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I. Introduction

The valley of the Mehaigne river near Huccorgne is rich in Paleolithic cave and rock shelter sites (fig. 1), most likely due to the combined advantages of the availability of such caves for shelter, the presence of abundant outcrops of good quality Maastrichtian flint, and access to the Hesbaye Plateau and river valleys for subsistence resources.

In the 1880s, Fraipont and Tihon systematically explored this region (Fraipont & Tihon, 1889; Tihon, 1890-91), discovering and excavating around ten caves. More recently, the open-air Gravettian site Station de l’Hermitage (Huccorgne) was excavated by Haesaerts (1970s) and by Straus and Otte (1991-92) (Otte et al., 1993; Martinez & Guilbaud, 1993; Noiret et al., 1994). Among these sites, the Grotte du Docteur stands out on the basis of its long stratigraphy - from Middle Paleolithic to Neolithic - and the presence of a Late Mousterian industry characterized by bifacial retouch, including bifaces and foliate pieces and resembling the Micoquian of Germany (Ulrix-Closset, 1973; Ulrix-Closset, 1975 : 85).

In the interest of clarifying the 19th century stratigraphy, and to obtain absolute dates for the Middle and Upper Paleolithic assemblages found there, in 1998, excavation of two sondages on the terrace were undertaken by the Université de Liège, in collaboration with Les Chercheurs de Wallonie. The sondages proved to be fruitful, yielding intact Aurignacian and Mousterian levels, including lithics and well-preserved fauna and permitting a concordance between their stratigraphy and that of the earlier excavations.

This text is a preliminary report presenting a summary of the history of excavations, a discussion of the stratigraphy of the site in light of the data yielded by the sondages, industry attributions, and a discussion of the faunal remains.

II. Description of the site

The Grotte du Docteur opens to the north-east on the left side of the small Roua valley, 17 meters above a stream and around 360 meters from its confluence with the Mehaigne river (Ulrix-Closset, 1975 : 83). It is about 4 meters from the top of the cliff face with a steep talus slope dropping to the valley floor.

The terrace is 10 m wide by 8.5-9 m deep. The entrance is 5 m high and 8 m wide. The main chamber, completely excavated, has an average height of 5 m, and is 12.5 m deep and 8.5 m wide. The corridor at the back of the cave is 45 m long, with two main branches, one of which continues ~20 m before becoming too narrow for human passage. Numerous small passages extend from this corridor and many probably formerly gave access to the plateau above.
III. History of excavations

The Grotte du Docteur was first discovered in 1886 by Dr. F. Tihon (and subsequently named after him) and explored with J. Fraipont and A. Orban. Completely filled from the base to the ceiling, from 1886 to 1888, Tihon, Fraipont and Orban undertook intensive excavations on the terrace, in the main chamber, the two lateral annexes, and the anterior part of the corridor at the back of the cave (Fraipont and Tihon, 1889 : 10). They identified five stratigraphic levels (discussed in more detail below) in which they found abundant lithic artifacts and faunal remains. Neolithic human remains, discovered in Niveau 4, included an adult and two children. These were analyzed and published by Fraipont (Fraipont, 1897-98).

In 1898, new excavations were undertaken by E. Doudou (Doudou, 1901, 1903) of a “lambeau de couche intacte” which nevertheless contained many roots from an ancient tree that Tihon had respected (Doudou, 1901 : 2). Doudou recovered several lithic artifacts, mammoth bones and a human cranium which he considered to be of Quaternary age. Controversial even at the time, it has since been identified as being Neolithic (Otte, 1979 : 446).

During the 20th century, numerous researchers and amateurs variously explored the site but collections which resulted are private or unknown and were generally not published.

In the 1970s, Destexhe and Haeck excavated an area to the left of the cave entrance against the wall of the cliff, discovering a backed bladelet (Haeck, pers. comm.). A sondage at the base of the talus slope yielded rare lithic artifacts.

