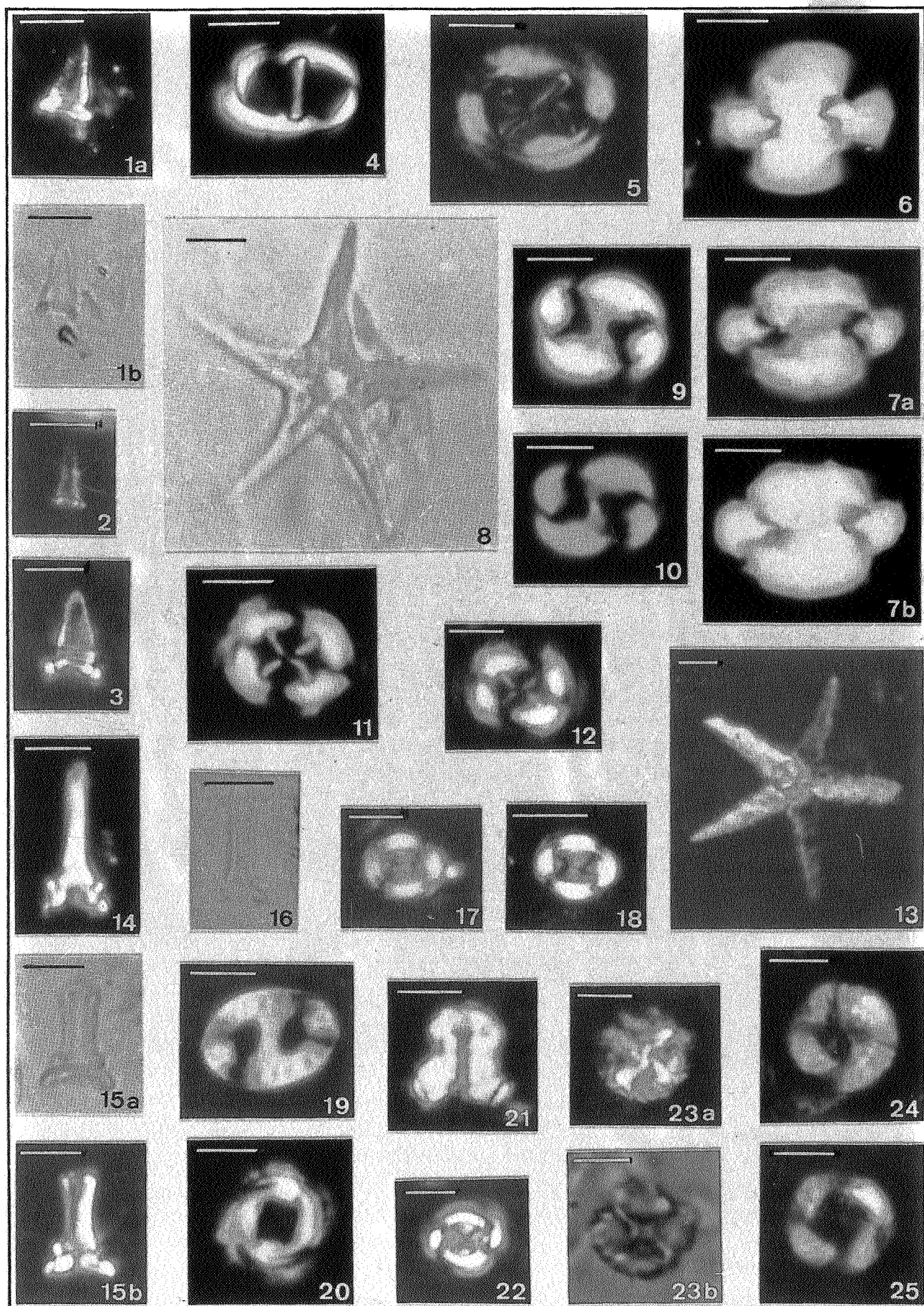


PLATE 2

Roubaix Clay Member, nanno-zone III.

