Léotard, J.-M., Straus, L. and Otte, M. (editors). *l'Abri du Pape*. Liège, ERAUL 88, 1999, p. 29-58.

EXCAVATION OF THE BASAL NEOLITHIC AND MESOLITHIC LEVELS AT THE ABRI DU PAPE (FREYR, DINANT, NAMUR PROVINCE, BELGIUM), 1993-1994

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INTRODUCTION

Archeological deposits under the small Pape rockshelter were discovered in 1988 by Philippe Lacroix in a 3 m deep, irregularly shaped sondage, measuring c. 1.5 x 1.5 m, at the base of the cliff. A 3.5 m deep, 2 m wide x 8 m long trench was excavated by S.O.S. Fouilles and Service de Préhistoire (Université de Liège) under the direction of Jean-Marc Léotard in 1989 and 1990. It was in the latter year that the present author first saw the site in the company of Léotard, Lacroix and Marcel Otte during the course of an archeological excursion organized by Pierre Vermeersch and Otte for the IVth International Symposium on the Mesolithic in Europe at Leuven. Having dug a series of late Roman, Iron Age, and late and middle Neolithic layers, Léotard's team had, by 1990, reached the top of a Mesolithic deposit (Level 20). In 1992, Lacroix dug a second (1x1 m) sondage about 4 m from the cliff base through a series of layers (20-25), some of which were archeologically fertile and said to include Mesolithic and possibly "final Paleolithic" materials (Léotard 1989, 1993).

In 1992, the Belgian team proposed that I continue excavation of the pre-Neolithic deposits at l'Abri du Pape. This, I and a Belgian-American crew did with the invaluable assistance of Lacroix, within the limits of the Léotard trench, in the months of July 1993 and June 1994. Although excavation of the bulk of the Neolithic layers had been done by Léotard (with no Neolithic material remaining in rows M-O toward the front of the talus at the time we began our work), there were still remnant ceramic-bearing deposits (including a witness section in danger of continued collapse in parts of squares K-L/19-20) at the rear of the rockshelter in 1993. This we had to excavate in order to reach the top of Stratum 20, which had been disturbed by Neolithic pits/burials. Thus, while the majority of this report concerns Mesolithic (and sterile) Strata 20-26, I also present a brief description of materials apparently corresponding to Léotard's Strata 11-18. Our classification of Mesolithic materials includes the finds made by Lacroix in his second sondage, since their provenience could be correlated with Léotard's numbered stratigraphic units (20-25). However, the relatively abundant lithic materials from the initial sondage unfortunately could not be so accurately correlated and were thus not included in our assemblage counts.

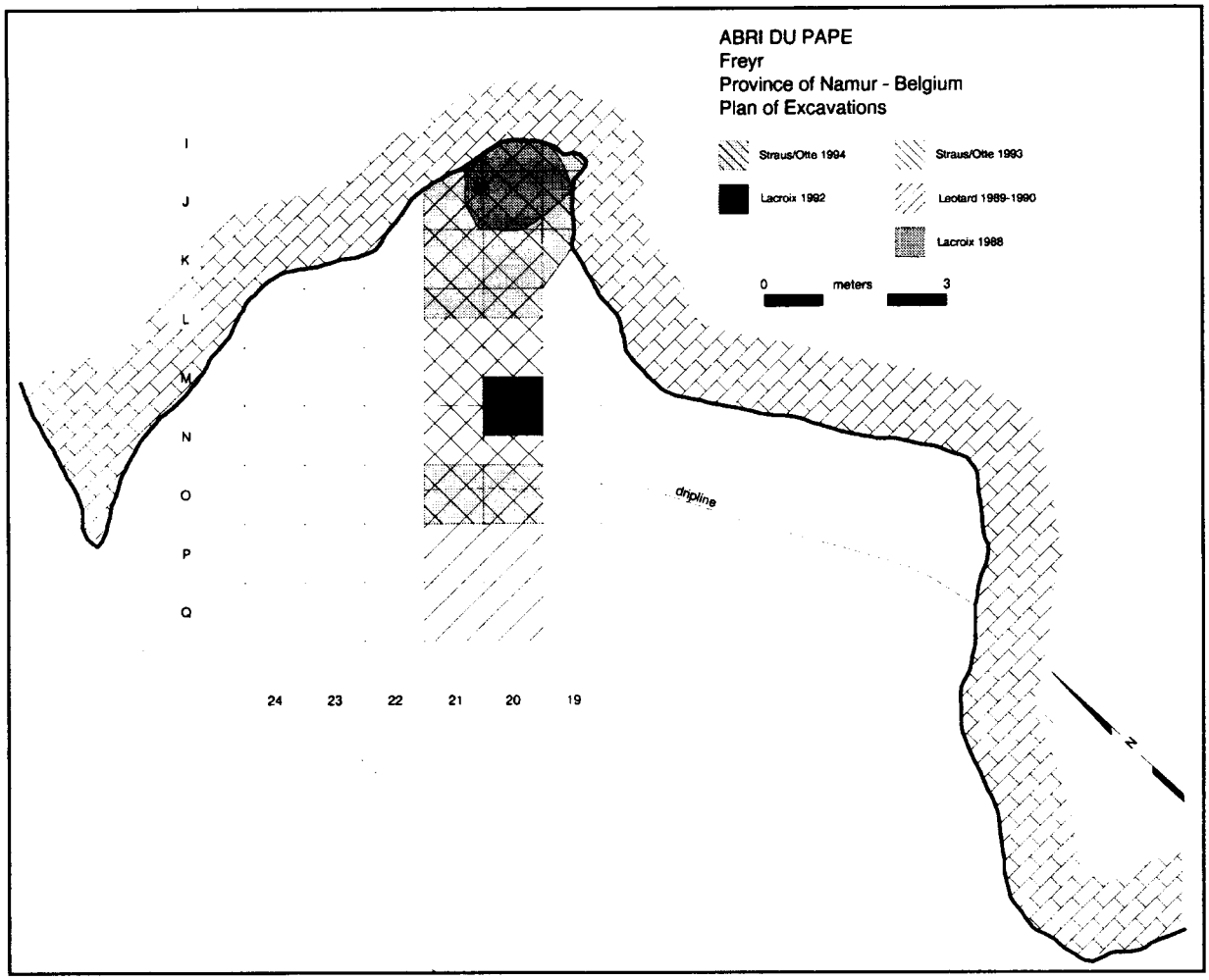

Figure 1: Plan of the Abri du Pape, showing areas excavated.

THE 1993 EXCAVATION

In July 1993 we confined our work to the southern halves of meter squares L20-21, squares M-N21, the northern half of M20 and the southern half of N20 (Fig. 1). Stratum 20 was already exposed in this whole area of the trench, so no Neolithic materials were encountered in 1993. Lacroix's second sondage corresponded essentially to the southern half of M20 and northern half of N20. For simplicity's sake, we describe the axis of Léotard's trench as being "North-South", though in reality it is NE (toward the Freyr cliff base)-SW (toward the Meuse riverbank). In 1993, we (like Léotard before us) left in place a bench of intact Neolithic deposits in the northern halves of L20-21 as a valuable witness section. By so doing we were able to add to Léotard's master stratigraphic section as we dug down in the southern half of L20-21 (Fig. 2). Once cleaned, drawn and photographed by us, the stratigraphy exposed in Lacroix's second sondage served as a valuable guide to our excavation of Strata 20-25. That stratigraphy is described as follows:

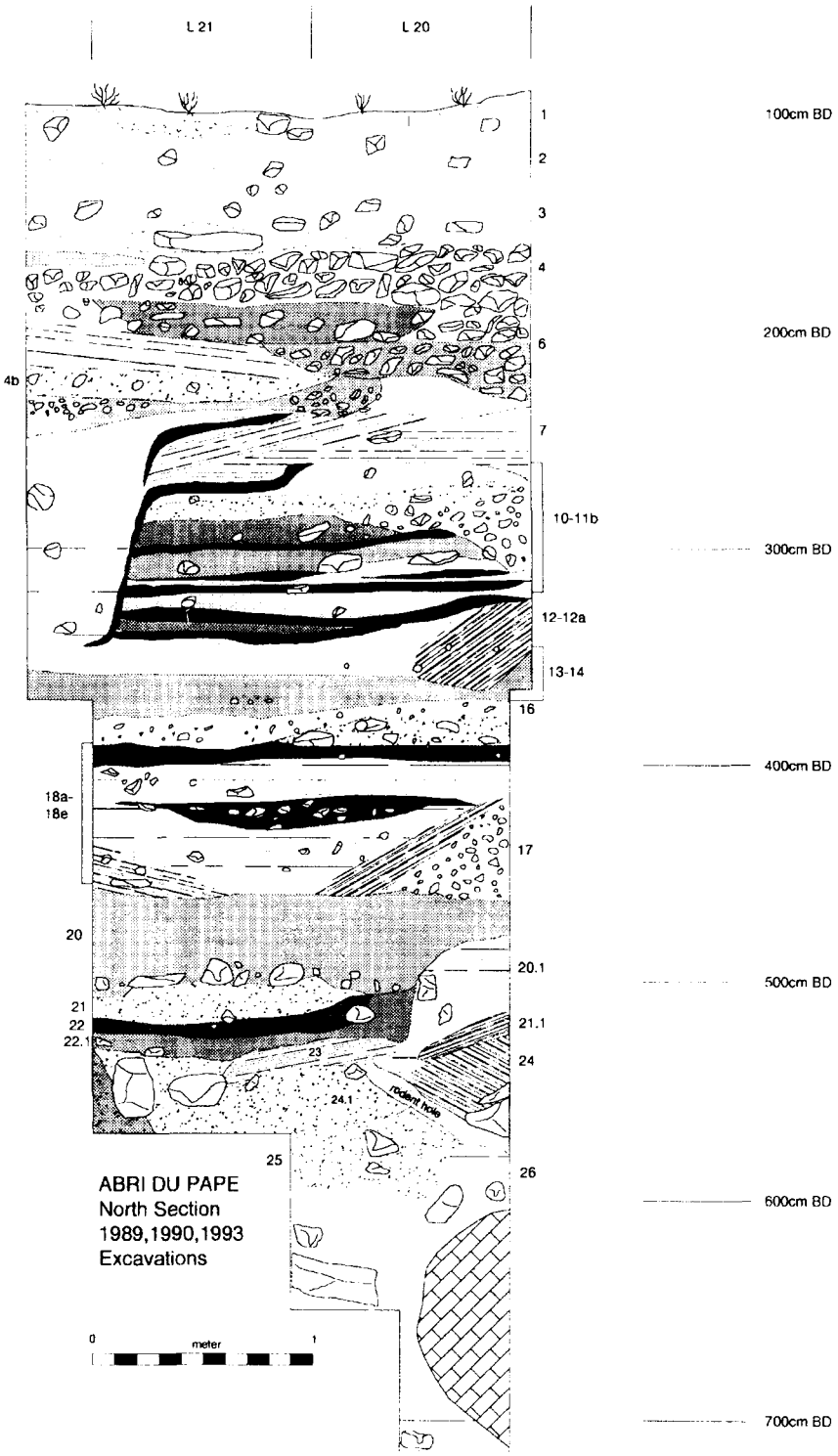

Figure 2. North section of the Abri du Pape trench, midway through squares L20-21.

Stratum 20: large angular gravel with some medium-size angular limestone blocks in a grayish silt matrix; rich in ash, charcoal, lithic artifacts and faunal remains; 10-70 cm.

