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TERTIARY AND QUATERNARY DEPOSITS IN AND AROUND THE MONS BASIN, DOCUMENTS FOR A FIELD TRIP

by

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The Mons Basin is approached from the North. The Tertiary formations (Ypresian, Landenian), resting on the Palaeozoic basement without Cretaceous and Early Paleocene deposits, are first visited at Lessines and Blaton.

The basin itself is entered at Ciply, where the Cretaceous/Tertiary boundary is well exposed.

Afterwards, the Late Paleocene-Early Eocene beds are scrutinized in the vicinity of Mons (Landenian, Ypresian, Paniselian).

Finally, some aspects of the Quaternary are shown: the loams and loesses of the Pleistocene at Harmignies and the Holocene of the Haine Valley near the Maison van Gogh.

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Contents:

SAMENVATTING

Tertiaire en kwartaire afzettingen in en rond het Bekken van Mons. Een excursiegids.

Voor deze excursie wordt het Bekken van Mons benaderd vanuit het noorden. De tertiaire afzettingen (Ypresien, Landenien), die bij afwezigheid van krijt- en vroeg-paleocene sedimenten, rechtstreeks op de palaeozoische sokkel rusten, worden eerst bezocht te Lessines en Blaton.

Men komt het bekken binnen bij Ciply, waar de Krijt/Tertiair-grens goed ontsloten is.

Vervolgens worden de laat-paleocene en vroeg-eocene afzettingen in detail bekeken in de omgeving van Mons (Landenien, Ypresien, Paniselien).

Tenslotte worden enkele aspecten van het Kwartair gedemonstreerd: leem- en loess-afzettingen van het Pleistoceen bij Harmignies en het Holoceen van de Haine vallei bij het "Maison van Gogh".

INTRODUCTION

The structural setting and the age of the subsidence

The Mons Basin is a small area of relatively strong subsidence, elongated along the Variscan front (Midi Fault); it is connected westwards with the northern part of the Paris Basin and northwards with the southern part of the Belgian Basin (fig. 1).

After the Variscan orogeny, a faulted bed, named Zone-de-Cisaillement-Nord-Artois = Z.C.N.A. ("North-Artois-Shear-Zone"), develops on the Variscan front. Then, the Z.C.N.A. shows an episodic activity characterized by a dextral strike-slip movement. Earthquakes of moderate magnitude (2.5. to 4.5. M.S.K.), the hypocentres of which lie at a depth of 3 to 5 km, are scattered in the neighbourhood of the Z.C.N.A., especially along the Mons Basin.

It is likely that the subsidence of the Mons Basin is partly related to a mechanism, until to-day not explained, dependent upon this Z.C.N.A. However, this trend of subsidence evokes an inheritance. It coincides, for example, with the "Hainaut Trough" in which, during the Dinantian, thick evaporites were accumulated.

The Post-Palaeozoic sedimentation begins during the Mid-Cretaceous and reaches an average thickness of about 340 m. But the sum of the maximum thicknesses of the various Cretaceous and Tertiary units attains about 1300 m because of locally different rates of subsidence.

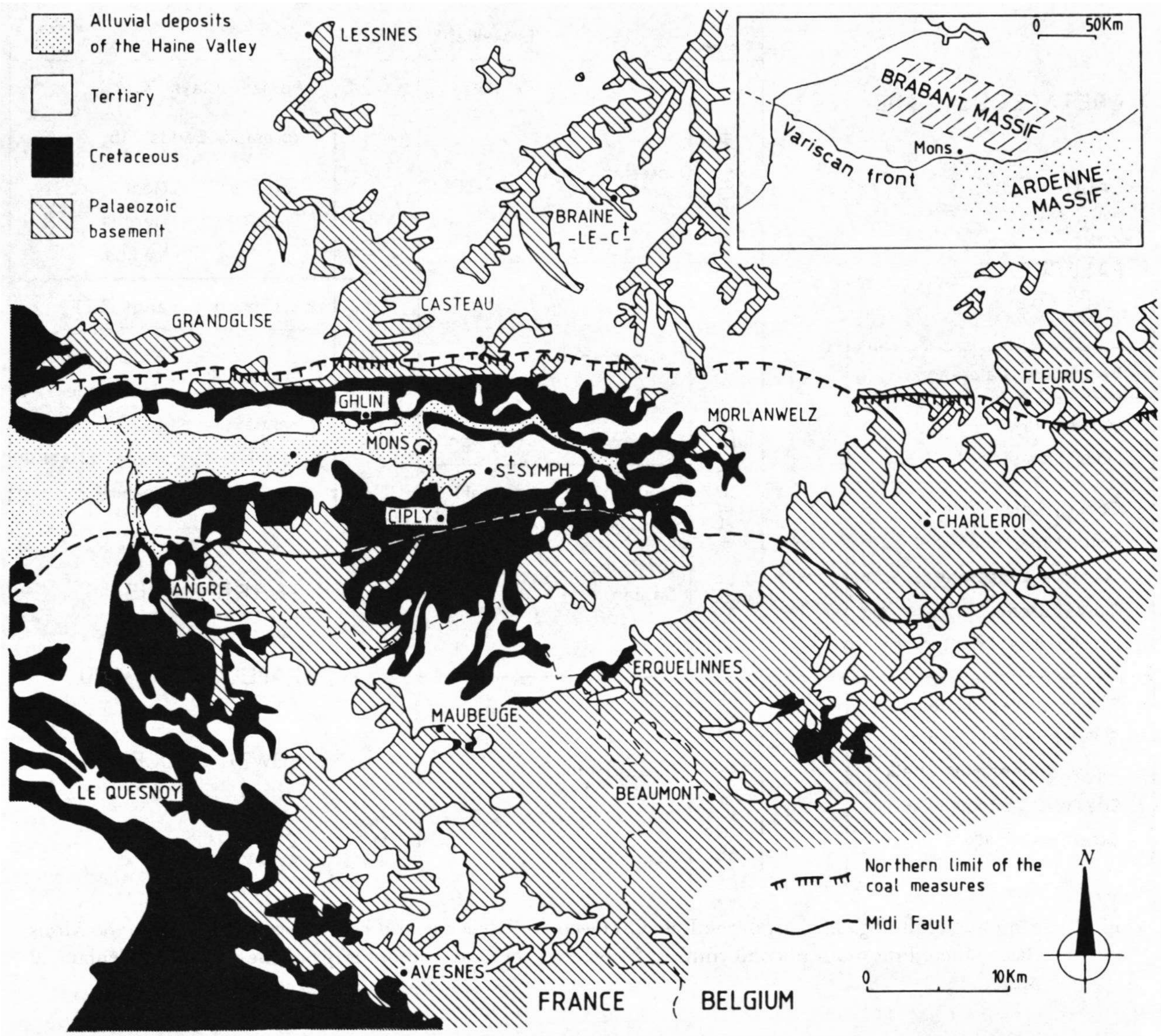

Fig. 1. Simplified geological map of the Mons Basin and its neighbourhood. Drawn according to the geological map of Belgium, scale 1 : 500.000 (De Béthune, in: Atlas de la Belgique, 1955).

The Tertiary sedimentation

The Tertiary of the Mons Basin is composed of two main sequences: calcareous at the base, terrigenous in its upper part (fig. 2).

The calcareous Paleocene

The lower third part of the Paleocene deposits comprises dominantly calcareous units, continuing the Cretaceous sedimentation. It has a complex subsidence history, marked by large thickness variations, local unconformities, specific facies, etc.

