Chapter 2

SCLADINA CAVE: ARCHAEOLOGICAL CONTEXT AND HISTORY OF THE DISCOVERIES

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1. Topography, geography, and geology of Scladina

The village of Sclayn (City of Andenne, Province of Namur, Belgium; Figure 1) is situated on the border between High and Middle Belgium, along the south bank of the Meuse River, between Andenne and Namur: 5 km from Andenne and 14 km from Namur. At this location the river has cut deeply into the Palaeozoic limestone substratum, actively contributing to the development of a complex karstic network.

Scladina Cave, in Sclayn, is located on the west side of the small Fond des Vaux Valley, through which runs a small stream called Ri de Pontainne (or Pontine). This brook joins the Meuse River in the village approximately 750 m downstream from the cave. About fifteen caves are found within the west valley wall (Dubois, 1981). Scladina, the main one, opens towards the southeast approximately 7 m below a plateau that served as the interfluvial zone between the Meuse and the Ri de Pontainne, and about 30 m above the alluvial plain (Figure 2). The coordinates of the site are: 50° 29' 33" N and 5° 01' 30" E; the altitude is 137.7 m AMSL.

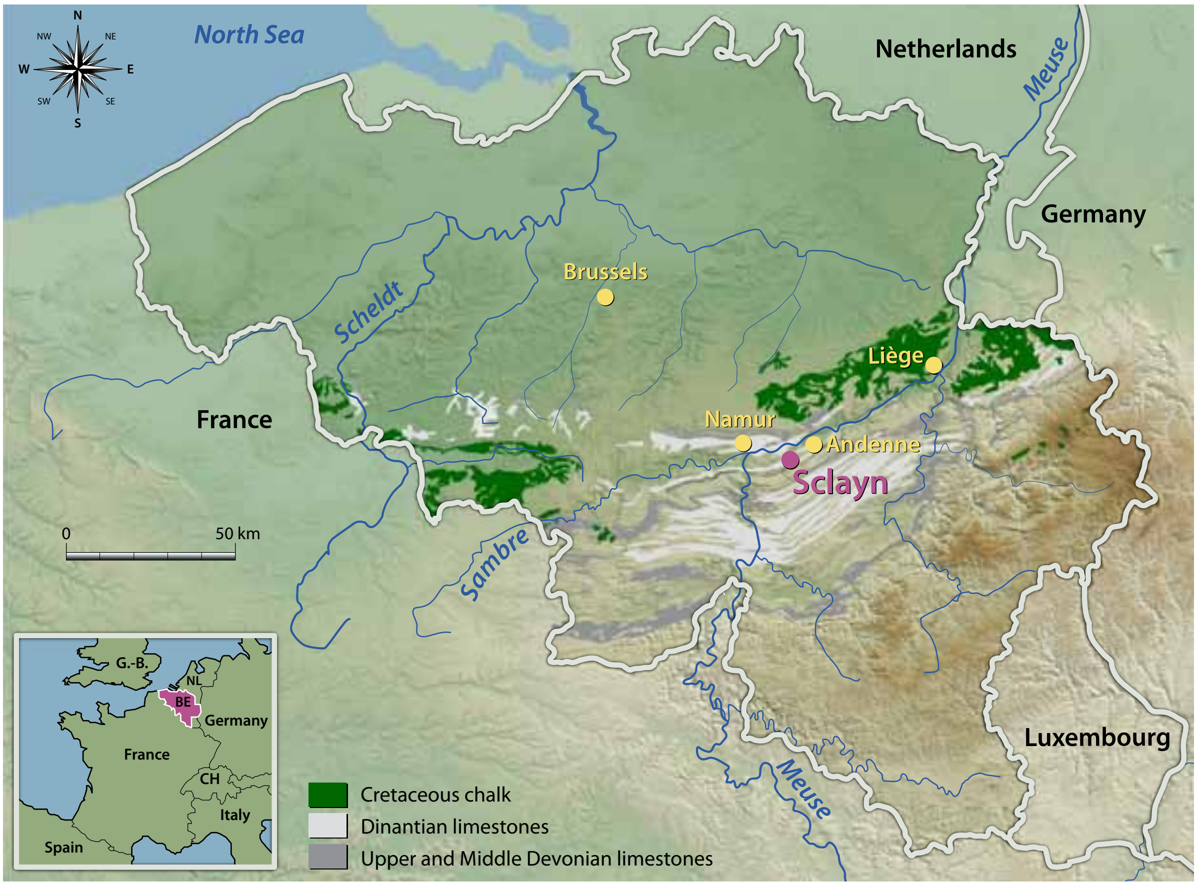


Figure 1: Situation of the village of Sclayn (Andenne) in Belgium; the Meuse Valley incises the Palaeozoic limestones and separates High Belgium to the south from the low plateaus of Middle Belgium to the north (graphics K. Di Modica, J.-F. Lemaire, SPW).

Figure 2: Sclaḍina Cave is situated high in the west wall of a small valley adjacent to the Meuse River (map © IGN; top view © Google).

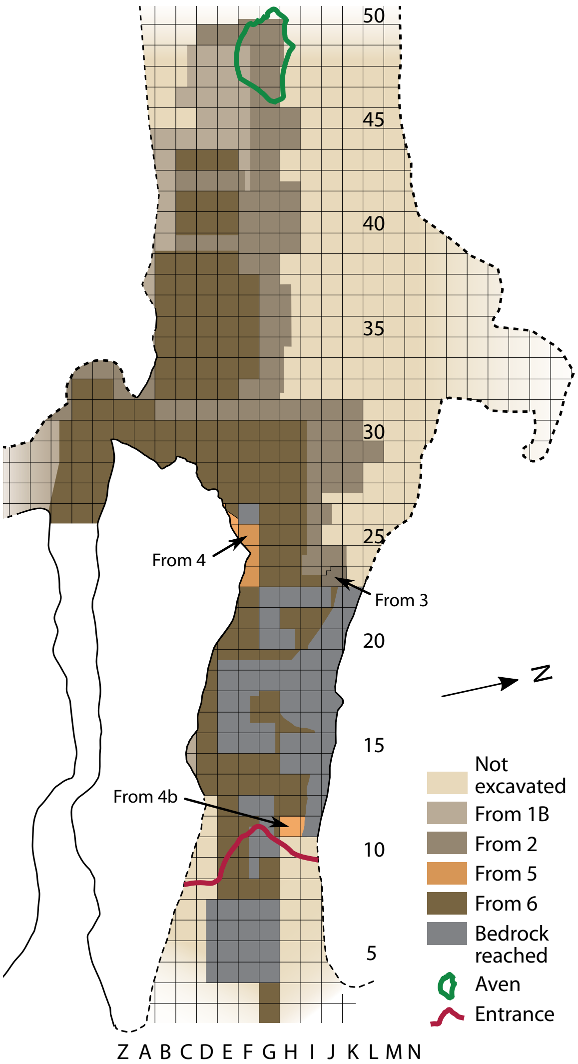


Figure 3: At Scladina, the archaeological research began on the terrace, from metre 2 to metre 10 and extends 39 m inside the cave, from metre 11 to metre 50.

The bedrock is composed of Visean Limestone (Lower Carboniferous), and Scladina is located within the superior portion of the Haut-le-Wastia Member of the Lives Formation (Pirson, 2007).

Several other caves are found in the immediate area. Approximately 5 m south of Scladina at a similar elevation is Saint-Paul Cave which, 20 m to the northwest of its entrance, intersects Scladina. Several metres below Saint-Paul another gallery develops, called Sous-Saint-Paul. This gallery is connected to Saint-Paul by a chimney. A survey on Scladina's terrace (carried out in 1978) revealed another karst cavity, which corresponds to an expansion of Sous-Saint-Paul. These three caves (Scladina, Saint-Paul, and Sous-Saint-Paul) constitute a cave series known in literature as the *Grottes de Sclayn* (caves of Sclayn).

According to Gullentops & Deblaere (1992), three terraces of the Meuse have been identified in Sclayn. The presence of ancient fluviatile deposits was confirmed by the observation of water-worn river rocks on the plateau above Scladina, which range in size from pebbles to cobbles.

