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Thema : ASSESSMENT OF PALEOGEOGRAPHIC DISTANCES :
IMPLICATIONS FOR APPLIED GEOLOGY

THE LATE CRETACEOUS BETWEEN
ANTWERP AND AACHEN :
DIFFERENTIATION IN SEDIMENTARY
FACIES AS A RESPONSE TO
TECTONIC ACTIVITY

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Reappraisal of biostratigraphy data on the Upper Cre- taceous deposits between Aachen (FRG) and Antwerp (Belgium) learns that these do not represent an uninterrupted, continuous succession of sediments. On the contrary, there is evidence for frequent and even considerable hiatuses which are interpreted as a response to local differential warping of the intensely block-faulted basement. Moreover, in contrast to former opinions, there are good biostratigraphic tools (belemnites, ammonites, foraminifera, ostracodes, bioclast assemblages) demonstrating the strongly diachronic character of sedimentary facies. For instance, the lower half of the white chalk (Zeven Wegen Chalk) of the Upper Campanian at Halembaye (CPL Quarry of Haccourt) and Maastricht (Kastanjelaan and Heugem boreholes) is absent in the intermediate area of Lixhe and 's-Gravenvoeren and passes into a glauconitic, sandy marl to the north (Bunde borehole; cf. Herbignac et al., 1986), north east (De Dael outcrop near Heerlen) and east (Hombourg borehole and Zeven Wegen outcrop; cf. Jagt et al., 1987). These lateral changes in lithofacies are so dramatic and take place over such extremely short distances that, until recently, nobody accepted that these might be coeval. These differences are now explained by synsedimentary tectonics, long-shore currents and other sedimentary models (Bless et al., 1987).

This example shows that contrasting lithologies or fossil assemblages do not yield a clue for identifying their original distance or nearness.


THE ORDOVICIAN OF BRITTANY AND PORTUGAL, SIMILAR SEDIMENTARY
SEQUENCES DEPOSITED SEVERAL HUNDREDS OF KILOMETERS APART

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The Ordovician deposits of Brittany and Portugal show a remarkable similarity in the succession of lithologies and their thickness (tab. 1).

Table 1. - Comparison between the Ordovician rocks of the Presqu’île de Crozon (Brittany) and The Serra de Bucaco (Portugal), after Henri et al., 1974.

AGE CROZON (BRITANNY) BUCACO (PORTUGAL)
Ashgill Rosan Formation (tufts and lavas) Porto do Santa Anna Form.
Kemmer Formation (alternating micaeous silstones and quartzitic sandstones) thickness : max. 300 m
Kermeur Formation (alternating micaceous silstones and quartzitic sandstones) thickness : max. 250 m
Postolopenc Formation (micaceous silstones intercalated by quartzitic sandstones; fine-grained silstones in lower quarter) thickness : 300-350 m
Llandeil Cacemers Formation (micaceous silstones with in upper portion micaceous sandstones) thickness : 400-700 m
Llanvion Gres Armorican (thick-bedded quartzitic sandstones with in upper portion micaceous sandstones) thickness : 100-1000 m
Arenig Gres Armorican (thick-bedded quartzitic sandstones) thickness : 100-1000 m

Also the fossil assemblages (notably those of the Postolopenc and Cacemers Formations) are very similar as far as chitinozoans, ostracodes and trilobites are concerned. This