In autumn 1998, the Université de Liège received authorization to undertake sondages on the terrace in order to locate possibly intact archaeological levels with which to clarify and date the stratigraphy described by Fraipont and Tihon. Based on the results obtained in two sondages, it is clear that the Grotte du Docteur still possesses valuable material which, excavated with modern techniques and analyses, will provide important information for the prehistory of the Mehaigne valley. Further excavations will be continued in 1999.

IV. Stratigraphy and industry attributions (last century and recent)

The excavations of Fraipont and Tihon yielded a complex stratigraphy with five separate levels (Fraipont & Tihon, 1889 : 10-12) (fig. 2). It is almost certain that these levels contained multiple occupa-
tions of different industries although a possible explanation for the mixture of Mousterian industries observed in Niveau 2 is given below.

At the base, Niveau 1 (0.3 to 1.5 m thick) contains rolled cobbles and rolled nodules and cobbles of flint, with little sediment. It is found in all areas of the cave to the entrance of the corridor and on the terrace. It is archaeologically sterile apart from the presence of some highly altered and unidentifiable faunal remains.

The overlying Niveau 2 (1.5 to 2.5 m thick) is found in the cave, diminishing in thickness before disappearing 3.5 m from the right side of the terrace and 5.5 m from the left side. It consists of brown sediment with numerous rolled cobbles and angular limestone blocks. It is rich in Mousterian material but some Upper Paleolithic artifacts are also present. Faunal remains are abundant, with horse the most common, followed, in decreasing order, by hyena, rhinoceros, Bos primigenius, and mammoth. Rare fauna include Sus scrofa, Cervus elaphus, Cervus canadensis, Megaceros hibernicus, Rangifer tarandus, Antilope (Capella) rupicafra, Bison priscus, probably all hunted by humans, and Castor fiber, Ursus spelaeus, Ursus ferox, Meles taxus, Canis lupus, Canis vulpes, and Felis spelaea, which probably occupied the cave when not occupied by humans (Fraipont & Tihon, 1889 : 13).

Of the five most common fauna, horse, rhinoceros and mammoth are primarily represented by young individuals. These represent the remains of hunted animals. The age distribution reflects a hunting strategy geared toward the young in a herd, which were easier to successfully hunt and whose meat was less tough than adults. Horse is overwhelmingly abundant (if acceptable according to modern techniques, Fraipont and Tihon give an MNI of 124 based on molar count - 2346 isolated molars of which 1484 belong to the maxilla and 862 to the mandible, Fraipont & Tihon, 1889 : 14-15).

Fraipont and Tihon considered that hyena was also hunted and eaten in contrast to Dupont for sites in the Lesse Valley: “D’après M. Ed. Dupont, l’homme de l’âge du mammoth dans la vallée de la Lesse et de la Malignée ne mangeait guère l’hyène. L’homme de la même époque était moins difficile dans la vallée de la Maigne et consommaient de nombreuses hyènes” (Fraipont & Tihon, 1889 : 44, footnote 1). I would argue in contrast that with hyena the second most abundant species, with an MNI of 30 (Fraipont & Tihon, 1889 : 43), it is much more likely that there was a substantial hyena occupation following abandonment of the cave by humans. Such an occupation would account for the mixing of at least two separate human occupations during the Mousterian, evidenced in extant collections at the Université de Liège by the presence of a Mousterian with bifacial retouch and a Mousterian with Levallois technique.

Three crania - horse, chamois, and hyena - and long bones were found in the corridor at the back of the cave. Excluding the hyena, these represent non-meaty parts of the animals and the corridor could have served as a refuse area for discarding animal remains.

Niveau 3 (1.25 to 2 m thick) is found in the cave but not in the corridor and diminishes on the terrace. In certain areas, a stalagmitic layer 2-3 cm thick separates layers 2 and 3. This level consists of a yellow sediment with numerous angular limestone blocks and rarer rolled cobbles. Lithic and faunal remains were less common than in Niveau 2. Based on de Mortillet’s schema for Paleolithic chronology (Chelléen, Moustérien, Solutréen, Magdalénien), this level was attributed to the Magdalénien (Fraipont & Tihon, 1889 : 59) although typologically today it is recognized as Early Upper Paleolithic.