Scladina Cave is a long cylinder-like karst structure that extends along the axial plane of an anticline. Currently, the excavation of the sediment within the cave extends about 40 m from Scladina's entrance (50 m from the edge of the terrace; Figure 3), and speleological prospecting indicates that the cave extends for at least another 12 m. The height of the gallery is approximately 6 m. Its width is variable: for the first 12 m (corresponding to metres 10 to 21) the average is only 6 m, beyond metre 21 it widens considerably. The

Figure 4: At the time of discovery, the cave was filled to the vault with sediments. In some areas, the Holocene stalagmitic floor is still partially attached to the stalactites (upper right; Photograph, July 2010).

total width is not known because the cave extension to the north remains concealed by sediment (Figure 4). Toward the south the cave joins Saint-Paul at about metre 30. The maximum width excavated to date is in the order of 12 m at metre 29; however, the total width is estimated to be about 20 metres (Pirson, 2007).

Between squares K and L, from metres 22 to 25, a chimney is present in the ceiling of Scladina. Also, on the plateau, approximately 35 m from the

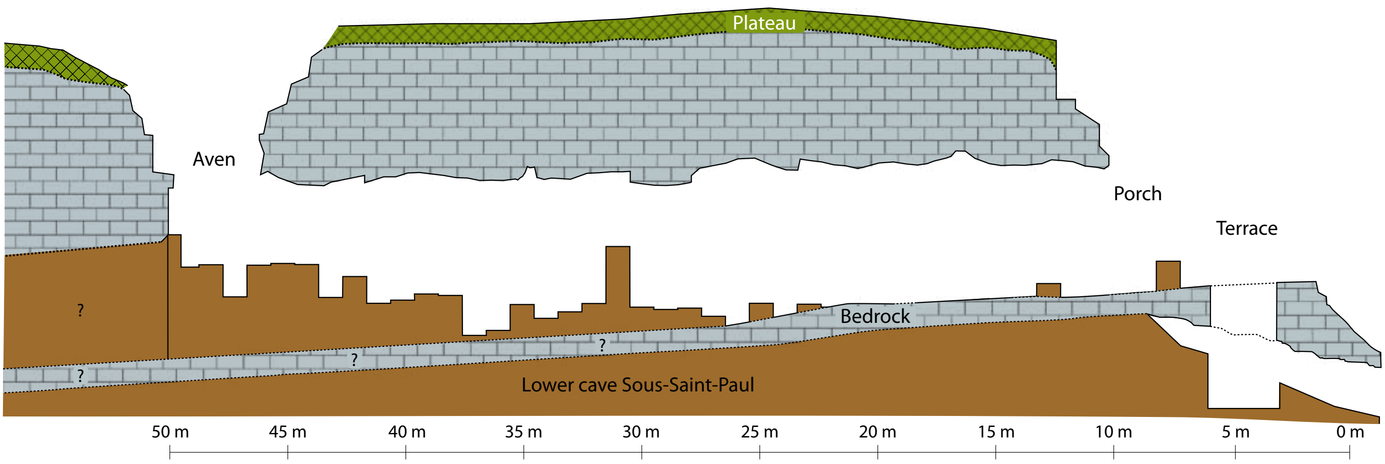


Figure 5: Longitudinal schematic section of Scladina Cave from the entrance to the aven (from Pirson, 2007; section D. Bonjean, M. Chardon; graphics G. Abrams, K. Di Modica, E. Dermience & A. Laurys, RBINS, J.-F. Lemaire, SPW).

porch a depression of around 60 m² was visible before the excavation. This dolina indicated the presence of an aven, connecting the cave to the surface (Figure 5). This structure was discovered in 1997 (Bonjean et al., 2002) and is situated on the hinge line of the anticline. Today, a concrete slab blocks the opening.

2. History of the research

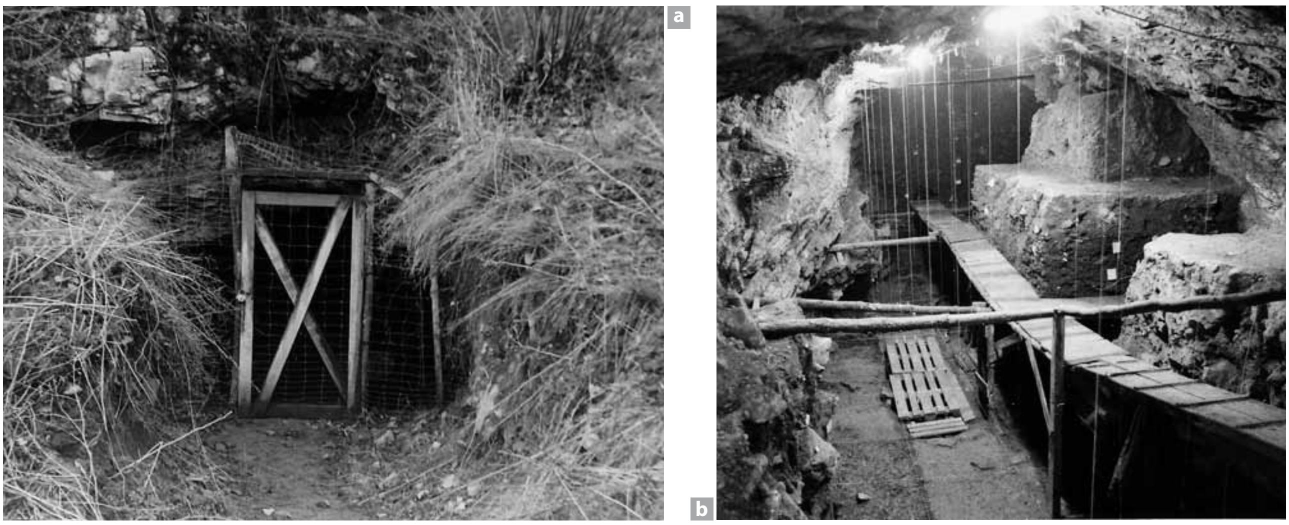
From 1910, the karsts of Sclayn were of high interest because of their speleological potential (Donceel et al., 1910). Starting in 1949, the immediate area around Scladina was prospected by speleologists and amateur archaeologists from Namur. Both the Saint-Paul and Sous-Saint-Paul caves were exploited after their discoveries in 1951 and 1953, respectively (Bonjean, 1998[a]). A rich faunal and archaeological collection ranging from the Middle Palaeolithic to the Neolithic was exhumed during these excavations, including an important Neolithic burial. Unfortunately, the absence of recorded context and the dispersal of the material to several private collections (to which access is limited) prevented any interpretation.

In 1971, Scladina Cave was discovered and named by speleologists and amateur archaeologists from Sclayn (Otte et al., 1983; Otte (ed.), 1992; Bonjean 1998[a]). At that time, the cave was filled to the vault with sediment. From 1971 through 1977 they unblocked the passage and started work on the first 15 m with the purpose of opening a karstic site for tourism. In the process, the two metres of sediment directly under the ceiling were removed without respecting the stratigraphy. Following the discovery of the first artefacts, the speleologists contacted several professional archaeologists; this initiative, retrospectively, would save the cave.

In August 1978, the Department of Prehistory of the University of Liège, under the direction of Marcel Otte, collaborated with local amateurs from the Cercle Archéologique Sclaynois (CAS) to undertake the first scientific excavation (Figure 6). A 10 metre deep test pit on the terrace of the cave was opened in the middle of a chimney that leads to the lower network of Sous-Saint-Paul (Figure 5). Before long, the stratigraphy of the site was published for the first time (Otte et al., 1983).

At present, the excavations are carried out by the nonprofit organization Archéologie Andennaise in conjunction with the University of Liège, with support from the City of Andenne and the Service public de Wallonie. Dominique Bonjean has been the director of the site and its excavation since 1991. In 1996, the cave was classified as an archaeological site and made *site exceptionnel de Wallonie* (exceptional site of Wallonia, protected by regional laws) (Bonjean, 1998[a]). The present team at Scladina is solely dedicated to research and is comprised of local personnel including three archaeologists, four workers, a laboratory assistant, and a secretary.