The upper units of this sequence are Late Danian, Montian and "Heersian" in age. They are confined to narrow zones near the axis of the basin. Generally they are unconformably overlain by

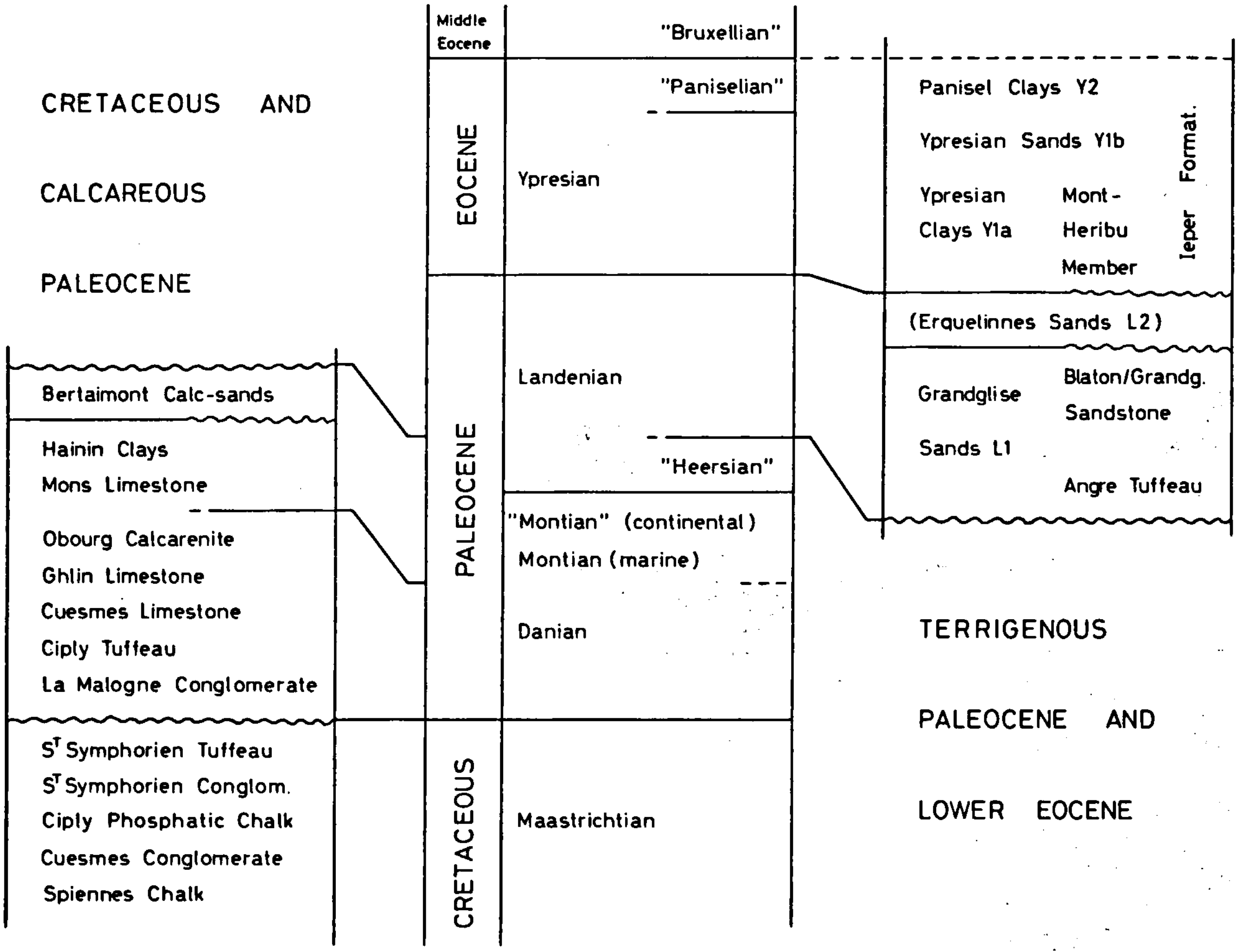

Fig. 2. Simplified lithological chart of the Late Cretaceous, Paleocene and Early Eocene deposits in the Mons Basin, including main unconformities. Nowadays there are no outcrops of the upper Landenian L2 unit.

Landenian Grandglise Sands. On the margins of the basin this unconformity is expressed by a hiatus, as in the Boulangerie quarry, where the Grandglise Sands directly overlie the Danian Ciply Tuffeau, without Montian and Heersian sediments in between (excursion point D).

In such conditions parts of the stratigraphic record are very rarely preserved. This is especially the case with the Cretaceous-Tertiary boundary, and the Danian and Montian beds which are remnants of a vanished N-S connection between the Paris Basin and the North Sea Basin.

— The Cretaceous/Tertiary boundary

At Ciply (van Damme quarry — excursion point C) the boundary between Mesozoic and Tertiary formations is exposed (fig. 6): the Ciply Tuffeau (Middle to Late Danian) rests on the St. Symphorien Tuffeau (Late Maastrichtian).

The uppermost Maastrichtian formation is a chalky calcarenite (the St. Symphorien Tuffeau) which contains the brachiopod *Thecidea papillata* (von Schlotheim, 1813) and the cephalopod *Belem-*

nitella junior Nowak, 1913. But it is not of latest Maastrichtian age. The *Belemnella casimirovensis* zone, which cephalopod indicates the latest Maastrichtian, is not present in the Mons Basin.

Above the St. Symphorien Tuffeau, the first Tertiary sediments are calcarenitic (the Ciply Tuffeau) and contain planktonic Foraminifera indicating a Middle to Late Danian age.

Thus, the Danian sediments unconformably overlie an erosion surface which represents a period of diastrophism occurring during about 1 to 1.5 MA between the deposition, successively, of the St. Symphorien Tuffeau and the Ciply Tuffeau.

— Remarks on the Danian and the Montian of Mons

The Ciply Tuffeau is known since 1861. Rutot & van den Broeck (1886) placed this formation in the Montian and separated it from the St. Symphorien Tuffeau, in which a Maastrichtian fauna was found. Although several authors, as Cornet (1927), placed the Ciply Tuffeau within the Danian, Marlière (1964) continued to consider it as Montian s. lat. on the basis of the continuity of facies studied in borings. On this basis, the Ciply Tuffeau has been considered, erroneously, as "type Montian" by some authors.

The correct biostratigraphic position of the Ciply Tuffeau was determined by means of planktonic Foraminifera, like *Globigerina daubjergensis* Brönnimann, 1953, *G. pseudobulloides* Plummer, 1926, *G. triloculinoides* Plummer, 1926 and *G. compressa* Plummer, 1926. This assemblage indicates a Middle to Late Danian age.

The Mons Limestone ("Calcaire grossier de Mons") = type Montian. The relations between the Mons Limestone and the Ciply Tuffeau are still problematic because they have never been found superposed. Thus, Rutot & van den Broeck (1886) considered the two formations as lateral, synchronous facies, while Marlière (1964) claimed that different ostracod assemblages demonstrate superposition.

The age of the Mons Limestone also remains a delicate question because the formation is very poor in planktonic forms. It is probable that the Mons Limestone is more recent than the upper Danian sediments of Denmark. For example, it is significant that at Hainin, just above an equivalent of the Mons Limestone, lacustrine clays are present which contain insectivore teeth considered to be of Middle (to Late ?) Paleocene age. This means that the Mons Limestone (= type Montian) may be younger than the Danian and constitute a true stage.

The terrigenous Paleocene and Early Eocene

In the Mons Basin, on top of the Bertaimont Calc-sands which form a mixed lithologic unit, the second sequence of Tertiary beds is mainly terrigenous and consists of sands and clays.

The effects of the subsidence are not so important. Its most obvious consequence consists of the slight warping of the strata, well visible for instance at the Mont-Panisel — Bois-là-Haut twin hill (excursion point E).

Outside the Mons Basin, the Grandglise Sands and the Ypresian Clays and Sands extend largely onto the Brabant Massif. Such a situation probably gives a picture of the previous transgressions before erosion. At least for the Late Cretaceous some traces trapped in the Palaeozoic rocks confirm this point of view (excursion point A).

The Late Paleocene-Early Eocene sediment succession is well exposed in the centre of the Mons Basin (fig. 3). It forms the most complete eastwards record between the Paris Basin and the Belgian Basin.

