

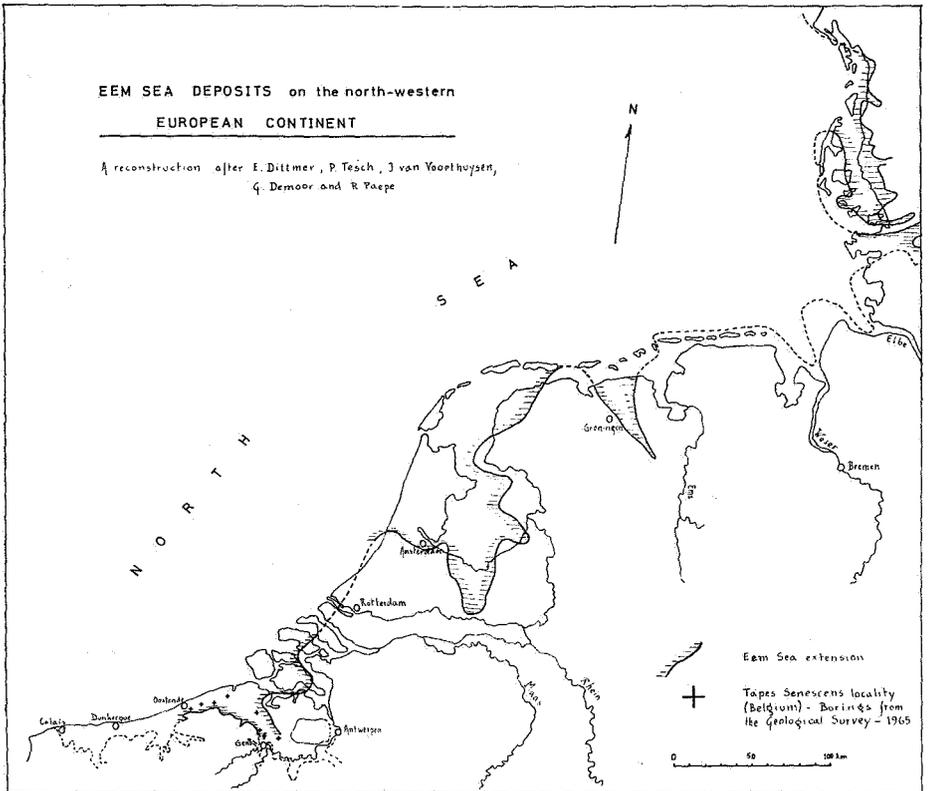
On the Presence of « *Tapes senescens* » in some borings of the coastal plain and the Flemish Valley of Belgium,

by R. PAEPE.

RÉSUMÉ. — Des sondages exécutés dans la plaine maritime et dans la « vallée flamande » au Nord de la Belgique ont révélé l'existence de *Tapes senescens* var. *eemiensis* dans les « sables marins à *Corbicula fluminalis* » de l'Assise d'Ostende. Une revue des échantillons de sondages ultérieurs conservés au Service géologique de Belgique, nous a permis de poursuivre la présence de ce fossile dans la « Vallée flamande » à l'Est de Gand.

The Geological Survey has recently undertaken a serie of borings in the coastal plain and in the Flemish Valley in order to study the stratigraphy of the quaternary deposits and the top of the underlying tertiary sediments. In most of the localities, Stalhille, Houtave, Koolkerke, Moerkerke, Maldegem and Kaprijke, all together 15 borings, *Tapes senescens* was found at the base of the quaternary strata. These are generally known as the « marine sands with *Corbicula fluminalis* from the assise of Oostende ».

