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## TRANSGRESJA NAMURU W BELGII

(3 fig.)

### *Namurian transgression in Belgium*

(3 Figs.)

#### STRESZCZENIE

Tabela 1 przedstawia podział stratygraficzny namuru na podstawie goniatyfów ustalony w wyniku badań przeprowadzonych w szeregu krajów zachodnioeuropejskich. Podział ten został uwzględniony przy rozpatrywaniu etapów transgresji namuru na obszarze Belgii i sąsiadujących krajów.

Profile geologiczne (fig. 1, 2) wykazują, że wiek dolnych warstw namuru leżących na wizenie jest różny, w Belgii od poziomu E2a z *Cravenoceras cowlingense* aż po Hb1 z *Homoceras beyrichianum*. Poziom R1a z *Reticuloceras circumplacitile* został stwierdzony tylko na obszarze Francji, natomiast poziom R1b z *Reticuloceras nodosum* jest znany z wierceń na obszarze Belgii.

Transgresja namuru rozwijała się stopniowo, postępuje ona z kierunku NE (fig. 2). Różny wiek transgredującego morza namurskiego był wynikiem różnic morfologicznych w budowie podłoża, np. osady poziomu E2b2 z *Cravenoceratoides edalensis* gromadziły się w kenionach podniesionej penepłeny wizeńskiej.

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Namurian stratigraphy based upon goniatites enables very precise correlations. This paper will try to draw a reconstruction of transgression in Namurian times.

#### STRATIGRAPHY

Based on the discoveries in England, Belgium, Ireland, France and Western Germany our knowledge on Namurian stratigraphy is well established. Since the last discovery in the Dinant Basin J. Bouckaert and A. C. Higgins conclude that the faunas ascribed to E<sub>1</sub> in Belgium and Ireland are dissimilar: the earliest recognisable Namurian deposits are of E<sub>2a</sub> age (Figs 1, 2).

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The zonal framework within which the events of Namurian transgression can be dated may be established as in Table 1.

Table 1

R <sub>1</sub>	R <sub>1b</sub> R <sub>1a</sub>	<i>Reticuloceras nodosum</i> group <i>Reticuloceras circumplicatile</i>
H <sub>2</sub>	H <sub>2c</sub> H <sub>2b</sub> H <sub>2a</sub>	<i>Homoceratoides prereticulatus</i>
H <sub>1</sub>	H <sub>1b</sub> H <sub>1a</sub>	<i>Homoceras beyrichianum</i> <i>Homoceras subglobosum</i>
E <sub>2</sub>	E <sub>2c</sub> E <sub>2b4</sub> E <sub>2b3</sub> E <sub>2b2</sub> E <sub>2b1</sub> E <sub>2a</sub>	<i>Nuculoceras nuculum</i> <i>Cravenoceratoides stellarus</i> , <i>Ct. nititoides</i> <i>Cravenoceras holmesi</i> , <i>Ct. nitidus</i> <i>Cravenoceratoides edalensis</i> <i>Cravenoceras</i> aff. <i>kettlesingense</i> <i>Cravenoceras cowlingsense</i>

In order to date the Namurian transgression the contact between Namurian and the underlying beds must be examined.

#### AGE OF CONTACTS

##### 1) E<sub>2a</sub> with *Cravenoceras cowlingsense*.

A contact of E<sub>2a</sub> age with *C. cowlingsense*, *Eumorphoceras bisulcatum*, *E. bisulcatum grassingtonense* and *E. bisulcatum ferrimontanum* was recently established by J. Bouckaert and A. C. Higgins (1963) in the Dinant basin where the Namurian is locally exposed in small outcrops. They form the earliest recognisable Namurian deposits in Belgium and the presence of E<sub>1</sub> is still to be proved.

From the same basin G. Herbst described in 1951 an outcrop situated at the SE of Eschweiler in Western Germany. The section is situated eastwards from the road Nothberg-Hastenrath. A marine horizon, 20 m above the carboniferous limestone contains *C. aff. cowlingsense* and is probably of E<sub>2a</sub> age. In the same area W. Van Leckwijck and F. Stockmans observed in 1956 an identical succession.

