LATE FRASNIAN STROMATACTIS-CORAL-MICROBIAL CARBONATE MOUNDS, BELGIUM

LOCALITY. – Late Frasnian (top of early *rhenana*-base of late *rhenana* conodont zones) subtropical outer ramp, south of the London-Brabant Massif (Southern border of the Dinant Synclinorium and Philippeville Anticline, Belgium) (Fig. 102).

STRATIGRAPHY. – Petit-Mont Member, Neuville and Valisettes Formations (Fig. 102). In the Philippeville Anticline (proximal belt), mounds are 40-80 m thick and 150-250 m in diameter, flattened or hemispherical carbonate lenses isolated in shale and nodular shale; in the southern border of the Dinant Synclinorium (distal belt), mounds are 30 m thick and 150 m in diameter (Fig. 103).

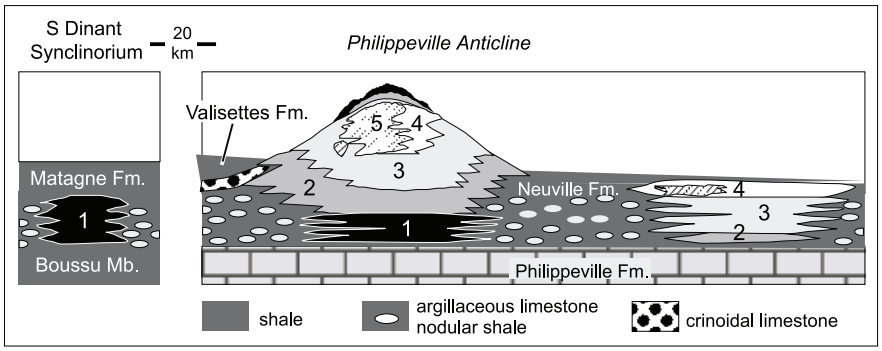
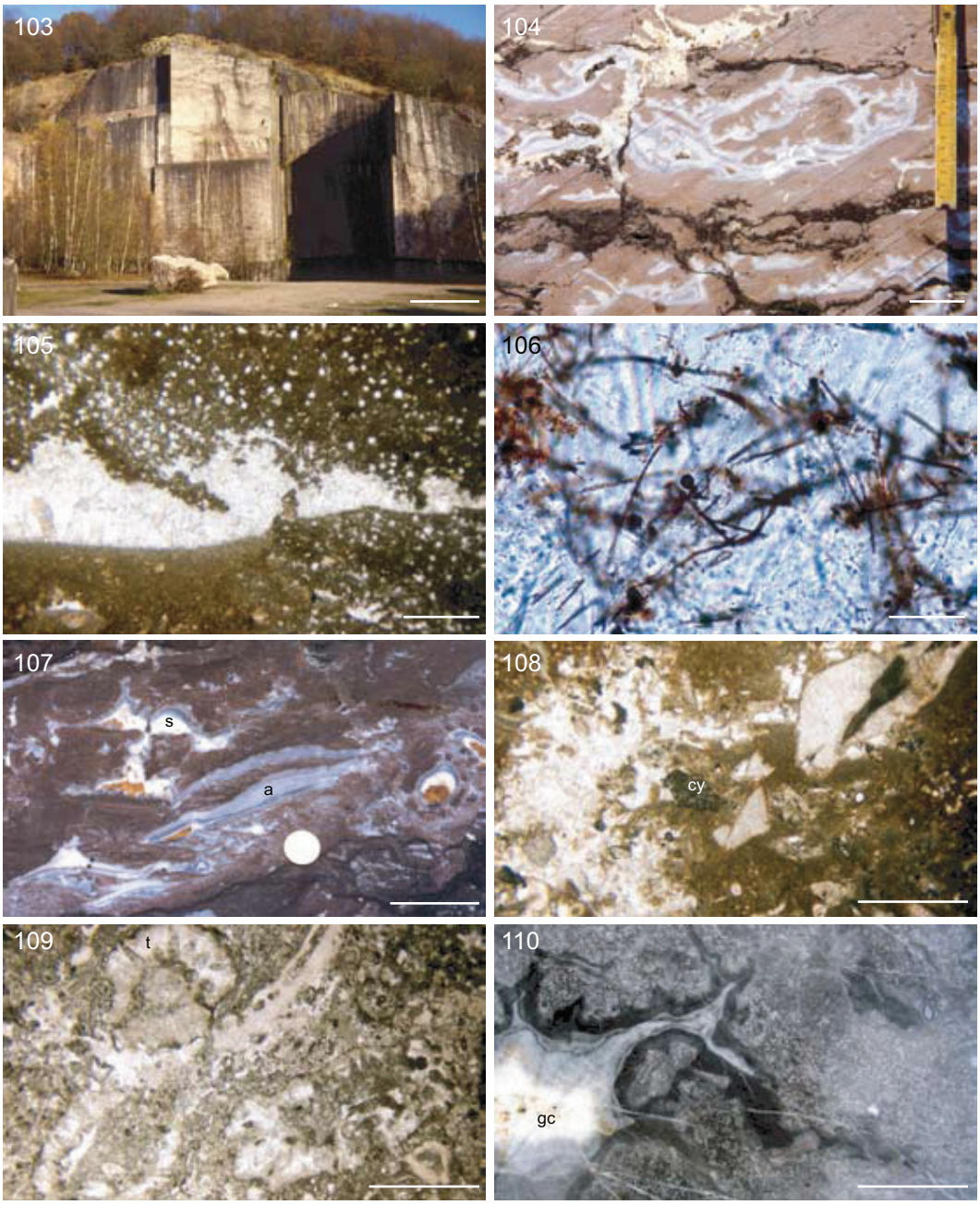