Stratum 21: small, yellowish-beige gravels and beige silt; locally archeologically sterile (toward talus slope) or relatively poor (toward shelter rear); 10-70 cm.

Stratum 22: large angular gravels and blocks (some partially rounded) in yellowish-beige clayey silt matrix, with localized patches of gray ash and charcoal (hearth residues); archeologically relatively rich; 5-20 cm.

Stratum 23: very fine, washed out, rounded beige "pea" gravels without silt; archeologically poor; 10-25 cm.

Stratum 24: larger angular, cryoclastic gravels and slabs in a silt matrix; archeologically sterile; 10-45 cm.

Stratum 25: gravels with yellowish-gray-brown clayey ("alluvial"?) silt matrix and water-worn pebbles; archeologically sterile; 30-45 cm.

Stratum 26 (first encountered in 1993): light yellowish-beige-brown, clayey silt with fewer gravels, but more large blocks; archeologically sterile; at least 125 cm thick (base not reached) (See also Fig. 3).

In addition to these main strata, we identified a number of localized lenses which are either separate, thin, but fairly extensive stratigraphic units (numbered relative to each overlying stratum) or smaller lateral facies of adjacent strata. They are as follows:

Lens 20.1: wedge of light gray-beige fine gravel with silt in L20; archeologically sterile; 17-40 cm.

Lens 21.1: wedge of light beige silt and gravel in L-M20; archeologically sterile; 5-25 cm.

Lens 22.1: gray silt with patches of pea gravels in N-L rows; 5-10 cm. (gradual transitional zone between Strata 22 and 23 without clear limits).

Lens 24.1: gravels with blocks and a few water-worn pebbles in a dry silt matrix in M-L rows; 20-35 cm.

There is also a wedge of flowstone sloping down toward the southeast in L21 up against which appear to be banked Strata 21-24.1, unless this unit in reality represents posterior calcification of those units through precipitation of calcium carbonates (less likely, as it, unlike Strata 21-22.1, is archeologically sterile and that probably preceded their formation). There is clear evidence of (rodent?) burrow disturbance between Strata 24-25.

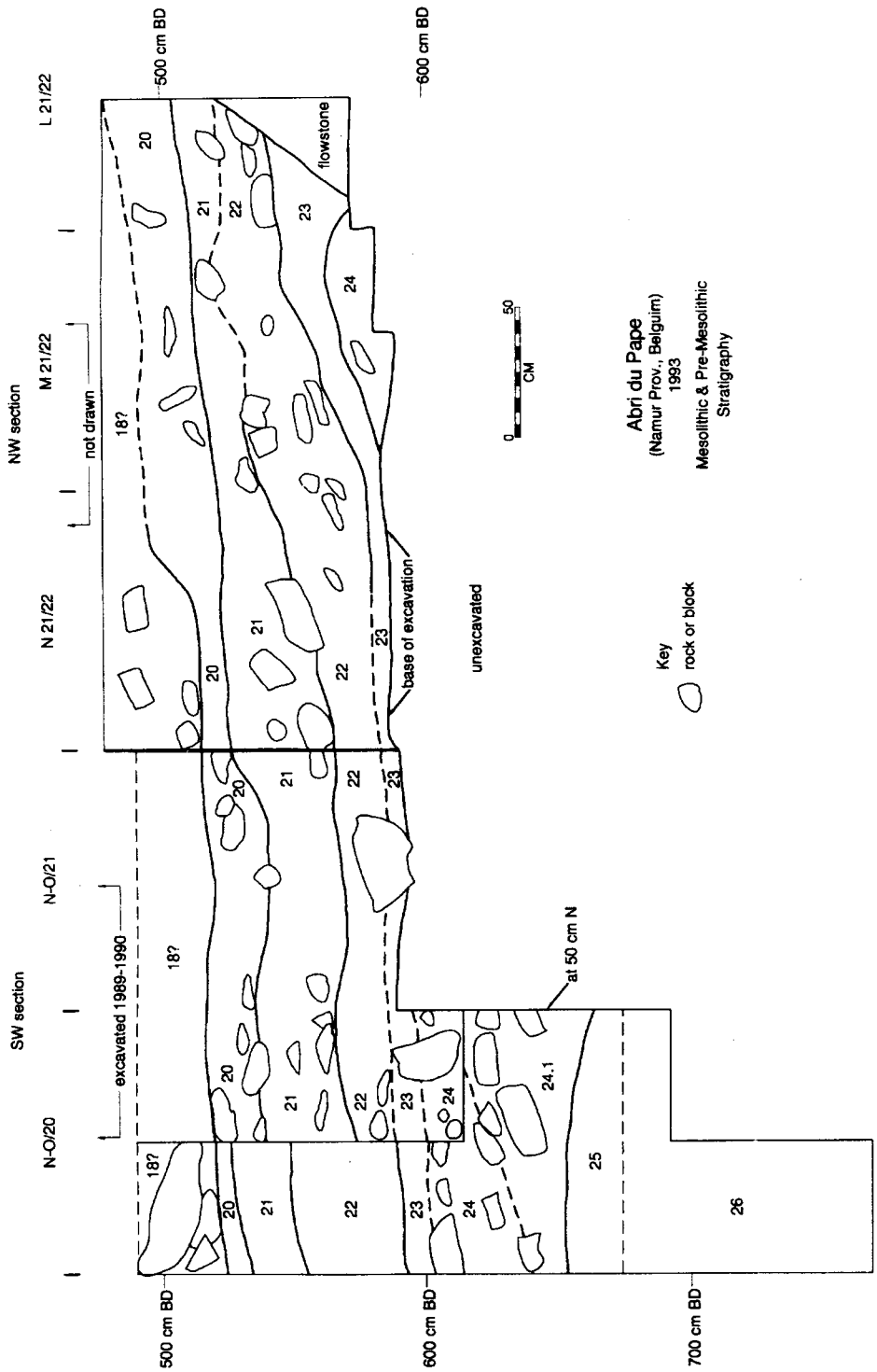

Figure 3. N-O/20-21 and N-L/21-22 sections of the Abri du Pape trench, showing basal Neolithic, Mesolithic and pre-Mesolithic levels only.

However no ceramics or other obvious intrusives were found in our excavation of Stratum 20 or underlying levels in the frontal talus area (L-O rows).

With few exceptions, the entire talus deposit is a scree, composed of usually angular gravels and larger blocks fallen from the cliff in a silt or clayey-silt matrix of beige-yellowish beige color, with locally grayer and/or browner patches that are most likely of organic/anthropogenic origin. Because the whole deposit is internally so similar, and because inter-strata differences are usually gradational in nature, with only subtle color and granulometric distinctions, establishment of this stratigraphy was relatively difficult---especially given the depth and narrowness of the trench and the fact that all levels above Stratum 20 had been covered with plywood shoring before the start of our 1993 excavation. Nonetheless, there are fairly distinct fluctuations in artifact and faunal density (with Strata 20 and 22 being the richest). There are some sterile (or nearly sterile) zones between dense concentration lenses of human cultural residues, although there are also clear "downward migration" zones below some of the occupation "surfaces". This is not surprising, given the high (often open-work) gravel content of the sedimentary deposits. Nevertheless, the integrity of the archeological levels is good, with clear horizontal and vertical associations of artifacts and faunal remains with hearth residues (ash, charcoal, fire-cracked rocks). A particularly well-defined hearth was documented at the top of Stratum 22 in squares M20-21 (Fig. 4). Confirmation of the separation and integrity of Stratum 20 *vis-à-vis* closely underlying cultural levels 21-22.2 is provided by the 1000 year gap in radiocarbon dates between these two cultural horizons (20 vs. 21.22.2). The latter, however, should be regarded as one closely spaced series of occupations all dating to a short period c. 8800 BP (uncal.).

Excavation methods included use of quarter square meter subunits and (in the cases of thick strata) 5-8 cm spits (excavation levels). All tools found *in situ*, all larger (>5 cm) and/or potentially identifiable bones and teeth, cores and larger debitage items (usually those >1 cm) were piece-plotted in three dimensions. Other items found *in situ* were bagged by subsquare and spit. All sediments were screened, first through 5 mm mesh and then through 2.5 mm mesh. A portion was water-screened in the nearby Meuse River and the rest was dry-screened on-site.

Some sediments were first dry-screened through 5 mm mesh; then the residue was bagged and transported by boat and truck to Namur where Lacroix screened it through 1 mm mesh for malacofauna and other very small remains (fish and micro-mammalian remains, microdebitage).

Because most of the sediments are dry and loose (gravelly), the results of on-site wet and dry screening were judged to be essentially equivalent. All lithics (especially bladelets and microdebitage), fragments of macro-mammalian remains and fish and bird bones were collected from the screens. The screening residues were sampled for micro-molluscs and micro-mammalian remains. Charcoal samples were directly hand-picked during excavation for radiocarbon dating.

The total area excavated in 1993 totaled only 4 square meters, most of it to the base of Stratum 25. Small sondages were dug into sterile Stratum 26 in L20 (S half) and in N20 (NE

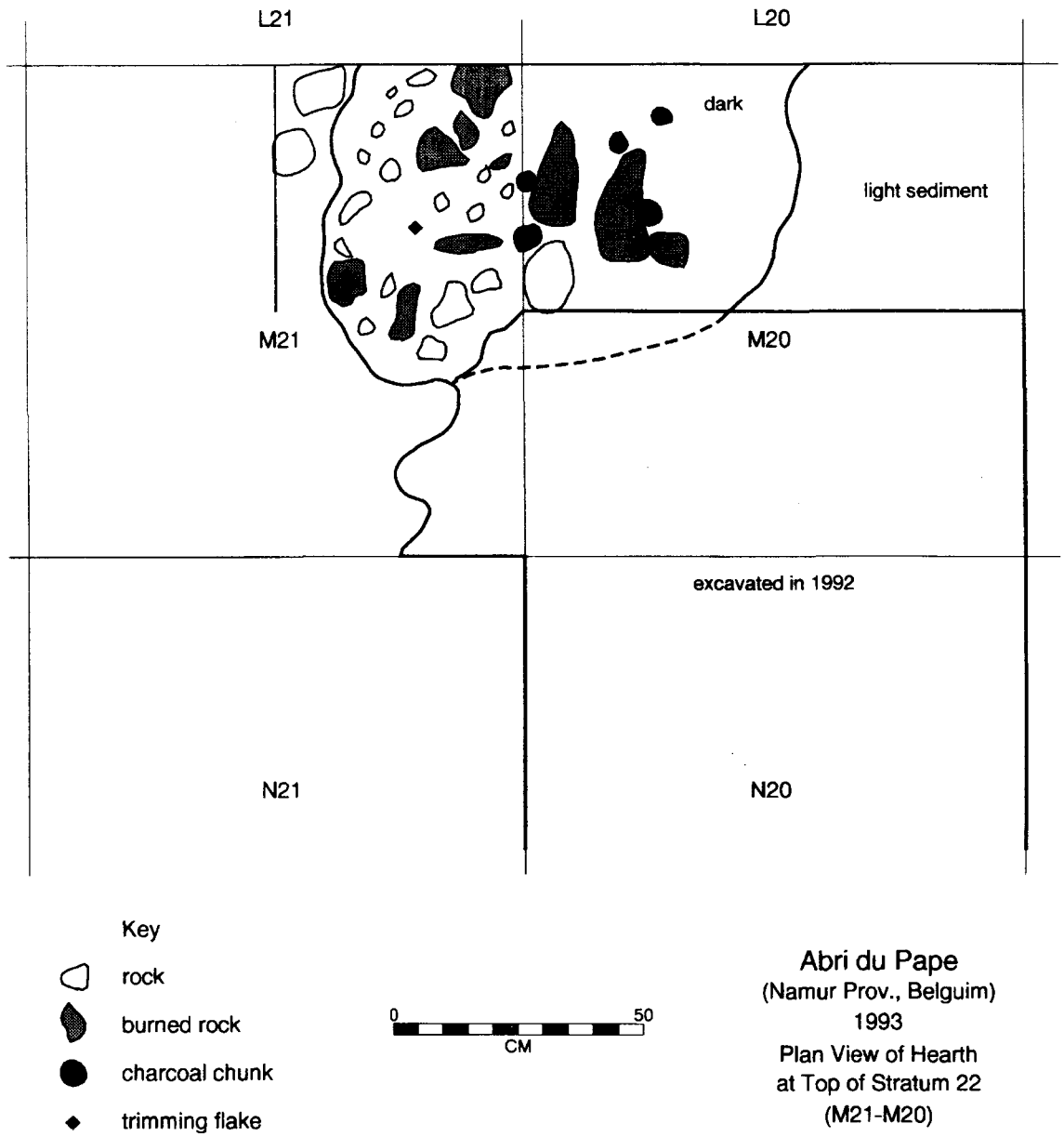

Figure 4. Plan of hearth at top of Stratum 22 in squares M20-21.

quarter) with only coarse screening. A possible bedrock "step" (old cliff edge) was found outcropping nearly vertically in L20 (Fig. 5).

