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In memoriam:
Bernardino Bagolini

Riparo Gaban: the Mesolithic layers

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con la collaborazione di
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ABSTRACT- The paper presents the results of the archaeological investigation in the Mesolithic layers at Riparo Gaban, in the Conca of Trento, northern Italy. Riparo Gaban is a small rock-shelter multilayer site, presenting part of a local cultural sequence: Sauveterrian-Castelnovian-Early Neolithic. Similar sites are known from Romagnano III and Pradestel.

PAROLE CHIAVE: Mesolitico, Industrie litiche, Faune, Livelli, Riparo Gaban
KEY WORDS: Mesolithic, Lithic industry, Fauna, Levels, Gaban Rockshelter

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L'interesse per l'archeologia e la passione per la ricerca di tante persone unite dal loro entusiasmo hanno fatto rivivere il Gaban, grazie.

1. INTRODUCTION

The following publication presents the results of the archaeological investigation in the Mesolithic layers at Riparo Gaban, near Trento, northern Italy (Fig. 5). The excavations, begun by Bernardino Bagolini in the early seventies, were continued by him and by the Authors, together with Alberto Broglio and Michele Lanzinger in the early eighties (Tab. 1). Then we agreed to publish both the Mesolithic and Early Neolithic materials, coming from both excavations, in a special publication. Unfortunately, the unexpected and premature death of our friend, a great specialist in the north-Italian Early Neolithic, forced us to modify our previous plans. In the end, we decided to publish only the Mesolithic material, coming from the "old" and "new" excavations.

1.1. *The history of this research*

In the study of the Romagnano III Mesolithic series, a detailed Sauveterrian sequence was found. However, the final part of this sequence was missing and it was impossible to recognise a detailed sequence in the Castelnovian series, which was divided into a quite ancient group (dated at the first half of the VI millennium BC) and into a group on the borderline of the Neolithic, at about 4.500 BC (uncalibrated date) (BROGLIO & KOZLOWSKI, 1983). This consideration re-

Fig. 1 - Riparo Gaban, view from the South-East.

Fig. 2 - Bernardino Bagolini (Photo:U.Tecchiati).

Fig. 3 - Riparo Gaban, excavation campaign 1982-83.

Fig. 4 - Riparo Gaban, excavation campaign 1982-83.

called our attention to the other series, in which the existence of Castelnovian sequences could be presumed, such as Riparo Gaban and Pradestel. This is why excavations of the Mesolithic deposits of Riparo Gaban have been resumed, as these deposits had only been explored in the earlier (1971-1979) digs. The importance of the findings of the Early Neolithic already uncovered at Riparo Gaban (dwelling structures, plentiful ceramics, ornamental and decorative objects) was another reason for interest, as it gave the possibility of widening the study of the relationship between the Castelnovian and Early Neolithic (Gaban Group).

The research was carried out by a group from Warsaw University, Ferrara University and the Museo Tridentino di Scienze Naturali. Two excavations (1982 and 1983) of the Mesolithic deposits in the IV and the V sectors (Fig.7) took place. This study and publication were sponsored by the Museo Tridentino di Scienze Naturali and the Warsaw University.

The hard technical work of preparation and description of the material was done by us, Michele Lanzinger and Alberto Broglio (part of the text) at the Museo Tridentino di Scienze Naturali in 1985. We are grateful to them for their help. The study of the raw materials was prepared by G. Dalmeri and M. Bassetti. Flaking products were measured by Anna Cusinato. The faunistic remains were studied by Christophe Griggo from the Joseph Fourier University, Grenoble. The dating was done by the Kiel University C^{14} Laboratory.

1.2. *The site*

The Riparo Gaban site (geographical coordinates F. LAVIS 21 III N.E. 46° 05' 36" Lat. 11° 07' 21" Long. Grew) is a multilayer (from Early Mesolithic till Early Iron Age) rockshelter, located on the western slope of Monte Calisio in Piazzina di Martignano, Trento (Fig. 5-6).

Exposed on the East, it is 29 meters long, 6 meters high, 2,5 meters deep (but in Mesolithic up to 4 meters), and it is elevated about 80 meters above the Adige Valley. It is placed just on the borders of a dry narrow (50m) Late Glacial Stream Valley, sloping to the South. The shelter itself is in the rock called Dos Castellet (top at 281m a.s.l.), in the place called Maso Pasquali. The site is classified and is now owned by the Provincia Autonoma di Trento.

1.3. *Excavation*

Bagolini's excavations took place between 1971 and 1979 with G. Bergamo-Decarli, L. Postal, L. Bertoldi, C. Balista, G. Fiorito and M. Lanzinger (see numerous Bagolini's works in the References). They were sponsored by the Museo Trentino di Scienze Naturali and Cassa di Risparmio di Trento of Rovereto.

The surface of about $30m^2$ was excavated to a depth of 5 meters (Mesolithic, Neolithic, Bronze Age, Early Iron Age), but the Mesolithic (Fig. 7) layers were explored only on the surface of some 15 m^2 (undisturbed layers only on about $12m^2$).

During the almost 30 years, which passed from the beginning of archaeological investigations of Gaban, many publications concerning this site appeared (see References). Most of them concerned the Early Neolithic layers (Gaban is an eponymous site chosen by Bagolini to name the local Early Neolithic group "Gruppo Gaban"). The Mesolithic material was also mentioned and even partly shown in some articles, but never really published, except for some art pieces.

Excavations Bagolini, Broglio, Kozlowski (with participation among others of G. Dalmeri, M. Lanzinger, J. Budziszewski, A. Boguszewski and K. Szymczak) took place in 1982 and 1983. They touched almost exclusively the Mesolithic layers of sectors IV and V on the surface of about 6,5 m^2 and a depth of 1,1 m.

1.4. *The methods of excavations and documentation*

B. Bagolini subdivided the site into five sectors (I – V), from which IV – in the South, III in the centre and V in the North were excavated. A square meter grid, oriented along a N-S axis, was introduced. Each meter (or its part) was explored by the horizontal or slightly oblique mechanical layers 5-10 cm thick, and sieved.

This method permitted Bagolini to create a system of the cultural stratigraphy of the site as follows: two Sauveterrian layers (30 and 29), and two (28 and 27) Castelnovian layers; each of them were 25-40 cm thick, the Early Neolithic (26) layer, went even to 30-50 cm (Fig. 8).

Bagolini was fully aware of the artificial character of the proposed stratigraphic scheme but the lithological characteristics of the Gaban Mesolithic sediments (lack or destruction of the living floors and structures, small quantity of specimens) led him to choose the system already known in other local sites (e.g. Romagnano III). The result was that the meaning of "layer" became totally conventional and represented in fact not one episode of the site occupation, but a sum of occupations, which occurred in certain and even long period.

Fig. 5 - Riparo Gaban, its geographic location.

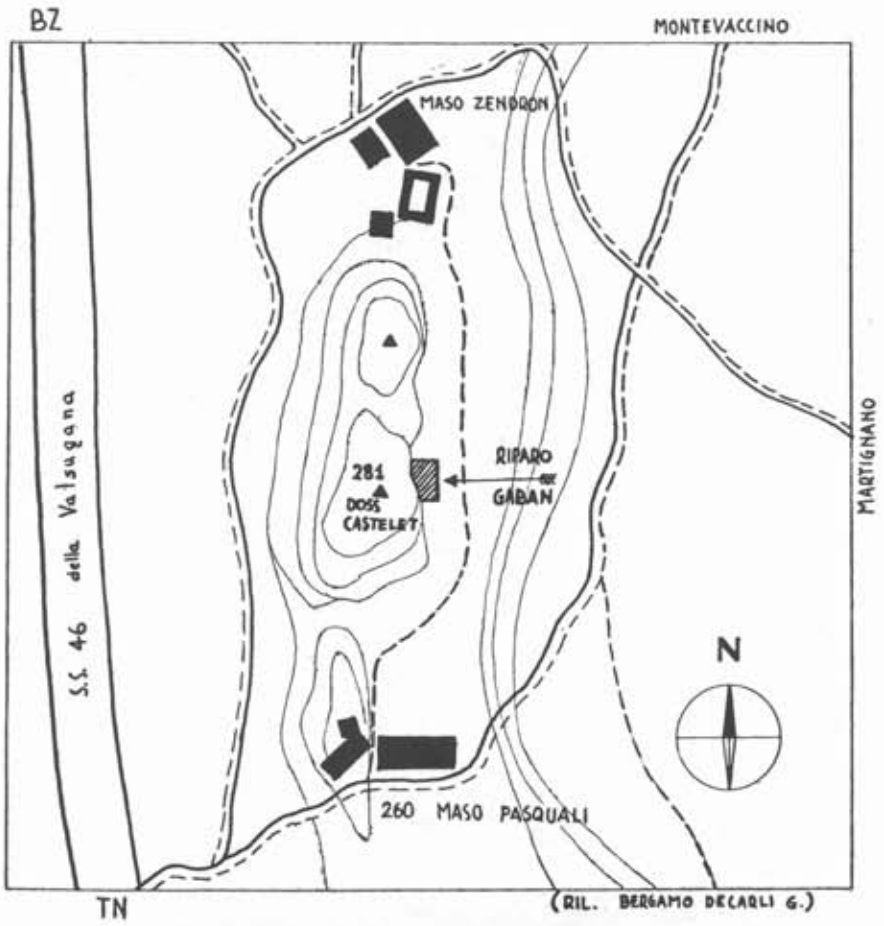


Fig. 6 - Riparo Gaban, general situation.

Settore IV							Settore III		Settore V			
D			E_1-E_2	D_8-D_9			BUCAN	TC1	26			**26**
E	E_3-E_5	E_3-E_4		D_{10}-E_1		TBNE 1-3		TC1A	27			**27**
				E_2	E_2-E_5			TC1B	TCE-F	TCE-F		
FA	F_1-F_5	F_1-$F_{8/9}$	F_1-F_5	E_3-E_5	E_6-E_7	TBNE 4-5 TBNE 6 BUCAM		TC1C TC2A-B	TCG-L	TCG-K	27 B	**28**
FB	F_6-F_9	$F_{9/10}$-10/13	F_6-$F_{11/13}$	E_6-E_7	E_8			TC2C	TCM-R	TC-L		**29**
FC	F_{10}	$F_{11/14}$..	$F_{12/14}$	E_8					TCS-Y			**30**
	K.	K.	K.	B.	B.	B.	B.	B.	K.	K.	B.	

Tab.1 – Scheme of correlation of the excavated layers from all sectors; it includes also the field denomination of each excavation unit. 26) Neolithic; 27-28) Castelnovian; 29-30) Sauveterrian; B.) Bagolini; K.) Kozlowski.

Our own excavations followed rather closly the methods and the interpretations already proposed by Bagolini (see table above). All this led us to the establishment of a common stratigraphical system based mostly on the careful study of the N-S cross-section (see geology and lithology).

All the material is stored in the Museo Tridentino di Scienze Naturali. It was sorted, according a scheme of Broglio and Kozlowski (1983), by Giampaolo Dalmeri, and myself.

2. STRATIGRAPHY

2.1. *Geology and Lithology*

Our own field study and a previous publication by Balista (1977), helped us to understand the geology and lithology of the Mesolithic sediments of Riparo Gaban quite well.

At the beginning we should stress the double-fault characteristic of the N-S cross-section (Fig. 8).

The northern part of this profile is built up of alluvial sediments, and forms an alluvial cone which was alimented by the stream flowing along the valley next to the rock-shelter from the East. This cone is well visible on the Bagolini's still standing eastern cross-section wall, in sectors V and III. It is built of loose sediment of a brownish colour, containing only 25-50 % of the cryoclastic material (limestone fragments) and mainly clay and sand elements. Sand prevails (75-80%) in these two classes of material.

The southern part of the N-S cross-section (sectors IV and a southern part of sector III) is built of a different sediment. It is a typical cave sediment, grey in colour, also with clay and sand; but especially with numerous (80-90%) limestone fragments; among them, big fragments (> 5cm) are rather numerous (about 10%). In the fine-grain fractions, sand reaches 35-40%. The Mesolithic layers there are partly destroyed there by the Karstic phenomenon.

Between these two sedimentological systems, there existed a natural depression dividing the site into two parts. This depression could be the origin of the system of pits, located in the section III (Mesolithic pit, then Neolithic pit, then Medieval pit, Fig. 7-8).

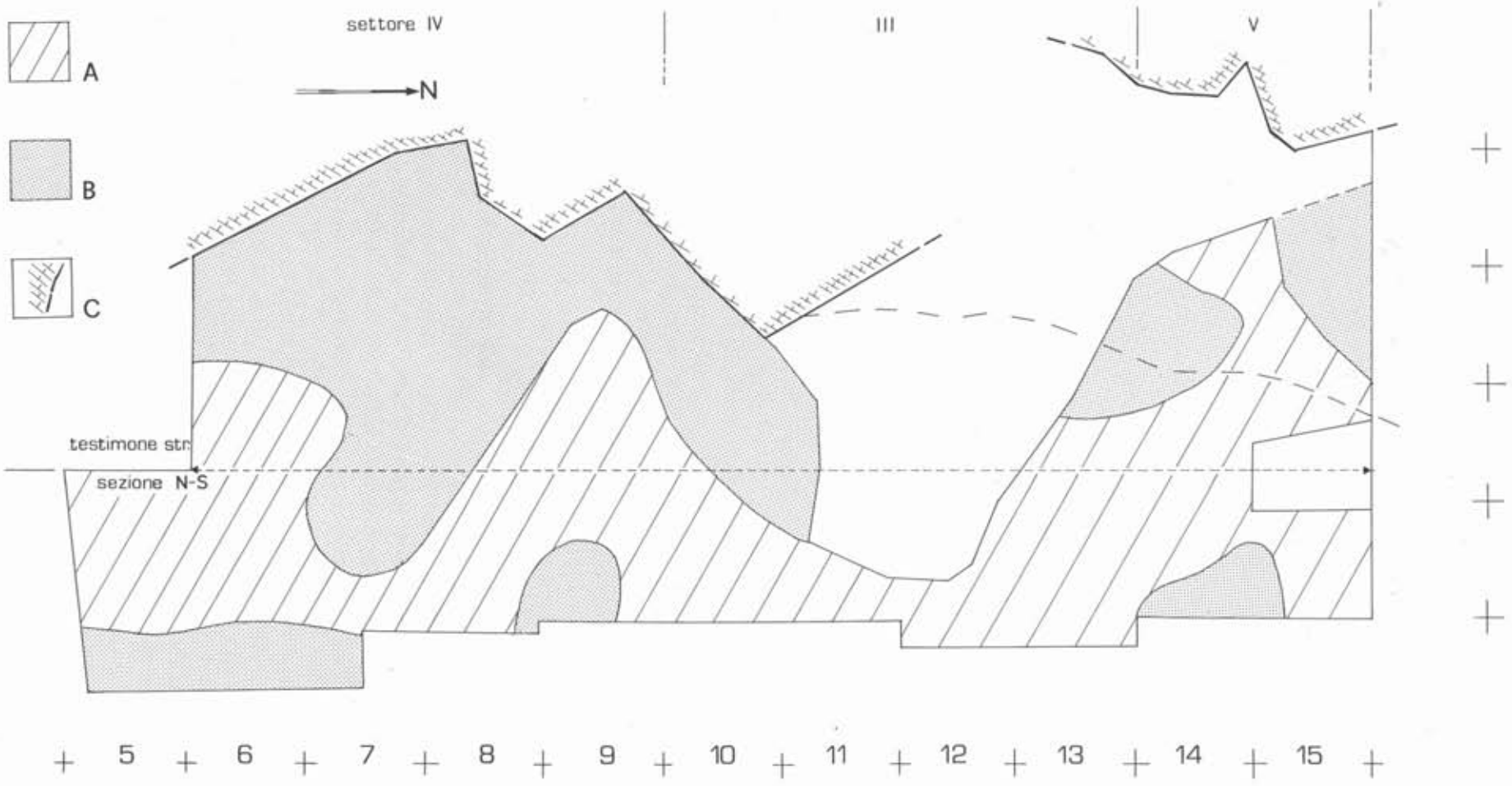


Fig. 7 - Riparo Gaban, plan of the excavations. A) Mesolithic layer in situ; B) partly or total destruction of the Mesolithic layer; C) rock called Dos Castellet.

2.2. *Cultural sequence*

A big problem for the excavation and the study of Riparo Gaban was the existence of holes filled with more recent material which had eroded the most ancient deposits. Some of these holes were caused by renewed water activity (above all, at the base of the Mesolithics deposits and others by prehistoric or other more recent structures). A deep pit of the Renaissance period particularly, involved the central part of the Mesolithic deposits (III) (see above).

The possibility of a stratigraphic correlation between the two sections left in place, was made more difficult by a notable difference in the sedimental lithology.The only certain correlation between the IV and the V sites both from a lithological and cultural point of view was the D8-9 (IV sector)-26 (V sector) layer that is strongly conditioned by Early Neolithic anthropic influences (Fig. 8).

The remains from the two sites have been treated separately in the study and the description of the assemblages. All the remains collected near the rearranged areas were eliminated.

2.2.1. *IV sector*

Layer D8-9, of variable thickness, going from 5 to 20 cm, contains many stuctures (pole holes, later flooring made up of ash and adulterated lime-stone). The findings refer to the Early Neolithic. This site was detroyed by both the Renaissance pit and water activity.