Figure 6: Scladina Cave and the evolution of the site excavation: **a.** A 2 metre deep trench opened on the terrace in the direction of the cave (1972); **b-c.** Two steps in the evolution of the site (1985 and 2005); **d.** Today's excavators are equipped with powerful halogen lights, permitting a careful observation of the geometry of the stratigraphy (photographs Cercle Archéologique Sclaynois, Archéologie Andennaise).



Over the first 15 years of field research, the interest in Scladina was essentially archaeological and was linked to the discovery of Middle Palaeolithic artefacts primarily recovered from former layers 5 and 1A (Otte & Bonjean, 1998), now understood and communicated as sedimentary units 5 and 1A after further sedimentological investigation (Pirson, 2007). The study of the stratigraphic context, palaeontology, and palynology completed the approach and were the subjects of numerous publications (Otte (ed.), 1992; Otte et al. (dir.), 1998).

Since 1993, an emotional dimension has been part of the excavation at Scladina with the recovery of a mandible, a maxillary fragment, and 16 isolated teeth belonging to a juvenile Neandertal. This discovery, the most important made in Belgium in the 20th century, permitted Scladina to join several other Belgian sites that have yielded Middle Palaeolithic human remains (Toussaint et al., 1994, 1998, 2001, 2011; Bonjean, 1995; Toussaint & Pirson, 2006). The study of this Neandertal child's remains is the subject of this monograph.

3. Sedimentary context

Since the beginning of scientific research in 1978, multidisciplinary studies have been frequently carried out at the site (Otte (ed.), 1992; Otte et al. (dir.), 1998; Pirson, 2007; Pirson et al., 2008). These demonstrated that the sediment contained evidence of a number of climatic fluctuations belonging to the Upper Pleistocene. From a palaeoclimatic perspective, this is one of the most complete sequences available to researchers in Belgium. The palaeoenvironmental context and the chronostratigraphic sequence of Scladina are the subject of a specific chapter within this volume (see Chapter 4).

The major units that make up the stratigraphic sequence were identified in the original works (Otte et al., 1983; Deblaere & Gullentops, 1986; Gullentops & Deblaere, 1992; Haesaerts, 1992; Benabdelhadi, 1998); however, beginning in 2003, a detailed re-examination in the form of research for a PhD thesis found a previously unknown complexity in the sediment deposition (Pirson, 2007). Presently, more than 120 layers, divided into 30 sedimentary units, have been identified in a sequence that is approximately 15 m thick. A large number of sedimentary processes (e.g., run-off, debris flow, torrential flow, solifluction, and settling) and post-depositional processes (e.g., deep frost, cryoturbation, bioturbation, precipitation of iron hydroxide and manganese dioxide) are understood, which makes Scladina an excellent reference site.

4. Archaeological context

Scladina is one of the major Palaeolithic archaeological sites in Belgium. Two important Middle Palaeolithic artefact series have been recovered here (the assemblages from units 5 and 1A), which have been studied from a variety of perspectives, including typology, technology, petrography, spatial distribution, and statistics (Otte et al., 1988; Otte et al. (dir.), 1998; Bonjean et al., 2009[a]). The excavation methods used in the field over the years have profoundly evolved and continue to do so. They now follow a

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microstratigraphic approach in combination with horizontal and/or vertical excavation.

4.1. Excavation Methods: Evolution and Difficulties

From its discovery in 1978, Scladina's Unit 5 revealed a surprising richness: the first square metres probed under the porch delivered tens of bones and lithic flakes. The exceptional concentration of artefacts with relatively fresh, sharp edges motivated the researchers to establish an excavation system based on the horizontal cleaning of square metres before observing the spatial relationships between the objects (OTTE, 1990). Currently, close to 20,000 artefacts and bone fragments from Unit 5 have been recorded and mapped according to their 3-dimensional coordinates. The contextualization of this material permitted the study of its distribution within its sedimentary context. In addition, systematic screening of the sediment through a 2.5 mm mesh added to the exhaustive recovery of material. The small pieces obtained through screening brought the total number of analyzable objects to nearly 100,000.

Hundreds of planimetric plottings of the material have been produced, allowing for a detailed study of their spatial and altimetric distributions. Unfortunately, they showed a mainly homogenous distribution of artefacts in the first chamber of the cave (from the entrance to metre 23) in terms of the raw material, debitage techniques, and debitage typological classes (OTTE et al. (dir.), 1998; BONJEAN, 1998[b]). No clearly circumscribed anthropogenic zones were recognized through the examination of the spatial distribution of the objects. The burned bones and those with butchering marks were spread across the total surface of the first chamber (PATOU-MATHIS & LÓPEZ-BAYÓN, 1998). Large clusters of morphologically similar lithics were observed; some clusters contained only debitage, while others were comprised almost completely of larger flakes and blocks. These clusters have been interpreted as the possible evidence of activity zones (BONJEAN, 1998[b]; BONJEAN & OTTE, 2004).

Recent stratigraphic observations (PIRSON, 2007) revealed the existence of a gully inside Unit 5, clearly visible on the stratigraphic Section H/I 23 (see Chapter 3, Figure 5). Coming from the terrace, the gully was the result of an erosional event that likely affected the first 12 m of the cave. The formation of this gully generated an intense reworking of both sediment and objects, which potentially originated several layers underneath. Such mechanisms caused by natural phenomena can distribute objects in a way that is seemingly anthropogenic. The concentration of artefacts numerically declines towards the back of the cave, which also indicates transportation of the material by erosion (BONJEAN et al., 2009[a]). Referring again to the maps mentioned above, the refitting of lithics from different locations substantiates the same direction of movement (BONJEAN, 1998[b]). Therefore, caution is necessary during the interpretation of data, especially when identifying the difference between anthropogenic and natural actions that occurred during sedimentary deposition. For this reason, an excavation method adapted for this stratigraphic complexity was established (BONJEAN, 2009).

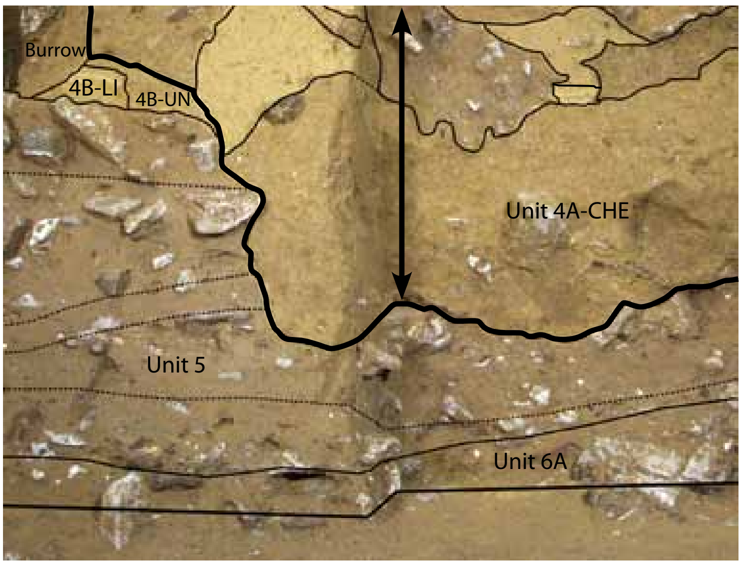

Figure 7: View of a 1-metre-wide longitudinal section in the middle of Square F34. The stratified deposits (units 6A, 5 and layers 4B-LI and 4B-UN) were at first eroded by the event(s) that created the gully (Unit 4A-CHE). The different steps in the sedimentation of the gully represent a second phase. Pleistocene and Holocene bioturbations finished the reworking phase, visible on the sections, creating a mosaic of different types of sediment, whose genesis must be reconstituted before excavation.

