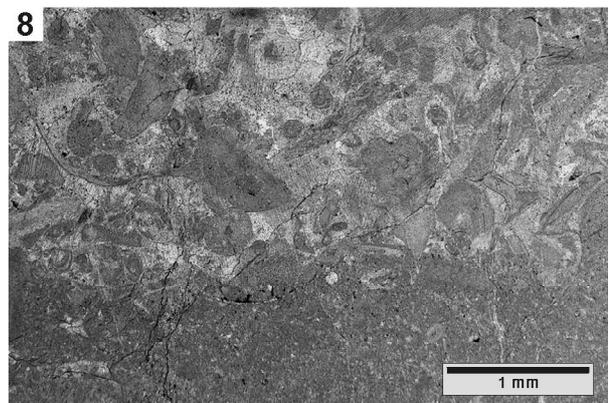
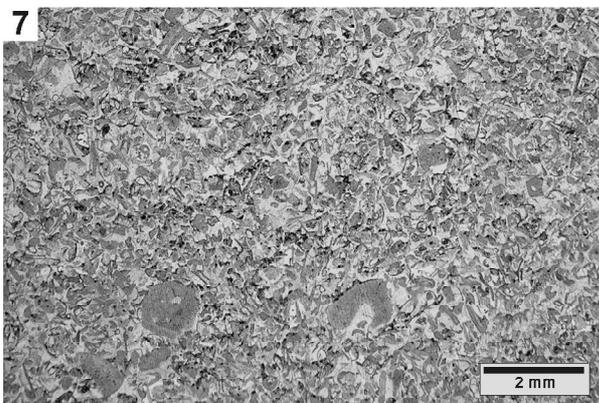
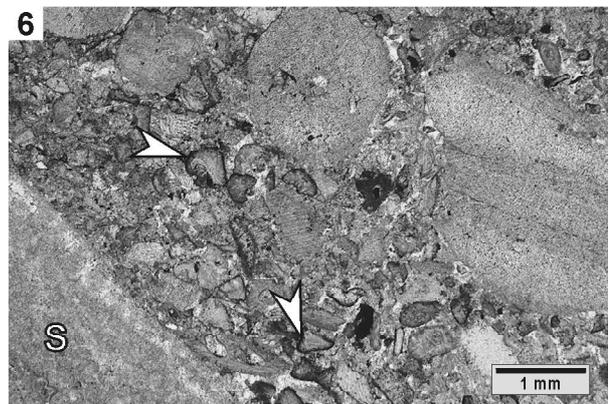
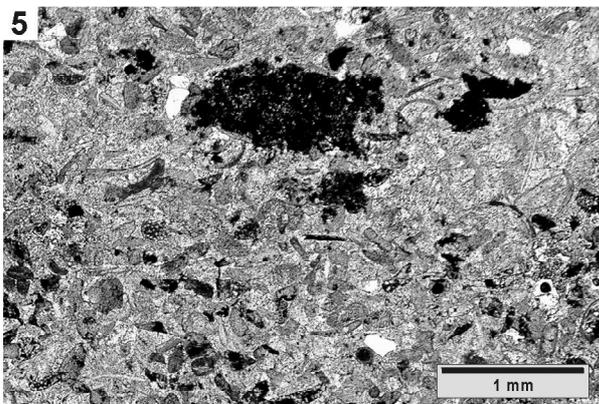
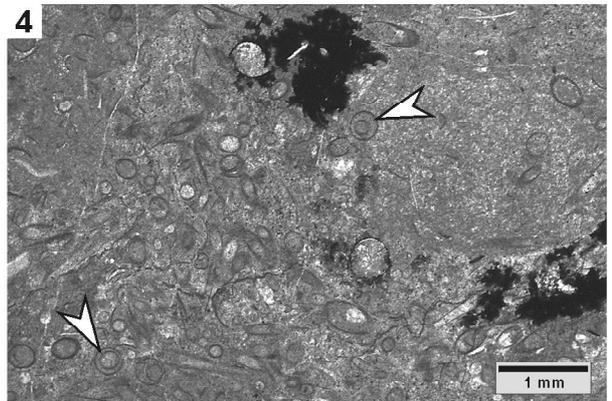
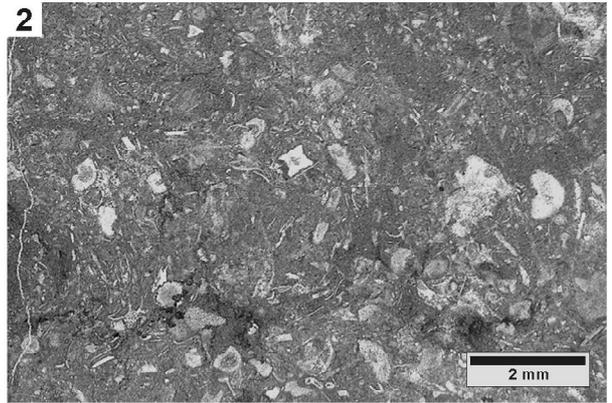
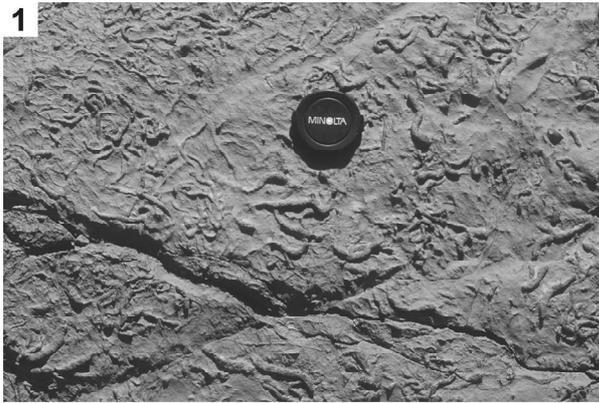