Layer E about 20 cm thick, whitish and characterised by a widespread concretion, was demolished by holes in many places. The assemblages are from the Castelnovian Period.

Layer FA, 10-15 cm thick, is characterised by the presence of structures and anthropic material. On the edge of the squares 8 and 9, a lenticular structure was visible. Its diameter was 140 cm and it was almost completely destroyed by the later excavations and pits. The post-hole found in square 7 could be correlated to this structures. This structure is also visible, in the form of stone walls and small pits on the plan of squares C and D 6/7 and of our excavations. In the surrounding area, the level of the structure was clearly marked by a remarkably carboniferous level which was also involved in later excavations. The assemblages are from the Castelnovian period.

Layer FB, 20-30 cm thick, extremely anthropic, differs from the former in its lithology. The assemblages are from the Sauveterrian Period.

Layer FC, 10-30 cm thick, is a distinct stratigraphic unit, that is notably anthropic. The assemblages are from the Sauveterrian Period.

A steriale layer of big limestone rocks can be found at the bedrock level.

2.2.2. *III Sector*

This sectors' deposits have been mostly destroyed by the Renaissance pit, which reached the Mesolithic level. Beneath the pit, the majority of the Mesolithic deposits had already been destroyed by a swallowing phenomenon, that had also dragged downwards materials from the Metal Age deposit.

Only the artefacts, that were securely placed, were studied, as coming from the stratigraphic units listed here.

Layer D8-9 (South side of the sector, touching sector IV) – 26 (North side, touching sector V) contains Mesolithic material. It covers a Mesolithic (pit) structure. The filling of the Mesolithic pit (2x1,2 mt), on the southern side, is divided into two parts. At the base (layer 6) a Castelnovian assemblage was found, that correlated the fragment of deer antler decorated with female figures (Graziosi, 1973; Graziosi, 1975; Bagolini 1972, 1973).

Above this (levels 0-5), the filling contained a mixed assemblage. It was presumed that the digging of the pit could be correlated to Level E of the IV sector. The remains coming from this pit have been studied apart.

On the northern side, there is also a Neolithic (pit) structure, dug in the Mesolithic deposits and cut by the Renaissance pit. For this reason, the Neolithic pit cannot be linked to the Neolithic deposit in the far northern part of sector III and sector V.

2.2.3. *V Sector*

An easily recognisable Neolithic deposit (layer 26) was on the top. Below, the Mesolithic deposit, that was extremely homogenous from a lithostratigraphic point of view, was dug in artificial cuts, going subparallel to the base of the layer 26.

Inside the deposit, the subdivisions made during the analysis of the remains, took into consideration two principal factors. First, the appearance of the trapezes, that identifies a division correlated to the limit between levels FA and FB of the sector IV. Second, the relative frequency of the artefacts in the series, that defines another division correlated to the limit between the levels E and FA of the IV sector.

To conclude, two groups with Castelnovian assemblages (27 and 28, respectively correlated to E and FA layers of IV sector) and two groups with Sauveterrian assemblages (29 and 30, respectively correlated to FB and FC layers of IV sector) have been identified

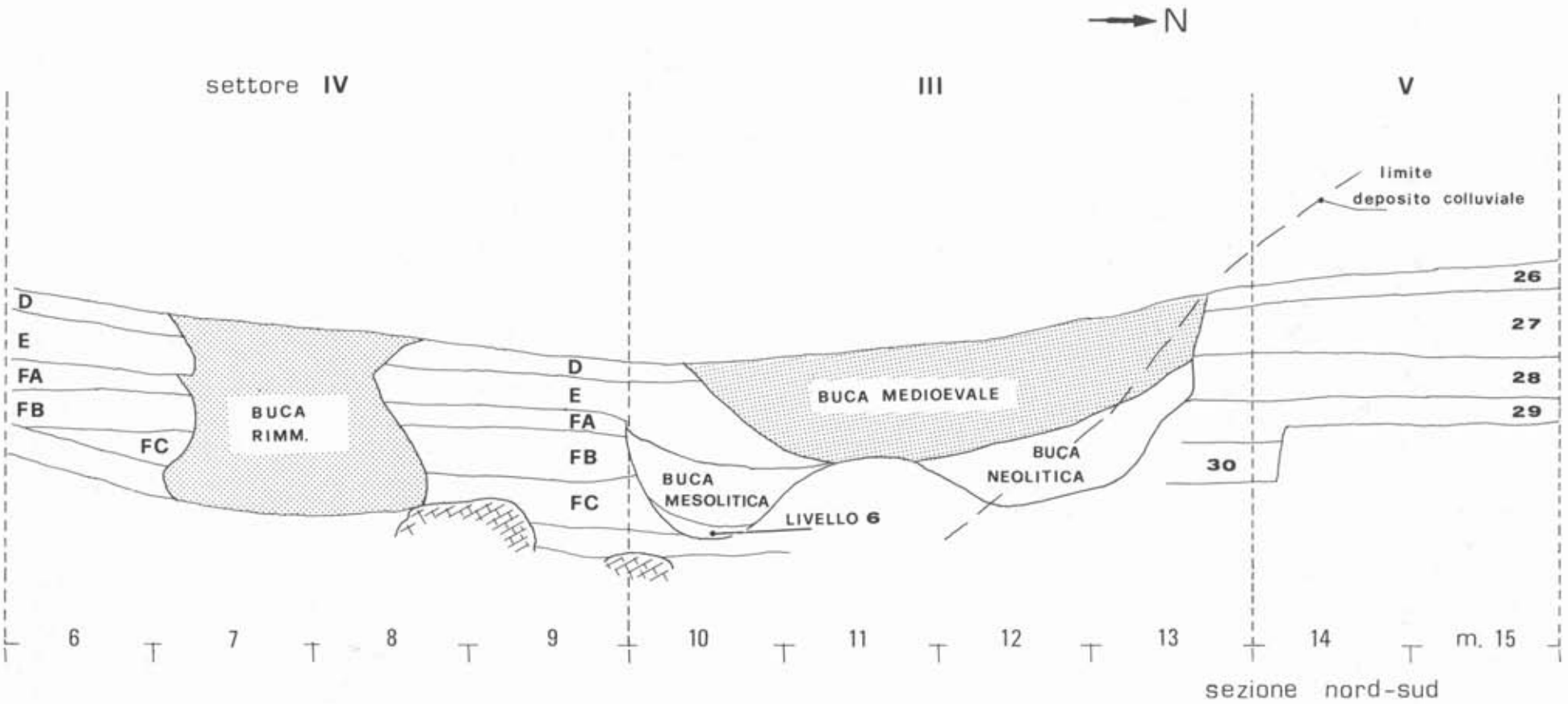


Fig. 8 - Riparo Gaban, S-N cross section.

below the Neolithic deposit (Layer 26). The levels with Casltelnovian assemblages, above level 27, in the sector V have been influenced by later excavations.

In the Castelnovian layer 28 there also existed a pit (0.5 x 0.5 m). Fig. 8 presents the scheme of correlation of the excavated layers from all sectors. It also includes the field denomination of each excavation unit.

3. THE ^{14}C DATING

Altogether nine charcoal samples, coming from Bagolini-Broglio-Kozlowski excavations (sector IV), were dated by the Laboratory of the Christian-Alberts University in Kiel, Germany, giving the following results:

Sample n°	Laboratory Code	Layer	Radiocarbon age BP	Calibrated age BC	Calibrated age BC One σ	Calibrated age BC Two σ	Culture
GAB 1	KIA 10362	D	7283±38	6197, 6194, 6160, 6139, 6090	6215-6186, 6184-6168, 6164-6071	6226-6053, 6042-6028	Early Neolithic
GAB 2	KIA 10363	E	6968±41	5839, 5820, 5811	5886-5850 5844-5787	5979-5949 5919-5726	Castelnovian
GAB 3	KIA 10364	FA	7971±42	7029, 6966, 6950, 6931, 6917,6880, 6833	7047-6799 6791-6769 6757-6754 6716-6713	7058-6687	Early Castelnovian
GAB 4	KIA 10365	FA	8323±63	7451, 7407, 7402 7391, 7376, 7358, 7355	7518-7500 7482-7315 7218-7205	7539-7278 7274-7180 7149-7143	Early Castelnovian
GAB 5	KIA 10366	FA	7725±49	6586, 6584, 6526, 6523, 6505	6636-6624 6593-6468	6645-6456	Early Castelnovian
GAB 6	KIA 10367	FA	7902±55	6745, 6743, 6729, 6724,6697	7027-7019 7000-6991 6983-6968 6948-6934 6911-6881 6829-6651	7047-6638 6619-6609	Early Castelnov
GAB 7	KIA 10368	FB	8193±66	7285, 7272, 7236, 7233, 7180, 7148, 7143	7322-7215 7214-7078	7466-7464 7451-7406 7404-7390 7378-7058	Late Sauveterr
GAB 8	KIA 10369	FC (F13)	8509±44	7577, 7555	7584-7538	7597-7520 7499-7487	Middle Sauveterr
GAB 9	KIA 10370	FC (F16)	8847±57	8157, 8143, 7964	8200-8167 8165-8101 8086-8066 8064-8040 8017-7938 7931-7917 7900-7870 7861 7830	8233-7745	Middle Sauveterr

Tab.2 – The ^{14}C datings

Frank Bruhn, from the ^{14}C Laboratory sent us the following comment on the treatment of samples, as well as the value of the obtained results:

"The charcoal samples were checked and mechanically cleaned under the microscope. The material was then extracted with 1% HCl, 1% NaOH and again 1% HCl at 60°C. The following combustion to CO_2 was performed in a closed quartz tube together with CuO and silver wool at 900°C. The CO_2 was reduced to graphite with H_2 at 600 C° at 2 mg of an iron catalyst. The iron/carbon mixture was pressed as a pellet into a target holder for the AMS measurement.

The ^{14}C concentration of the samples was measured by comparing the simultaneously collected ^{14}C, ^{13}C and ^{12}C beams of each sample with those of Oxalic Acid standard CO_2 and coal background material. Conventional CO_2 ages were calculated with a $d^{13}C$ correction for isotopic fractionation based on the $^{13}C/^{12}C$ ratio measures by our AMS-system simultaneously with the $^{14}C/^{12}C$ ratio (note: This $d^{13}C$ includes the effects of fractionation during graphitization and in the AMS-system and, therefore, cannot be compared with $d^{13}C$ values obtained per mass spectrometer on CO_2). For the determination of our measuring uncertainty (standard deviation s) we observe both the counting statistics of the ^{14}C measurement and the variability of the interval results that, together, make up one measurement. The larger of the two is adopted as a measuring uncertainty. To this we add the uncertainty connected with the subtraction of our "blank". The quoted 1s uncertainty is thus our best estimate for the full measurement and not just based on counting statistics. "Conventional age" according to Stuiver & Polach (1977:355). "Calibrated age" according to "CALIB rev4.0, test version 6" (Data set 1), Stuiver *et al.* (1998:1041-1083).

All samples yielded more than the minimum amount of 1 mg carbon that is usually required for a precise measurement and thus sufficient ion beam in the AMS instrument. The $d^{13}C$ values are in the normal range and do not indicate any non-correctable isotope fractionation. The results are therefore reliable. Of the four humid acid fractions measured, three agree with the result of the alkali residue (within 2s). This indicates that the samples are contemporary with the mobile fractions in the soil and the risk of contamination from the surrounding soil is minimum. The difference between the results of the humic acid and the alkali residue of sample KIA 10362 is slightly larger than 2s but is still small enough (2.5s) not to cause problems. Looking at the results as a whole, the samples document occupational phases between about 8900 and 7000 ^{14}C years BP, and it is likely that your first assessment of some disturbance of the stratigraphic order was correct".

The archaeological comment is as follows:

- the dating follow (with two exceptions: GAB 2 and GAB 4) the geological and cultural stratigraphy, established on the site (see above);
- they also clearly confirm the dating of the Sauveterrian-Castelnovian transition, established on the neighbouring site of Romagnano III (Broglio & Kozlowski, 1983) and placed around 8000 years BP;
- they also confirm the stratigraphic and uninterrupted continuation of the site at that time,
- the dates suggest the existence of a Late Sauveterrian occupation of the site (GAB 7, layer FB) little known in the other sites of the Conca di Trento (see limited assemblage from Vatte di Zambana, and probably not homogenous industry of the AN 3 layer from Romagnano III).

4. THE ARCHAEOLOGICAL MATERIAL

4.1. *The lithic industry*

4.1.1. *Saturation of the layers by the lithic material*

Taking into consideration the following factors: a) the volume in cubic meters of excavated sediment, and b) the number of retouched pieces recovered from this sediment, we can try to estimate the mean saturation of each of the distinguished layers using the flint material density.

It seems that the Castelnovian layers are more saturated (130-150 pieces per one sq. meter of the average Mesolithic layer, 25-40 cm thick), while the Sauveterrian are less rich (90-130 pieces, see Fig. 10).

This repeats situations already known from Mesolithic sites in the region (e.g. Romagnano III), and could indicate greater activity of Late Mesolithic hunters, or greater population of the Adige Valley during Late Mesolithic.

4.1.2. *Raw materials*

Flint

Although our knowledge of local flint raw materials is limited, and especially we do not know much about the localisation of their outcrops, we had practical experience, when observing macroscopically (colours) the archaeological material from the Mesolithic sites from Conca di Trento and from the neighbouring regions. Lanzinger (1991) published the maps on this issue, showing three zones characterised or do-

minated by different raw materials, while G. Dalmeri and M. Bassetti made a study of classical local collections from Romagnano III, Pradestel, Vatte di Zambana and Gaban (based on the cores, see Fig. 9).

It seems that when taking into consideration the whole Mesolithic collection of Gaban a hierarchy of colours is as follows:

1. from brown to ochre = 43%
2. from white to black = 20%
3. from red to violet = 19%
4. green = 10%
5. grey = 8%

A comparable colour structure of colours is known from the Mesolithic (Sauveterrian plus Castelnovian) collections of Romagnano III and Pradestel, while raw material structure in Vatte di Zambana (Late Sauveterrian) is different, perhaps because of the small size of the sample. When studying the Early and the Late Mesolithic separately, we obtain different results.

The Sauveterrian layers of Gaban show the domination of "from brown to ochre" raw material, in second place is the "from red to violet", and in third the "from white to black" variety; this structure totally differs from other known Sauveterrian collections.

In the Castelnovian layers of our site "from white to black" variety predominates, followed by al most as numerous "from brown to ochre", while the role of the "from red to violet" variety is drastically decreasing. One can observe more or less similar situations in the Castelnovian and Sauveterrian layers of Romagnano III, but not in Pradestel.

This very local change of raw material preferences, which we observe in Gaban, seems not to be correlated with (observable in this time) the evolution of core technology (from discoidal to conical/subconical cores, see cores and observations on Romagnano III and Pradestel below) but rather with a change of extra-regional contacts/connections.

Rock crystal

This raw material is known in a very small number of pieces (altogether 9) both from the Sauveterrian and Castelnovian layers. These are mostly flakes, but also one discoidal core and one "double backed point" (Broglio & Lunz, 1984). It seems to come from the north (see northern raw material territory on the map by Lanzinger, 1991).

4.1.3. *General technological structure – a function of the site*

The following chapter will deal with the theme of the site's function ("home" – "workshop" and "base"- "satellite" camps). The material from 1982-83 excavations in sector IV presented in three stratigraphic units has been used as a basis for this study: Sauveterrian (layers FC+FB, counted together for statistical reasons), Early Castelnovian (layer FA), and Late Castelnovian (layer E).

All of the material, belonging to these three collections, was subdivided into four technological/functional groups: 1) pre-cores and cores, 2) flakes and waste, 3) blades and microblades, 4) retouched tools.

The microburins are not counted at all. Depending on the changing functions of the assemblages (= its place on "chaine operatoire"), the indexes of each of these four groups should and will change considerably. The tables below show the four indices, according to proposed stratigraphic subdivision:

Layer	Total	Cores	Flakes	Blades	Tools
E	5616	6	4661	483	466
FA	5273	26	4726	311	210
FB+FC	4310	42	3734	393	143

Tab. 3 – General technological structure (N°)

Layer	Total	Cores	Flakes	Blades	Tools
E	5616	0.1	83.0	8.6	8.3
FA	5273	0.5	89.6	5.9	4.0
FB+FC	4312	1.0	86.6	9.1	3.3

Tab. 4 – General technological structure (%)

It appears, that the indices obtained from Gaban are close to those from the "home" Mesolithic sites e.g. from Serbia (Vlasac), Montenegro (Odmut), Poland (Wistka Szlachecka III, Wieliszew XIII), but also from the West-European Mesolithic sites (e.g. Grotte Coleoptère and Station Leduc in Belgium), as well as from the Early Holocene PPNA sites in the Near East (e.g. Nemrik and M'lefaat in Iraq).

All mentioned assemblages come from the seasonal camps located in caves (Odmut, Coleoptère) or in the open countryside (Vlasac, Leduc, Wistka), or from hunter-gatherer villages (Nemrik). In some of them dwelling structures were preserved (Nemrik, M'lefaat, Leduc, Vlasac).