In this level, horse remains the most abundant species but hyena are very rare. Other species present are much less common than horse and include Cervus elaphus, Rangifer tarandus, Capra hircus (primigenia), Bos primigenius, Bison europaeus, all hunted, and Ursus spelaeus, Meles taxus, cave occupants, and Canis vulpes, Felis spelaea, and Felis cattus, carnivore occupants (Fraipont & Tihon, 1889 : 17).

Based on the rarity of hyena remains, it appears that Niveau 3 was formed after the hypothesized hyena occupation and thus disturbance due to hyena activity did not occur in this level.

Niveau 4, found only in the cave, is a black sediment with limestone éboulis. This level contained the Neolithic graves of an adult and two children. Only modern fauna - rabbit, fox, and badger - were found.

Niveau 5, found only on the terrace, is a humic sediment with rolled cobbles. Some Neolithic human remains (a demi-mandible) were found, along with rare domesticated fauna (horse, steer, sheep) and lithics.

While probably consisting of multiple occupations and disturbed by hyena activity, the stratigraphy described by Fraipont and Tihon is fairly straightforward, with a disturbed Mousterian level (Niveau 2), an intact Upper Paleolithic level (Niveau 3), and Neolithic levels (Niveaux 4 and 5).

V. 1998 Sondage stratigraphy and industry attributions

The current terrace can be divided into different sectors. As one faces the cave entrance, there is a path more or less in the center. To the right, there is a large pile of angular limestone blocks - déblais from earlier excavations - sloping up to the cliff face. To the left, there is a hill of déblais and modern soil, including a tree stump and a tall tree, overlying the remblais from...
earlier excavations. An edge of this earlier trench was visible in our sondage and the earlier excavation had been filled in with large limestone blocks and little sediment. Backing towards the steep talus slope, there is a flat area to the right which appears to be remblais. To the left, we placed 1 m by 3 m sondage (Sondage 1: L8-9-10), just in front of the tall tree. Leaving a meter or so intact and following the slope down to the left of the cave entrance, we placed a second 1 m by 2 m sondage (Sondage 2: J7-8), approximately 1.25 m below surface of the first. The stratigraphy of the two sondages is described below.

Sondage 1:

Stratum 1 - surface - humic layer - dark brown silt thick with roots, angular blocks fairly common.

Stratum 2 - remblais (approximately 1 m thick) - dark brown silt with many large angular limestone blocks. Only a few lithics recovered. In L10, an edge of an earlier trench was intersected, revealing large limestone block fill with little sediment.

Stratum 2a - brown silt (L8 only) (approximately 50 cm thick) - compact brown silt with rare lithics similar to those found in Stratum 3.

Stratum 3 - YCS (29-32 cm thick) - yellow clayey silt - compact, slightly clayey silt with smaller angular limestone blocks, clearly differentiated from the remblais. White and bluish-white patinated flint found, along with well-preserved faunal remains. Two carinated burins support an attribution to Aurignacian.

Stratum 4 - RCS (6-9 cm thick) - reddish-brown silt, less clayey than Stratum 3, with rolled pebbles and rolled, naturally broken flint. Lithic artifacts present, sometimes worn, sometimes fresh, commonly with a yellow patina. Fauna present as well but less common than in Stratum 3. A “couteau à dos sur éclat débordant”, a slightly rolled Levallois flake, and two possible disks support an attribution to Mousterian in general.

Stratum 5 - gravel layer (at least 50 cm, still present at base of sondage) - extremely numerous small, sorted pebbles in light brown silt. Rolled, heavily patinated, naturally broken flint present but archaeologically sterile.

Stratum 6 - rocky layer - angular limestone blocks, densely packed with little sediment. Archaeologically sterile. Interpreted as rockfall from cliff face and close to bedrock following the slope of the cliff.

When the stratigraphy from the sondages is compared with the admittedly general descriptions of the layers in the Fraipont and Tihon excavations, there are some clear similarities, both in the geological nature of the layers and the order in which they appear.

Stratum 5 (gravel layer) corresponds perfectly to Niveau 1, being a rolled pebble layer with little sediment, with heavily rolled, naturally broken nodules of flint, and archaeologically sterile.