The Grandglise Sandstone (called also Blaton Sandstone) contains a very scarce molluscan fauna, like *Arctica scutellaria* (Lamarck, 1806), *Cucullaea crassatina* Lamarck, 1805, *Nemocardium* (*N.*) *edwardsi* (Deshayes, 1858) and *Turritella bellovacina* Deshayes, 1861, similar to that of the Bracheux Sands in the Paris Basin. The base of the Grandglise Sands is clayey and sometimes rich in siliceous sponge spicules (excursion point D, Boulangerie quarry). It corresponds probably to the more strongly silicified Angre Tuffeau, in which the mollusc species *Panopea intermedia* (Sowerby, 1814), *Pholadomya konincki* Nyst, 1845, *Arctica planata* (Sowerby, 1841), *A. scutellaria* (Lamarck, 1806), *Pleurotomaria landinensis* Vincent, 1883, *Atrina affinis* (Sowerby, 1821) etc., were found. The micropaleontological contents of this formation, which is often non-calcareous, is unknown. On the opposite the Bertaimont Calc-sands are classically characterized by the abundance of the foraminifer *Polymorphina* sp.

On the Landenian sands, which seem to be regressive (excursion points B and D), the Ypresian transgression begins with a clayey unit, the Ypresian Clays Y1a, followed by the Ypresian Sands Y1b and the Panisel Clays Y2.

Macrofossils are very scarce in the Ypresian beds Y1, but a rich fauna was collected in the past from laterally equivalent strata, the "Morlanwelz Argilites": the cephalopods *Aturia zigzag* (Sowerby, 1813) and *Nautilus regalis* Sowerby, 1822, the gastropod *Turritella solanderi* Mayer, 1877, the bivalve *Nucula* (*N.*) *fragilis* Deshayes, 1829 s. lat., the foraminifer *Nummulites planulatus* Lamarck, 1804, etc.

Dinoflagellates, organic-walled microfossils, allow to date the deposition of the Ypresian Clays, which belong to the upper part of the *Wetzeliella meckelfeldensis* Range Zone, the second dino-zone of the Ypresian (excursion point D).

The Ypresian Sands Y1b exhibit a calcareous, bioturbated level containing Ostracoda and benthic Foraminifera, among which *Nummulites planulatus* Lamarck, 1804 is abundant. The presence of nummulites probably indicates the opening of the North Sea Basin to Mesogean influences via the Channel.

The Panisel Clays Y2 are the last strata of the Tertiary preserved in situ in the Mons Basin. Composed of clayey, glauconitic sands at the base they become more sandy upwards. Diagenetic mobilization of silica led to the formation of diffuse sandstones in the lower clayey part and of quartzites in the upper sandy part (excursion point E). Macrofossils are abundant in the silicified beds: the gastropods *Rimella* (*R.*) *fissurella* (Linné, 1767), *Clavilithes* (*C.*) *longaevus* (Solander, 1766), *Eopleurotoma lajonkairei* (Deshayes, 1845), *Turritella dixoni* Deshayes, 1861, the bivalves *Vepricardium* (*Orthocardium*) *paniselense* (Vincent, 1881), *Megacardita* (*Venericor*) *planicosta* (Lamarck, 1806) s. lat. and *Pinna margaritacea* Lamarck, 1805, and the foraminifer *Nummulites planulatus* Lamarck, 1804. The foraminiferal contents is not well-known and up to now calcareous nannoplankton has not been observed.

On the Bois-là-Haut hill surface some sandstone fragments containing the foraminifer *Nummulites laevigatus* Bruguière, 1801 were found in the past. They probably represent the ultimate remnants of an eroded "Bruxellian" cover.

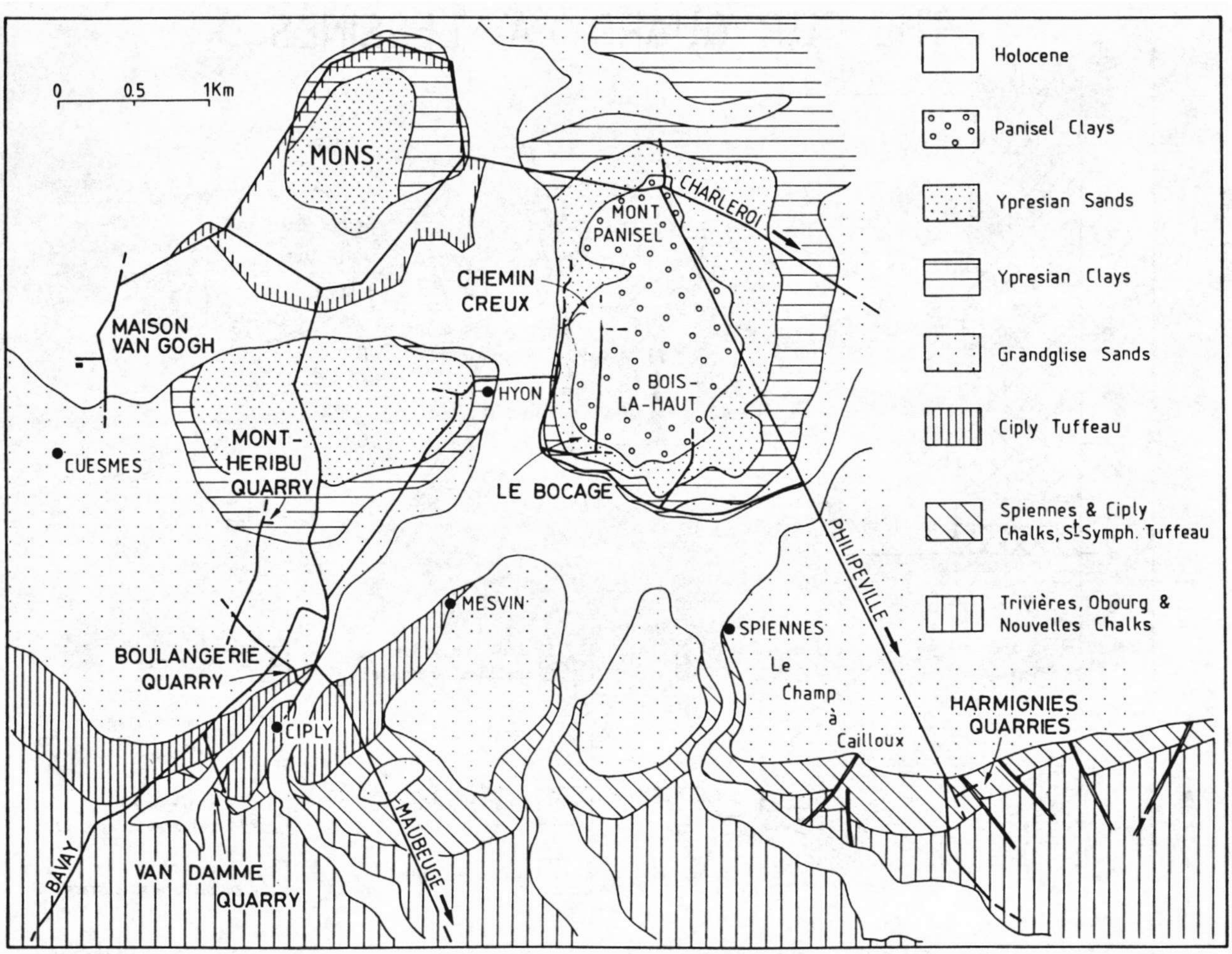

Fig. 3. Geological sketch map of the central Mons Basin. Drawn according to the geological map on scale 1 : 25.000, sheet 151 Mons-Givry (Marlière, 1967; Ministère des Affaires Economiques, Brussels).

The Post-Tertiary history

One may suppose that the Mons Basin emerged during the Middle Eocene as the Artois Horst and it seems that its history has remained terrestrial ever since. During this last period erosion has shaped some cuestas, for instance on the top of the white chalks at Harmignies and on the top of the Paniselian deposits at Bois-là-Haut (fig. 3 and excursion points E and F-1).

