

SOME STRUCTURAL PARTICULARITIES ON A TUBIZE-FORMATION OUTCROP AT MONT-SAINT-GUIBERT (BRABANT MASSIF, BELGIUM)

Manuel SINTUBIN¹, Eric LEMONNE² & Alain HERBOSCH³

(3 Figures)

1. *Structural Geology & Tectonics Group, Katholieke Universiteit Leuven, Redingenstraat 16, B-3000 Leuven, manuel.sintubin@geo.kuleuven.ac.be*
2. *Centre d'Informatique pour la Région Bruxelloise, Avenue des Arts 20, bte 10, B-1000 Bruxelles, eric.lemonne@advalvas.be*
3. *Département des Sciences de la Terre et de l'Environnement, Université Libre de Bruxelles, Avenue F.D. Roosevelt 50, B-1050 Bruxelles, herbosch@resulb.ulb.ac.be*

ABSTRACT. Aeromagnetic anomaly data of the predominantly concealed, Lower Palaeozoic Brabant Massif (Belgium) allows to integrate the structural geometry of the Tubize-Formation (Lower Cambrian) outcrops at Mont-Saint-Guibert within the overall structural architecture of the central part of the Brabant Massif, interpreted as a dextral transpressional shear zone.

KEYWORDS: Anglo-Brabant belt, aeromagnetic anomaly, Cambrian, Caledonian, cleavage, potential field, turbidites

Just south of the church of Mont-Saint-Guibert (~30km SE of Brussels) metasediments, belonging to the base of the Lower Cambrian Tubize Formation, are cropping out in an escarpment at the base of the church. This outcrop is characterised by a rhythmic sequence of sandy, silty and argillaceous beds. A detailed survey of this 5 meter-long section (fig. 1) shows sedimentological features supporting a turbiditic origin of this rhythmic sequence. The turbiditic sequence can be described in terms of the classical Bouma division. Incomplete Tab and Tae sequences, with a mean thickness ranging from 10cm to 1m, are most frequent. While load casting and graded bedding are frequently observed, flute casts are scarce. Only one complete Tabcde sequence, with rip-up clasts, has been recognised. All bedding polarity criteria indicate a younging of the sequence towards the WNW.

The bedding attitude is approximately 282/80¹, while the cleavage attitude in most argillaceous beds is approximately 315/82. This implies a steeply WNW-plunging cleavage-bedding intersection (~280/80). Bedding and cleavage show a clockwise angular relationship and are 33° apart. The structural particularity of both bedding and cleavage attitudes, as well as of the bedding-cleavage relationship, is its striking similarity with the geometrical observations in the, now vanished, outcrops along the TGV track at Lembeek (see Sintubin *et al.*, 1998). Also the sedimentary characteristics are strikingly similar.

At Lembeek an assemblage of subangular folds (fig. 2) has been recognised (Sintubin *et al.*, 1998) with two particular characteristics: (1) a divergent cleavage fan, which reflects local strain variation during flexural slip folding and (2) steeply plunging fold hinge lines (FHL= \sim 297/73). Basically two types of limb domains could be distinguished. Type 1 limb domains are characterised by a WNW-ESE-striking, subvertical bedding (223/85) and cleavage (026/84). Cleavage and bedding are approximately 20° apart and show an anticlockwise angular relationship. Type 2 limb domains show a NE-SW-striking bedding (310/73) and cleavage (333/73). The angular relationship between cleavage and bedding is clockwise at 22°.

The geometrical characteristics of type 1 limb domains seemingly represents the more regional trend. This is apparent in other outcrops in the Tubize area. An other example is the Rogissart roadcut (fig. 3), which is characterised by a bedding attitude (065/80) and a cleavage attitude (035/70) very similar to those of the type 1 limb domain of the fold assemblage at Lembeek. The regional character of the trend of the type 1 limb domains is also clearly reflected on the aeromagnetic lineament map (Sintubin 1997, 1999) (fig. 3). Type 2 limb domains rather seem to form the exception.

It is clear that the structural setting at Mont-Saint-Guibert fits the geometrical characteristics of the type 2 limb do-

¹ Dip direction/dip convention (dip direction is indicated by its azimuth)