- Fig. 1-3 : *Naninfula dupuisii* n. sp.
side view; nanno-zone IIIa₁, upper part NP11.
1. Ooigem borehole (83E-407), 35.50m depth; paratype.
2. Kallo borehole (27E-148), 310.80m depth; paratype.
3. Ooigem borehole (83E-407), 38.50m depth; paratype.
- Fig. 4 : *Lophodolithus nascens* BRAMLETTE & SULLIVAN, 1961
Kruishoutem borehole (84E-1362I), sample 8, 41.50m depth; nanno-zone IIIb₂, base NP12; distal view.
- Fig. 5 : *Chiasmolithus eograndis* PERCH-NIELSEN, 1971
Bossuit Canal section, Moen, sample N9; nanno-zone IIIb₂, base NP12; distal view.
- Fig. 6-7 : *Ellipsolithus macellus* (BRAMLETTE & SULLIVAN, 1961)
6. Ooigem borehole (83E-407); 33.50m depth; nanno-zone IIIa₂, top NP11; distal view.
7. Tielt borehole (68E-169), 102.50m depth; nanno-zone IIIa₁, NP11; distal view.
- Fig. 8 : *Discoaster lodoensis* BRAMLETTE & RIEDEL, 1954
Marke, clay pit Koekelberg, sample N6; nanno-zone IIIb₂, NP12; distal view.
- Fig. 9-10 : *Pontosphaera fimbriata* (BRAMLETTE & SULLIVAN, 1961)
distal view.
9. Kruishoutem borehole (84E-1362I), sample 8, 41.50m depth; nanno-zone IIIb₂, base NP12.
10. Bossuit Canal section, sample N3; nanno-zone IIIa₁; upper part NP11.
- Fig. 11-12 : *Chiasmolithus consuetus* (BRAMLETTE & SULLIVAN, 1961)
distal view.
11. Melle borehole (70E-183), 67m depth; nanno-zone IIIb, zone NP12.
12. Kruishoutem borehole (84E-1362I), sample 8, 41.50m depth; nanno-zone IIIb₂, base NP12.
- Fig. 14-16 : *Rhabdosphaera truncata* BRAMLETTE & SULLIVAN, 1961
side view; nanno-zone IIIb₂, base NP12.
14. Kruishoutem borehole (84E-1362I), sample 8, 41.50m depth.
15. Marke, clay pit Koekelberg, sample N6.
16. Kruishoutem borehole, sample 8 (see Fig. 14).
- Fig. 18 : *Toweius* sp.
Ooigem borehole (83E-407), 26.50m depth; nanno-zone IIIb₃, NP12; distal view.
- Fig. 19 : *Pontosphaera pulchra* (DEFLANDRE in DEFLANDRE & FERT, 1954)
Ooigem borehole (83E-407), 38.50m depth; nanno-zone IIIa₁, upper part NP11; proximal view.
- Fig. 20 : *Toweius magnicrassus* (BUKRY, 1971)
Kallo borehole (27E-148), 308.50m depth; nanno-zone IIIa₂, top NP11; proximal view.
- Fig. 21 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
Kallo borehole, 303.90m depth; nanno-zone IIIb₃, NP12; side view.
- Fig. 22 : *Cruciplacolithus cribellus* (BRAMLETTE & SULLIVAN, 1961)
Ooigem borehole, 35.50m depth; nanno-zone IIIa₁, NP11; distal view.
- Fig. 24-25 : *Hayella* sp.
Bossuit Canal section, Moen; nanno-zone IIIb₂, NP12; distal view.
24. Sample N9;
25. Sample N10.
- Mons-en-Pévèle Sand Member, Steenhuize-Wijhuize (Herzele) borehole (86W-142 VII, C); nanno-zone IIIb₂, base NP12.
- Fig. 13 : *Micrantholithus mirabilis* LOCKER, 1965
18.00m depth; proximal view.
- Fig. 17 : *Toweius* sp.
24.50m depth; distal view.
- Fig. 23 : *Chiphragmalithus calathus* BRAMLETTE & SULLIVAN, 1961
18.00m depth; distal view.