The stratigraphy of Scladina is typical of cave environments: irregular, often oblique, and exhibiting complex sedimentary structures often caused by erosion (Figure 7). In retrospect, the traditional excavation method was inadequate because it did not allow for the observation of stratigraphic subtleties. Furthermore, this method can lead to the association of anachronistic remains based on their geographic proximity (Bonjean et al., 2009[a]).

To remedy the problem, a new field approach was conceived and applied. Implemented in 2004, the system combined horizontal excavation on a reduced surface (100 cm long, 10–50 cm wide) with stratigraphic observation and control made possible by the use of 2–4 adjacent vertical sedimentary sections. Therefore, everywhere in the cave archaeological investigations now begin by the meticulous cleaning of an existing section. The section is then photographed and printed. In the cave, the excavator annotates the photograph by adding the limits and the names of the layers, as well as some altimetric information.

The worker subsequently excavates by horizontally removing the sediment on the reduced surface, while observing the vertical sections adjacent to the excavation zone so the stratigraphic structure is respected (Bonjean, 2009). In order to precisely observe the nature of the sediment that contains an object, the excavator establishes a small section at the object's base. This operation permits the verification of the homogeneity of the sediment surrounding the object and the excavator is also assured what layer the object is from. Simultaneously, the spatial distribution in three dimensions is recorded. All sediment that is removed from the cave is wet screened.

4.2. Prehistoric occupations

The sedimentary deposits of Scladina recorded numerous occurrences (Figure 8) of Neandertals frequenting the Ri de Pontainne Valley. After 35 years of investigation, each of the 30 observed sedimentary units (Pirson, 2007) have provided at least some artefacts.

4.2.1. The principal assemblages

Two assemblages contain a considerable number of artefacts. Around 13,500 tools and knapping waste products of diverse rock types (e.g., flint, quartz, and quartzite) constitute the archaeological assemblages from units 5 and 1A.

4.2.1.1. The assemblage from Unit 5

The sedimentary Unit 5 is composed of several layers. The sedimentary dynamics in lower deposits (Layer 5-G) seem to be dominated by solifluction, while the top layer of the deposit (Layer 5-J) has heavily eroded the underlying layers, and is likely a debris flow (Pirson, 2007; see Chapter 3). Archaeological material can be found in this unit across the cave, scattered by these processes. Most of the environmental elements, such as palynology, sedimentary dynamics, magnetic susceptibility, point to cold climatic conditions during its deposition. The combination of the available dates for the sequence and the other chronostratigraphic data suggests that Unit 5 was deposited during a cold phase of the Weichselian Early Glacial (Pirson et al., 2008; see Chapter 4).

The lithic assemblage is characterized as much by the different types and geographic origins of raw material as by the nature of the artefacts. Flint was transported to the cave in the form of small, crudely sculpted nodules, as well as in the form of prepared products. The most likely source of this material is the Hesbaye region, located about 6 km north of the site on the opposite bank of the Meuse. Therefore, at one of the numerous passages found at confluences, the river must have been forded. Some quartz and quartzite pebbles, collected from the Meuse alluvium near the cave, were also brought to the cave either in their original form or, in some cases, anthropogenically modified. Blocks of limestone and chert available around the site and in the Ri de Pontainne Valley were also exploited (Figure 9). Finally, some rare pieces manufactured from other raw materials, such as fine grained flints or tertiary sandstones, perhaps attest to the exploitation of another geographic zone and could correspond to a tool kit that Neandertals took with them from place to place (van der Sloot, 1998).

Guided by a desire to economize material, as well as to employ the best type of rock based on its functional characteristics (Figure 10), these materials were exploited through flexible and complementary methods. Preferentially, flint had served to produce delicately created tools such as scrapers (Figure 11) and points, while the local material (quartz and quartzite) was used in the production of heavy, asymmetrical pieces (Figure 12) such as knives (Figure 13), which were easily grasped by their wide backs, opposed to

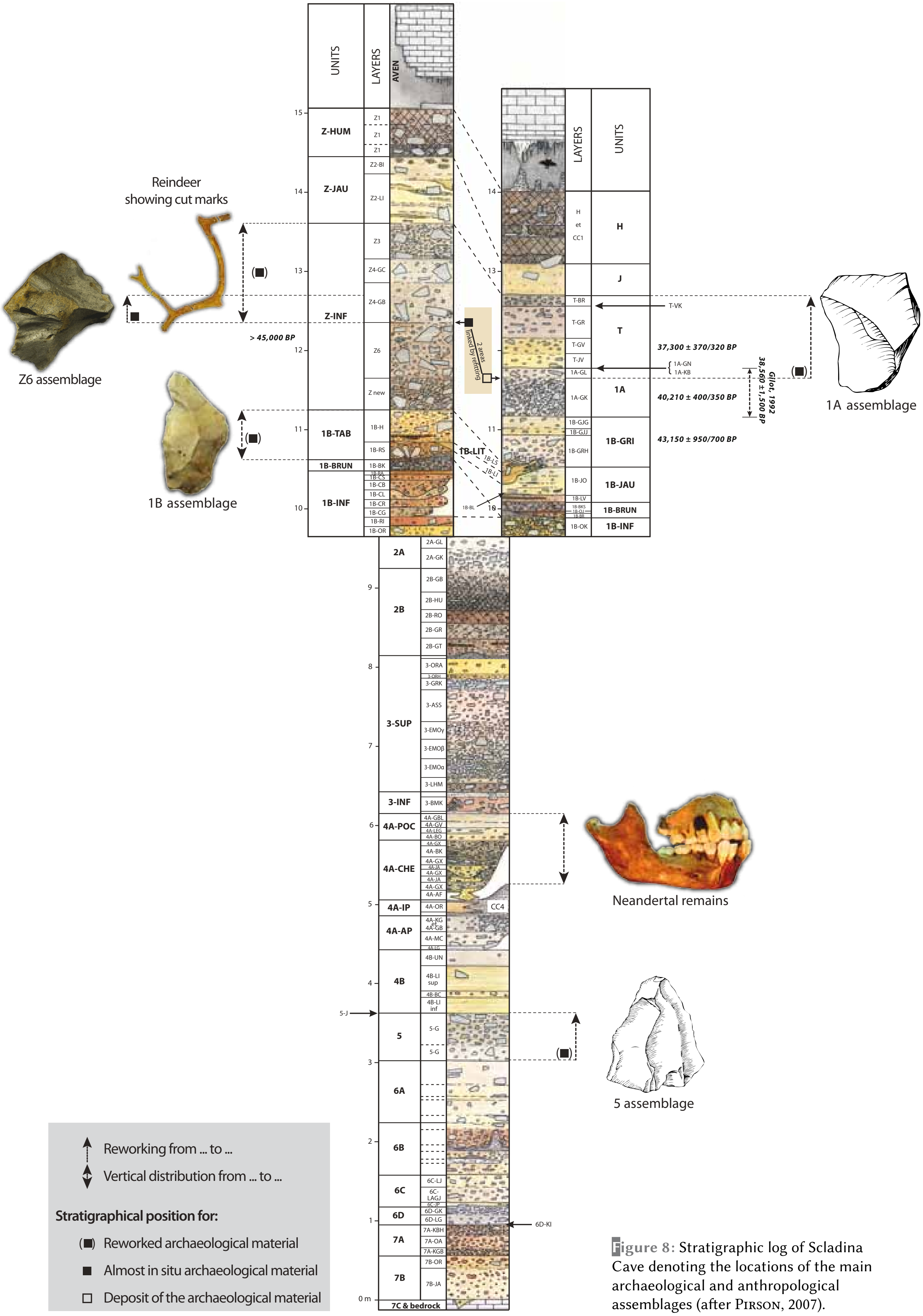

Figure 8: Stratigraphic log of Scladina Cave denoting the locations of the main archaeological and anthropological assemblages (after PIRSON, 2007).