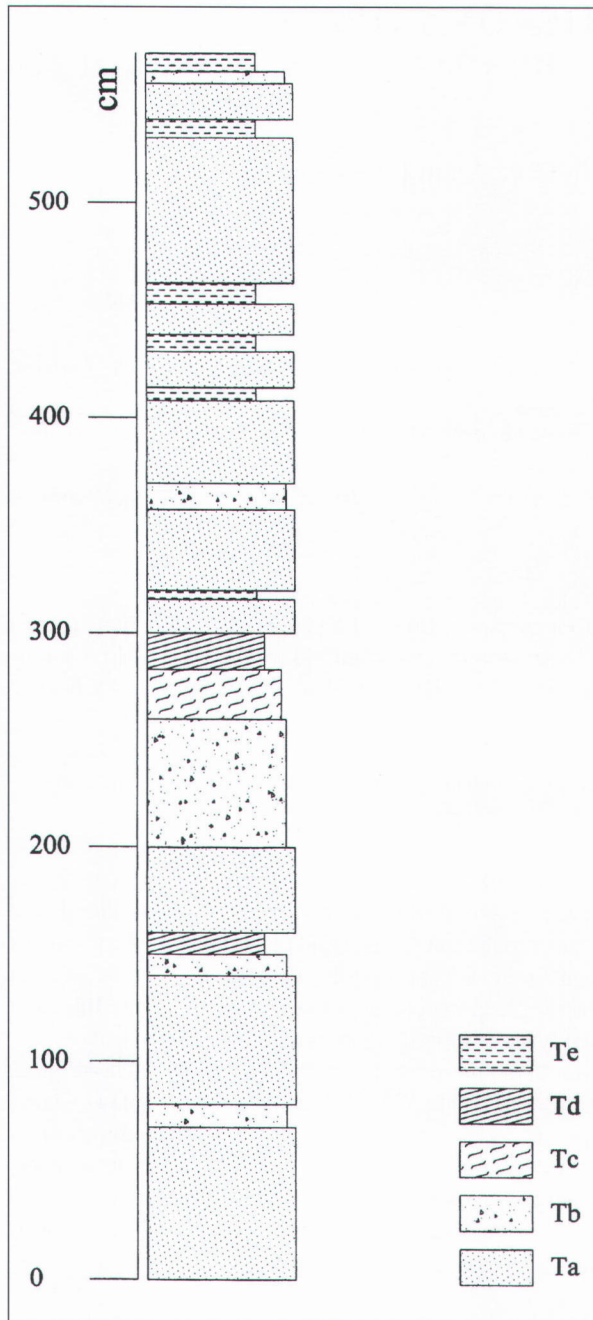


Figure 1. Lithological log of the Mont-Saint-Guibert outcrop, with indication of the terms of the Bouma sequence. The entire section is dominated by massif, medium-grained, sandstones (Ta). Only one horizon with convolute bedding (Tc) has been recognised.

mains of the fold assemblage at Lembeek, although bedding and cleavage attitude at Mont-Saint-Guibert seems to have undergone an overall 30° anticlockwise rotation with respect to the attitudes at Lembeek (fig. 3). This overall rotation is also obvious on the aeromagnetic map (Sintubin, 1997), where aeromagnetic lineaments in the Mont-Saint-Guibert area have undergone a 30° anticlockwise rotation with respect to similar lineaments in the Lembeek area (fig. 3). Based on this striking similarity a

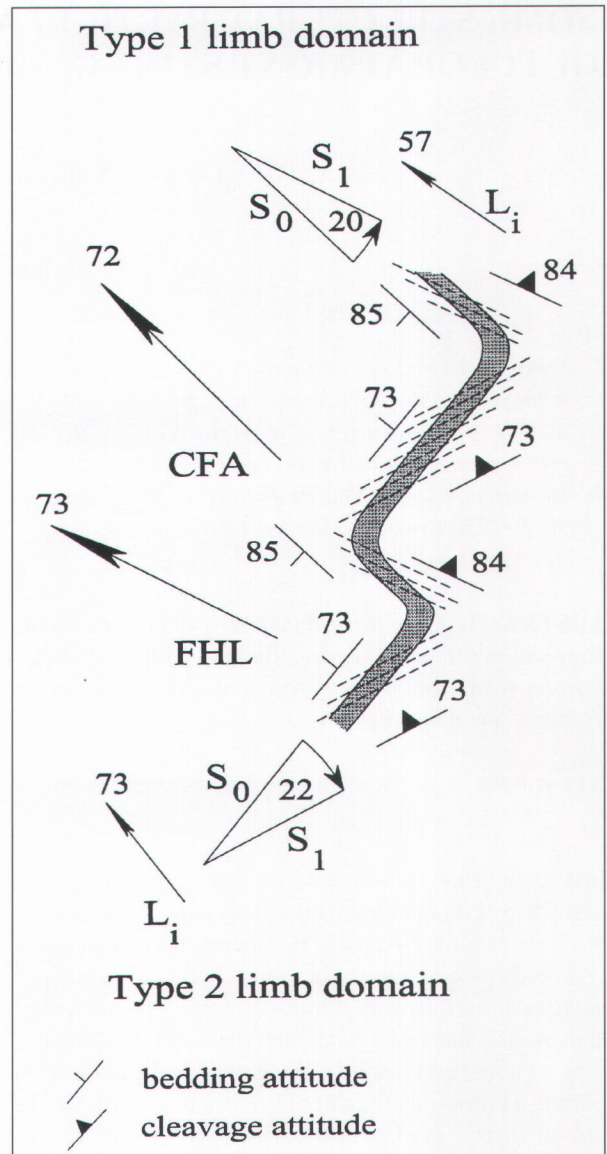


Figure 2. The subangular fold assemblage as observed along the TGV track at Lembeek (Sintubin *et al.* 1998) with indication of the type 1 and 2 limb domains (not to scale). S_0 = bedding; S_1 = cleavage; CFA = cleavage fan axis; FHL = fold hinge line; L_i = bedding-cleavage intersection.

fold assemblage as observed in the Lembeek section can be assumed present in the Mont-Saint-Guibert area.