This kind of "home" sites normally have a characteristic general technological structure, which results from the following facts:

- the hunting activity (use, destruction, loss and production of the arrowheads, see microburins),
- "home" activity (use, repair, destruction and production of scrapers, knives and burins),

- these two kinds of activity resulted in a moderate production of blades/bladelets from the preformed cores (exploited, repaired and finally mostly left on the site), and gave the frequencies already present in Gaban. They are also a result of a relationship between what was imported to the site by the new comers, what was left on place, what was produced there and what was finally exported, when the inhabitants left the site. It is also interesting to mention that the index of cores decrease considerably during time; while the core to blade ratio is as follows:

Layer	Cores	Blades	N° of blades per one core
E	6	483	80.5
FA	26	311	12.0
FB+FC	42	393	9.3

Tab. 5 – Cores/Blades ratio

This means that in the Sauveterrian and in the early Castelnovian assemblages all or almost all blades were produced on the site, while in the Late Castelnovian an important part of them were imported. It could also mean that Late Mesolithic cores were more "productive" than those coming from the early periods.

The proportion of "home" (end-scrapers, burins, retouched blades) and "hunting" (microliths) types could answer the question if we are dealing with a "base" (= more "home" types.) or a "satellite" (= more "hunting" types), see below.

4.1.4. *Base or satellite camps*

If, as was suggested above, the typology and statistics of tools could serve as the indicators of the "hunting" (microliths) and the "home" (scrapers, burins, retouched blades etc.) activities, we could try to solve the problem of functional character: did Gaban serve as a base or a satellite camp?

The base camp normally shows a certain equilibrium of the two functional groups mentioned above, even if microliths are still more numerous (but there they are accompanied by numerous microburins). The satellite camp ("halte de chasse") is characterised by a small number of home tools and a high percentage of microliths. In Gaban the proportions are as follows (whole collection) and repeat the model of base camp (e.g. Romagnano III , cf. Broglio & Kozlowski, 1983).

Layer	N°		%
	Home	**Hunting**	**Home**
27/E	270	275	49.5
28/FA	131	257	33.8
29+30/FB+FC	79	129	38

Tab. 6 – Home/hunting elements ratio

It is clear that we are dealing with a "base" camp, in which the "hunting" tools slightly (except layer 28/FA) prevail over the "home" specimens. Nevertheless the two lower layers show predomination of the hunting type/activities, while the more recent layer is characterised by the equilibrium of the two functional groups. This suggests a very stable /semisedentary occupation of the site in the period 27/E in opposition to the less stable occupation of the shelter by the Sauvetterrian and Early Castelnovian (29+30/FB+FC and especially 28/FA) hunters.

In fact we should correct our opinion on the stability of the settlement, when we take into consideration the fact that the real number of arrowheads in the Sauveterrian should decrease to 50% or less, due to specific construction of arrowheads in the two periods mentioned (1 arrowhead = at least 2 Sauveterrian microliths but only 1 Castelnovian trapeze).

A balance is almost reached in the Sauveterrian layers (79:65, which places the "home" tools on the 54% level - we count here 2 microliths per one arrowhead). And suddenly the Early Castelnovian assemblage has the least "base" characteristic in the whole sequence.

4.1.5. *Description of material*

Pre-cores and cores

The cores constitute from 0,1 to 1,0% of all flint artefacts in Gaban. The specimens in different stages of exploitation were found, starting from the initial forms (pre-treated nodules and pre-cores) up to the final stages of exploitation.

The pre-cores do not exist only in the Early Neolithic layers (D). This suggests a procedure of core pre-formation taking place off-site (in the workshops located on/near the outcrops) and fits in well with the disproportion between cores and blades noted in the layer E (see above: cores/blades ratio).

From a typological point of view, the cores from Gaban are very similar to the typology established for Romagnano III by Broglio & Kozlowski (1983). In our collection, there are rather numerous discoidal forms (group V, 12-16 in the Mesolithic layers), followed by small (III-IV) and big (I-II) cores for bladelets, normally less numerous.

We observe in Gaban, and also in Romagnano

III, a strong techno-typological continuity throughout the whole Mesolithic and Early Neolithic sequence, with a tendency to replace "old" (=discoidal) cores with "new" (=bladelets) ones.

TYPE		E 27	FA 28	FB 29	FC 30	All levels
I	1	3	5	2		
	2	1	1	1		
	3	1	3	1	1	
II	4	2				
	5		3	1		
	6	1				
Tot		**8**	**12**	**5**	**1**	**26**

Tab.7 – Pre-cores

TYPE		D 26	E 27	FA 28	FB 29	FC 30	All levels
I	1		1			1	
	2	2	2	4			
	3		1				
	4		4	2		1	
II	5						
	6						
III	7		1	1			
	8	1		4	3	1	
	9		1		1	1	
IV	10				1	1	
	11						
V	12	1	5	4	1		
	13	1	4	1	1	2	
	14		3	1		1	
	15				1		
	16					1	
	16a			3	2	4	
VI	17	1	1				
	18	2	2	2	2	1	
VII	19				1		
	20	6	8	19	9	6	
	21						
Tot		**14**	**33**	**41**	**22**	**20 (21)**	**130 (131)**

Tab.8 – Cores

Flakes and waste

They constitute the most numerous group of flint artefacts in the Gaban collection (83,0-89,6% in sector IV, excavations 1982-83, see general technological structure), and mostly come from the core preforming (cortical and non-cortical items), as well as from the preparations of cores, and also partly from the exploitation of some of the discoidal cores seen mostly in the lower layers. It is interesting to note, that the index of flakes diminish in the uppermost layer E, which correlates well with a very low number of cores seen in this layer (see general technological structure); a high number of the blades in this period were produced abroad. A part of the flakes served as the support for the end-scrapers and burins. The more advanced study of the flakes (especially of their dorsal faces) could lead to a better understanding of the local "chaines operatoires" in their Sauveterrian and Castelnovian variants.

Blades

The collection from Gaban IV, seasons 1982-83 (squares C D E), gave around 1187 blades and their fragments; they constitute between 5,9 and 9,1% of assemblages (without counting the microburins, see general technological structure). All specimens are elongated (proportions 1:2 - 1:3,5) and their breadth is limited to between 4 and 19 mm, with a majority between 7 and 11-12 mm.

There is no visible difference in the sliminess of Sauveterrian and Castelnovian blades (see diagram below), but there is a slight change in the breadth of blades in the E layer; it seems also that the pieces from the Castelnovian layers are more regular (parallel sides).

The table below shows the proportions of whole blades against the proximal, medial and distal parts.

N°					
layer	**total**	**whole**	**prox.**	**mes.**	**dist.**
E	483	171	143	119	50
FA	311	95	68	77	71
FB+FC	393	126	85	108	74

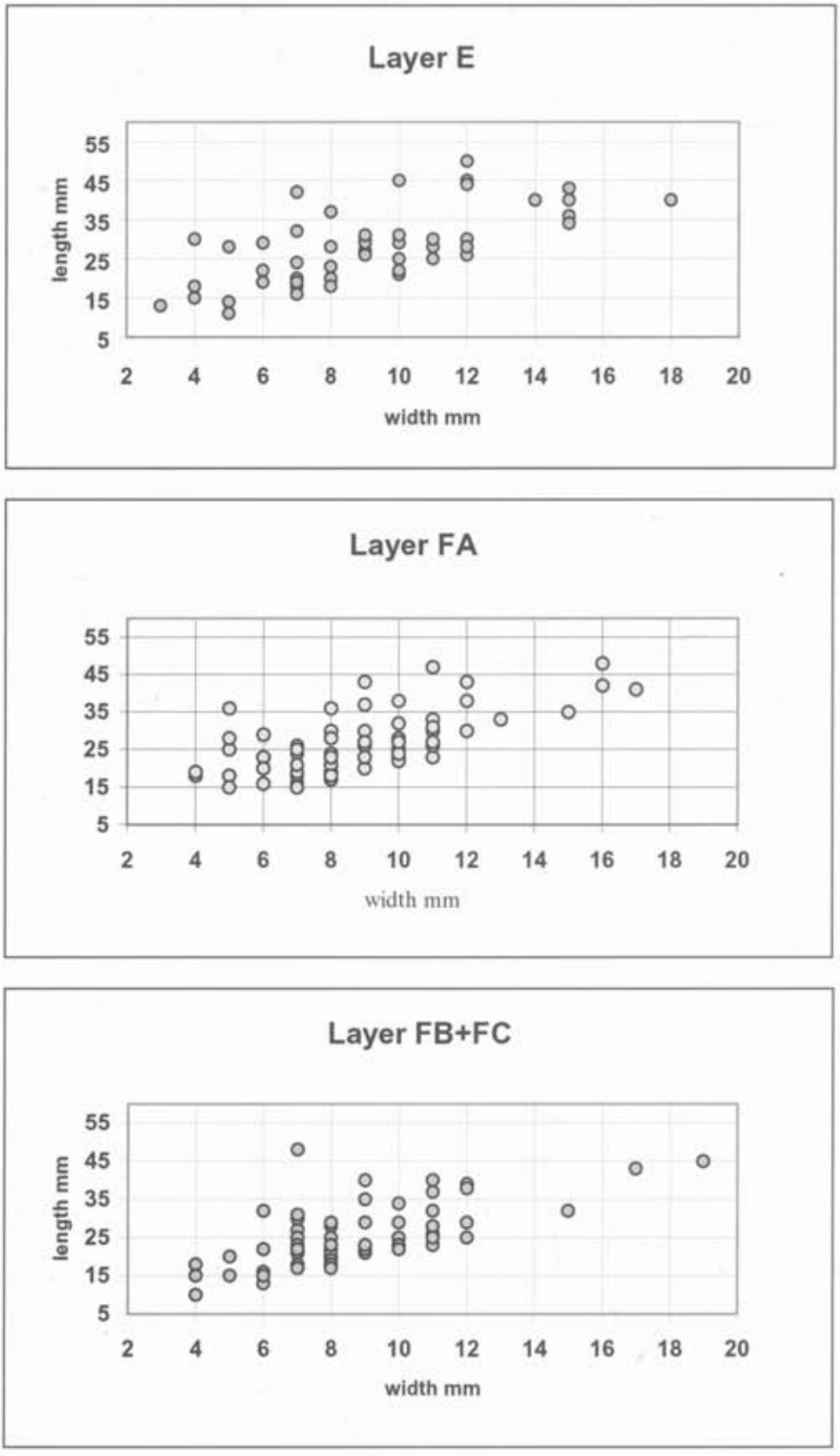
%					
layer	**total**	**whole**	**prox.**	**mes.**	**dist.**
E	483	35.4	29.6	24.6	10.4
FA	311	30.5	21.9	24.8	22.8
FB+FC	393	32.1	21.6	27.5	18.8

Tab.9 – Blades

At least a part of these broken blades seems to be broken intentionally, which means that they result from a sectioning of blades.

This not very well studied technique seems to be well known in several Mesolithic traditions, and

especially the Russian Plain Mesolithic (S.K. Kozlowski 1975) and the Castelnovian tradition. The goal of this technology was to obtain a standardised, rectangular insert, made of the medial part of the blade ("gilette"). In Gaban these supposed inserts constitute a quarter of all blades.



Tab.10 – Scatter plots showing Length and Width variables (for blades only).

Microburins

Very numerous microburins are present in all layers; they prove the intensive local production of the microliths on the spot. The following classes are present: proximal, distal, with perpendicular breaking, Krukowski, double.

The table below presents the microburin types according to the cultural stratigraphy (whole collection). In both cultures, the Sauveterrian and the Castelnovian, the proximal and the distal forms predominate, and present a relative equilibrium, although the Sauveterrian items are slightly smaller than the Castelnovian. The Krukowski microburins reach the same indexes in both cultures (11-12%), which is rather surprising. In the Sauveterrian the microburins are three times as many as microliths (339:114 pieces), while in the Castelnovian they are only 1,5 more numerous (763 and 532).

	Sauveterrian	Castelnovian
proximal	144	305
distal	139	340
breaking	12	23
Krukowski	38	84
double	6	11

Tab.11 – Microburins (N°)

This could suggest either differences in the microliths production (e.g. more frequent use of the breaking technique in Castelnovian), or production of a part of Castelnovian microliths (trapezes) outside the site. The second solution seems correlate with the external production of a big part of the Castelnovian blades (see above).

4.1.6. *Typologie des industries* (Fig. 17-19)

L'analyse a été effectuée sur la base de la liste typologique (Fig. 11-16) crée pour l'étude des industries mésolithiques de Romagnano III. Aux types déjà décrits (Broglio & Kozlowski, 1983) nous avons ajouté les suivants:

A. Grattoirs. 1A: Grattoir sur lame, court, intègre, avec front arqué. 4A: Grattoir sur lame, double, sans retouche latérale. 4B: Grattoir sur lame, double, avec retouche latérale. VI A: Fragment de grattoir sur lame. 41A: Grattoir frontal court sur éclat, avec front arqué oblique et retouche latérale. 47A: Grattoir frontal très court sur éclat avec front arqué oblique et retouche latérale. 59A: Grattoir ogival à ogive large, avec retouche latérale.
B. Eclats retouchés. 16A: Racloir à retouche inverse.
C. Burins. 4A: Burin sur lame fracturée, double. IIIA: Burin dièdre sur lame mince. 11A: Burin dièdre à biseau carénoïde. 29A: Burin court et massif à biseau carénoïde. 29A: Burin court et massif à biseau carénoïde opposé à burin dièdre. 34A: Burin court et massif à un enlèvement opposé à burin sur troncature.
C1. Groupe des "Burins de Ripabianca". Le "Burin de Ripabianca" a été défini comme un burin sur retouche latérale (Broglio & Lollini, 1963). Plusieurs types ont été définis, selon différents critères: localisation et profil de la retouche de préparation; orientation de la retouche; association de plusieurs enlèvements ou types (Barfichi & Broglio, 1965; Guerreschi, 1972).
D. Lames tronquées. 6: lame très large (> 20 mm) tronquée.
G. Couteaux à dos courbe. 4A: fragment du type 4. 9A: couteau à dos marginal très court. 11: couteau à dos marginal très étroit. 12: fragments de couteaux à dos.
K. Composites. Grattoir-Perçoir. Grattoir-Eclat retouché.
N. Pointes sur lame ou éclat laminaire. 6A: Fragment de Pointe-Troncature.
T. Trapèzes. 8A. Autres trapèzes asymétriques courts. 12A: Autres trapèzes symétriques.

Tout le matériel lithique a été groupé dans des tableaux (par nombre de pièces et pourcentage) selon les groupes typologiques (voir plus bas: A-T) et les unités stratigraphiques (voir séquence culturelle). Les indices statistiques ont aussi été représentés dans les diagrammes (Fig. 11-16)

4.1.7. *Conclusions*

Structure des catégories des outil et des armatures (Fig. 11-12)

A l'intérieur de la catégorie des outils, les grattoirs (38-49%), les becs et les perçoirs (< 5%) présentent une certaine stabilité dans toute la séquence. Les couteaux à dos et les composites sont caractérisés toujours par des pourcentages très faibles (environ 2% maximum). Les autres groupes mettent en évidence des changements: diminution des éclats retouchés (16/21-8/10%) et des burins (5/10-2%) plus accentuée en correspondance avec le passage entre le Sauveterrien et le Castelnovien; augmentation des lames tronquées (2/9-5/11%) et des lames retouchées (19/20-22/38%).

A l'intérieur de la catégorie des armatures on remarque une certaine stabilité dans la séquence mésolithique pour les pointes à dos et les dos tronqués (les deux toujours inférieur à 5%) et, dans toute la séquence, pour les pointes à deux dos (toujours in-

férieur à 10%). Les autres groupes montrent des tendances évolutives: disparition graduelle des pointes sur éclat laminaire et des segments; forte diminution (plus marquée dans le Castelnovien) des triangles; augmentation progressive des trapèzes qui dans le Néolithique arrivent à 84%. Cela correspond à une rarefaction et disparition des armatures sauveterriennes, remplacées par celles castelnoviennes.

Structure des groupes d'outils (Fig. 11)

A. Grattoirs. Les grattoirs sur support laminaire varient entre 22 et 65%, sans toutefois mettre en évidence une tendance uniforme. Dans le Sauveterrien (FB-29) la fréquence est de 48%; elle diminue dans le Castelnovien jusqu'à 29-22% et dans le Néolithique atteint le maximum (65%). Néanmoins, dans les deux secteurs considérés, en ce qui concerne le niveau E-27, la situation est différente, aussi bien pour les grattoirs sur lame que pour les trapèzes: dans le secteur V les grattoirs sur lame sont presque absents et on remarque une grande concentration de trapèzes. Cela semble suggérer une différentiation fonctionnelle entre les deux secteurs. Les autres groupes de grattoirs ne montrent aucune tendance évolutive.

C1. Burins de Ripabianca. Ils sont présents, en faible quantité (2 pièces), seulement à partir du Néolithique.

D. Lames tronquées. Au cours du Néolithique on assiste à l'introduction d'un type de troncature sur support laminaire grand et massif inconnu au Mésolithique.

E. Lames retouchées. Dans la séquence castelnovienne et dans le Néolithique on a observé une augmentation progressive des lames retouchées, liée surtout à celle des lames à encoche et denticulées. Nous soulignons que les lames à encoche et denticulées sont présentes depuis le Sauveterrien.

G. Couteaux à dos. Ils sont présents dans toute la séquence mésolithique.

Structure des groupes d'armatures microlithiques (Fig. 12)

N. Pointes sur éclat laminaire. Le nombre des pièces est très faible. Néanmoins, on observe, dans le Sauveterrien, un équilibre entre les deux classes.