# PLATES

## Plate 1

Lithofacies 2, 3, 9, and 5 (micritic limestones, dacryoconarid limestones, and crinoid limestones)

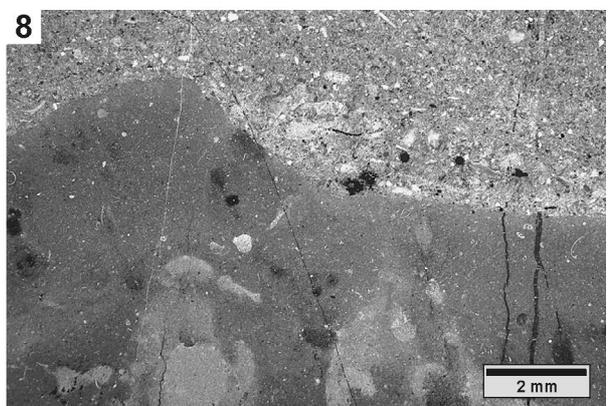
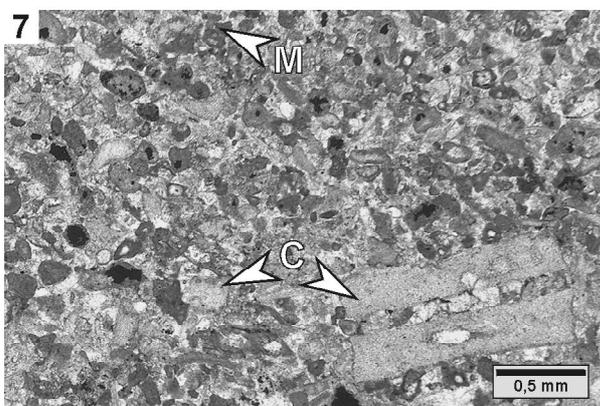
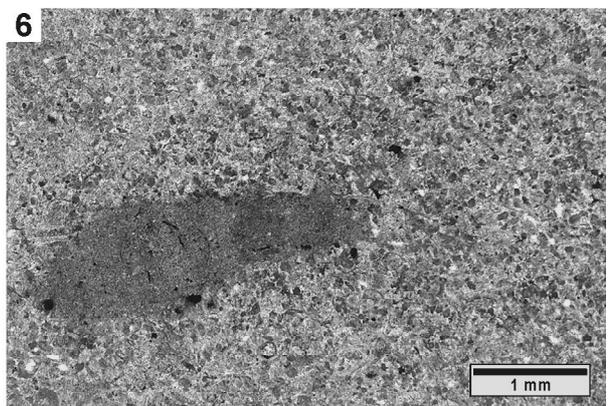
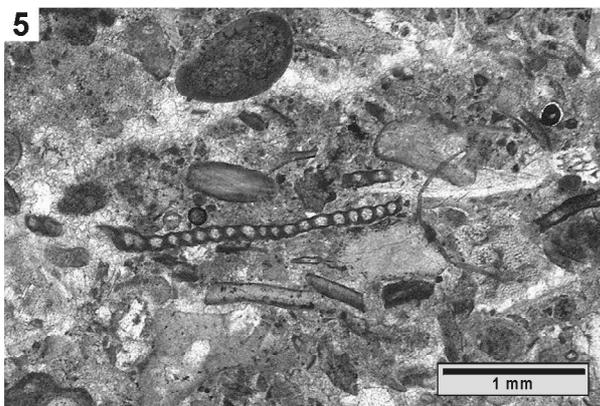
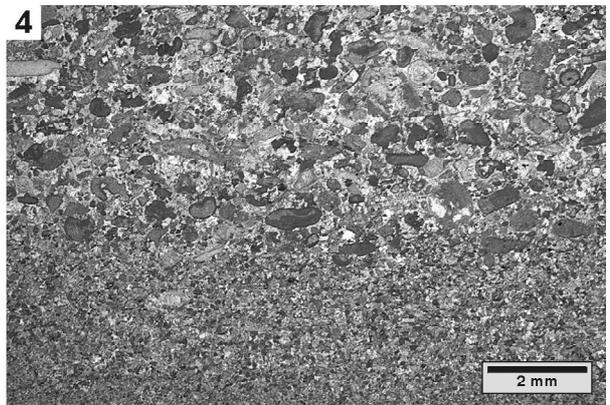
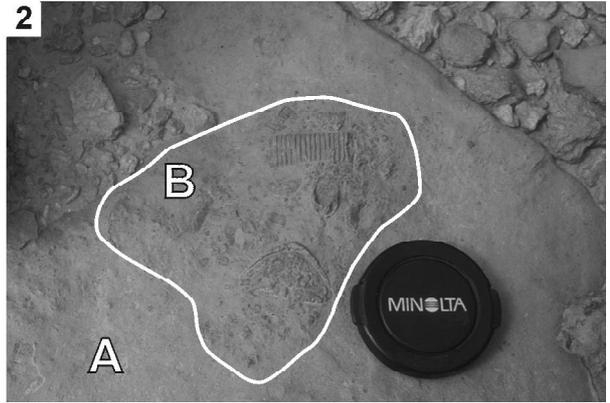
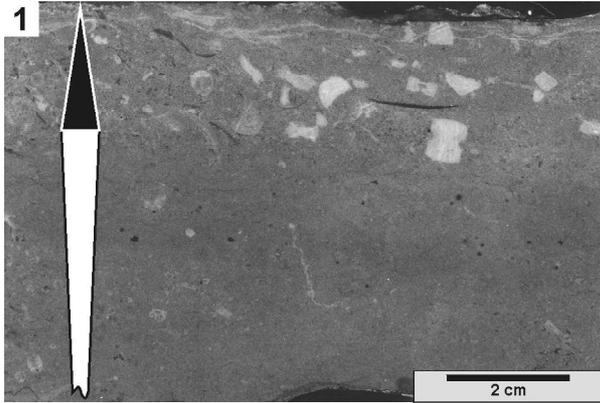
- Fig. 1:** Bedding plane within the LF 3a succession at Boulchral-1 with abundant *Planolites* burrows (lower Eifelian).
- Fig. 2:** Poorly-sorted, bioturbated nodular limestone of LF 2b (crinoid-bioclust wackestone) with crinoids, trilobites, brachiopods, and bioclusters (upper Emsian, Jebel Oufatène, sample JO-00-6).
- Fig. 3:** Crinoid limestone bed with abundant crinoid holdfasts (middle Emsian, Jebel Kem). This bed represents the proximal facies equivalent of the dacryoconarid limestones (compare Fig. 4 on this plate).
- Fig. 4:** Bioturbated dacryoconarid packstone; some dacryoconarid shells (arrows) show telescoping (middle Emsian, Jebel Rheris, sample JR-99-2).
- Fig. 5:** Well-sorted bioclastic grainstone with dark lithoclasts and detritic quartz grains. Skeletal components comprise crinoids, brachiopods, and trilobites (upper Emsian, Jebel Kem, sample JK-00-21)
- Fig. 6:** Poorly-sorted crinoid grainstone (LF 5b) with coated bioclastic grains (arrows) and a large stromatoporoid (S) (lower Eifelian, Madène El Mrakib, sample MM-99-5g).
- Fig. 7:** Well-sorted crinoid grainstone of the LF 5a succession at Jebel Maharch (lower Eifelian, sample JM-00-5).
- Fig. 8:** Poorly-sorted crinoid grainstone with bryozoans erosively overlying a mudstone of LF 3a (lower Eifelian, BL-1, sample BL-1-23).



