1979

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THE COMPARATIVE STRATIGRAPHY OF PALAEOLITHIC PALESTINE WITH SPECIAL EMPHASIS ON THE FLINT IMPLEMENTS

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B.A. University of Saskatchewan, 1971

THESIS

Submitted in partial fulfilment of the requirements
for the Master of Arts degree
Wilfrid Laurier University
1979

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ABSTRACT

Since World War I the Palaeolthic industries of Palestine have been the subject of a considerable amount of investigation and discussion. The results of this work have been made available to scholars of the Ancient Near East primarily in isolated journal articles or publications of single sites. The present writer intends, therefore, to present an account of those Palaeolithic industries in which this data is collected, systematized and interpreted in such a way that scholars working in this area of Near Eastern studies may have at their disposal a foundation which is readily meaningful and broadly factual.

This foundation is divided into four major sections. In chapter I the history of studies in this field is reviewed so that our intentions may be set within this perspective. Chapter II introduces us to the information which is crucial to the development of a chronology and typology for this period. The typology is set forth s[illegible]stically and then it is explained much more fully i[illegible]hapter III. With the construction of the chart in chapter II outlining the Palaeolithic typology, and with its detailed explanation in chapter III we concentrate most

keenly on the synthesis of this data which has not been widely available to scholars. Finally, in chapter IV we go beyond the tools to look at the men who made them. Our emphasis is on the implications of these tools in understanding the tool-makers.

Inasmuch as there are many terms and related concepts which are not used widely outside of the study of prehistory, we have included in the text many figures, and we have attached a glossary of terms at the end of this work.

The final chapter is intended to point the way to further research arising out of the work which we have presented.

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CHAPTER I

INTRODUCTION

The History of Studies in Palaeolithic Palestine

The systematic study of Palaeolithic Palestine began with the excavation of three large caves in the Wadi el Mughara of Mount Carmel by D. Garrod in 1928. The results published in 1937 and 1939 revealed not only a continuous occupation stretching from the Lower Palaeolithic through the Upper Palaeolithic, but also a rich store of fossil human remains from the Middle Palaeolithic.[1] The magnitude of this find still commands serious attention due to the quantity of material from many of the layers. In the Tabun cave alone over fifty-five feet of occupational debris contained well over 55,000 tools. Garrod's division of layer E has been criticized as subjective and her technique as primitive.[2] This coupled with the Tayacian problem and the Pre-aurignacian problem have prompted new

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[1] D.A.E. Barrod and D.N.A. Bate, The Stone Age of Mount Carmel, vol. 1. (Oxford: Clarendon Press, 1937) and McGowen and Keith, The Stone Age of Mount Carmel, vol 2. (Oxford: Claredon Press, 1939).

[2] David Gilead, "Early Palaeolithic Cultures in Israel and the Near East" (Ph.D. dissertation, Hebrew University, 1970), pp. 329-330.

excavations which are still in progress.[1]

While the work on Mount Carmel was in progress, R. Neuville began excavation in the Judean desert south of Bethlehem at the Lower Palaeolithic cave of Oumm Qatafa. Within the surrounding wadis more caves were excavated and as at Mount Carmel a continuous sequence of occupational levels was established, stretching from the Lower Palaeolithic through the Upper Palaeolithic. Here at least seven caves are involved and occupation, therefore, moved from cave to cave with fewer remains than at Mount Carmel. The discoveries led to a further development of the typology for Palestine by correlations with the finds at Mount Carmel. R. Neuville's work Le Prehistorique de Palestine (Rev. Bib., 1934, pp. 237-259) was followed by the work of R.P. de Vaux, La prehistoire de la Syrie et de la Palestine d'apres les recherches recentes (Rev. Bib., 1946, pp. 99-124). Finally Neuville completed his publication of material from the seven caves in 1951, "Le Paleolithique et le Mesolithique du desert de Judee." This work has had a considerable influence in establishing the sequence of the Upper Palaeolithic in more detail.

Meanwhile in Syria two Palaeolithic rock shelters at Jebrud near Damascus contained a third Palaeolithic sequence which paralleled those of Mount Carmel and the

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[1]Ibid., pp. 330-339.

Judean desert. This was published in 1950 by A. Rust (De Hohlenjunde von Jabrud (Syrien)). Although the quantity of tools catalogued was much smaller than that of Carmel the attention shown by Rust to stratigraphy has made his work somewhat of a standard in this aspect of Palaeolithic research in Syria Palestine.

Thus the broad outlines of the greater part of the Palaeolithic typology emerged. The result was an increasing tendency to think of the Palestinian Palaeolithic within the Near Eastern context rather than simply comparing it with the more detailed typologies that had already appeared in Europe. Also interest grew in the development of chronological frameworks. Thus Wetzel and Haller began the work of relating the fossil beaches of the Lebanese coast with the various industries and ultimately it was hoped that this could be related to the climatic fluctuations of the Pleistocene. This has not yet proven entirely satisfactory[1] despite the work of H. Fleisch, "Les depots de la cote Libanaise et leur place dans la chronologie basee sur le Quaternaire marin," (Quaternaire III, 1956, pp. 101-131). Similar work was done by J. Ewing at Ksar Akil and D. Garrod at Adloun and Ras el Kelb.[2]

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[1]W. P. Farrand, "Palaeo-Environment of Pleistocene Man in the Levant." Eretz-Israel 13 (1977): 1-13.

[2]D.A.E. Garrod and D. Kirkebride, "Excavation of a Palaeolithic Rock Shelter at Adlum, Lebanon, 1958,"

Inasmuch as the cave deposits never contained material from the earliest Lower Palaeolithic phases the discovery in 1959 at Ubeidiya of an industry which contained typological similarities with the early chopping industries of Olduwai Gorge raised considerable interest. The excavations just south of the Sea of Galilee carried out by M. Stekelis and his colleagues provide us with the earliest Palaeolithic finds in Palestine. The variety of the specialists involved and the detail of the reports have clearly outlined the value of the finds (M. Stekelis, Archaeological Excavations at Ubeidiya, 1960-1963, publication of the Israel Academy of Sciences and Humanities, Jerusalem 1966. M. Stekelis et al, Archaeological Excavations at Ubeidiya, 1964-1966, Israel Academy of Sciences and Humanities, Jerusalem, 1969. L. Picard and U. Baida, "Geological Report on the Lower Pleistocene Deposits of the Ubeidiya Excavations," G. Haas, "On the Vertebrate Fauna of the Lower Pleistocene Site, Ubeidiya." Also see a summary work by Ofer Bar Yosef, "Early Man in the Jordan Valley," Archeology 28 (January 1975)). Not only does Ubeidiya provide an early assemblage but also those tools are found in relationship with severe tectonic movements which it is hoped will provide chronological links with other aspects of the Pleistocene.

Fifth International Congress of Prehistoric and Protohistoric Studies, Hamburg, 1959.

In recent years there have been several more comprehensive treatments of the Palaeolithic in the Near East. F.C. Howell in Upper Pleistocene Stratigraphy and Early Man in the Levant (Proc. Am. Phil. Soc., vol. 103, 1959, pp. 1-65) presents a typological study coupled with new climatic studies from cave soils and fossil beaches. H. E. Wright in Climate and Prehistoric Man in the Eastern Mediterranean presents a survey that is most strongly based on geological evidence. Jean Perrot has published a recent survey of Palaeolithic studies in which he emphasizes the chronological framework in which to set the Palaeolithic of Palestine. Perrot discusses both relative and absolute frameworks and their potential. (Dictionnaire de la Bible, Supplement, columns 288-366), 1972.

The latest survey of Palaeolithic finds in Palestine is contained in the Hebrew section of Ertez-Israel 13: 1-17. For an English summary of this article see pp. 288-290 of the same volume.

These are the key studies of the Palaeolithic of Palestine. There are hundreds of other sites and many other reports, some of which we shall meet presently.

Current Problems

There are several problems which face scholars working with material from Palaeolithic Palestine. In the first place significant terminological ambiguity exists.

Terms such as "racloir" and "sidescraper" are at times used to refer to the same tool and by other writers are used to distinguish between tools. Another tool which has two designations is a point we shall encounter, variously named Font-Yves, Krems, or El-Wad. A standard classification of tools with a fixed terminology has not yet been established for the Near East of Palestine. Thus the industry from the lower levels of Tabun is variously designated "Tayacian," "Tabunian," Jabrudian" and "Clactonian." The Upper Palaeolithic has been divided into six stages designated either by numbers or by key sites.

The comparative youth of Palaeolithic studies in Palestine accounts for many of these problems. A number of the most important contributions to our understanding in this area have come from prehistorians trained in Britain or France. These persons have brought with them classifications and terminology which reflect those areas. As the study of Palaeolithic Palestine has matured a number of these terms and classifications have proven unsatisfactory after they have become established in the literature. In an effort to replace or modify them some confusion has arisen. Currently the impetus for such prehistoric research comes from within Israel itself so we may hope for a continued reworking of these difficulties.

A second area of concern has to do with the inaccessibility of data, especially in a form which is meaningful to scholars familiar with the Near East but largely untrained in Prehistory.

There are three basic areas in which one might find this data and all three are likely to prove problematic. Archaeological reports which form the basis of such a study are obtained only through inter-library loans, and often at quite an expense. As most of these reports were published in journals after 1930 they are rarely found concentrated in any particular library. Once gathered these reports due to their technical nature are largely meaningless to the average scholar. There may also be a language barrier in that such major reports as those on the Judaean desert and Jabrud are in French and German respectively.

One would hope then that there might be a summary of data with helpful commentary in a more readable form. To date this need has only been filled by Anati's Palestine Before the Hebrews, 1968, which is a good summary of current discussions but lacks in reporting the primary data. Furthermore, this work is no longer in print.

The third area in which one might hope to find some help is in the general works on the Old Stone Age. There are several of these but only that by Bordes pays any attention to Palestine. His information is well directed

but far too brief to be of any substantial assistance. Here again the problem arises of terms that can only be understood by those with a prior knowledge of prehistory.

Author's Intent

It is the present writer's intention, therefore, to present an account of the data related to the Palaeolithic industries of Palestine in such a way that the scholar working in this area of investigation may have at his disposal a foundation which is at once readily meaningful and broadly factual. This account will be composed of a synthesis of data from the major archaeological sites that have subsequently molded the chronology and typology for Palestine. In order to overcome the terminological barrier, diagrams, figures, charts and explanations will accompany the typological data and form a major part of the text. As well there will be a glossary attached to to the text for general purposes.

To this foundation of data will be attached chapters dealing with the broader problems of chronology and some aspects of Palaeolithic life. Inasmuch as the present synthesis of stratigraphy and typology is primarily foundational, we will conclude with some suggestions for further research arising out of this work.

CHAPTER II

TYPOLOGY AND CHRONOLOGY

By way of a simple introductory explanation we may say that the Palaeolithic of Palestine is generally divided into three main periods which are subject to further subdivision as follows:

Lower Palaeolithic
Pebble Culture?
Lower Acheulian
Middle Acheulian
Upper Acheulian
Jabrudian and pre-Aurignacian

Middle Palaeolithic or Levalloiso-Mousterian or Mousterian

Upper Palaeolithic
Stage 0 ? pre-Aurignacian ?
Stage 1 Emiran
Stage 2 Transitional
Stage 3 Ahmarian
Stage 4 Antelian
Stage 5 Atlitian
Stage 6 Kebarian

The Lower Palaeolithic is dominated by hand-axes except in the early Pebble phase and the late Jabrudian and Pre-Aurignacian levels. The Middle Palaeolithic marks the peak of the use of the Levallois technique, and the Upper Palaeolithic is characterized by the production of blades.

The Problem of Chronology

Since the archaeological exploration of the caves

in the Wadi Mugharet by Garrod and Bate a limited number of scholars have wrestles with the possibility of linking the Palestinian lithic typology with another chronology. This has been attempted by means of the study of fauna, pollens, cave soils, fossil beaches, coastal dunes, and the ancient beaches of inland lakes. All of these have been found in relation to Palaeolithic industries form various periods, and all have the potential of affording some conclusions as to the fluctuations of the ancient climate. By a study of these climatic fluctuations and the related tools from the Near east it is ultimately hoped that at some point a synchronization with the climate and industries of Europe may be obtained.

This endeavor has not been without is serious difficulties and an ongoing spectrum of opinions.[1]

The study of pollens has really only begun. The study of fauna was initiated by Bate who aasumed climatic variations on the basis of the frequency of woodland deer versus grassland gazelle as indicated by the faunal remains in the Carmel caves. However, one could just as surely explain these remains as evidence of the hunting preference of the cave's occupants, and so Bate is no longer followed.

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1. Farrand W.R, Palaeo-environment of Pleistocene Man in the Levant", Eretz-Israel, vol 13, pp 1-12.

There has also been some discussion of a "great faunic rupture" such as occurred in Europe at the onset of the last glaciation, and indeed, faunic changes such as that of the -16m. level of Ksar Akil have occurred in the Near East.[1] However, the interpretation of these has been made difficult by the fact that the climatic fluctuations in the Near East which parallel those of the last European glaciation were comparatively modest. This allowed some species to persist,and possibly the influx or removal of others was retarded as compared with Europe.[2] L. Picard held that the fauna has always been "sub-tropical", and has never included tropical or boreal-artic elements. This opinion is still held except for Ubeidiya.

F.C.Howell has systematically examined the soils of the more important caves of Syria and Palestine and suggests that the red clays are indicative of wetter periods,[3] whereas Wright suggests that the red clays may

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[1]Ewing J.F, "Preliminary note on the Rxcavations at the Palaeolithic site of Ksar Akil, Republic of Lebanon" Antiquity, vol 24, (1947) p192.

[2]Picard L,"Inferences on the Problem of the Climate of Pleistocene Palestine and Syria", The Prehistoric Society, No 5, 1937.

[3]Wright H.E, "Climate and Prehistoric Man", p76

simply be the result of non-occupancy.[1]

Furthermore, Wright suggests that the specific nature of the variations of temperature and humidity during the last glaciation in Europe is much less clearly understood than is generally appreciated, so that correlations with the pluvials of the Near East are essentially in jeopardy.[2] Even if this problem was solved we would be uncertain as to which pluvial conditions necessarily correspond to given glacial conditions.

The fossil beaches of the Lebanese coast reveal that on at least four occassions the Mediterranean Sea pressed inland during the Pleistocene. The oldest of these transgressions covered the shore to a height of 80 to 100 meters and then 30 to 60 meters. The third transgression rose to the 15 to 20 meter level. This fossil beach is generally considered to be coincident with the last interglacial of Europe, that is, the Riss/Wurm. Therefore, flint implements found in relationship with this beach can supposedly be related also to the chronology of Europe.[3] There are also traces of a six meter beach from the fourth transgression.

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[1] H.E.Wright, "Climate and Prehistoric Man", p76

[2] Ibid., p 78 ff.

[3] F. C. Howell, "Upper Pleistocene Stratigraphy and Early Man in the Levant", Proceedings of the American Philosophical Society, no.103, (1959), p 3.

There are several sites along the coast which are geologiacally related to these beaches and so are potentially valuable in the comparison of European and Near Eastern typologies and chronologies. Bahsas, Chekka, and Ksar Akil are associated with the beach of the third transgression.[1]

The interpretation of fossil beaches is beset by the probability that the majority of the Upper Palaeolithic deposits in such beaches were laid down below the present sea level, if as is generally supposed, the Upper and much of the Middle Palaeolithic occured during the last glaciation when the transfer of water from the oceans to the ice sheets caused the regression of the coast line.[2] Nevertheless, Wright still maintains:

> The most reliable basis for distant correlations is probably the marine terrace and its associated sediments, for glacier controlled changes in sea level are presumably world-wide and unaffected by local climates.[3]

Ksar Akil, at which Wright worked as full time geologist holds conside-able promise in this regard. It has been carefully excavated and given up nearly 2,000,000 flint artifacts or fragments and well over 1,000,000

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[1] J. Perrot, "Prehistory", PP 303,4

[2] H. E. Wright,"Climate and Prehistoric Man in the Eastern Mediterranean",

[3] Ibid., p 85.

pieces of bone.[1] This wealth of information is linked in its lowest levels to the 18 Meter beach which is generally supposed to be of the last interglacial period. There are also three distinct red clay beds in this deposit which may also indicate three pluvial maxima, and as mentioned above, there is a sharp faunal break at the -16 m. level.[2] With all this potential it is a great pity that the definative publication for this site has not yet been made.

Whereas inland lakes are the product of local climatic conditions and tectonic forces, it is not safe to use them as links in worl-wide correlations in the same way that the fossil beaches have been used.

The stream terraces in the Judaean desert associatied with the caves explored by R. Neuville are also difficult to use, mainly because they are hard to follow. Those of the Wadi Khareitoun have been altered by tectonism and descend too sharply to the Salt Sea to leave systematic terraces.

A series of Carbon 14 determinations have been collected for the Palaeolithic by Perrot and are as follow:[3]

For the Middle Palaeolithic:

Ras el Kelb, Levallois-Mousterian,	Gr N-2556:	52,000
Ksar Akil, Levallois-Mousterian,	Gr N-2579:	43,750±1500
Shanidar, Mousterian	Gr N-1495:	50,000±3000
Djerf Ajla, Levallois-Mousterian	NZ	43,000±2000
Kebara, Levallois-Mousterian	N-2561:	41,000
Tabun-D, Lower Levallois-Mousterian	Gr N-2170:	35,400±900

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[1] J.Ewing, "Priliminary Note on Ksar Akil", Antiquity p 190.

[2] Wright, Op, cit., p 75

[3] Perrot, Op. cit., pp 286 ff.

Tabun-C, Lower Levallois-Mousterian, Gr N-2729: 40,000± 1,000

Tabun-B, Upper Levallois-Mousterian, Gr N-2534: 39,000± 800

For the Upper Palaeolithic:

Shanidar-C, Baradostian,	Gr N-2016:	35,440± 600
	Gr N-2015:	34,450± 500
	Gr N-1830:	33,900± 900
	Gr N-1494:	34,000± 420
	W-178 :	29,000± 1500
		28,700± 700
	L-335H:	26,500± 1500
Shanidar-B, Zarzian,	W-179 :	12,000± 400
	W-667 :	10,600± 300

One should note then that the Carbon 14 determination for the transition from the Middle to the Upper Palaeolithic is at about 35,000 B.P., similar to that of Europe. Whereas there are still problems with the Carbon 14 method, and indeed, the date for Tabun D is younger than those of the later layers C and B, the general picture provided by these determinations is likely to be of continuing value, at least with regards to the relative sequence in Palestine and other parts of the world.

Of final interest is the variety of opinions that have been put forward since the work of Rust at Jabrud.[1] This variety is precipitated by the pre-Aurignacian industry which Rust observed at Jabrud. The pre-Aurignacian is an industry from the late Acheulian or early Middle Palaeolithic which contains a significant number of blades. Blades in these proportions are not found until the Upper Palaeolithic, and so their presence here is monst unexpected and unparalleled outside the Near East. In order to

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[1] H. E. Wright, "Climate and Prehistoric Man", p.78.

explain their presence here one might assume that in fact the development of flint industries in the Near East was considerably retarded as compared with Europe, and the pre-Aurignacian represents a brief influx of material from Europe at the beginning of the Upper Palaeolithic. This technical advance was soon lost in the retarded culture of the Near East, and was not found again until it was introduced a second time from the later Upper Palaeolithic of Europe. This roughly is the position of F. Bordes, who suggests then that the Acheulian and Levallois-Mousterian occurred in the Near East as late as Wurm II and Wurm III respectively.[1] F.Clark Howell includes the pre-Aurignacian as the first phase of the Upper Palaeolithic (numbered "stage O" because there was already a "stage I").[2] Miss D. A. E. Garrod su-ports a chronology for the Near East in which the Acheulian coincides with the last interglacial and the Levallois-Mousterian with Wurm I. Vaufrey puts the Acheulian in Wurm I.[3] Perrot put the pre-Aurignacian at 45,000 B.P. or earlier,[4] and Gilead places it as early as 70,000 B.P.[5] Bordes and presumably Howell would put it around 35,000 B.P.

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[1] F. Bordes, "Le Palaeolithique inferior et moyen de Jabrud (Syrie) et la question du Pre-Aurignacien," L'Anthropologie 59 (1955) pp486-507.

[2] F.C.Howell,"Upper Pleistocene Stratigraphy" pp25,26

[3] H.E.Wright, "Climate and Prehistoric Man",p.78.

[4] J.Perrot, "Prejistory", p339.

[5] D.Gilead, Early Palaeolithic Cultures, p 335.

The Typology Chart

The typology chart is divided into three sections representing the Lower, Middle and Upper periods of the Palaeolithic. Across the top are listed archaeological levels from various sites, beginning on the left with the earliest and moving right across the page to progressively later levels. The tools are listed in the left margin and are arranged with the earliest at the top and those below are progressively later in a general sense. The tool families are given in capital letters and variations within several of the families are listed in smaller letters. The number of variations that could be listed was limited by the space on the page. This was unfortunate especially with regards to the hand-axes. Therefore, they will be dealt with in detail in the chapter on the Lower Palaeolithic.

Some serious problems were met in the construction of this chart. The reporting of artifacts varied considerably with regards to terminology and the extent to which cataloguing was carried out. Thus one might neglect to report waste flakes, cores, unretouched Levallois flakes, or, in the earlier layers, atypical small tools that were infrequent until much later periods. Some tools were also irregular or belonged to rare classifications beyond the scope of this study. Some writers gave percentages for only the tools which dominated the level. Others gave no percentages. Instead tools were spoken of as rare, frequent

common, etc.

We have included in each tool family a category termed "various" to cover tools of a variety we have not specified. If the report simply gave the family name we have placed them in the category of "various" by the family name.

One should note that the capitalized "VARIOUS" at the bottom of the page includes only tools whose family name was not given or tools whose family name is not on the chart. An example of such would be the core family.

We have also used the letters "P", "R", and "A" to refer to tools whose percentage we could not determine but which were known to be present or, more specifically, rare or abundant respectively.

