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QUANTITATIVE PALYNOLOGY AT THE FRASNIAN/FAMENNIAN AND THE
DEVONIAN/CARBONIFEROUS BOUNDARIES IN THE ARDENNE-RHINE BASINS.

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A quantitative (and qualitative) analysis of palynomorphs has been made in middle (Hony) and outer (Sinsin) shelf paleoenvironments at the F/Fa boundary and in argillaceous/silty/sandy material intercalated in between nodular limestone layers which represent "biologically bathyal" paleoenvironments (Hasselbachtal and Oberrödinghausen) at the D/C boundary.

Between the uppermost limestone bed containing the Frasnian linguiformis conodont Zone and the lowermost limestone bed containing the Famennian early triangularis conodont Zone many samples were taken in the 150 cm (Hony) and the 30 cm (Sinsin) of, sometimes black, siliciclastics. The relative proportions of miospores versus spiny acritarchs (a function of the distance between the deposits and the shore-line) evolve in a similar pattern in both sections. It demonstrates that the "increasing shallowing" detected in the last Frasnian limestone by the conodonts continue throughout the mudstone until and, at Hony only, within a level of fissile shale (immediately below the Famennian limestone) where the sedimentation rate is dramatically increasing. A sharp change in the quantitative composition of acritarchs occur in the lower part of the black mudstone but no major break in miospore development is noticed throughout the sections.

Between the uppermost layers of the Famennian Wocklumer Kalk containing the middle praesulcata conodont Zone and the lowermost layers of the Carboniferous Hangenberg Kalk containing the sulcata conodont Zone, several metres of siliciclastics (sometimes black) were sampled in Hasselbachtal and Oberrödinghausen sections and boreholes. Acritarchs are poorly present in these samples where miospores are very abundant (at least ten times more than in the shelf environment of Hony and Sinsin!) indicating a sudden replacement of the "biologically bathyal" conditions by very near shore conditions of environment. This interpretation is supported by the occurrence of reworked miospores in these samples (mainly at Oberrödinghausen). The sedimentation rate is not as important as found in the shales below the first Famennian limestone at Hony. The timespan of deposition corresponds here to one complete miospore zone (LN Zone) known to characterize some 250 m of sediment in the South Munster Basin in Ireland. It seems that the sedimentation rate was even lower in the upper part of the sections where a major (climatic?, not marked in lithology) change took place, representing the extinction event (LN/VI B.) for plants/miospores.

It is concluded from the comparison of both areas that, despite an evident similarity in the lithological succession, anoxic and regressional events "danced to a different beat" at the F/Fa and D/C boundaries. The eustatic fall was quicker and bigger with also a sharper (climatic?) change at the D/C than at the F/Fa B.