THE 1994 EXCAVATION

Upper Neolithic Levels

In June of 1994 we excavated in the two remaining areas at the bottom of the Léotard trench: O20-21 at the edge of the talus break-in-slope (to sample the outer margin of the inhabited area of the site) and the inner rockshelter area (southern half of L20-21, K-J/20-21 and small parts of I, J, K, L/19 back into a small crevice in the cliff base. The total area excavated in 1994 was about 7 square meters, since part of the area at the very rear of the rockshelter, at the cliff base, had already been dug in Lacroix's initial sondage of 1988. The grand total of the area of Mesolithic deposits excavated at Pape (including Lacroix's pits) was about 14 square meters.

The first task in 1994 was to excavate a <1 square meter remnant of Medieval, Roman and possibly Iron Age deposits against the cliff face in K23-24 (Strata 3-5) to save it from collapse and to expand a flat work surface for bucket hauling and dry screening at the top of the talus. Stratum 5 yielded a thick, orange and brown sherd with rock temper and a few teeth and bone fragments probably of ovicaprids. Then we removed and screened mixed fill that had earlier collapsed from the upper (Roman and Iron Age) deposits in K23-22 onto the Neolithic surfaces at the rear of the rockshelter. Coarse, rock-temper (Iron Age?) and fine, high-quality (Roman) sherds---including *terra sigilata*---were recovered from these section collapse sediments. The intact deposits exposed in J-L/20-21 (which corresponded to the base of Léotard's 1990 excavation) were at different depths and seemed to correlate to a variety of strata from 11 to 16 according to the L20-21 section and measurements we made from Léotard's site datum.

These Neolithic levels at the rear of the rockshelter (L-I/19-21 area) were dug by spits within natural layers and by quarter square meter units, without piece-plotting, except that burials and other possible structures and major finds (e.g., broken ceramic vessels, significant human remains) were mapped. All Stratum 11-18 sediments were screened through 5 mm mesh only. Stratum 11 is the dark gray, ash- and charcoal-rich fill either of a pit or of a natural depression in the axis of the rear of the shelter. Stratum 12 is a light brown, éboulis-rich deposit with abundant ash in the axis of the center of the shelter between lateral talus cones. At its base were several large blocks.

Underlying Stratum 14 in K19 yielded a slab-covered pit adjacent to the shelter wall with juvenile human bones together with thick, rock temper sherds and a large black flint flake, all of which were found eroding out of the J-K/19 section. There was also a small black charcoal- and ash-filled pit in Stratum 14 in the J-K/20 section (Fig. 6). The same level yielded more juvenile human remains (vertebrae, ribs, etc.) in L20a. There was a cemented ash lens and reddish (burnt) earth at the top of Stratum 14. Large fish bones and sherds (thick,

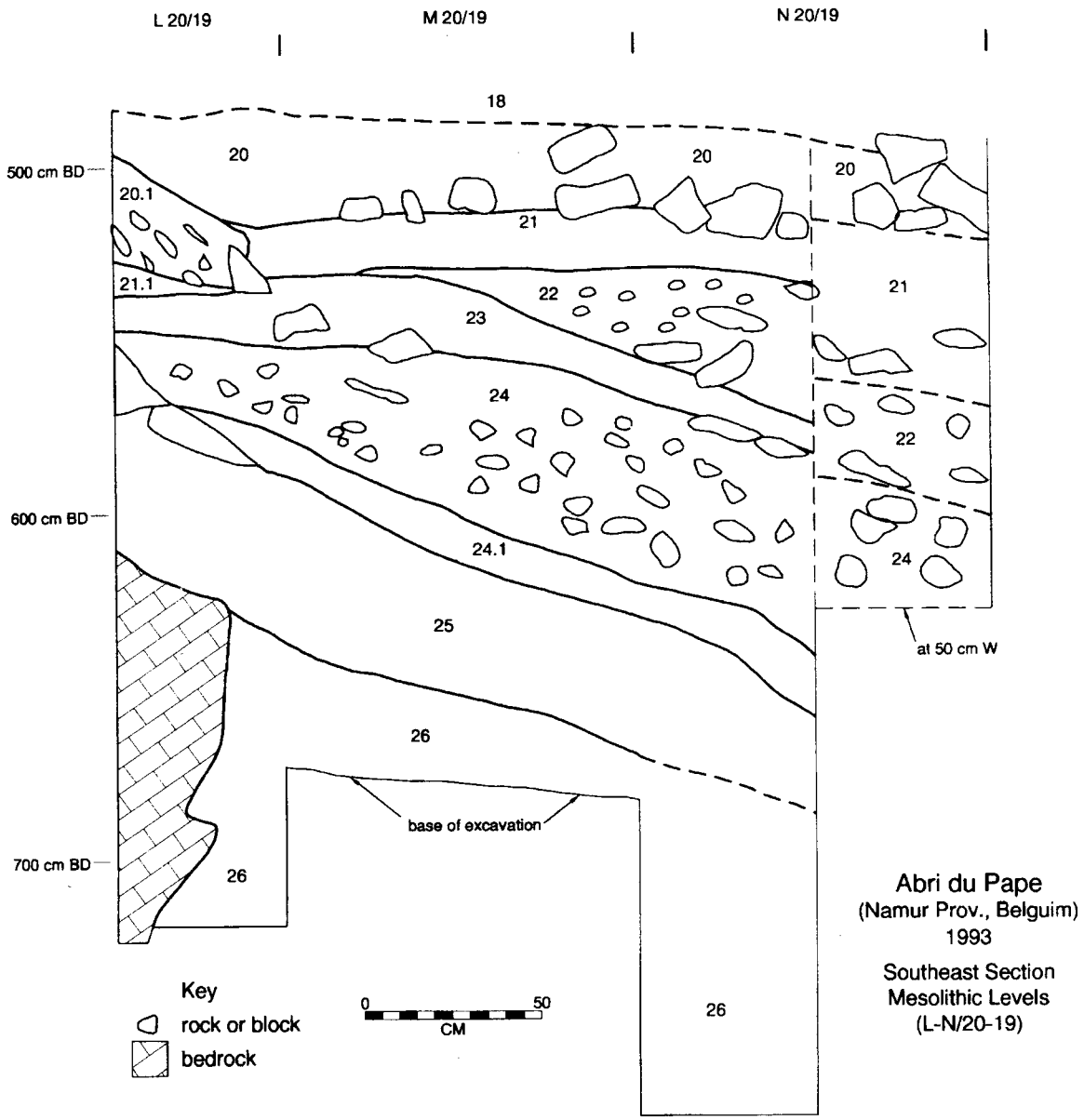

Figure 5. L-N/20-19 section, showing Mesolithic and pre-Mesolithic levels only.

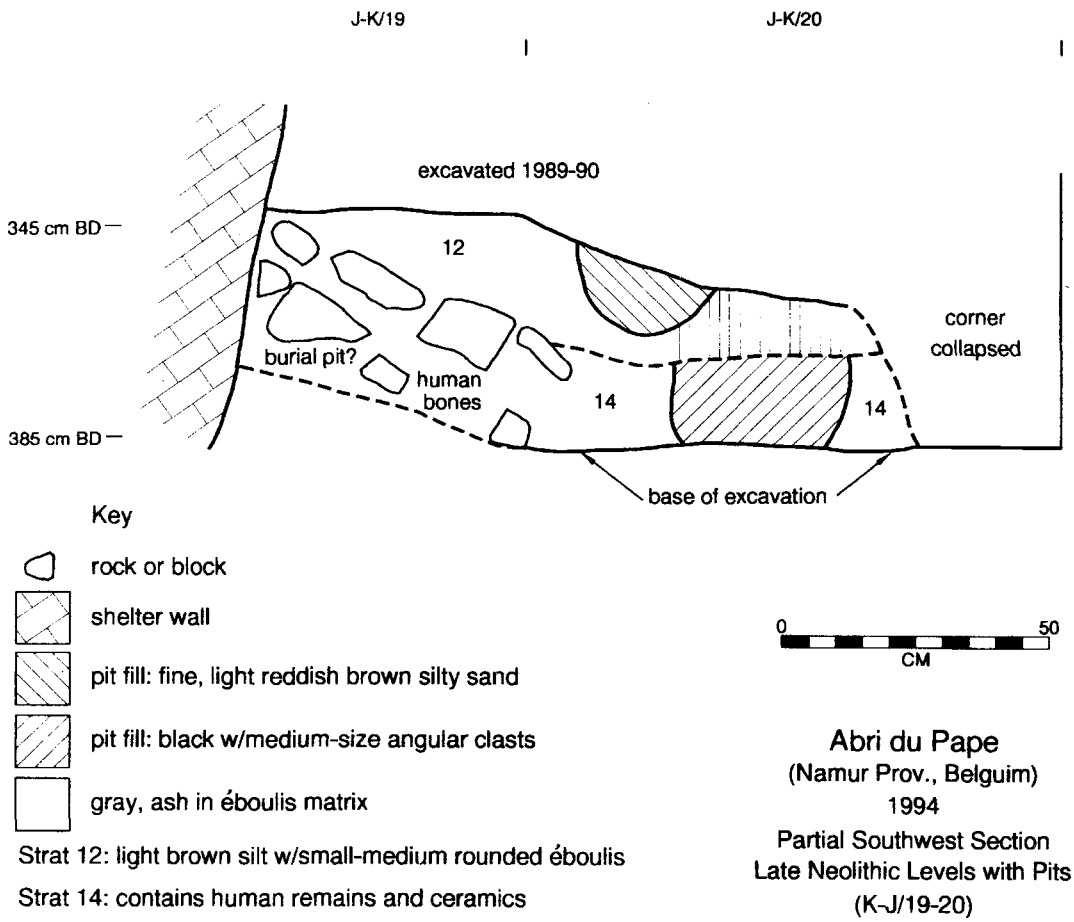

Figure 6. K-J/19-20 section, showing Neolithic pits and burial.