##### 2) E<sub>2b1</sub> with *Cravenoceras* aff. *kettlesingense*.

During the period 1961—1962 a broad trench was dug for an Electric Power Company in Monceau-sur-Sambre (Charleroi). The trench exposes a very good section of Visean and Namurian beds belonging to one of the overturned massifs of Landelies.

The normal section from top to bottom is as follows: (Fig. 1).

Nº of beds	Thickness in meters.
1. Blue shale with fragmentary plant remains and <i>Arenicolites fourmarieri</i> Graulich	4,00
2. Dark blue shale with poorly preserved <i>Posidoniella</i> and <i>Anthracoceras</i>	2,70

№ of beds	Thickness in meters
3. Bullion bed	0,30
4. Dark brown shale with abundant <i>Ct. edalensis</i> and <i>E. bisulcatum</i> group (E <sub>2b2</sub> )	1,50
5. Bullion beds	0,50
6. Blue shale, jarositic	5,00
7. Violet shale with abundant <i>C. aff. kettlesingense</i>	0,20
8. Brown shale with dark brown layers	1,70
9. Violet shale with abundant <i>C. aff. kettlesingense</i> (E <sub>2b1</sub> )	0,20
10. Brown shale	0,90
11. Carboniferous limestone	

Higher up the section may be completed by a third level containing *Cravenoceratoides nitidus* (E<sub>2b3</sub>), exposed in the Railway station of St. Martin, and situated at 9 m above the horizon with *Cravenoceratoides edalensis*.

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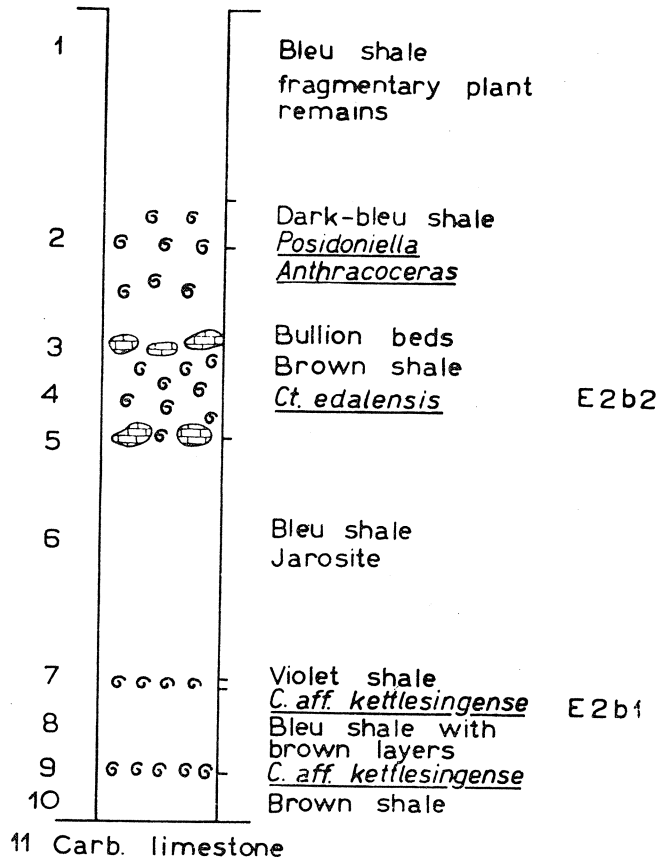


Fig. 1. Profil namuru w Monceau-sur-Sambre (Charleroi)  
Fig. 1. Profile of the Namurian at Monceau-sur-Sambre (Charleroi)

The Namurian in Northern France is described by J. Ch alard in a very important memoir (1960). The *Eumorphoceras* stage is composed by 3 horizons: beds with *E. bisulcatum* and *Anthracoceras paucilobum*, beds with *Cravenoceratoides edalensis* and at the base a thin layer with *Eumorphoceras* sp. These 3 horizons are known in the 1<sup>st</sup> borehole of

