

THE MAASTRICHTIAN STAGE; THE CURRENT CONCEPT

Natuurhistorisch Museum Maastricht/Centre Céramique

6-8 September 2012

Workshop programme, abstracts and field guide

Edited by

John W.M. Jagt & Elena A. Jagt-Yazykova

Natuurhistorisch Museum Maastricht, Maastricht, the Netherlands/Uniwersytet Opolski, Opole, Poland



Some type specimens are housed at Liège University. Among the echinoids, we may cite the type of *Micraster? cipliensis* Schlüter, 1897, allegedly from the Maastrichtian of Cipliy. In spite of our efforts, the type of *Leymeriaster maestrichtensis* (Schlüter, 1897) (Maastricht Formation, Maastrichtian), reported by Schlüter (1897) to be part of the Liège collections, has not yet been traced (see also Meijer, 1955). Also worth noting are the types of the ichnofossil *Taonurus saportai* Dewalque, 1881 from the 'Senonian' of northern France (Anzin).

REFERENCES

- Cotteau, G., 1875. Note sur les Echinides crétacés de la province de Hainaut. *Bulletin de la Société géologique de France*, (3)2 (1874): 638-660.
- Dewalque, G., 1881. Fragments paléontologiques. *Annales de la Société géologique de Belgique*, 8: M43-M54.
- Meijer, M., 1955. Sur un échinide peu connu du Maestrichtien du Limbourg hollando-belge. *Hemiaster (Leymeriaster) maestrichtensis* Schlueter. *Natuurhistorisch Maandblad*, 44: 74-77.
- Mottequin, B., Coen-Aubert, M. & Poty, E., 2011. The Belgian collections of fossil Cnidaria and Porifera. In: Aretz, M., Delculée, S., Denayer, J. & Poty, E. (eds). Abstract Volume of the 11th International Symposium on Fossil Cnidaria and Porifera, Liège 2011. *Kölner Forum für Geologie und Paläontologie*, 19: 111-112.
- Schlüter, C., 1897. Ueber einige exocyclische Echiniden der baltischen Kreide und deren Bett. *Zeitschrift der deutschen geologischen Gesellschaft*, 49: 18-50.

Poster

Detailed mapping of Santonian-Maastrichtian formations in northeast Wallonia, Belgium

Bernard Mottequin¹, Pierre Ghysel², Martin Laloux³, Jean-Marc Marion¹ & Jean-Louis Pingot³

¹Unité de Paléontologie animale, Université de Liège, Allée du 6 Août, B18, Sart Tilman, B-4000 Liège 1, Belgium, email: bmottequin@ulg.ac.be; jmmarion@ulg.ac.be; ²Institut royal des Sciences naturelles de Belgique, Service géologique de Belgique, Rue Jenner 13, B-1000 Bruxelles, Belgium, email: pierre.ghysel@sciencesnaturelles.be; ³Earth and Life Institute, Université catholique de Louvain, place Louis Pasteur, 3, boîte L4.03.06, B-1348 Louvain-la-Neuve, Belgium, email: Martin.LALOUX.ext@spw.wallonie.be, jean-louis.pingot@uclouvain.be

Cretaceous rocks, unconformably resting on the Palaeozoic basement, are recognised in several regions within the southern and northeastern parts of Wallonia, mainly in the Mons Basin and the Liège area, respectively (e.g., Robaszynski *et al.*, 2002). In northeast Wallonia (Fig. 1), Upper Cretaceous deposits essentially include sands, chalks and calcarenites. Northwest of Liège, they are generally covered by Cenozoic (Paleogene) and/or thick loess deposits. Campanian and Maastrichtian carbonate rocks (Gulpen and Maastricht formations) are still extensively quarried for the production of Portland cement in the valleys of the Meuse and Geer rivers, north of Liège. They are also excellent reservoir rocks, affected by a double porosity (Dassargues & Monjoie, 1993), and constitute the Hesbaye aquifer, which is crucial for the water supply of Liège and its suburbs.