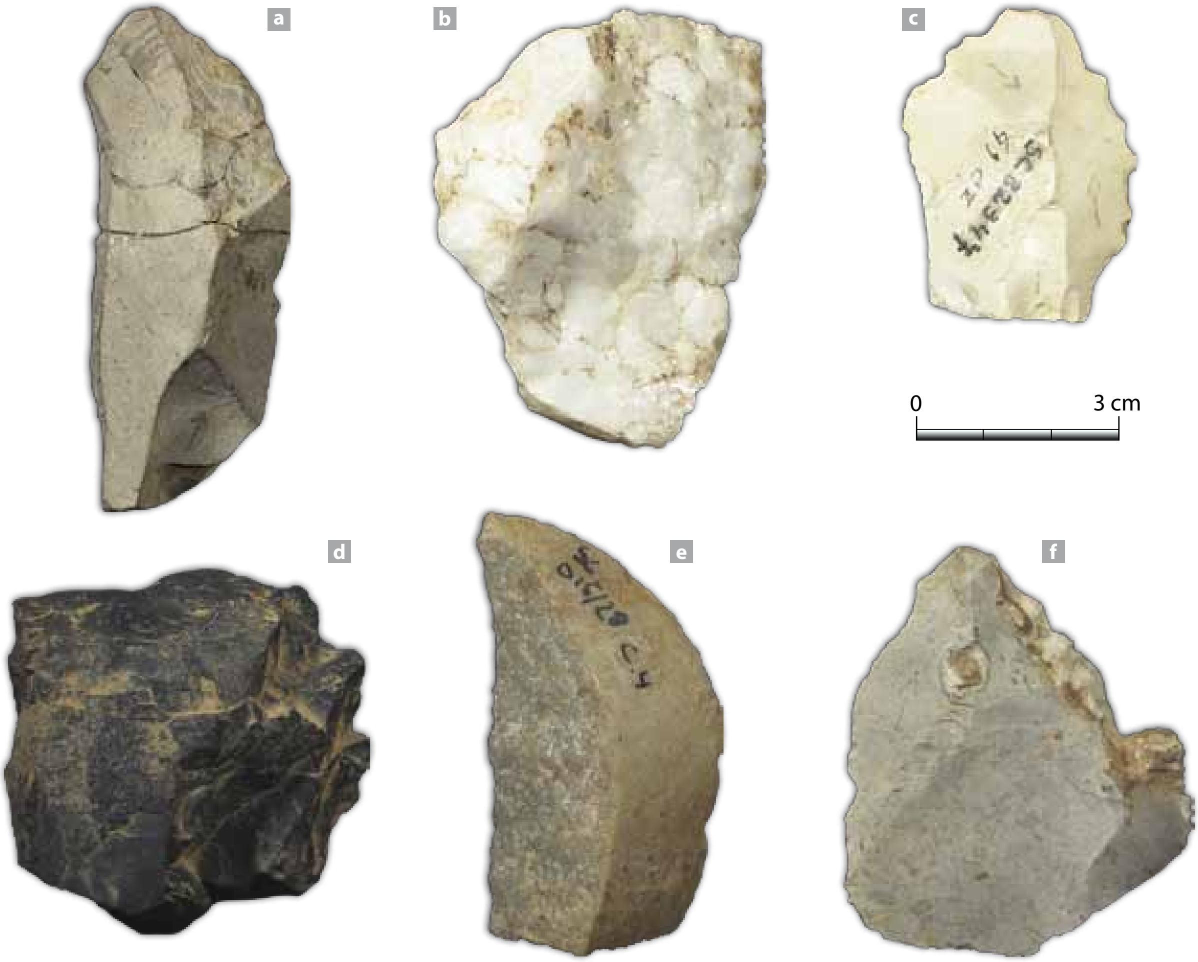

Figure 9: The raw material types worked in the assemblage from Unit 5: **a.** Limestone, **b.** Quartz, **c. & f.** Two types of flint, **d.** Chert, **e.** Quartzite.

their sharp edges (Di Modica, 2010[a]; Di Modica, 2010[b]; Di Modica et al., in press).

The instruments necessary for the production of lithics have also been found. Tens of quartzite pebbles recovered from Unit 5 show the characteristics of their use as stone hammers (i.e. evidence of pecking; Di Modica, 2010[b]). Recently, evidence of the use of bone tools complemented the series of pebbles. In fact, an examination of a number of bone fragments permitted the identification of 26 large diaphyseal fragments that were used as retouchers (Abrams et al., 2013).

However, the acquisition and use of raw tool making materials as the explanation for Neandertals to use Scladina is not substantiated, since quality materials are absent for several kilometres around the site. Therefore, the motivation to stop at Scladina must be linked to other types of resource acquisition, such as the exploitation of animals from the hilly environment of the *Sillon Sambre-et-Meuse* (between the Sambre and Meuse valleys). The zooarchaeological data suggests that hunting with the purpose of building up a surplus of food may have been the motivation for habitation at Scladina. Some bones show traces of flint cut marks, and faunal analysis shows that 6 whole chamois had been taken to the site and processed there in order to obtain skins, meat, tendons and marrow. It is suggested that they were likely packaged for transport to another site, which suggests that Scladina was a hunting camp (Patou-Mathis, 1998[a]). The predation of small game was also illustrated by the presence of a coxal bone of a hare (Figure 14), bearing 18 butchery marks (Bonjean et al., 2011). Finally, more than 1000 burned bone fragments have been collected, illustrating the existence of one or several hearths.

4.2.1.2. The assemblage from Unit 1A

Situated 2 m higher in the stratigraphy, this group of artefacts was the first identified by the pioneers of the site. Its chronological position can be very precisely determined, even though diverse processes have reworked the artefacts, predominantly by debris flows and run-off. The first layer in which the assemblage appears is 1A-GL, which