— = 5 μ m

PLATE 3

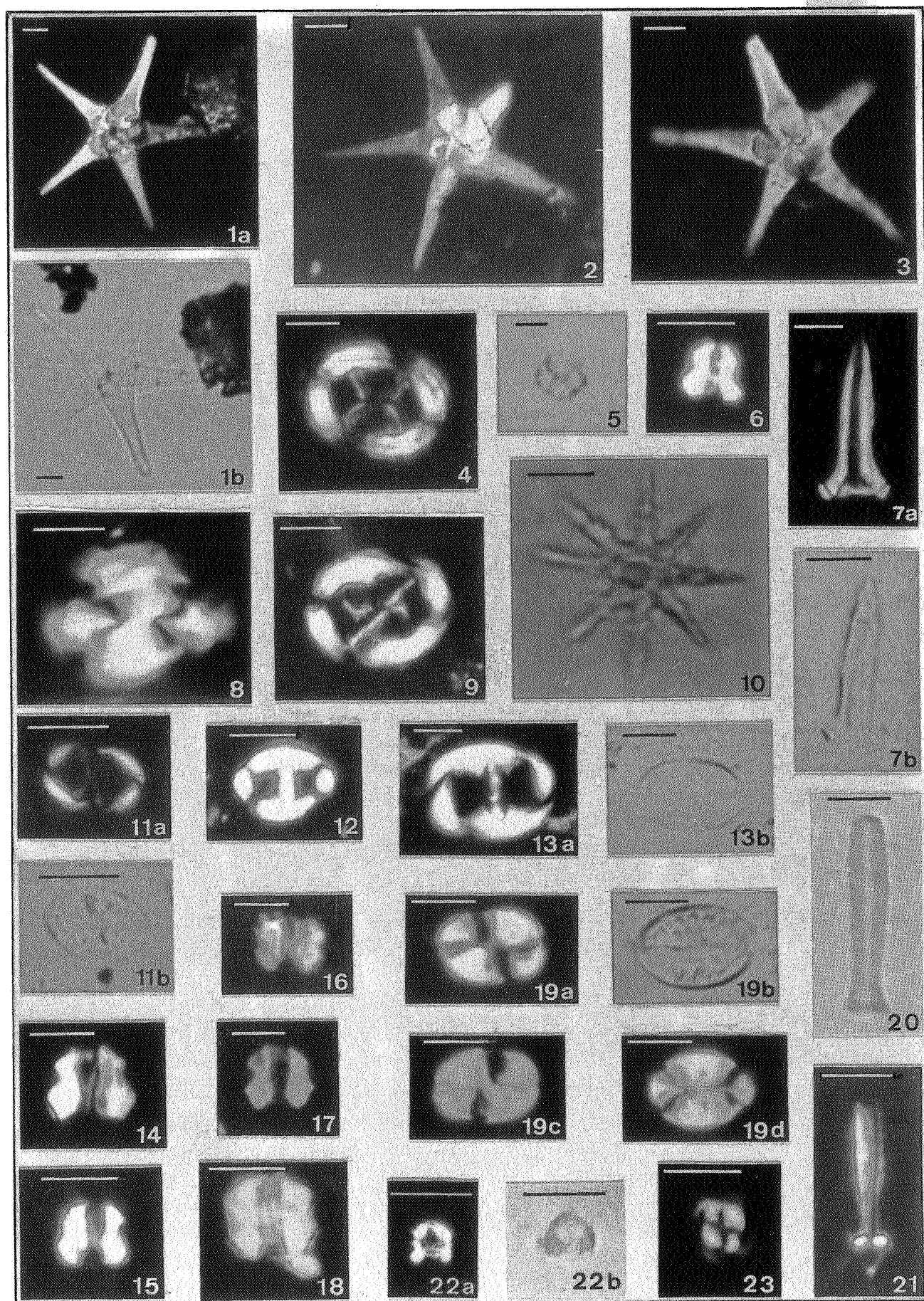
Roubaix Clay Member; nanno-zone IV and V.