Stratum	12.0		18.0		20.0		21.0		22.0		22.1		22.2		23.0	
Tool type	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
1: simple endscraper			1	10.00	1	3.23										
2: atypical endscraper					1	3.23										
5: endscraper on retouched flake/blade			2	20.00												
8: endscraper on flake			1	10.00	1	3.23										
12: atypical carinated endscraper					2	6.45										
13: thick nosed endscraper					1	3.23										
15: core endscraper					1	3.23										
24: bec					1	3.23										
30: angle on break burin	1	50.00			1	3.23										
60: straight truncated piece													1	50.00		
61: oblique truncated piece			1	10.00					1	12.50						
62: concave truncated piece					1	3.23										
65: piece with continuous retouch – one edge	1	50.00	1	10.00	5	16.13	2	40.00	3	37.50			1	50.00	1	100
66: piece with continuous retouch – two edges					3	9.68			1	12.50						
74: notch					6	19.35	1	20.00								
75: denticulate			1	10.00	2	6.45	1	20.00								
76: splintered piece			1	10.00												
77: sidescraper					1	3.23	1	20.00								
79: triangle									2	25.00						
89: notched bladelet					4	12.90			1	12.50						
92: other*			2	20.00							1	100				
TOTAL:	**2**	**100**	**10**	**100**	**31**	**100**	**5**	**100**	**8**	**100**	**1**	**100**	**2**	**100**	**1**	**100**

* Michelsberg point in Stratum 18, Tardenoisian point in Stratum 22.1.

Table 1. Frequencies and percentages of formal tool types (de Sonneville-Bordes and Perrot typology) for Neolithic and Mesolithic strata of l'Abri du Pape.

friable, red, quartz temper) were abundant in Stratum 14. Human remains were scattered throughout both it and Stratum 12---the result of disturbance of the many burials that made these levels a real ossuary in the back of the rockshelter. Next to the shelter wall, in an area of open-work, loose scree deposit, J-K19 yielded the remnants of another juvenile human burial, including a humeral diaphysis, a parietal and an incisor. The lower pit fill in J-K19 was labeled Level 14.1. It contained very dark gray silt and éboulis, with human remains that included a deciduous canine, an incisor and a molar. Further down we recovered more teeth, maxillary fragments, a humeral epiphysis and another shaft fragment, phalanges and a temporal fragment. One of the maxillary fragments has three unerupted permanent molars. Sherds seem to have been more abundant around this child burial that in the surrounding fill and there were also large fish, ovicaprid, snake, small mammal remains and an unerupted boar/pig tooth. It became clear that the J-K/19 burial had been made atop large, squarish blocks and that it had been covered with rocks that had later been seriously disturbed (in Stratum 12 times). Another pit fill in K20 was labeled Level 14.2.

Below Stratum 14 is another rubified layer: Stratum 15 (reddish brown, baked clay, grading to beige color away from the center of burning in L20). The Stratum 14 pits were cut into Stratum 15. Little of 10 cm-thin Stratum 16 existed in the area we excavated. It lay atop a more massive ashy horizon, subdivided into a series of lenses of rock, ash and charcoal: Stratum 18. A localized wedge of gravel and angular éboulis without ash in L20b probably corresponds to Léotard's Stratum 17---virtually archeologically sterile. A radiocarbon date of 4190+/-60 BP (uncal.), obtained on human bones from a collective burial of at least six people by Léotard (1989), apparently pertains to the Strata 14-16 span of deposits. Strata 11-16 at the rear of the rockshelter yielded a grand total of only 147 sherds (mainly in Stratum 14); most are thick (8-12 mm) and quartz tempered, often with a red exterior and black interior. A few have incised lines. There is one possible tripod leg fragment from Stratum 11/12 in K19.

The Lower Neolithic Deposit and Assemblages

Stratum 18 yielded both unburnt and calcined human and faunal bones, a few burnt hazelnut shells, many sherds and lithics (Tables 1 and 2). The latter include 2 Michelsberg points (arrowheads), 4 endscrapers (all items---points and endscrapers--- very comparable with pieces illustrated by Toussaint and Becker [1992, Fig. 4] for the Michelsberg burial site of Heid Cave near Liège), a truncated piece, a continuously retouched piece, a denticulate and a splintered piece, plus 25 items of piece-plotted debitage (divided equally between flakes and blades) and 106 other non-piece-plotted items of debitage (debitage total=131, mainly flakes, blades and bladelets) (Fig. 7). Microdebitage (trimming flakes and shatter) make up 18.3%, larger flakes 35.1%, blades 26.0%, bladelets 16.0%. The lithics (the only significant assemblage from any of the Neolithic levels we dug at Pape) are on excellent-quality flint, possibly from the Upper Cretaceous sources in the Spiennes area of the Mons Basin to the West. There are no cores and only 6 chunks (4.6%). Items with any cortex are very rare (11.4% of total debitage). There are no crested blades or platform renewal flakes.

Sherds are abundant in Stratum 18 and include a dense concentration of 53 sherds, mainly in J19 (but also in part of K19). They lay under a cluster of juvenile human bones and teeth and include straight-shaped rim and base pieces, 21 of which refit. All are remnants of a

	12.0	14.0	14.1	15.0	17.0	18.0	
Debris type	**n**	**n**	**n**	**n**	**n**	**n**	**%**
1: non-cortical trimming flake						11	8.4
22: cortical trimming flake							
2: non-cortical shatter						13	9.9
23: cortical shatter							
3: plain flake	1	3	1			40	30.5
4: primary decortication flake				1			
5: secondary decortication flake						6	4.6
6: plain whole/proximal blade		2				15	11.5
24: broken plain blade	1					12	9.2
7: primary whole/proximal decortication blade						3	2.3
8: secondary whole/proximal decortication blade						2	1.5
27: medial/distal cortical blade						2	1.5
9: plain whole/proximal bladelet						10	7.6
25: broken plain bladelet					4	9	6.9
28: medial/distal cortical bladelet							
29: whole/proximal cortical bladelet						2	1.5
11: unidirectional crested blade							
20: platform renewal flake							
14: prismatic blade core							
17: pyramidal bladelet core							
18: mixed core							
19: non-cortical chunk	3					6	4.6
26: cortical chunk	1		1				
TOTAL	**6**	**3**	**4**	**1**	**4**	**131**	**100**

Table 2. Frequencies and percentages of unretouched lithic debris types for Neolithic strata of l'Abri du Pape.

single large, broken, globular pot of dark gray/brown exterior and black interior color, with coarse rock and vegetal temper, and wall thickness ranging from 7-9 mm. Based on refitting by A. Martinez, this vessel is estimated to have had a rim diameter of about 17 cm and a maximum body diameter of about 24 cm. There is one possible handle fragment. Other ceramics in Stratum 18 are thick, rock-tempered and bi-color (black interior and red exterior). They tend to be concentrated at the top of this thick deposit. Along with the relatively coarse sherds, there are some finer, harder-fired, internally and externally burnished red ones---possibly all from one vessel. Stratum 18 yielded the overwhelming majority of the ceramic sherds found in 1994: some 298 sherds (plus a ceramic ball). At least one sherd each is incised or impressed.

Some juvenile human bones and teeth may have derived from the Level 14.1 burial, as the distinction between that feature and Stratum 18 fill is often far from clear. There seems to be an archeologically nearly sterile zone in the basal spits of Stratum 18 (dark, wet, clayey sediments), although calcined animal (and possibly human) bones continued to be found. Among the animal remains are a few of a badger-size animal. A few small bladelets from this lower zone may have been brought up from the underlying Mesolithic Stratum 20.

The sedimentary break between Strata 18 and 20 is abrupt in the rear of the rockshelter. Stratum 20 is light brown-beige sandy silt with fine gravels and éboulis. Based on the fact that Stratum 18 contains Michelsberg (Middle Neolithic) cultural material, that dates elsewhere in Belgium between approximately 5400-4600 BP (uncal.) (Toussaint and Becker 1992), and Stratum 20 is an 8000 BP (uncal.) Mesolithic level, there was a considerable depositional hiatus between the two stratigraphic units. However, pits dug from Stratum 18 cut deeply into Stratum 20 and even as far as Stratum 22, especially in square K20. Their fill included sherds that had to be separated out from the Mesolithic materials of the surrounding fill. The limits of these intrusive pits were sometimes difficult to establish with complete certainty, given the gravelly nature of the sedimentary matrix.

Mesolithic Levels at the Outer Edge of the Site Area

In 1994 we also excavated Stratum 18 at the edge of the talus break-in-slope in squares O20-21 (Fig. 8). Here, however, this +/- 1 m-thick, beige-brown deposit of densely packed silt with fine gravel and angular éboulis is archeologically virtually sterile. Here too it lies atop Stratum 20, which is locally relatively rich in lithics, especially in O21. Stratum 20 here is a gravelly silt that is light gray in color (no doubt due to dispersed ash). At this distance from the rear of the rockshelter especially the lower strata plunge steeply down toward the riverbank, making this more likely a dumping or erosion zone than a living area. The only other levels that could be distinguished in O20-21 were Stratum 21 (beige gravelly sand with abundant large blocks) and Stratum 22 (dark gray, organic gravelly sand). Again the gray color is probably due to washed-out ash (and there are charcoal flecks and some calcined animal bones in Stratum 22, as in 20). Stratum 22 seems to have been eroded by gullying (except where protected by a natural "retaining wall" of blocks in square O20. The "gully" was infilled with nearly sterile Stratum 21 sediments. In contrast to the areas closer to the cliff, there were no definable lenses in O20-21. The principal cultural horizons seem to have been 20 and 22. Stratum 20 is particularly rich in lithics in the O row, and also yielded

relatively many faunal remains, including a boar maxilla, for example. Here however we were clearly on the outer margin of the main inhabited area for the earlier occupations (21 and 22). Excavation was stopped at contact with archeologically almost sterile Stratum 23 (light beige/gray gravel).

Mesolithic Levels at the Rear of the Rockshelter

In the main area of Mesolithic excavation in 1994 (L-I/19-21), all sediments were water-screened through 3 mm mesh (after rigging pulley systems to haul buckets first to the platform at the top of the talus at the cliff base for dry screening through 5 mm mesh, and then to lower buckets of residue down a cable to the riverbank). Columnar samples of sediment from the section of square M20 (unscreened on-site) were transported to Namur by boat and truck for water-screening through 1 mm mesh to permit recovery of malacofauna, rodent, fish and small bird remains, wood charcoal, seeds and nuts by Lacroix. Systematic columnar sampling for pollen analysis was done by Cl. Noirel-Schutz, but after processing, all samples were found to be sterile or nearly so.

The Mesolithic stratigraphy in the rear of the rockshelter (L-I rows) included the following units:

Stratum 20: light gray-brown, ashy level with a gravelly matrix; rich in lithic artifacts, plus some faunal remains.

Lens 20.1: loose, light beige, coarse éboulis with some cultural remains.

Stratum 21: thin (5-8 cm.), less gravelly, light brown, with large rocks at top; culturally nearly sterile.

Stratum 22: light gray-beige, clayey gravel with ashy patches; archeologically fertile.

Lens 22.1: gray, less stony lens.

Lens 22.2: compact silt, medium brownish gray, with fewer small éboulis, but more large blocks; archeologically rich (cluster of large, burnt lithic artifacts including a truncated blade, an exhausted core, chunks, etc. in J21-19), with abundant charcoal flecks. The cluster of lithics in the crevice at the rear of the rockshelter gave the appearance of a possible "cache".