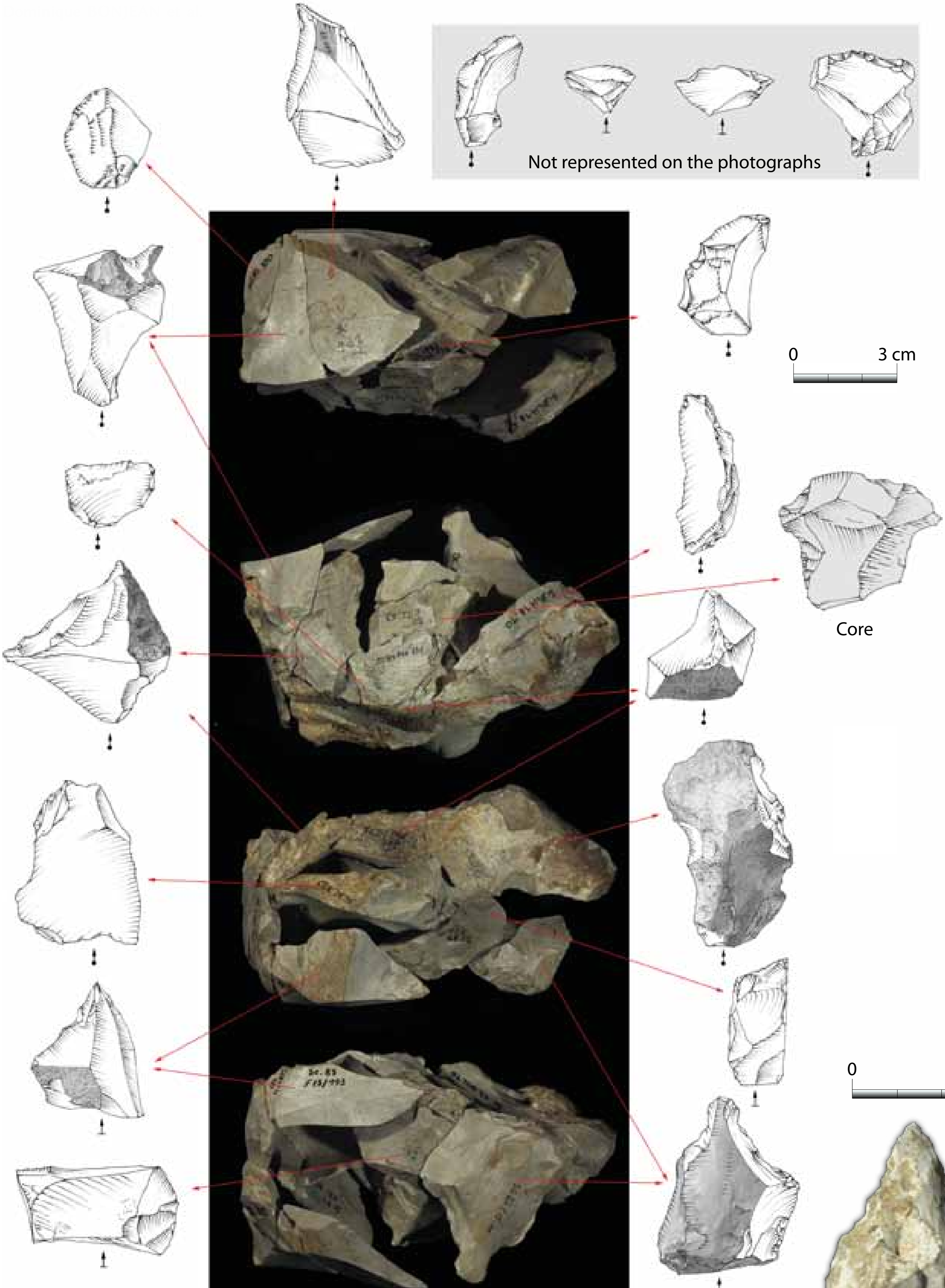

Figure 10: The flint nodules are roughly prepared. Their exploitation shows low standardization, which translates as an important flexibility in the concepts of tool making (drawings Sylviane Lambermont, refitting, photographs and graphics Kévin Di Modica).

Figure 11: Simple convex side scraper on a bulky, asymmetric flint flake coming from the assemblage of Unit 5.

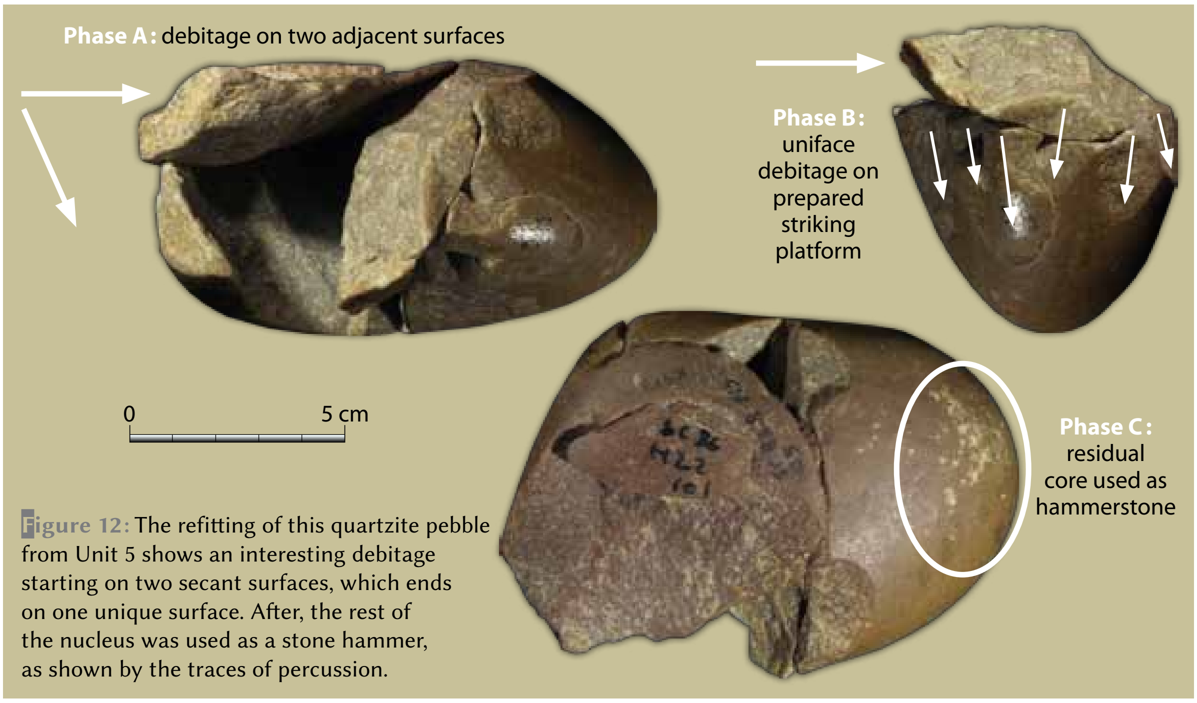

Figure 12: The refitting of this quartzite pebble from Unit 5 shows an interesting debitage starting on two secant surfaces, which ends on one unique surface. After, the rest of the nucleus was used as a stone hammer, as shown by the traces of percussion.

Figure 13: A massive quartzite asymmetrical knife from Unit 5.

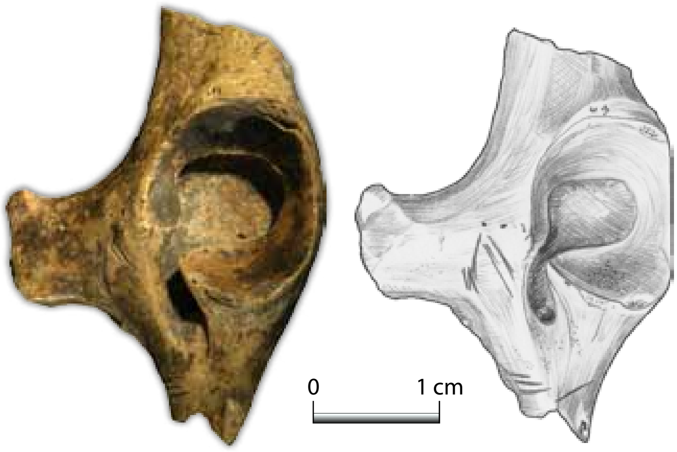

Figure 14: Found in Unit 5, this hare coxal fragment attests to the hunting of small game. This bone exhibits 18 cut marks (drawing Sylviane Lambermont, AWEM).

is dated to between 40,210 +400/-350 BP (GrA-32635; Pirson, 2007) and 37,300 +370/-320 BP (GrA-32633; Pirson, 2007). These dates correspond to the Weichselian Middle Pleniglacial (MIS 3).

With approximately 4500 artefacts, the assemblage of Unit 1A is the second most valuable archaeological series of the site. Unlike the assemblage of Unit 5, the Unit 1A assemblage is characterized by a poorer state of preservation, heterogeneity of patina, highly abraded edges of the flint artefacts, as well as less circumscribed planimetric and stratigraphic distribution.

The differential use of the raw materials observed in this assemblage is essentially controlled by economic imperatives: small blocks and river pebbles of flint (Figure 15) or quartzite, complete exploitation, and immediate knapping without preparation. The series shows some behavioral similarities to that of Unit 5 in terms of flint importation strategies and the use of local raw materials. These similarities show the stability and balance attained by Neandertals in terms of their response to their needs and their exploitation of environmental resources. These analogies

