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# A DISCUSSION of GULLENTOPS, F. & DE MOOR, G. (2001) : Quaternary lithostratigraphic units (Belgium). 2.2 Remaining marine-estuarine deposits. *Geologica Belgica*, 2001, 4/1-2: 153-164.

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The present comments refer to the subdivivsion 2.2. "Remaining marine-estuarine deposits" (p. 156-157) of the Quaternary lithostratigraphic units presented by Gullentops & De Moor in the Lithostratigraphic scale of Belgium (*Geologica Belgica*, 4, 1-2, 2001, 153-164). As stated in the preface of the Special Edition, the members of the Quaternary commission did not reach an agreement. Consequently, the presented lithostratigraphy only reflects the vision of the authors without considering the numerous comments made at the meetings of the Subcommission.

This would be less harmful if the authors had included literature later than 1979. Instead, all recent references were left out of the literature review, resulting in a lithological definition of the lithostratigraphic units which does not match reality.

Moreover, a formal lithostratigraphy is meant to be useful as a guide to every interested geoscientist in recognizing and subdividing a sedimentary record. With respect to this objective, the Holocene part of the lithostratigraphy in subdivision 2.2. is a complete failure. Some peculiarities concerning the definition and description of the units will be highlighted. The subdivision as such and its terminology will not be discussed because it has been argued at many occasions (e.g. Baeteman, 1981b, 1983, 1999, Denys, 1999).

According to the introduction by Gullentops *et al*. (2001, p. 153), the deposits of the coastal area are nearshore marine sediments. In the lithological description of the Vlaanderen Formation, however, only tidal flat sediments appear. The description of the tidal-channel sand as coarse sand is far too exaggerated since sand from the tidal channels is hardly coarser than the fine "wadden sand". The coastal dune deposits are not included in the description of the Vlaanderen Formation.

The description of the Vlaanderen Formation specifies tidal flat clay, but none of the Members contain clay according to the further description. The Calais Member as stated in the lithostratigraphic units, consists of sandy wadden deposits with intercalated channel sand and silty tidal flat deposits towards the top. This definition reminds very much of the one the Soil Survey used in the 50's and 60's (cf. Baeteman, 1983). But since then, hundreds of boreholes have been carried out penetrating the Holocene sequence (e.g. Mostaert, 1985; Baeteman, 1981, 1993, 1999; Allemeersch, 1991). From the numerous published borelogs and cross-sections, it can be seen that the entire Holocene sequence consists of mud and silty mud in at least half of the coastal area. Moreover, the mud is intercalated with peat beds and not with channel sand. The question arises how to recognize the difference between sandy wadden deposits and channel sand when they are intercalated.

It is surprising that the Basal Peat is not assigned to a Bed by Gullentops & De Moor (2001). Its stratigraphical position, distribution and facies are nevertheless very characteristic. On the other hand, the "major Pervijze peat" is assigned to a Bed, however, without saying where it occurs, because the definition only mentions that it allows distinction of two Members, without specifying which ones, since four Members are presented here. This peat bed certainly is one the numerous intercalated peat beds (called horizons by the authors), but the term "major Pervijze peat Bed" has never been used before, and the term *major* is not defined here, so it might be difficult to recognize the Bed. In the southern part of the western coastal plain, e.g. some of the intercalated peat beds can have identical thicknesses.

The description of the Dunkerque Member (*Rhythms of tidal flat sediments with intercalated channel sand, caused by several sea ingressions* p. 157) is curious, to say the least. Most probably, the authors must have heard about tidal rhythmites (cf. Dalrymple, 1992). However, the latter concerns a sedimentary process caused by neap-spring variations in tidal current speed and is not caused by sea ingressions. It is assumed that "several sea ingressions" is used here to bypass the big debate about the Dunkerque transgressions. Apparently, Gullentops & De Moor find it hard to accept that the Dunkerque transgressions do not exist (cf. Vos & Van Heeringen, 1997; Baeteman, 1981a, 1999, Ervynck *et al*, 1999).

It is also not correct to state that in the Dunkerque Member the channel sand is intercalated in the tidal flat sediments. The most typical feature of the "Dunkerque Member" are the deep and narrow incisions caused by tidal channels and filled up with sand. Some of them even completely eroded the Pleistocene deposits. These sand-filled channels can reach thicknesses of up to 18 m (e.g. Baeteman, 1985).

De Haan Member is newly introduced here by De Moor to name the shelly sand of coastal barriers

and associated beaches. The age is put between the Atlantic and present, but according to the "Schematic distribution of the Quaternary lithostratigraphic units" (Table 2, p. 155), the Member can be found from the beginning of the Holocene. Moreover, the barriers occur in the coastal plain according to the description. The question arises where to find these coastal barriers. It appears that the coastal evolution is not well understood. The shoreline, and thus the coastal barrier (only one) from the "Flanders coastal plain in Belgium" has been transgressing (shifting landwards) from the beginning of the Holocene until about 5000 BP due to the post-glacial sea-level rise (e.g. Baeteman, 1999). Such a transgressive barrier is essentially a transitory feature that maintains itself in dynamic equilibrium with rising sea level by the landward transfer of sand, eroded from the shoreface to backbarrier settings (Roy *et al.*, 1995). Consequently, the position of the "Atlantic" barrier is now located in the present-day offshore area, and the barrier itself has been removed by wave action.

The description of the Oostende Formation also requires some additions. Its distribution is not restricted to the eastern coastal area and Flemish Valley, but deposits of the Last Interglacial are widely distributed in the western coastal area as well (see map in Baeteman, 1993). Moreover, it would have been interesting to distinguish two Members: the open marine facies (coarse and gravelly sand with open-marine shells, not only restricted to storm-beach deposits as stated by Gullentops & De Moor) and the less-energetic estuarine facies consisting of fine-grained tidal flat deposits with peat beds. According to the description, the Eemian age is inferred on the basis of a.o. molluscs, therefore it is barely understandable why the typical *Corbicula fluminalis* considered as a guide fossil for the Eemian in Belgium (Meijer & Price, 2000) is not mentioned, but instead, the common gastropode *Hydrobia*.

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