Chart 1 TYPOLOGY CHART

LOWER PALAEOLITHIC

Early Acheulian — Cave Acheulian — Pre-Aurignacian

TOOLS / LEVEL	Ubeidiya III 12	III 20	II 24	I 15-L F	K 5	Ubeidiya K 6	Qatafa E	J. B. Yaqub V	M. Baruckh	Qatafa D 2	Qatafa D 1	Jarub I 24/25	I 23	Jarub I 22	Tabrud F	E d	E c	E b	Tabuh E a	Zuttiyeh	Jabrud I 17	16	15	14	13	12	Jabrud 1
CHOPPERS	P	P	17	15	41	41																					
SPHEROIDS		P	1	5	14	2																					
PICKS			1	.9	3	14																					
HAND-AXES				1	2	13	59	48	P	46	P	2	6		28	20	12	13	15	P	15					6	.
CLEAVERS								29			P																
DISKS															3	1				P							
R end-bulb, one-sided										6					11	20	25	25	22	P	3	3		16		3	1
A end-bulb, double															2	3	5	4	3	P							
C end-bulb, pointed															2	3	4	3	.8					4		1	
L end-bulb, angled															1	3	.7										
O end-bulb, others										4					.8	2	2	2	3								
I oblique, one-sided															5	10	12	10	9								
R oblique, angled															4	7	7	6	6								
various							10				P	41	41	52	7	14	15	17	18	.3				4		.5	.
F																											
L Levallois							9											P	P	P							
A notched																											
K utilized				19	9	7				4		24		14	.5	.6	.6	10	2		4	41	15	80	31	75	6
E unused	R	P	55	38	9	12		20							+6	+.6	+2	+9	+2		23	14	41	80	31	75	6
B blunt-backed																											
L nibbled-blade																				P							
A notched-blade																				P							
D flake-blade										23	P																
E various							9								.2	.2		.3	1	P			25		47		
P Audi																	.1		.1								
O Chatelperron																	.5		1				.7		1.8		
I Emiran																											
N Le Moustier																											
T El-Wad																											
Gravette																											
various										10	P	14	15	8	.2	.3	.4	.9	1	P	4			.2		3	
SCRAPER steep & semi-steep															4	4	4	6	7				1		4		
end							10								.3	.4	.2	.5	.3				2		5		
nose																			.1	P							
round																											
flake																											
various								2																			
B angle										2																	
U bec-de-flute																		P	P								
R polyhedric																		P	P								
I beaked																											
N flat																											
various											P		2	1	.8	.6	.6	.7	.8	P	.9		6	.2	5	3	.
BORERS										2	P	4										6	.3	.2	1	.2	
MICROLITHS																											
VARIOUS			26	20	21	11	3			1		4											9	.8	4	.7	

MIDDLE PALAEOLITHIC

TOOLS / LEVEL	Jabrud I 17,18	Tabun D	Skhul C	Tabun C	Tabun B	Jabrud I 14	Tabun Chn I&I	Skhul B2	Skuhl B1	Abu Sif C,B	Sahba C,B	Shukbah D	Jabrud I 10&12	Jabrud I 1-9	Tabun B
CHOPPERS		2		.1			1	.1	.1						
SPHEROIDS															
PICKS															
HAND-AXES	12	2		.4	.1			.1				.3	6	.1	.1
CLEAVERS															
DISKS		.2		.1	.4							2			.4
R end-bulb, one-sided		18		14	22	87	14	7	11	P	P	10	9		32
A end-bulb, double		6		7	3		4	1	2			5			3
C end-bulb, pointed													.7		
L end-bulb, angled						7									
O end-bulb, others			.5												
I oblique, one-sided	1									P	P				
R oblique, angled															
various	32			.6	.5		.4	.2	.3	P	P			13	.5
F															
L Levallois		14	26	+21	+20		+26	25	27	P	P	41	P	P	20
A notched		2		5				.2	.2	P	P				1
K utilized	14	3	5	5	12		8	3	2	P	P	10			12
E unused		+12	64	+11	+8		+10	47	29	P	P		74	43	8
B blunt-backed															
L nibbled-blade															
A notched-blade															
D flake-blade															
E various		8		11	2		2			P	P	22		10	
P Audi										P					
O Chatelperron										P	P				.1
I Emiran															
N Le Moustier										P	P				4
T El-Wad															
Gravette										P					
various	37	15	.5	4	8	1	7	2	2	P		7	10	22	4
SCRAPER steep & semi-steep		.3		.6			.6	.1				.2			
end		.1					.7		.1			1			.1
nose		.1			.1		.2								
round							.2								
flake															
various		2		.4	2	2									2
B angle											P				
U bec-de-flute										P	P				
R polyhedric															
I beaked															
N flat															
various	4	2	1	1	1	1	1	.2	.1	P		2	5	.3	1
BORERS					1	.4							.1	.1	
MICROLITHS															
VARIOUS		.7				7								6	

UPPER PALAE

I — II — III

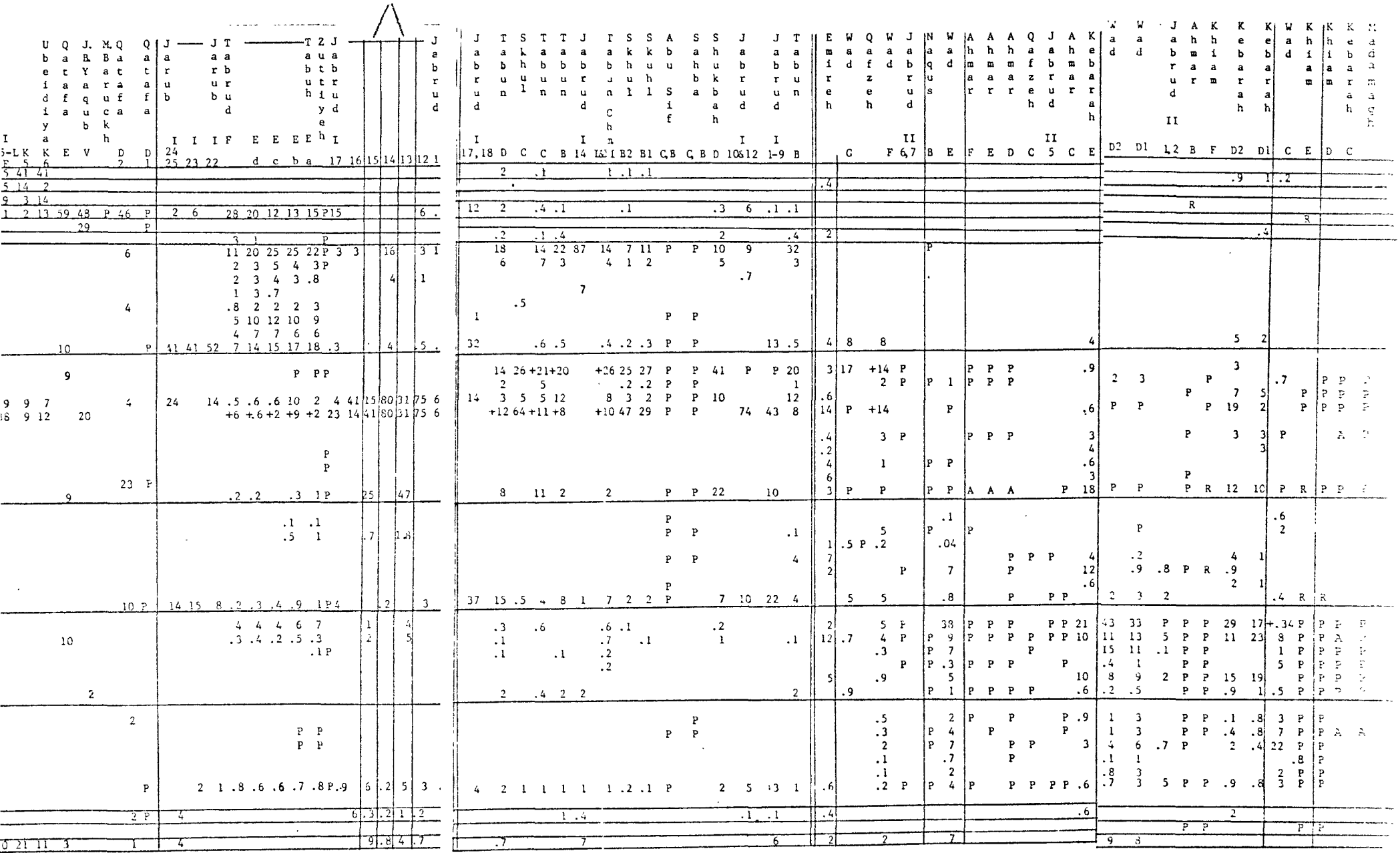
TOOLS / LEVEL	Emireh	Wad G	Qafzeh	Wad F	Jabrud II 6,7	Naqus B	Wad E	Ahmar F	Ahmar E	Ahmar D	Qafzeh C	Jabrud II 5	Ahmar C	
CHOPPERS														
SPHEROIDS	.4													
PICKS														
HAND-AXES														
CLEAVERS														
DISKS	2													
R end-bulb, one-sided						P								
A end-bulb, double														
C end-bulb, pointed						.								
L end-bulb, angled														
O end-bulb, others														
I oblique, one-sided														
R oblique, angled														
various	4	8		8										
F														
L Levallois	3	17		+14	P			P	P	P				.
A notched				2	P	P	1	P	P	P				
K utilized	.6													
E unused	14	P		+14			P							:
B blunt-backed	.4			3	P			P	P	P				
L nibbled-blade	.2													
A notched-blade	4			1		P	P							.
D flake-blade	6													
E various	3	P		P		P	P	A	A	A			P	1
P Audi							.1							
O Chatelperron				5		P		P						
I Emiran	1	.5	P	.2			.04							
N Le Moustier	7									P	P	P		
T El-Wad	2				P		7			P				1
Gravette														.
various		5		5			.8			P		P	P	
SCRAPER steep & semi-steep	2			5	P		38	P	P	P		P	P	21
end	12	.7		4	P	P	9	P	P	P	P	P	P	10
nose				.3		P	7				P			
round					P	P	.3	P	P	P			P	
flake	5			.9			5							10
various		.9				P	1	P	P	P	P			.6
B angle				.5			2	P		P			P	.9
U bec-de-flute				.3		P	4		P				P	
R polyhedric				2		P	7			P	P			3
I beaked				.1			.7			P				
N flat				.1			2							
various	.6			.2	P	P	4	P		P	P	P	P	.6
BORERS	.4													.6
MICROLITHS														
VARIOUS	2			2			7							

NOTE: P=present R=rare A=abundant

Chart 1 TYPOLOGY CHART

LOWER PALAEOLITHIC — MIDDLE PALAEOLITHIC — UPPER PALAEOLITHIC

cheulian — Cave Acheulian — Pre-Aurignacian — I — II — III — IV — V — IV

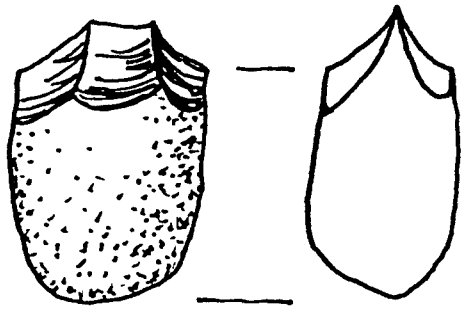


NOTE: P=present R=rare A=abundant

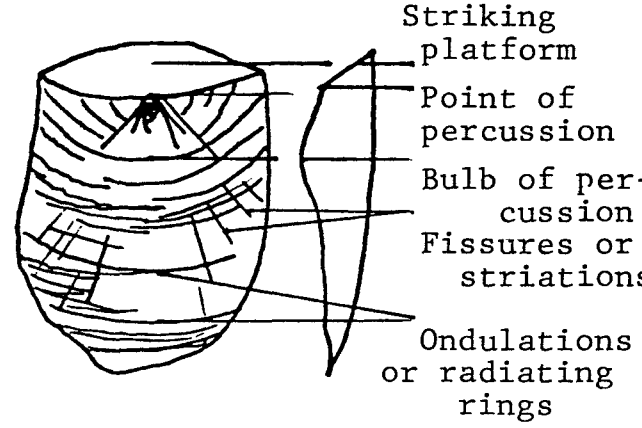
The Development of Technique

An examination of the typology chart indicates that the various periods are characterized by the manufacture of essentially four types of tools: choppers, hand-axes, flake-tools, and finally, blades. These involve four separate manufacturing procedures of increasing sophistication. Thus the typology of the Palaeolithic is grounded in the development of technique.

The earliest choppers from Ubeidiya have been made by simply striking flakes off a pebble in one or two directions. Later this flaking was extended to include the whole surface of the tool.



Pebble Chopper
Figure 1



Flake characteristics
Figure 2

The striker was another pebble. This is called the "block on block" technique which was characteristic of the earliest pebble cultures of Olduvai. The "block on block" technique continued in use throughout the whole of the Palaeolithic. However, only in the earliest phases as at

Ubeidiya is it dominant.

The block on block technique can be recognized by the scars left by the flaking process. When a flake is removed a bulb of percussion appears on the flake and a corresponding negative bulb of percussion appears on the flint core from which the flake was removed. Also rings will be seen radiating from the point at which the flake was struck. (see figure 2)

Essentially similar to the "block on block" technique is that using a stone anvil against which the core is swung causing the removal of a flake.

The "block on block" and "stone anvil" techniques used on the early choppers, sheroids, picks and hand-axes left deep-biting scars corresponding to the bulbs of percussion. Therefore, the cutting edges of these tools often zigzagged or formed what is known as an "S-twist." The radiating rings were quite pronounced, and there were also fissures or striations created by excessively violent blows. These fissures radiated out from the point of percussion. (See figure 2)

With the next development in technique thes features were softened. The bulbs of percussion left shallower scars, the rings blended more smoothly into the flake surface, the fissures were avoided, and the tool-makers were able to finish their works to a degree unparalleled by modern experimenters. The use of a softer hammer of

bone, antler or hard wood made this possible. With the ability to remove thinner more regularly sized flakes, the Acheulian tool makers developed standarized forms of tools. In this period the hand-axe family of tools is divided amongst many forms, and the consistent production of certain of these forms at various periods of the Lower Palaeolithic has been suggested as the key to our understanding of the typology.[1] (See figure 12 for the various forms.)

The Middle Palaeolithic is characterized by the production of flakes using the Levallois technique. This technique was present in the Lower Palaeolithic and continued on into the Upper Palaeolithic but only in the Middle Palaeolithic was it dominant. It involved several new procedures. First, the end product was basically prepared on the core. The flake's outer surface was trimmed and its essential size and shape were determined while it was still attached. Secondly, the core was prepared so that with one blow the tool-flake could be removed from it. A surface was prepared at a right angle to the flake so that the decisive blow could be conveniently and accurately placed. More modern experimenters have been able to detach Levallois flakes successfully by striking the core against a stone anvil.[2] F. Bordes claims that they can be removed

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[1]David Gilead, 'Early Palaeolithic Cultures."

[2]Flint Impliments, British Museum Publication, p. 55.

by direct striking.[1] Once the flake was removed it could be further trimmed and finished.

Levallois flakes are often triangular or oval in outline and have one flat side corresponding to the surface on the core from which they were struck.

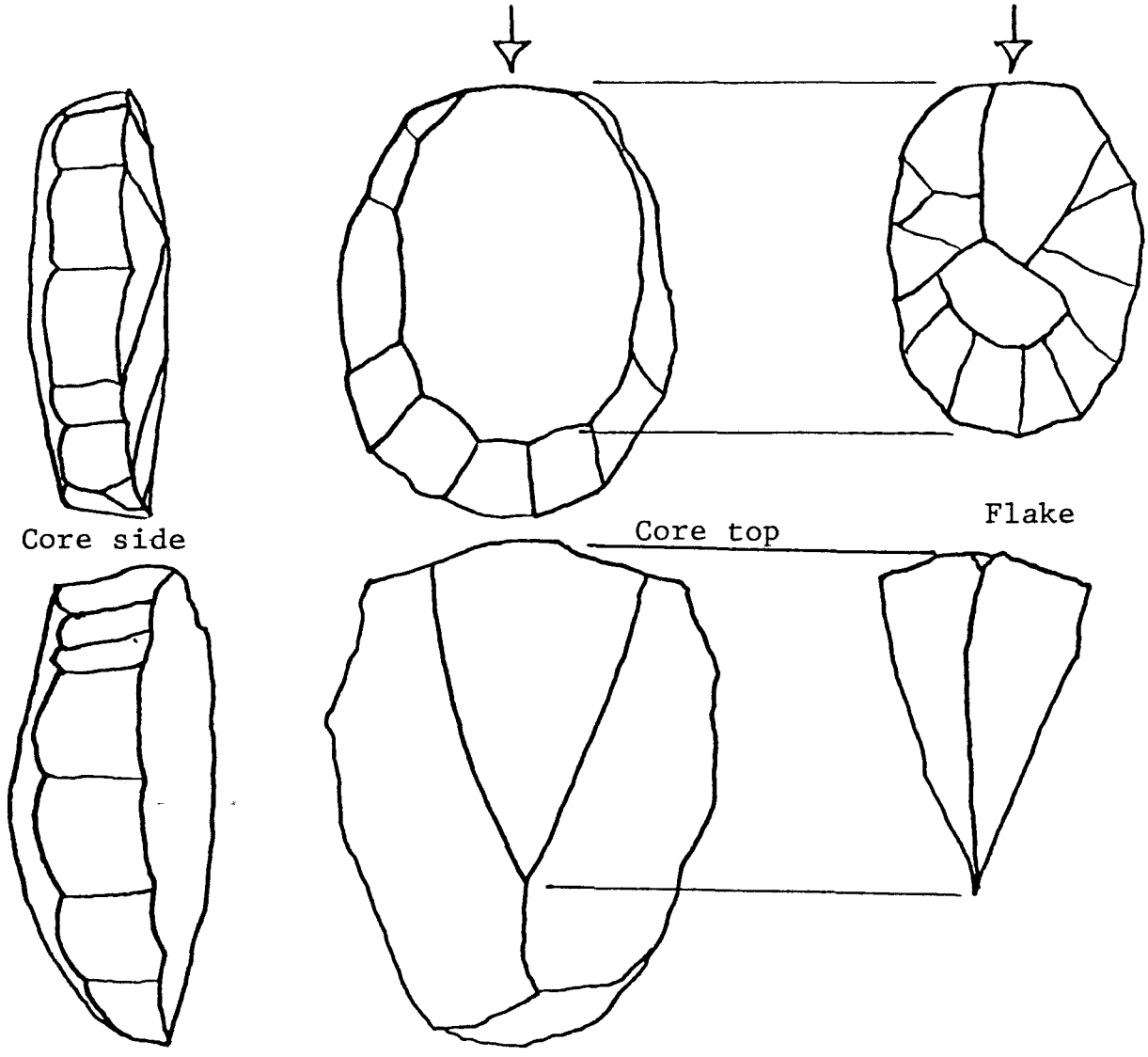


Figure 3 : The production of broad and triangular Levallois flakes.

[1]F. Bordes, The Old Stone Age (Toronto: McGraw-Hill, 1968), p. 28.

The technique used to produce blades in the Upper Palaeolithic involves indirect percussion or pressure. The methods illustrated below have been observed in historic times. Various results can be obtained, depending on the roundness or pointed nature of the tip of the punch. Once again the punch is of a resilient material like antler, bone or hard wood.

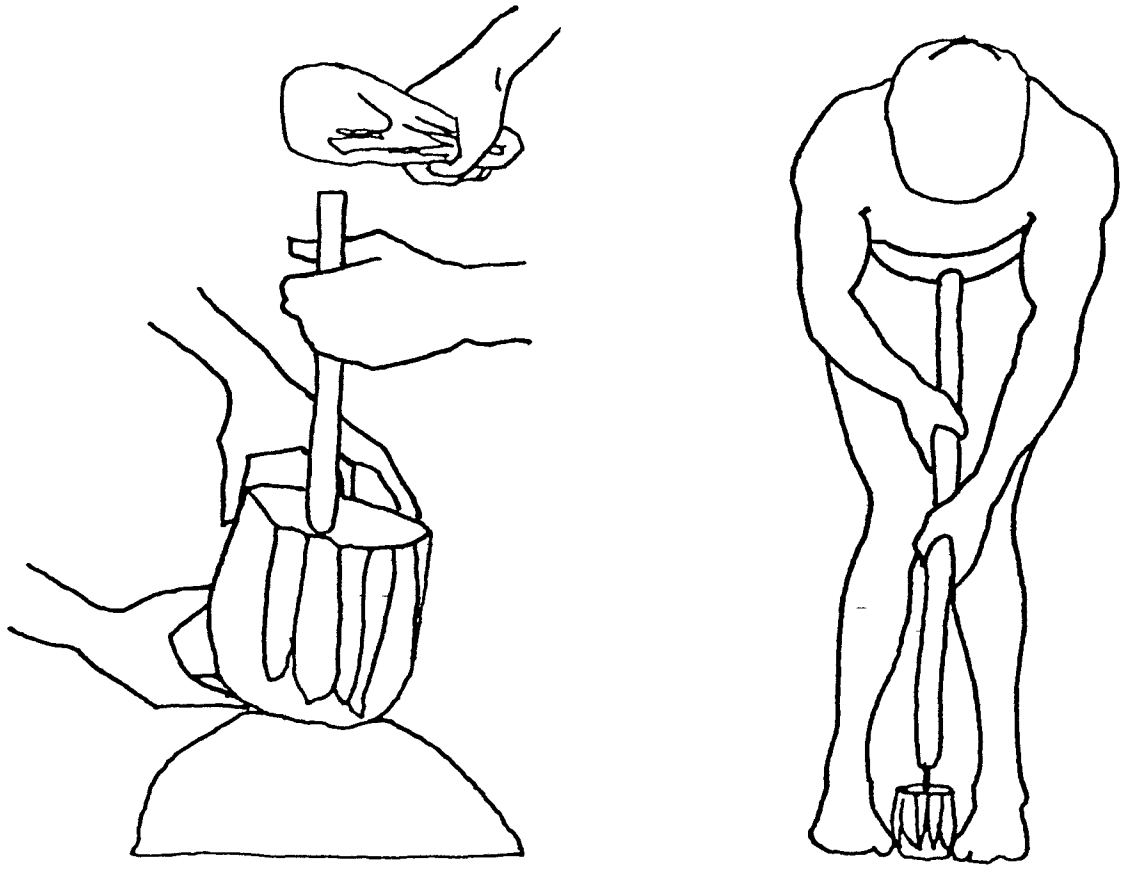


Figure 4: Punch technique and pressure technique[1]

[1]Ibid., p. 26.

The blades produced by these methods are slightly curved with a reduced bulb of percussion. They are also thickest at the punched end.

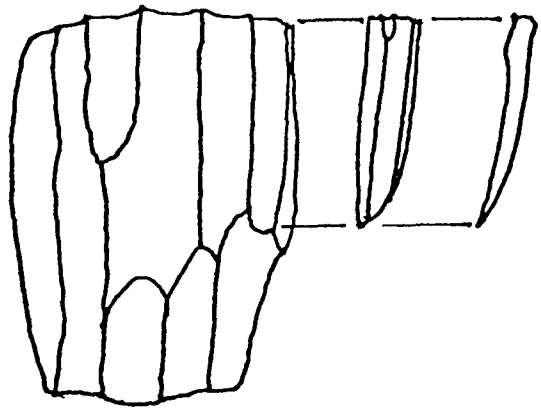


Figure 5: Blade and Core

Pressure flaking was used especially in the Neolithic period and possibly earlier to finish tools. By this method flakes of not more than one-half inch in length can be removed with fine uniformity. Thus very nicely dressed tools can be obtained. Two examples of present day methods of pressure flaking are illustrated in figure 7.

The development of flaking techniques in the Palaeolithic can also be followed by noting the cores characteristic of each period. In the earliest period there were not prepared cores as tools were formed from pebbles or flakes removed by hard percussion. Similarly, very fine hand-axes were shaped in the Acheulian from flint pebbles or large flakes. (See figure 6)

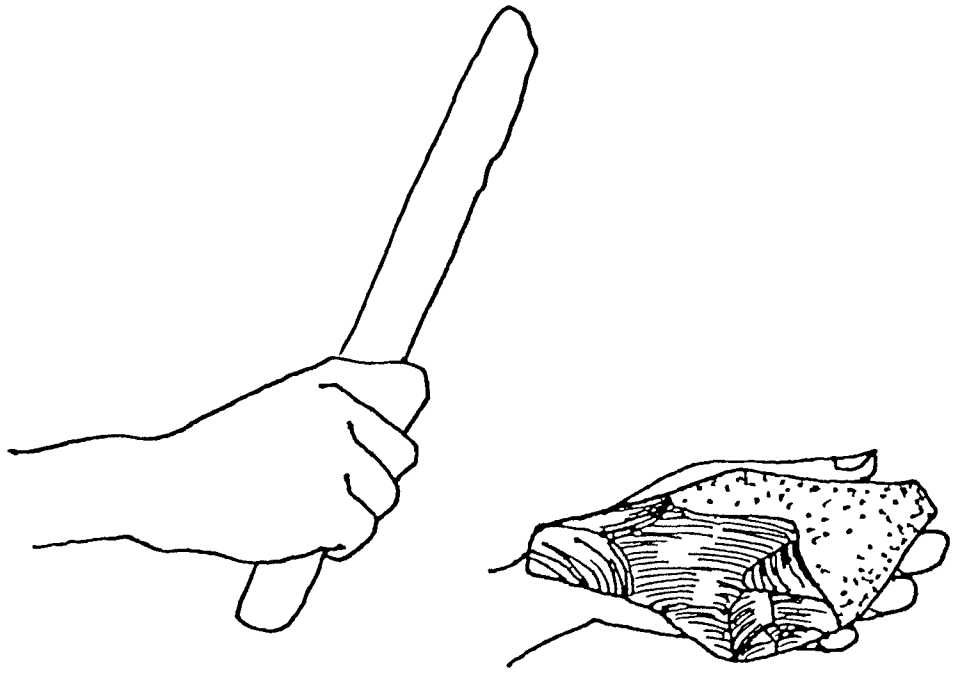
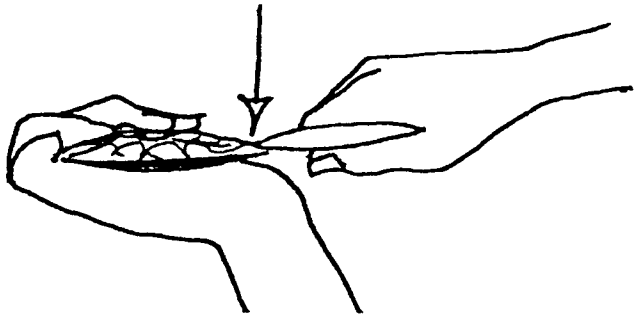
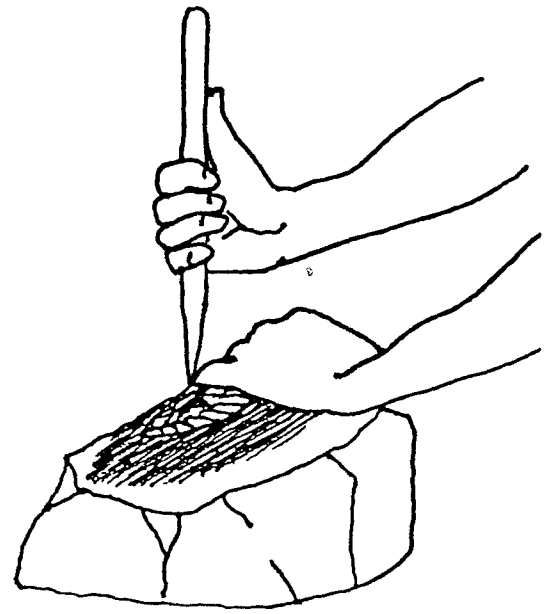


Figure 6: The production of a hand-axe using a "soft" hammer. From Flint Implements, p. 48.