Silicification and red paleosol formation took place elsewhere in this period; may be at the beginning of the Quaternary ? (Grandglise Sandstone, excursion point B).

Since the Middle Pleistocene steps of the morphological evolution are recorded by the progressive incision of the fluvial network. A good example is given by the alluvial sheets of the Trouille River between Spiennes and Mesvin (Robaszynski & Dupuis, 1983).

In periglacial episodes, when topographic conditions were favourable, loesses and loams were deposited, as e.g. on the cuesta backslope at Harmignies, where a very demonstrative record of the last or Weichselian glaciation is exposed (excursion point F-1).

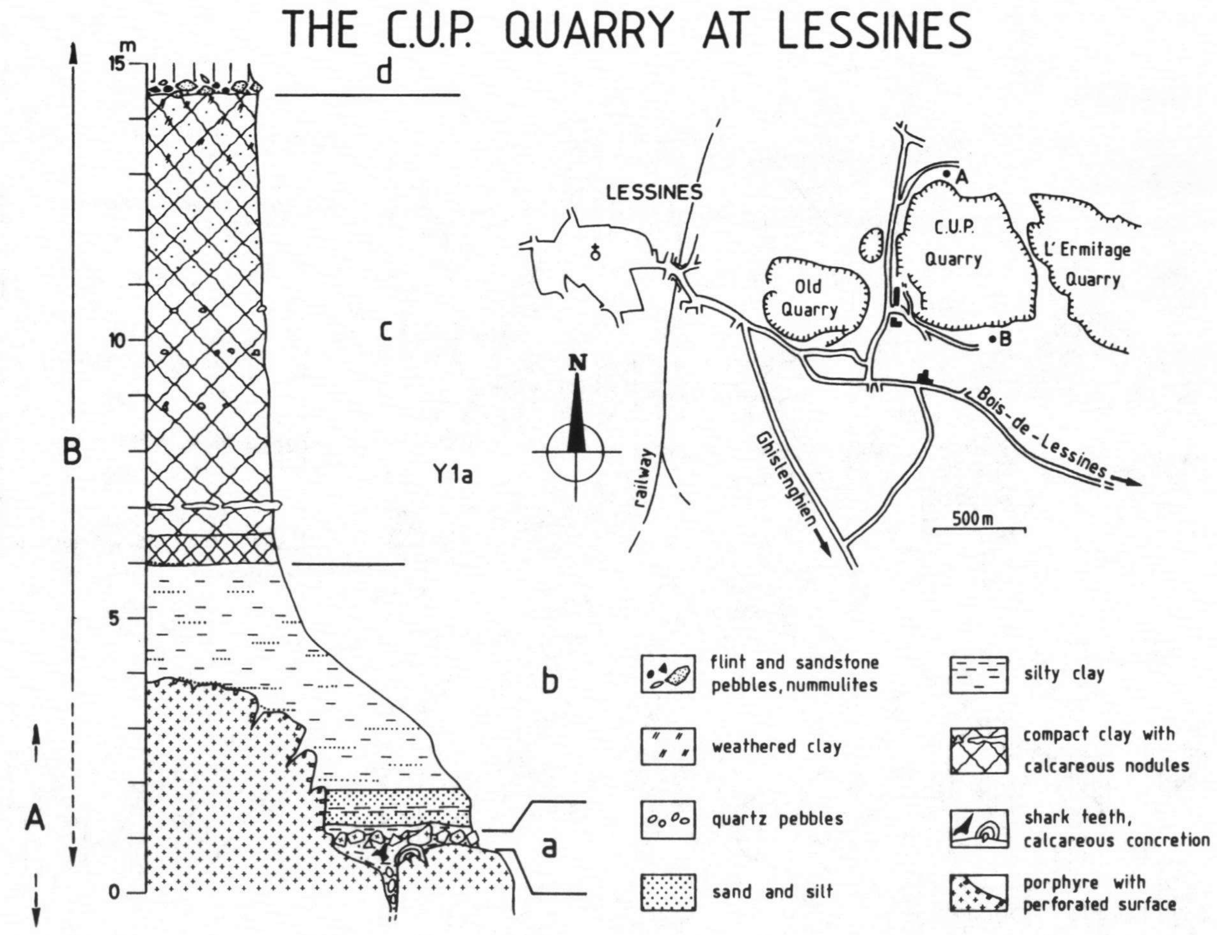

Fig. 4. Ypresian cover and Late Cretaceous infillings through fractures of the Palaeozoic porphyric dacite of the C.U.P. quarry at Lessines.

Holocene peat deposits are largely developed in the Haine Valley occupying the axis of the Mons Basin (fig. 1). In this area damages related to ground-water extraction are frequent (excursion point F-2).

EXCURSION POINTS

A. The "Carrières Unies de Porphyre" (C.U.P.) quarry at Lessines (fig. 4).

The C.U.P quarry at Lessines is hollowed in a dacitic "porphyre" of Caledonian age (414 ± 16 MA, near the Silurian/Ordovician boundary) which belongs to the Brabant Massif. The overburden is constituted by about 5 m of Quaternary loams (d) overlying about 13 m of Ypresian Clays Y1a, in which two parts can be distinguished. The upper part (c) is a grey compact clay, containing some levels of calcareous nodules. The lower part (b) is a grey-brown clay incorporating silty seams and sandy layers.

The lower Tertiary unit (a) consists of argillaceous sands with quartz pebbles and sometimes shark teeth. It fills the deeper depressions of the eruptive rock surface. The top of the infillings is obviously marked by a dacitic conglomerate below which calcareous sandstone concretions are frequently developed, just at the contact with the bedrock.

Above the conglomerate the eruptive rock surface exhibits numerous tiny perforations of unknown origin and also pyrite coatings.

The microbiozonation of the section is not yet established. The calcareous nodules and concretions do not yield calcareous nannoplankton and the study of organic-walled microfossils is still in progress. Useful informations are brought by shark teeth which give an Early Eocene age, like *Striatolamia* sp. of small size, *Otodus* sp., non *O. obliquus* Agassiz, 1843, *Odontaspis* cf. *robusta* Leriche, 1921 (identifications by Dr. J. Herman, Geological Survey of Belgium, Brussels).

Vertical sections of the cristalline rock show several veins, filled with sediment, of some cm to 1-2 dm width, sometimes going down to about 30 m or more. They are filled with a white to yellowish limestone, unporous and fine. Thin sections of this limestone show a planktonic foraminiferal fauna, containing double-keeled globotruncanids, which indicates a Late Cretaceous age. This limestone is interpreted as a chalk, filling open fractures initiated during the Late Cretaceous. This implies that the Cretaceous sea largely covered the Brabant Massif at that time.

Some less deep fractures (10 to 20 m), containing disintegrated products of the dacite, mixed with a small quantity of marine sand, are possibly of Tertiary age.

B. The Mont-des-Groseilliers outcrops at Blaton and the quarry of Grandglise (fig. 5)

Along the Nimy-Blaton canal-cutting (B) and the Blaton-Bernissart road-cut (A) of the Mont-des-Groseilliers, several outcrops expose a large part of the Grandglise Sands (many large outcrops in the upper part of the Grandglise Sands exist in the town itself, for example at C).

On the Palaeozoic basement, gullied by some Cretaceous conglomerates (a), the Grandglise Sands appear divided in three parts. The first part (b) is an inverse sequence, probably regressive, with an upward coarsening of the mean diameter (31-106 µm) and an upward decrease of the clay content. The second part is argillaceous (c). The energy of the depositional environment, perhaps brackish, was very low. Finally the end of the clay sedimentation is marked by a perforated surface. The third part, the so-called Blaton Sandstone, is composed of some short inverse sandy sequences, poorly consolidated, with a coarser mean diameter (125-185 µm). Long, vertical callianassid-like burrows are frequent. It is noteworthy that the weak consolidation results from interlocking between quartz overgrowths at the grain contacts.

