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Chaired by F. DIMANCHE, Président de la Société géologique de Belgique

Organized by M. STREEL, Paleontology, University of Liège and M.J.M. BLESS, Natuurhistorisch Museum Maastricht

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THE WESTPHALIAN C-D STRATA IN THE NORTHEASTERN CAMPINE POSSIBILITIES FOR SEAM TO SEAM CORRELATIONS

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The Westphalian C-D strata in the northeastern Campine represent a sequence characterised by a monotonous coal-mudstone-sandstone cyclic alternation of fluviatile origin, dominated in the upper part by coarse-grained sandstone (Neeroeteren Sandstone Member). They reach a thickness of at least 1150 m, limited at the base by the Maurage-Aegir marine horizon (Westphalian B-C limit) and truncated at the top by an unconformity of Campanian or Lower Triassic to Upper Permian age.

These strata have been explored recently by a series of cored boreholes covering an area of ± 250 km^2. Borehole geophysical logs actually are available for 6 boreholes only, covering a sequence of ± 1000 m.

Within this sequence rapid lateral changes in depositional environment and ever recurring facies conditions prevent detailed correlations. Nevertheless exact seam to seam correlations are essential for identifying potentially mineable coal seams and hence for assessing the recoverable coal reserves where upon any new mine planning is necessarily based.

The basic framework for the stratigraphical subdivision is provided by biostratigraphical zonations and by tonstein correlations, as presented in a review of the Silesian (Paproth *et al.*, 1983).

No marine incursions are known within the Westphalian C-D sequence of the northeastern Campine. Tonstein beds are more frequent and prove very useful as they may be indentified unequivocally and traced over long distances and thus make the link between different coal basins. Campine tonstein studies and identifications are carried out by Dr. K. Burger (Ruhrkohle, Essen) and B. Delcambre (UCL). A comprehensive review of Campine tonstein occurrences actually is in preparation.

Biostratigraphical zonations equally allow interregional correlations. Although fossil groups of continental origin may evolve less rapidly than their marine counterparts and closely follow facies wanderings within the paralic sediment sequences, assemblage zones may be recognised and utilised for local correlations and facies reconstructions as well. The GS-SF miospore assemblage limit, marking the base of the epibole of *Torispora securis* always occurs in the coal seam group overlying the Nibelung tonsteins. Megaspore and macroflora assemblages are studied by P. Pierart (Mons) and E. Houlleberghs (KUL) respectively.

The first appearance of *Neuropteris ovata*, defined as the Westphalian C-D stage boundary, is hard to establish within a sequence of very simular forms and is also very diachronous due to the increasing distribution of inhospitable environments but ranges downwards into the Walkure coal seam group of the German classification (Ph. D. thesis, E. Houlleberghs). For this reason *N. ovata* has little practical value. Furthermore the presumed Westphalian C-D stage boundary slightly precedes the onset of the Neeroeteren Sandstone which proves a useful though somewhat unconformable lithostratigraphic limit. A new proposal for marking the Westphalian C-D stage boundary would be most welcome.

The fauna associations (mainly mollusc and ostracode) are studied by E. Paproth (GLANW-Krefeld) and M. Bless (Nat. Hist. Mus. Maastricht) respectively. A marine-influenced horizon, characterised by the ostracode *Geisina* has been observed in three boreholes. Apparently the habitat most favourable for *Geisina* is slightly diachronous between these borehole sites. Since the *Geisina* horizon just precedes the important and widely recognised lower Nibelung tonstein horizon at about the middle of the Westphalian C sequence, it may also support a subdivision of this stage at these levels.

However the most precious tools for detailed seam-to-seam correlations within the stratigraphic framework already established are provided by the borehole geophysical logs. Although these logs only reflect the lithological composition of the strata, they amazingly allow ever far reaching interregional comparisons based on cycles of coal seam groups and intervening sandstones. Once a standard log suite has been established - which was only possible through the cooperation of Dr. A. Schuster (Neuenhaus) and D. Schmitz (WBK, Bochum) - very rapid visual correlations may be made between adjoining boreholes, even based on a single gamma-ray log. This constitutes the major advantage of this method which should be continuously controlled by other stratigraphical information. In this way it was possible to estimate the throw along faults and to validate some correlations proposed by ir. J. Tricot (N.V. K.S.). Nevertheless these correlations are limited to sedimentary features of some extent : not every single bed but rather characteristic sandstone bodies, thick coal seams or composite seams will be related.

All these methods lead to basic interregional correlations and allow detailed local correlations, at least of most thicker and laterally persistent coal seams.

PAPROTH, E., DUSAR, M., *et al.* (1983). Bio- and lithostratigraphic subdivisions of the Silesian in Belgium, a review. Ann. Soc. géol. Belg., 106 : 185-283.