V. NORDMANN (1908) was the first to mention the presence of this fossil in borings from Nieuwpoort (petit crocodile), Leffinge and Vlissingen (the Netherlands). This author, however, believed the fossil showed a reworked nature and consequently proposed an age younger than the Riss-Würm interglacial. G. DUBOIS (1923), A. HACQUAERT (1931) and F. HALET (1931) attributed a post-glacial Flandrian age to these deposits untill R. TAVERNIER (1946) denied completely such interpretation and argued for at least an interstadial age. The latter author based his viewpoint on the presence of *Dryas octopetala* on top of the Oostende sands. Furthermore, in accordance with the stratigraphical position of the *Corbicula fluminalis* beds underneath three Würm loess deposits in the Lys valley, nearby Avelgem and the general presence of these beds at the bottom of the thalweg of the river valleys in Lower Belgium, especially in the Flemish Valley, he proposed an even more older age : Riss-Würm interglacial.



G. DEMOOR (1963) who mapped the extension of the Flemish Valley, noticed the presence of *Corbicula fluminalis* and *Venerupis senescens* (determinations after J. DE CONINCK) together with *Cardium edule*, *Scrobicularia* and *Macra* in the Sifferdok from the harbour of Ghent. Also J. DE HEINZELIN and R. MARÉCHAL (1963), after a work in preparation from J. DE CONINCK, mention *Venerupis senescens*. It is surprising that none of the authors, mentioned above, has never made an attempt for correlation with the Tapes Senescens Sands from Northern Germany.

THE EEM SEA TRANSGRESSION.

The Eem sea flooded to a large extent the coast of Holland, western Schleswig in Germany, southwestern Jylland, the western Baltic region (Lille Belt and Southern Fyn) and furthermore western and eastern Prussia in Poland. The coast of the Eem sea was not a regularly one and many are the bays through which the Eem sea progressed landinwards (see map) : the Guelder valley south of the Zuiderzee in Holland, the Nordfriesische Rinne (E. DITTMER, 1941, 1951; G. VAN DE BRELIE, 1951) and the Nordmann Rinne western in Schleswig.

The name «Senescens Sande» is derived from a strand formation at the base of the Eem deposits in the Nordfriesische Rinne. This deposit is composed of sands and gravels and reaches about 1,5 m in thickness; *T. senescens* occurs to be very abundant. The entire layer rests on continental deposits. In the Nordmann Rinne this fossilbearing sand occurs only very sporadically (DITTMER, 1951) notwithstanding the fact that the marine Eem sediments are again built up by sand and gravels (G. VAN DE BRELIE, 1951).

The Senescens Sands are covered by marine clays, the so-called « Turritellen Ton », which are gradually going over to brackish water clays. The complete sequence may have a total thickness of 30 m.

Borings in the Esbjerg-Tönder area reach Eem sediments at a depth of 7 m to 10 m below sea level. This lithology is the same as the one described above for the Schleswig area. The fauna is lusitanian and contains *Tapes senescens*, *Gastrana fragilis*, *Mytilus lineatus*, *Divaricella divaratica*, *Haminea navicula* and *Syndesmya ovata*. They are lying on undisturbed Riss till and meltwaters sediments and are overlain themselves by Würm and holocene deposits. The so-called Skaerumhede serie belonging to a later Eem transgression phase, was never found directly lying above them. The two Eem deposits seem actually to be seperated in space and time what leads S. HANSEN (1965) to think that the Eem transgression is due to an eustatic change of the sea level while the Skaerumhede transgression was probably an isostatic one. The first is thus the expression of the colder interglacial phase and the second reflects the beginning of the advance of the Würm ice sheet.

TAPES SENESCENS BEDS IN BELGIUM.

In the coastal plain of Belgium (borings at Stalhille, Houtave, Koolkerke), the Eem deposits generally start with outspoken gravel and coarse sand deposits (0,5 m to 1,5 m in thickness) wherein *T. senescens* occurs in a relatively large amount. The gravel is composed of flint, paniselian sandstone, squala teeth and vegetation remnants. It gradually goes over into grayish finer sands containing at some levels a very rich fauna with sporadically *T. senescens*. In the same fine sands, gravelly layers composed of flint stones, clayey horizons and vegetations zones may also occur. About *T. senescens* itself, one can state specimens that reach more than 5 cm in width. The fossil does not show traces of transport and even a bivalve was found at Stalhille. The usual accompanying faune is *Cardium edule*, *Hydrobia ulvae*, *Macoma balthica*, *Mactra*, *Nassa reticulata*, *Littorina littorea*, *Natica* and *Mytilus*.