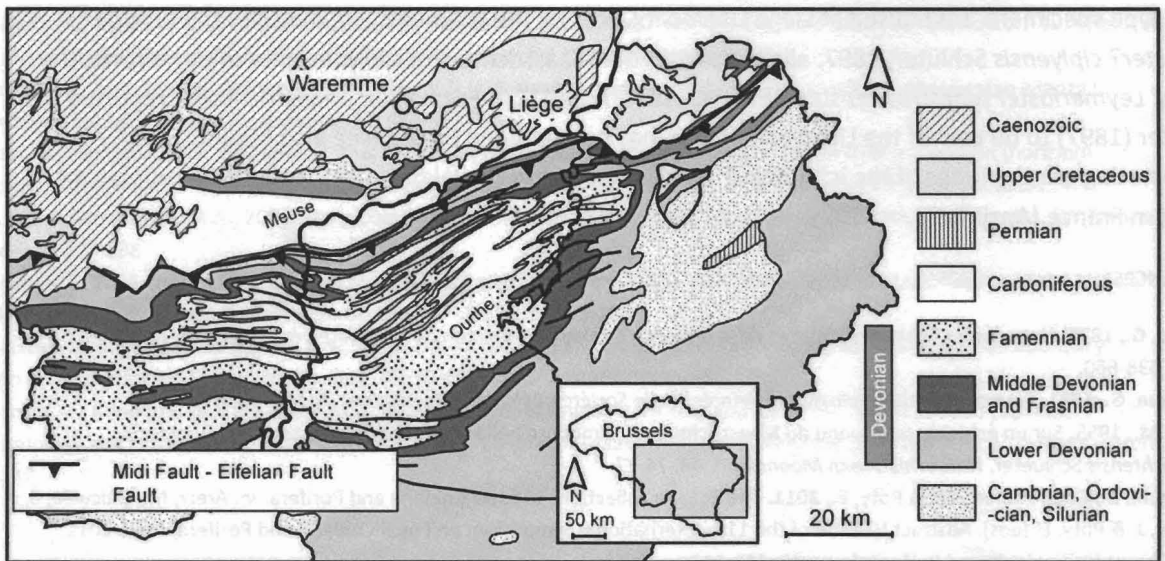


Figure 1. Partial geological map of Belgium (modified from de Béthune, 1954, planche 8), showing the location of Upper Cretaceous deposits in northeast Wallonia.

Detailed geological mapping of the Cretaceous formations in northeast Wallonia, carried out within the context of updating of the geological map of Wallonia, is almost completed and most of the maps (at 1/25,000), dealing with Cretaceous-aged rocks, have already been published (Laloux *et al.*, 1996a, 1996b, 2000; Barchy & Marion, 2000). Previous editions of these maps, which were published at a scale of 1/40,000, date back to the end of the nineteenth century and the beginning of the twentieth. Their revision was thus badly needed. The new geological maps of Wallonia are based exclusively on lithostratigraphy, contrary to the previous ones which were based on chronostratigraphy. They are more useful to all human activity which involves knowledge of the subsoil, such as mining, management of waste dump sites, hydrogeology and civil engineering.

The Cretaceous sedimentation recorded in northeast Wallonia spans the interval ranging from the Middle Santonian to the Late Maastrichtian (Robaszynski *et al.*, 2002). It was controlled by complex interactions between sea level changes and block tilting and resulted in lateral thickness and facies variations but also in numerous stratigraphic gaps (e.g., Bless *et al.*, 1987; Bless, 1989). The mapped lithostratigraphic units (Aachen, Vaals, Gulpen and Maastricht formations) are those proposed by Felder (1975) and Albers & Felder (1979). However, their members can only be recognised in quarries and thus, due to the general lack of significant outcrops in the major part of the area considered here, are not used for mapping.

Mottequin & Marion (in press) have modified the definition of the Gulpen and Maastricht formations by transferring the Lanaye Member (calcarenes with flint nodule horizons) from the top of the Gulpen Formation to the base of the overlying Maastricht Formation. From a lithological viewpoint, these calcarenites are easily distinguished from the underlying chinks that constitute the major part of the Gulpen Formation and show close affinities with those of the overlying Maastricht Formation. This lithological criterion is of easy use within the context of geological mapping and clearly less subjective than a boundary based on a thin, variably developed, particular horizon, i.e., the Lichtenberg Horizon (Felder, 1975). Indeed, this horizon, which corresponds to the *craille à coprolites* (Uhlenbroek, 1905), cannot be recognised everywhere and the boundary between both formations, as previously defined, could be delimited only on the basis of correlations between flint nodule layers according to Felder (1988).

In central Hesbaye, south of the town of Waremme (Fig. 1), the chalk (Gulpen Formation) is covered by about ten metres (or more) of loess and, thus the chalk is not visible in the field. Nevertheless, the nature of the substratum is known from numerous boreholes drilled for phosphate extraction. There is, under the loess, a thick residual flint conglomerate (*conglomérat à silex*) (up to 10 m thick) overlying a layer of phosphatic nodules, which attains up to 1 m in thickness. The phosphate was extensively exploited at the end of the nineteenth century and during the Second World War (e.g., Pacyna, 2004). This explains why our knowledge of this area is better than at the end of the nineteenth century when it was first mapped. The chalks and calcarenites of the Gulpen and Maastricht formations show two periods of karstification. The first has a pre-Selandian age as karst cavities were filled by the sandy and marly deposits of the Heers Formation (middle to late Selandian). Karst phenomena of this age are known only north of the River Geer (= River Jeker in Dutch). Karsts belonging to the second period of karstification cover a large area of the map sheet Waremme-Momalle (Pingot, in prep.). These karsts are filled by sands of the Sint-Huibrechts-Hern Formation (Rupelian, Oligocene), which means that the Rupelian transgression was more widespread than the former which is just preserved in karstic cavities.