This assumption may have some tectonic significance. Sintubin *et al.* (1998) suggests a possible genetic relationship between the characteristic fold assemblage at Lembeek and NW-SE-trending dextral transpressional shear zones bordering the Cambrian core to the southwest. Interpreting the aeromagnetic lineament geometry (Sintubin, 1997) a similar shear zone can be assumed passing the Mont-Saint-Guibert area. This shear zone, however, should show a more WNW-ESE trend, which may explain the overall anticlockwise rotation of the geometrical setting at Mont-Saint-Guibert.

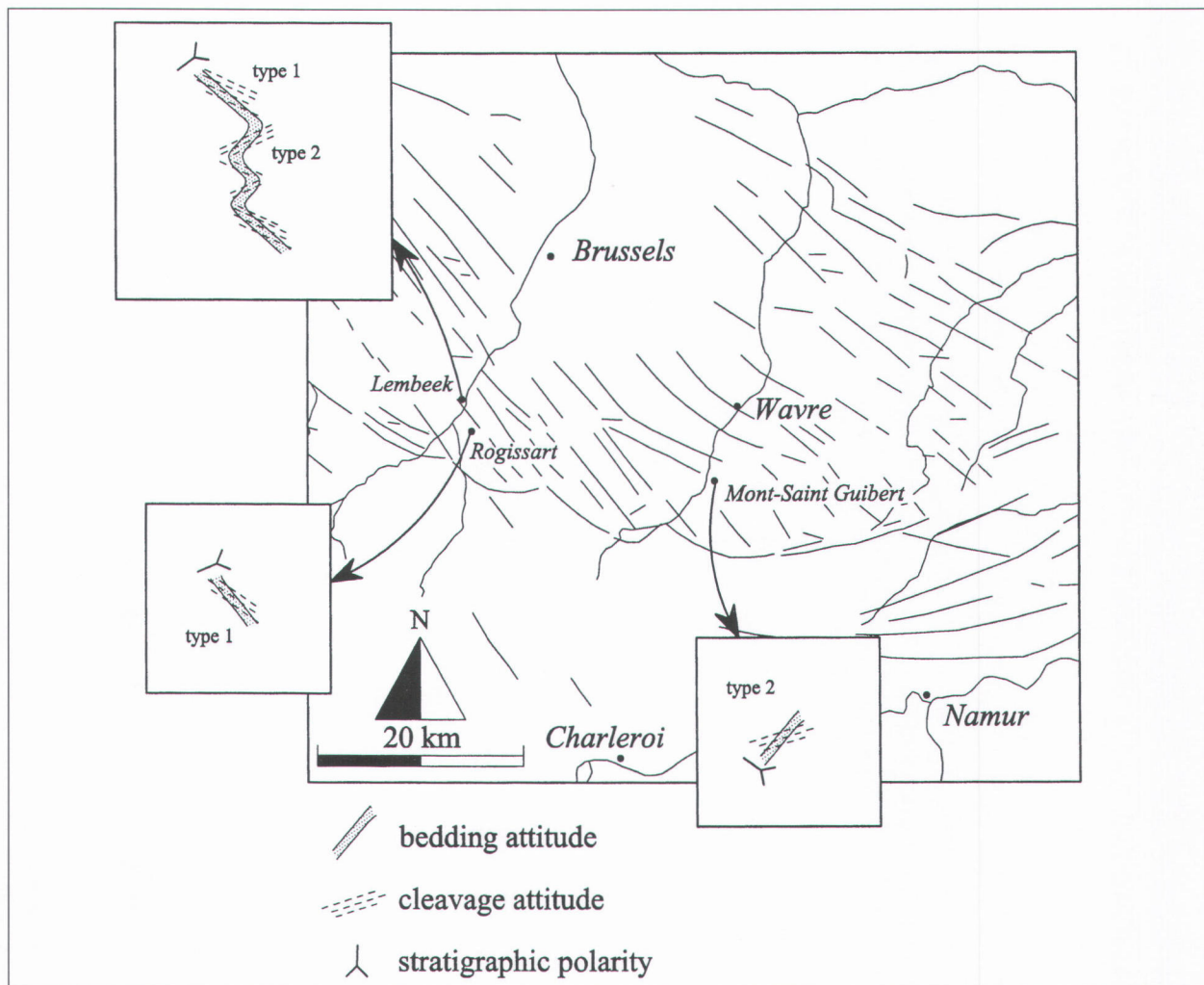


Figure 3. Map of the area south of Brussels with the Tubize-Formation outcrops discussed in the paper: the fold assemblage at Lembeek, the bedding-cleavage relationship at Rogissart and Mont-Saint-Guibert. The aeromagnetic lineaments (after Sintubin 1997) are also indicated.

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