P. Segments. Dans ce groupe aussi, le nombre des pièces est très faible: on peut toutefois remarquer, au sein du Sauveterrien, la prédominance constante des types allongés (12.2%).

R. Triangles. Les triangles sont toujours présents, même dans le Néolithique. Les scalènes sont toujours prédominants (90-98%). Les triangles isoscèles semblent diminuer. Les scalènes longs à base courte augmentent au détriment de ceux à base longue. Les triangles à trois côtés retouchés, considérés dans leur ensemble, augmentent dans le Castelnovien (jusqu'à plus de 50% en E-27).

S. Pointes à deux dos. Elles sont peu nombreuses. Dans le Sauveterrien on observe une prédominance des formes longues (7.2%).

T. Trapèzes. On enregistre une tendance à l'augmentation des types asymétriques courts, qui sont toujours les plus nombreux (40-55%), la diminution des romboïdes (23-16%) et une certaine stabilité des types asymétriques longs et symétriques (10-15%). A l'intérieur du groupe des asymétriques on observe une tendance évolutive pour le type 10, qui devient plus long, avec les troncatures plus concaves et le côté court toujours plus petit.

4.1.8. *Comparaisons avec la séquence du bassin de Trento.*

La comparaison entre la séquence de Romagano III et celle de l'abri Gaban permet de mettre en évidence que les deux industries sauveterriennes de l'abri Gaban se situeraient après la fin de la séquence sauveterrienne de Romagano III.

Ces considérations se fondent sur les datations 14C (voir plus haut) et sur l'indice élevé des segments longs par rapport aux courts.

Les différences mises en évidence sont représentées par:

- le bas pourcentage des triangles scalènes avec base courte à Gaban contrastant avec les valeurs élevées auxquelles on s'attendrait (tels qu'ils sont connus par exemple à Romagnano et qu'on retrouve aussi dans des pourcentage similaires dans les sites des Pyrénées français ou à Isola Santa dans la Province de Lucca, Italie centrale);
- l'index plus élevé des grattoirs sur éclat par rapport à Romagnano;
- en ce qui concerne le Castelnovien, on remarque une grande similitude structurale entre les deux séries appartenant au Castelnovien ancien (couche FA-28) et moyen/récent.

Il faut souligner que le Castelnovien récent de Gaban a produit la plupart de ses nucléus et lames à l'extérieur du site et qu'il présente plus de caractères locaux que l'industrie du Castelnovien ancien de la couche FA/28.

Le Néolithique de Gaban met en évidence une continuation technique, typologique et structurale avec le Castelnovien local. Du point de vue structural il se pose dans une position plus évoluée par rapport à l'industrie de la couche AA de Romagnano III.

	30 FC	%	29 FB	%	FA 28	%	27 E	%	26 D	%	
A	14	*37.8*	19	*45.2*	64	*48.8*	124	*45.9*	29	*38.6*	
B	6	*16.2*	9	*21.4*	13	*9.9*	24	*8.9*	8	*10.6*	
C	2	*5.4*	4	*9.5*	14	*10.7*	6	*2.2*	2	*2.6*	
D	1	*2.7*	1	*2.4*	6	*4.6*	31	*11.5*	4	*5.3*	
E	11	*29.7*	8	*19.0*	29	*22.1*	73	*27.0*	29	*38.6*	
F	1	*2.7*	1	*2.3*	1	*0.7*	6	*2.2*	3	*4.0*	
G	1	*2.7*					1	*0.4*			
H							1	*0.4*			
I					3	*2.3*	2	*0.7*			
K	1	*2.7*			1	*0.7*	1	*0.4*			
L							1	*0.4*			
N° Strumenti	**37**		**42**		**131**		**270**		**75**		**555**

Tab.12 – Tools group frequency: A) Grattoirs; B) Eclats retouchés; C) Burins; D) Lames tronquées; E) Lames retouchées; F) Becs et perçoirs; G) Couteaux à dos courbe; H) Pointes; I) Pieces ecaillees; K) Composites; L) Divers (cf. Broglio & Kozlowski, 1983).

	30 FC	%	29 FB	%	FA 28	%	27 E	%	26 D	%	
N	2	*5.1*	9	*10.5*	18	*7.0*	8	*2.9*			
O	1	*2.5*	2	*2.3*	12	*4.7*	3	*1.0*			
P	6	*15.3*	13	*15.2*	19	*7.4*	9	*3.3*			
Q			1	*1.1*	2	*0.8*	5	*1.8*			
R	23	*58.9*	49	*57.6*	130	*50.6*	36	*13.0*	4	*7.8*	
S	5	*12.8*	6	*7.0*	14	*5.4*	15	*5.4*	3	*5.8*	
T			2	*2.3*	52	*20.2*	195	*70.9*	43	*84.3*	
U			2	*2.3*	5	*1.9*					
V	2	*5.1*	1	*1.1*	5	*1.9*	4	*1.4*	1	*1.9*	
N° Armature	**39**		**85**		**257**		**275**		**51**		**707**

Tab.13 – Microliths group frequency: N) Pointes sur lame ou éclat laminaire; O) Pointes à dos; P) Segments; Q) Dos et troncatures; R) Triangles; S) Pointes à deux dos; T) Trapèzes; U) Pointes et lamelles à dos marginale; V) Divers (cf. Broglio & Kozlowski, 1983).

4.2. *Bone and antler industry*

About 50 tools (including fragments) made from bones and antlers, as well as some not-utilitarian pieces made of the same materials, occurred in the Mesolithic layers of Gaban. For the European Mesolithic this is quite a big number, but for statistical analysis the series is, of course, too small, especially if we divide it into the stratigraphic units, as was the case with the flint material.

For this reason the stratigraphic position of each class of artefacts is shown only in the figures (respectively S=Sauveterrian and C=Castelnovian), while we present here the series together.

A part from the work of H. Camps-Fabrer and her collaborators, no coherent typological system describing the prehistoric bone/antler material exists. In most cases, the shape of the tools results more from the primitive morphology of support than from the will of its producer.

As a result, the Mesolithic industries, except a few special forms (e.g. the spear-points) show a striking and banal uniformity all over the whole continent.

4.2.1. *Tools* (Fig. 20-21)

1. The collection is dominated (10 pieces) by the red deer antler (Fig. 20: 5-7), cut or broken-off

the main stem, with a polish-abrasion of the top parts: the tips could be pointed, perpendicular or chisel-formed. Three specimens are complete. This form is popular in European Mesolithic.

2. The second form (three pieces) is a massive red-deer antler "axe" (Fig. 21) with an obliquely cut and polished working edge and a perpendicularly cut back. The form is also popular in the European Mesolithic (Fig. 18).
3. The third form is a slim narrow bone "point" (4 pieces, Fig. 20: 1-4), with an oval or rectangular cross-section and perhaps of a spindle shape. It is morphologically and functionally close to Upper Palaeolithic points-"sagaies". The spindle shape of bone points is characteristic of the Gravettian, Epi-Gravettian and post-Gravettian (as well as Sauveterrian and Castelnovian) industries of the South-Western Europe.
4. There also exists, in Gaban, one fragment of a big point-sagaie (Fig. 20: 9), with a rectangular cross-section, and several perpendicular incisions on the upper face.
5. Bone awls of different shapes (7 pieces) (Fig. 20: 10-13), very popular in the European Mesolithic.
6. A pointed item with series of parallel incisions on one back (Fig. 20: 8); similar incisions are known from the "dagger" of Romagnano III.
7. Two "daggers" made of a long bone with ventral polished and pointed rounded tips (Fig. 20: 14-15); one of them bears the traces of red ochre. They have many analogies in European Mesolithic.
8. Next are two pieces (Fig. 20: 16), which could be classified as "chisels" (ventral, obliquely oriented polish and transversal tip). They are well known in many Mesolithic sites in Europe, especially in the regions where the red-deer predominated (Western and Central Europe).

The main tools forms (1-3, 5, 7), described above, are both well known in the Sauveterrian and Castelnovian contexts. As was mentioned above, the bone/antler industry from Gaban has many common features with Western and Central Europe Mesolithic industries, but especially those known from the circum-Alpine region (e.g. Schötz 7 and Birsmatten-Basisgrotte in Switzerland, Martinet and Rouffignac in France, Vlasac in Yugoslavia, and of course Romagnano III, only a few kilometres away from Gaban).

The spindle-shaped points find their analogies in Late Palaeolithic and Mesolithic of Balkans (Breg in Slovenia, Vlasac in Yugoslavia, Cuina Turculini in Rumania), but also west and north of Alps (e.g. Le Martinet, Châteauneuf-lez-Martigues, and Téviec in France), respectively in the Epi-Gravettian, Sauveterrian and Castelnovian assemblages.

4.3. *Decorated pieces*

The following decorated pieces, mostly of non-utilitarian character were recovered from the Mesolithic (precisely Castelnovian) layers of Gaban.

1. "Spatula" made of red-deer antler (Fig. 22a: 2). The original surface of antler was partly removed by polishing. The stem of the object is richly decorated with thin engraved lines. Three of them, following the longitudinal axis, divide the stem into two symmetric zones, which are covered by three lines of zigzags. The stem is also separated from the spatula itself by decorations made up of triangles.
2. Fragment of big, long bone, covered by thin, engraved decorations made up of thin lines (Fig. 22a:3).
3. Two flat fragments of bone with similar (see 2) decorations, either parallel or perpendicular lines (Fig. 22a: 4-5).
4. Cylindrical bead made of red deer antler, polished and decorated (engraved lines: zigzags divided by a straight line, a line of points, Fig. 22a: 7).

The analogies for this type of decoration (also for the incisions described in the section on the bone/antler tools) are scarce but mostly localised in one region in the northern Mediterranean. They are known from the Late Pleistocene-Holocene Epi-Gravettian of Balkans (Cuina Turculini in Rumania, Vlasac and Lepenski Vir in Yugoslavia) but also from the post-Epi-Gravettian (=Sauveterrian) context (Rouffignac in France). Similar style is also known in the local, Italian Epi-Gravettian context (Riparo Tagliente, Balzi Rossi). The "spatula" has its nearest formal (shape) analogy in the neighbouring Pradestel and in Vlasac in the Iron Gates on the Yugoslavian/Romanian border.

4.4. *Woman's statuette* (Fig. 22a: 1)

In 1974, the excavations by Bagolini of sector III revealed a famous female statuette. It was found in the base (=6) layer of the Castelnovian pit (see above). In fact here we are dealing with not a full statue but rather with a bas-relief made by incision and polishing techniques on the surface layer of a red-deer antler. The anatomic details are very realistic (body, legs, hands, breast), only the head/face are almost invisible.

The side-profile of the figurine is rather flat (especially the breast), when compared to the statuettes of the Palaeolithic "Venus" type. It seems that it was never planned to imitate this style. Because of the

structure of the raw material (only 5,5 mm thick hard layer appropriate for the treatment, backed by the spongiosa) the statuette could only at most become a "silhouette" (with a flat back). But it is also possible that there was no intention to cut the bas-relief from its original red-deer antler base (the tip of the piece is formed into a kind of handle, perhaps to be hung up).

It is not clear if the item is finished or not. Although the head and the face are missing, the lack of these elements, as we know from the Upper Palaeolithic examples, does not mean that the "Venus" is unfinished.

If the "Venus" from Gaban was never planned to be of Palaeolithic style (and that is probably the case), it is worthless to think of it as a descendent of this specific style (Graziosi, 1975). We believe that the piece from Gaban is unique, and it fact has also no analogies either in the Palaeolithic or in the Neolithic Pantheon (Bagolini, 1979), except, of course, the women's theme, already well known in both periods.

Chronologically, our piece is clearly Castelnovian, and rather Late (Layer E-27) than Early Castelnovian, which means that it should be placed after 7.700 years (dates for layer FA) and before 6.500 BP (beginning of Gaban Neolithic).

4.5. *The ornaments*

Bone-Antler

Below the already described ornamented, cylindrical bead, Gaban also revealed a few other ornaments made of animal bone: three red deer teeth, one of them perforated (Fig. 22a: 6) (Sauveterrian and Castelnovian contexts); four beads made of big fish vertebrae (Fig. 23) (Castelnovian, one piece in the Mesolithic pit, together with "Venus"); one ring (Fig. 22b) made of red deer antler (Sauveterrian). Such pieces belong to the "standard equipment" of many Mesolithic European sites.

Shell (Fig. 23)

The shell ornaments also have their important place in the collections from Riparo Gaban. There are three groups of ornaments: A) the pierced shells of *Columbella rustica* found in 29 examples in a good stratigraphic position (7 Sauveterrian and 22 Castelnovian); they probably come from the Adriatic beach, and follow the old custom of importing ornaments from abroad. B) one *Dentalium* specimen (Sauveterrian). C) one fragment of big *Cardium* (Castelnovian). B and C fossils seem to come from the Mediterranean coasts, and repeat the already existing old custom of long distance "trading" of these shells (mostly known from the Magdalenian). In fact all these shell ornaments are the constant and traditional part of Palaeolithic/Mesolithic equipment of human groups in Europe.

Regional differences of such equipment are often due to the diversity of shells, which could be found in, or be imported to the specific territory.

4.6. *The stone pendant*

One piece made (by polishing and piercing) of ivory comes from the Castelnovian context.

4.7. *The red ochre*

22 pieces of the red ochre (hematite) were found in the Mesolithic layers, both Sauveterrian and Castelnovian. They are small (mostly less than 10 mm in diameter) and their origin is unknown. Dalmeri (1992) also mentions the traces of red colour on a limestone fragment and on one of the bone daggers. The common use of red ochre started in the Upper Palaeolithic and continued in the Mesolithic.

4.8. *Ground stone industry*

Four artefacts (three Castelnovian and one Sauveterrian) belonging to this group are made of no strictly local raw materials. Three are of river pebbles (one of quartz, the second formed by a punch technique into the sphere) imported to the site, the fourth is also of no strictly local origin (quartzite); it bears the negatives of forming by the chipping technique. All they belong to poorly studied Mesolithic ground stone industry.

5. LA FAUNE

5.1. *Introduction*

Le matériel faunique récolté dans l'abri Gaban représente un total de 7672 fragments osseux. 3466 proviennent des différents niveaux sauveterriens et 4206 des ensembles castelnoviens. Les restes osseux sont, dans l'ensemble, bien conservés. Ils présentent, cependant, un fort taux de fragmentation et, par conséquent, comme dans de nombreux autres sites mésolithiques (Chaix *et al.*, 1991; Bridault, 1994), la pro-

portion d'ossements indéterminés est très élevée.

Ce fort taux de fragmentation, n'a pas permis d'effectuer d'étude paléontologique. En effet, trop peu de pièces ont pu être mesurées. Par conséquent, dans cette étude, après avoir donner la liste des espèces reconnues dans le site, nous limiterons notre exposé à quelques observations taphonomiques et archéozoologiques.

5.2. *Liste faunique*

	NRT	NRD	NID	% NID
Castelnovien	4206	461	3745	89,1
Sauveterrien	3466	573	2893	83,5
Total Gaban	7672	1034	6638	86,5

Tab. 14 - Nombres de restes déterminés et indéterminés et taux de restes indéterminés. NRT: Nombre de Restes Total; NRD: Nombre de Restes Déterminés; NID: Nombre de restes Non Identifiés.

Le Tableau 14 présente le nombre de restes déterminés et le taux de restes indéterminés pour les ensembles sauveterriens et le castelnoviens. Au total, nous avons déterminé, d'un point de vue taxonomique, 1034 fragments osseux et reconnu 19 taxons (Tabl. 15-16). En ce qui concerne les principaux taxons reconnus, représentés surtout par des Ongulés, il n'y a pas de différence notable entre les niveaux du Castelnovien et ceux du Sauveterrien (Fig. 26).

Le Chevreuil, *Capreolus capreolus*, est l'espèce qui a livré le plus grand nombre de restes. Vient ensuite le Cerf, *Cervus elaphus*, puis le Sanglier, *Sus scrofa*.

Le Lièvre, *Lepus europaeus*, et le Lapin, *Oryctolagus cuniculus*, ont tous les deux été identifiés, mais ils ne sont représentés que par quelques restes. Les Carnivores sont extrêmement rares et chaque espèce n'est signalée que par un ou deux restes.

Au sein du matériel faunique, nous avons identifié un reste humain. Il s'agit d'un fragment d'arc neural de vertèbre cervicale. Comme beaucoup de restes animaux, il est complètement carbonisé.

Les associations fauniques des niveaux sauveterriens et castelnoviens de l'abri Gaban sont constituées essentiellement d'espèces forestières: Chevreuil, Cerf, et Sanglier. Il est important de noter l'absence d'espèces de montagnes, telles que le Bouquetin ou le Chamois, ou celles qui sont dépendantes du milieu aquatique, comme le Castor. Ces espèces ont pourtant été reconnues dans les niveaux mésolithiques du site de Romagnano 3 (Boscato & Sala, 1992), localisé dans la vallée de l'Adige, à proximité de l'abri Gaban, et y constituent une part importante de l'association faunique.