REFERENCES

- Albers, H.J. & Felder, W.M., 1979. Litho-, Biostratigraphie und Palökologie der Oberkreide und des Alttertiärs (Präobersanton-Dan/Paläozän) von Aachen-Südlmburg (Niederlande, Deutschland, Belgien). In: Wiedman, J. (ed). Aspekte der Kreide Europas. *International Union of Geological Sciences*, A6: 47-84.
- Barchy, L. & Marion, J.-M., 2000. *Carte géologique de Wallonie, Dalhem-Herve (42/3-4)*. Ministère de la Région Wallonne, Namur: 71 pp.
- Béthune, P. de, 1954. *Carte géologique de Belgique (échelle 1/500.000)*. Académie royale de Belgique, Atlas de Belgique, Bruxelles, planche 8.
- Bless, M.J.M., 1989. Event-induced changes in Late Cretaceous to Early Paleocene ostracode assemblages of the SE Netherlands and NE Belgium. *Annales de la Société géologique de Belgique*, 112: 19-30.
- Bless, M.J.M., Felder, P.J. & Meessen, J.P.M.Th., 1987. Late Cretaceous sea level rise and inversion: their influence on the depositional environment between Aachen and Antwerp. *Annales de la Société géologique de Belgique*, 109: 333-355.
- Dassargues, A. & Monjoie, A., 1993. Les aquifères crayeux en Belgique. *Hydrogéologie*, 2: 135-145.
- Felder, W.M., 1975. Lithostratigrafie van het Boven-Krijt en het Dano-Montien in Zuid-Limburg en het aangrenzende gebied. In: Zagwijn, W.H. & Van Staalduinen, C.J. (eds). *Toelichting bij geologische overzichtkaarten van Nederland*. Rijks Geologische Dienst, Haarlem: 63-72.
- Felder, W.M., 1988. Excursion A8. Lithology and stratigraphy of Upper Cretaceous of the Belgium-Dutch borderland west of the river Meuse. In: Herbosch, A. (ed.). *IAS 9th European regional meeting: excursion guidebook, Leuven-Belgium, September 1988*. Ministry of Economic Affairs/Belgian Geological Survey, Brussels: 99-134.
- Laloux, M., Dejonghe, L., Geukens, F., Ghysel, P., Hance, L., Polrot, F. & Servais, Th., 1996a. *Carte géologique de Wallonie, Limbourg-Eupen (43/5-6)*. Ministère de la Région Wallonne, Namur: 192 pp.
- Laloux, M., Dejonghe, L., Ghysel, P. & Hance, L., 1996b. *Carte géologique de Wallonie, Fléron-Verviers (42/7-8) (+ notice explicative)*. Ministère de la Région Wallonne, Namur: 150 pp.
- Laloux, M., Geukens, F., Ghysel, P., Hance, L. & Servais, Th., 2000. *Carte géologique de Wallonie, Gemmenich-Botzelaar (35/5-6), Henri-Chapelle-Raeren (43/1-2), Petergensfeld-Lammersdorf (43/3-4) (+ notice explicative)*. Ministère de la Région Wallonne, Namur: 95 pp.
- Mottequin, B. & Marion, J.-M., in press. *Carte géologique de Wallonie, Tongeren-Herderen (34/5-6)*. Service public de Wallonie, Namur.
- Pacyna, D., 2004. Effondrements de terrains causés par d'anciennes exploitations souterraines de marne et de phosphate. *Revue Architrave*, 151: 10-12.
- Pingot, J.L., in prep. *Carte géologique de Wallonie, Waremme-Momalle (41/3-4) et Heers-Borgloon (33/7-8, partie sud)*. Service public de Wallonie, Namur.
- Robaszynski, F., Dhondt, A. & Jagt, J.W.M., 2002. Cretaceous lithostratigraphic units (Belgium). *Geologica Belgica*, 4 (2001): 121-134.
- Uhlenbroek, G.F., 1905. Le Sud-Est du Limbourg néerlandais. Essai géologique. *Annales de la Société géologique de Belgique*, 32: M151-M198.