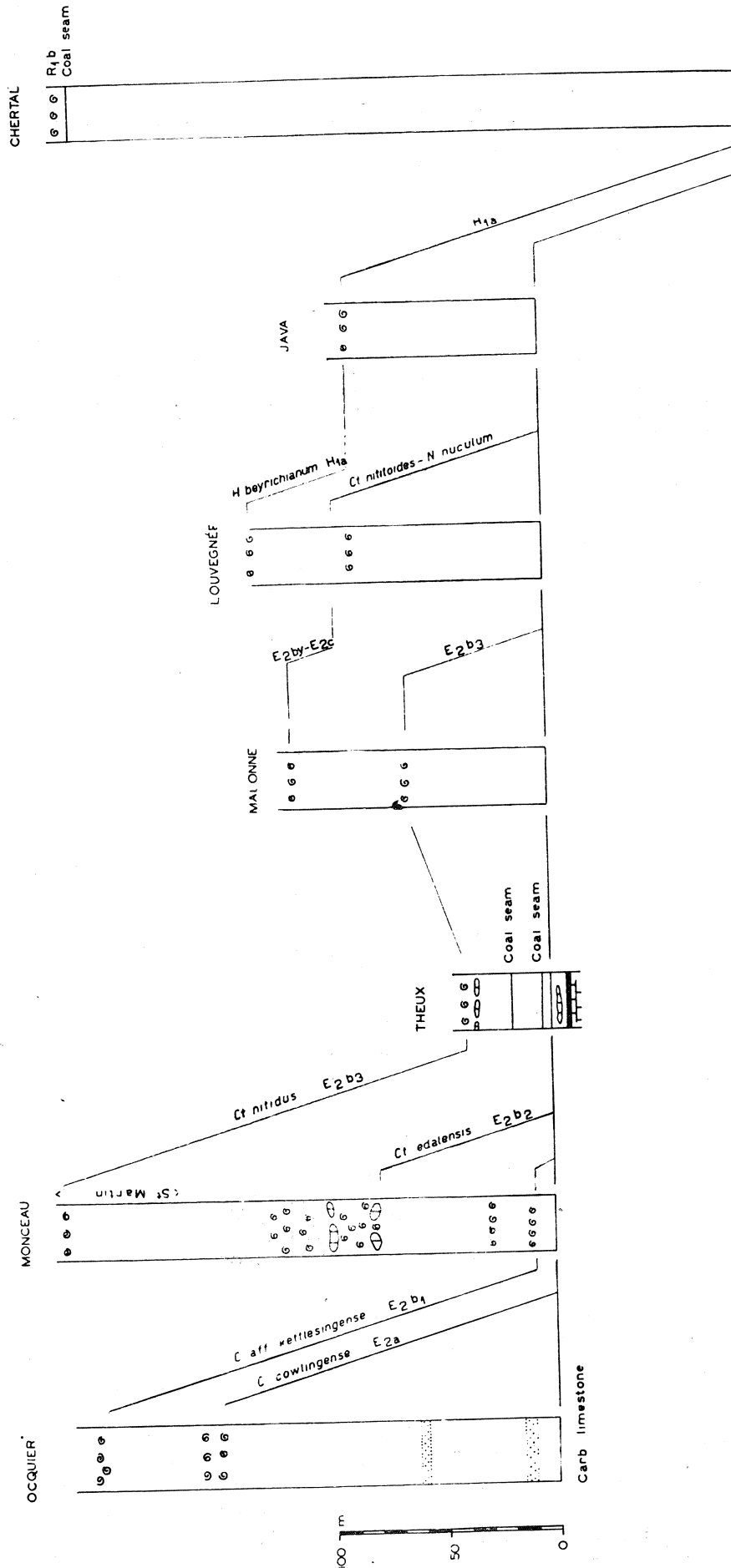


Fig. 2. Rozwój transgresji namuru w Belgii  
 Fig. 2. Stages of the Namurian transgression in Belgium