Level 23: yellowish-brown, clayey silt with gravels, ubiquitous throughout the excavated area, from the O to the I row. Much purer clay at the rear of the rockshelter, where, in the crevice in J-I/19 it is like a "cave clay". Archeologically sterile except for a few "straggler" flints that may have moved down into the top of Stratum 23 from overlying Stratum 22 and its lenses.

Bedrock was exposed under Stratum 23 in the I and J rows and in K21 and northern part of K20, all at the rear of the rockshelter, where Strata 24-26 are absent. There is obviously a bedrock ledge in the L row, in front of which the old cliff-face drops off more or less vertically and against which Strata 24-26 are banked.

RADIOCARBON DATES

One conventional radiocarbon date had been run by E. Gilot of the Louvain laboratory on human bones from Léotard's excavation of the late Neolithic (probably Stratum 14). We had two other conventional dates done on charcoal from the top and base of Stratum 18. And we had 4 AMS (accelerator mass spectrometry) determinations run on charcoal samples from Strata 20, 21, 22 and 22.1. All our dates were done by H. Krueger of Geochron Laboratories in Cambridge, Massachusetts. All the Pape dates are listed in Table 3.

Table 3. Abri du Pape radiocarbon dates.

Stratum	Spit	Square	Date (BP)	Lab No.	Method	Calibrated Age (BC)+	Attribution
14(?)			4190 ± 60	LV-1747	Conv.	2888-2603	Late Neolithic
18 top	25-26	K19	3490 ± 340	GX-20205	AMS	2275-1410	Mid Neolithic*
18 base	13-14	K19	4450 ± 360	GX-20206	AMS	3637-2579	Mid Neolithic
20 upper	2	M21	7843 ± 85	GX-19365	AMS	6757-6509	Mid Mesolithic
21 base	6	L21	8817 ± 85	GX-19366	AMS	7968-7703	Early Mesolithic
22 mid	7	M20	8780 ± 85	GX-19367	AMS	7947-7645	Early Mesolithic
22.1 top	10	M21	8756 ± 83	GX-19368	AMS	7933-7602	Early Mesolithic

+ Radiocarbon Calibration Program Rev.3.0.3, Stuiver and Reimer 1993 (1 sigma range).
* Date on bulked charcoal fragments from Stratum 18 top probably contaminated and made to seem more recent by charcoal from hearths in overlying levels.

The Louvain date for the Stratum 14 range corresponds to a Seine-Oise-Marne (SOM) Late Neolithic age, while the older Geochron date for Stratum 18 corresponds to a Michelsberg Middle Neolithic age (Otte and Toussaint 1988; Toussaint and Becker 1992). Stratum 18 yielded two typical (large) Michelsberg arrowheads during the 1994 excavation. It is apparent that there is a c. 3400 year hiatus between the latest Mesolithic (Stratum 20) and the earliest Neolithic (Stratum 18---Stratum 19 being absent at least in the area we excavated in 1994 and in Léotard's master L20-21 section). L'Abri du Pape lacks precisely any levels dating to the interesting period of Mesolithic-Neolithic transition, documented elsewhere in Belgium for the period c. 6500-6000 BP (uncal.).

Stratum	20.0		22.0		22.1		22.2		23.0		24.0		25.0	
Debris type	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
1: non-cortical trimming flake	467	24.2	50	13.97	1	6.25	13	9.22	10	19.23				
22: cortical trimming flake	8	0.4	1	0.28			3	2.13						
2: non-cortical shatter	212	11.0	38	10.61	1	6.25	10	7.09	10	19.23			1	50.00
23: cortical shatter	9	0.5	12	3.35			4	2.84	1	1.92				
3: plain flake	260	13.5	81	22.63	6	37.50	44	31.21	13	25.00			1	50.00
4: primary decortication flake	15	0.8	6	1.68			3	2.13						
5: secondary decortication flake	52	2.7	18	5.03			15	10.64	1	1.92				
6: plain whole/proximal blade	84	4.4	23	6.42	2	12.50	7	4.96	2	3.85				
24: broken plain blade	52	2.7	18	5.03	2	12.50	9	6.38	2	3.85				
7: primary whole/proximal decortication blade	5	0.3					1	0.71						
8: secondary whole/proximal decortication blade	32	1.7	5	1.40										
27: medial/distal cortical blade	10	0.5												
9: plain whole/proximal bladelet	481	25.0	50	13.97	2	12.50	13	9.22						
25: broken plain bladelet	174	9.0	41	11.45	1	6.25	5	3.55	9	17.31	1	100.0		
28: medial/distal cortical bladelet	5	0.3	2	0.56					4	7.69				
29: whole/proximal cortical bladelet	11	0.6	2	0.56										
11: unidirectional crested blade			1	0.28										
20: platform renewal flake	5	0.3	1	0.28			3	2.13						
14: prismatic blade core	1	0.1					2	1.42						
17: pyramidal bladelet core	2	0.1	1	0.28										
18: mixed core	1	0.1	4	1.12	1	6.25	4	2.84						
19: non-cortical chunk	28	1.5	4	1.12			5	3.55						
26: cortical chunk	13	0.7												
TOTAL:	**1927**	**100**	**358**	**100**	**16**	**100**	**141**	**100**	**52**	**100**	**1**	**100**	**2**	**100**

Table 4. Frequencies and percentages of unretouched lithic debris types for Mesolithic strata at l'Abri du Pape.

The three early Mesolithic dates (although their average values are in stratigraphically reversed order) are statistically indistinguishable at 8800 BP. This fact clearly suggests that Strata 22.1, 22 and 21 were formed very quickly and that there is a c. 1000 year hiatus between Strata 21 and 20. Given small artifact sample sizes and the great likelihood of inter-strata "migration" of especially small objects, we can ultimately lump the assemblages from the lower Mesolithic levels and compare them with the assemblage from Stratum 20. The existence of major hiati in the Pape stratigraphy (and the suspicion of gullying) suggests that deposits may have been eliminated by episodes of intensive runoff *erosion*, perhaps exacerbated by local deforestation. It is hard to imagine periods without fairly continuous *deposition*, since spall is continuously falling from the Freyr Cliff (a fact which would preclude safe excavation at Pape were it not for the---puncture-riddled---plexiglass roof over the trench).

DESCRIPTION OF THE MESOLITHIC CULTURAL REMAINS FROM STRATA 20-23

What follows is a review of the combined Mesolithic artifactual finds (Figs. 9-13) from the 1993 and 1994 seasons plus finds made by Léotard in 1989-90 and Lacroix in 1992 (but not including items found by Lacroix in his initial exploratory test pit in 1988, since they cannot be placed in the levels defined later by Léotard and ourselves). Most of the pre-1993 finds are from Stratum 20. Detailed comparisons among the late and early Mesolithic strata (i.e., Stratum 20 versus Strata 21-22 combined) are presented elsewhere in this volume by Orphal and Straus (see also Tables 2 and 4).

In all, we excavated about 1.95 cubic meters of Stratum 20, 1.84 cubic meters of Stratum 21, 1.66 cubic meters of Stratum 22, 0.79 cubic meters of Stratum 23 and 0.34 cubic meters of Stratum 24. Since we also classified materials from Lacroix's second sondage (corresponding to about one half each of squares M-N20), the total volumes for strata 20, 21 and 22 to which the respective assemblages correspond, in reality equal or slightly exceed 2 cubic meters in each case. The volumes of the lenses (22.1, 22.2) are far smaller---only fractions of the volumes of the principal strata.

Stratum 20:

By far the richest level, Stratum 20 yielded a total of 1958 chipped stone artifacts: 31 retouched tools and 1927 debris (cores + debitage). The 62 to 1 ratio of debris to tools is extraordinarily high and testifies to the rarity of formal tools in this assemblage. There are no microliths (geometric or otherwise), no microburins, no backed blades, no arrowheads. Fully 22.% of the tools are endscrapers of a variety of types (including both thin ones made on flakes/blades and thick ones made on cores/chunks). There is also a sidescraper. Pieces with continuous retouch and denticulated/notched pieces each make up 25.8% of the tool assemblage (and there are 4 notched bladelets, which would bring the total denticulate/notch index to 38.7%. An atypical perforator (bec) and a simple burin on break round out this rather banal assemblage. There seems to have been little investment in formal tools and none in

lithic weapon tips in Stratum 20 times at Pape. The emphasis on scraper and denticulate edges might be suggestive of carcass/hide processing and the working of wood or other vegetal products. Over half the tools are made on flakes, the rest being on small blades or bladelets (here defined as being < 2 cm in length).

The Stratum 20 debris include 4 small cores, all with laminar removals. There are also 41 chunks, two-thirds of which are non-cortical. Further evidence of *in situ* blank production is the presence of 5 platform renewal flakes. There are also tips of two antler tines (roe deer?) that seem to have been used as retouchers or punches which broke in use. Cortical materials are, in general, not abundant. While in total there are 696 items of micro-debitage (trimming flakes/chips and shatter, all < 1 cm in length), only 17 of these have any cortex. Yet 20.5% of the larger flakes are at least partly cortical; 25.7% of the blades are cortical, but only 2.3% of the bladelets---a percentage identical to that of cortical micro-debitage (2.4% of total chips + shatter). This difference between large and small debitage in terms of the representation of cortex might be the result of the transport of large flakes and blades to the site from knapping locations (some quite distant in the case of chalk flint, which is not local) and the knapping of already decorticated cores at Pape that had earlier also been transported to this site from source locations. Such tertiary knapping would produce non-cortical micro-debitage and bladelets. Of note is the abundance of small blades and especially bladelets (the latter far outnumbering large flakes). This is curious given the scarcity of tools and the absence of armatures made on bladelet blanks. For some reason, small laminar products were being brought to and made at Pape (from cores that, finally exhausted, were abandoned at the site), but either few were being converted into implements or weapon elements or those that were so converted were taken from and not returned to be finally lost or abandoned at Pape in Stratum 20 times some 8000 years ago.

Thirty-one lithic artifacts from the original 1988 sondage (centered on square K20) could be fairly reasonably assigned to Stratum 20 in consultation with Ph. Lacroix. Of these, only 4 items are tools: 2 short blades continuously retouched on one edge, a sidescraper on a blade and an endscraper on a flake. There are 17 unretouched blades of various types (mostly small [3-2 cm long] and non-cortical), 5 bladelets and 5 flakes. All these lithics are made of good-quality, non-local chalk flint (our types 10-11-12). The emphasis on scraper edges in this small collection is congruent with the character of the tools found in Stratum 20 in 1993-94.

Stratum 21:

At first thought to be sterile, Stratum 21 finally did produce 244 knapped lithic artifacts, all but 5 of which are debris. There is stratigraphic separation between Strata 20 and 21 in terms of vertical artifact distribution. The retouched pieces are one sidescraper, denticulate and notch each, plus 2 continuously retouched pieces. There is nothing diagnostic about this tiny assemblage. Nearly half (99) of the 239 debris are micro-debitage. The next largest category is bladelets: n=66 (27.6%). The remaining items are mostly flakes (20.5%), as blades are very few (n=17---7.1%). Cortical material is virtually absent among all categories of debitage. There is only one (mixed) core and chunks are also very rare (n=7). Knapping activity seems to have been fairly slight during Stratum 21 times.