Pressure flaking in North America after W.H. Holmes



Pressure flaking in N.W. Australia after D.S. Davidson

Figure 7: Pressure flaking, from K.P. Oakley, Man the Tool-maker, p. 27.

The first prepared cores come in the Middle Palaeolithic. The Levallois technique incorporated two common core shapes, the tortoise-back from which broad flakes were produced and the longitudinally flaked core from which triangular flakes were made. (See figure 3) In the Upper Palaeolithic the prismatic core becomes dominant. It is especially designed for the production of blades. (See figure 5)

Both the Levallois cores and the prismatic cores of the Upper Palaeolithic can be used for the multiple production of flakes and blades respectively. When such is the case the secondary flakes have both an upper and a lower surface which is quite flat and the blades have on their upper surface long low ridges.

CHAPTER III

THE PALAEOLITHIC INDUSTRIES

The Lower Palaeolithic

The material from the Lower Palaeolithic has been divided on the basis of site types into two categories. The material from the caves is regulated by conditions of stratigraphy that relate industries from various periods rather intimately. The material from the open sites is often earlier than that of the caves, however, it is not always bound by horizons indicating its age in relationship with other industries. Instead there are often faunal comparisons, geologic indications, or most often typological similarities with other deposits that give us a clue to the relative chronology.

We will deal first with the open sites and then the cave deposits.

The Olduwan and Early Acheulian of Ubeidiya

Toward the end of the Lower Pleistocene the climate of the Near East was damper than it is today allowing great lakes to form. The accompanying lush vegetation attracted many large vertebrates. Also the men of this period left their tools on the shores of these lakes, on river banks

and beside the sea.[1]

Ubeidiya, the oldest site in Palestine, is located in the marshes of one of these lakes that formed in the central Jordan Valley. These deposits have since been severely folded by tectonic movements similar to those which originally formed the valley.[2]

Excavations at Ubeidiya uncovered tools from the ancient marshes. Some of these were in a fresh condition while others were abraded by the action of the sea which twice expanded. Tools were also found on the slope rising from the sea. These were sometimes subject to abrasion, especially in the layer K-6, which was possibly transported by the seasonal flow of the wadi bed where it was discovered.

The tools of Ubeidiya offer interesting evidence of the development of early assemblages and technologies. The earliest levels like II-24 include choppers, spheroids and picks but no hand-axes. The core-choppers were usually formed by removing from three to ten flakes with a stone hammer.[3]

Flint was preferred for choppers. A large portion of the natural cortex remained, especially on the butt-end.

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[1] J. Perrot, "Prehistory," p. 325.

[2] O. Bar-Yosef, "Early Man in the Jordan Valley," Archaeology 28 (1975): 31-35.

[3] Ibid., p. 35.

The average width of 4-5cms. is usually greater than the average length of 3-4cms. Chopping tools are the most commonly found tool at Ubeidiya.

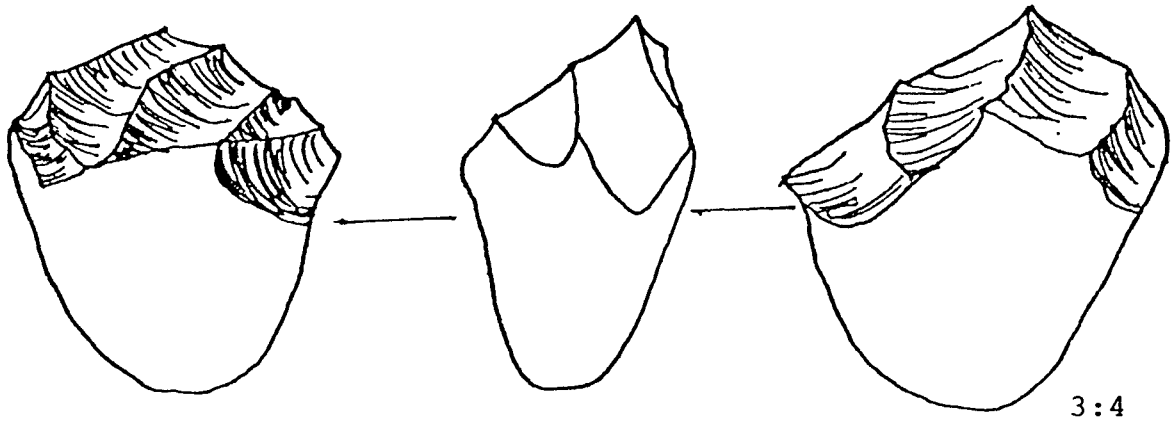

Figure 8: Core choppers, from M. Stekelis, Ubeidiya, 1966, plate VIII.

About 95 percent of the spheroids were made of limestone,[1] but basalt and flint were also used.[2] The diameter is between 45 and 120mm. except for one specimen of 157 mm.

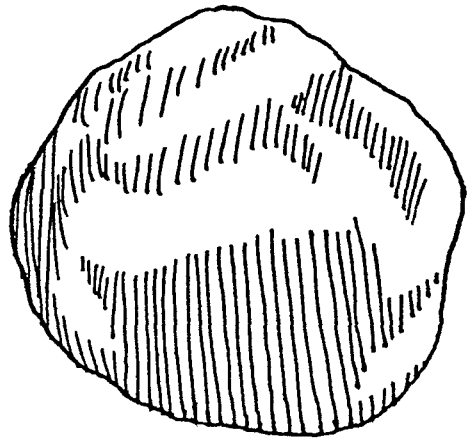

Figure 9: A spheroid, from O. Bar Yosef, Archaeology 28: 35.

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[1]M. Stekelis, O. Bar Yosef and T. Schick, Archaeological Excavations at Ubeidiya, 1964-66 (Jerusalem, 1966), p. 11.

[2]Ibid., p. 20.

The picks were usually made of basalt, but also of flint and limestone. Like the chopping tools a considerable surface of natural cortex often remains on the butt-end. The points of the working end have been classified on the basis of their cross-section into proto-trihedrals, trihedrals, and quadrihedrals.[1]

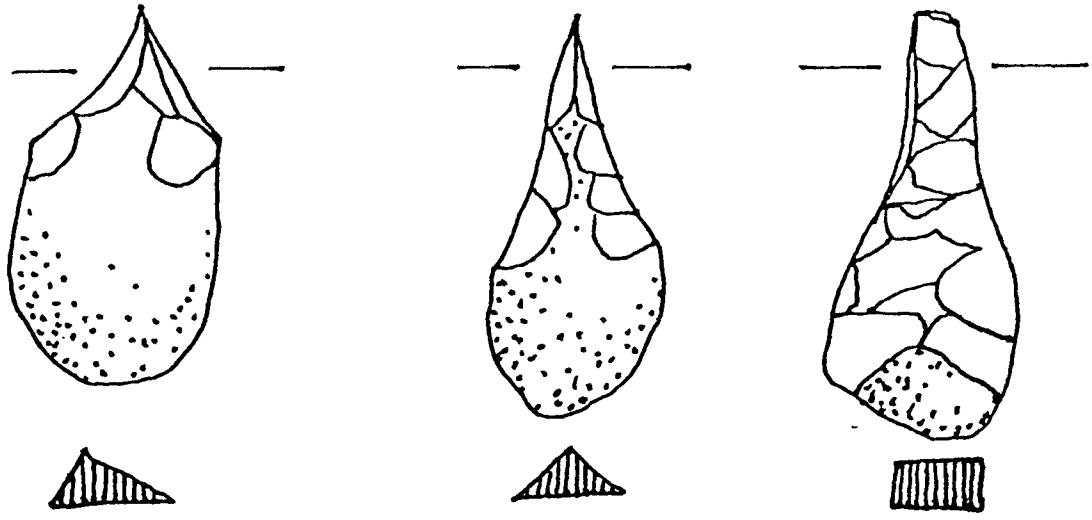

Figure 10: Proto-trihedral, trihedral, and quadrihedral picks.

There is considerable range in sizes with the picks from a minimum length of 113mm. to a maximum of 285mm.[2]

Hand-axes join the assemblage in layer I-25. These become more common in the later levels of the slopes, K-5 and K-6. Most of the hand-axes are made of basalt rather than flint. The butt-ends are thick with

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[1]Ibid., p. 12.

[2]Ibid., p. 17.

cortex remaining. Each face has only about five or six deep flake scars and the edges are therefore sinuous. The hand-axes are usually of a pointed or proto-cleaver form.[1] Excavations up the slope from the ancient marshes uncovered an assemblage in trench K-5 containing many spheroids, core choppers, flake tools, and hand-axes. The flake tools include such light duty tools as scrapers, awls and burins. These are characteristically of flint.[2]

The level of K-6 contains an abraded selection of choppers, basalt picks and hand-axes, but no spheroids.[3] The more sophisticated hand-axes now have up to fifty flake scars.[4]

The assemblages of Ubeidiya are important for the typological similarities they bear to those of Olduwai Bed II.[5] They also outline the transition from a very primitive industry dominated by chopping tools to a more advanced assemblage in which hand-axes are conspicuous. One should, however, cautiously recall the fragmentary nature of the evidence. While some working stations may be associated with the living floor of I-15 [6] the

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[1]Ibid., p. 13.

[2]Ibid., p. 11.

[3]O. Bar-Yosef, Archaeology, p. 36.

[4]Ibid., p. 35.

[5]M. Stekelis, O.Bar-Yosef and T. Schick, Op. cit, 25.

[6]Ibid., p. 15.

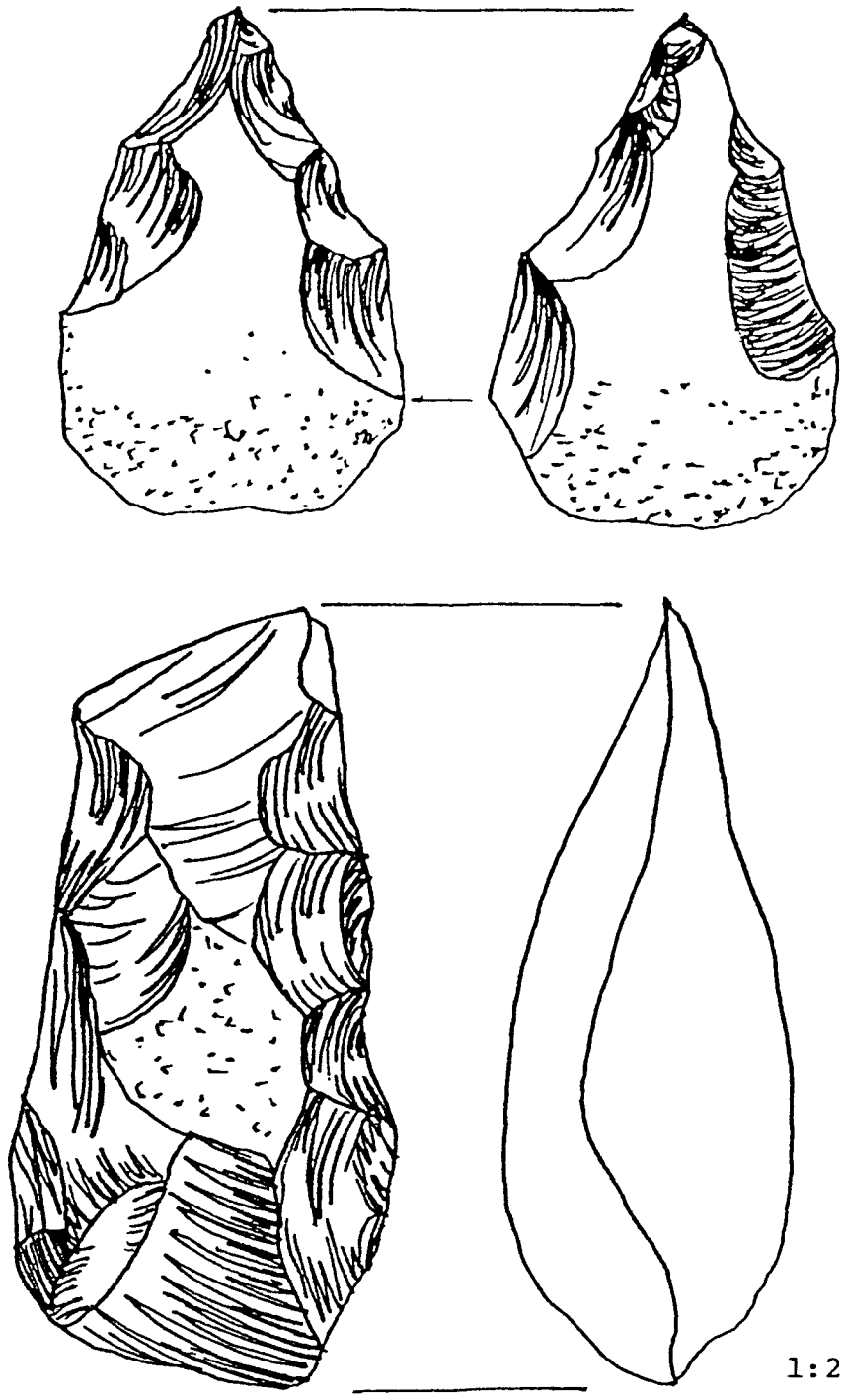

Figure 11: Pointed hand-axe and proto-cleaver, from Stekelis.

industry recovered is necessarily limited, especially that of the earliest levels and that of K-6 which was subject to the sorting of a flowing stream.

Work by M. Prausnitz and A. Ronen at Evron Quarry has recently uncovered an Early Acheulian industry which included "large, simple bifaces and hand-axes which resemble some of those from Ubeidiya. These are chopping tools, hammer stones and cores."[1] A fauna dominated by large vertebrates was also present. The Evron site is adjacent to an ancient river bed.

The Middle Acheulian

In the Middle and the Late Acheulian the hand-axes became the dominant tool. Their manufacture became refined by the use of a resilient striker or hammer so that preferred shapes became standardized and produced with remarkable regularity. The most common of these shapes or outlines for the hand-axes are shown in figure 12.

Perhaps the oldest Middle Acheulian industry has been found at Jisr Banat Yaqub, level V. Like Ubeidiya and Ma'ayan Baruckh it was an open hunting station of the ancient Jordan Valley.

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[1]M. W. Prausnitz and A. Ronen, "Early Acheulian Site in the Evron Quarry." Israel Exploration Journal 27 (1977): 162-163.

UBEIDIYA: THE LITHIC DATA FROM UBEIDIYA — Chart 2

	Provisional Olduvan								Early Acheulian																
	12 III	20 III	21 II	22	23	24	25	26	15 I	27 II	28	29	32	36 III	24 III	25	(5) K-29	(6) K-30	37 II	38	39	40	34 III
									Living Floor	Abraded (beach)								Abraded (Wadi)		Hippo kill			Abraded (Wadi)
Choppers	R	P	P	P	P	17	P	12	15	P	P	P	P	P	P	P	41	41	R	P	P	P	P
Spheroids		P				1			5				P	P			14	2	R				
Picks						1			.9					P			3	14					
Hand-axes									1					P			2	13		P	P		
Utilized Floor									19								9	7					
Flakes	R	P			P	55		67	38	P		P	P		P	P	9	12	R	P	P	P	P
Varia					P	26	P	21	20			P				P	21	11					
Total	-	-	1	2	20	164	8	97	1684	3	2	22	-	-	4	5	202	210	-	-	-	-	10

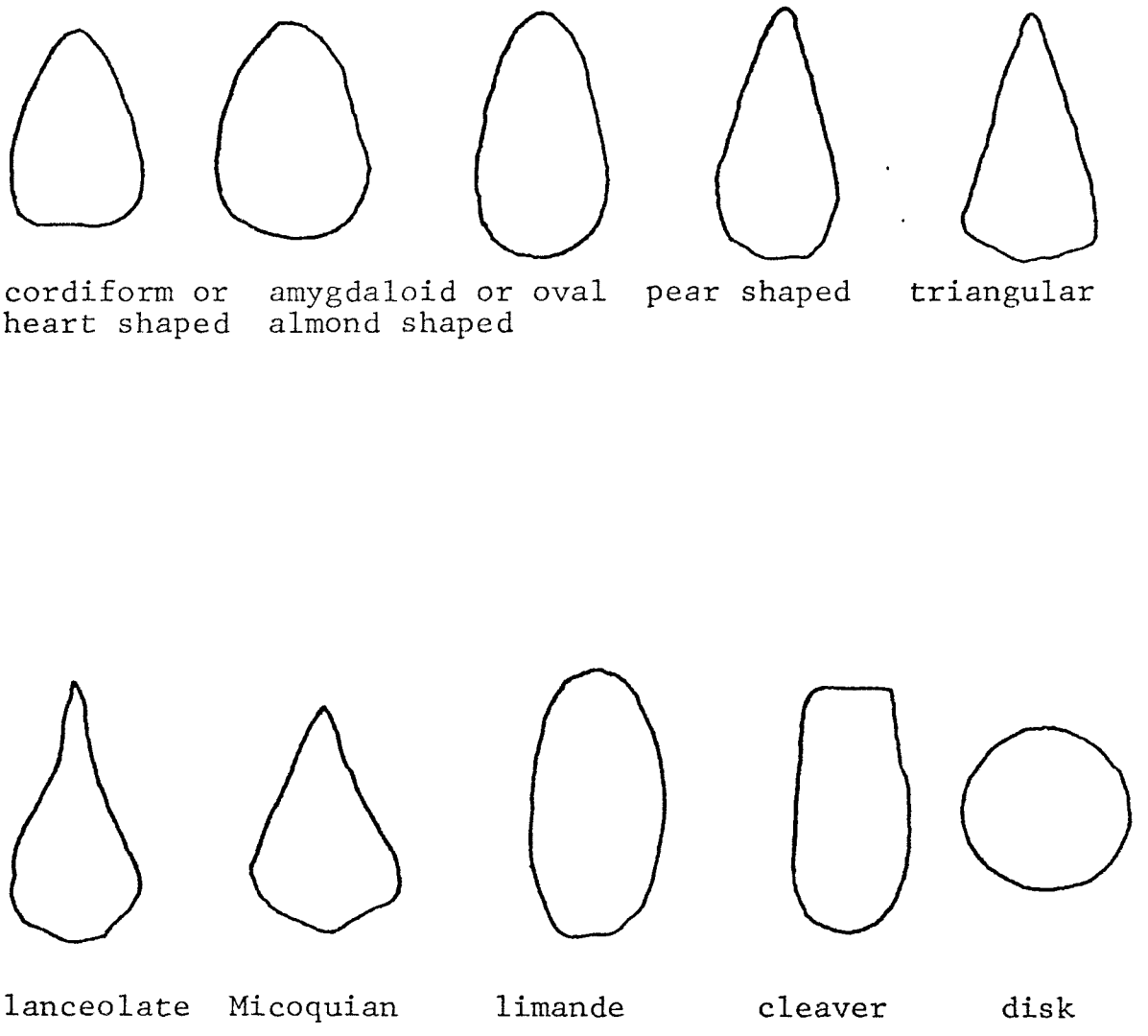

Figure 12: Common outlines for hand-axes.

Jisr Banat Yaqub

In 1934 D. A. E. Garrod discovered a few hand-axes in debris along the Jordan River about four km. south of the Lake Huleh near Jisr Banat Yaqub. Of special interest was a hand-axe made from a lava pebble: the first to be noted in Palestine. Fossil bones of a "giant fossil fish" which later proved to be an elephant had been reported from Jisr Banat Yaqub the year before and more fossils were discovered in 1935. It was M. Stekelis who discovered the origin of the hand-axe during preliminary explorations begun in 1936-37 and completed in 1951 after World War II.

Stekelis' research uncovered six beds of the Jordan River (see chart#6).The first contained material of Levallois technique. Beds II-IV contained sharp tools of Acheulian technique made of grey chert. However, in bed IV we also find nine lava hand-axes in a rolled condition. These could have come from the lower Bed V which contains the most important finds of Jisr Banat Yaqub. In Bed V was found an industry made up of only lava implements. They were 47 hand-axes, 28 cleavers and 20 flakes. These are not abraded and Stekelis suggests that they were covered very quickly by Bed IV. These hand-axes are of the primitive "block on block" technique. Bed IV contains hand-axes and cleavers of lava but their condition is so rolled that they can only be recognized by their shape and

primitive S-twist, a feature common to tools that have been crudely formed by the "block on block" technique.

STRATIGRAPHY OF JISR BANAT YAQUB

Bed	Depth	Implements
I	0-.42m	Levallois remains
II	.42-.62m	15 hand-axes of grey chert, sharp
III	.62-.90m	8 hand-axes of grey chert, sharp
IV	.90-1.70m	12 hand-axes of grey chert, sharp
V	1.70-3.40m	47 hand-axes and 28 cleavers of lava, sharp
VI	3.40-5.50m	Unspecified hand-axes and cleavers, rolled

Chart 3

The fauna associated with these tools would also indicate an early date. Stekelis lists two forms of elephant, a rhinoceros, a hippopotamus and five species of extinct water mollusca.[1] The selection of large vertebrates is similar to that of Ubeidiya where remains of hippopotamus, elephant, and rhinoceros were found.

The industry of basalt from Jisr Banat Yaqub V is unique in the Near East. Also its composition with such a high percentage of cleavers is unusual. There are probably gaps in our information for the stages between Ubeidiya K-6 and Jisr Banat Yaqub V and between Jisr Banat Yaqub V and the other Middle Acheulian sites.

[1] M. Stekelis, "The Implementiferous Beds of the Jordan Valley." Fourth International Congress of Prehistoric and Protohistoric Studies, (Madrid, 1959), p. 393.