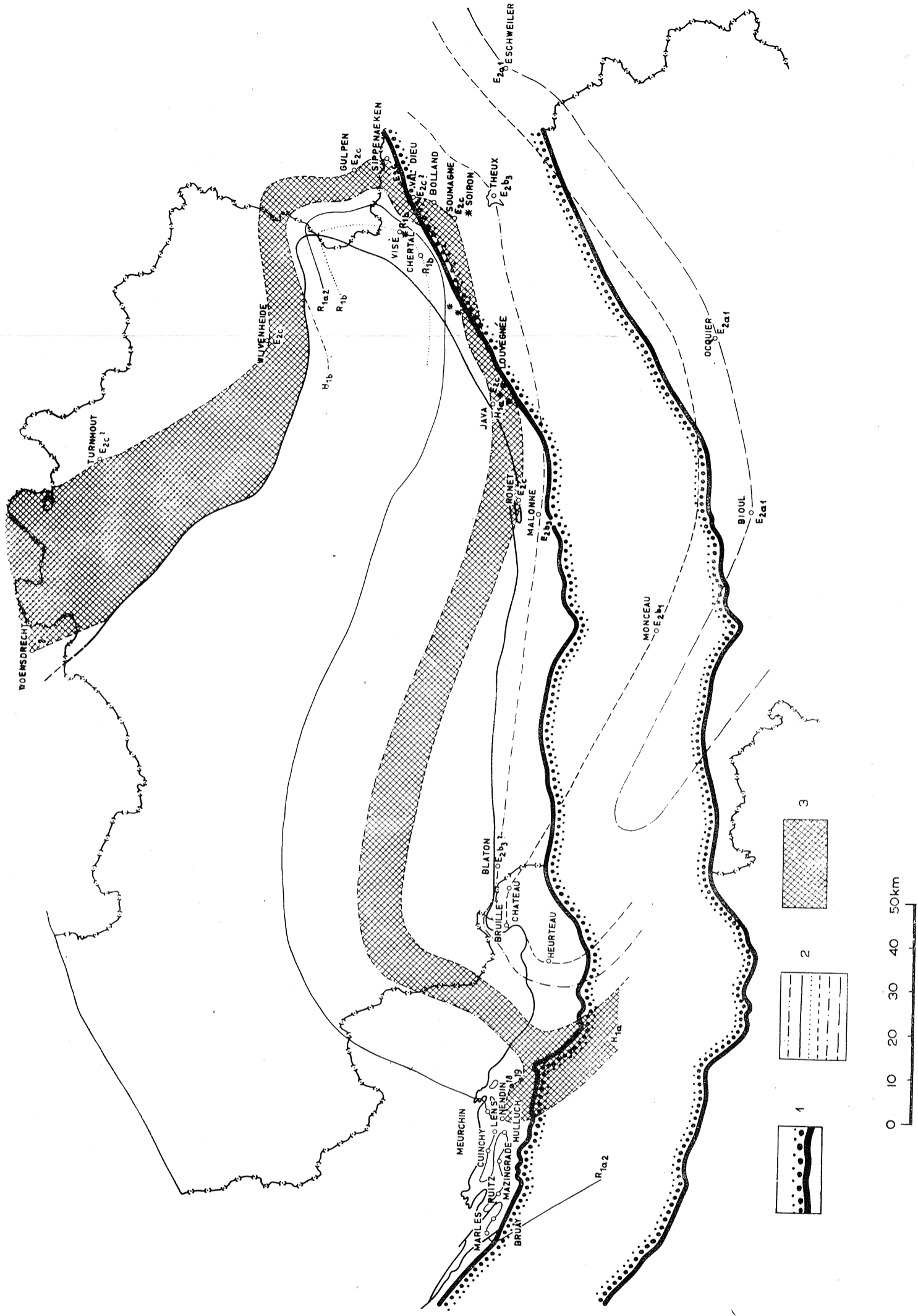


Fig. 3. Zasięg poszczególnych pięter goniatytowych w basenie Namur. 1 — granica luki stratygraficznej obejmującej poziom E<sub>1</sub>; 2 — granice zasięgu podpięter goniatytowych; 3 — strefa występowania poziomu goniatytowca H<sub>1</sub>.