Paleopedologic features are locally developed and the Blaton Sandstone, usually grey or green, becomes reddish and variegated. This facies, named Grandglise Sandstone, is well exposed near Grandglise (D).

The slight silicification, not present below the Ypresian Clays, might be a recent phenomenon, perhaps linked with water stagnation above the impermeable layer c. The paleopedologic evolution probably took place after the silicification.

C. The van Damme quarry at Ciply (fig. 6)

Several formations are or were formerly exposed in the van Damme quarry. From top to bottom the sequence is as follows.

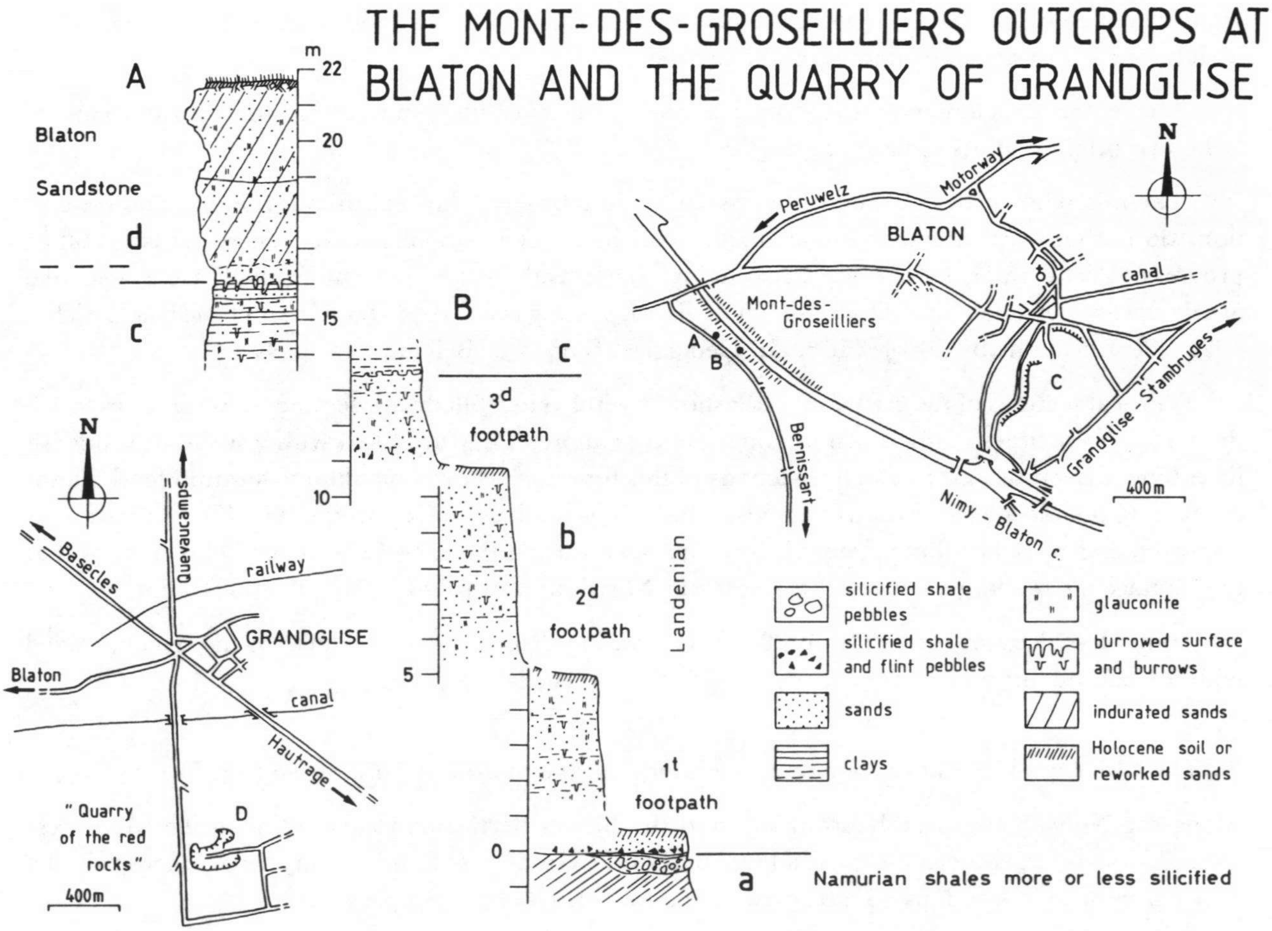

Fig. 5. The Landenian succession upon the Palaeozoic basement near Grandglise and the Mont-des-Groseilliers Landenian outcrops at Blaton.

Tertiary

The Ciply Tuffeau is a calcarenite, friable and yellowish, exposed over several metres, containing irregular chert beds and, near the base, some thin lenticles of coarse, reworked phosphatic grains. It contains planktonic foraminifers, like *Globigerina compressa* Plummer, 1926, of Middle to Late Danian age. The "La Malogne Conglomerate" constitutes the base of the Ciply Tuffeau. It consists of phosphatic pebbles and sometimes belemnite fragments, all reworked from the upper part of the underlying Cretaceous hardground levels.

Cretaceous

The St. Symphorien Tuffeau was formerly outcropping in the northern part of the quarry. The brachiopod *Thecidea papillata* (von Schlotheim, 1813) of Maastrichtian age was mentioned from this unit, which consists of white calcarenite.

The Ciply Phosphatic Chalk is a calcarenite with brown phosphatic grains (8 to 10% P_2O_5), strongly bioturbated and yielding the brachiopod *Carneithyris carnea* (Sowerby, 1812), the bivalve *Aequipecten pulchellus* Nilsson, 1827 and the cephalopod *Belemnitella junior* Nowak, 1913, all of Late

Maastrichtian age. In the 19th century, large *Mosasaurus lemonnieri* Dollo, 1889 and *Hainosaurus bernardi* Dollo, 1885 were collected and are exposed in the Institut royal des Sciences naturelles at Brussels. The upper part of the Ciply Chalk consists of a complex hardground, about 1 m thick, which formed the roof of past underground works. The surface of the hardground shows burrows filled in with the overlying Ciply Tuffeau. The Cuesmes Conglomerate forms the base of the Ciply Phosphatic Chalk. It contains a lot of belemnite rostra, looking like a graveyard. Other macrofossils may be collected, like small sponges, terebratulids, rhynchonellids and the heteromorph ammonite *Baculites faujasi* Lamarck, 1799.

The Spiennes Chalk, white and granular, with black flints, is slightly consolidated in its upper part and burrows are present filled in with the overlying Ciply Phosphatic Chalk.

The Nouvelles Chalk, white and fine, underlies the Spiennes Chalk, its upper part being consolidated. It contains the small brachiopod *Magas pumilus* Sowerby, 1816 and the cephalopod *Belemnitella mucronata* (Link, 1807) of Late Campanian age.

Summarizing, the succession of geological events is as follows:

— deposition of the Nouvelles Chalk (Late Campanian);
— a small gap in the sedimentation is marked by a thin hardground;
— deposition of the Early Maastrichtian Spiennes Chalk;
— a period of non-sedimentation, longer than the preceding one, is recorded by a thin hardground and burrows filled in by the succeeding brown Ciply Phosphatic Chalk;
— deposition of the Late Maastrichtian Ciply Chalk, bioturbated;
— local consolidation of the upper part of the Ciply Phosphatic Chalk;
— deposition of the St. Symphorien Tuffeau (Late Maastrichtian);
— period of diastrophism, between the Late Maastrichtian and the Middle Danian, during which faults provoked some vertical displacements and submarine erosion led to the realization of an unconformity surface;
— deposition of Middle to Late Danian Ciply Tuffeau.