## Plate 2

### Lithofacies 5 and 6 (crinoid and peloid limestones)

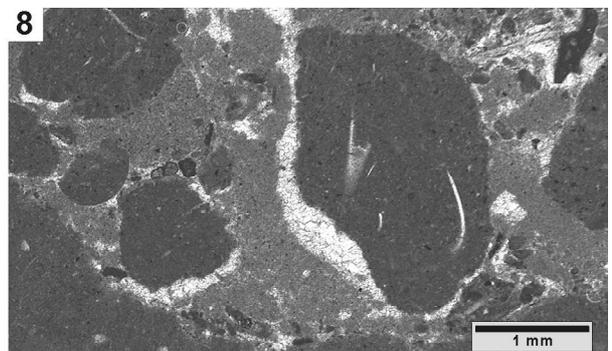
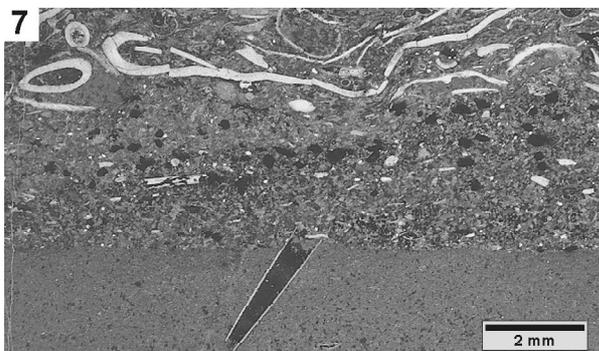
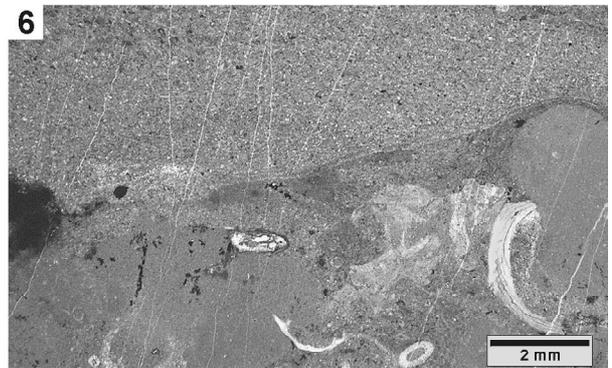
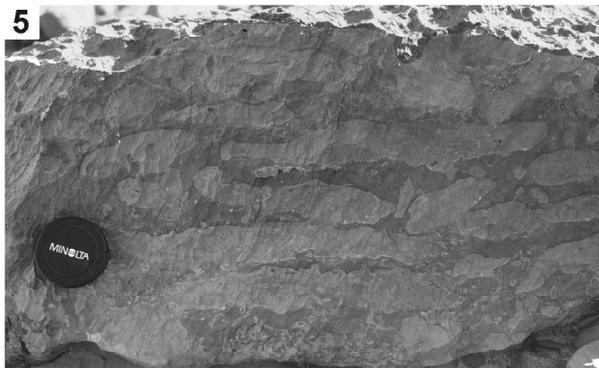
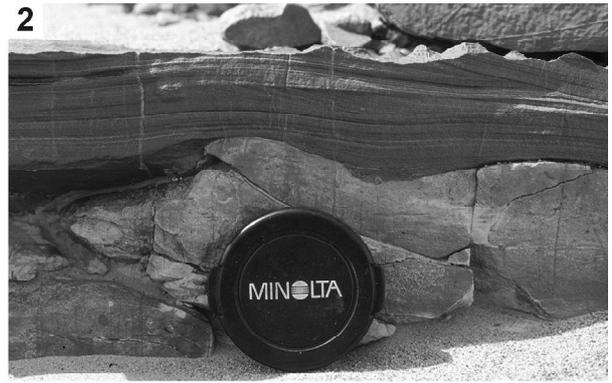
- Fig. 1:** Crinoid grainstone within the LF-5b succession at Jebel Kem (lower Eifelian, sample JK-00-31). Triangles indicate the proposed small-scale baselevel cycles. During baselevel fall, very well-sorted crinoid grainstones were accumulated whereas during the subsequent rise larger remains of crinoids and brachiopods were preserved.
- Fig. 2:** Crinoid-brachiopod clump on a bedding plane within the LF-5a succession at Jebel Maharch (lower Eifelian). The surrounding sediment (A) is interpreted to have accumulated during small-scale baselevel fall whereas the clump (B) was preserved during subsequent baselevel rise.
- Fig. 3:** Scour and fill structure (arrow) within alternations of crinoid-peloid-calcimicrobe grainstones of LF 5d (compare Fig. 4 on this plate) with marls at Jebel Rheris (lower Givetian, photograph by S. Fröhlich).
- Fig. 4:** Medium-sorted crinoid-peloid-calcimicrobe grainstone (LF 5d) with a lower fine-grained unit. Grainsize differences appear as horizontal lamination in outcrop. Note that many components are intensely micritised (lower Givetian, JR, sample JR-99-6)
- Fig. 5:** Poorly-sorted crinoid-bioclust-calcimicrobe packstone (LF 5c) with coated trilobite fragments and peloids (lower Givetian, Ouhlane, sample OUI-00-13). The chambered component in the centre is a calcimicrobe (*Rothpletzella*).
- Fig. 6:** Typical texture of a peloid-bioclust packstone (LF 6b) with a floating mudstone lithoclast (lower Givetian, Boulchral-1, sample BL-1-36).
- Fig. 7:** Medium-sorted peloid-bioclust packstone (LF 6b) with diverse bioclusts comprising crinoids, bryozoans brachiopods and abundant microbial remains (lower Givetian, Boulchral-4, sample, BL-4-9). This sample is similar to LF 5d of Fig. 5 on this plate.
- Fig. 8:** Bioturbated hardground overlain by a laminated peloid-bioclust packstone of LF 6b (lower Givetian, Bou Makhlof, sample BM-1). Same sample as polished slab on Pl. 3, Fig. 3.