Since these Eem deposits are overlaid by the so-called Calais Sands, the upper limit is often difficult to establish. One may say that it fluctuates between 6 and 8 m below present sea level.

The Tapes Senescens Gravel and Sand rest generally on the tertiary substratum with the exception of two borings at Koolkerke where a loamy deposit shows up under the Senescens layer. The loamy layer contains lots of *H. ulvae*, peat remains and reaches 2 m in thickness. In one of the borings fine loamy sands with *T. senescens* underneath the loamy layer characterise the transition to the tertiary substratum. It goes without saying that the lower boundary of the Eem deposits vary largely from one place to another over a relatively short distance : — 10 m at Stalhille, — 15 m at Houtave and — 13 m and — 14 m at Koolkerke, under present sea-level.

In the Flemish Valley, the situation is somewhat different as was shown through borings from Moerkerke, Maldegem and Kaprijke. Whereas the top of the Senescens Sands remains at about — 7 m below present sea level, the base, however, can be as deep as — 17 m O.P. although its abundance, and its size becomes much smaller than in the coastal plain. Also this fossil is usually accompanied by *Corbicula fluminalis*. Its presence however, shows that the Eem deposits in the Flemish Valley have been largely influenced by marine conditions.

In samples from older borings preserved at the Geological Survey in Brussels *T. senescens* was found even more easterly in the Flemish Valley : in two borings at Evergem and in two borings at Lochristy.

CONCLUSION.

The geographical distribution of *T. senescens* can be compared with the situation described above for northwestern Germany and Holland. The Eem sea penetrated very far landinwards and its shoreline lies beyond the present shoreline. No traces of the Skaerumhede transgression are found up to now.

The lithological and faunistical characteristics of the Oostende Sands and to some extent also their topographical position, show a striking parallelism with the Senescens Sands of Northern Europe.

The hypothesis put forward by R. TAVERNIER (1954), arguing in favor of a Riss-Würm interglacial age finds thus a new support.

We like to express our thanks to Dr GLIBERT who was so kind to confirm our determinations.

BIBLIOGRAPHY.

- DEMOOR, G., 1963, Bijdrage tot de kennis van de fysische landschapsvorming in Binnen-Vlaanderen. (*SOBEG*, Mém. n° 13, Jaarg. XXXII, n° 2.)
- HANSEN, S., 1965, in *The Quaternary*, vol. 1, Interscience Publ., N. Y.
- DE HEINZELIN, J. et MARÉCHAL, R., 1963, Excursion K du VI^e Congrès International de Sédimentologie, Belgique et Pays-Bas.
- TAVERNIER, R., 1954, Le Quaternaire in *Prodrome d'une description géologique de Belgique*. Liège.
- WOLDSTEDT, P., 1962, *Das Eiszeitalter*. 1, 1954 ; 2, 1958, Stuttgart.
- GEOLOGICAL SURVEY BORINGS, Sheet Evergem (40° W), n^{rs} B 273 (n^r 3) and B 256 (n^r 23).
- Sheet Houtave (22 E), n^{rs} 177 and 178.
- Sheet Kaprijke (24 E), n^{rs} 103, 104 and 105.
- Sheet Koolkerke (23 W), n^{rs} 366, 367 and 368.
- Sheet Lochristi (40 E), n^{rs} B 119 and B 120.
- Sheet Maldegem (24 W), n^{rs} 141, 142 and 143.
- Sheet Moerkerke (23 E), n^{rs} 61 and 62.

LEGEND TO THE PLATE.

Tapes senescens var. *eemiensis* (natural size).

to the right : boring at Koolkerke;

to the left : boring at Stalhille.