FIG. 102. Sedimentary architecture of the facies described in the text in the Dinant Synclinorium and the Philippeville Anticline.

FACIES AND MICROFACIES (Figs 103-110). – Proximal belt: above an argillaceous limestone substrate, the first carbonate mound facies consists of spiculitic wackestone with stromatactis (1), which becomes progressively enriched in crinoids and corals (2), then in peloids, stromatoporoids and cyanobacteria (3). (4) consists of algal-coral-peloid wackestone and packstone with green algae and thick algal coatings. A core of algal and microbial bindstone (5) sporadically occurs within large mounds. The uppermost part of these mounds may show a recurrence of facies (2) and (1). (1) to (3) are coloured red by hematite derived from microaerophilic iron bacteria; (4) and (5) are grey. Mounds from the distal belt are characterized by spiculitic wackestone with stromatactis (1) only.

Appels figures à identifer soit Fig 102: 1, soit Fig 103: 1, etc...

BIODIVERSITY AND TAPHONOMY. – Fossils from facies (1) to (3) are generally preserved in life position. Upper facies (4, 5) are characterized by local reworking by waves. Bioturbation is very uncommon in mound facies, but well developed in lateral argillaceous facies. Biodiversity increases from (1) to (4), then decreases with facies (5) (domination stage). In these mounds, stromatactis formed from sponge degradation in a relatively coherent sediment (Bourque & Boulvain 1993). The lower part of the mounds is coloured red by hematite derived from microaerophilic iron bacteria (Boulvain *et al.* 2001).



FIGS 103-110. All pictures come from the Petit-Mont Member, Philippeville Anticline. **103**, Upper 30 m of the Beauchâteau quarry, Senzeilles; scale = 4 m. **104**, Red limestone with stromatactis (facies 1), Les Croisettes quarry, Vodecée; scale = 5 cm. **105**, Red mudstone with stromatactis and sponge spicules (1), Hautmont quarry, Vodelée; thin section, plane polarized light; scale = 2 mm. **106**, Microaerophilic iron bacteria, preserved in a cavity from facies (3), Rochefontaine quarry, Franchimont; thin-section, plane polarized light; scale = 50 µm. **107**, Red limestone with stromatactis (s), corals and crinoids (facies 2); supported cavities filled with radiaxial cement occur below *Alveolites* (a); Beauchâteau quarry, Senzeilles; scale = 5 cm. **108**, Wackestone with stromatactoid fenestrae, crinoids (c), fenestellids and fragments of cyanobacteria coatings (cy) (facies 3); Tapoumont quarry, Neuville; thin section, plane polarized light; scale = 2 mm. **109**, Packstone with peloids and *Trelonella* (t, Udoteaceae) (facies 4), Tapoumont quarry, Neuville; thin-section, plane polarized light; scale = 2 mm. **110**, Grey algal and microbial bindstone (5) with growth cavities (gc), Hautmont quarry, Vodelée; scale = 5 cm.

DISCUSSION. – The transition from the aphotic to the cyanobacterial photic zone is recorded in the succession (2)-(3); the transition from the cyanobacterial to the green algal photic zone is recorded by (3)-(5). Storm wave base was reached within (3) and fair-weather wave base within facies (5) (Boulvain 2001). Beyond that, hypoxic conditions are indicated by the sponge and iron-bacteria consortium in the lower parts of the mounds. This is in agreement with the general assumption of stratified water masses during late Frasnian, preceding the prominent Lower Kellwasser crisis

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