## Plate 3

### Lithofacies 6 and 8 (peloid and lithoclast limestones)

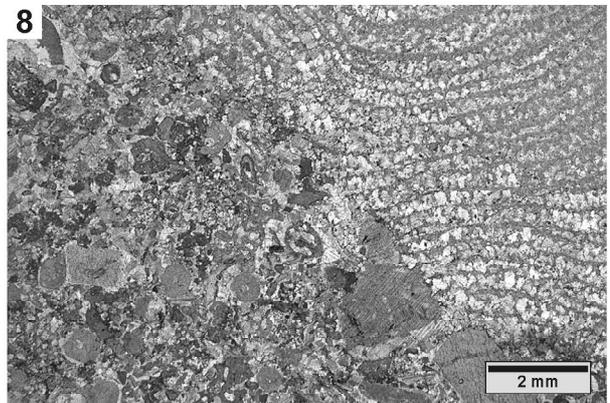
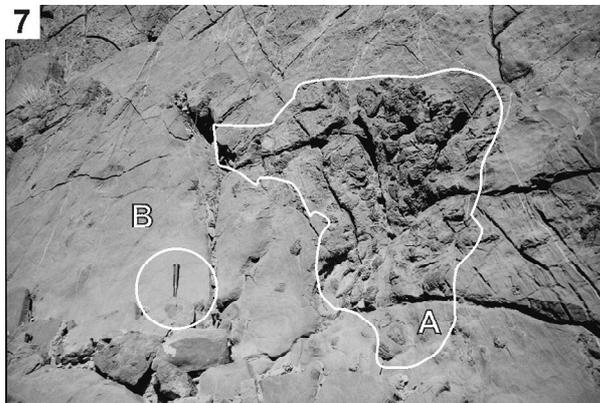
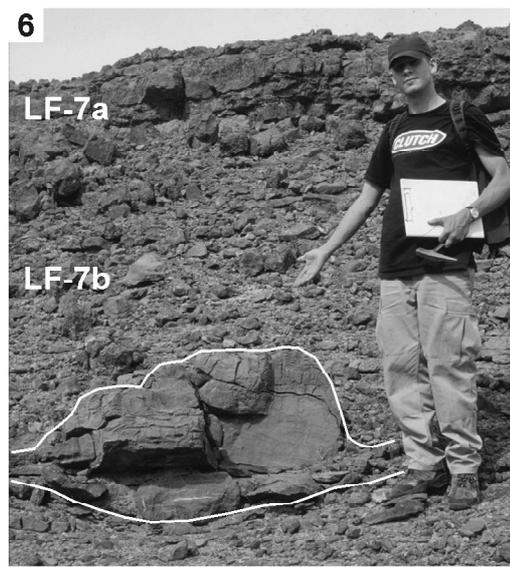
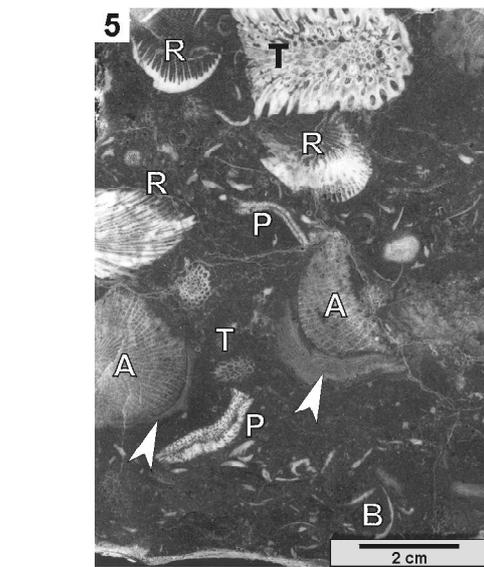
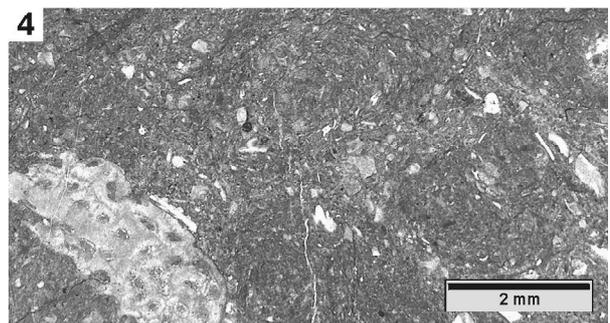
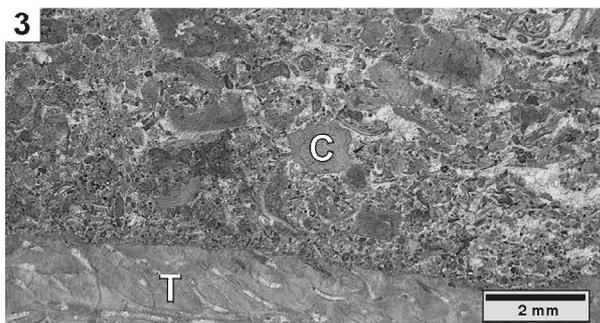
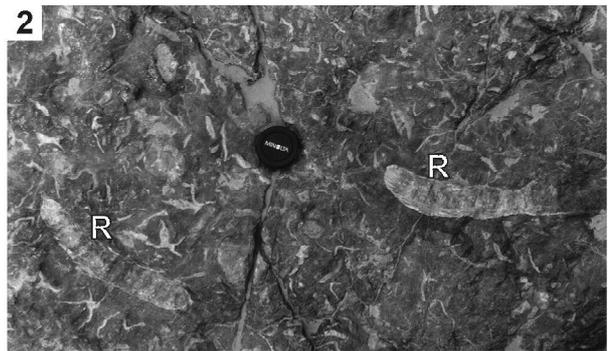
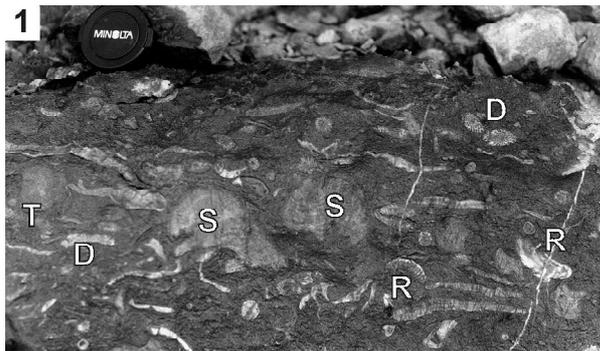
- Fig. 1:** Polished slab showing convolute lamination and slightly deformed horizontal lamination. Light-coloured zones consist of peloid-bioclust material whereas dark zones consist predominantly of micrite (upper Givetian, Bou Dib, sample BD-36).
- Fig. 2:** Horizontally-laminated and hummocky-cross bedded peloid-bioclust packstone (LF 6b) which erosively overlies an argillaceous limestone of LF 9 (lower Givetian, Boulchral-8).
- Fig. 3:** Polished slab showing a hardground with an undulating upper surface which is overlain by a dark-coloured, laminated peloid-bioclust packstone of LF 6b. Note the burrow filled with dark micritic sediment (arrow). Details are shown on Pl. 2, Fig. 8 (lower Givetian, Bou Makhlouf, sample BM-1).
- Fig. 4:** Well-preserved *Zoophycos* of the lower Givetian strata at Bou Dib.
- Fig. 5:** Debrite bed (LF 8b) with large, flat-shaped mudstone lithoclasts floating in a peloid-bioclust packstone matrix. Additionally, crinoids, brachiopods, and trilobites occur within the matrix (lower Givetian, OUI).
- Fig. 6:** Lower debrite unit (LF 8a) of a two-layer bed with well-rounded mudstone clasts (arrows), some biogenic clasts, and an erosively overlying upper unit consisting of a peloid-bioclust packstone of LF 6b (lower Givetian, Bou Dib, sample BD-00-2-2).
- Fig. 7:** Detail of the erosive base of a lithoclast-bioclust packstone. The lower part shows a monotonous mudstone (LF 3b) with a dacryoconarid shell whereas the upper part of the photograph shows the fine bioclastic matrix of the lithoclast-bioclust packstone (LF 8b) with abundant trilobites, peloids and bioclasts (lower Givetian, Boulchral-7, sample BL-7-2).
- Fig. 8:** Debrite (LF 8a) with subrounded to well-rounded mudstone lithoclasts floating in a micritic matrix which contains only a few bioclasts (lower Givetian, Boulchral-3, sample BL-3-15).