Stratum 22:

Stratum 22 yielded a tip of an antler tine "punch" just like the two found in Stratum 20. Perhaps not coincidentally, cores (n=5, one of which is a pyramidal bladelet core) are fairly abundant as in Stratum 20 and there is one platform renewal flake and one crested blade each. The total lithic assemblage numbers 366 items, of which only 8 are tools or armatures. There are 2 triangles (one whole scalene, plus one tip fragment), together with a notched bladelet, a truncated piece and 4 continuously retouched pieces. Just over 28% of the debris are micro-debitage, while just over 29% are larger flakes. Slightly under 13% are blades, but more than twice that number (27.5%) are bladelets. There are thus both similarities and differences between this debris assemblage and that of immediately overlying Stratum 21, among the latter being the lesser relative frequency of micro-debitage and higher relative frequencies of flakes and blades in Stratum 22.

A small collection of items found by Lacroix in 1988 in his sondage centered on square K20 could be reasonably equated with Stratum 22. These include 2 flakes and a small blade and 6 tools that could arguably be assigned to Stratum 22. The tools include a simple endscraper, a double endscraper, a bilaterally backed point (armature) and, all together on one plain flake blank, a thick-nosed endscraper, a continuously retouched edge and a notch. Thus there is a probable total of 3 armatures from Stratum 22 (plus one in underlying Lens 22.1). This is in contrast with Stratum 20 which has none.

Lens 22.1:

There is only one retouched item in Lens 22.1: a possible distal fragment of a Tardenois point. There is also a mixed core together with 15 items of debitage. These include 6 flakes, 4 blades, 3 bladelets and 2 items of micro-debitage.

Lens 22.2:

This lens yielded only a truncated piece and a continuously retouched piece, associated, however, with a relatively large debris assemblage: 141 items. These include 6 cores (all with some laminar removal scars), 5 chunks and 3 platform renewal flakes. Cortical material is scarce except among the larger flakes (n=62---44% of the debris assemblage), 29% of which have some cortex. The debris assemblage includes 21.3% micro-debitage and 25% bladelets, but only 7.7% blades.

Stratum 23:

These are probably items which had migrated downward from 22.2 and were found near the top of the clayey silt unit (23), which was otherwise largely sterile. There is only one tool: a continuously retouched piece. The 53 items of debris are all debitage, as there are no cores (or chunks). In keeping with this being a group of small items that probably migrated downward, nearly half (40.4%) are micro-debitage, 25% are bladelets, and the few remaining pieces are flakes and blades. Cortical items are virtually absent.

Strata 24 and 25:

There are no tools in either of these strata. Stratum 24 yielded one bladelet and Stratum 25 a piece of shatter and a plain flake. Stratum 26 was completely sterile archeologically. There is no hint of pre-Mesolithic (e.g., Magdalenian) materials in our collections from these basal levels (23-25).

All in all, the Mesolithic assemblages from Pape are microlithic in the sense that most of the objects (including the cores) are very small. Bladelets, small blades and generally small flakes (not including, of course, the abundant micro-debitage). But geometric elements and other armatures are completely absent in the most recent occupation (Stratum 20) and present but rare in the early occupation (Stratum 22/22.1). Use of the microburin technique is absent, as are backed bladelets. These are simple, unelaborate assemblages, with minimal retouching and formalization. Yet by their abundance and microlithic characteristics, the Pape Mesolithic assemblages do stand in sharp contrast to the very poor Middle Neolithic assemblages, which are, however, characterized by fairly large items.

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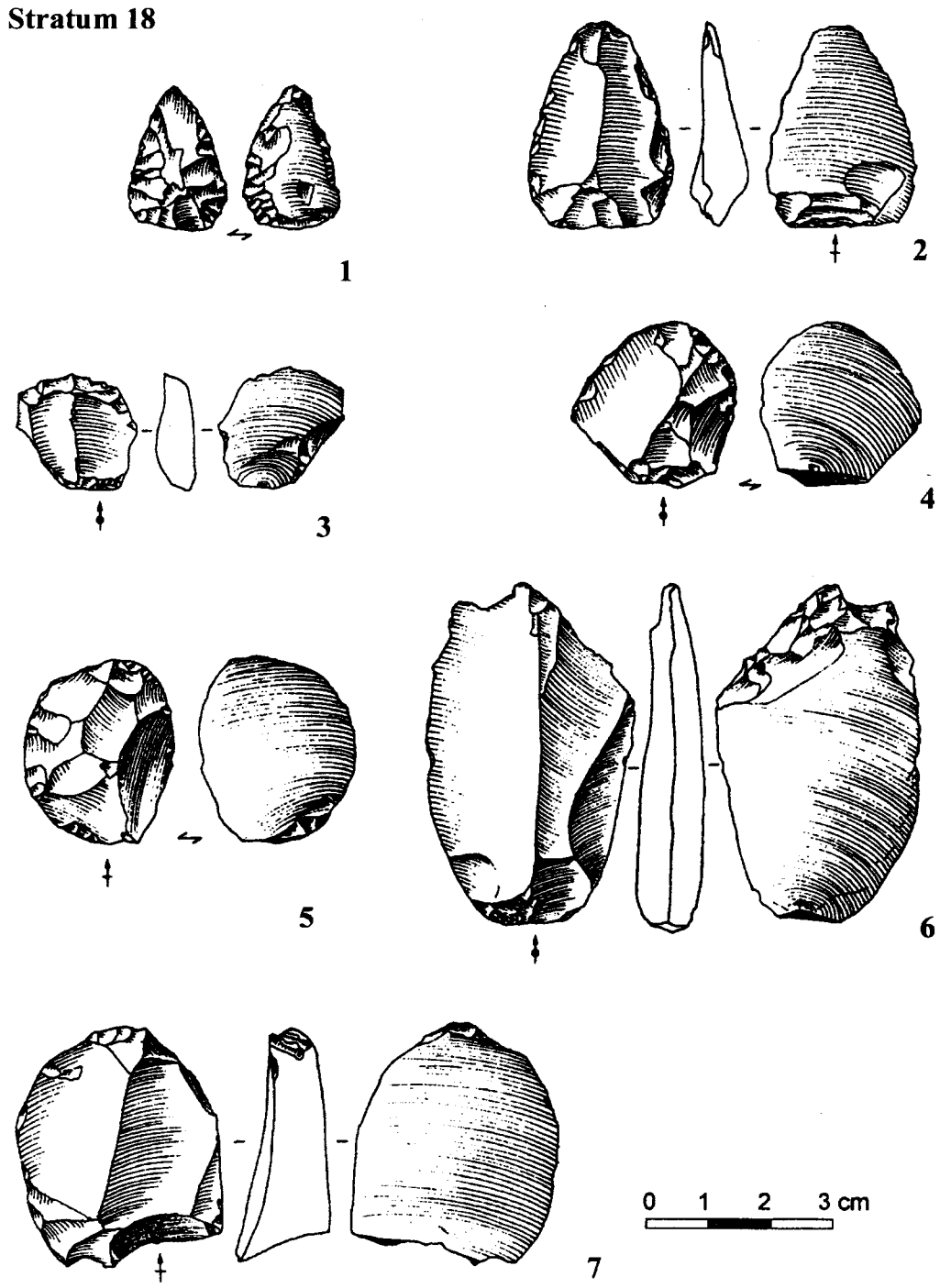

Figure 7. Abri du Pape. Stratum 18, Neolithic artifacts. 1: Michelsberg point (bifacial); 2: Michelsberg point (unifacial); 3-5, 7: endscrapers on flakes; 6: *pièce esquillée*.

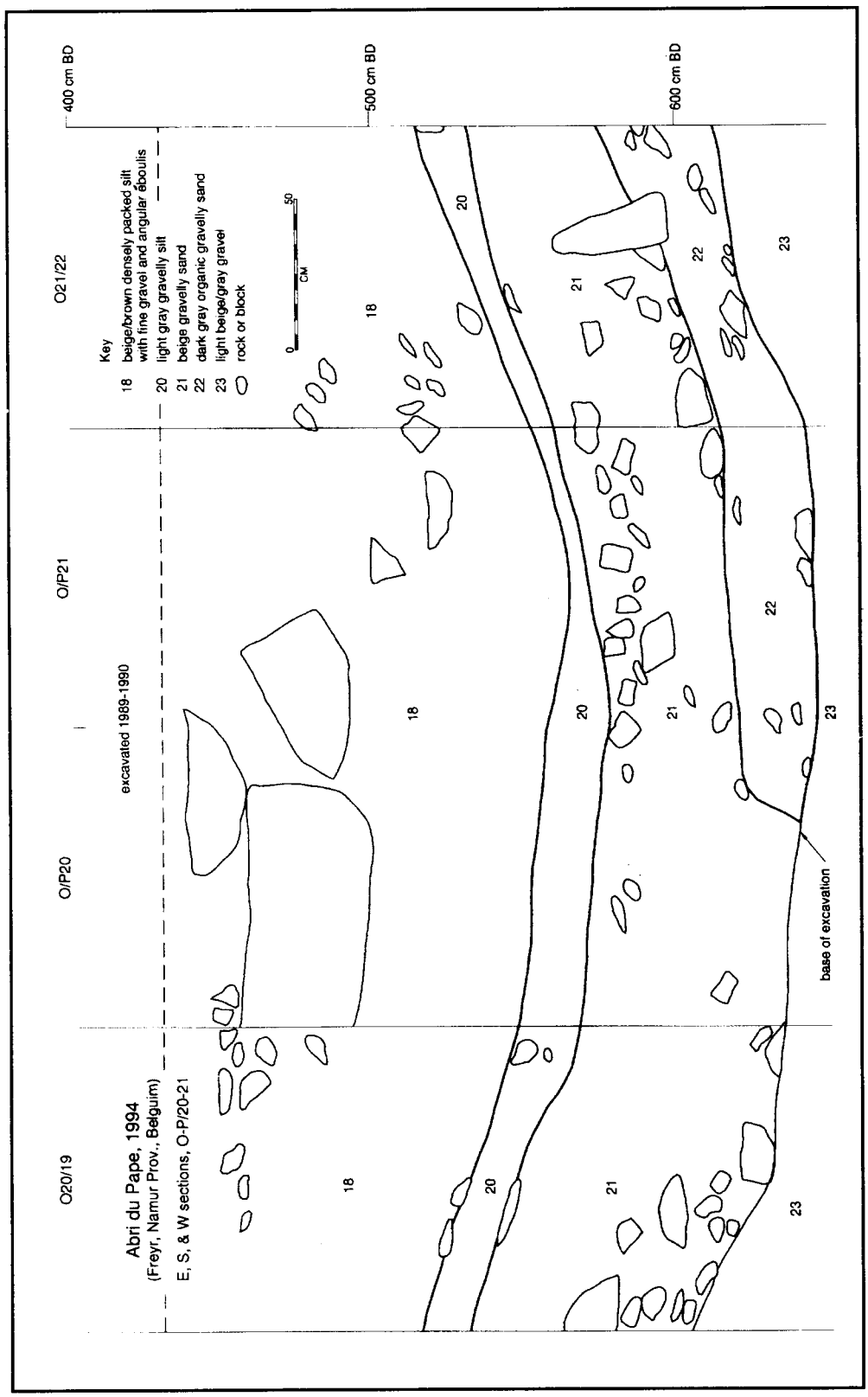

Figure 8: O/20-19, O-P/20-21, O/21-22 sections at south end of Abri du Pape trench, showing basal Neolithic and Mesolithic levels only.