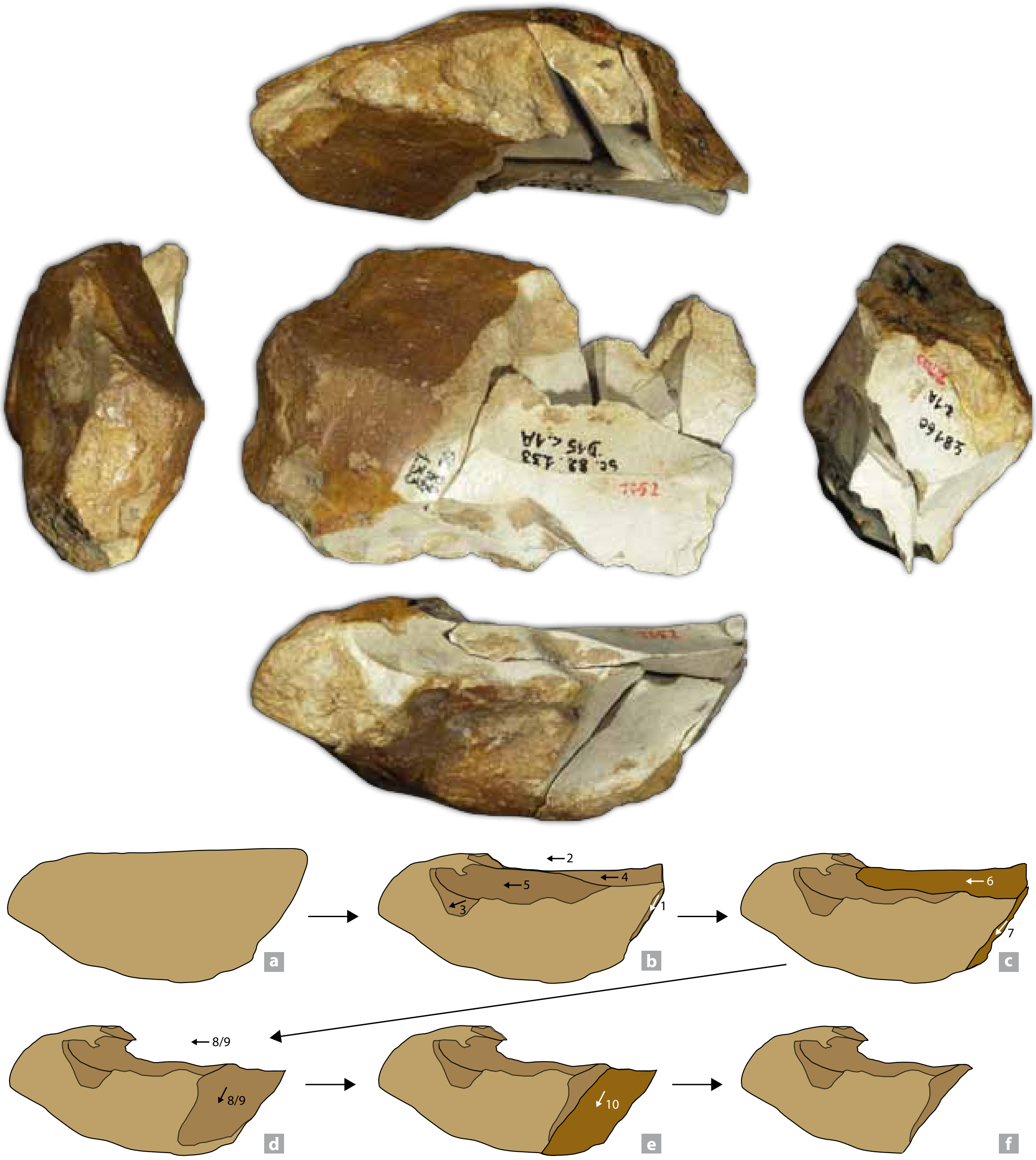

Figure 15: Different faces (above) and schematic drawings (below) of the sequence of debitage (a-f) of a small alluvial flint pebble following the Quina conception, recovered in Unit 1A.

seem to ignore the ca. 70,000 years that separated the occupations, as well as the climatic and environmental variability (Otte et al. (dir.), 1998; Di Modica, 2010[b], Di Modica et al., in press).

The analysis of faunal remains within Unit 1A indicated that less osseous material was present than teeth (Lamarque, 2003). Almost 148 cave bears were counted on their molars; but a minimum of only 9 individuals were represented by bones, which frequently exhibited hyena gnawing marks (Figure 16). The poor preservation of bone impeded the observation of the relationship between Neandertals and fauna. If hunting was the major objective for stopping at Scladina, as previously suggested, the 1550 bones of ungulates recovered, corresponding to 17% of identified remains, exhibited no proof of predation by humans (Bourdillat, 2008). However, almost two hundred fragments of burned bone, some of which calcined, suggested the use of bone

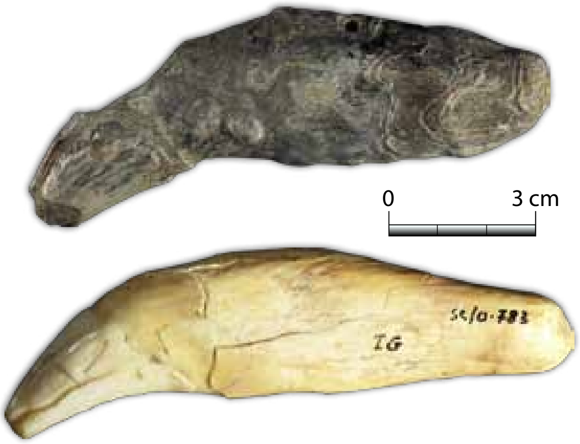

Figure 16: Two cave bear canines (*Ursus spelaeus*). One (up) is altered by the gastric acid of a cave hyena (*Crocuta spelaea*).

as fuel and, in fact, is the only proof of anthropogenic interaction with fauna found so far (Abrams et al., 2010).

As excavation at Scladina reached 35 m beyond the entrance, an aven became visible (Bonjean et al., 2002). The opening of this aven was first observed in Layer 1B-TAB (Pirson, 2007). The aven was totally filled with sediment from the plateau, creating a peculiar stratigraphic sequence that developed simultaneously with the sequence that was deposited from the entrance. In this new sedimentary sequence approximately 100 flint, quartz, and quartzite artefacts were recovered from the limit between layers Z6 and Z4, as well as the basal part of Z4. These artefacts were petrographically and technologically similar to the lithic series collected from Unit 1A. Two quartzite flakes from the two sedimentary sequences were refitted, demonstrating that both archaeological collections seem to represent a single human occupation.

4.2.2. The small lithic assemblages

The small lithic assemblages are an indicator that the cave and the surrounding region were frequented by Neandertals for approximately 100,000 years; however, their interpretation is complicated by the low number of anthropogenically modified objects. When faced with coherent assemblages composed of thousands of pieces, such as those from units 5 and 1A, the location and the type of activity, the contemporaneous relation to deposits, the consistency of assemblages, the reworking processes, and even the details of site function are questions that can be addressed. However, with only a few tens of pieces, all these questions are more difficult to confront and to answer because of the absence of statistical parameters and contemporaneous links such as those established by refitting. Therefore, in small assemblages almost all artefacts can only be studied for themselves.

Flint flakes from units 2A, 2B and 3, all derived from very cryoclastic layers, were characterised by a very poor state of preservation of the ridges and cutting edges (Figure 17). The lithology of the units (particularly the abundance of limestone fragments) as well as the mode of deposition and the successive depositional reworking all had a powerful effect on the conservation of artefacts, and suggest the substantial displacement of material from its original context (Di Modica & Bonjean, 2004). In each case, is the reworked material contemporaneous with the sedimentary unit that contains it? Did this redistribution of artefacts in the cave come from one or several older archaeological deposits? Did the reworking of these pieces originate at the entrance of the cave or from the overlying plateau? At this time all these questions remain unanswered.

In some of the sedimentary units, the flint flakes have a very fresh appearance (Figure 17). This is the case for the few pieces found in the silts of units 6A, 6B and 6C, which are almost devoid of limestone fragments. The freshness of the material does not necessarily facilitate its interpretation. Does this indicate a taphonomic exception, or is this evidence of an occupation site? Again, this question remains unanswered due to the lack of material.

The archaeological interpretation of Layer 1B-TAB is also difficult. Directly below the aven, approximately 100 small, unweathered flint flakes and chips with the same white patina were recovered. In this place, silty sediment containing very few limestone fragments had slid from the plateau and had been moderately dispersed in the cave. All these factors indicate a coherent assemblage, including: freshness of the material, taphonomic homogeneity, and a concentration of small, relatively unmodified, knapped artefacts sparsely spread within the silt matrix. This seems to correspond to a location that was used by hominids for short periods of time, for which the question is whether this activity occurred on the plateau beside the aven or, less likely, in the cave under an opening that produced light.