Fig. 3. Extent of Goniatites Horizons in the Namurian Basin. 1 — borders of the Condroz overthrust; 2 — extent of the Goniatites Horizons; 3 — extent of the H<sub>1</sub> stage

Bruille, in the borehole du Chateau and in the borehole n° 1 from Heurt-eau. The lowest layer with *Eumorphoceras* sp. is supposed to be of E<sub>2b1</sub> age.

3) E<sub>2b3</sub> with *Cravenoceratoides nitidus* and *Cravenoceras holmesi*.

This contact was identified in the southern part of the Namur basin (Demagnet, 1941; Bouckaert, 1962). In the massiv of Theux J. M. Graulich and A. Delmer (1959) identified the same horizon situated at 4 m above the Visean. In the section of Blaton, described by J. Bouckaert, A. Delmer and P. Overlau (1961) occurs *Cravenoceratoides* aff. *nititoides* and *Ct. fragilis* (E<sub>2b4</sub>). At 15 m below black shale yielded *Eumorphoceras bisulcatum* and *Posidonia corrugata elongata* Yates, a subspecies very common in E<sub>2</sub> (Yates, 1962). This last horizon may be supposed to belong to E<sub>2b3</sub>.

4) E<sub>2c</sub> with *Nuculoceras nuculum*.

This horizon covers Visean in Ronet (J. Bouckaert, 1962). In the bore-holes of Turnhout, Wijvenheide, Gulpen, Sippenaeken, Bolland and Soumagne it appears as the first horizon of the Namurian. In the tunnel of Louvegnée *N. nuculum* is the first regular deposit.

Not identified in Val Dieu, an horizon with *Cravenoceratoides* sp. underlying *Homoceras beyrichianum* may be supposed to belong to E<sub>2c</sub> (Van Leckwijck and Lambrecht, 1958).

5) H<sub>1b</sub> with *Homoceras beyrichianum*.

In Belgium this direct superposition on the Visean is only identified in the Java galery (Van Leckwijck, 1962). It is also supposed to exist in the Woensdrecht borehole. In France the extension of *H. beyrichianum* on the Visean is restricted to the Pas-de-Calais (J. Chalar-d, 1960).

6) R<sub>1a</sub> with *Reticuloceras circumplacitile*.

The overlapping of this age is only known in France (J. Chalar-d, 1960).

7) R<sub>1b</sub> with *Reticuloceras nodosum* group.

In the Chertal borehole (A. Delmer and J. M. Graulich, 1954) and in the area of Visé (L. Lambrecht, P. Charlier, 1956) this horizon occurs as first in the Namurian transgression.

## DISCUSSION

Previous reconstructions of the paleogeography of *Homoceras* times have been attempted by Wills (1951) and Trotter (1952) and by F. Hodson (1959). In 1962 J. M. Graulich proved the sudetian period of the variscan orogenesis in the Namurian syncline eastwards from the Samson river.

In this very interesting paper J. M. Graulich observed that the sudetian period has influenced the deposits and the nature of the Carboniferous in the Namurian syncline and that the folds became younger from South to the North. Out of the mapping of the different points of contact of the Namurian with the underlying formations results a series of isohypses corresponding to homotaxial shore lines. The rough traced pointed line (Fig. 3) corresponds to the Condroz overthrust and that the two parts of the paleozoic major thrust plane are being replaced in their primary situation is supposed.

The overturned outlier of Monceau can be situated farther to the

South. The contacts of Bolland, Val Dieu and Theux and Soumagne belong to the Autochthonous Massiv.