## Plate 4

### Lithofacies 7 (coral-stromatoporoid limestones)

- Fig. 1:** Coral-stromatoporoid limestone bed (LF 7c) with ragged stromatoporoids (S), small domal tabulate corals (T), dendroid tabulate corals (D) and rugose corals (R). The micrite-free matrix consists of sand-sized crinoids and silt-sized peloids (lower Givetian, Jebel Zireg).
- Fig. 2:** Bedding plane of a coral-stromatoporoid limestone (LF 7b) with abundant dendroid tabulate corals, a few large rugose corals (R) and a dark micritic matrix (lower Givetian, Madène El Mrakib).
- Fig. 3:** Poorly-sorted crinoid-peloid-grainstone matrix of a coral-stromatoporoid limestone of LF 7c with a large tabulate coral (T) at the bottom of the photograph and a crinoid(C)-peloid matrix above. Intergranular space is partially cemented by syntaxial rim cements (lower Givetian, Jebel Zireg, sample JZ-00-15).
- Fig. 4:** Bioturbated, well-sorted bioclastic-packstone matrix of a coral-stromatoporoid limestone (LF 7b) with a floating fragment of a tabulate coral on the lower left side (lower Givetian, Jebel Oufatène, sample, JO-00-19).
- Fig. 5:** Polished slab (LF 7a) with reef-dwelling organisms as rugose corals (R) including *Acanthophyllum* (A), tabulate corals as *Platyaxum* (P) and *Thamnopora* (T), and encrusting stromatoporoids (arrows). At the lower right side, some brachiopod shells are visible (lower Givetian, Jebel Oufatène, sample JO-00-22).
- Fig. 6:** Large domal stromatoporoid embedded in limestone-marl alternations (LF 7b) at Jebel Oufatène. At the top of the photograph the massive coral-stromatoporoid limestone facies (LF 7a) crops out.
- Fig. 7:** Plan view showing a discrete accumulation of stromatoporoids (A) embedded in crinoid-peloid-calcimicrobe limestones (B) of LF 5d (compare Fig. 14). The accumulation is interpreted as a remain of a patch reef (lower Givetian, Jebel Rheris, photograph by S. Fröhlich).
- Fig. 8:** Thin section showing large stromatoporoid fragment on the right side and fine-grained crinoid-peloid-calcimicrobe matrix of LF 7d. Components are cemented by syntaxial rim cements (lower Givetian, JR, sample JR-00-11).