- Fig. 1-3 : *Micrantholithus mirabilis* LOCKER, 1965.
 1. Kallo borehole, 297 m depth; nanno-zone IV, NP12; proximal view.
 2. Moeskroen, "Bois Fichau" clay pit, 17.60 m depth; nanno-zone V, NP12; proximal view.
 3. Kallo borehole, 295 m depth; nanno-zone V, NP12; proximal view.
- Fig. 4 : *Chiasmolithus* aff. *expansus* (BRAMLETTE & SULLIVAN, 1961)
 Moeskroen, "Bois Fichau" clay pit, 17.60 m depth; nanno-zone V, NP12; distal view.
- Fig. 5 : *Chiphragmalithus calathus* BRAMLETTE & SULLIVAN, 1961
 Moeskroen, "Bois Fichau" clay pit, 17.60 m depth; nanno-zone V, NP12; distal view.
- Fig. 6 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 Ooigem borehole, 22 m depth; nanno-zone IV, NP12; side view.

Mons-en-Pévèle Sand Member; nanno-zones II and III.

- Fig. 7 : *Semihololithus kerabyi* PERCH-NIELSEN, 1971
 Mol borehole (31W-237), 394.70 m depth; nanno-zone IIIa1, NP11; side view.
- Fig. 8 : *Ellipsolithus macellus* (BRAMLETTE & SULLIVAN, 1961)
 Mol borehole, 394.70 m depth; nanno-zone IIIa1, NP11; proximal view.
- Fig. 9 : *Chiasmolithus eograndis* PERCH-NIELSEN, 1971
 Mol borehole, 390.80 m depth; nanno-zone IIIa1, NP11; distal view.
- Fig. 10 : *Discoaster binodosus* MARTINI, 1958
 Mol borehole, 392.20 m depth; nanno-zone IIIa1, NP11; distal view.
- Fig. 11 : *Neochiastozygus concinnus* (MARTINI, 1961)
 Mol borehole, 394.70 m depth; nanno-zone IIIa1, NP11; distal view.
- Fig. 12 : *Zygodiscus plectopons* BRAMLETTE & SULLIVAN, 1961
 Mol borehole, 394.70 m depth; nanno-zone IIIa1, NP11; distal view.
- Fig. 13 : *Zygodiscus adamas* BRAMLETTE & SULLIVAN, 1961
 Mol borehole, 392.20 m depth; nanno-zone IIIa1, NP11; proximal view.
- Fig. 14-18 : *Zygrhablithus bijugatus* subsp. *nolfii* n. subsp.
 side view; cross-polarised light.
 14. Mol borehole, 394.70 m depth; nanno-zone IIIa1, NP11; holotype.
 15. Mol borehole, 386.80 m depth; nanno-zone IIIa2, top NP11; paratype.
 16. Mont Panisel borehole (151E-340), 39.85 m depth; nanno-zone IIIa1, NP11; paratype.
 17. Mol borehole, 394.70 m depth; nanno-zone IIIa1, NP11; paratype.
 18. Mont Panisel borehole, 41.75 m depth; nanno-zone IIb, NP11; paratype.
- Fig. 19 : *Pontosphaera kingii* n. sp.
 Mol borehole, 386.80 m depth; nanno-zone IIIa2, top NP11; proximal view; holotype, a. viewed at 25° in clockwise direction, b. & d. viewed at 45° to the polarisation directions; c. almost parallel to the polarisation directions.
- Fig. 20-21 : *Rhabdosphaera sola* PERCH-NIELSEN, 1971
 Mol borehole, side view.
 20. 394.70 m depth; nanno-zone IIIa1, NP11.
 21. 398.50 m depth; nanno-zone II, NP11.
- Fig. 22 : *Naninfula* sp.
 Mol borehole, 388.50 m depth; nanno-zone IIIa1, NP11; side view.
- Fig. 23 : *Toweius pertusus* (SULLIVAN, 1965)
 Mol borehole, 394.70 m depth; nanno-zone IIIa1, NP11; distal view.

