

## MEUSE-RHINE EUREGION GEOLOGISTS MEETING IN LIEGE, MAY 24th, 1985

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  
in cooperation with the "Société géologique de Belgique", Liège and Geofiles, Tervuren

### MICROORGANISMS IN THE MALAGASIAN SHALES FROM THE KAVUMWE (EASTERN MOSSO, BURUNDI)

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The palynological study of shaly levels with microflora from the Kavumwe Group enables us to recognize approximately twenty species of palynomorphs. These make a correlation with B IIc (Bushimaie Group in Kasai, Zaïre) possible and more generally with the basis of Upper Riphean (Scandinavia, East European Platform, Siberia, ...).

The Kavumwe Group as well as Groups of Bushimaie (Zaïre), Bukoban (Tanzania) belongs to the Katangian and is located in the Malagasian of Upper Riphean age.

The stratigraphical position of this Group in the Malagasian Supergroup is discussed.

### EXTENSION DE LA ZONE METAMORPHIQUE SUIVANT UN AXE NORD-SUD DANS LA PARTIE OCCIDENTALE DES ARDENNES

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Depuis plus d'un demi siècle, les études consacrées au métamorphisme des terrains paléozoïques de la partie occidentale des Ardennes n'ont apporté que peu de modifications au tracer des limites des "zones métamorphiques" (au sens géographique du terme) reconnues par Corin (1930, 1931). L'utilisation du paramètre de la cristallinité des complexes micacés (ou des illites s.l.) nous a permis de préciser davantage l'extension de la "zone métamorphique" (au sens zono-graphique du terme) suivant un axe nord-sud.

La détermination de la cristallinité des complexes micacés le long d'une transversale joignant Namur (au nord) à Marbehan (au sud) révèle, tout d'abord, que la zone métamorphique occupe, au niveau de la surface de dénudation actuelle, toute l'aire paléozoïque située au sud de la limite Siegenien-Gedinnien du bord sud du synclinorium de Dinant.

Au nord de cette limite, la détermination de la cristallinité des complexes micacés dans les séries stratigraphiques recoupées par les sondages de Porcheresse et de Wépion indique que la zone métamorphique, qui est atteinte avec les séries du Dévonien moyen, s'étend sous l'aire paléozoïque des synclinaires de Dinant et de Namur.

CORIN, F. (1930). Le métamorphisme de l'Ardenne. Ann. Soc. géol. Belg., Bull., 54 : 99-115.

CORIN, F. (1931). Coup d'oeil sur la zone métamorphique de Paliseul. Bull. Soc. belge Géol. Paléont. Hydrol., 48 : 451-473.

### FLUID INCLUSION STUDY

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The fluid inclusion technique allows composition, salinity and density determination of the mineralizing fluid. It can, sometimes, give way to an estimation of the P-T conditions of formation.

Two problems are now treated :

1. the Pb Zn Ba F ore deposits from Belgium : Meuse-Vesdre (North district) and Sud Dinant (South district);
2. the relations between quartz veins and metamorphism or magmatism in the Ardenne (Rocroi-Serpont-Stavelot massives and metamorphic area of Bastogne).

### PERMIAN STRATIGRAPHY IN THE CAMPINE BASIN

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In the northeastern part of the Campine basin, the Westphalian coal measures are overlain by a Permo-Triassic sequence dominated by red-coloured sediments and attributed to the Buntsandstein formation. However in the central part of this area (between Bree and Opglabbeek) a grey coloured calcareous sequence attributed to the Zechstein is preserved, traversed by four cored and partly logged boreholes. The Zechstein strata slowly thin from north to south (30 m in borehole 169, 18 m in borehole KS 25) but remain remarkably constant in facies. They consist of dolomitic silty marls alternating with more sandy stratifications and contain an abundant though poorly diversified mollusc fauna and rare dispersed though well preserved plant remains. At the base a thin often inconspicuous basal conglomerate marks the contact with the Westphalian. The upper limit remains unclear : the grey-red colour change apparently crosses lithostratigraphic correlation lines, otherwise facies changes seem gradual.

Pollen assemblages obtained from borehole KB 169 (between 1064 m and 1069 m) contain numerous striated grains (*Striatissaccus* type) which are characteristic of Permian strata up to the Vettugian stage in the Lower Triassic. *Klausipollenites schaubergeri* which is often observed, is typical of the Upper Permian (Thuringian stage). The samples also contain specimens belonging to the *Lueckisporites* palynodemes and more precisely *L. virkkiae* (normes Ac and Bc). According to Visscher (1971, fig. 19), they are indicative of the transition Zechstein/Lower Buntsandstein.

In borehole KB 172, the palynological data allow the same conclusion. Moreover, the study of the associated macroflora reinforces these results. Numerous fragments of conifers, leafy twigs and isolated needles, are representative of the genera *Ullmania* (*U. bronni* and *U. frumentaria*) *Pseudovoltzia* (*P. heterophylla*) and *Quadrocladus* (*Q. solmsii* and *Q. orobiformis*);

they all are regarded as restricted to the Upper Permian (Zechstein facies). On the other hand these remains are found together with bark fragments of *Pleuromeia* a Lycopod typical for the Lower Buntsandstein. This unusual association points to the transitional character of this flora.

VISSCHER, H. (1971). The Permian and Triassic of the Kingscourt Outlier, Ireland, Geological Survey of Ireland, spec. p. 1.