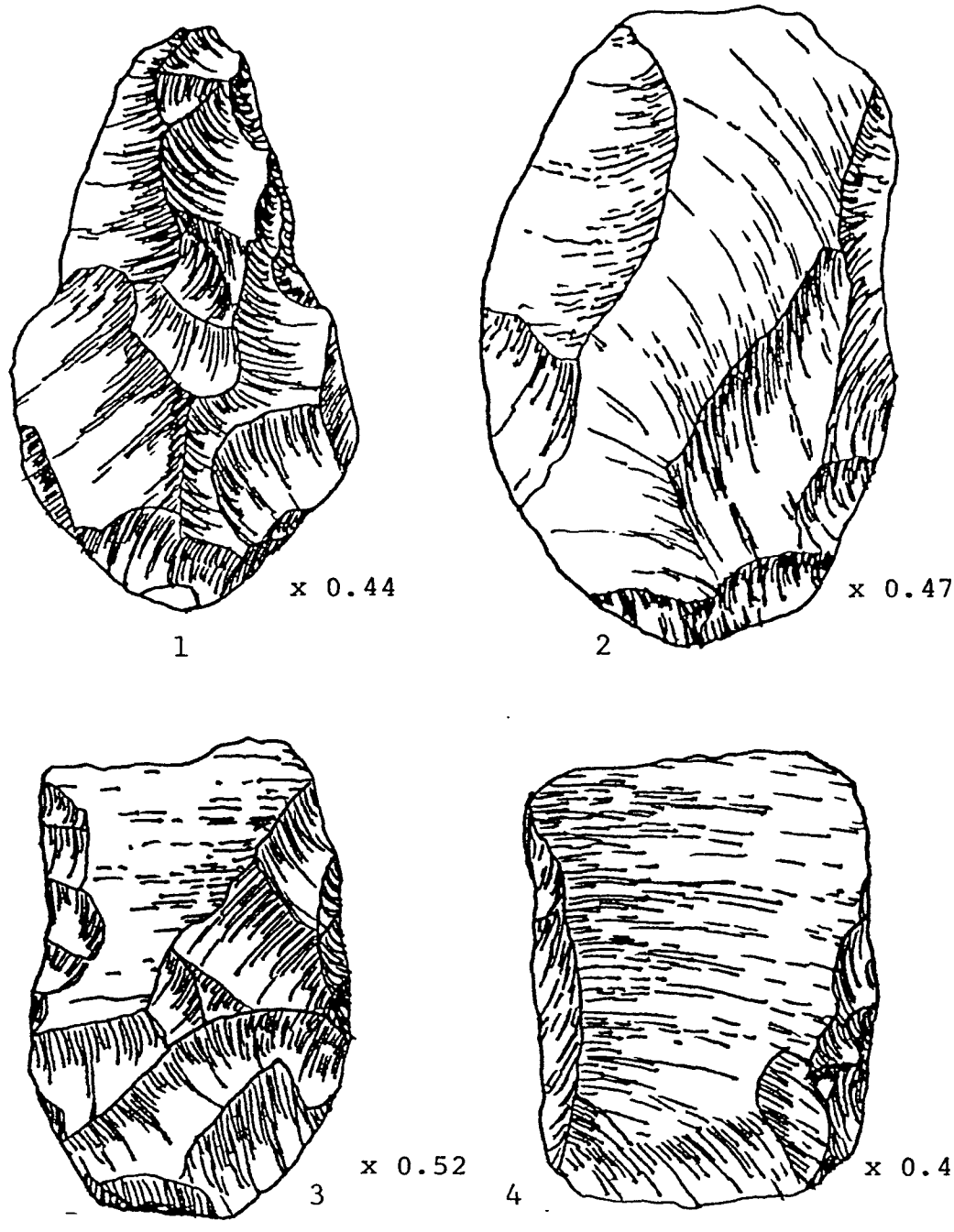

Figure 13: 1. A pear-shaped hand-axe from a lava pebble.

2. A limande hand-axe from a large lava flake.

3 & 4. A U-shaped and a quandrangular cleaver made from lava flakes, from M. Stekelis, The Palaeolithic Deposits of Jisr Banat Yaqub, pp. 74, 75, 81, 82.

At Latamne an industry with 30 percent hand-axes, most of which are lanceolate, 8 percent trihedrals, 4 percent spheroids, and 2 percent cleavers bears some close relationships with the later industries of Ubeidiya. Limestone and some basalt were preferred for the choppers and spheroids, and a stone striker was used for the manufacture of most of the hand-axes.[1] Because of the unusual character of the Jisr Banat Yaqub V assemblage it is difficult to say whether or not it comes before that of Latamne.

Other sites of the Middle Acheulian are the Evron-Quarry, Oumm Qatafa E, Kharga KO 10, and perhaps Kfar Menahem, area A-B-G, and Holon.[2]

The Late Acheulian

The late Acheulian open sites have been arranged typologically by David Gilead (see chart 5). The lanceolate forms which are abundant in the Middle Acheulian becomes very rare near the end of the Late Acheulian. Instead cordiform-amygdaloids and discoids or ovaloids predominate. The cordiform-amygdaloids which are closely related forms seem to be best represented at the first, whereas, the more rounded discoid-oval forms are more numerous toward the end of the Late Acheulian. We also

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[1]David Gilead, "Early Palaeolithic Cultures," pp. 318-322.

[2]Ibid.

LOWER PALAEOLITHIC

OPEN SITES

Chart 4

	Olduvan			Early Acheulian			GAP	Middle Acheulian					Late Acheulian							
	Ubeidiya III 12	Ubeidiya III 20	Ubeidiya II 24	LF	K 5	K 6		JB Jaqud V	Latamne	Kharya KO 10	K. M. Menahem	Holon	M. Baruckh	Evron Pardess	Evron Zinnad	Kissufim	S. Sekoussin	Rephaim Baqa	Beth Uzziei	Yiron
Spheroids		R	1	5	14	2			4											
Choppers	R	R	17	15	41	41			R		P									
Picks			1	.9	3	14			2											
Hand-axes				1	2	13		48		4										
Cleavers								29	.6				2	R	3	2	3	4		4
Lanceolate									18	30	30				7	6	4			1
Cordiform													19	A	14	16	8	10	6	11
Amygdaloid											47		27	A	37	32	26	26	24	26
Distoidal													11		14	10	30	33	27	21
Oval										R			28	30	10	12	15	19	20	19
Limande													3							
Micoquian													1		3	1				
Subtriangular													3		4	2	55	1	4	3
Levallois technique													R					R	R	R
Notes			Provisional	Stone hammer Flint with some basalt & limestone				Stone & soft hammer Flint, some basalt & limestone. Stone hammer basalt only.				Only 4 basalt hand-axes								

find, for the first time, during this period the Micoquian and subtriangular forms which are somewhat similar. Cleavers form a regular but rather limited part of the industries.

The technique used during the Late Acheulian is predominately that of a resilient striker. Also Levallois flakes are produced, however, they are quite rare yet and in no way dominate the industries as they will in the Middle Palaeolithic. Likewise, some rough tools made with a stone hammer will persist throughout the whole of the Palaeolithic.

One may suspect that the actual development of the industries may not have been as continuous as the typology would indicate. Certainly the study of the typology for pottery reveals several periods of decline in historic times. However, without the aid of deeply stratified sites we can only follow Gilead's approach. Furthermore, the period is partly paralleled by the Lower Palaeolithic cave deposits which provide some guidelines within a stratigraphically controlled context.

Ma'ayan Baruckh

Ma'ayan Baruckh in the upper Jordan Valley represents an open Palaeolithic site from a period slightly later than Jisr Banat Yaqub. The site has not been excavated. Rather the 3775 tools have been collected by Ammon Asaf

from the terra rosa soil of the gentle slope of Kibbutz Ma'ayan Baruckh which overlooks the Huleh Plain.

The great majority of the tools are of flint. However, four basalt hand-axes and two basalt flakes were collected as well.

The 2503 hand-axes which make up 85.2 percent of the collection are generally unabraded and of fine workmanship. The flake scars are regular, flat and often quite long so that the marginal retouch can be very fine. Most of the edges are quite straight though several hand-axes still have a crude S-twist characteristic of the "hammer-stone" technique. The majority have been worked with a resilient striker of wood or bone. Of the hand-axes 27 percent are ovate, 27 percent are amygdaloid, and 17 percent are cordiform. Several elements indicate that although the collection is largely of Late Acheulian times a small number of tools may be earlier. Besides the four basalt hand-axes mentioned above there are also some crude chopping tools with sinuous edges, eleven spheroids, two picks and one trihedral pick. The site is suited to hunting similar to that which was carried on at Ubeidiya and Jisr Banat Yaqub, and it is possible that a minority of the tools are from this earlier period. However, it may also be that these supposed earlier tools are actually indigenous elements of the Late Acheulian collection which is most in evidence at the site. There are also present

a few Levallois points and six cores of Levallois technique. These may be later elements or part of a small Levallois element found in many Late Acheulian assemblages.

Rephaim Baq'a

As early as 1897 blades, cores and bifaces were reported from the valley south of Old Jerusalem known to the Arabs as al-Baq'a or traditionally as the Valley of Rephaim. Since then many surface finds have been made, almost entirely of abraded tools that had been washed down into the valley. In 1933 M. Stekelis, with the help of R. Neuville, excavated a pit eight meters in length and five meters in breadth. At the fifth and sixth levels, between 2.60 meters and 3.70 meters, they uncovered about 5,000 tools, most of which had suffered from abrasion. Unfortunately no remains of fauna were discovered. However, the manufacturing technique was reported to vary from an early Acheulian to that of the Late Acheulian. At the time of his report (1948) Stekelis felt that the tools were most closely equivalent to those of Jisr Banat Yaqub, and earlier than those of Oumm Qatafa.

The tools were divided into nine groups on the basis of such criteria as working technique, preservation and patina. Groups I-III were made up entirely of bifaces or rudely worked flints to which a stone hammer had been

applied. Some also showed evidence of the introduction of a resilient striker. Groups IV-IX represent more refined Acheulian implements typical of the Late Acheulian.

Typologically Gilead has placed this collection of tools in the Late Acheulian. It would seem possible that as at Jisr Banat Yaqub several phases of Acheulian were present, but at Rephaim Baq'a they were more thoroughly mixed as indicated by the widespread abrasion evident.

Many other sites of the Lower Palaeolithic are known. For the Middle Acheulian they include the Evron-Quarry, Azraq in Jordan, Kilwa in Jebel Tabsiq, Nahal Bsor west of Gaza, and Holon. For the Late Acheulian there are many sites including Sherah, Wadi Sherata, Wadi Nakhabir, Nahal shkma, Boeri, Tell Abu Hureireh, Negba, and Heletz in the southern coastal plain. In the Negev are Jebel el Faliq, and Beer Mashabim and the Kharga Refuf Pass. In Sharon are Hamaapil, givat Haim, Kfar Glickson, Kfar Monash, Ramat Hakovesh, Ramat Hashavim, Herut and Eyal. In the plain of Esdraelon is Ein Moussa.[1]

The Lower Palaeolithic Cave Deposits

The main sites used to develop the typology of the Lower Palaeolithic cave deposits are Oumm Qatafa, levels

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[1]Gilead, "Early Palaeolithic Cultures," pp. 319ff.

LOWER PALAEOLITHIC CAVE DEPOSITS

TOOLS	LEVEL	Q. Qafzeh G	Q. Qafzeh E,F	Tabun G	Q. Qafzeh E	Q. Qafzeh D2	Q. Qafzeh D1	Tabun F	Ed	Ec	Eb	Ea	T. 25	24	23	J. 22	18	17	J. 16	P. 15	J. 14	P. 13	12	Jabrud 1 11
CHOPPERS			2	6				18	9	8	7	5												
SPHEROIDS							P																	
PICKS																								
HAND-AXES					A	A	A	27	19	10	13	14		1.4	2		2	1.5					6	.7
CLEAVERS							R	.4	.4	.3	.4	.5												
DISKS								3	1															
R end-bulb, one-sided					P	P	P	11	20	25	25	22	19	8	9	33	5	3	31		16		3	19
A end-bulb, double								2	3	5	4	3												
C end-bulb, pointed								2	3	4	3	.8	15	3		20					4		1	2
L end-bulb, angled								1	3	.7														
O end-bulb, others								.8	2	2	2	.3												
I oblique, one-sided								5	10	12	10	9												
R oblique, angled								4	7	7	6	6												
various				10				7	14	14	15	17	6	3	4	3	5	3			4		5	.9
FLAKE: Levallois					R	R	R																	
FLAKE: notched																								
FLAKE: utilized		5	15	73	P			.5	.6	.6	10	2	15	12	12	15	75	4	41	15	80	31	76	69
FLAKE: unused		95	85	10	A			+6	+6	+2	+9	+2	16	56	17	8	75	23	14	41	80	31	76	69
B blunt-backed																								
L nibbled-blade																								
A notched-blade																								
D flake-blade						P																		
E various								.3	.2		.3	1								25		47		
P Audi											.1	.1												
O Chatelperron											.5	1								.7		1.8		
I Emiran																								
N Le Moustier																								
T Krems(Font-Yves)																								
Gravette																								
various					P	P	P	.2	.3	.4	.9	1	11	6	5	8	7	4			.2		3	2
SCRAPER: steep & semi-steep								4	4	4	6	7								1		4		
SCRAPER: end					P		P	.3	.4	.2	.5	.3								2		5		
SCRAPER: nose												.1												
SCRAPER: round																								
SCRAPER: flake																								
SCRAPER: various																								
BURIN: angle																								
BURIN: Bec-de-flute																								
BURIN: polyhedric																								
BURIN: beaked																								
BURIN: flat																								
BURIN: various					R	P	P	.8	.6	.6	.7	.8	6	3	.6	.9		.9		6	.2	5	3	.7
BORERS					P	P	P							.3		1.6			6	.3	.2	1	.2	
MICROLITHS																								
VARIOUS													13		2	7	9	7		9	.8	4	.7	6

NOTE: P=present R=rare A=abundant

Chart 5

G, F, E, D2 and D1, Et-Tabun, layers E, F, and G, and the Rock Shelter I of Jabrud, levels 11 to 25.

Within these deposits we have four main typological categories. First, there is in the earliest levels of each site an assemblage dominated by flakes and without hand-axes. We shall refer to these provisionally as the "Tabunian" layers. This is followed by layers rich in hand-axes and especially in racloirs. Tabun E is the best representative of this type of material which we shall call the "Cave Acheulian." At Jabrud we find inter-stratified with the cave Acheulian the two other categories. There is in levels 13, 16 and 22 an assemblage similar to the cave Acheulian only without hand-axes, and named "Jabrudian." Also there are two layers (13 and 15) which are dominated by blades of a type which does not appear until the Upper Palaeolithic. Therefore, the name "pre-Aurignacian" has been given to these unique occurrences.

We shall deal with these in the order outlined above which corresponds to their stratigraphical occurrence.

The Tabunian

The Tabunian is a crude flake collection which precedes the Acheulian. It is found in the lowest levels of three caves: Tabun G, Oumm Qatafa G-F3, and Jabrud I-25. The Tabunian has been compared to the Pre-Acheulian Tayacian and Clactonian of Europe, but its presence in

the Near East is poorly established to say the least.

R. Neuville reported 143 flakes with 5 percent retouch from layer G of Oumm Qatafa, and 129 flakes in layers F2, F1 and E3, with 15 percent intentional retouch. Aside from a few cores there were no other tools.. A heavy stone fall separated this group from the Acheulian above.

The asserted Tabunian of Jabrud I level 25 is represented by 269 specimens of which only 19 percent have been classified as utilized flakes. The number of racloirs here reaches 30 percent and there are 10 percent points and 6 burins. This industry is very similar to the Jabrudian of later layers which we shall meet shortly.

The tools at Tabun are composed of 73 percent utilized flakes. "These are small and irregular in shape, with edges much nibbled and broken by use."[1] Tabun G also contained 10% racloirs and 2.6% choppers. Layer G contained only 464 flints, a very poor representation for Tabun, but quite good for other sites.

Since the early claim by Garrod at Tabun for an industry corresponding to the Tayacian of Europe, there have been increasing doubts raised.[2] The three examples of the Tabunian cited here are followed in each case by a different phase of the Acheulian. It seems that the

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[1]Garrod, Mount Carmel, p. 93.

[2]Gilead, "Early Palaeolithic Cultures," p. 338.

Tabunian should be accepted only provisionally as an industry representing the first cave occupations. These occupations must have been of short duration. The 272 flints of Oumm Qatafa were found in three meters of debris. I would suggest that the crude tools represented here could be those left by hunters of the open sites who sought refuge in the caves in passing. This could account for the makeshift character of the collections and the interval between the earliest levels of Oumm Qatafa and those of Jabrud. On such a theory the Tabunian would not be an industry in itself. Rather it is a by-product of the Acheulian of the open sites.

The Cave Acheulian

Within the cave deposits there are many levels in which hand-axes form a dominant or significant percentage of the assemblages. The hand-axes class of Oumm Qatafa has been shown to correspond to that of the transitional stages of the Middle to Late Acheulian of the open sites.[1] In Qatafa E we see a high frequency of lanceolate hand-axes which are common in the Middle Acheulian. We also find a large selection of cordiform and amygadaloid hand-axes which are characteristic of the Late Acheulian. These continue in the next layers (D2 and D1) whereas the lanceolate hand-axes discontinue. The small selection

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[1]Gilead, "Early Palaeolithic Cultures," pp. 319-327.

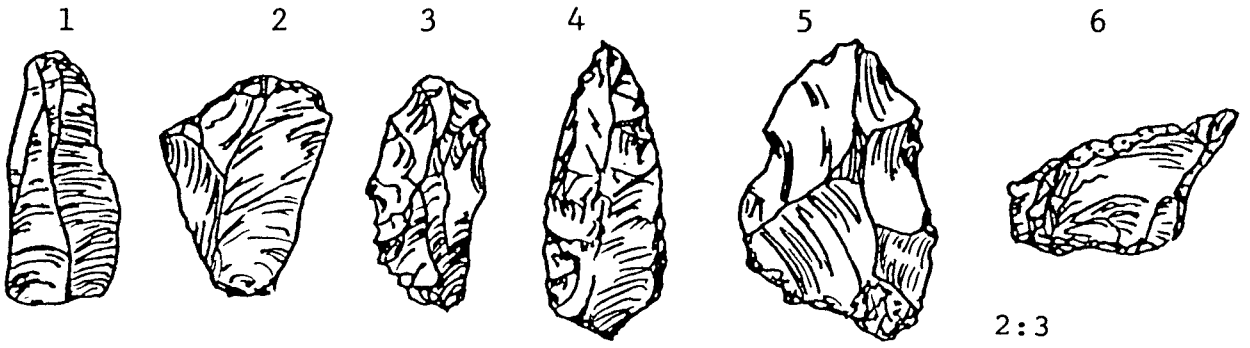

Figure 14: Tabunian flake tools from Et-Tabun, layer G. 1. Burin 2,3, Racloirs 4. Point 5. Steep scraper 6. Utilized flake, from Garrod and Bate, Mount Carmel, plate XLVII

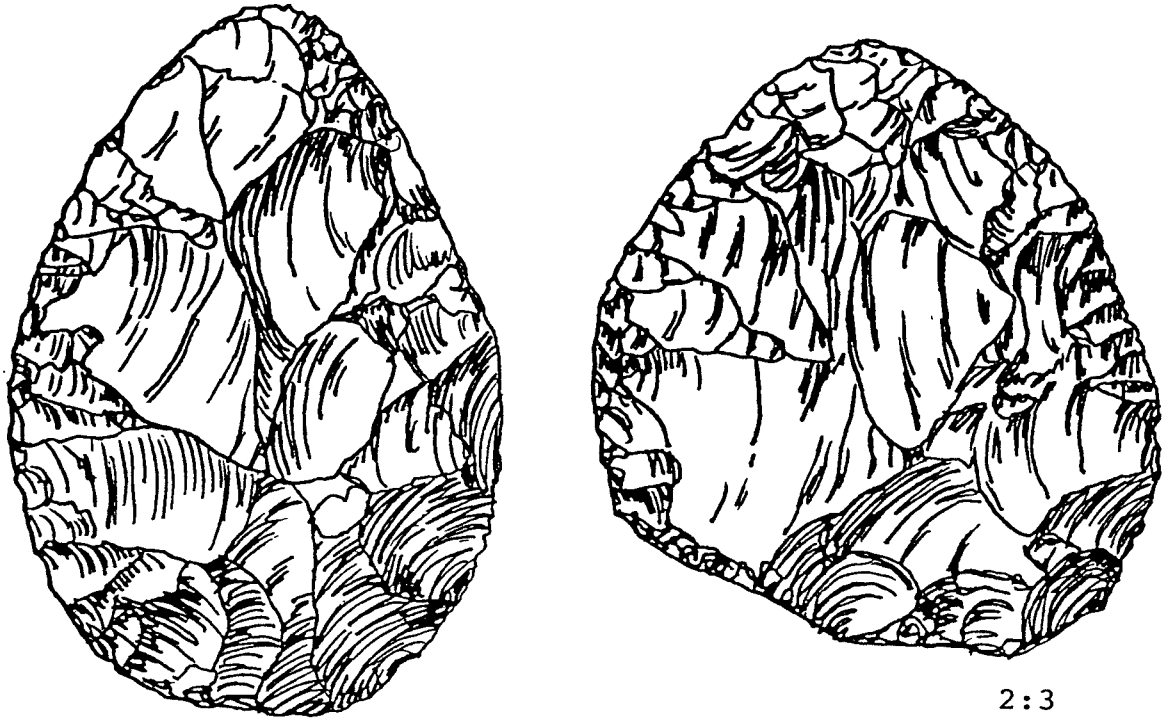

Figure 15: Hand-axes from layer F of Et-Tabun. All are pear-shaped, tending to be ovate, from Garrod and Bate, Mount Carmel, plate XLVIII

of limande and Micoquian hand-axes also indicate an early stage of the Late Acheulian.

TYPOLOGY FOR QATAFA WITHIN THE ACHEULIAN

	LATAMNE	KHARGA	KMESHEM	E	D2	D1	MBARACKH	EVROARP.	EVROARZ.	KISSUTIM	S.KOUSSIÑ	RBAQA	B.UZZIEI	YIRON
Cleaver	.6			R	2	3	2	R	3	2	3	4		4
Lanceolate	18	30	30	30		8			7	6	4			1
Cordiform				45	11	17	19	A	14	16	8	10	6	11
Amygdaloid			47		32	19	27	A	37	32	16	26	24	26
Discoidal					11	14	11		14	10	30	33	27	21
Oval	R			R	22	9	28	30	10	12	15	19	20	19
Limande					2		3							
Micoquian					2	12	1		3	1				
Subtriangular					4	7	3		4	2	6	1	4	3
Levallois tech.					R	P	R				R	R	R	R
	Middle Acheulian			Qatafa			Late Acheulian							

CHART 6

The Acheulian deposit of Tabun layer E was unusually rich in flints, yielding over 40,000 implements. Garrod found it difficult to distinguish between the minor horizons within this layer. However, her data is subdivided between Ea, Eb, Ec and Ed. This division has been criticized and it is hoped that the re-examination of these deposits currently being undertaken will clarify this question and the questions raised as to its relation to the

Jabrudian.[1]

The Acheulian represented at Tabun layers Ec and Ed has a substantial number of Micoquian hand-axes (Ed=106 and Ec=73) which is similar to their occurrence in the D1 and D2 layers of Oumm Qatafa. The dominant hand-axe form in Tabun E, however, is the pear shape rather than the heart, almond, oval or round outlines that we have seen in the open sites and at Oumm Qatafa. One should note, nevertheless, that the transition between some of these classifications is rather blurred at times. Miss Garrod classified a large number of hand-axes as pear-shaped with a blunt end or pear-shaped with a pointed end. These are not true pear-shapes but rather tend to compare with the amygdaloids and Micoquian forms. With a re-classification along these lines the hand-axes would fit more comfortably into the typology arranged by Gilead for the Late Acheulian.

There are still considerable differences in the percentages of the oval or rounded forms.

The distinguishing feature of the Tabun Acheulian is the high frequency of racloirs. The racloir appears to be a versatile tool for scraping, cutting or chopping. Garrod has distinguished them from the scrapers of the

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[1]See A. J. Jelinke, "A Preliminary Report on Some Lower and Middle Palaeolithic Industries from the Tabun Cave, Mount Carmel (Israel), " (1975) in Wendorf and Marks, pp. 297-316.

