

In the Nismes section, the Fort Hulobiet Member of the Fromelennes Formation is represented by 13,5 metres of fine stratified limestone which is sometimes a little bioclastic with small shells or brachiopods; fragments of crinoids appear just below the Nismes Formation. Between 8 and 9,75 metres under the base of this lithostratigraphic unit, there are three thin layers rich in corallites of *Disphyllum virgatum* (HINDE, G.J., 1890); in the second one, these rugose corals are associated with some *Alveolites* and *Thamnopora*. All this sequence with the beds of *D. virgatum* is exposed in the upper level of the Nismes section.

D. virgatum has been found in the same facies and in the same stratigraphic position as in Nismes, in the Vaucelle quarry of Frasn-lez-Couvin, at the Haute Roche of Dourbes and at the Fort de Charlemont of Givet. The first two sections have been described by M. COEN & M. COEN-AUBERT (1971), the third one by M. ERRERA, B. MAMET & P. SARTENAER (1972).

D. virgatum also occurs at the Sourd d'Ave section near Wellin, but here the upper part of the Fort Hulobiet Member consists of an alternation of fine limestone and layers with massive and dendroid stromatoporoids. These accumulations of rolled reef building organisms sometimes contain corallites of *D. virgatum* and rare fragments of *Alveolites*; some thin beds of shale are also present.

Thus all these occurrences of *D. virgatum* from the southern border of the Dinant Synclinorium characterize the upper part of the Fort Hulobiet Member; they belong to the Upper *Polygnathus dengleri* Subzone before the entry of *Ancyrodella binodosa* at the base of the Nismes Formation.

MIOPORES NEAR THE GIVETIAN-FRASNIAN BOUNDARY

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Accurate miospore-based correlations of the Givetian-Frasnian boundary (the Middel-Upper Devonian boundary) cannot be achieved starting from the Global Stratotype Section exposed at Col du Puech de la Suque in the southern Montagne Noire, France, nor from the Auxiliary Stratotype at Nismes. Miospores are not known in these two sections where the limit is drawn at the base of lower *asymmetricus* conodont Zone.

However, miospores occur with conodonts of the Givetian-Frasnian transitional beds in the Ferques railroad section in the Boulonnais area, north of France.

The conodont zonation was demonstrated there by BULTYNCK (in BRICE *et al.*, 1979). We refer here (fig. 1) to his table III emended by observations made by COEN (in BRICE *et al.*, 1981).

In the Membre de Couderousse of the Formation de Blacourt, faunas IV and V correspond to the middle and upper *varcus*

Zones (BULTYNCK in BRICE, 1987). The basal beds of the succeeding Formation de Beaulieu are not present in this section but a few meters above the first shales of the Membre de Cambresèque occurs the fauna IX with *Ancyrodella rotundiloba alata* (BRICE *et al.*, 1979) which has a rather early occurrence within the lower *asymmetricus* Zone. The first occurrence of *Ancyrodella gigas* noted by COEN (in BRICE *et al.*, 1981) in the Membre des Noces of the Formation de Beaulieu corresponds to the base of the middle *asymmetricus* Zone.

Three successive Oppel Zones of miospores (TA Zone, TCo Zone, BJ Zone) are present in the range of these conodont Zones in this section. They are described by LOBOZIAK & STREEL (1980, 1981) and STREEL *et al.* (1987). RICHARDSON & Mc GREGOR (1986) described two Assemblage-Zones (*optivus-triangulatus* Zone, *ovalis-bulliferus* Zone) in about the same timespan, around the old Red Sandstone Continent. The limit between these Assemblage-Zones is taken by RICHARDSON & Mc GREGOR (1986), in the Ferques section, at the limit between the TCo Zone and the BJ Zone. The *optivus-triangulatus* Zone probably includes both TA and TCo Zones as its base is characterized by the first appearance of miospores with prominent development of zona in the radial regions (*Samarisporites triangulatus*).

The Givetian-Frasnian boundary occurs within the TCo Zone. On fig. 1, we have selected a few species which might help to delineate this boundary. They are *Verrucosporites premmus*, *Ancyrospora ancyrea* var. *ancyrea* and *Rhabdosporites langii* (the last one not met in this section but only in the Tournai borehole). The last occurrences of these species are known within lower parts of the TCo Zone limits in many regions of the O.R.S. Continent and adjacent areas (Mc GREGOR, 1981; RICHARDSON & Mc GREGOR, 1986). The informal interval zone between these last occurrences and the first appearance of *Chelinospora concinna* and *Cirratriadites jekhowskyi* is, for the time being, the best miospore-marker available to approach the Givetian-Frasnian boundary.

These criteria have been recently applied to correlations between the Boulonnais area and three boreholes made in Belgium, two in the Namur Syncline (Nieuwerkerke and Tournai), south of the Brabant Massif and one in the Campine (Booischoot), north of the Brabant Massif.

In the Booischoot borehole (STREEL & LOBOZIAK, 1987) the lower part (1037-1078 m) of the continental green conglomerates, despite the absence of *Ch. concinna*, might well belong to the informal interval zone described below the Givetian-Frasnian boundary in the Boulonnais area. If confirmed, this correlation would date the lower range of *Archaeopteris fimbriata* known in this borehole, of the Givetian age.

In the Tournai borehole the upper part (939 - 944 m) of the Formation d'Alvaux (COEN-AUBERT *et al.*, 1981) obviously belongs to this informal interval zone of Uppermost Givetian age (LOBOZIAK & STREEL, unedited). This is confirmed here by the occurrence of *Ancyrodella rotundiloba* near the base of the overwhelming Formation de Bovesse (COEN-AUBERT *et al.*,