La présence exclusive d'espèces forestières dans l'abri Gaban semble indiquer que les Castelnoviens ou les Sauveterriens ont fréquenté le site lors de pha-

	E1	E2	E3	E4	E5	E6	E6a	E7a	E8a	E9a	E10a	E11a	E12	E12a	E13a	F1	F2	F3	F4	F5	Total Castelnovien
Capreolus capreolus	4	2	2	1	3	7	9	2			1	1	4	4	23	46	33	17	7	22	188
Cervus elaphus						5	7	1	1		2	1	4		1	2	2	17	15	56	114
Sus scrofa		1			1	2	3			1		2		1	3	12	5	11	2	11	55
Cervidés indét.					2	1															3
Ongulés moyens		2				3	6	2					3		2	9	2	10	1	20	60
Ongulés petits									1		2	2									5
Lepus europaeus																	1	2	2		5
Oryctolagus cuniculus						3					2	3									8
Ursus arctos																				1	1
Canis lupus																		1			1
Vulpes vulpes																	1				1
Meles meles															1						1
Martes foina			1												1						2
Aquila sp.															1						1
Buteo buteo																				1	1
Garrulus glandarius																	1			1	2
Oiseaux indét.											1							1			2
Tortue																1	4	2	1	2	10
Homme																1					1
NRD TOTAL	4	5	3	1	6	21	25	5	2	1	8	9	11	5	32	71	49	61	28	114	461
NID	105	88	73	91	147	403	52	44	48	3	72	78	34	41	299	628	302	448	107	682	3745
NR TOTAL	109	93	76	92	153	424	77	49	50	4	80	87	45	46	331	699	351	509	135	796	4206

Tab.15 – Couches Castelnoviennes: nombres de restes déterminées par taxon et par couche.

	F6	F7	F8	F9	F10	F11	F12	F13	F14	F16	Total Sauveterrien
Capreolus capreolus	9		5	29	52	67	52	21	13	25	**273**
Cervus elaphus	19	9	1	19	35	45	13	3	1	4	**149**
Sus scrofa	3	4		6	8	5	8	10	4	8	**56**
Ongulés moyens	4	3	3	7	7	20	8	1	2	5	**60**
Lepus europaeus	1			1	3	3		1			**9**
Oryctolagus cuniculus									2	1	**3**
Ursus arctos			1								**1**
Vulpes vulpes					1		2			1	**4**
Felis sylvestris		1					1		1		**3**
Meles meles									1		**1**
Anas platyrhinchos				1							**1**
Oiseaux indét.	2			1							**3**
Tortue	1	2		1				1	1	4	**10**
NRD TOTAL	**39**	**19**	**10**	**65**	**106**	**140**	**84**	**37**	**25**	**48**	**573**
NID	**331**	**204**	**102**	**369**	**373**	**441**	**344**	**351**	**128**	**250**	**2893**
NR TOTAL	**370**	**223**	**112**	**434**	**479**	**581**	**428**	**388**	**153**	**298**	**3466**

Tab. 16 – Couches Sauveterriennes: nombres de restes déterminées par taxon et par couche.

ses climatiques relativement chaudes, ce qui aurait permis le développement de la forêt dans la vallée de l'Adige. Les bouquetins et les chamois se seraient réfugiés dans les montagnes environnantes. De plus, l'absence de ces derniers pourrait correspondre à une occupation saisonnière du site. En effet, durant la bonne saison, bouquetins et chamois se cantonnaient à des altitudes élevées et seules les espèces forestières (Cerf, Chevreuil et Sanglier) étaient présentes dans l'environnement immédiat de l'abri Gaban.

Par conséquent, les populations sauveterriennes et castelnoviennes de l'abri Gaban ont strictement exploité, sur un plan cynégétique, les forêts de plaine et leurs lisières et n'ont pas chassé dans les forêts de montagne.

5.3. *Etat du matériel*

Le matériel osseux de l'abri Gaban est dans son ensemble relativement homogène. Il présente un assez bon état de conservation. C'est-à-dire qu'il n'y a pas de problèmes de conservation différentielle ; les parties spongieuses étant aussi bien représentées que l'os compact. En effet, nous n'avons pas observé de trace de racines ou de carnivores sur les ossements (Tabl. 17).

	Traces naturelles		Traces anthropiques		
	Racine	Carnivore	Stries	Percussions	Rainurage
Castelnovien	0	0	2	1	4
Sauveterrien	0	0	3	5	1

Tab. 17 – Répartition des traces observées sur le matériel déterminé.

Comme dans de nombreux sites mésolithiques (e.g. Bridault, 1994; Bridault & Bautista, 1993; Chaix *et al.*, 1991), ce matériel se caractérise par un taux de fragmentation relativement important. En moyenne, 70 % des vestiges osseux ont une taille inférieure ou égale à 2 cm (Tabl. 18 et Fig. 27).

De plus, ces ossements sont très souvent brûlés. Cependant, ils le sont beaucoup plus dans les niveaux castelnoviens: 67,7 % contre 29,4 % pour les niveaux sauveterriens (Tabl. 19 et Fig. 28). L'examen du Tableau 19 permet également de constater que l'action du feu concerne surtout les fragments osseux de petite taille.

		= 2 cm		>2 cm et =5 cm		> 5 cm		Total
		NR	%	NR	%	NR	%	NR
Castelnovien	Total	2930	69,7	1124	26,7	150	3,6	4204
	NRD	162	35,3	196	42,7	101	22,0	459
	NID	2768	73,9	928	24,8	49	1,3	3745
Sauveterrien	Total	2534	73,1	781	22,5	151	4,4	3466
	NRD	257	44,9	248	43,3	106	18,0	573
	NID	2287	79,1	543	18,8	46	1,6	2893

Tab. 18 - Répartitions des vestiges osseux par classes de tailles

		NR non brûlés	NR brûlés			
			Total	=2 cm	>2 cm et 5cm	> 5 cm
Castelnovien	Total	4204	**2845 (67,7 %)**	2098 (69,7 %)	703 (26,7 %)	44 (3,6 %)
	NRD	459	**231**	101	100	30
	NID	3745	**2614**	1997	603	14
Sauveterrien	Total	3466	**1018 (29,4 %)**	876 (73,4 %)	135 (22,5%)	7 (4,4 %)
	NRD	573	**74**	46	24	4
	NID	2893	**944**	830	111	3

Tab. 19 - Nombre d'ossements brulés et répartitions par classes de tailles

5.4. *Actions anthropiques*

Nous pouvons, par conséquent, considérer que le feu est en partie responsable de la fragmentation intense des vestiges osseux recueillis dans l'abri Gaban. Toutefois, la présence d'impacts de percussion (Tabl. 17) et la morphologie des cassures, de type spiralé à surfaces lisses, indiquent également une fragmentation d'origine anthropique, très certainement en relation avec l'extraction de la moelle.

Les fortes proportions d'ossements brûlés, aussi bien dans les niveaux castelnoviens que sauveterriens, posent le problème de leur origine. Ils ont pu être brûlés en cours de cuisson, utilisés comme combustible, jetés au feu à des fins d'hygiène ou bien encore brûlés accidentellement (e.g. Brain, 1981; David, 1990; Stiner *et al.*, 1995). Des expérimentations ont démontré que les ossements pouvaient être utilisés en tant que combustible (Costamagno *et al*, 1999). Cependant, ce sont les éléments spongieux qui renferment une grande quantité de graisse, qui se consument le mieux. Les fragments de diaphyses d'os longs, quant à eux, brûlent très difficilement. De ce fait, dans les sites archéologiques, si les ossements ont été employés en tant que combustibles, ces différentes parties squelettiques ne sont pas affectées par l'action du feu dans des proportions identiques.

Dans l'abri Gaban, les traces de combustion sont présentes sur tous les éléments squelettiques, avec cependant des proportions légèrement plus importantes pour les fragments de diaphyses d'os longs (os compact) (Tabl. 20 et Fig. 29). Par conséquent, l'hypothèse d'une utilisation des ossements en tant que combustible ne peut pas être retenue et il est probable qu'ils aient été brûlés soit accidentellement, soit à des fins d'hygiène.

	Total	= 2 cm	>2 cm et 5 cm	> 5 cm
Castelnovien				
os compact	**76,1 %**	79,0 %	53,1 %	28,6 %
os spongieux	**64,1 %**	66,8 %	54,7 %	28,6 %
Sauveterrien				
os compact	**38,7 %**	44,4 %	27,3 %	8,8 %
os spongieux	**29,7 %**	32,3 %	2,5 %	0 %

Tab. 20 – Pourcentages d'ossements brulés par classes de tailles en fonctions de leur nature histologique.

	Espèce	Situation du fragment	traces	Long. fragment
Castelnovien				
82-F1-D6/5	*Capreolus capreolus*	merrain	rainurage + feu	3 cm
82-F3-D6/9	*Cervus elaphus*	merrain	rainurage + feu	2 cm
83-F4-D6/5	*Cervus elaphus*	merrain	rainurage	7 cm
82-F5-D6/9	*Cervus elaphus*	merrain	rainurage	2 cm
Sauveterrien				
83-F9-C6/5	*Cervus elaphus*	merrain	rainurage	5,5 cm
83-F9-C6/6	*Cervus elaphus*	andouiller		5,5 cm

Tab. 21 – Bois de cervidés et traces anthropiques.

Les traces de découpe sont extrêmement rares (Tabl. 16). Ces stries de boucherie ont été observées sur des os de Cerf, sauf dans un cas, où il s'agit d'un os de Chevreuil. Elles sont surtout localisées au niveau des extrémités articulaires et résultent très certainement d'un travail de désarticulation. Cependant un fragment de diaphyse de côte, recueilli dans le niveau F10 (Sauveterrien), porte, sur la face externe, de nombreuses stries allongées et parallèles au sens d'allongement de l'os. Elles pourraient, quant à elles, indiquer un travail de décharnement.

Sur les 6 fragments de bois de Cervidés identifiés, 5 portent des traces de rainurage témoignant d'une intention de travail du bois; il s'agit de fragments de merrain (Tabl. 21). Le seul qui n'en porte pas correspond à une extrémité d'andouiller. Excepté un cas, où il s'agit du Chevreuil, ces fragments de bois de Cervidés ont été rapportés au Cerf. Trois des vestiges rainurés ont une taille inférieure à 3 cm et sont brûlés.

5.5. *Conclusions et discussions*

En conclusion, l'étude de la faune ne permet pas de caractériser les deux cultures mésolithiques identifiées dans l'abri Gaban. En effet, elle montre peu de différences entre les niveaux castelnoviens et les niveaux sauveterriens. Les espèces qui dominent sont le Chevreuil, le Cerf et le Sanglier. Il s'agit donc essentiellement d'espèces de milieu forestier, ce qui indique une chasse qui s'est cantonnée aux plaines et à leurs abords.

Le matériel osseux se caractérise par un taux de fragmentation très important et il est, en fortes proportions, brûlé. Cependant, le pourcentage d'ossements brûlés est plus élevé dans les niveaux castelnoviens que dans ceux attribués au Sauveterrien. De plus, pour ces deux cultures mésolithiques, la présence d'ossements brûlés ne semble pas correspondre à une utilisation des os en tant que combustible.

Les Castelnoviens, plus que les Sauveterriens ont travaillé les bois de Cervidés et notamment ceux de Cerf. Le débitage a été effectué par rainurage.

Les traces d'activités anthropiques, résultant d'un travail de boucherie ou de la consommation de la viande ou de la moelle, sont très peu nombreuses. Les stries ont surtout été observées sur des os de Cerf, qui est l'espèce la plus grande reconnue dans l'abri Gaban et correspondent surtout à un travail de désarticulation. La rareté des stries de boucherie peut être expliquée par le mode de cuisson des animaux. En effet, s'ils sont bouillis (par exemple, dans un four de type polynésien), la viande se détachera facilement de l'os et ne nécessite pas l'utilisation d'outil en silex.

6. GENERAL CONCLUSION

1. Riparo Gaban is a typical small rock-shelter multilayer site (in the Conca of Trento), presenting part of a local cultural sequence: Sauveterrian-Castelnovian-Early Neolithic. Similar sites are known from Romagnano III and Pradestel, all also localized in the same region.
2. The Sauveterrian is represented here in its middle and latest phase; the Castelnovian could be divided into two phases. This chronology is confirmed by the list of hunted animals, with a domination of the cerividae and the absence of ibex.
3. The Mesolithic Riparo Gaban is a site of the home, hunter-gatherer type, mostly in the base camp variation. It also seems that the site was mostly occupated in the winter season, but the analysis of the faunal remains does not permit us to prove this. The "home" function of the site could also be suggested by the high degree of the bones fragmentation.
4. The core processing activity, in the Sauveterrian

period, mostly took place at the site, while in the Castelnovian period (and especially in its upper layer) a part of the cores were exploited abroad and mostly bladelets and arrowheads came to the site; a part of the microliths were also produced abroad.

5. The Riparo Gaban Mesolithic industries, similar to those from e.g. Romagnano III, differ from their contemporaneous and neighbours in some aspects:
   - its raw material structure in the Sauveterrian period differ considerably from those of Romagnano III (distance of only 8,5 km) and Pradestel (distance of 4 km); in the Castenovian period the raw material structure of Gaban is similar to that of Romagnano, but still different from that of Pradestel;
   - some typological and statistical data of Gaban's Mesolithic are also slightly different from those mostly known from Romagano III (the almost whole Mesolithic, except Late Sauveterrian, sequence of Conca of Trento) and Vatte di Zambana (the Late phase of the Sauveterrian). The difference is well visible in the group of end-scrapers, where the flake forms predominate in Gaban (except in layer 27/E) on the blade pieces, which is the opposite of the situation seen in Romagnano III. The second difference is clearly visible in the group of triangles which are more numerous here (except layers 27/E and 26D) than in Romagnano III. In the group of triangles, Gaban also seems to differ from the Late Sauveterrian of Romagnano. While, in this last site, long base scalene triangles are equally present with scalene triangles with a short base (the same in Vatte di Zambana), Gaban's later Sauveterrian shows the prevalance of the long base variety, and the equilibrium of the two varieties appears only in the Early Castelnovian.

All this could mean that the Mesolithic industries of Gaban, which seem to be contemporary to the upper part of Romagnano III sequence (layers AC2-AA) constantly differ from those of Romagnano and Pradestel in the raw material structure, end-scrapers structure, internal structure of triangles, and internal composition of microliths group (lack of some types).

All this could not be accidental, but seems to depict a permanent difference really existing between the industries of the compared sites. This could mean that inside the Conca of Trento, just between Romagnano III (+Pradestel ?), on one hand, and Gaban on the other (distance of 4-8,5 km), there existed a real (tribal?) border in the Mesolithic period.

SUMMARY- Riparo Gaban, in the Conca of Trento, is a small rock-shelter multilayer site, presenting part of a local cultural sequence: Sauveterrian-Castelnovian-Early Neolithic. Similar sites are known from Romagnano III and Pradestel, all also localized in the same region. The Sauveterrian is represented here in its middle and latest phase; the Castelnovian could be divided into two phases. The Mesolithic Riparo Gaban is a site of the home, hunter-gatherer type. It also seems that the site was mostly occupated in the winter season, but the analysis of the faunal remains does not permit us to prove this. Comparison between Riparo Gaban Mesolithic industries and those contemporary coming from Romagnano III and Pradestel have been done.

RIASSUNTO - Il Riparo Gaban, situato nella Conca di Trento, è un riparo sottoroccia con una serie di livelli antropizzati all'interno di un deposito ben stratificato che presenta parte della sequenza culturale locale: Sauveterriano-Castelnoviano-Neolitico antico. Situazioni simili sono note nei siti di Romagnano III e Predestel, localizzati nella stessa area. Il Sauveterriano è qui rappresentato dalla fase media e finale; il Castelnoviano può essere diviso in due sottofasi. Il Riparo Gaban rappresenta un sito residenziale di cacciatori-raccoglitori, occupato prevalentemente nella stagione invernale. Le analisi archeozoologiche dei resti faunistici non ci permettono di confermare l'ipotesi della frequentazione invernale del sito. Vengono presentati confronti tra gli insiemi litici mesolitici di Riparo Gaban e quelli provenienti da insiemi litici coevi provenienti da Romagnano III e Pradestel.

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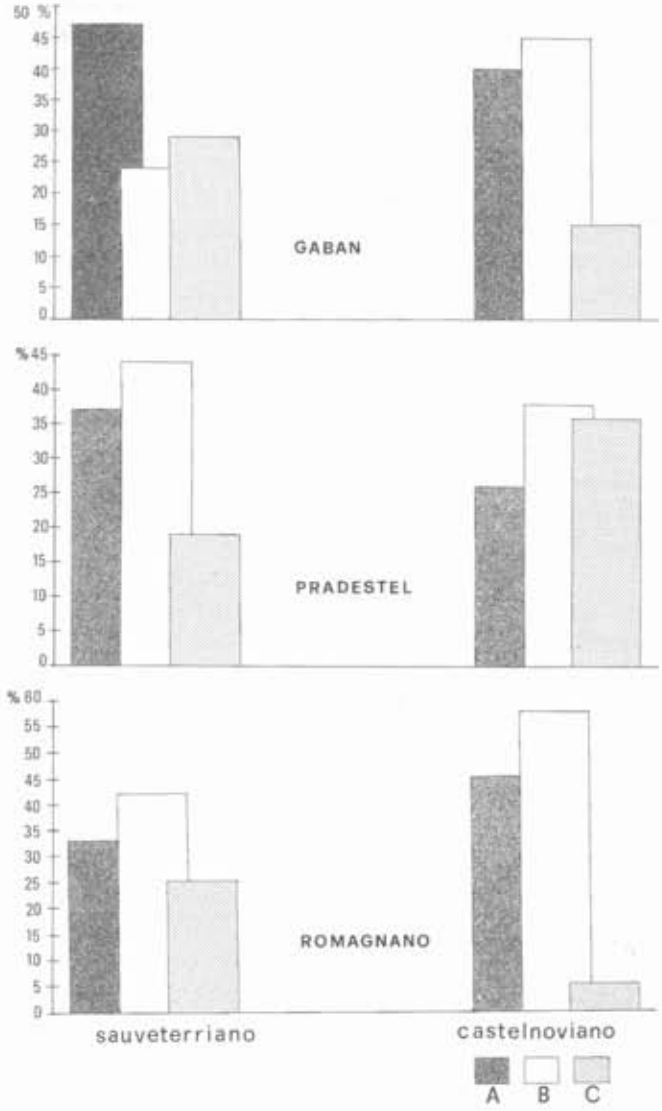

Fig. 9 - Three more important raw materials from Riparo Gaban, Pradestel, Romagnano III. A) from brown to ochre; B) from white to black; C) from red to violet.