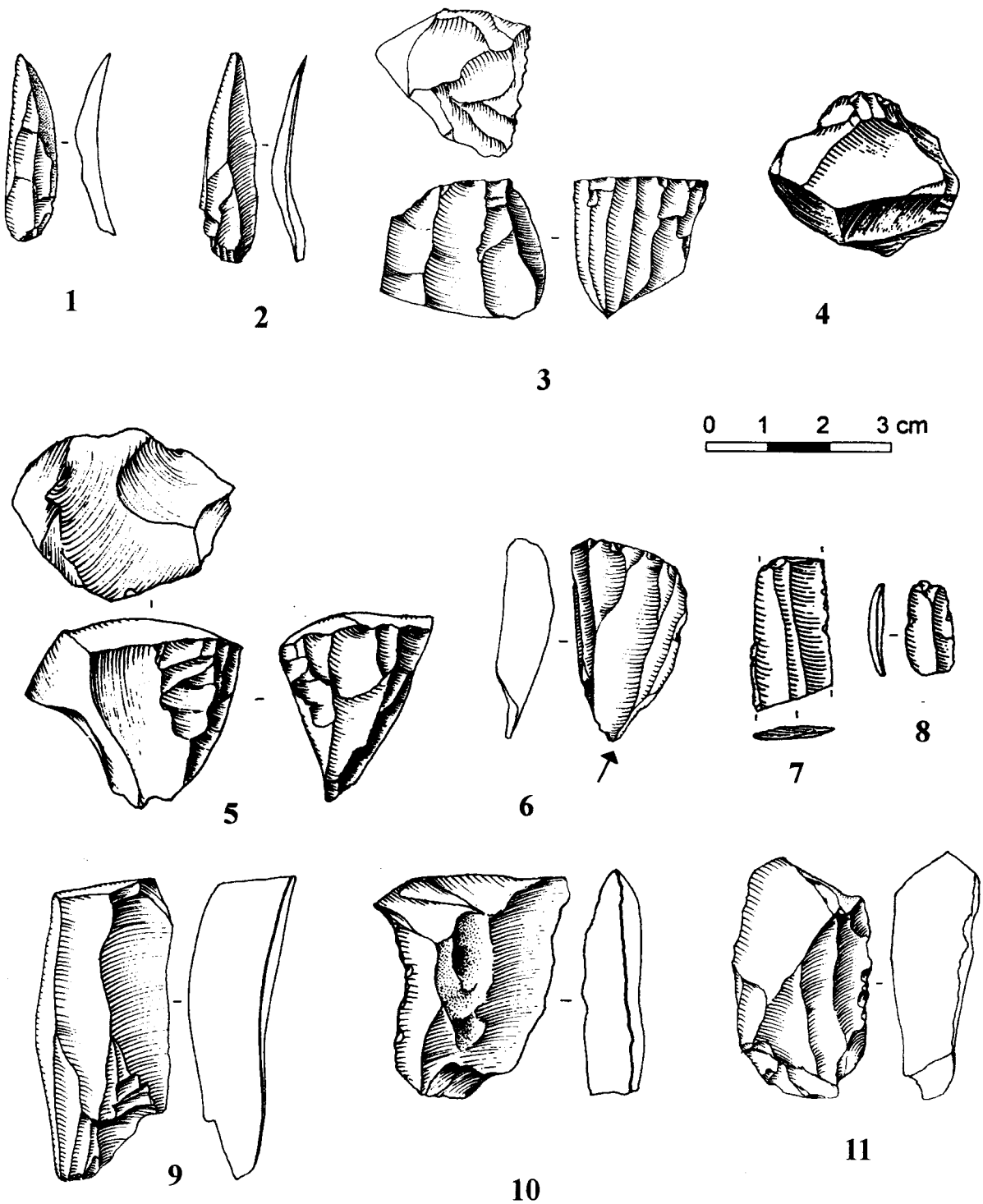

Figure 9. Abri du Pape. Stratum 20, Mesolithic artifacts. 1-2, 8: bladelets; 3: pyramidal bladelet core; 4: nosed endscraper; 5: mixed core; 6: angle burin on break (on core fragment); 7: utilized blade; 9-10: plain blades; 11: secondary decortication blade.

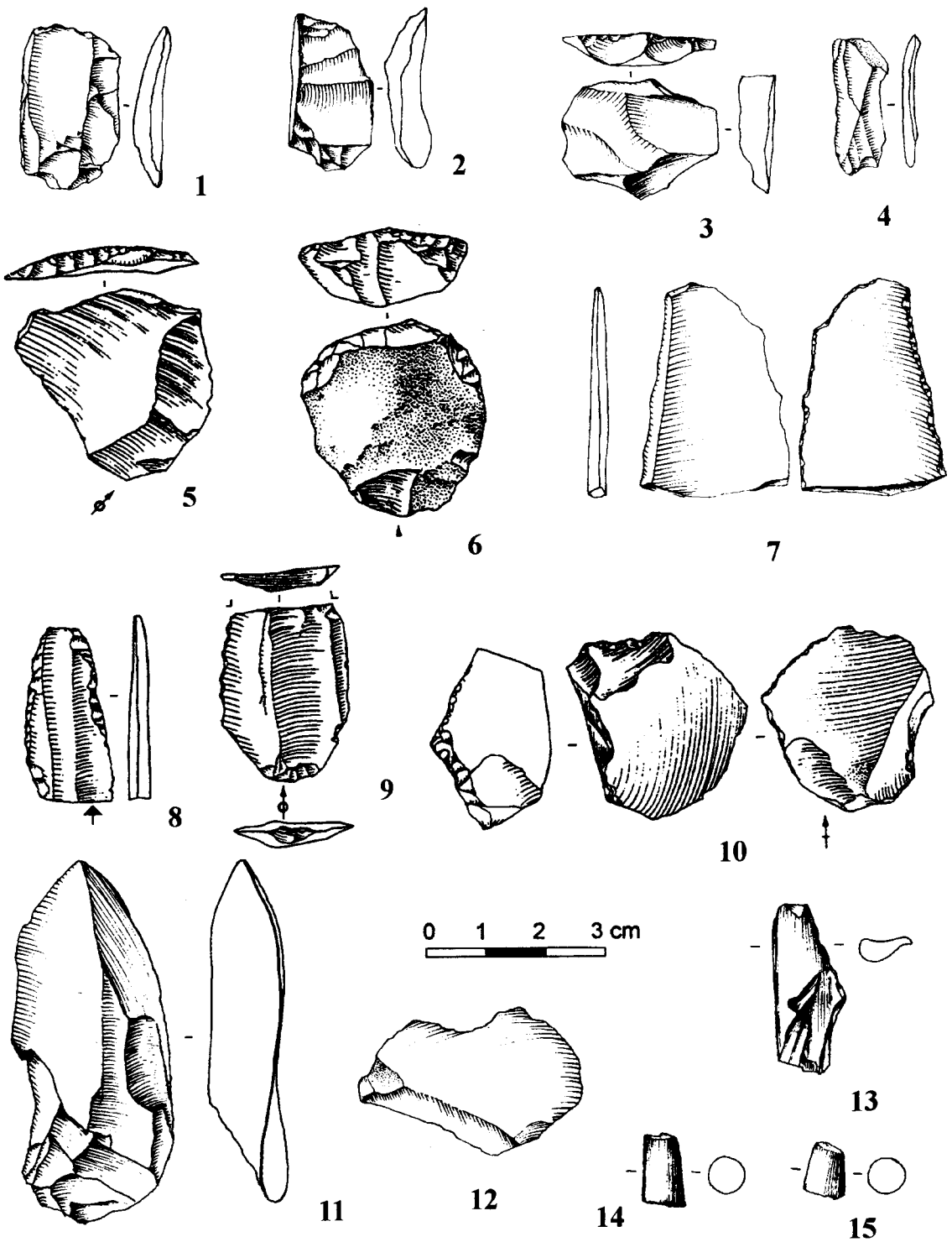

Figure 10. Abri du Pape. Stratum 20, Mesolithic artifacts. 1, 8: continuously retouched blades (two edges); 2: platform renewal flake; 3: atypical endscraper; 4: notched bladelet; 5-6: endscrapers on flakes; 7: notched and retouched flake; 9: continuously retouched blade (one edge); 10: slightly retouched broken blade; 11: plain blade; 12: notch; 13: cut and burnt bone; 14-15: antler retouchers.

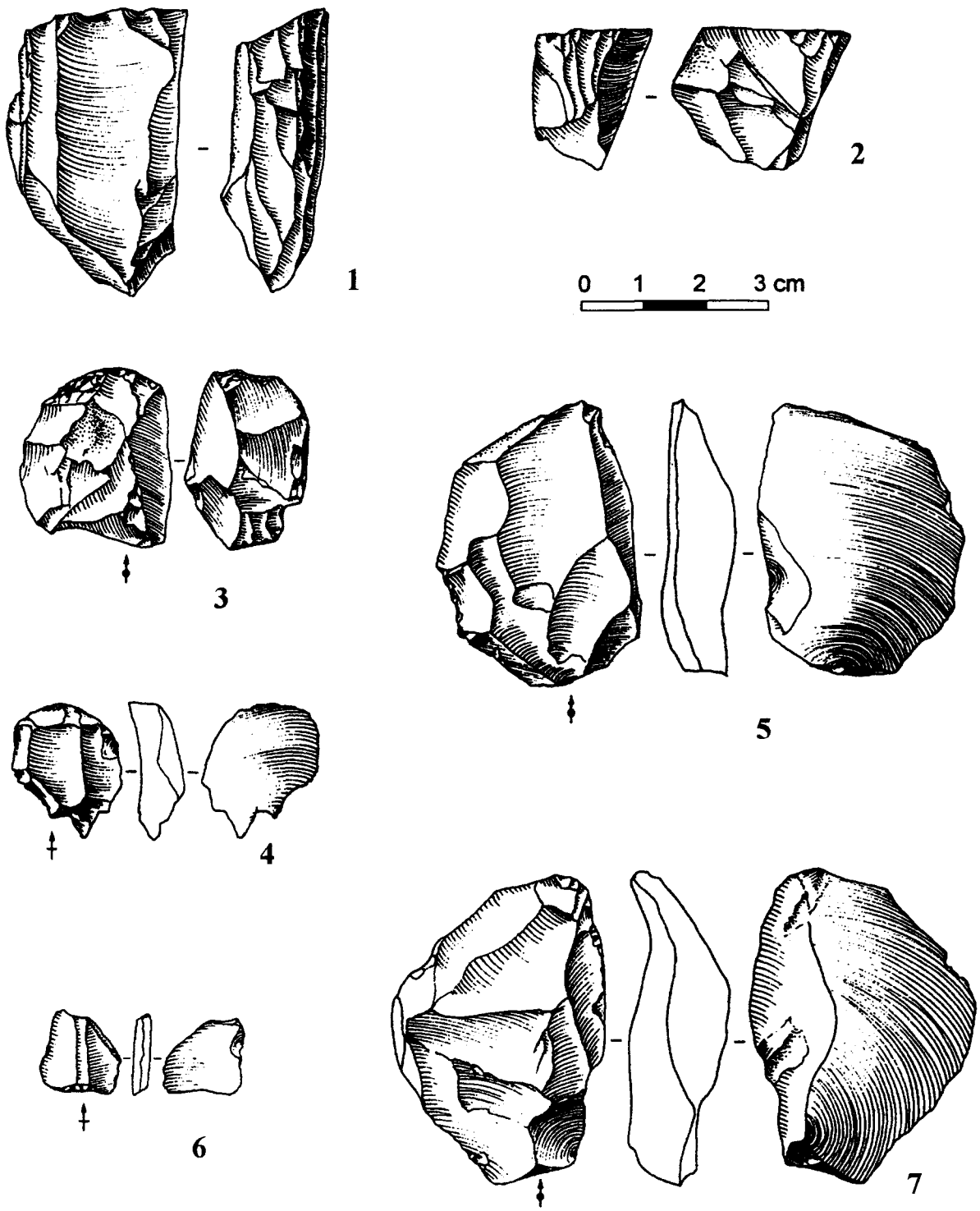

Figure 11. Abri du Pape. Stratum 20, Mesolithic artifacts. 1-2: cores; 3-4: endscrapers on flakes; 5: sidescraper; 6: armature fragment (trapeze?); 7: notch.