## Plate 5

### Lithofacies 10 and 11 (siltstones and coquinas)

**Fig. 1:** Siltstone bed with various types of laminations: the lower part shows hummocky cross bedding with local depressions (A); these were filled by small ripples (B) and subsequently covered by hummocky-cross bedded silt (C) (lower - middle Givetian, Boulchral-6).

**Fig. 2:** Solemarks of a siltstone bed (LF 10) with groove casts and prod marks (lower Givetian, Bou Dib).

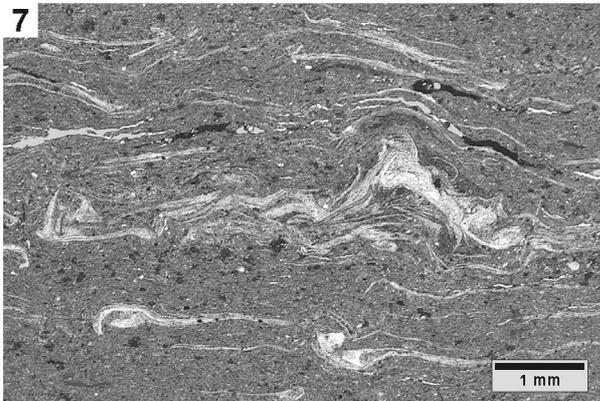
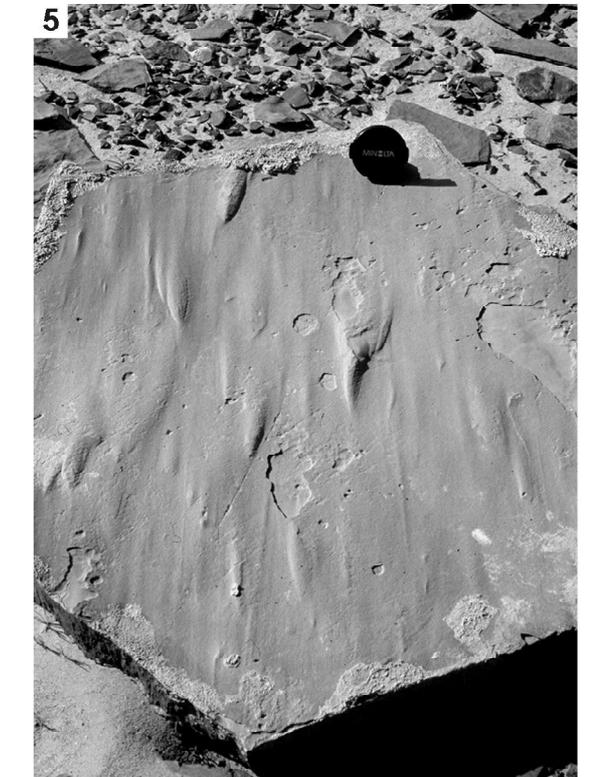
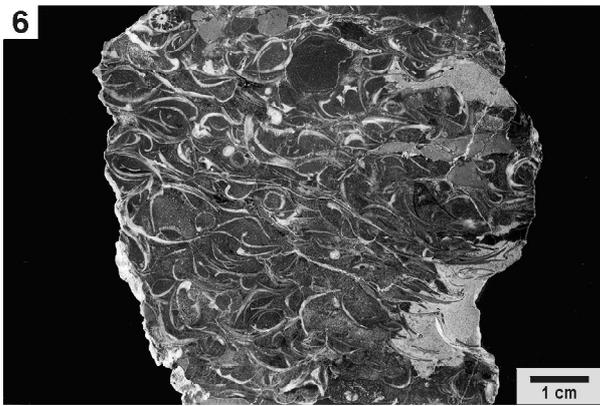
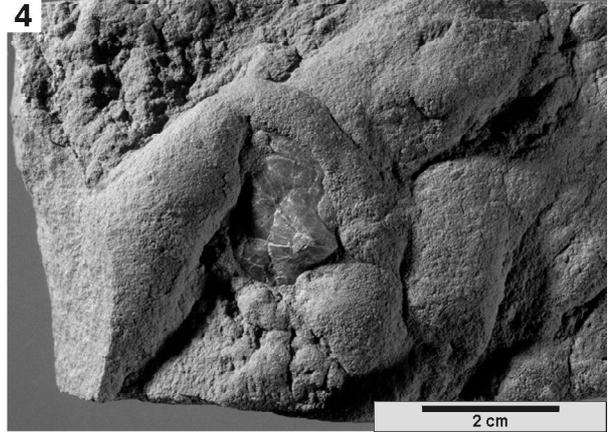
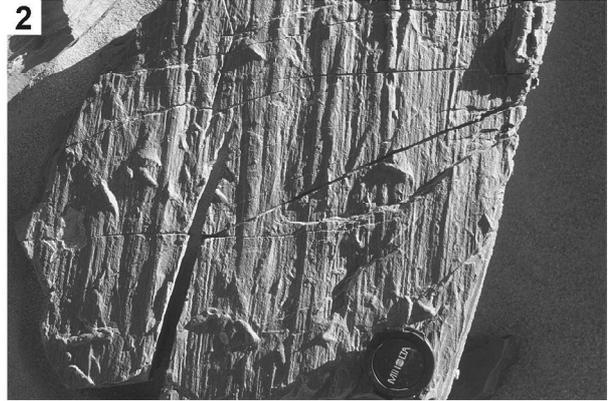
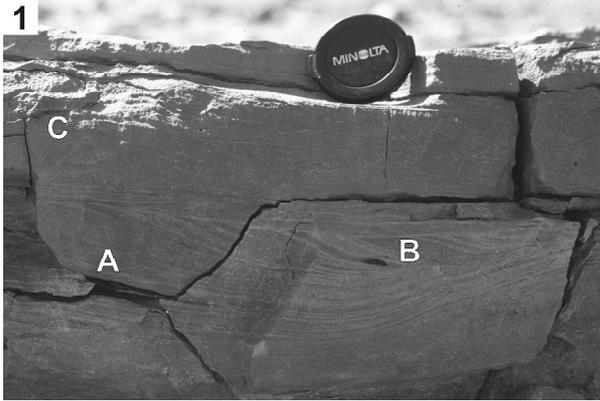
**Fig. 3:** Convolute bedding related to overpressuring by rapid covering of a fine-grained sandstone (lower Givetian, Bou Dib).