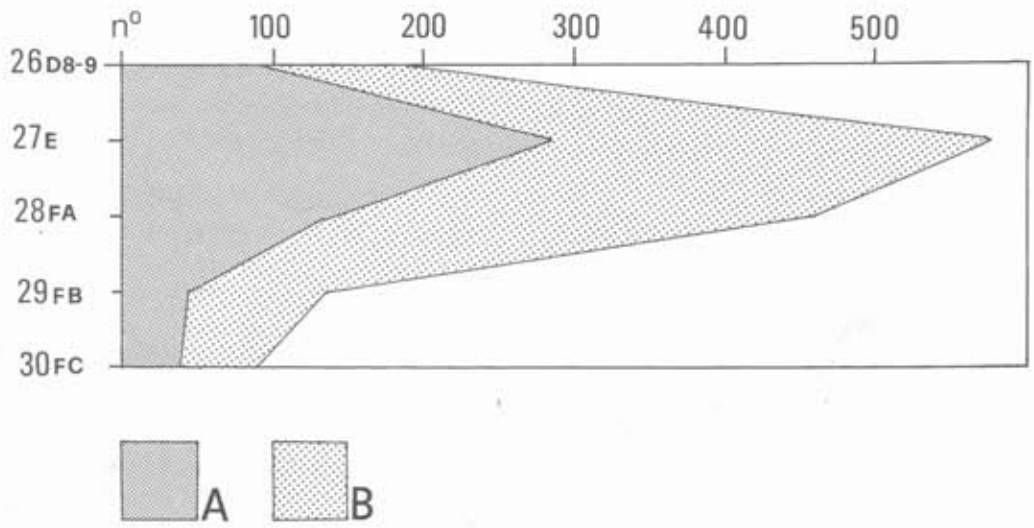

Fig. 10 - Riparo Gaban, number of tools (A) and number of microliths (B).

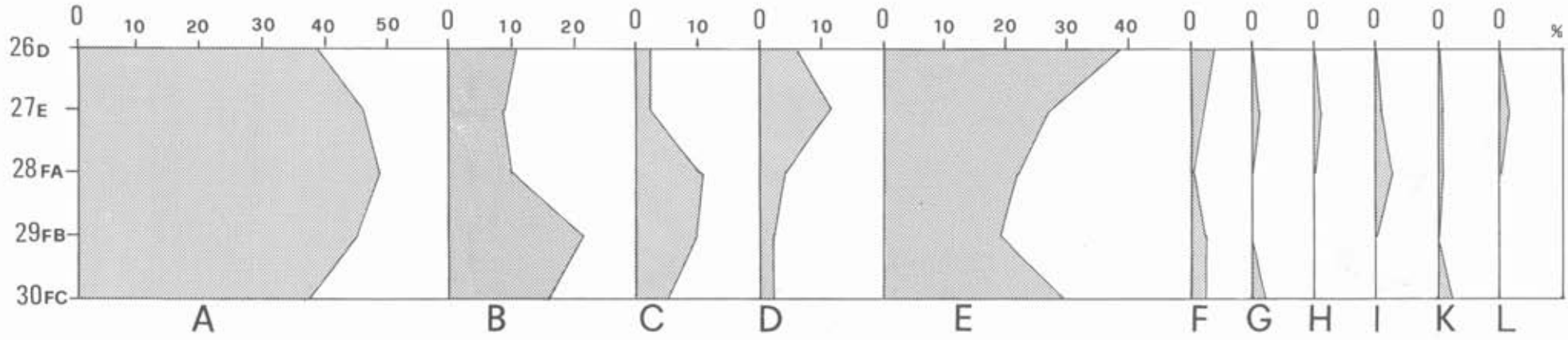

Fig. 11- Riparo Gaban, tools group frequency: A – Grattoirs; B – Eclats retouchés; C – Burins; D – Lames tronquées; E – Lames retouchées; F – Becs et perçoirs; G – Couteaux à dos courbe; H – Pointes; I – Pieces ecaillées; K- Composites; L- Divers.

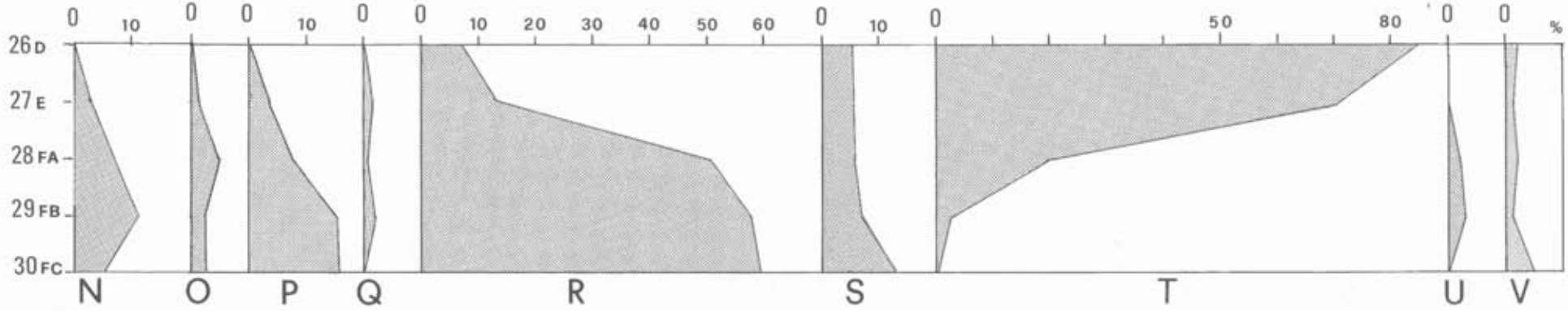

Fig. 12 - Riparo Gaban, microliths group frequency. N – Pointes sur lame ou éclat laminaire; O – Pointes à dos; P – Segments; Q – Dos et troncatures; R – Triangles; S – Pointes à deux dos; T – Trapèzes; U – Pointes et lamelles à dos marginale; V – Divers.

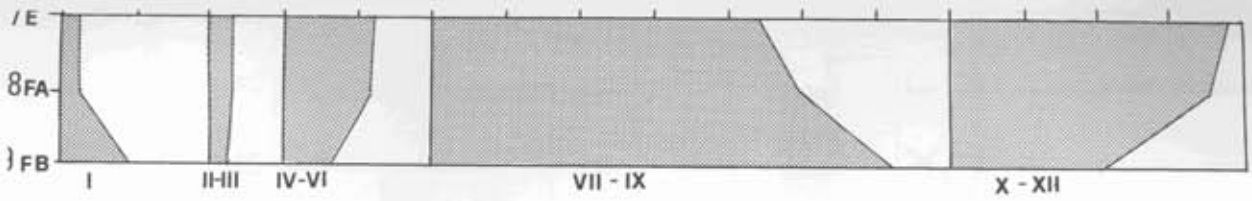

Fig. 13 - Riparo Gaban, frequency of the end-scrapers classes.

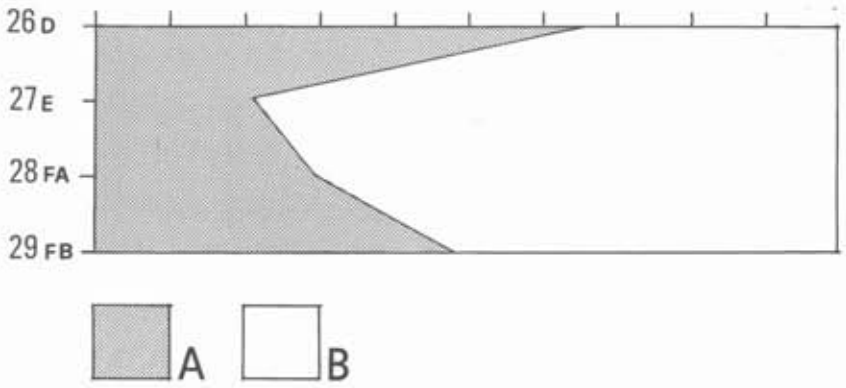

Fig. 14 - Riparo Gaban, frequency of the end-scrapers on blade (A) and on flake (B).

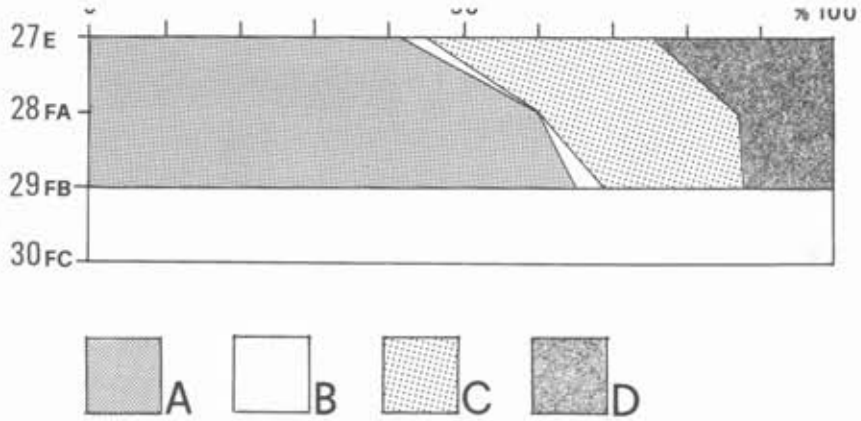

Fig. 15 - Riparo Gaban, frequency of the triangles, classified on the basis of the number of retouched sides and of their shape. A) isosceles and scalene triangles with not retouched or partially retouched third side; B) isosceles triangles with totally retouched third side; C) short scalene triangles and long scalene triangles with long base with totally retouched third side; D) long scalene triangles with short base with totally retouched third side.

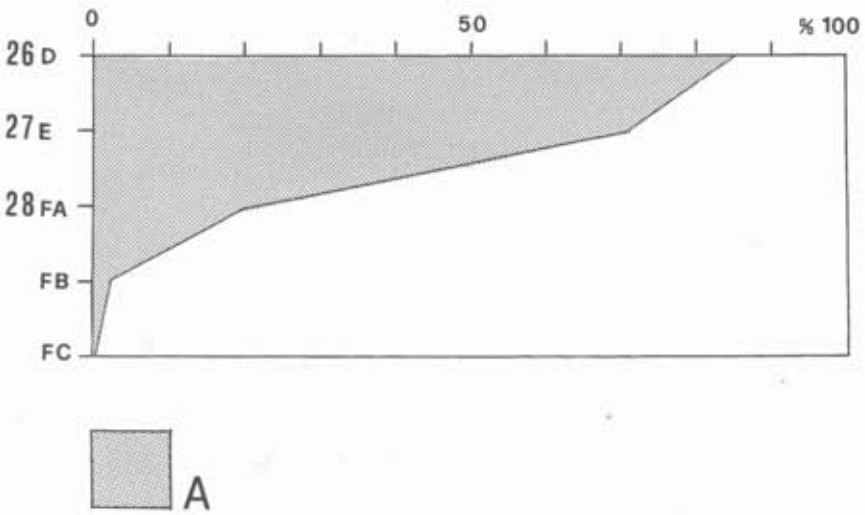

Fig. 16 - Riparo Gaban, trapeze frequency (A) in the microliths group.

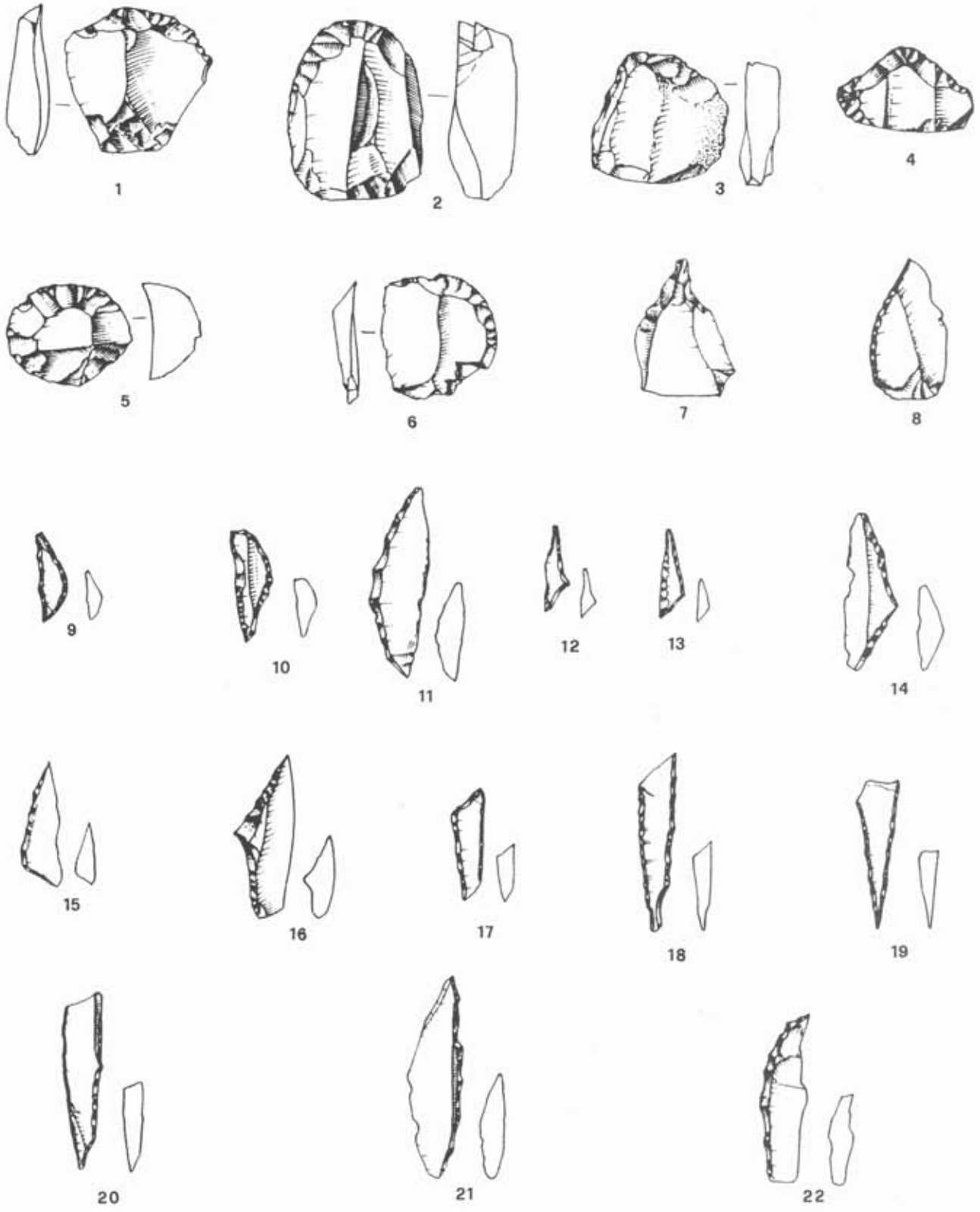

Fig. 17 - Riparo Gaban, sectors III-IV, Sauveterrian, Bagolini excavation. (scala 1:1).