Out of the drawing of the shore lines, a reconstruction of Namurian transgression can be made. It results that the transgression coming from the NE filled up the Namurian Basin, by regular overlapping horizons probably surrounding the Massiv of Brabant.

But the contacts of Namurian with Visean rock is not always normal. In different localities (indicated by \* on the Fig. 3) the Visean limestone shows phenomenons of dissolution, where goniatites indicate an  $E_{2b2}$  age (*Ct. edalensis*) in the Visean pockets filled by Namurian shale. This observation may be explained by a period when the Visean peneplaine was lifted up during this stage ( $E_{2b2}$ ) but crossed by a series of small canyons filled during the transgression of *Ct. edalensis* stage.

#### WYKAZ LITERATURY REFERENCES

- Bouckaert J. (1961), Le Namurien à Namur. *Bull. Soc. Belge Géol.* 70, fasc. 3, p. 358—375.
- Bouckaert J. (1961), Les goniatites du Carbonifère belg. Documents pour l'étude de la Paléontologie du Terrain Houiller. *Soc. Belge Géod.* Bruxelles.
- Bouckaert J., Delmer A., Overlau P. (1961), Stratigraphie du Viséen moyen et supérieur et du Namurien inférieur dans la région Basécles — Blaton. *Mém. Inst. Géol. Univ. Louvain*, 22, p. 239—255.
- Bouckaert J. et Higgins A. C. (1963), La base du Namurien dans le Bassin de Dinant. *Bull. Soc. Belge Géol.* 72, fasc. 2, p. 106—122.
- Chalard J. (1960), Contribution à l'étude du Namurien du Bassin Houiller du Nord de la France. *Service Géol. H. B. N. P. C.* Valenciennes.
- Delmer A., Graulich J. M. (1958), Solution de quelques problèmes de stratigraphie houillère par la découverte de niveaux à goniatites. *Bull. Soc. Belge Géol.* 67, p. 425—454.
- Demagnet F. (1941), Faune et stratigraphie de l'étage namurien de la Belgique. *Mém. Inst. Roy Hist. Nat. Belg.* No 84.
- Graulich J. M. (1961), Description et occurrence de *Arenicolites fourmarieri*. *Bull. Soc. Belge Géol.* 70, fasc. 1, p. 6—17.
- Graulich J. M. (1962), La phase sudète de l'orogène varisque dans de synclorium de Namur à l'Est du Samson. *Bull. Soc. Belge Géol.*, 71, fasc. 2, p. 181—198.
- Herbst G. (1951), Neue Fossilfunde in den Walhorner Schichten des Aachener Gebiet. *C.-r. IIIe Congrès Strat. Carb. Heerlen*, 1. p. 277—280.
- Hodson F. (1959), The Palaeogeography of *Homoceras* times in Western Europe. *Bull. Soc. Belge Géol., Pal., Hydr.*, 68, fasc. 1, p. 134—151.
- Lambrecht L., Charlier P. (1956), Le Westphalien inférieur et le Namurien dans la région Cheratte-Argenteau. *Publ. Ass. Etud. Paléont.* No 25, 98, Bruxelles.
- Trotter F. M. (1952), Sedimentation of Namurian of North-West England and adjoining areas. *Liverpool and Manchester Geol. J.* 1, p. 77—112.
- Van Leckwijck W. (1952), Le Namurien dans le bassin d'Andenne. *Publ. Ass. Etud. Paléont. Strat. Houillères* No 11, Bruxelles.
- Van Leckwijck W., Stockmans F. (1956), Sur la limite entre les assises d'Andenne et de Chokier. *Bull. Soc. Belge Géol.*, 65, fasc. 2, p. 292—305.
- Wills J. (1951), *Palaeogeographical Atlas.* London and Glasgow.
- Yates P. J. (1962), The Palaeontology of the Namurian rocks of Slieve Anierin, Co Leitrim Eire. *Palaeont.* 5, part 3, p. 355—443.