## EROSION SURFACES AND NEOTECTONICS ON THE HAUTES FAGNES PLATEAU

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The reconstruction of Cretaceous and Paleogene erosion surfaces on the Hautes Fagnes plateau and the NW-Eifel shows irregularities in their profiles, whose origin is certainly to be found in tectonic deformations taking place after the elaboration of the surfaces, i.e. during Neogene and Quaternary times.

Two types of irregularities are visible: at first, a longitudinal, SW-NE oriented upwarping moving the Baraque Michel massif and the eastern part of the Hautes Fagnes crest. This upwarping involves the development of flexures deforming the erosion surfaces north and south of the Baraque Michel massif. On the other hand, transverse irregularities disturb the surfaces in a SE-NW direction; they are associated with other remarkable morphological features. They witness thus for major zones of radial fracturation, active during Neogene and Quaternary times on the Cambrian massif of Stavelot.

These are to be connected with the SE-NW radial fault system, determining the opening of the Lower Rhine Embayment. It is however the first time that such a Cenozoic activity of fractures belonging to this system is observed on the Paleozoic massif. We have moreover to emphasize that this activity is limited onto the Cambrian, and doesn't affect the Lower Devonian shales of the Eifel syncline, which show a tectonically incompetent behaviour.

Finally, the disposition of the radial faults on the Hautes Fagnes plateau and the updoming of the Baraque Michel indicates that this epeirogenic movement took place after the reactivation of the faults.

## A NEW EVENT-STRATIGRAPHICAL MARKER BED IN THE UPPERMOST DEVONIAN OF THE ARDENNO-RHENISH MASSIF

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A new ferruginous ooid-bearing limestone bed is described from the uppermost Famennian in the Denée borehole, near Maredsous (Dinant Synclinorium).

This pseudo-oolitic ironstone (level V) consists of a 19 cm-thick medium-grey bioclastic grainstone/rudstone with densely-packed, non-sorted ferruginized allochems (50-60% bioclasts) and heterogenous intraclasts (Fe-intrasparrudite). The grainstone itself is embedded in finely-laminated and bioturbated, micaceous siltstone, interlayered with silty mudstone.

Microfacies analysis points to either slowed accumulation of coarse bioclastic material in the zone of constant winnowing, or to a settling from turbid surficial clouds in a highly turbulent environment.

This new "oolitic ironstone" level (V) shows some good similarities with level IV, which is associated with a transgressive lag deposit or a mineralized hardground at the very base of the Souverain-Pré Formation (Dinant and Vesdre Synclinoria) (Dreesen, 1982). Biometric analysis of the spore flora of the enveloping mudstones indicated the presence of the D/E step limit within the *S. lepidophytus* Zone. This limit is situated at or just below the base of the Etroeungt Limestone in the Ourthe and Hoyoux Valleys (Northern border of Dinant Synclinorium). Thus according to palynological data, level V is situated near the top of the LV Sporezone (Higgs & Streel, 1984) or at the PLm/PLsI transition (sensu Paproth & Streel, 1971).

A particular event deposit occurs at exactly the same (bio)stratigraphical level within the Rheinisches Schiefergebirge, near Dillenburg (Dill Syncline).

Here, the so-called "Jungoberdevonischer Bombenschalestein" represents an excellent marker bed at the very base of the greenish grey shales and sandstones of the Wocklum Stufe (do VI). This volcanic bomb level is a heterogenous lithological complex (2-25 m) comprising spilitic volcanic bombs, pillow lavas, tuffs, and subordinated exoclastic boulders of Upper Devonian cephalopod or reef limestones, and ironstones.

The youngest conodonts collected from the enclosed limestone boulders indicated a Lower *praesulcata* Zone (or top of former Middle *costatus* Zone). Moreover, palynological analysis of the enveloping shales indicated that a 25 m "Bombenschalestein" sequence at Langenaubach (near Dillenburg) is included within the upper part of the LV Sporezone (Somers & Streel, 1978), or more precisely, that is inserted between shales bearing respectively C and E biometric spore zones.

This remarkable synchronism of extremely different event deposits from widely-spaced localities, is not a coincidence, but rather the result of strongly interdependent tectono-sedimentary processes, which have been episodically triggered by synsedimentary tectonic movements along deep-seated transversal faults or block faults crosscutting the Ardenno-Rhenish Massif.

DREESEN, R. (1982). Storm-generated oolitic ironstones of the Famennian (Fa1b-Fa2a) in the Vesdre and Dinant Synclinoria (Upper Devonian), Belgium. Ann. Soc. géol. Belg., 105 : 105-129.

HIGGS, K. & STREEL, M. (1984). Spore stratigraphy at the Devonian-Carboniferous boundary at the Northern "Rheinisches Schiefergebirge", Germany. Cour. Forsch.-Inst. Senckenberg, 67 : 157-179.

PAPROTH, E. & STREEL, M. (1971). Corrélations biostratigraphiques près de la limite Dévonien/Carbonifère entre les facies littoraux ardennais et les facies bathyaux rhénans. Congr. Colloques Univ. Liège, 55 : 365-398, Liège.

SOMERS, Y. & STREEL, M. (1978). Spores du sommet du Dévonien à Langenaubach (Synclinal de la Dill, RFA). Relations entre la conservation des spores, le pouvoir réflecteur de la vitrinite et des intrusions diabasiques. Annales des Mines de Belgique, 7-8 : 147-154.

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

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