Pl. 3



$5\mu\text{m}$

PLATE 4

Mons-en-Pévèle Sand Member

- Fig. 1-4 : *Naninfula dupuisii* n. sp.
Mol borehole (31W-237); nanno-zone IIIa₁, NP11; side views.
1. 394.70 m depth, paratype;
2. 388.50 m depth, paratype;
3. 388.50 m depth, holotype;
4. 388.50 m depth, paratype.
- Fig. 5-6 : *Pontosphaera exilis* (BRAMLETTE & SULLIVAN, 1961)
5. Mol borehole, 394.70 m depth; nanno-zone IIIa₁, NP11; proximal view.
6. Mons-en-Pévèle, sample G55/4; nanno-zone IIIa₁, NP11; distal view.
- Fig. 7 : *Neochiastozygus junctus* (BRAMLETTE & SULLIVAN, 1961)
Rillaar borehole (75E-128), 127 m depth; nanno-zone IIIa₁, NP11; distal view.
- Fig. 8 : *Calcidiscus* aff. *protoannulus* (GARTNER, 1971)
Rillaar borehole (75E-128), 128 m depth; nanno-zone IIIa₁, NP11; distal view; coccosphere.
- Fig. 9-10 : *Rhabdosphaera truncata* BRAMLETTE & SULLIVAN, 1961
side view.
9. Kwaadmechelen borehole (46E-179), interval 219.80-224 m depth; nanno-zone IIIb₂, base NP12.
10. Mons-en-Pévèle, sample G55/5; nanno-zone IIIa₁, NP11.
11. Ronse, Waaienberge, sample 1, 11 m below surface; nanno-zone IIIb₂, base NP12.
- Fig. 12 : *Ellipsolithus macellus* (BRAMLETTE & SULLIVAN, 1961)
Mons-en-Pévèle, sample G55/4; nanno-zone IIIa₁, NP11; proximal view.
- Fig. 13-15 : *Aubryosphaera deconinckii* n. sp.
nanno-zone IIIb₂; base NP12, paratypes.
13. Kwaadmechelen borehole (46E-179), interval 219.80-224 m depth; upper face.
14. Kwaadmechelen borehole; interval 219.80-224 m depth; basal face.
15. Ronse, Waaienberge, sample 1, 11 m below surface; upper face.
- Fig. 16-17 : *Toweius magnicrassus* (BUKRY, 1971).
16. Mont-Panisel borehole (151E-340), 41.75 m depth; nanno-zone IIb, NP11; distal view.
17. Ronse, Waaienberge, sample 1, 11 m below surface; nanno-zone IIIb₂, NP12; distal view.
- Fig. 18 : *Chiphragmalithus calathus* BRAMLETTE & SULLIVAN, 1961
Mont-Panisel borehole (151E-340), 39.85 m depth; nanno-zone IIIa₁, NP11; distal view.
- Fig. 19 : *Discoaster lodoensis* BRAMLETTE & RIEDEL, 1954
Ronse, Waaienberge, sample 1, 11 m below surface; nanno-zone IIIb₂, NP12; proximal view.
- Fig. 20 : *Pontosphaera excelsa* (PERCH-NIELSEN, 1971)
Mol borehole (31W-237), 382.80 m depth; nanno-zone IIIb₃, NP12; proximal view.
- Fig. 21 : *Discoaster barbadiensis* TAN SIN HOK, 1927
Mons-en-Pévèle, sample G55/4; nanno-zone IIIa₁, NP11; distal view.
- Fig. 22 : *Pentaster* sp.
Kwaadmechelen borehole (46E-179); interval 219.80-224 m depth; nanno-zone IIIb₂, NP12; plane view.