Stratum 4 (RCS) appears to correspond to Niveau 2, being a brown sediment with rolled cobbles and angular limestone blocks, with an abundant Mousterian industry inside the cave. When one examines the profile of the old stratigraphy (fig. 2), on the terrace Niveau 3 is in direct contact with Niveau 1. However, it is possible that we intersected a part of the sloping Niveau 2 just before it disappears, particularly since most of the material from Stratum 4 is found in L10, the part of the sondage closest to the cave entrance (see fig. 2).

Stratum 3 (YCS) appears to correspond with Fraipont and Tihon’s Niveau 3, being a yellow sediment with numerous angular limestone blocks. The industry is clearly Upper Paleolithic with no mixture of Mousterian. Fraipont and Tihon considered Niveau 3 to be Magdalenian, based on de Mortillet’s chronology, but they noted that although the artifacts were smaller than those in the Mousterian layer and that there were more blades, the tools appeared to be larger than were typical for Magdalenian sites in France.

Stratum 2a (brown silt) does not appear to have an analogue in the old stratigraphy. Considering that it is present only in L8, furthest from the cave entrance and on the slope, it is possible that this represents more recent deposits with some mixture from the intact Stratum 3.

Fraipont and Tihon present M. Lohest’s detailed explanation for the geographical origins of the fill of the cave, including the rolled pebbles, the angular limestone blocks, and the sediment (Fraipont & Tihon, 1889: 32-35), and this explanation seems to be logical. After examining the rolled pebbles and determining geological origins, and examining the geological formations upstream and downstream from the Mehaigne, Lohest argues that these pebbles could not have come from Mehaigne alluvium. Geological de-
posits upstream are not the same as those posited for the pebbles and it is highly unlikely that the Mehaigne would have reversed direction. He proposes that the pebbles come from more ancient alluvial deposits on the overlying plateau, which contain identical pebbles and rolled, broken flint nodules. These would arrive in the cave after heavy rains via fissures and chimneys connecting the cave to the plateau.

We would argue additionally, based on current erosion and soil movement, that sediment from the plateau also followed the slope of the plateau above and pathways along the cliff face to be deposited on the terrace and inside the cave via the cave entrance. In Sondage 2, one can clearly see slopes in two different directions. One is fairly steep and is parallel to the cave entrance, supporting an inference of sediment washing down the right side of the cave entrance and curving in front across the terrace. The second is less steep and is perpendicular to the cave entrance, reflecting slippage and erosion down the talus slope, probably a continuation of deposits entering the cave via chimneys and fissures and exiting from the cave entrance.

The angular limestone blocks as well as a good percentage of the sediment (20% based on petrographical analysis by Fraipont & Tihon, 1889: 36) come from degradation of the limestone cave (i.e., roof fall) and the cliff face itself. The rest of the sediment would have been washed in along with the rolled pebbles.

VI. Typological attributions

In Stratum 3 (YCS), a small assemblage, made on blades and flakes, contains three tools which are probably linked to the Aurignacian: a broken burin on a thick blade (fig. 3:1), a dihedral burin with a curved surface removal (burin dièdre à enlèvement plan et courbe) (fig. 3:2), and a carinated burin (fig. 3:3). Stratum 4 (RCS) contains an assemblage including debris from industries exploiting a fine-grained flint, and utilizing centripetal reduction methods of Mousterian type (fig. 4).

Ulrix-Closset’s (1973, 1975) analysis of the Middle Paleolithic material from the ancient collections revealed the presence of two industries - Mousterian with bifacial retouch and Levallois method (fig. 5-6-7).