D. The Mont-Heribu quarry at Mons and the Boulangerie quarry at Mont-Ciply (fig. 7)

The Boulangerie quarry is perhaps the only exposure of the basal Grandglise Sands in the Mons Basin. This unit differs from its equivalent at the Mont-des-Groseilliers by the presence of opale in the lowermost argillaceous deposit a. The amorphous silica is noteworthy materialized by abundance of sponge spicules. The slight hardening of the sediment is probably related to the intense weathering of the outcrop rather than to the opale presence as in the Angre Tuffeau.

Nowadays there is no exposure available of this latter, well-known formation, but it can be sampled around the type locality, for example along the Chemin-de-la-Haie-d'Angre, coordinates X = 101.475, Y = 117.325.

The top of the section (b) is more sandy (125-140 μm). This fact expresses the upward coarsening of the sediment, the maximum of which being observed in the Heribu quarry, just below the contact with the Ypresian Clays Y1b (170-190 μm). Concomitantly, the glauconite disappears upwards from the Landenian sands. The bioturbations, especially callianassid burrows, become scarce but are better preserved.

The Mont-Heribu quarry is the *locus typicus* of the base of the Ieper Formation: the Mont-Heribu Member, which is divided in two main parts: e and f (de Coninck et al., 1983). The stratification of

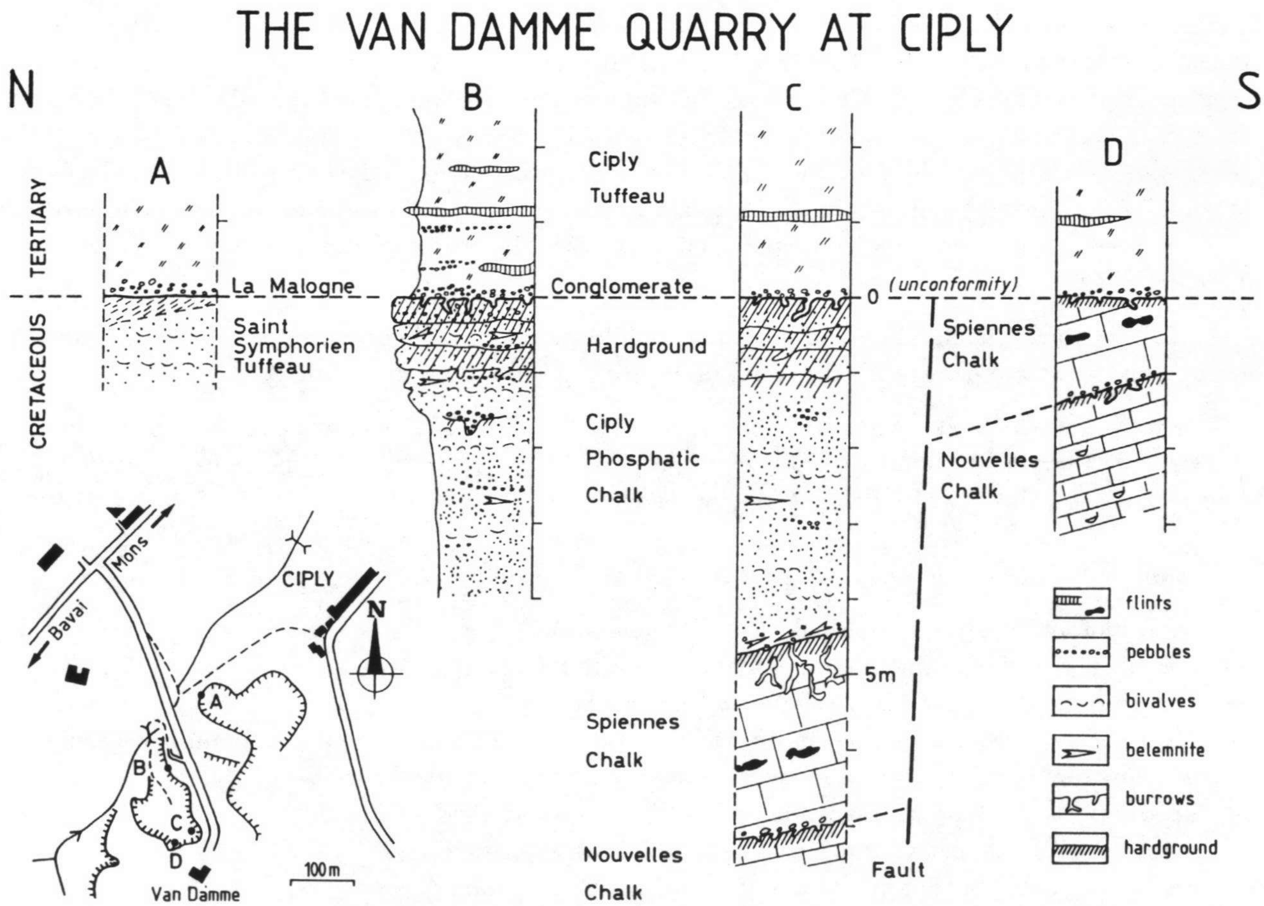

Fig. 6. The Cretaceous/Tertiary boundary at the van Damme quarry (Mons-Ciply).

the basal part e is disturbed by bioturbations and probably by compaction. It ends with 30 cm of a nearly compact clay. The upper division f is a more regular alternation of silty and clayey layers.

In e, an agglutinated Foraminifera association, dominated by *Trochamminoides subtrullisatus* (Grzybowski, 1896) and *Ammodiscus septatus* (Grzybowski, 1898) reveals possibly a bay environment. Rare shark teeth, unfortunately irrecognizable, where collected. An almost equivalent level at Ghlin (coordinates X = 119.150, Y = 120.900) contains Squalidae comparable to those of Lessines.

E. The Mont-Panisel — Bois-là-Haut outcrops at Mons (fig. 8)

The Mont-Panisel — Bois-là-Haut outcrops show the upper part of the Ypresian beds preserved in the Mons Basin: the Ypresian Clay Y1a, the Ypresian Sands Y1b and the "Paniselian" Y2 (fig. 2).

In the vicinity of the Mons Basin another small outcrop of Paniselian sediments is known NW of Casteau (coordinates X = 122.100, Y = 134.850), where fragments of a silicified glauconiferous rock, covered with numerous fossils in mould preservation may be collected.

Successively (compare fig. 8):

— the top of the Ypresian Clay Y1a is exposed (badly) at point C;
— the Ypresian glauconitic sands Y1b and the base of the Paniselian Y2 appear more or less con-