Pl. 4

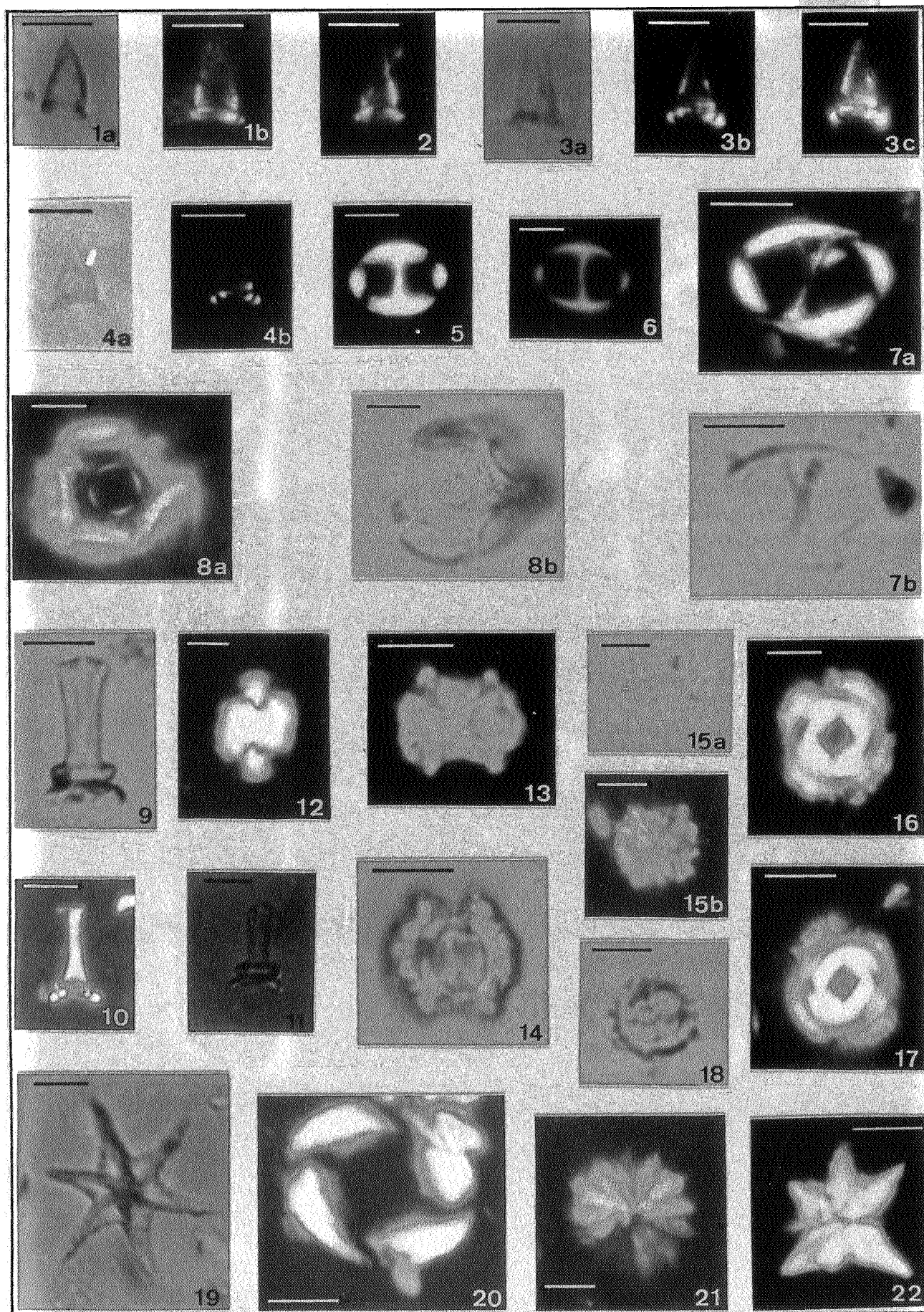
— = 5 μ m

PLATE 5

Mons-en-Pévèle Sand Member, nanno-zones III and IV

- Fig. 1-3 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959).
 1. Ronse, Waaienberge, sample 1, 11 m below surface; nanno-zone IIIb₂, NP12; side view.
 2-3. Mol borehole, 376.30 m depth; nanno-zone IV, NP12; side views.
- Fig. 4-5 : *Discoaster lodoensis* BRAMLETTE & RIEDEL, 1954
 Mol borehole; nanno-zone IV, NP12.
 4. 376.30 m depth; 5-rayed specimen; proximal view.
 5. 374.50 m depth; 6-rayed specimen; proximal view.
- Fig. 6-7 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 Mol borehole; nanno-zone IV, NP12; side views.
 6. 370.80 m depth;
 7. 374.50 m depth.