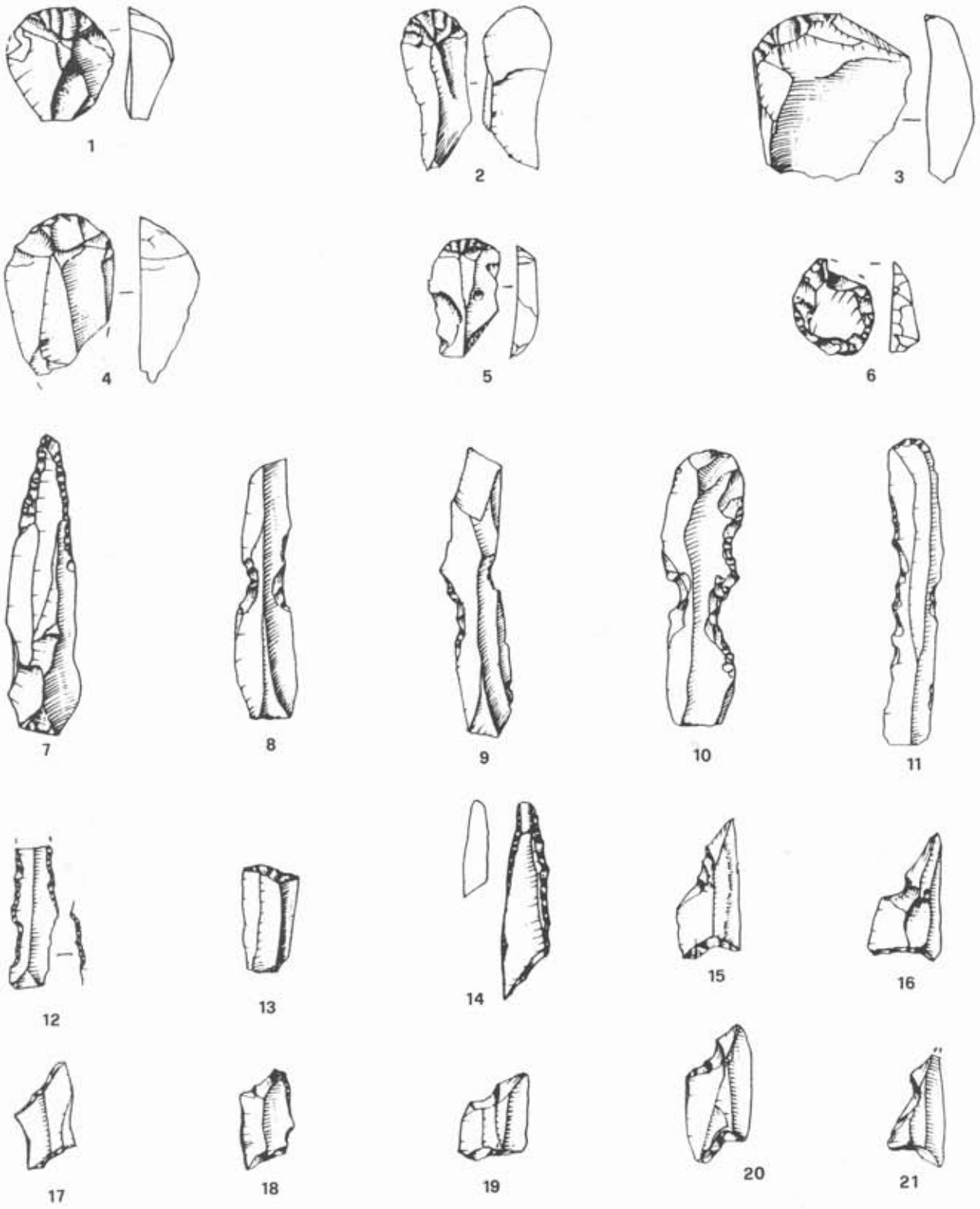

Fig. 18 - Riparo Gaban, sectors III-IV, Castelnovian, Bagolini excavation. (scala 1:1).

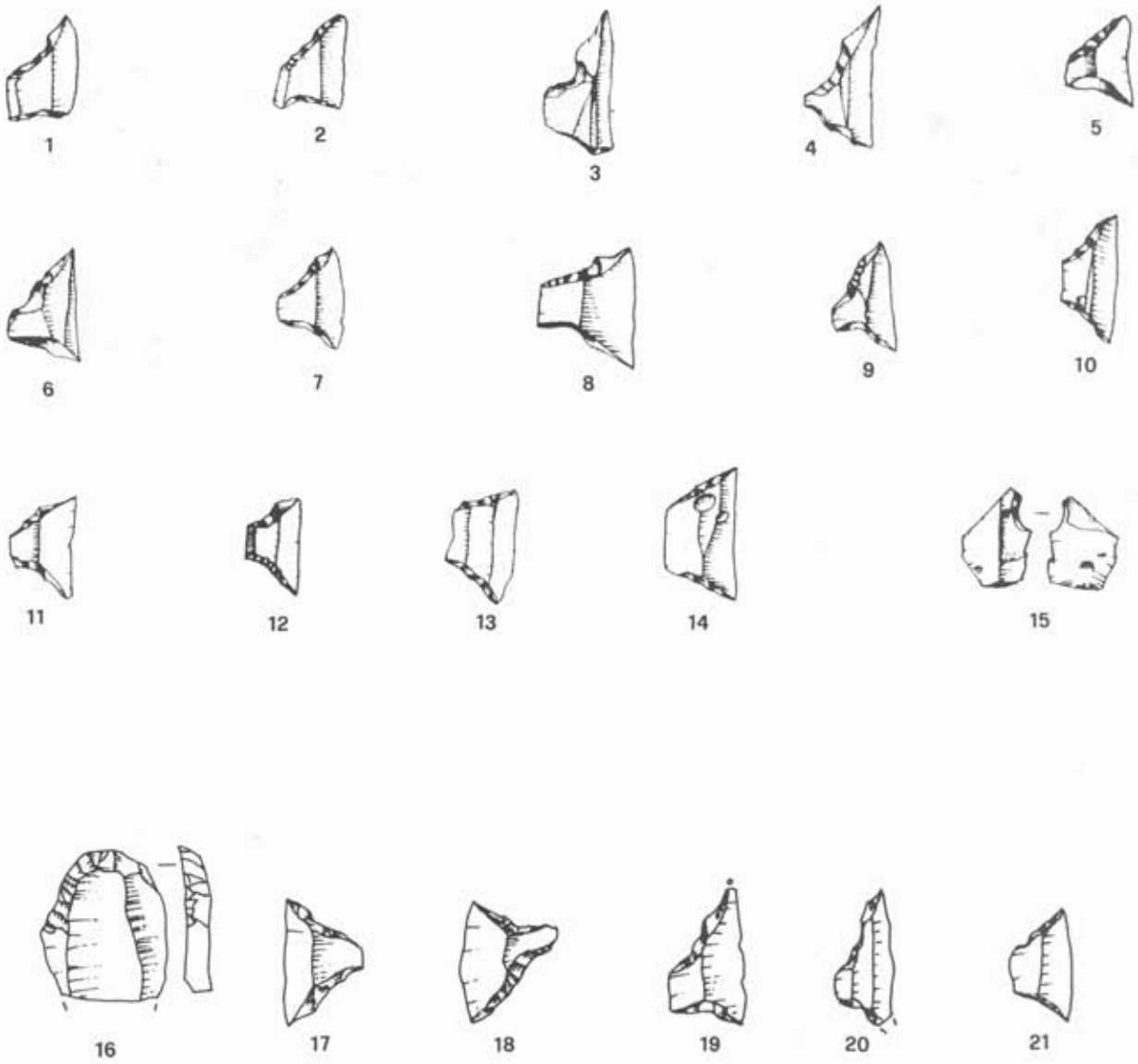

Fig. 19 - Riparo Gaban, sectors III-IV, Castelnovian, Bagolini excavation. Lower row: Mesolithic pit with Venus. (scala 1:1).

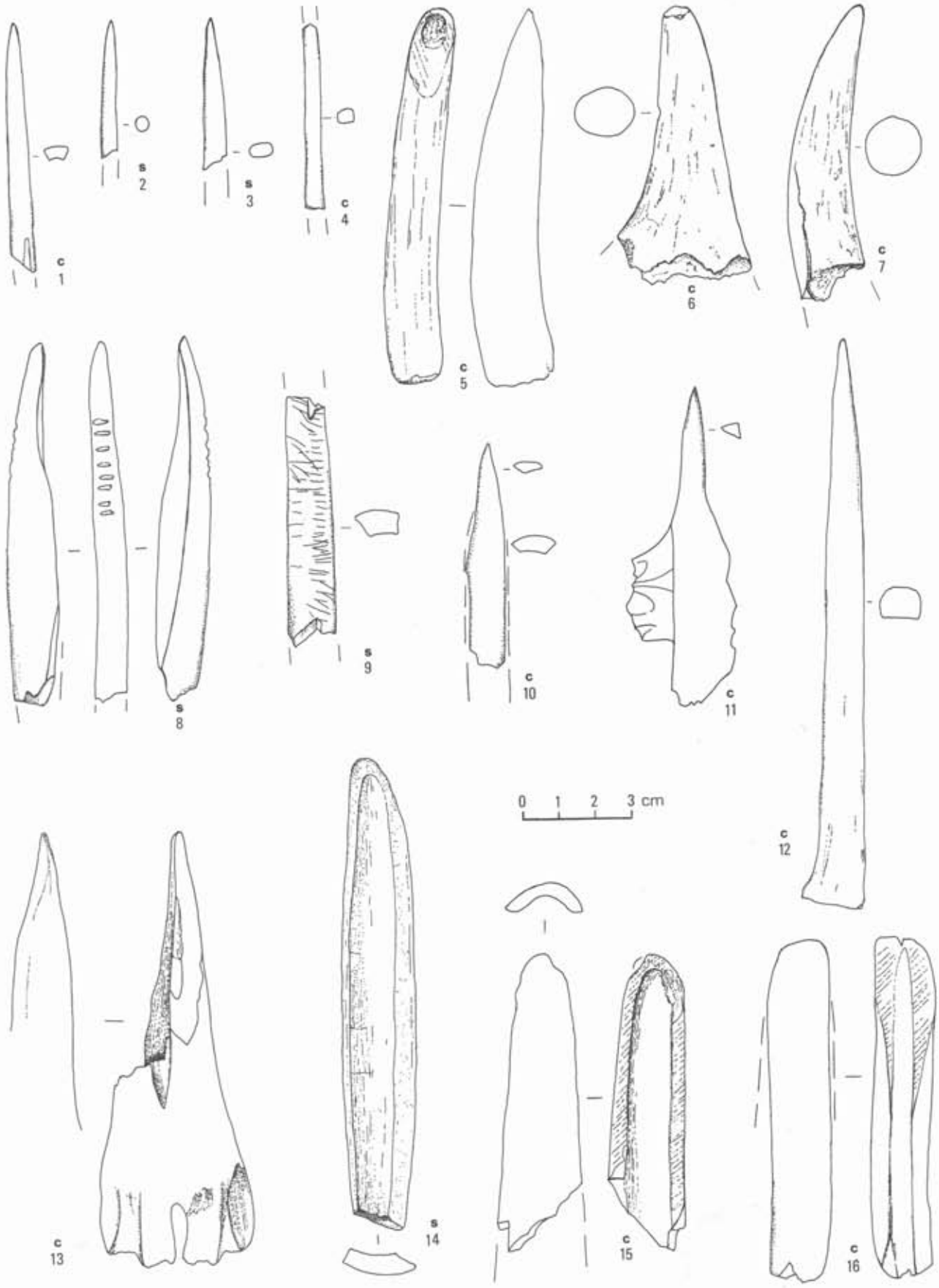

Fig. 20 - Riparo Gaban, the bone and antler industry (numbers see description in the text, S: Sauveterrian, C: Castelnovian).

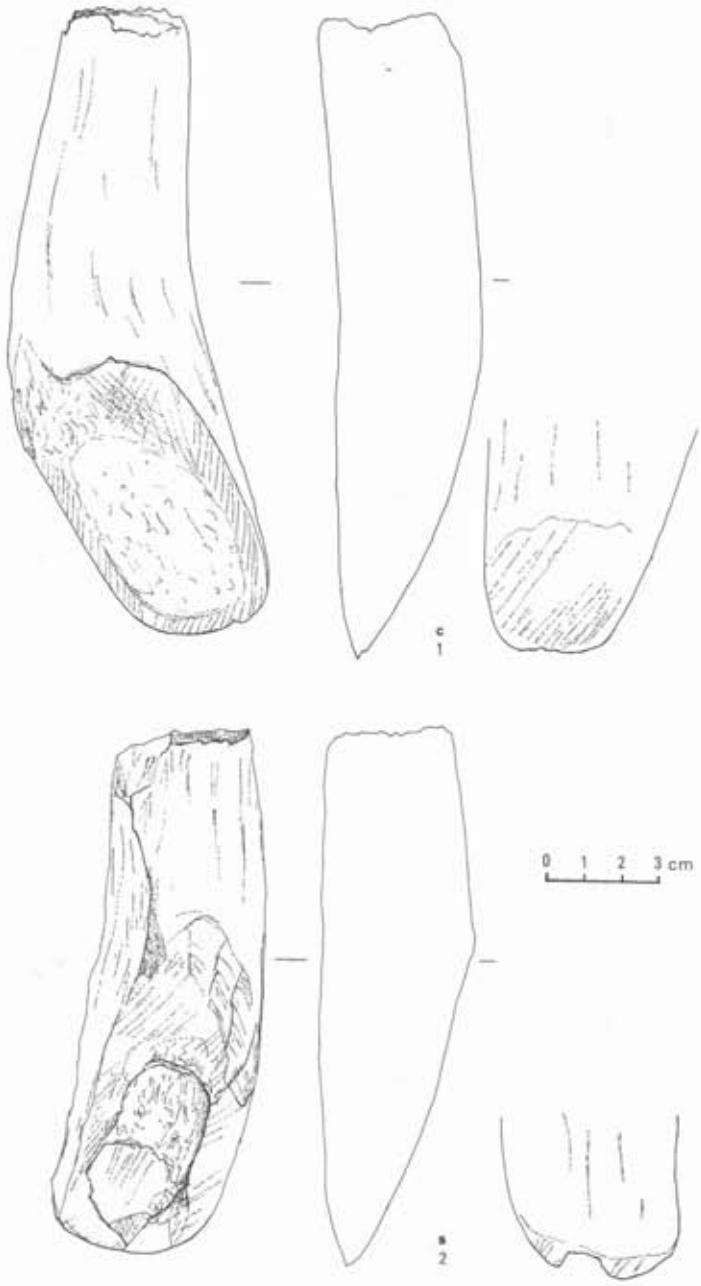

Fig. 21 - Riparo Gaban, the antler tools (numbers see description in the text, S: Sauveterrian, C: Castelnovian).

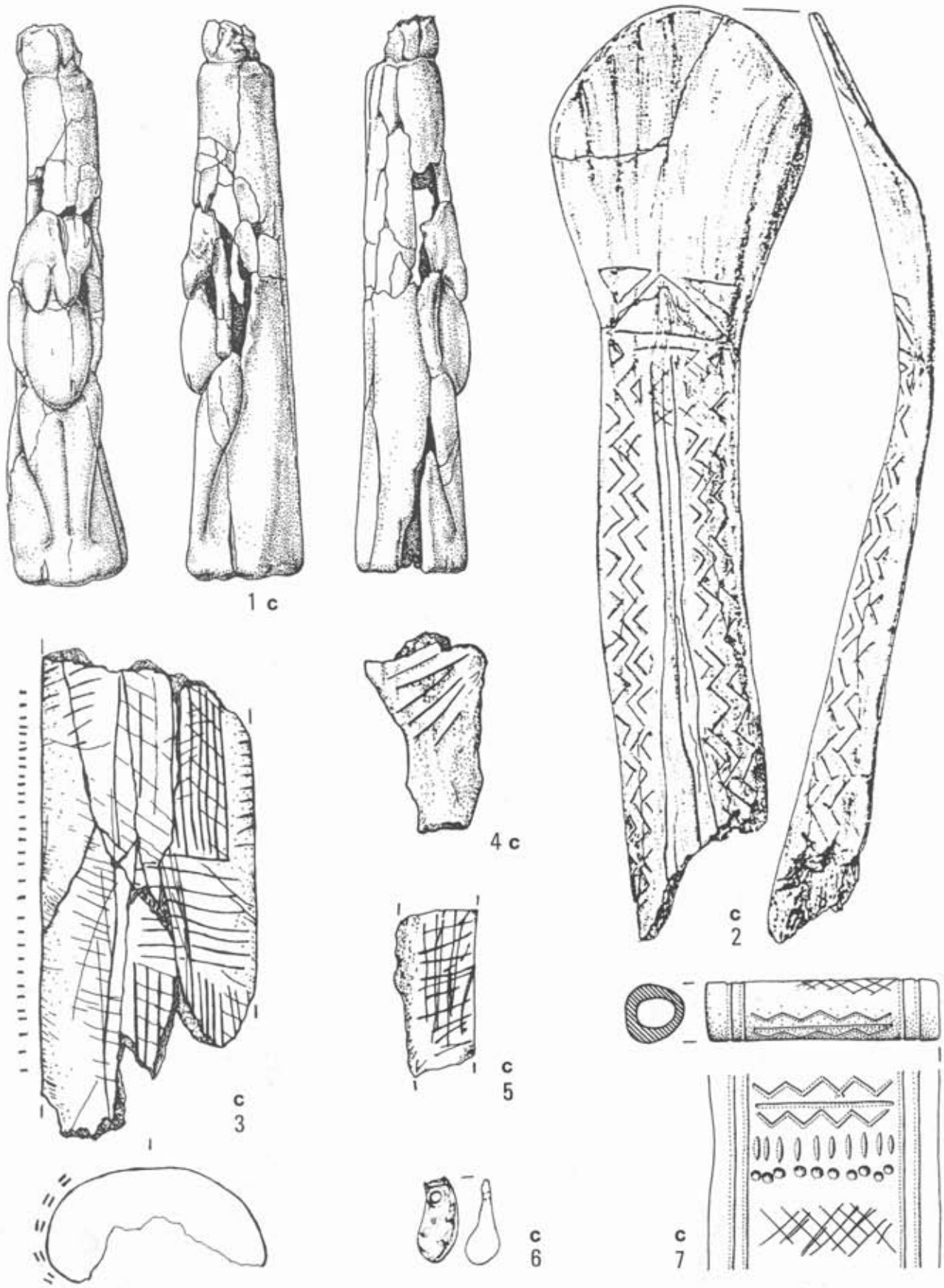

Fig. 22a - Riparo Gaban, bone and antler decorated pieces

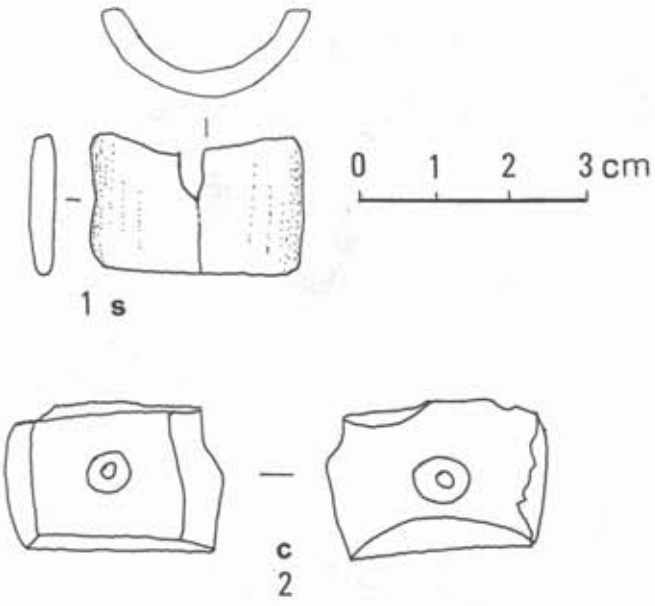

Fig. 22b - Riparo Gaban, a perforated marble plaquette.