Furthermore, under the aven, approximately 10 reindeer bones with butchery marks were

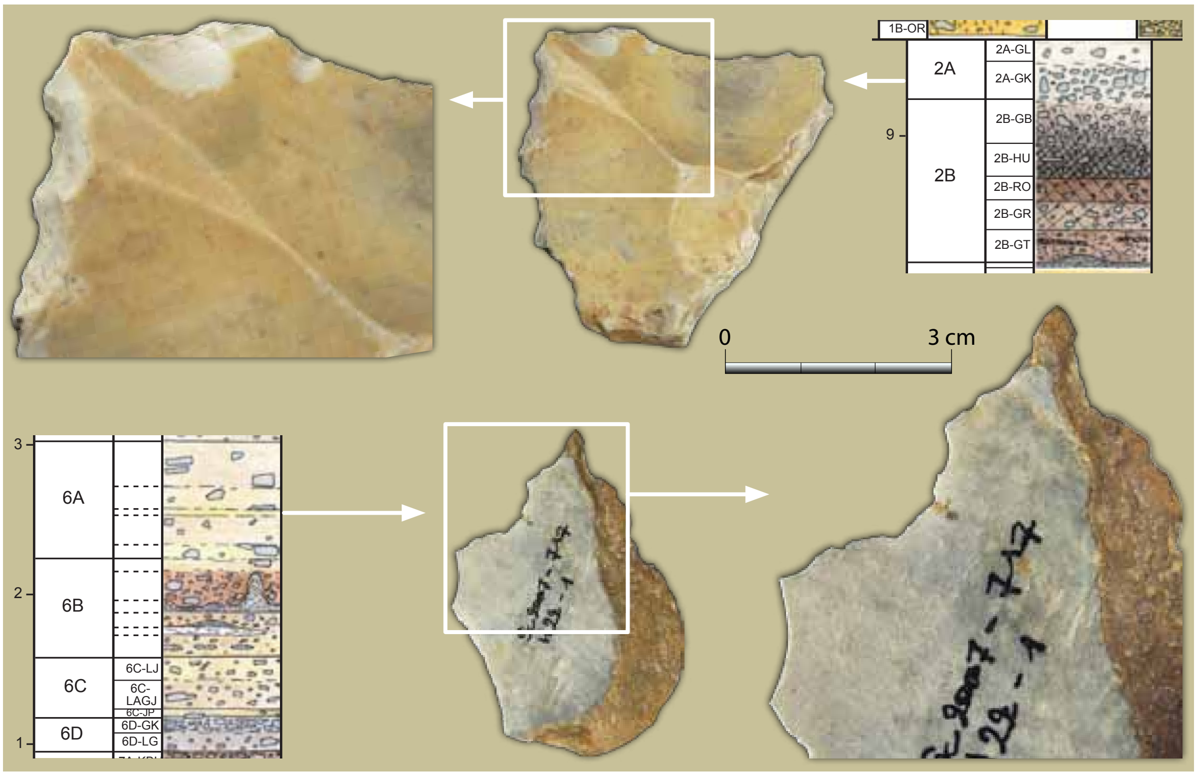

Figure 17: The flint artefacts of Unit 2A (above) are patinated with very blunt edges. On the other hand, the ones from Unit 6A (below) are fresh with sharp cutting edges.

found in Layer Z4. The bones seem to belong to a single individual. Their dispersal is limited, extended over only 9 m². Human activity is once again suggested to have occurred either on the plateau next to the aven, which functioned as a collector of waste, or in the cave where the dual advantage of both shelter and light was present.

Above the Middle Palaeolithic archaeological sequence, some pieces were excavated that belonged to later periods. These pieces, frequently extracted from perturbed sedimentary contexts (e.g. due to bioturbation), are of limited interest. Sediment reworked from the plateau to the cave through the aven, as well as several other chimneys, brought with it some Upper Palaeolithic and Mesolithic artefacts. A Neolithic group burial was also found at the entrance to the cave, as mentioned above. The activity of bioturbators also produced some of the most surprising anachronisms : a Roman tile fragment, ceramic pieces, and a clay pipe manufactured in Andenne during the 19th century were all incorporated into the cave through different types of burrows (Otte et al. (dir.), 1998 ; Otte, 1998 ; Bonjean et al., 2010).

5. The Scladina I-4A Neandertal Child: history of the discoveries

The first Palaeolithic hominid teeth were found at Scladina at the beginning of 1990. The first 12 years of excavation had emptied the cave up to metre 27, during which several thousand faunal remains had been exhumed from the Sedimentary Complex 4A (see Chapter 3), mainly attributed to *Ursus spelaeus* (Simonet, 1992 ; Patou-Mathis, 1998[b]). The first palaeontological assessment of the site was done on this material (Simonet, 1991).

Unfortunately, nobody had recognized the Neandertal remains at this time. The excavators did not identify the first 3 teeth of the Neandertal child (2 incisors and 1 canine) that were removed from excavation Square H27 on either February 22 and 23, 1990. Over the next 2 years, the excavation extended over 15 m² toward the back of the cave and 8 other teeth were recovered under the same conditions as the first 3 ; likely they were not recognized. The small maxillary fragment without teeth also passed unrecognized in 1992 during the excavation of Square D30.

The year 1993 compensated for these first failures. On July 16, Claire Curvers, a student from the University of Liège spotted the right hemimandible in Square D29 (Figure 18). It was precisely recorded in three dimensions. An anthropologist identified it as Neandertal four days later (Bonjean et al., 2009[b]).

From September 1993 on, part of the team continued excavation, while the other part took advantage of the collections and checked if some

Figure 18: Recreation of the geographic and stratigraphic position of the right hemimandible Scla 4A-1 discovered on July the 16th 1993. The sediment of Unit 4A-CHE (the gully) contains many limestone fragments and reworked speleothems (photomontage).

pieces of the Neandertal child had escaped the vigilance of the excavators and the first analysts. Through this process, the aforementioned 11 teeth and the maxillary fragment were recovered from bags stored over the preceding 4 years.

The field team was also fortunate: on December 14, 1993, an excavator from Archéologie Andennaise recognized the child's permanent maxillary right first molar in Square C30. After being photographed at the time of its removal (Figure 19), this tooth became the first Belgian Neandertal fossil to be pictured in the place of its discovery.

In 1995, 2 teeth escaped the observation of the excavators and were recovered during screening. However, the excavation being standardized and the planimetric map of the remains being sufficiently detailed the 2 pieces could be attributed to a precise sedimentary layer (see Chapter 5).

In 1996, the left hemimandible was found under spectacular circumstances, and it is by chance that its precise position could be recorded. Along the left wall of the cave, a limestone slab had detached from the roof, and, over time, had put pressure on the sediment in the underlying berm. A fracture developed and was about to cause the collapse of a small portion of the section. The director of the site made the decision to remove the fragile portion of the berm. On the new section, generated by the fracture, the left hemimandible was found (Figure 20).

Further excavations toward the back of the cave lead to the discovery of 2 more isolated teeth. The last hominid remain to have been discovered is the permanent mandibular right lateral incisor from zone F35–F37 that was recovered in 2006 during the screening of sediments derived from the collapse of an imposing berm weakened by several badger burrows.

This list closes with the discovery of the deciduous mandibular right second molar of the child, on November 13, 2001, in Square E38 (Figure 21). Although this is not the most recent Neandertal remain discovered at Scladina, it is world-renowned for being the element of the child that was analyzed by geneticists (see Chapter 19 and Orlando et al., 2006).

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Figure 19: Partial top view of Square C30. In the middle, the permanent maxillary right first molar appears in situ: x = 12 cm, y = 50 cm, z = -466 cm.

Figure 20: Detail of Section D/C 28. The left hemimandible Scla 4A-9 appears in situ: x = 98 cm, y = 75 cm, z = -478.5 cm. The fossil lays 2 cm from a stalagmite fragment reworked into the gully.

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Figure 21: In 2001, Square E38 yielded the deciduous mandibular right second molar Scla 4A-13 (inset). Top view of the square with the fossil in situ: x = 88 cm, y = 57 cm, z = -481 cm.

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