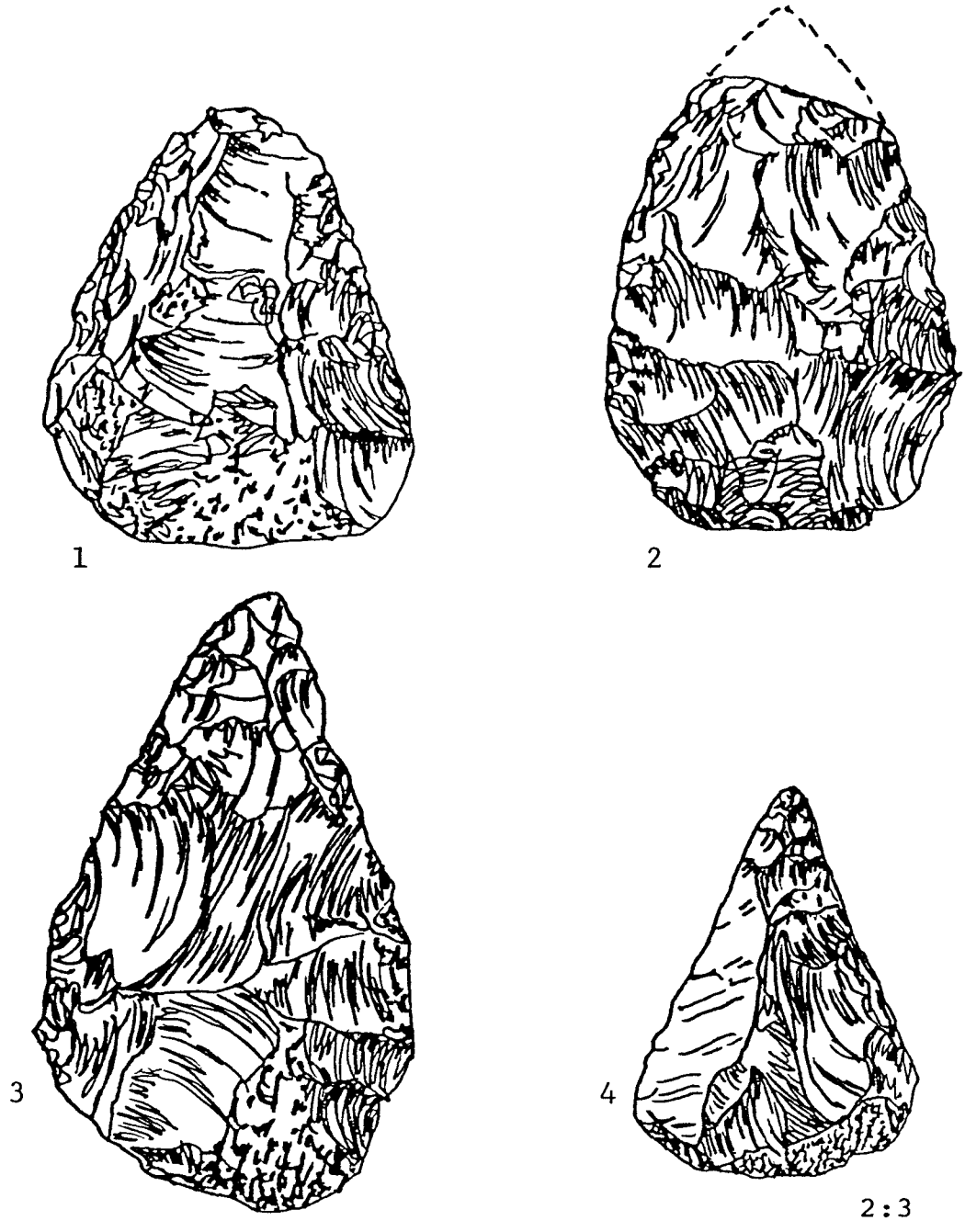

Figure 16: Hand-axes from Et-Tabun, layer Ea. 1-3 pear-shaped hand-axes that are pointed except #2 which appears to have been blunted. 4 Micoquin, from Garrod and Bate, Mount Carmel, plate XXXVIII

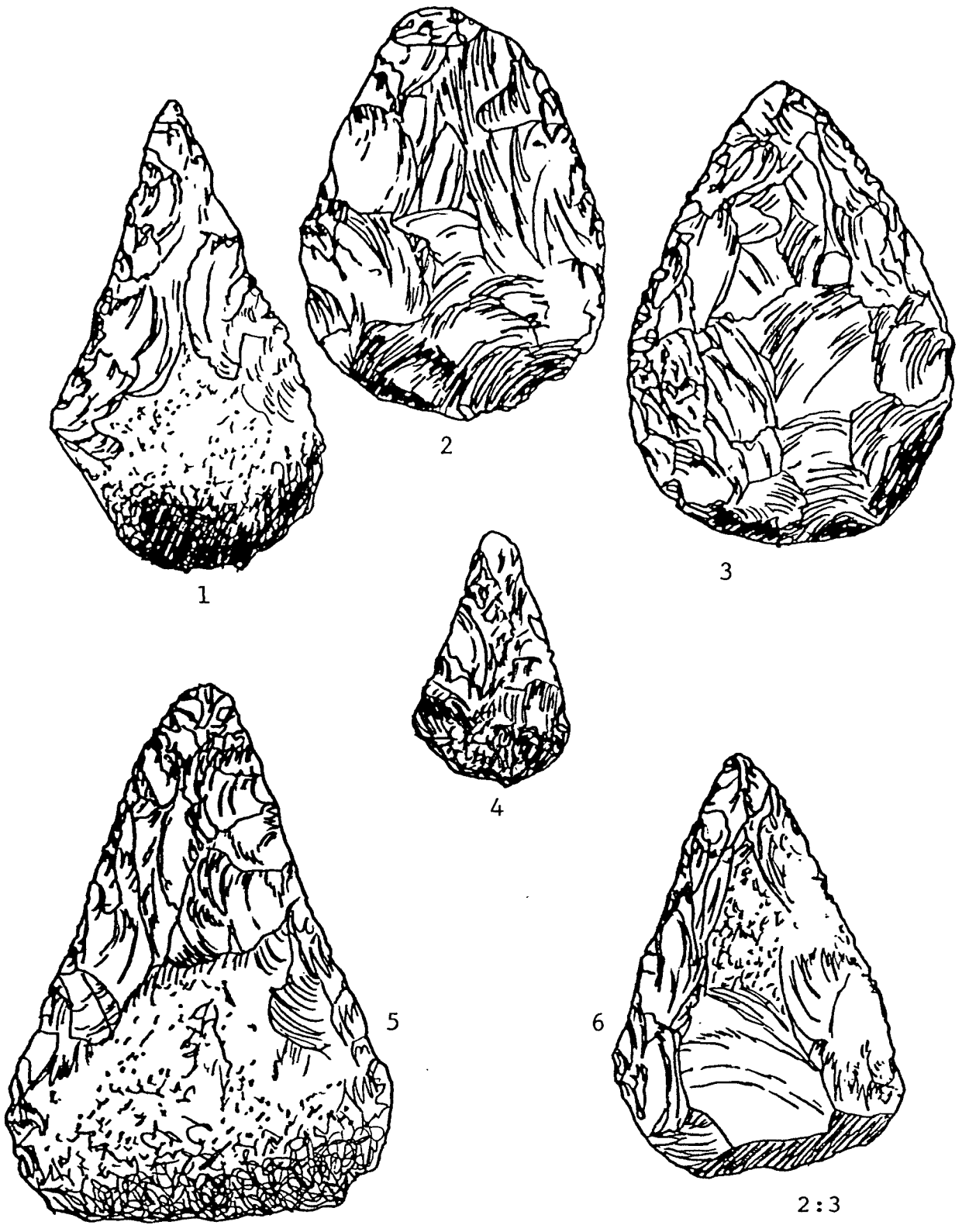

Figure 17: Hand-axes from various horizons of layer E. 1. Micoquian 2. Ovate 3-6 Classified as pear-shaped by Garrod. From Garrod and Bate, Mount Carmel, plates XLI, XLIII & XLIV

HAND-AXES OF TABUN LAYER E

	Ea	Eb	Ec	Ed
Pear-shaped, blunted	584	965	361	2218
Pear-shaped, pointed	363	716	156	1051
Micoquian	3	31	73	106
Square ended	36	52	15	70
Ovate	7	102	11	173
Total	1003	1866	616	3618

Chart 7

Upper Palaeolithic largely by the type of flake and the retouch technique.[1] The racloirs are made on thicker flakes and have resolved flaking on the cutting edge instead of flat retouch. Resolved flaking (also called step-flaking) involves a blow which does not pass through the tool. Rather a crack penetrates the tool edge and being unable to penetrate the heart of the tool breaks off a chip leaving a hinge fracture or step. A soft hammer is used.

The classification, description and frequency of racloirs in the E layer of Tabun is as follows.

The racloirs are divided into two main categories based on the point of percussion in the production of the tool-flake. If the bulb of percussion indicates that

[1]Garrod, Mount Carmel, p. 79.

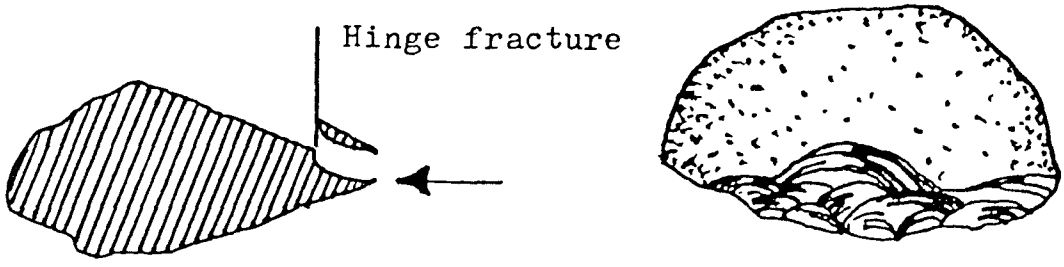

Figure 18: Resolved or step-flaking

the flake was removed by a blow at the end of the flake, the tool is classified in the "end-bulb" category. If, however, the blow was delivered to one side of the end then the tool is classified with the "oblique-bulb" types.

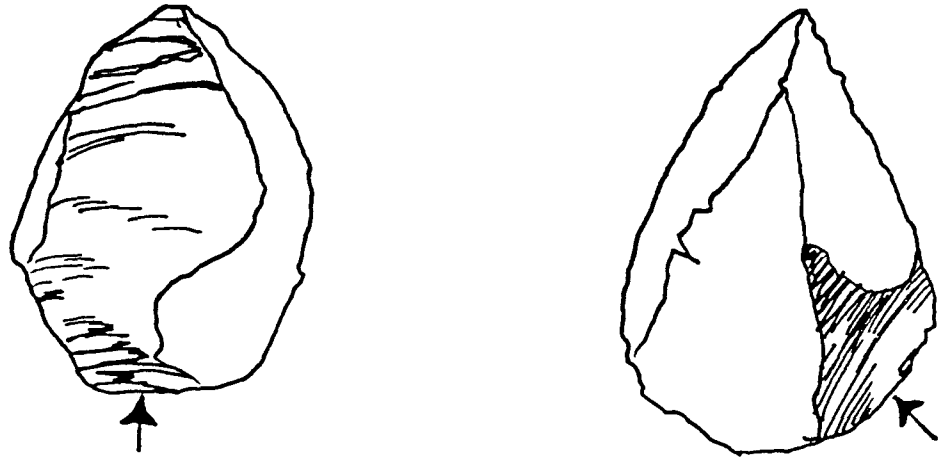

Figure 19: End-bulb type and oblique-bulb type racloirs

Further classification of the tool is based on the finishing of the tool to provide a sharp edge on one side or both faces, to provide a point, or a sharp edge on one side and the end.

The most frequent racloirs are the end-bulb type with one side finished to a sharp edge and the oblique-bulb with one sharp side. These made up more than 20 percent and 9 percent respectively of the industries of all the horizons of Layer E. In some of the literature these are referred to as "side-scrapers."

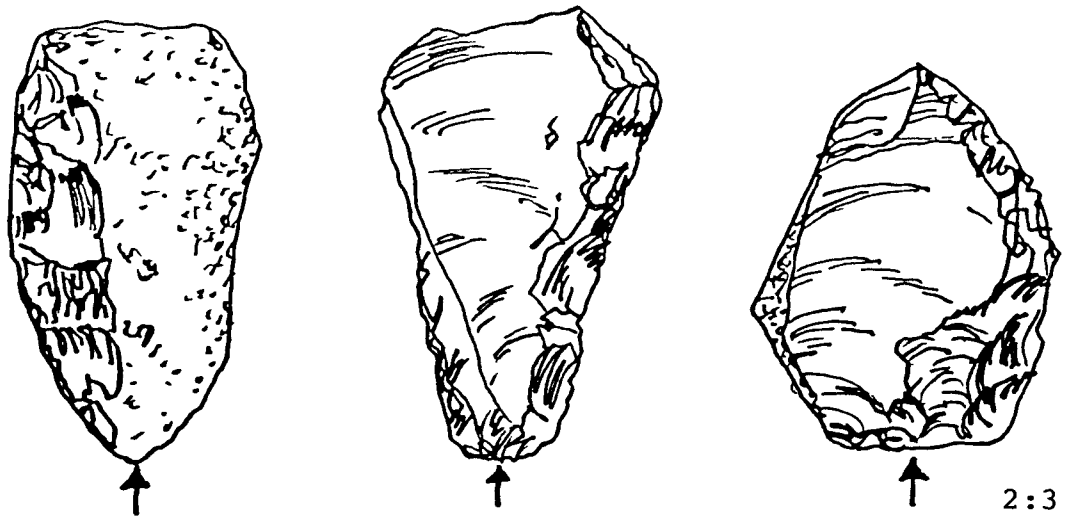

Figure 20: End-bulb, one sided racloirs from Tabun, Layer E. From Garrod and Bate, Mount Carmel, plates XXXIX & XLI.

Racloirs with two cutting edges meeting to form an angle were also common. These were usually on flakes with an oblique bulb of percussion. (See figure 21, 5-7) They composed four to seven percent of each horizon within layer E.

Other types of racloirs are illustrated in figures 21 and 22. These include double-sided (2-5 percent), pointed (2-4 percent), square ends, and side-bulb racloirs.

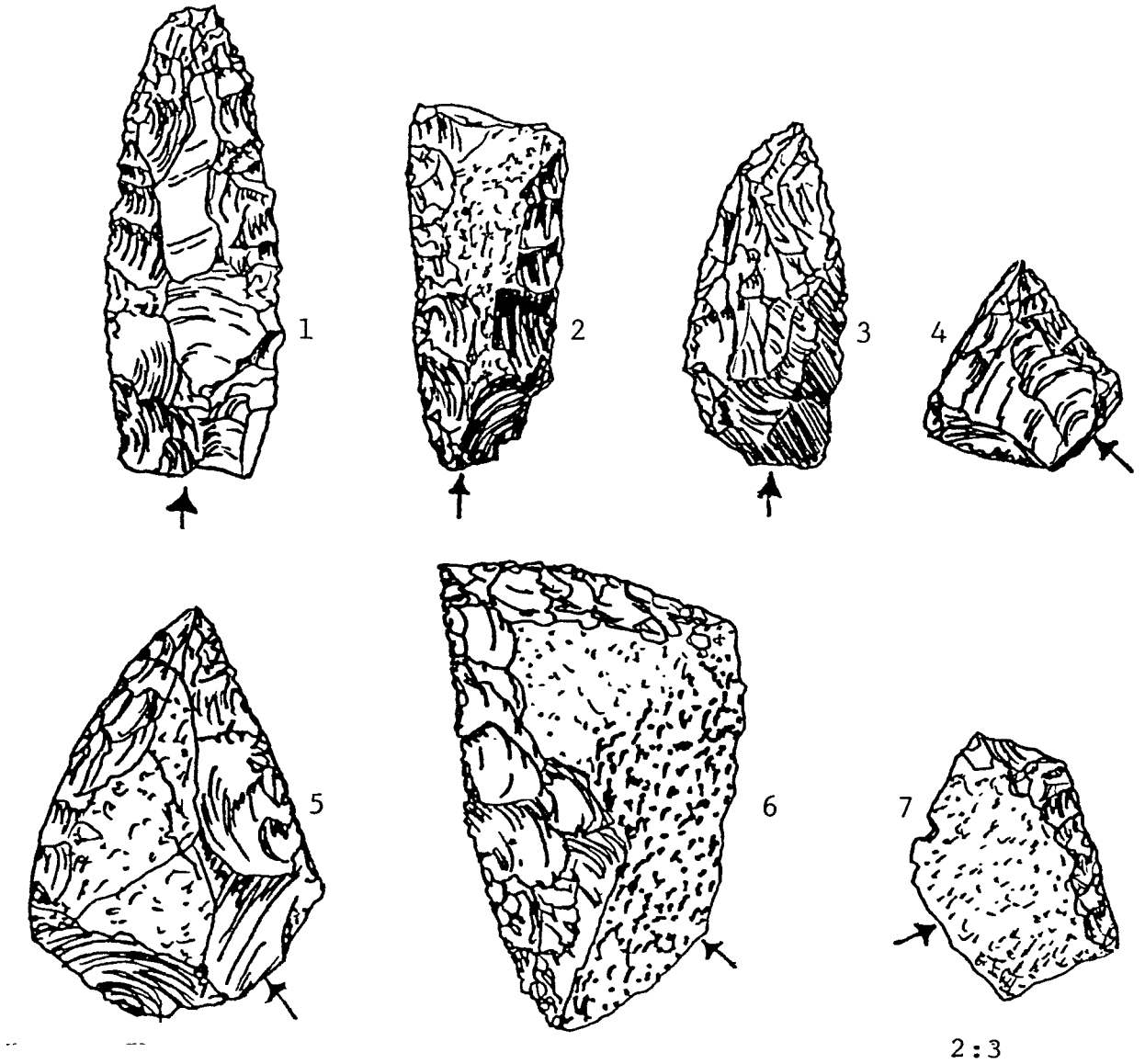

Figure 21: Racloirs. 1.& 2. End-bulb, double sided. 3. End-bulb, pointed. 4. Oblique bulb, pointed. 5. Oblique bulb, pointed, 6. Oblique-bulb, acute-angled. 7. Oblique-bulb, obtuse-angled.

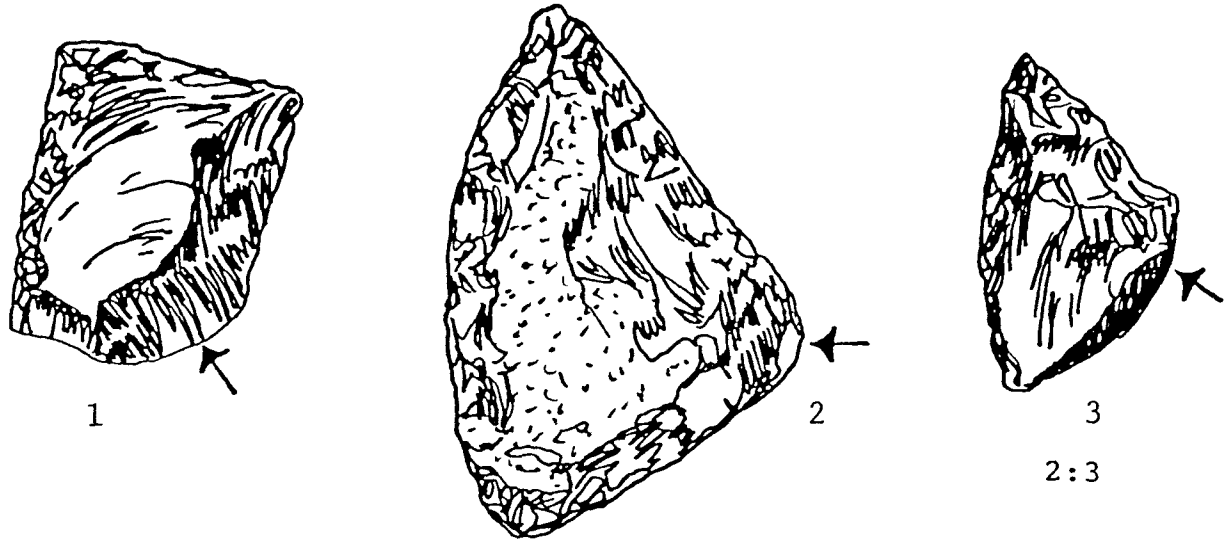

Figure 22: Racloirs. 1. Oblique-bulb, square ended. 2.& 3. Side-bulb type.

One should remember that in Tabun the racloirs accounted for a majority of all the tools in all the horizons of layer E and a substantial number in the adjacent layers which seem to be transitional.

PERCENTAGE OF RACLOIRS AT ET-TABUN

Layer	F	Ed	Ec	Eb	Ea	D
Racloirs	32%	62%	70%	65%	61%	26%
	Cave Acheulian					Transitional from Acheulian to Middle Palaeolithic

Chart 8

One other tool which was frequently met with in the Acheulian levels of Tabun was the steep or semi-steep

scraper. This tool is often made on the remnants of a core and may also be called a "core scraper." Like the racloir it tends to be a chunky tool whose primary function was scraping, but which also might be used for chopping.

The Jabrudian

The Lower Palaeolithic of the Jabrud Rock Shelter I, layers 25-11, presents a puzzling sequence. The shelter contains 11m. of deposits which were carefully divided into 25 layers, and numbered from top to bottom. Some of these such as layers 19, 20 and 21 contained so few tools that they will not be discussed.

The typology chart for the Cave Acheulian (see chart 5) indicates that at Jabrud I, 25-11, a great number of unused and utilized flakes were recorded. These combined make up from 25 percent to 80 percent of the flints in each layer, and whereas none of the layers excedes 500 flints we are left with a rather poor sample with which to make typological comparisons and adjustments. Nevertheless, two significant differences are apparent even in this limited collection.

First of all, while the Lower Palaeolithic layers of Jabrud I contain a large number of racloirs generally similar to those of Tabun E there are several layers which contain no hand-axes at all. These are layers

25, 22, 16, 15, 14, and 13. J. d'A. Waechter argued that these layers were essentially Acheulian of the sort found at Tabun E, and the hand-axes were absent due to the poor sample.[1] While this is not impossible one would expect that in the several hundreds of tools recorded in these layers there would be some hand-axes if hand-axes had been used in any numbers. Therefore, these layers, with the exception of 15 and 13 which we will discuss below, are referred to as "Jabrudian." By this we mean a Lower Palaeolithic industry dominated by racloirs but poor in or without hand-axes. There are also smaller percentages of points, borers and burins associated with the Jabrudian.

There is a considerable variation in the percentages of flakes made by Levallois technique in the Lower Palaeolithic layers of Jabrud I. F. C. Howell presents the following figures:[2]

Percentages of Flakes of Levallois Workmanship

Jabrud I, Layer	J 25	24	23	J 22	18
	4.2%	6.4	7.8	6.6	24.3
	17	J 16	J 14	12	11
	32.8	3.6	6	18	8.1

[1] J. d'A Waechter, "The Excavation of Jabrud and Its Relation to the Prehistory of Palestine and Syria." Annual Report of the Institute of Archaeology, University of London, 1952, 17.

[2] Howell, "Upper Pleistocene Stratigraphy," p. 22.

In the Jabrudian layers (25, 22, 16, and 14) the index remains low at between 3.6 percent and 6.6 percent, whereas in the Acheulian layers it rises to 32.8 percent.

With regards to layer 25 which we have discussed above in connection with the Tabunian, one should note that it fits more comfortably into the Jabrudian.

Tabun Ec and layers from the Abri Zumoffen and Zuttiyet have also been associated with the Jabrudian.[1] These all have hand-axes, most often Micoquians of poor manufacture.[2]

Our understanding of the Jabrudian is still in the formative stage. It seems that the industries of this period were subject to individual differences much more than at other times during the Palaeolithic. The Jabrudian is part of this variety. It is confined to caves and seems to be part of the last stages of the Late Acheulian.

The Pre-Aurignacian

The second significant difference in the Lower Palaeolithic layers of Jabrud I was the occurrence in the layers 15 and 13 of industries dominated by blades of an Upper Palaeolithic type. F. Bordes points out that these pre-Aurignacian collections have every appearance of being Upper Palaeolithic. In fact the Upper Palaeolithic

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[1] Gilead, "Early Palaeolithic Cultures," p. 330.

[2] Ibid.

layer 7 of Shelter II has statistically more similarities with the pre-Aurignancian of Shelter I, 15 and 13, than it has with layer 6 above it.[1] Likewise, F. C. Howell explains these pre-Aurignacian layers as the first stage of the Upper Palaeolithic in the Near East.[2] They are dominated by plain and retouched blades with a very fine touch.

Blade elements had been noted in Garrod's original findings at Tabun Ea and Eb. With Rust's discoveries at Jabrud and her further work at Abri Zumoffen and Zuttiyeh, Garrod claimed at all three Palestinian sites a pre-Aurignacian similar to Rust's at Jabrud. This industry she named Amudian after the wadi in the Upper Jordan Valley in which was the Zuttiyeh Cave.