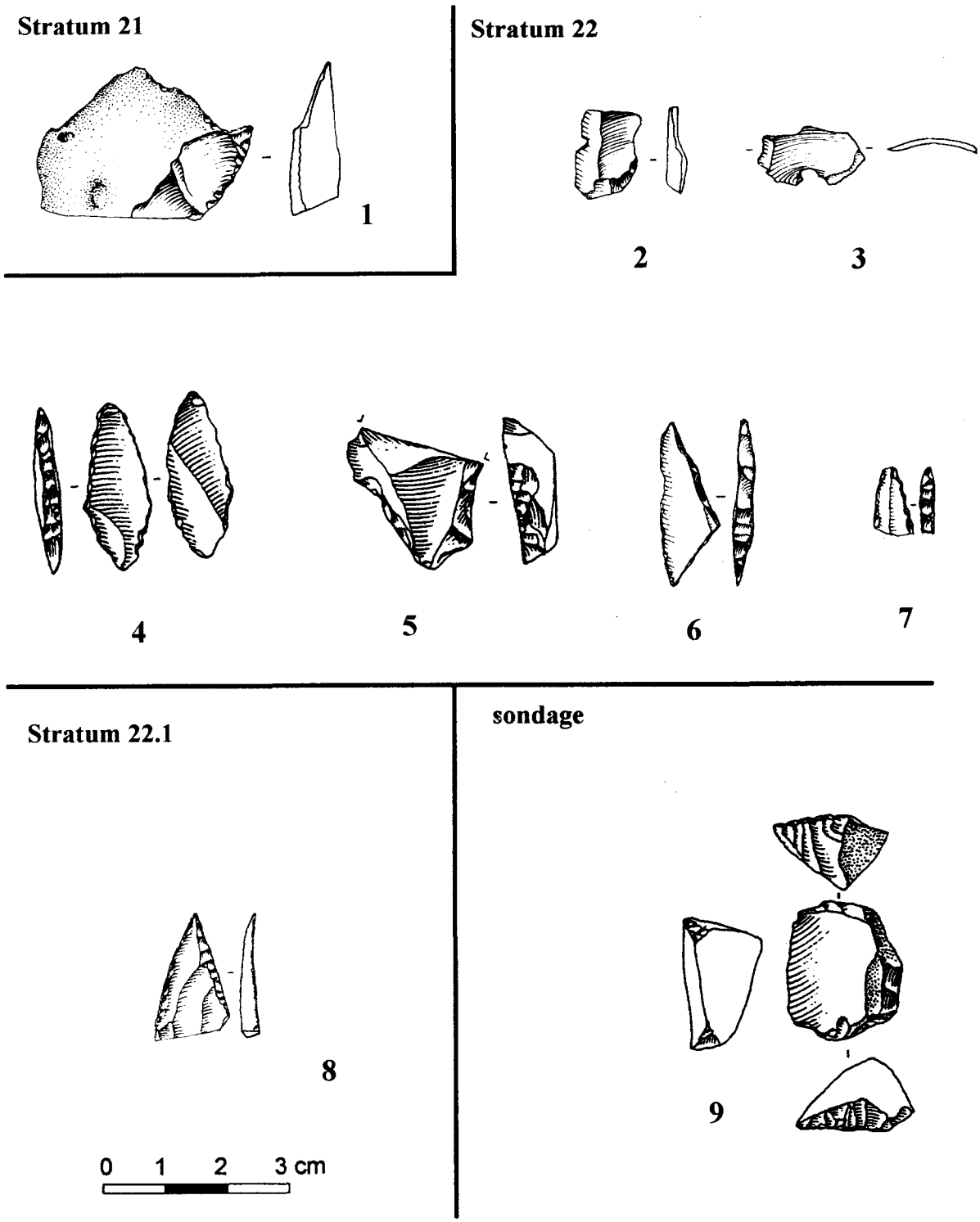

Figure 12. Abri du Pape. Strata 21, 22, 22.1 and sondage, Mesolithic artifacts. 1: perforator and continuously retouched piece (one edge); 2-3: bladelets; 4: doubly backed armature; 5: notch and backed piece; 6: scalene triangle; 7: triangle fragment; 8: Tardenois point fragment; 9: double endscraper.

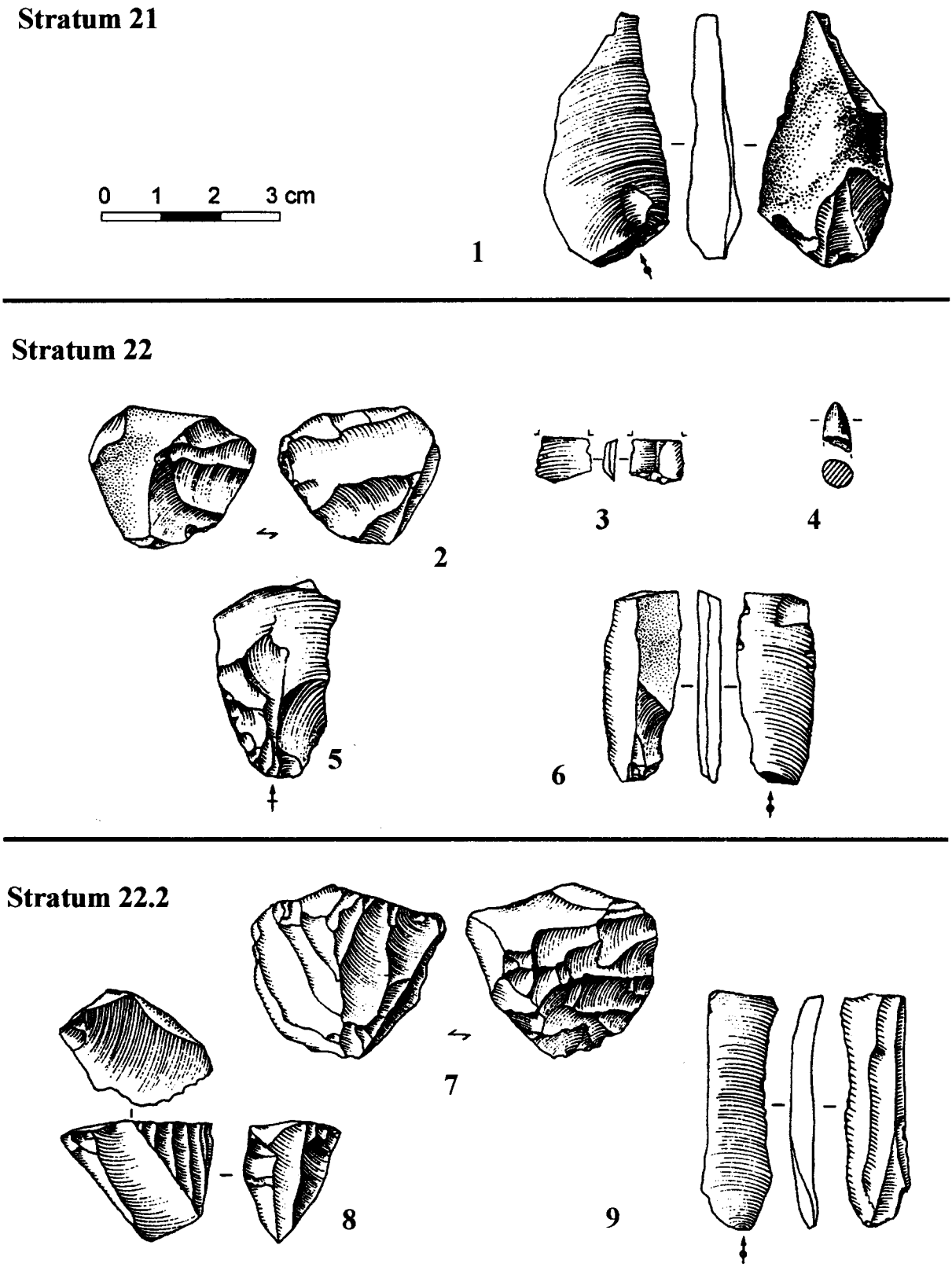

Figure 13. Abri du Pape. Strata 21, 22, 22.2, Mesolithic artifacts. 1: retouched blade; 2, 7, 8: cores; 3: armature fragment; 4: retoucher tip; 5: retouched flake; 6: utilized blade; 9: blade.

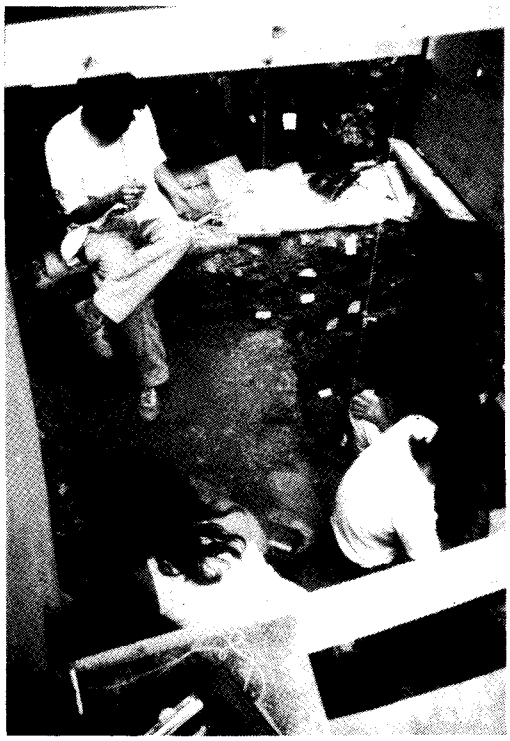

Plate 1. Excavation in l'Abri du Pape, 1993. (Photo: L.G. Straus)

Plate 2. Excavation in l'Abri du Pape, 1993. (Photo: L.G. Straus)

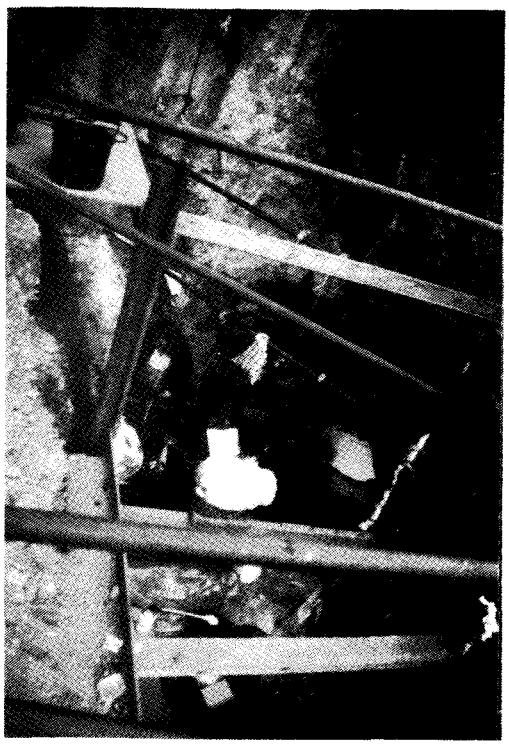

Plate 3. Excavation at rear of l'Abri du Pape, 1994. (Photo: L.G. Straus)