Fig. 8 shows a selection of artifacts drawn by Fraipont and Tihon (1889), including the only bone tool, an awl on a horse metacarpal. Although Fraipont and Tihon identified more than 50 bone tools, subsequent studies have shown that these artifacts are simply bone splinters, accidentally pointed or uniformly polished due to water action (Ulrix-Closset, 1975: 89).
Fig. 4 – Stratum 4 (RCS), Mousterian. 1: Levallois flake, 2: discoidal core, 3: backed knife on flake.
Fig. 5 – Mousterian with bifacial retouch (from Ulrix-Closset 1975). 1: lanceolate biface (nr. 286); 2: Keilmesser (short backed biface) (nr. 293).
From an archaeozoological viewpoint, the Grotte du Docteur presents a palimpsest character. The identified elements belong mainly to carnivore species and only some remains belong to herbivores. Some pieces, particularly the teeth, show traces of freeze-thaw breakage. It should be noted that the morphology of horse and rhinoceros teeth lends itself more easily than other species to be affected by these kinds of mechanical processes. In the same way, nearly 80% of the bones reflect wear due to rolling, probably in a wet environment: the edges are rounded and dulled. Nevertheless, we observe the presence of two different degrees of wear. The first is probably related to the location of the sondages close to the drip line with a significant amount of water present. The second is probably related to movement of bones over a more important distance, possibly from the plateau above the cave or from inside the cave. Additionally, movement due to carnivore action cannot be discounted.

Carnivore activity was important as implied by the presence of coprolites and gastroliths in the cultural layers. We must thus consider the possibility of penecontemporaneous occupation of the cave by humans and animals. The most common carnivore remains belong to *Crocuta crocuta* (hyena) and *Ursus spelaeus* (cave bear) although other carnivores (wolf, badger and fox) occupied the cave as well.

The herbivore remains do not present traces of butchery or disarticulation so it is difficult to associate their presence directly to human activity in the cave. Paradoxically, gnawing traces are rare as well. In this case, we must be cautious about the interpretation of the presence of herbivores. At present, we can say that the *Equus* family, probably *Equus germanicus*, is the most representative species, a finding in line with the results of analysis by Fraipont and Tihon. The second most common herbivore remains belong to reindeer, including two adult teeth, one burned, for the Mousterian layer, and a deciduous tooth from the Aurignacien layer. No postcranial remains of reindeer were found. The rolled aspect of the bones in general could be one of the causes of this absence, resulting in unidentifiable bone fragments.

If we compare this with the principal game - horse - we have a similar view, but some postcranial bones could be identified, primarily autopodium bones which are easily identifiable and which normally suffer from less pressure because of their lack of meat. One of these pieces, a proximal metacarpal fragment, appears to be sagitally sectioned. This may have been done in order to obtain the marrow. However, there is no clear link between this trace and anthropic action but was clearly produced after...
disarticulation of the foreleg because of the position of the blow on the proximal articular surface. This bone was selected for AMS dating, although we must be prudent about its particular interpretation.

VIII. Analyses in progress

In order to place the stratigraphy in an absolute chronology, samples of burned flint, teeth, and bone from Stratum 3 (YCS) and Stratum 4 (RCS) have been sent to laboratories for dating by thermoluminescence (TL), electron spin resonance (ESR), and accelerator mass spectrometry (AMS). Sediment samples from both strata have been taken for pollen analysis.

The lithic collections at the Université de Liège and the Musée Curtius will be reanalyzed in

Fig. 7 – Mousterian (from Ulrix-Closset 1975).
1 : Levallois flake (nr. 309), 2 : backed knife on Levallois flake (nr. 311), 3 : sidescraper (nr. 312).
Fig. 8 – Lithic and bone tools (from Fraipont & Tihon, 1889). 1 : leaf-shaped piece (Blattspitze) (Planche VIII, nr. 15), 2 : bone awl (Planche IX, nr. 18), 3 : sidescraper (Planche VI, nr. 9).
light of the stratigraphy and lithic material recovered from the sondages.

IX. Conclusions

The Grotte du Docteur is an important site for the Paleolithic of Belgium, both for its stratified sequence from Middle Paleolithic to Neolithic and for the presence of a Late Mousterian bifacial industry that may be the precursor to Early Upper Paleolithic foliate point industries in Northwestern Europe (Spy, Goyet, Couvin, Kent’s Cavern).

The two sondages realized in the 1998 field season have already yielded promising results with respect to clarifying the stratigraphy of the site and show that areas remain on the terrace with intact layers. Excavations planned for the 1999 season will expand the sondages on the terrace.

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