The pre-Aurignacian is limited to the same two caves and two rock shelters as is the Jabrudian. The renewed excavations of Tabun will no doubt deal more accurately with these minor horizons of layer E.

The Middle Palaeolithic or Mousterian of Palestine

The Middle Palaeolithic of Palestine has not been the subject of a thorough examination like the one D. Gilead applied to the Lower Palaeolithic industries.

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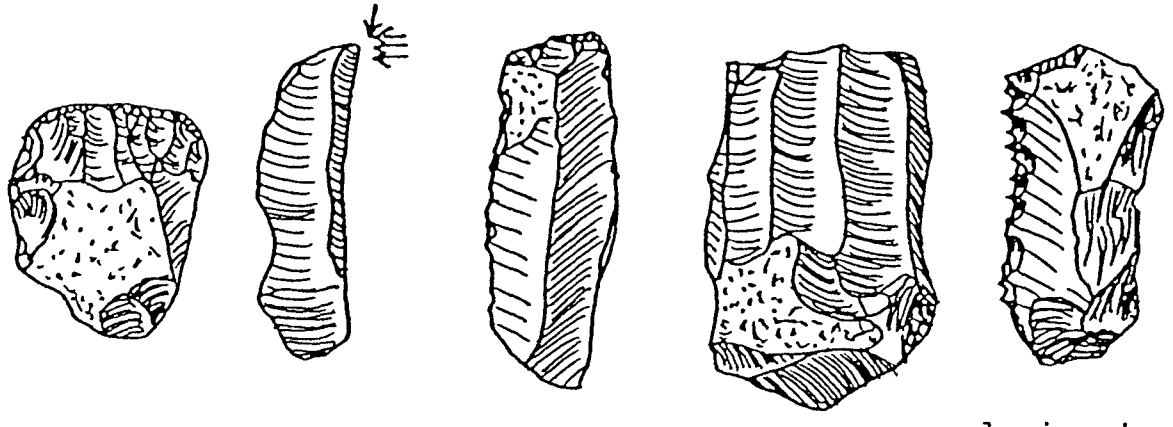
[1] Bordes, "Le Paleolithique," p. 500.

[2] Howell, "Upper Pleistocene Stratigraphy," p. 25.



no scale is given

Figure 23: Pre-Aurignacian tools from Jabrud I, layer 15, from Bordes, "Le Paleolithique inferior et moyen de Yabrud (Syrie) et la question du Pre-Aurignacies," figure 9.

2:3

Figure 24: Chatelperron knives and blades with nibbled edges from Tabun, layers Ea and Eb, from Garrod and Bate, Mount Carmel, plates XL & XLII.

However, it has been covered in several surveys like those by F. C. Howell, "Upper Pleistocene Stratigraphy and Early Man in the Levant," 1959; F. Bordes, The Old Stone Age, 1968; and J. Perrot's article on "Prehistory" in the Dictionnaire de la Bible, supplement, 1972. Whereas Howell attempted to arrange the Mousterian industries chronologically, Bordes and Perrot were more impressed by the variety of the industries within the Middle Palaeolithic and so concentrated on delineating the various facies of the Mousterian.

The Mousterian of Palestine has been regularly compared to that of Europe from which it gets its very name. It is an industry dominated by points made on triangular flakes and racloirs. The Mousterian of Palestine is characterized in most cases by the use of the Levallois technique and so has been termed Levallois-Mousterian. There has also been noted within the Mousterian of Palestine a frequency of blades, blade-tools, elongated points, and burins which is higher than that of Europe. This characteristic is assumed to be due to the early influence of the pre-Aurignacian.[1]

In our survey of the Mousterian we are most influenced by the work of J. Perrot, director of the Mission

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[1]Perrot, "Prehistory," p. 341.

Archaeologique Francaise in Israel.

Mousterian of Acheulian Tradition

Industries of the Late Acheulian have sometimes been included as the first stage of the Middle Palaeolithic. These assemblages have few hand-axes, a large number of scrapers, some denticulates and knives and at Jabrud, levels 18, 17 and 12, the percentage of the flakes of Levallois workmanship varies from 18 percent to 32 percent.[1] Whether one designates such industries as "Late Acheulian" or "Mousterian" is largely a matter of nomenclature. What is important is to note their place as a transitional phase between the Lower and Middle Palaeolithic.

Mousterian of Levallois facies

Perrot[1] following Bordes considers an industry to be of Levallois facies if at least 30 percent of the tools are on Levallois flakes. These may include blades, points and unretouched flakes. The Lower Mousterian layers C and D of Tabun are representative of such an industry. These industries each included well over 2,000 flints although only 1907 were recorded for layer C and 2,133 were recorded for layer D as a large number of Levallois flakes, flakes

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[1]Howell, "Upper Pleistocene Stratigraphy."

[2]Perrot, "Prehistory," p. 341.

(mostly triangular), blades and cores were not counted because they were so common. Nevertheless, those flakes catalogued composed about 30 percent of these industries.

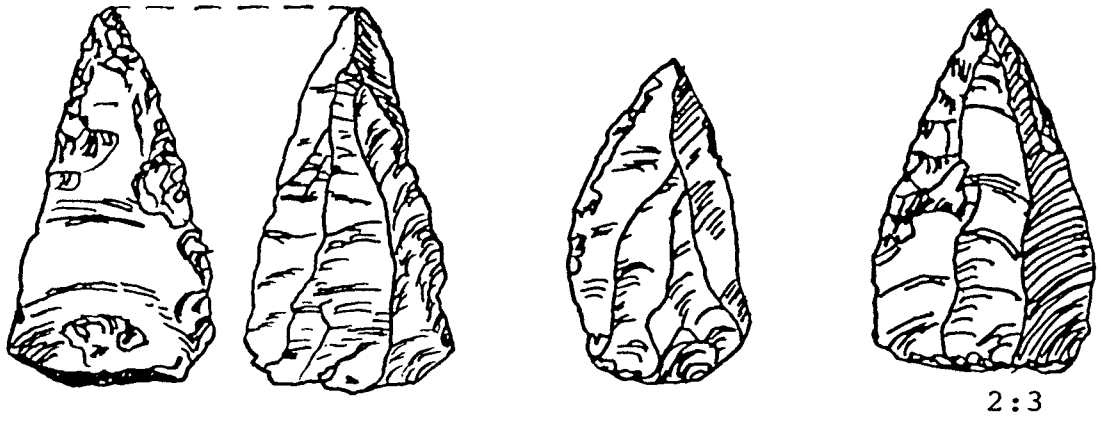

Figure 25: Levallois points from Et-Tabun, layer D, from Garrod and Bate, Mount Carmel, plate XXXV.

Equally dominant was the racloir class which composed 21.5 percent to 26 percent of these layers. In layer C about one-third of these are made on Levallois flakes whereas in the lower layer D the recloirs are rarely made on Levallois flakes. Rather they are much like those of the Late Acheulian layer E. Simple racloirs, that is, those with one finished edge, are most frequent.

The hand-axes and choppers disappear in the Lower Mousterian, dropping from 2 percent each in layer D to .1 percent and .4 percent respectively in layer C. In their place appear an equally limited number of tools which are characteristic of the Upper Palaeolithic.

These include burins (2 percent and .1 percent) and knives of the Audi and Chatelperron type (less than 1 percent). As well, a number of points have been finished on blades of considerable length. These are of typical Levallois workmanship.

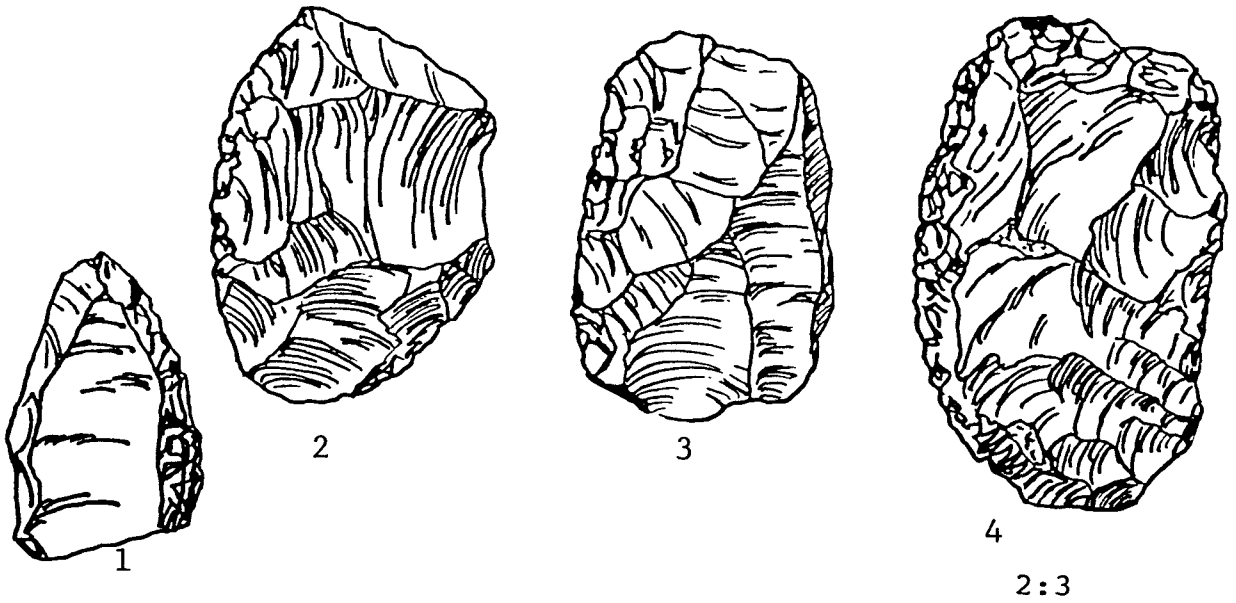

Figure 26: Racloirs from Et-Tabun, layers D and C.
1. Racloir made on a triangular Levallois flake.
2-4. Racloirs made on broad Levallois flakes. From Garrod and Bate, Mount Carmel, plates XXXV & XXXVI.

The C layer of Tabun is also important because it contained a fine series of human remains with a variety of Neanderthal and sapien characteristics.

A more evolved or Upper Mousterian of Levallois facies was recovered from the layer B and the Chimney I and II of Tabun and the neighboring cave of el Wad, layer G. The typological changes, however, are minimal. The percentage of tools of Levallois workmanship is still

high but lower than in layers D and C of Tabun. The number of worked Levallois flakes increases, whereas, in the Lower Mousterian layers of Tabun these are frequently left without retouch and used as such.[1] Also burins, blades and knives are less frequent.

Other sites with Mousterian industries of Levallois facies are Kebarah, Shukbah layer D, Jebel Qafzeh, levels F to L, and Jabrud. At Jabrud levels 10, 8-6, and 4-2 contain more points than racloirs. Once again we see the unpredictable nature of the industries from Jabrud. Layer 9 seems to be a weak pre-Aurignacian and layer 5

JABRUD I, LEVELS 10-2

Level	Hand-axes	Racloirs	Scrapers	Points	Burins	Borers	Denticulate	Diminutive	Flakes	Blades	Lev. Index	Blade Index	Denticulate Index
2	2	25		140	5				+300		54	13	0
3		63	9	147	40				+300	30	53	23	8
4		117	4	249	20				+400	70	49	7	10
5		293	14	185	17	5	30	125	190	70	30	10	39
6		53		133	12				200	23	45	10	16
7		92	59	146	24	2	33	40	+300	134	45	16	20
8	3	91		109	12				+300	97	47	16	13
9		44	16	36	23		70	15	145	98	32	19	30
10	2	40		135	3				+385		27	12	15

Chart 9

[1] Garrod and Bate, Mount Carmel.

has a high requency of denticulates. All of the levels are of Levallois facies. The cave of Shukbah is also of interest for the high percentage of plain Levallois flakes. Fourty-one percent of the industry is composed of these flakes, three-fourths of which are triangular. Here there is also an unusually high number of blades (21.5 percent). Otherwise the industry fits comfortably within the Mousterian typology of the Tabun layers which are also of Levallois facies.

As we see then the manifestations of the Mousterian of Levallois facies have technical similarities on the one hand, but a number of typological variations also.

Mousterian with Elongated Points

A Mousterian dominated by very long points, more or less retouched, and with lots of blades has been distinguished at the Judaean caves of Abu, Sahba and Larikba. R. Neuville has given no percentages for these tools; however, they dominate several plates in his publications for Abu Sif and Sahba (figures 25, 26, 27, 29, 30). In 1966 B. Vandermeersch in conjunction with J. Perrot and the French Archaeological Mission in Israel studied the material from Larikba. His table of typological characteristics[1] indicates that blades (75) outnumbered both

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[1] J. Perrot, L'Anthropologie 70 (1966): 130.

points (32) and flakes (34). It should be noted that of these blades only two were used as knives. The majority (69/75) are of Levallois workmanship and were generally retouched as points or racloirs.

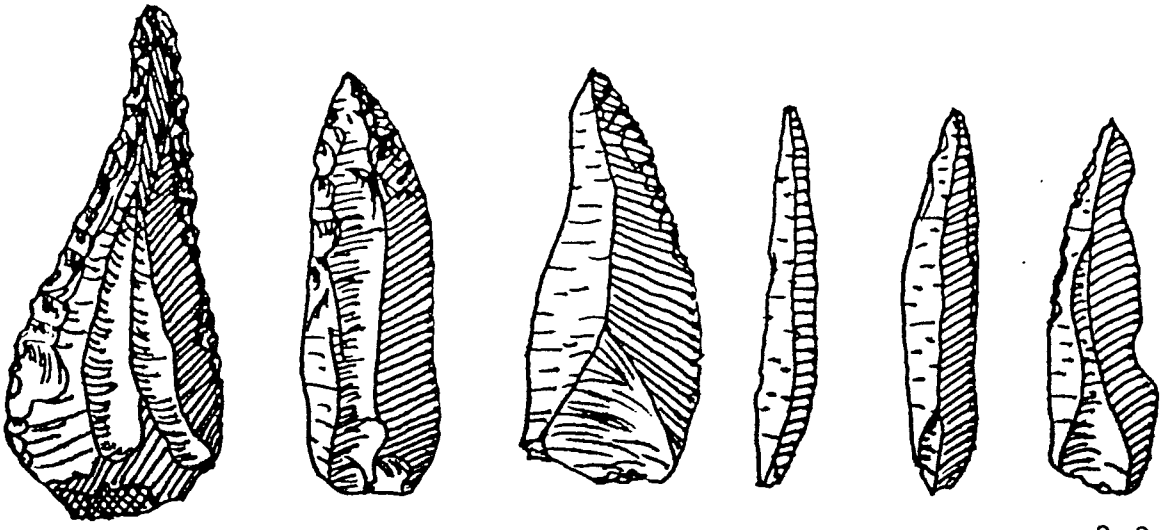

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Figure 27: Abou-Sif, layers C and B. R. Neuville, "Le Paleolithique et le Mesolithique de Desert de Judee, 1951, pp. 52, 53, 56, 57.

Typical Mousterian

The Typical Mousterian of the Near East is that which has a moderate number of racloirs and a normal percentage of tools of Levallois workmanship, that is, it follows the Mousterian of Western Europe and so is termed "Typical."[1] Perrot lists the industries of et Tabban, layer C. Oumm Naqus, layer C, level F of Jebel

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[1]Perrot, "Prehistory," p. 346.

Qafzeh, Jabrud I, level 7, and the cave of Shubbabiq as Typical Mousterian.[2] However, the more recent and fully published site of Tirat-Carmel is perhaps our best example of the Typical Mousterian in Palestine. Searched and excavated from 1965 to 1970 by Abraham Ronen of Tel Aviv University the groves adjacent to Tira produced a collection of 2,435 flints in the "Triangle" [2] and 113 flints from the "Excavation." The Levallois index is only 6 percent for the Excavation and 20 percent for the Triangle compared with 30-50 percent for the usual Mousterian sites of Levallois facies. There are a considerable number of tools of the Upper Palaeolithic type. These include 8-13 percent end-scrapers, less than 1 percent burins, and 2 percent borers. Knives make up 6-9 percent of the industry and the denticulates 7-10 percent.

A. Ronen mentions at least four sites of Mousterian occupation located in the red sand horizon of the coastal plain of Israel. None of these sites has been studied. He suggests that the relationship between these open sites in the coastal plain, the open site of Tirat-Carmel on the adjacent slopes of Mount Carmel, and the Mouserian industries of the caves of Mount Carmel should be a profitable subject of future research.[3] The two sites of

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[1] Ibid.

[2] A. Ronen, Tirat-Carmel, Institute of Archaeology, Tel Aviv University Publications No. 3, 1974, p. 4.

[3] Ibid., p. 64.

Tirat-Carmel seem to be related in that they are identical technically, but typologically different. The series of tools from the Excavation contained three times the relative quantity of cores and only one half the relative quantity of tools that the Triangle contained.[1] Also the Levallois index is lower for the Excavation.[2] Finally the much larger proportion of atypical scrapers, burins and awls in the Excavation further suggests that this site was a workshop from which the well made Levallois tools were removed and mostly the poorer tools and waste cores were left lying about.[3] The tools of the Triangle reflect more clearly an occupational state with a Typical Mousterian industry from Palestine.

Denticulate Mousterian

The Denticulate Mousterian is mentioned by Perrot as a less well-known variety which is likely to be of some importance. This industry is dominant in Turkey and the gravel beds of the rivers of Syria and Palestine. The only occurrence from a cave comes from the Rock Shelter I of Jabrud, levels 5 and 9.

The Denticulate Mousterian is of normal Levallois technique, that is, under 30 percent. It also has fewer

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[1]Ibid., p. 59.

[2]Ibid., p. 62.

[3]Ibid., p. 63.

scrapers than most Mousterian industries. The distinctive feature is its high proportion of denticulate edges.[1]

It would seem that the Denticulate Mousterian reflects the special requirements of men living in the open sites and especially the valley. One's first suspicion is that a denticulate edge would be well-suited to sawing.

Mousterian Bone Tools

The use of bone tools during the Middle Palaeolithic is not well recognized. However, a breakthrough in the understanding and the observation of these tools should result from the excavation of the cave in the Geula quarter of Haifa.[2] The Geula cave is one of 13 caves with Mousterian industries located in the western slope of the Carmel range.[3] The Geula industry is of Levallois facies. In layer B2 the points "are all elongated"[4] but not as long as those from the Judaen caves. With thin broad flakes they make up a high percentage of the assemblage. Racloirs, scrapers and burins are absent. In layer B1 there were small flakes and points and some

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[1]Parrot, "Prehistory," p. 346-348.

[2]E. Wreschner, The Geula Caves--Mount Carmel Quaternaria IX Roma, 1967.

[3]Ibid., p. 84.

[4]Ibid.

few racloirs. Scrapers and burins were absent.[1]

Layer A contained a more regular Levallois-Mousterian industry.[2]

Layers B2 and B1 come from a dry phase yielding a C14 determination of 42,000 year ± 1,700B.P. This seems to correspond to the Interpluvial which separates the Lower and Upper Mousterian.[3] The cave was abandoned with the return of pluvial conditions.

The bone tools of Geula, layer B, are generally taken from bovidea. They utilized the natural structure of the bones to create skinning, scraping, cutting and grooving tools. E. Wreschner suggests that these likely replaced the racloirs, scrapers and burins which are so conspicuously absent from layer B.[4]

Wreschner mentions that bone tools from the industries of Kebara and Qafzeh have also been reported.[5] The industry of Erq el-Ahmar which is composed mainly of small points and triangular flakes shows close typological links with the Geula industry.

It is quite possible that much evidence about Mousterian bone tools has been lost in the past simply because it was not recognized. The bone tools are not

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[1]Ibid.

[2]Ibid., p. 86.

[3]Ibid., pp. 86,87.

[4]Ibid., p. 87.

[5]Ibid.

the neatly formed points of later periods. Rather they are formed on split and spirally broken bones of large bovids. Also bone flakes are used. These tools seem to have served primarily in the working of skins.[1] However, the study of these tools has only begun, and future work on their forms, sources, and possible uses will no doubt build on the discussion by Wreschner.[2]

The Upper Palaeolithic

Since the work of R. Neuville on the Palaeolithic of the Judaean desert[3] the tendency has been to view the Upper Palaeolithic as a sequence of six or perhaps seven stages. The optional stage is made up of the pre-Aurignacian which F. C. Howell placed ahead of Neuville's six stages as stage 0. Howell does not seem to be widely followed, however.

Stage 1 is a transitional stage in which both Mousterian elements with Levellois technique and Aurignacian elements with a blade technique are intermingled.

O. Bar-Yosef, however, anticipates a re-organization of our understanding of the Upper Palaeolithic in Palestine.[4]

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[1]Ibid., pp. 115-131.

[2]Ibid., pp. 114-137.

[3]R. Neuville, "La Prehistorique de Palestine," Revue Biblique 43 (1934): 237-259.

[4]Bar-Yosef, 'Prehistoric Investigations," pp. 289f.

The six stage scheme of Neuville was based on only the results of el-Wad and Erq el-Ahmar, and a few new sites have since been found. The results from Qafzeh were not published because "they did not fit into what was known as stages I and II."[1] New excavations at Qafzeh, in the Negev, in Northern Sinai, and recent studies of the Ksar Akil collection have raised severe criticism of the accepted sequence. While no new interpretation has yet been widely accepted O. Bar-Yosef suggests that eventually two or three lithic traditions will emerge in place of the six-stage sequence. The matter is also complicated by the probability of more than one knapping method in many assemblages and by major differences in the assemblages of the early phases for Lebanon and Israel. Finally, the Epipalaeolithic cultures from the final phases of the Upper Palaeolithic and later (c17,000-8,000 B.C.) are increasingly distinguished from the Upper Palaeolithic. Further investigation of their origins should confirm this opinion.

The following presentation of the Upper Palaeolithic, one should note, does not go beyond the traditional six-stage sequence except to point to certain of its deficiencies.

Stage I is a transitional stage in which both the

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[1]Ibid.

Mousterian elements with a Levallois technique and the Aurignacian elements with a blade technique are intermingled. Besides the introduction of numerous blades made from prismatic cores, Stage I has also been defined by the rare and brief appearance of the Emirah point, which, until recently, was supposed to have been found only in this one transitional phase.

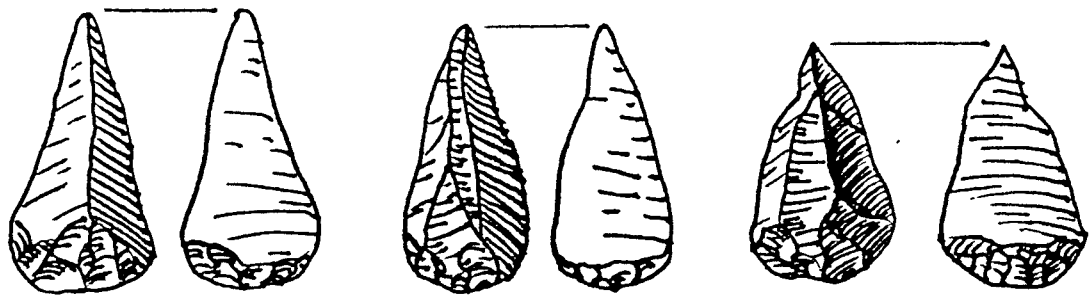

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Figure 28: Emireh points, from Garrod, The Mougharet El-Amireh in Lower Galilee p. 143, and Neuville, "Le Paleolithique et le Mesolithique de Desert de Judee," p. 74.

The renewed excavations of Kebarah by M. Stekelis between 1951 and 1965, and their recent publication[1] have established the presence of Emireh points both in the Upper Palaeolithic and throughout the Mousterian levels.[2] Stekelis points out that even at el-Wad, two Emireh points were found in the Upper Levallois-Mousterian,

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[1] Eretz-Israel 13: 97-149.