Kortemark Silt Member; Kallo borehole (27E-148), 265 m depth; nanno-zone VIb, NP12.

- Fig. 8 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 side view.
- Fig. 9 : *Discoaster lodoensis* BRAMLETTE & RIEDEL, 1954
 7-rayed specimen; proximal view.
- Fig. 10 : *Discoaster elegans* BRAMLETTE & SULLIVAN, 1961
 distal view.
- Fig. 11 : Inc. sed. sp.
 plane view.
- Fig. 12 : *Discoaster mirus* DEFLANDRE in GRASSE, 1952
 distal view.

Egem Sand Member, nanno-zones VII and VIII, NP12.

- Fig. 13 : *Toweius occultatus* (LOCKER, 1967)
 Kallo borehole (27E-148), 242.60 m depth; nanno-zone VIII, top NP12; distal view.
- Fig. 14 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 Kallo borehole, 242.60 m depth; nanno-zone VIII, top NP12; side view.
- Fig. 16 : *Chiphragmalithus armatus* PERCH-NIELSEN, 1971
 Kallo borehole, 242.60 m depth; nanno-zone VIII, top NP12; distal view.
- Fig. 17 : *Chiasmolithus grandis* BRAMLETTE & RIEDEL, 1954
 Mol borehole, 354.20 m depth; nanno-zone VIII, top NP12; proximal view.
- Fig. 20 : *Pontosphaera fimbriata* (BRAMLETTE & SULLIVAN, 1961)
 Maldegem borehole (39W-213), 101.50 m depth; nanno-zone VII, NP12; distal view.

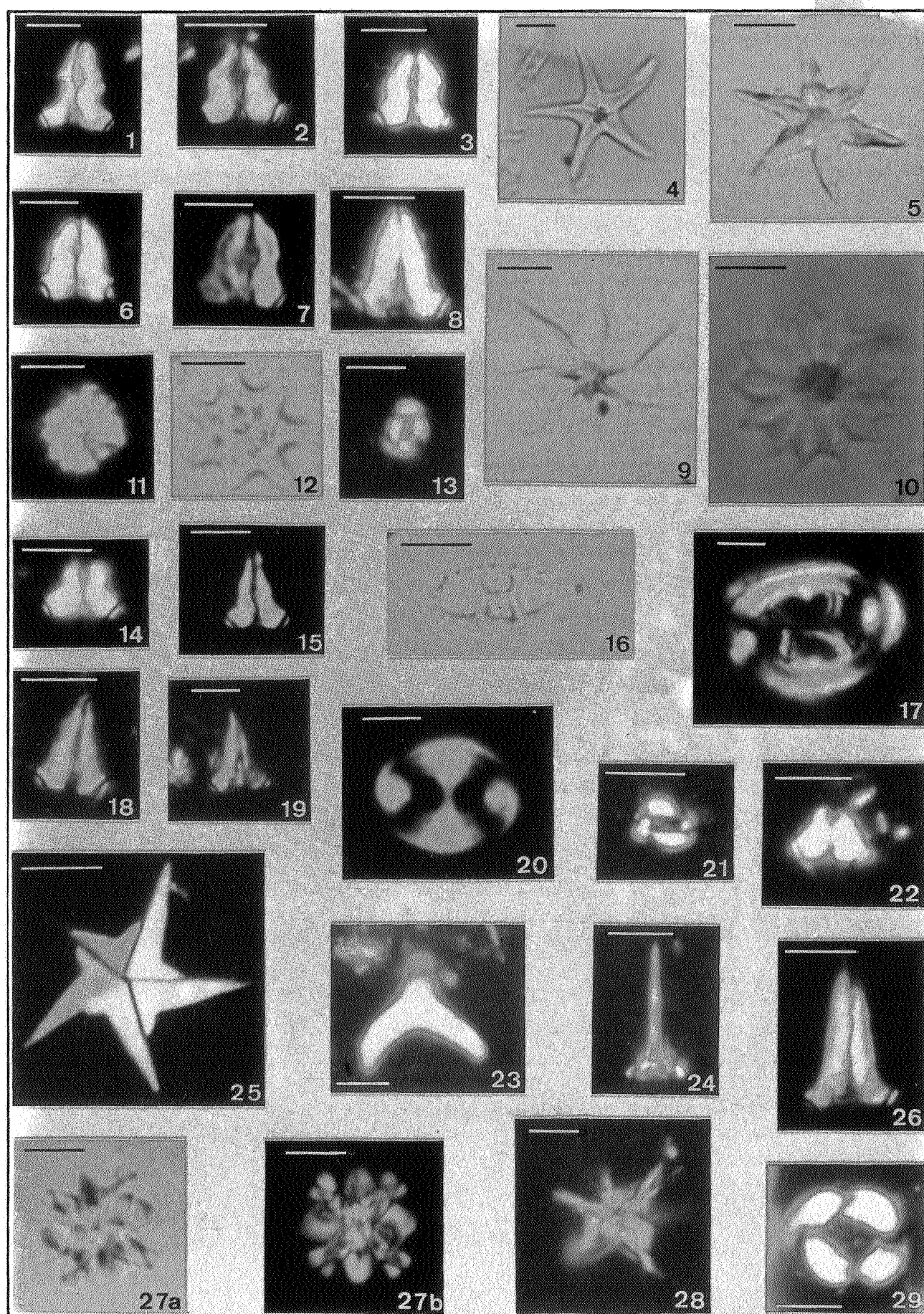
Panisel Sand Member; nanno-zones VII and VIII, upper part NP12.