**Fig. 4:** Flute cast which was generated by a brachiopod shell (lower Givetian, Bou Dib).

**Fig. 5:** Underside of a siltstone bed with abundant flute casts (lower Givetian, Bou Dib).

**Fig. 6:** Polished slab of a brachiopod rudstone (LF 11) with lithoclasts, crinoids, and rugose corals. Note that brachiopod shells are oriented chaotically (lower Givetian, Bou Dib, sample BD-00-1-10).

**Fig. 7:** Poorly-sorted brachiopod wackestone (LF 11) with concordantly oriented thin-shelled brachiopods, dacryoconarids, and trilobites (lower Givetian, Boulchral-5, sample BL-5-2).



## Plate 6

### Outcrop conditions, stratal geometries and baselevel cycles of the Mader

- Fig. 1:** Southeastern part of the Mader (south of Boulchral-1) with outcrops showing Emsian to lower Eifelian strata. Note that the upper Emsian - lower Eifelian limestones (depophase 1a, 1b, 2) are well exposed and many beds can be followed over long distances. The crest line is about 220 m above the plain.
- Fig. 2:** Northernmost part of the eastern Mader (north of Boulchral-1). Upper Emsian - lower Eifelian limestones (depophase 1a, 1b, 2, 3) constitute a minor crest consisting of limestone-marl alternations. They are overlain by marls and alternations of depophase 4, 5a, and 5b. Note the top bed on the upper left side which was termed "calcaire bleu marine" by Hollard (1974). This can be followed to outcrops north and northwest and is a distinct lithologic marker bed. Emsian - Eifelian limestones are ca. 80 m thick.
- Fig. 3:** Detail of the upper Emsian to lower Eifelian succession at Boulchral-1. Upper Emsian nodular limestones (depophase 1a) and the *Sellanarcestes* bed (part of depophase 1b) are excellent bio- and lithostratigraphic marker horizons. Thickness of the succession shown on the photograph is around 100 m and includes depophases 1a, 1b and most of depophase 2.
- Fig. 4:** Detail of a typical lower Givetian succession (depophase 5a, 5b) in the southern Mader (Jebel Zireg). Baselevel cycles can be recognised by the increasing occurrence of well-bedded biostromal limestones. The entire succession is ca. 40 m thick.
- Fig. 5:** Devonian outcrop in the northwestern Mader (Jebel Issoumour, II) showing a very similar succession as in Fig. 1 on this plate. Note the well-traceable lower Emsian limestones. The crest consists of upper Emsian - lower Eifelian limestones which are 60 - 80 m thick.
- Fig. 6:** Top of the lower Givetian succession (depophase 5b) in the southern Mader (MM) with unconformably overlying Frasnian limestones and the Upper Devonian succession which is ca. 150 m.