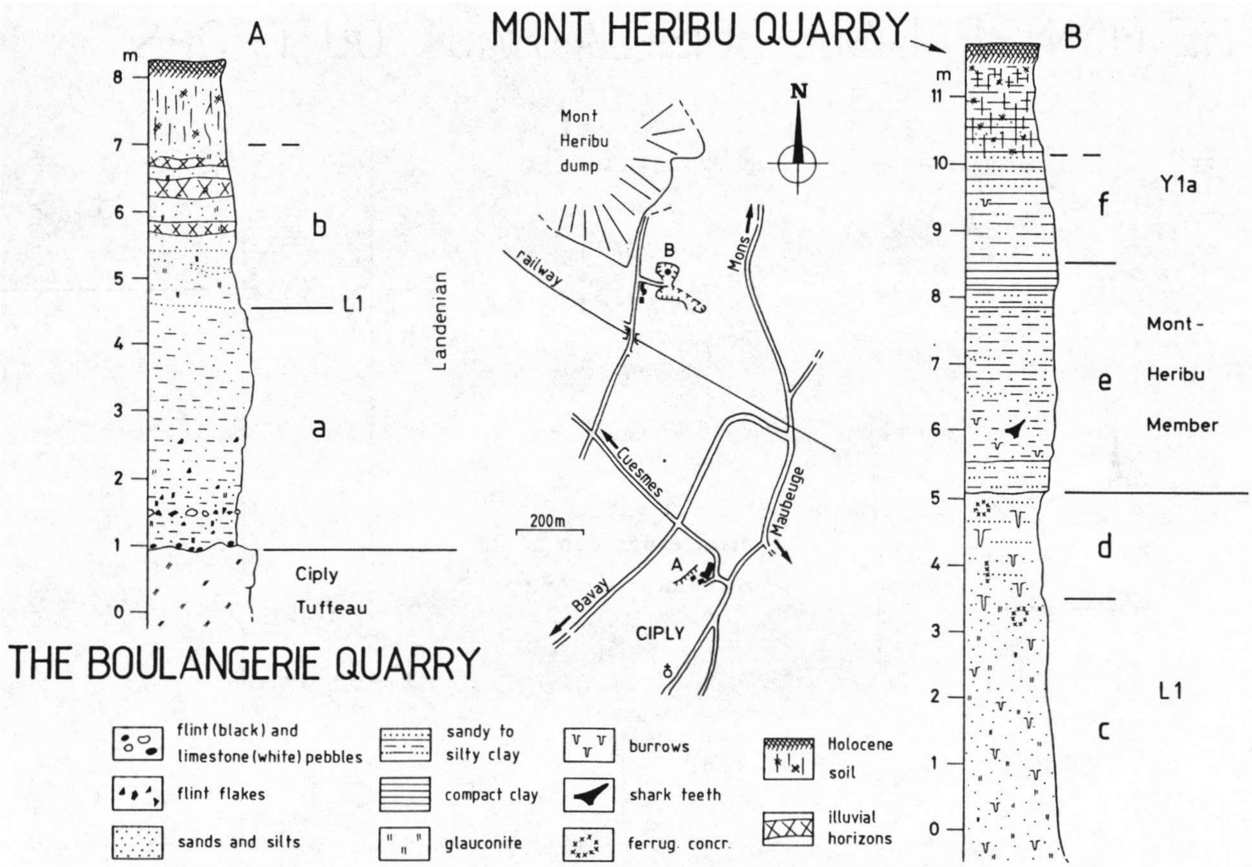

Fig. 7. Ypresian, Landenian and Danian at the Mont-Héribu quarry and at the Boulangerie quarry (Mons-Ciply).

tinuously along the foot-path near Le Bocage at point B; a, fine yellow sands (80-100 µm); b, bioturbated, fine, yellow calcareous sands (80 µm) with numerous *Nummulites planulatus* Lamarck, 1804 of A and B forms; c, fine yellowish sands (100 µm), oxidized in the upper part; d, sandy, glauconiferous clay with a dark layer of glauconite (base of the Paniselian), followed by bioturbated, glauconiferous clayey sands, capped with a hardened bed.

The fine sands with *N. planulatus* (indurated) and the base of the Paniselian facies can be observed also at the points D and E respectively.

The "Paniselian" Y2, exposed in the "chemin creux" at point A, is composed of weathered (partly decalcified) glauconitic and bioturbated clayey sands with diffuse silicificated beds. The hardened layers contain numerous macrofossils, among which the bivalves *Pinna margaritacea* Lamarck, 1805 and *Megacardita* (*Venericor*) *planicosta* (Lamarck, 1806) s. lat. are frequent.

The Mont-Panisel — Bois-là-Haut twin hill was chosen as the *locus typicus* of the "Paniselian" stage (Dumont, 1851). Nevertheless, the stratotype remains badly known because of a lack of new biostratigraphical data. As yet unpublished results on calcareous nannoplankton (Dr. E. Steurbaut, Rijks Universiteit Gent) lead to place the calcareous sand with *N. planulatus* at the top of the nannozone NP 11, situated in the lower half of the Ieper Formation.

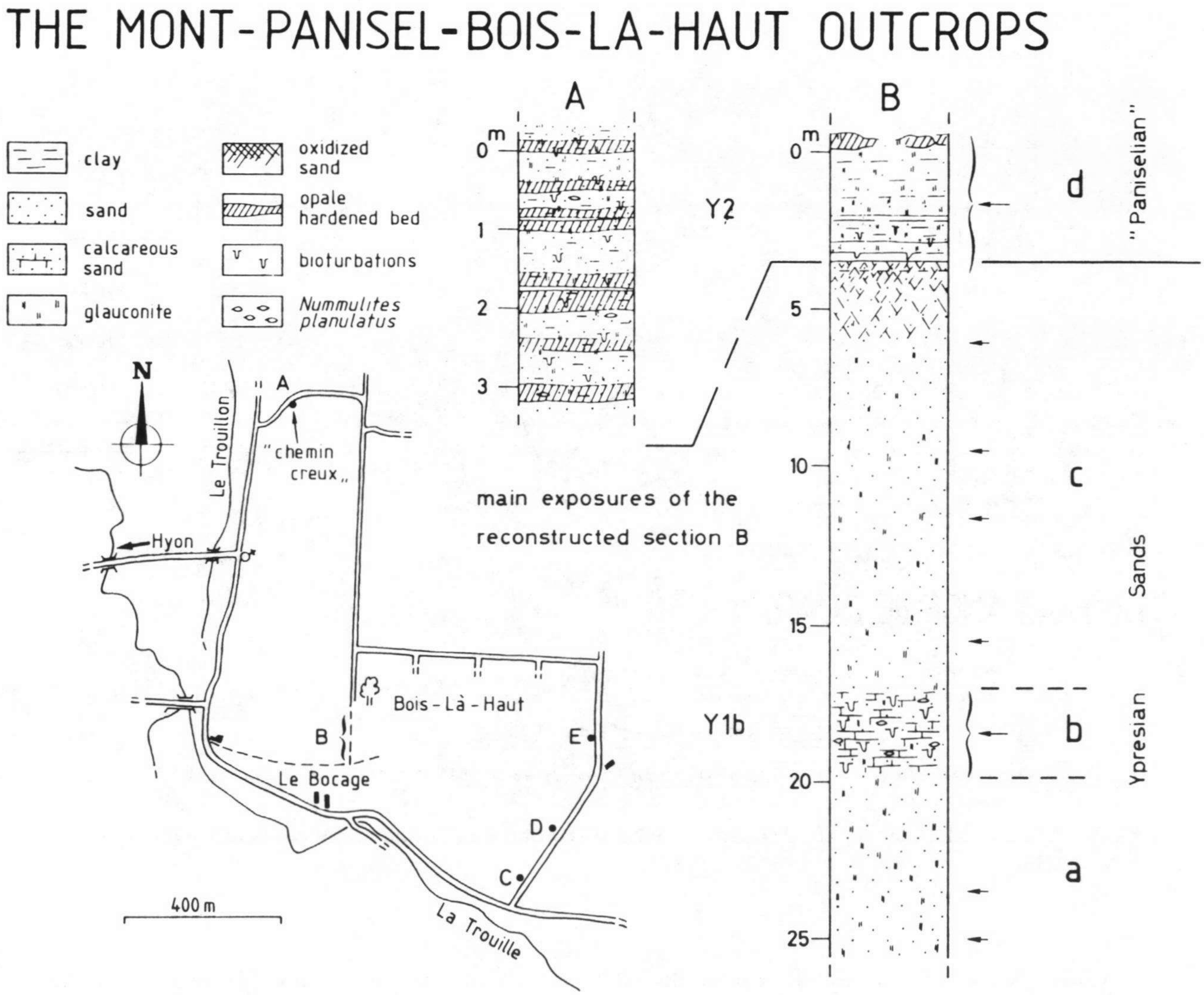

Fig. 8. The upper part of the Ypresian "Paniselian" facies of Dumont, 1851, at the type-locality of Mont-Panisel — Bois-là-Haut.