[2] Ibid., p. 110.

layer G, though Garrod claimed them to be intrusive from the layer above.[1] However, on the basis of findings at Kebara, Iraq el-Baroud, Qafzeh, and Nahal Oren, Stekelis has clearly shown the Emireh points were produced as early as the Mousterian of Kebara and at least as late as stage IV of the Upper Palaeolithic.[2]

It should be noted that in all but the most recent publications the Emireh point is assumed to indicate the presence of a brief transitional phase at the onset of the Upper Palaeolithic. Its reputation had become so secure that layers were considered Upper Palaeolithic I on the basis of its presence.[3]

The earlier discoveries of the transitional industries at the Emireh cave and el Wad were discounted as mixed deposits which had their source in two seperate layers, an Upper Mousterian and an Aurignacian. More than 20 years later following the discovery of undisturbed transitional industries at Abu Halka, IVe and f, and Ksar Akil 15-12 M., Miss Garrod reviewed the material from her dig at el Wad, layers F & G, treating them as a single layer despite the evidence of abrasion due to an ancient spring

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[1] Ibid., p. 112
[2] Ibid.
[3] Ibid., p. 113

in the back of the cave.[1] The same revised opinion is also held of Emireh, supporting the original opinion of the site's archaeologist Turville Petre.[2]

Besides the infrequent Emireh point stage I is generally composed of a selection of triangular points and Mousterian scrapers, plus such Upper Palaeolithic tools as end-scrapers on blades, steep scrapers, burins, borers, and Chatelperron knives. Technically the production of blades from a prismatic core is frequent.

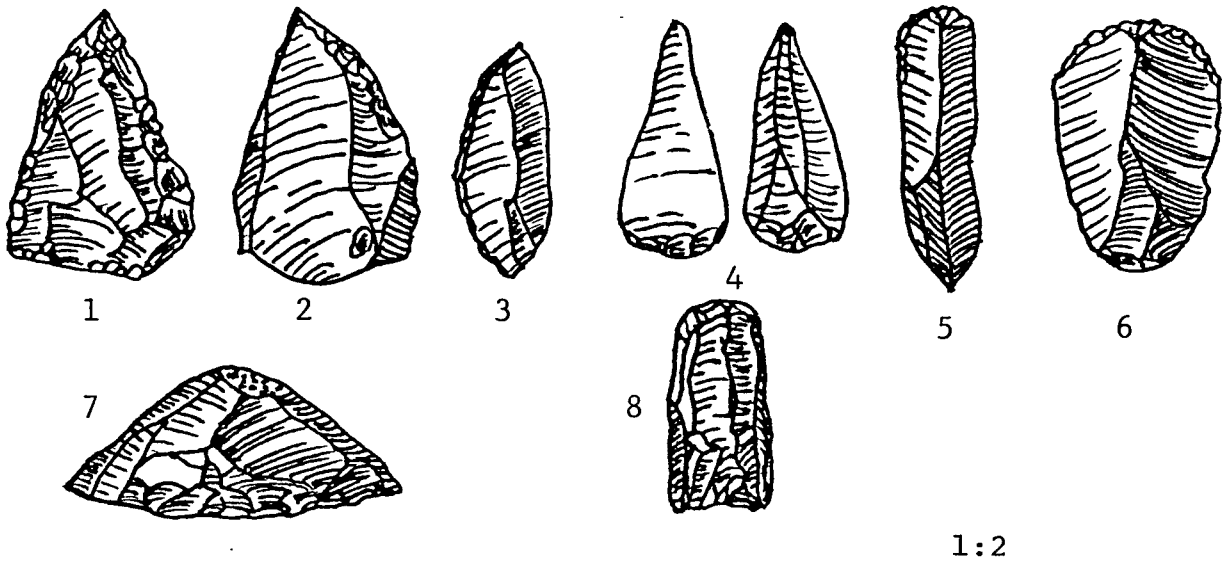

Figure 29: Tools from Stage I. 1. Mousterian scraper. 2. Triangular point. 3. Chatelperron knife. 4. Emireh point. 5,6. End-scrapers. 7. Steep scraper. 8. Prismatic core. From F. C. Howell, "Upper Pleistocene Stratigraphy," p. 58.

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[1]D.A.E. Garrod, "A Transitional Industry from the base of the Upper Palaeolithic in Palestine and Syria." Journal Royal Anthropologist Institute, 1952, pp. 121-132.

[2]Ibid., p. 128.

Garrod has noted two cores that have been used to produce both Levallois flakes and Upper Palaeolithic blades. It is not certain whether the blade industries are introduced from without or are the result of local invention.[1]

Stage II is also transitional. However there is a decrease in the proportion of Mousterian tools and the Emireh point disappears. The proportion of Chatelperron knives, end-scrapers, steep scrapers and burins increases significantly.[2] While the Levallois technique is still

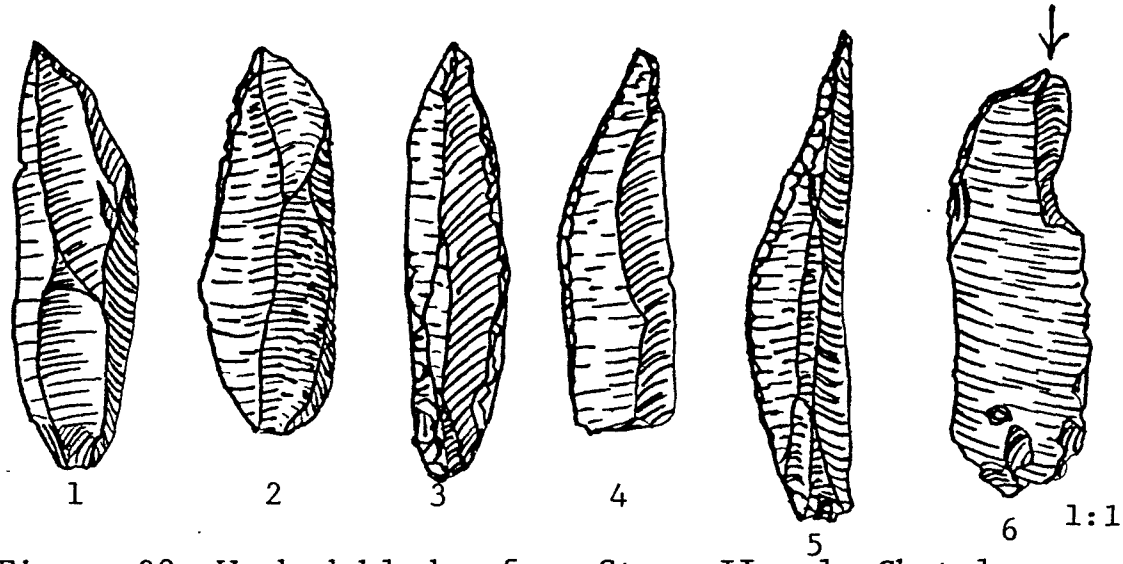

Figure 30: Worked blades from Stage II. 1. Chatelperron knife. 2-4. Blades. 5. El-Wad point. 6. Burin on a blade. From R. Neuville, "Le Paleolithique et ee Mesolithique de Desert de Judee," p. 91

used the production of blades by indirect percussion has

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[1]Ibid., p. 129.

[2]Perrot, "Prehistory," p. 355.

been improved. The blades are relatively thin, broad, and fairly short.[1] This stage is not very well represented in Palestine and appears to be absent from the Mount Carmel sequence. Nevertheless, sources outside Palestine suggest it could be quite a long phase. At Ksar Akil which has not been published after over twenty-five years, it apparently spanned eight meters of deposits from Stage II. The respective carbon 14 dates are 26,890± 380B.C. and 33,000 to 24,550B.C.[2] One should be cautious here as regional peculiarities were becoming increasingly common.

The El Wad point which is only reported from Emireh in stage I, is found in at least two sites of stage II. This long spiky point has been variously named, origonally by Garrod as a Font Yves point and later by Howell as a Krems point.[3] While similarities do exist it is rather distinctive in its Palestinian form and abundant from el-Wad, layer E. Therefore, prehistorians from Israel have favored the local name and hopefully this will settle the matter.

At Jabrud II, layers 7 and 6 a transitional industry occurs in which denticulates are present as well as a

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[1] Howell, "Upper Pleistocene Stratigraphy," p. 28.

[2] Perrot, "Prehistory," p. 356.

[3] Howell, "Upper Pleistocene Stratigraphy," p. 26.

single bone spear point.[1]

More frequent than the points are a variety of scrapers which comprise up to fifty percent of some of the industries. Most common among these are steep-scrapers or core-scrapers, and end scrapers while a whole variety of other scrapers exist as well.

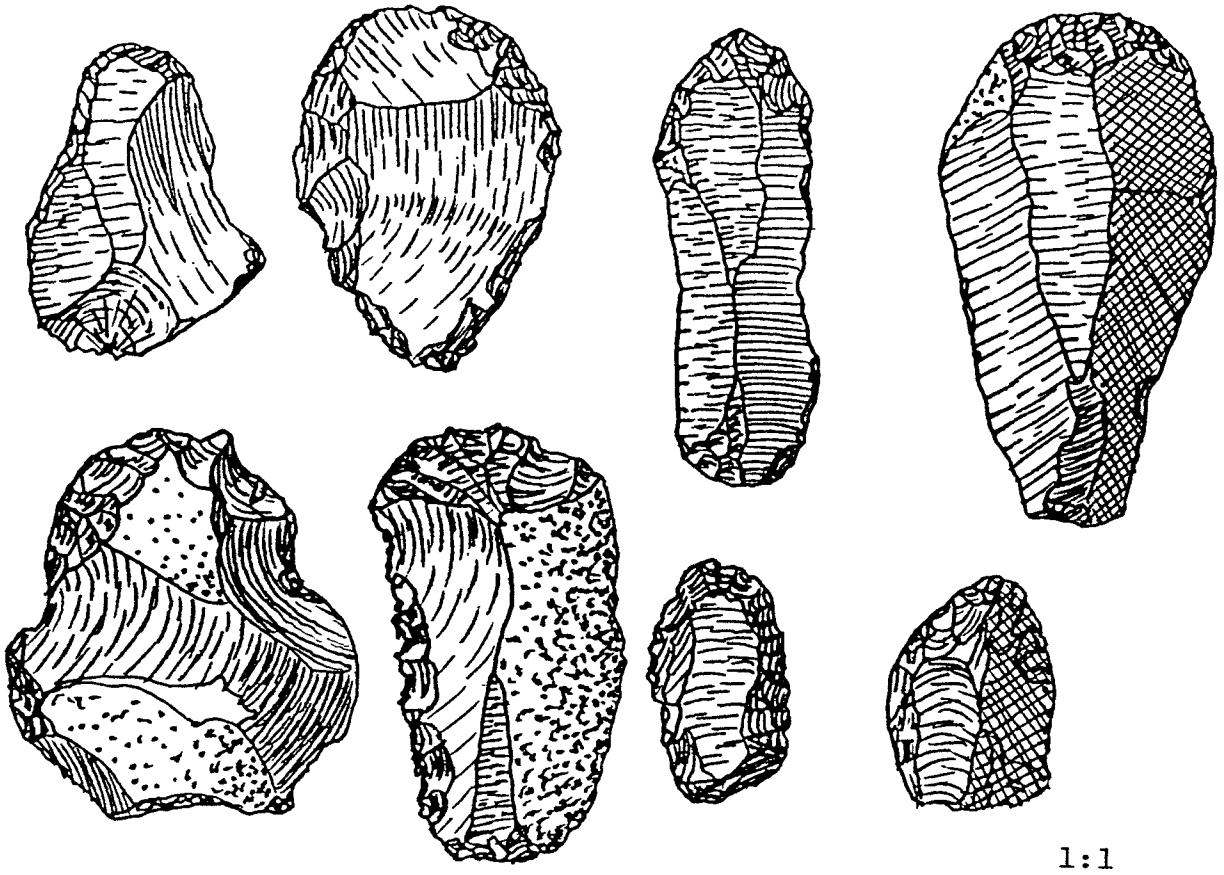

Figure 31: Scrapers from Stage II, from R. Neuville, "Le Paleolithique et le Mesolithique de Desert de Judee," pp. 84, 92.

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[1]Ibid., p. 28.

Finally a variety of burins is also present, especially at el-Wad, layer E, where they total over 20 percent of the industry.

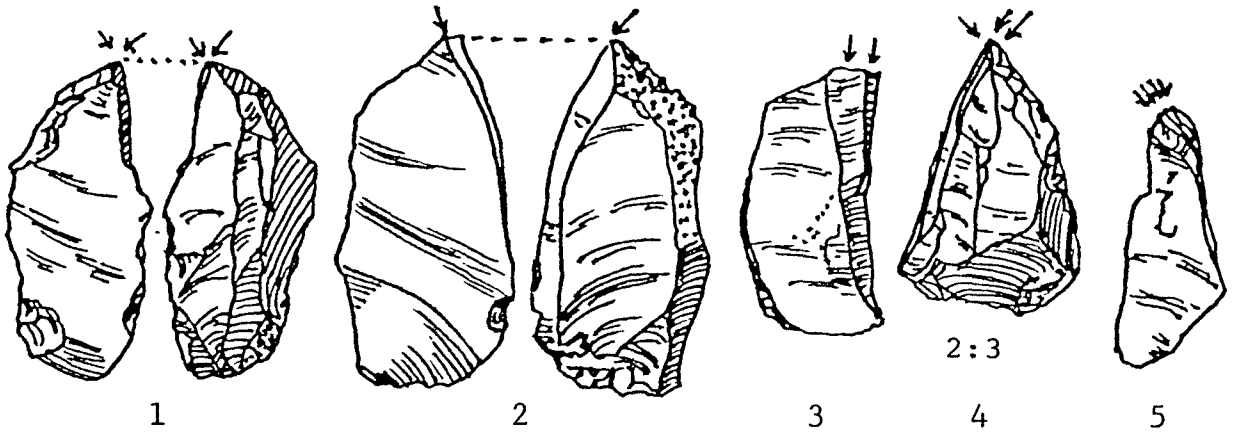

Figure 32: Burins from el-Wad, layer E. 1. Bec-deflute. 2. Angle burin. 3. Flat burin. 4. Polyhedric burin. 5. Beaked burin, from Garrod and Bate, Mount Carmel, plate XXXIII.

A sample of seven rare bone points was recovered from el-Wad. These may have been used as projectiles or as awls.[1]

By stage III the transition from the Mousterian to the Aurignacian is complete. While the Levallois technique lingers on Mousterian tools no longer fill a significant part of the assemblages.

Several tools are common during this period. The industry of el-Wad, layer E, included 2,349 catalogued

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[1]Garrod and Bate, Mount Carmel, p. 49.

points plus a large number of flakes, blades, and cores which were not counted but simply described as "very numerous."[1] These blades which were generally very small and similar to those which were used to make el-Wad points[2] composed 18 percent of the tools used of Kebara, layer E. However, Garrod indicates this is only a sample of the shaplier specimens from a much larger group.[3]

The El Wad point is common at all sites of this stage except Jabrud II, and Erq el-Ahmar, layer C, which R. Neuville describes as containing little kitchen debris and a very poor industry.[4] At Kebara layer E these points made up 12 percent of the industry and 7 percent at el-Wad, layer E.

Scrapers make up the largest segment of the industry at el-Wad, layer E. They include 60 percent (1,405 specimens) of the catalogued flints. Steep scrapers are by far the most numerous (881 specimens), and flake-scrapers (112 specimens) are also common.

The Kebara cave is located 13 kilometers south of el-Wad in the same face of the Mount Carmel range. Its

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[1]Ibid., p. 49.

[2]Ibid., p. 48, 49.

[3]Garrod, Excavation at the Mugharet Kebara, p. 169.

[4]Neuville, 'La Paleolithique," p. 101.

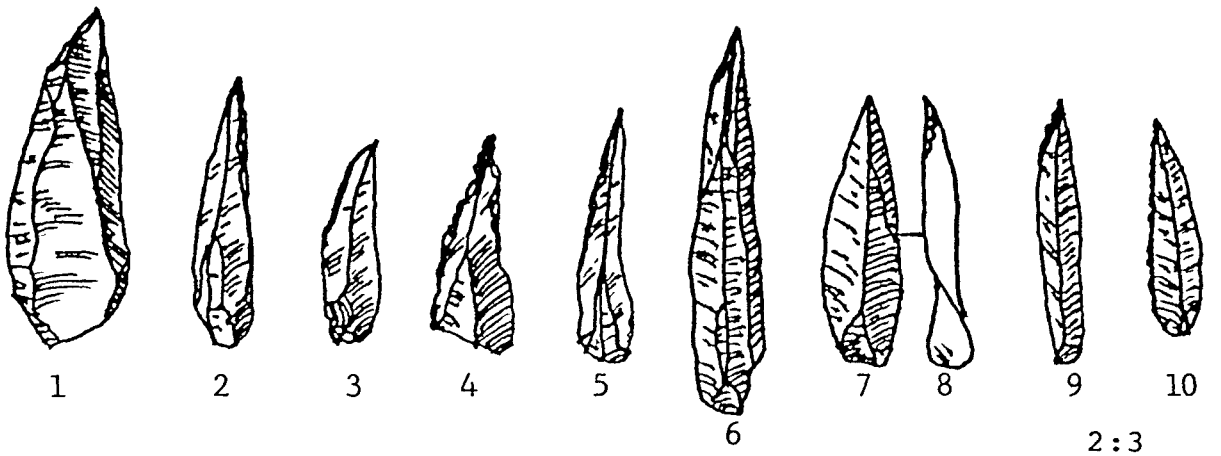

Figure 33: El-Wad points. 1. Chatelperron point. 2-5. El-Wad points from el-Wad. 6-9. El-Wad points from Kebara, layer E. From Garrod and Bate, Mount Carmel, plate XXIII, and Garrod, "Excavations at the Mugharet Kebara," p. 161.

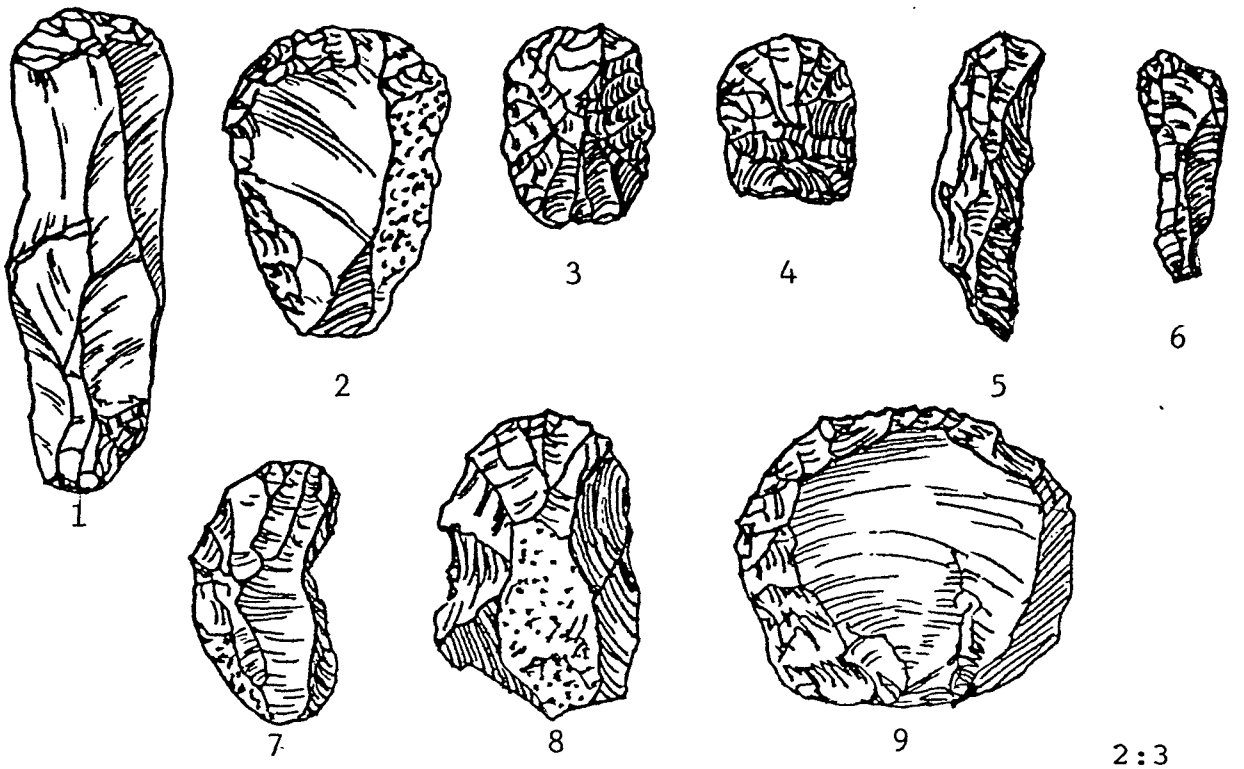

Figure 34: Scrapers from Stage III. 1,2. End-scrapers. 3-5. Steep scrapers. 6-8. Nose-scrapers. 9. Round-scraper. From Garrod and Bate, Mount Carmel, plates XXIV and XXV.

lowest level included a much smaller occurrence of El-Wad points (37 specimens or 12 percent), but scrapers were dominant (135 specimens or 40.7 percent), with steep scrapers (21 percent), flake-scrapers (10 percent) and end-scrapers (10 percent) abundant.

Scrapers also formed the largest part of the industry from the rock shelter of Erq el-Ahmar, layer D. Of the 65 specimens most are end scrapers with a peculiar type made on flat round flakes, having much of the circumference retouched. These unusual discoid flake-scrapers accounted for about one-fourth of the scrapers. Steep scrapers which dominate the stage three industries discussed above, are poorly represented here. There are only four of them.[1] As one would expect there is a good selection of El-Wad points (60) at this shelter.

The industries of stage III are also marked by a considerable increase in the number of gravers or burins. The work of Garrod at el-Wad, layer C-G, would indicate the increased manufacture of burins throughout the Upper Palaeolithic. In stage I they were absent from layer G, but formed about 3 percent of layer F. By stage III, layer E, they represented 19.6 percent of the industry, and in stage IV, layers D2 and D1 they included 8.5 percent and 19 percent respectively. Finally in stage IV, layer C,

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[1]Neuville, "Le Paleolithique," pp. 96-100.

their frequency amongst catalogued tools reached 40.8 percent.

Burins represented at Kebara 4 percent of layer E, stage III, and 4 percent and 7 percent of layers D2 and D1, stage IV. Although percentages cannot be obtained for Erq el-Ahmar and el-Khiam burins were common here from stage II and on.

In order to be classified as a burin a tool must have at least one burin facet. This is obtained by striking a blow roughly parallel to the edge of the flake or blade. In the case of blades this blow would be down the long edge of the tool. In all other forms of retouch the flaking is applied at about a right angle to the length of the blade or flake edge. The classification of the burins of Palestine in their most common form follows:

Stage	V	IV	IV	III	I
el-Wad	C	D1	D2	E	F1
polyhedric	22	6	4	7	6
ordinary	7	3	1	4	1
angle	7	4	1	3	1
multiple and single blow	2	3	1	2	.4
atypical	2	2	.2	.9	.2
beaked	.8	1	.1	.7	.2
flat	0	0	.8	4	.2
Total	41%	19%	9%	20%	9%

Kebara	D1	D2	E
polyhedric	4	2	3
ordinary	.8	.4	0
angle	.8	1	.9
multiple and single blow	0	.9	.6
atypical	.8	0	0
beaked	.4	0	0
flat	0	0	0
Total	7%	4%	4%

The most common burin in all Upper Palaeolithic stages is the polyhedric form. This tool serves as a gouge.

> Here a number of graver facets are required, inclined at an angle to one another in order to produce the convex curve of the gouge. There is generally a hollow on the opposite side formed by a large negative bulb of percussion at the top of the graver facet on the inner side of the working edge.[1]

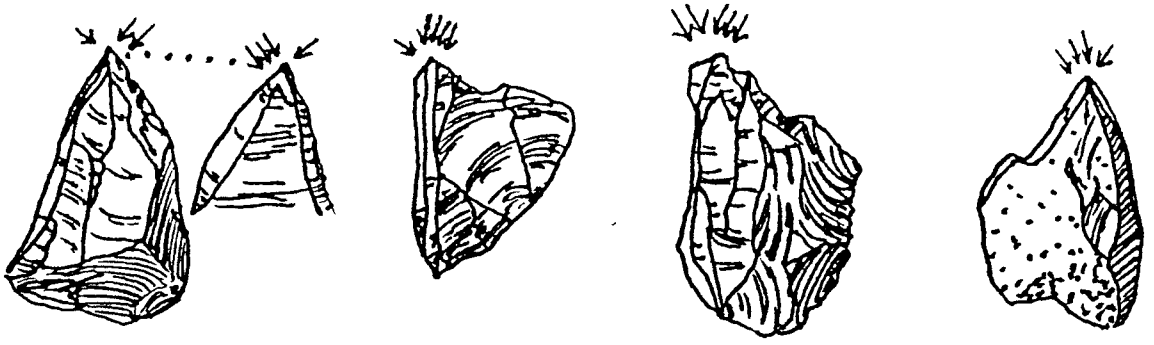

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Figure 35: Polyhedric burins from el-Wad and Kebara.