- Fig. 15 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 Steenuize-Wijnhuize (Herzele) borehole (86W-142, VII, C), sample 7, 6.50 m depth; nanno-zone VII, NP12; side view.
- Fig. 18-19 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 18. Mater borehole (85W-18), sample 7, 30 m depth; nanno-zone VII, NP12; side view.
 19. Schepdaal borehole (87E-5), 13.50 m depth; nanno-zone VIII(base), top NP12; side view.
- Fig. 21 : *Reticulofenestra* sp.
 Mater borehole (85W-18), sample 7, 30 m depth; nanno-zone VII, NP12; proximal view.
- Fig. 22 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 Mater borehole, sample 7, 30 m depth; nanno-zone VII, NP12; side view.
- Fig. 23 : *Tribrachiatus orthostylus* SHAMRAI, 1963
 Schepdaal borehole (87E-5), 13.50 m depth; nanno-zone VIII(base), top NP12; plane view.
- Fig. 24 : *Rhabdosphaera crebra* DEFLANDRE in DEFLANDRE & FERT, 1954
 Mater borehole, sample 7, 30 m depth; nanno-zone VII, NP12; side view.

Pittem Clay Member, Vlierzele Formation; nanno-zone X, NP13.

- Fig. 25 : *Micrantholithus inaequalis* MARTINI, 1961
 Knokke borehole (11E-138), 124.70 m depth; distal view.
- Fig. 26 : *Zygrhablithus bijugatus* s.l. (DEFLANDRE, 1959)
 Kallo borehole, 234 m depth; side view.
- Fig. 27 : *Nannoturba robusta* MÜLLER, 1979
 Kallo borehole, 234 m depth; side view.
- Fig. 28 : *Nannoturba spinosa* MÜLLER, 1979
 Kallo borehole, 234 m depth; side view.
- Fig. 29 : *Cruciplacolithus mutatus* PERCH-NIELSEN, 1971
 Kallo borehole, 234 m depth; distal view.

Pl. 5

 $\text{L} = 5\mu\text{m}$