It seems that the remaining 12 m of Y1b sands are not thick enough to contain all of the upper half of the Ieper Formation. In other words, does the Paniselian facies appear earlier in the Mons Basin than it does in the northern Belgian Basin, or is there a hiatus in the sedimentary record? Obviously, the existing scarce and weathered outcrops do not allow to answer such questions. For this reasons, in collaboration with the Mons Polytechnic, the Geological Survey of Belgium has forecasted a stratigraphic borehole in the stratotype for the present year.

F. A quick look at the Quaternary deposits of the Mons Basin

1. *The Pleistocene loams and loesses of the quarries of Harmignies (resting on Cretaceous chalks)* (fig. 9)

Along the cuesta of Harmignies Pleistocene deposits crop out on a front of several kilometres, as on the sides of the Mons-Beaumont road-cut. They rest on white chalks worked in large quarries, located North and South of the Road. They are composed of loams and loesses outlined as follows (from bottom to top, simplified after Haesaerts, in Robaszynski & Dupuis, 1983):

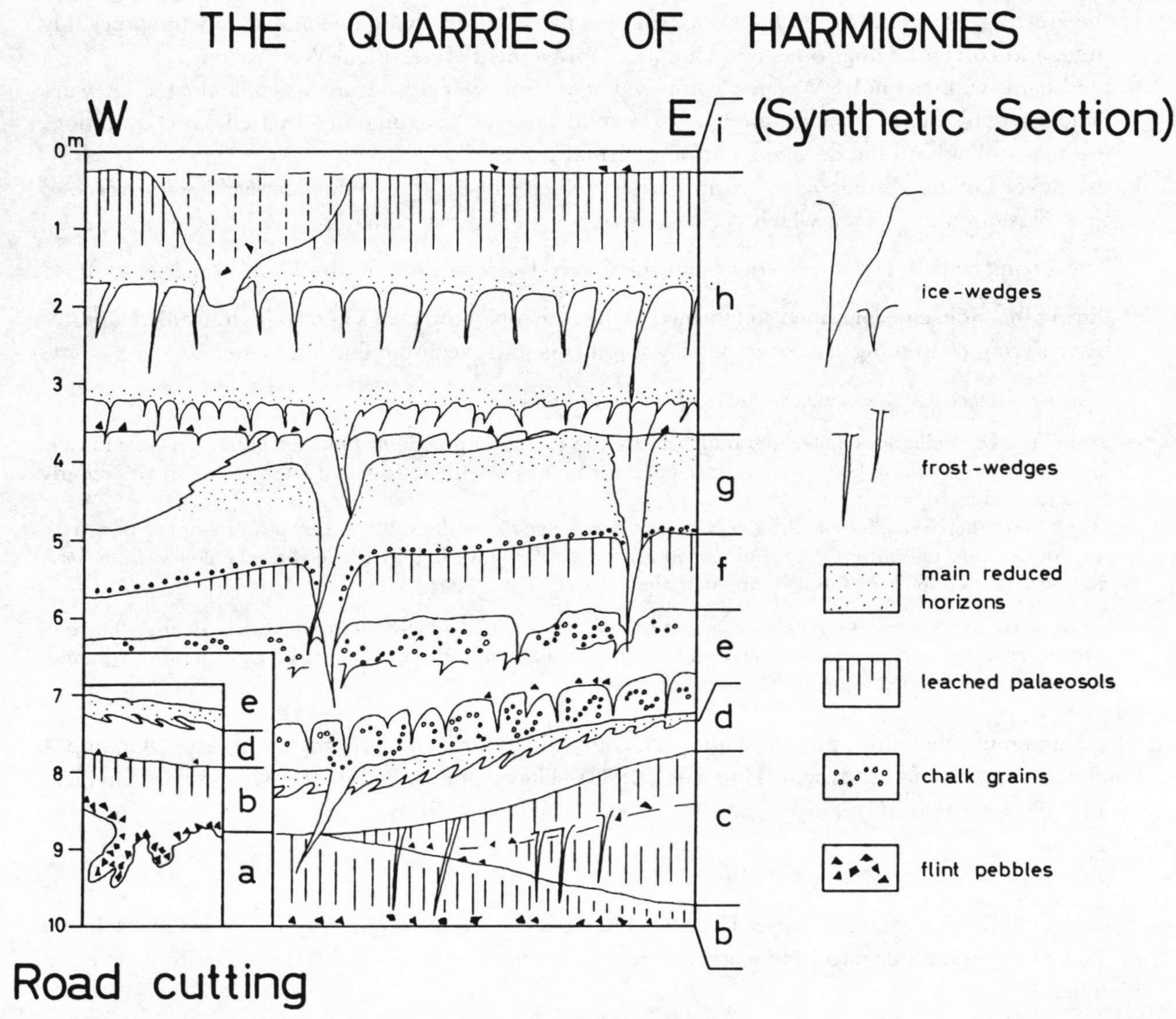

Fig. 9. The Pleistocene succession at Harmignies (simplified, after Haesarts, 1983).

a. the Chalky Conglomerates; result of the reworking of the chalk during a cold climate (Elsterian);
b. the Weathered Loams; divided in a brown clay (terra-fusca) of pedologic origin filling dissolution pockets (Holsteinian) and a non-calcareous sandy loam (Saalian) in which a leached brown paleosol is developed (Eemian);
c. the Clayey Stratified Loams; colluvial deposits accumulated during a cold climate and locally preserved (Early Weichselian);
d. the Humic Loams; deposited in a steppic environment and containing the first eolian sediments; they have a large extension on the backslope of the cuesta;
e. the Cryoturbated Loams; containing reworked chalky grains and partly of allochthonous origin, laid down during a rigorous climate testified by loess wedges (fossil ice wedges);

Humic loams and Cryoturbated Loams are attributed to the Pleni-Weichselian A.

f. the Heterogenous Loams; probably capped by a paleosol; overlying unconformably the preceding units and corresponding to a slight climatic improvement (Inter-Pleni-Weichselian);
g. the Loams with Large Ice Wedges; composed of several layers of calcareous eolian loams; they are penetrated by large fossil ice wedges in several levels, indicating rigorous climatic conditions leading probably to the development of a permafrost;
h. the Cover Loams; resting on an erosion surface which cuts the underlying loams. They correspond to a loessic sedimentation which occurs during a cold and dry climate;

The Loams with Large Ice Wedges and the Cover Loams belong to the Pleni-Weichselian B.

i. during the Holocene a leached soil formed within the top of the loams and colluvions filled a protohistoric ring containing Iron-Age pottery fragments and Neolithic flint implements.

In the Cretaceous basement two facies of the white chalks are exposed:

— at the top, the Spiennes Chalk: a granular and white chalk, with nodular flints irregularly disposed in the lower part and forming beds in the upper part; it contains belemnite rostra of latest Campanian or Early Maastrichtian age;
— at the base, the Nouvelles Chalk: a very fine and white chalk, without flints, except in its upper part; rare macrofossils are present e.g. the brachiopod *Magas pumilus* Sowerby, 1816 and the cephalopod *Belemnitella mucronata* (Link, 1807) of Late Campanian age.

The top of the Nouvelles Chalk is marked by a hardground, half a metre thick, yellowish, strongly burrowed, which has a regional extension. Between Cretaceous chalk and Pleistocene loams, glauconiferous Landenian sands are sometimes trapped in dissolution pockets.

Numerous Neolithic mining shafts made for flint extraction are known in the "Champ à Cailloux" (fig. 3) and at Mesvin (Haesaerts, 1983). They were worked by the Michelsberg Civilization (3.300 tot 2.000 BC).

2. *The Holocene near the Maison van Gogh at Mons-Cuesmes*

Vincent van Gogh stayed at Charles Decrucq's home in a coal-miners family. This was the last house of the painter in the Borinage. He worked here for about one year before his departure to Brussels in October 1880.

The Maison van Gogh is the last building of a ward of Cuesmes to-day destroyed. It has escaped from the floodings consecutive to coal-mining sinking. Its tilt is due to the presence of about 4 m of peat in the heterogenous Holocene deposits on which it was constructed.

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