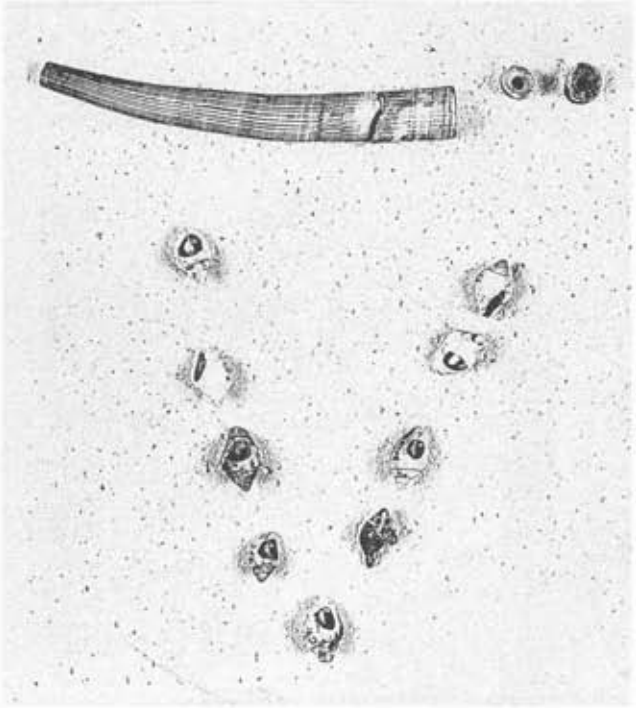

Fig. 23 - Riparo Gaban, Dentalium and Columbella, beads together with those made of fish vertabrae.

Fig. 24 - Riparo Gaban (Castelnovian Mesolithic levels), "Venus" made from deer antler (Photo: E.Munerati).

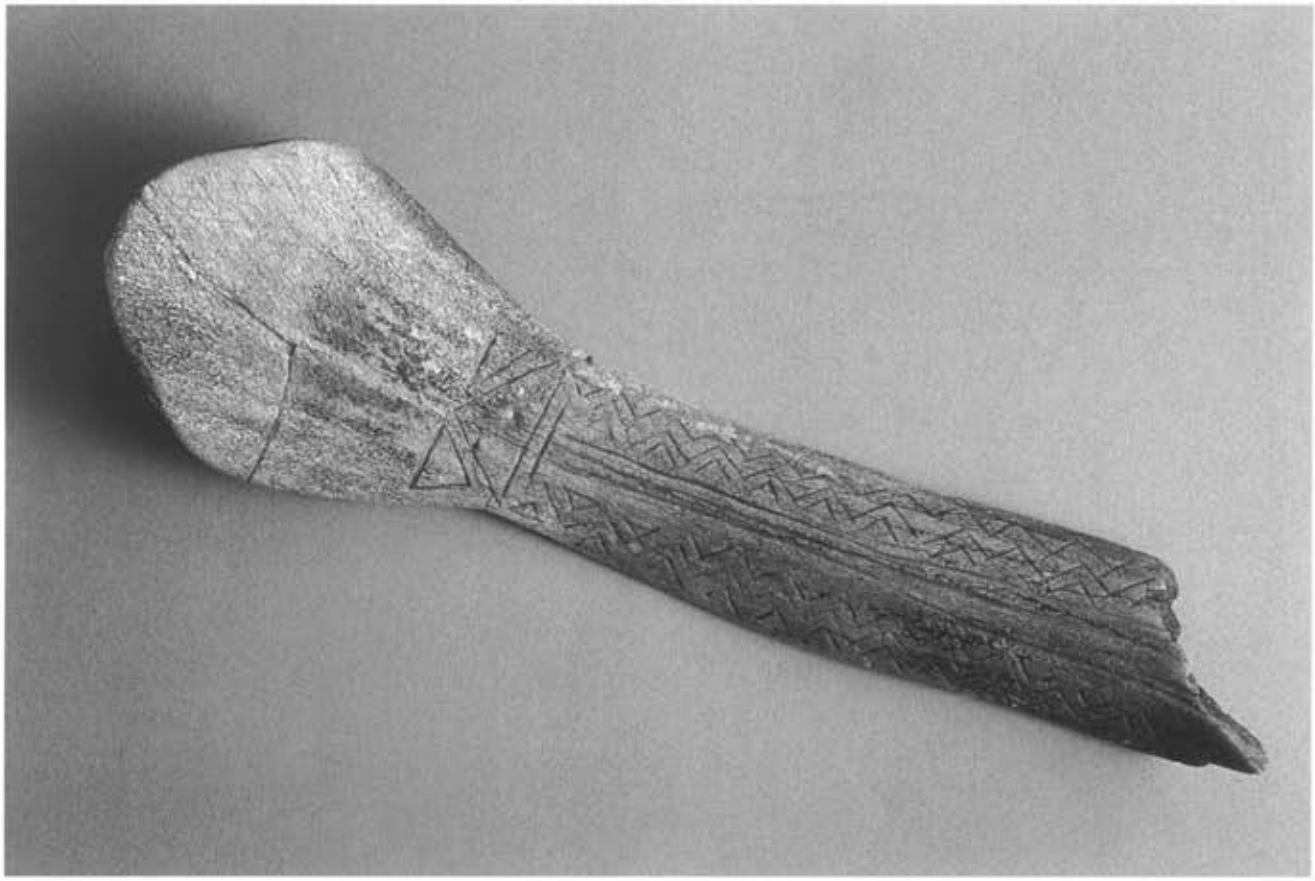

Fig. 25 - Riparo Gaban (Castelnovian Mesolithic levels), fragment of spatula made from deer antler and decorated by geometric motifs (Photo: E.Munerati).

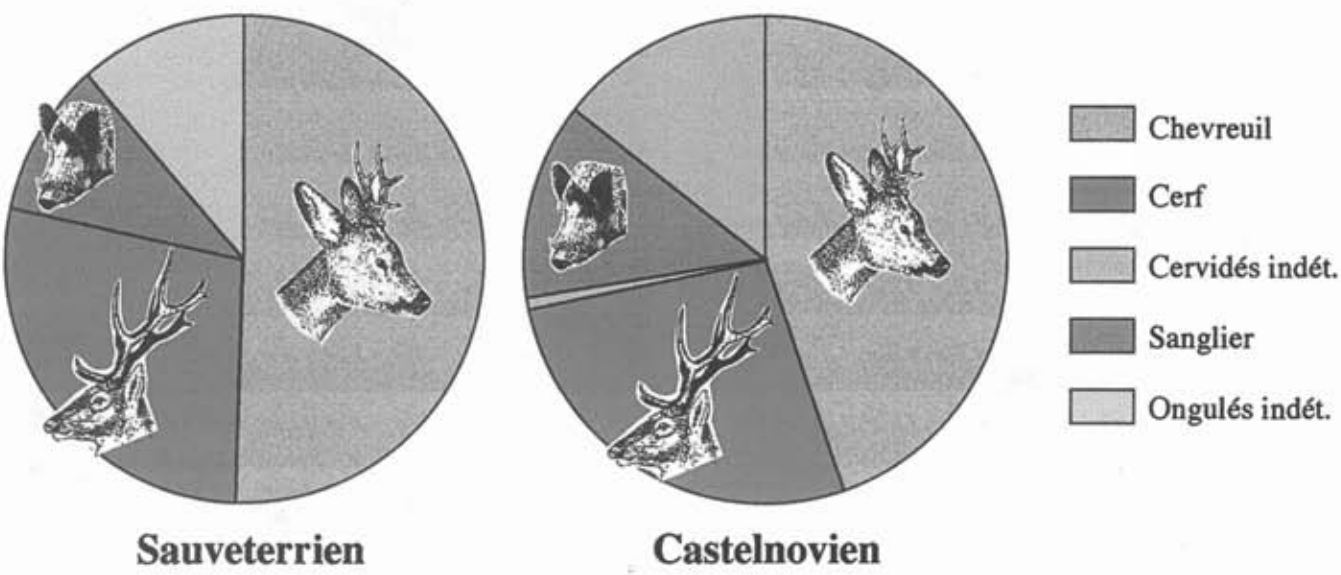

Fig. 26 - Fréquences en NR des Ongulés présents dans les ensembles mésolithiques de l'abri Gaban.

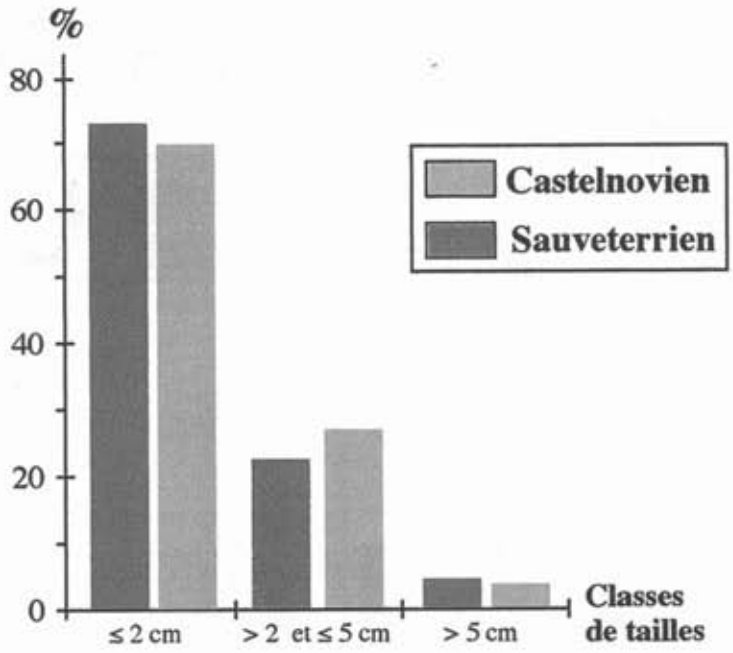

Fig. 27 - Répartitions des ossements par classes de tailles.

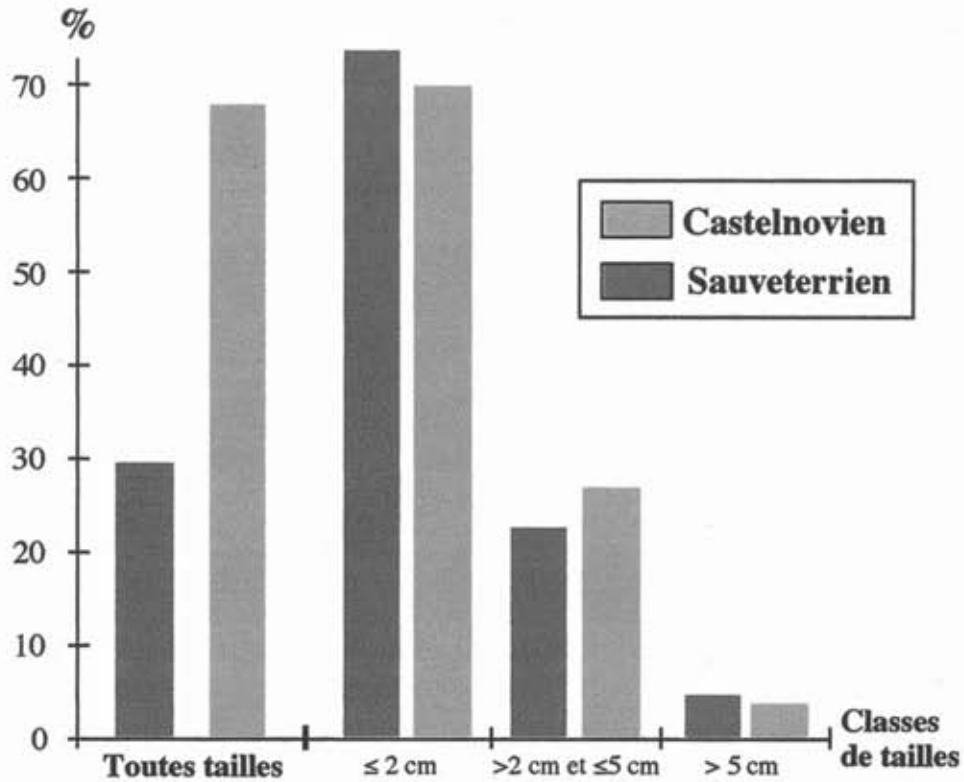

Fig. 28 - Répartitions des ossements brulés par classes de tailles.

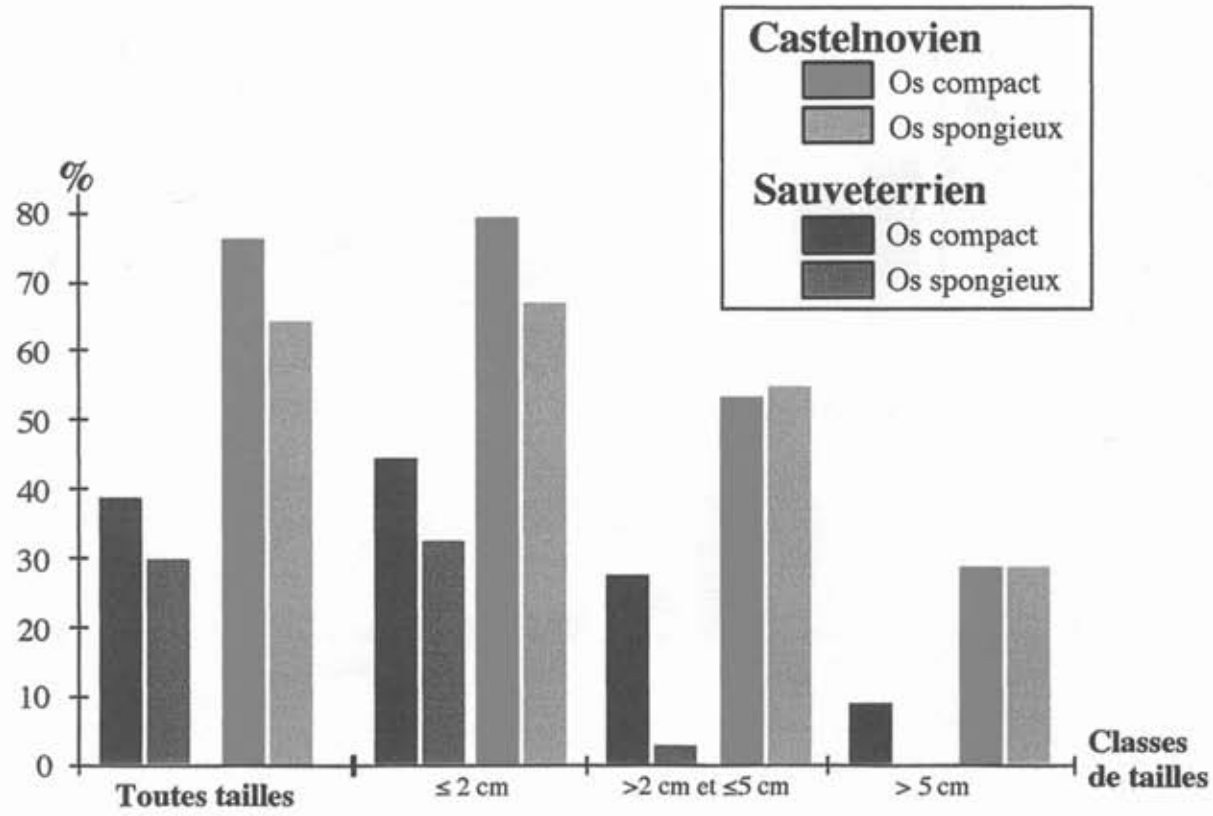

Fig. 29 - Répartitions des ossements brulés par classes de tailles en fonction de leur nature histologique.