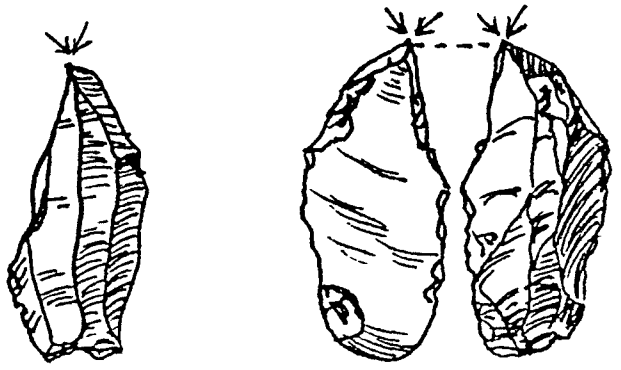

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Figure 36: Ordinary or bec-de-flute burins from Kebara and el-Wad.

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[1]Miles Burkitt, The Old Stone Age (New York: Atheneum, 1963), p. 67.

The second most common form is the ordinary burin or bec-de-flute. When made on a thin blade or flake one burin facet on each side of the working edge is sufficient to make a fine carving tool.

If the blade is thick two or more facets parallel to one another and in the same plan may be needed to produce a fine cutting edge.[1]

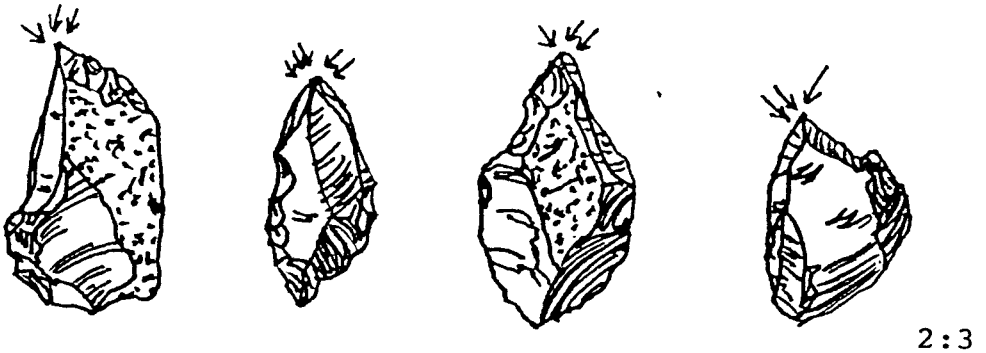

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Figure 37: Ordinary burins on thicker flakes from ed-Wad

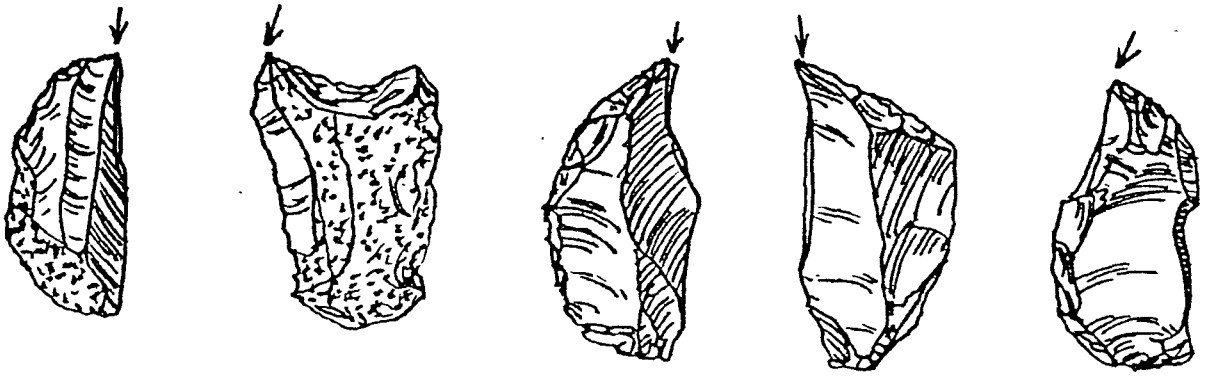

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Figure 38: Angle burins from Kebara and el-Wad

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[1] Ibid., p. 65.

Angle burins have a burin facet on one side of the working end and the other side trimmed by ordinary retouch. The trimming is classified according to its angle in relationship with the long axis of the tool. Thus all trimming angles are either oblique or transverse.[1]

Single blow burins can simply be made by striking a single facet from the end of a broken blade or pointed flake.

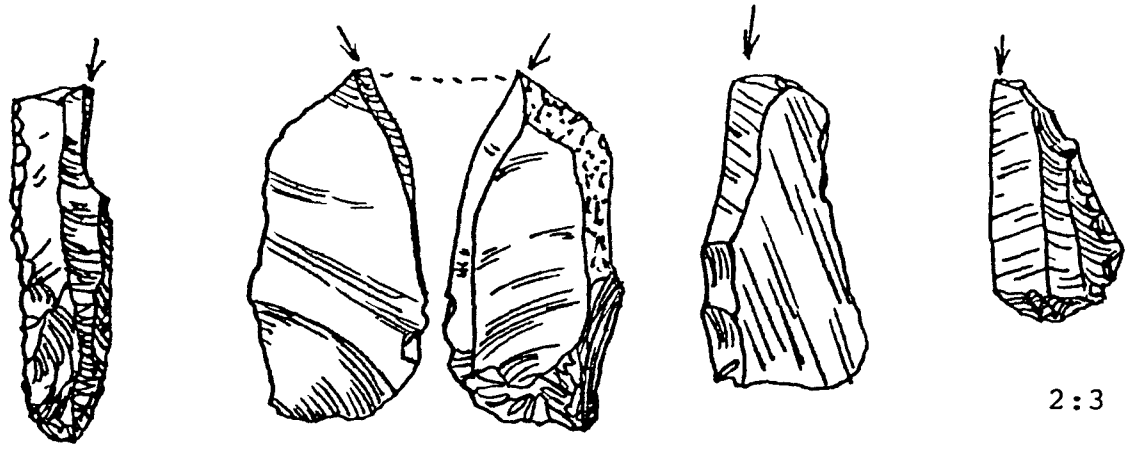

Figure 39: Single blow burins from el-Wad, Erq el-Ahmar, and Kebara.

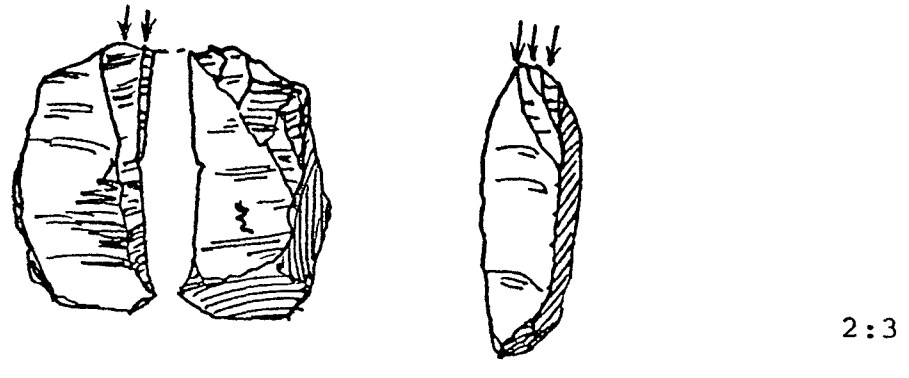

Figure 40: Flat burins from el-Wad and Europe.

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[1]Ibid., p. 66.

Flat burins have several facets one or more of which is nearly parallel to the main flake surface.

Beaked burins are not common.

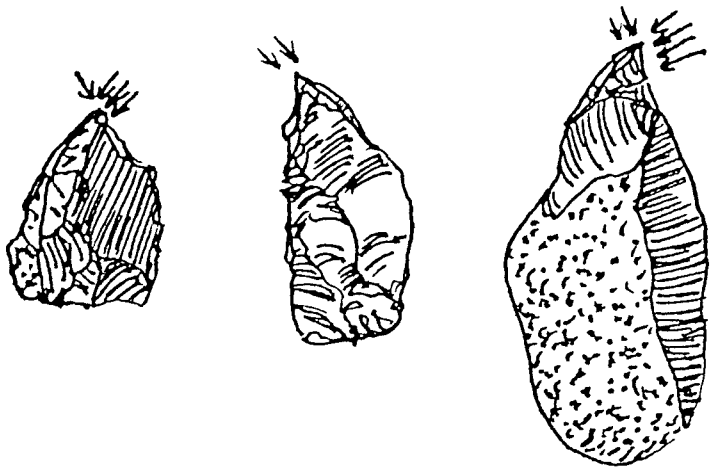

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Figure 41: Beaked burins from el-Wad.

Stage IV of the Upper Palaeolithic is an extension of the Aurignacian of stage III. During this period the points and burins become less numerous generally and there is an increase in the percentage of scrapers which are dominant.

Stage IV is the best known of all the Upper Palaeolithic phases. However, we have already met in detail most of its characteristic tools from our discussion of phase III. The exceptions are the scrapers which are met with such regularity at this time, and which will occupy most of our present discussion.

The most common of these is the steep or semi-steep scraper which form 43% and 33% of the

catalogued tools of el-Wad, layers D2 and D1. At Kebara, layer D, it ranged from 13 percent to 20 percent and was also abundant at Jabrud. The frequency of steep scrapers at Erq el-Ahmar and el-Khiam was much lower. Generally these scrapers are chunky and at times somewhat reminiscent of a core from which several miniature blades have been removed or a polyhedric burin.

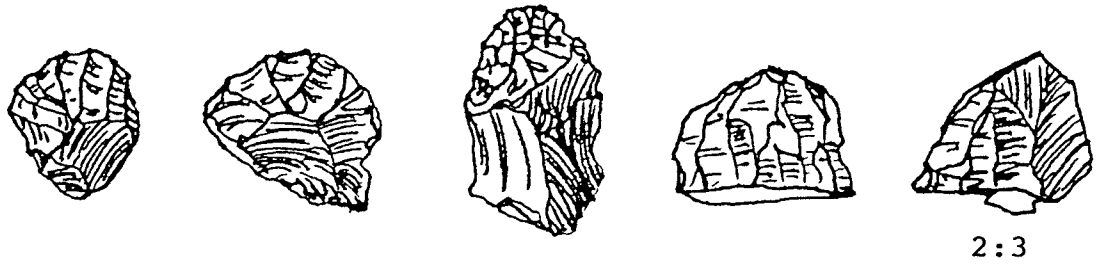

Figure 42: Steep or semi-steep scrapers from el-Wad, layer D.

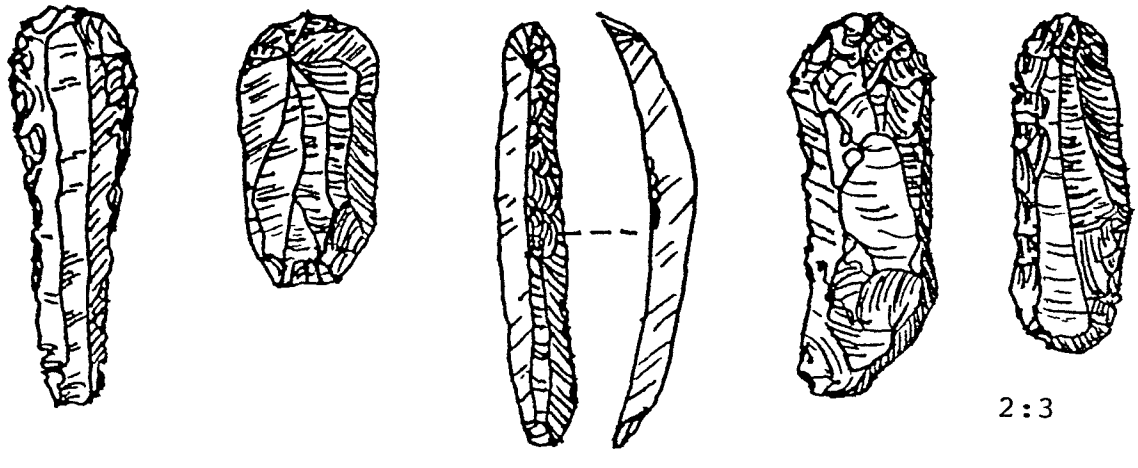

Figure 43: End-scrapers, from Kebara, layer D and Erq el-Ahmar, layer B.

The highest frequency of end-scrapers was 23 percent at Kebara, layer D1. Generally their presence accounts for from 10 percent to 20 percent of the stage IV tools. These scrapers have at least one end of a flake or blade sharpened to form a convex working edge. Trimming or sharpening of the other edges or end of the tool may also occur.

Flake scrapers are slightly less numerous than end-scrapers, reaching a high of 19 percent at Kebara. Of the 338 flake scrapers from el-Wad, layer D, the great majority are very rough, made on "broad flakes with scraper retouch round some part of the edge."[1]

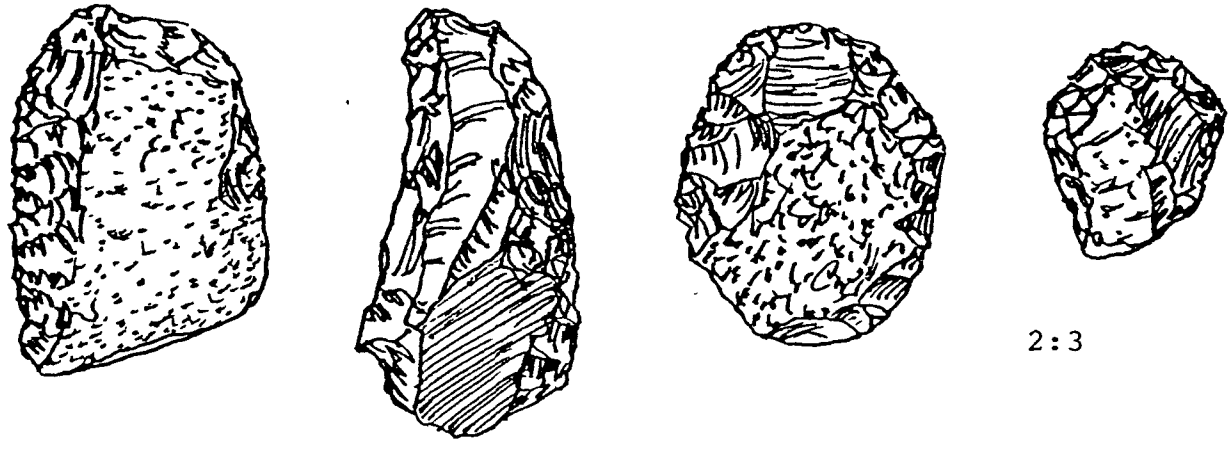

Figure 44: Flake scrapers, from el-Wad, layer D and Kebara, layer D.

Nose scrapers were numerous at el-Wad and Erq el-Ahmar, layer B, but in the other sites they were not

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[1]Garrod and Bate, Mount Carmel, p. 45.

very common. Nose scrapers appear on the end of flakes, blades or small cores and may sometimes be lost in these categories. Their distinguishing feature is the nose, defined on each side by a carefully trimmed notch.[1]

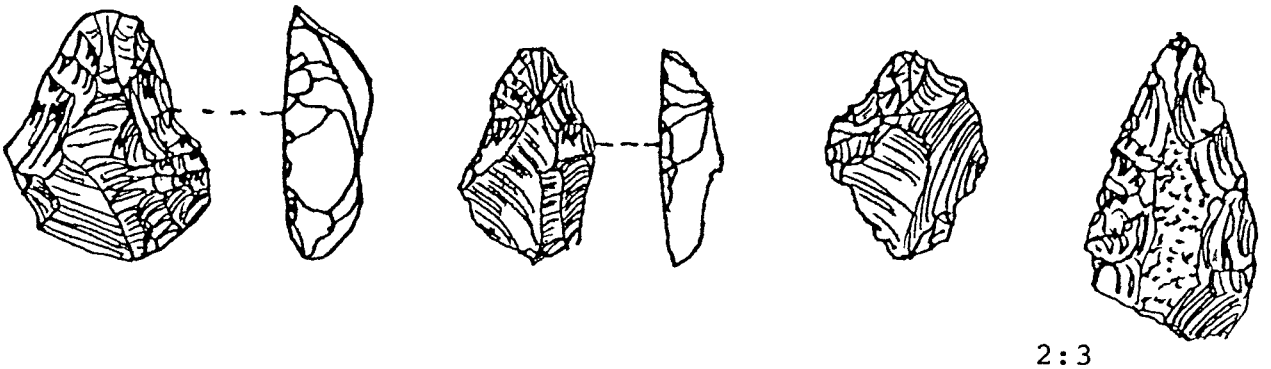

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Figure 45: Nose scrapers, from Kebara, layer D and el-Wad, layer D.

The great decline in the number of flint points since the Middle Palaeolithic may suggest that some other material was now used on projectiles. While wood may have been chosen a limited number of bone points have been collected. These include seven from el-Wad, layer E; two from Kebara, layer D2, one from Erq el-Ahmar, and several from Ksar Akhil and Jabrud. Only one split base point like those common in Aurignacian Europe has been found, that at Quseir.[2]

Stage V is not yet clearly defined. F. C. Howell views it as an extension of the Aurignacian of stage IV,

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[1]Burkitt, The Old Stone Age, p. 79.

[2]Perrot, "Prehistory," p. 361.

but with the El-Wad point now absent.[1] It is represented at el-Wad, layer C and el-Khiam, layer E.

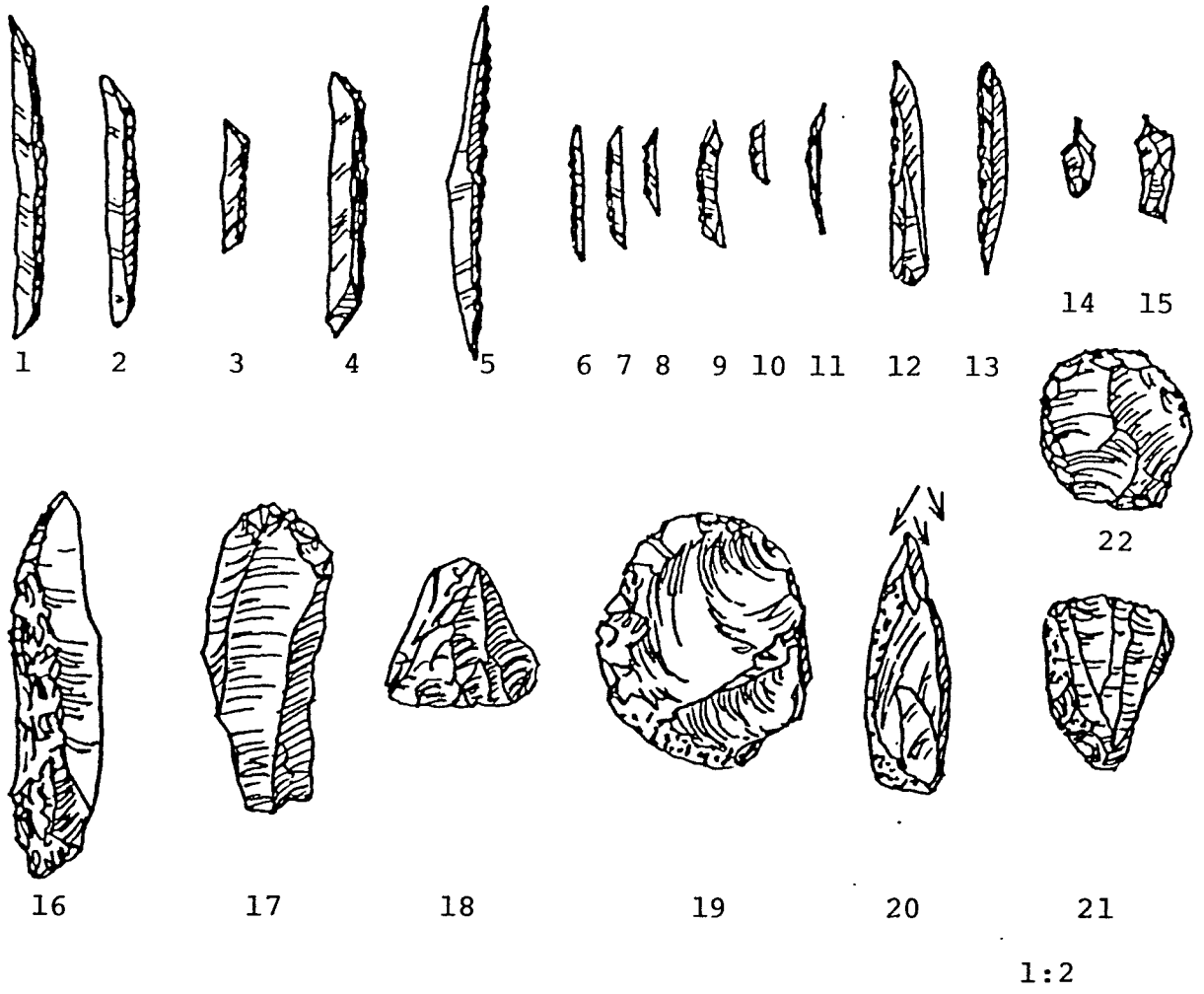

Figure 46: Tools from stage VI. 1-5. Bladlets with blunted backs from Kebara, layer C. 6-11. Microlithic backed bladlets with retouched points from Madamagh. 12&13. Backed blades from Madamagh. 14&15. Points on borers from Madamagh. 16-19. Larger tools from Kebara. 20-22. Larger tools from Madamagh.

Perrot mentions several other sites for this stage:

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[1]Howell, "Upper Pleistocene Stratigraphy," p. 31.

Qeseimeh, Qedeirat, Masaraq an Na'aj, and especially Atlit, which has given its name to this phase. His studies also indicate the presence of microliths in these layers so that stage V can be viewed as early transitional from the Aurignacian industries of stages III and IV to the microlithic industries of the Neolithic.[1] The publication of the material from Ksar Akil may illuminate our understanding of this stage.

With stage VI we meet industries that are dominated by microliths yet contain a considerable proportion of tools from the Aurignacian traditions. These are known as Kebaran from the Kebara cave in Mount Carmel. The tool which is most common to the sites of this stage is a microlithic blade which has been narrowed by having the back blunted. The ends have been obliquely truncated, often resulting in points at one or both ends. Microlithic points and triangles also occur but the latter are not common.

The larger tools that are common from this stage are thick end scrapers, burins and backed blades.

Regional variations seem to have developed by stage VI. In the Wadi Madamagh, near Petra, Jordan, an industry very similar to that of Kebara, layer C, was reported in 1958 by Miss D. V. W. Kirkbride. The unique

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[1]Perrot, "Prehistory," p. 362.

variation within this industry was not the form of the tools but their size. There were numerous bladelets which were very roughly half the size of similar microliths from Kebara. Also microburins were reported.[1] With these smaller microliths were also found tools of normal Aurignacian size. This industry from near Petra has been named Micro-Kebaran by Kirkbride.

With these stone tools at Petra was also found the remains of a necklace in the form of several pierced marine shells.[2]

Other sites with industries similar to that of Kebara, layer C, are Point 108 in the Negev, Wadi Dhobai, Kfar Vitkin, Ksar Akil, and Jabrud, Shelter III, layers 8, 7 and 3.[3]

Jabrud seems to have the most complete sequence for the close of the Upper Palaeolithic. Levels 10 and 9 are Aurignacian; level 8 is a poor microlithic bearing bed. Levels 7 and 6, termed Nebekian, are very close to Kebara, layer C. Level 3 is also microlithic with points termed Falitian. Finally in level 2 the transition is made to Natufian.[4] Micro-burins like those found from Wadi

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[1]D. V. W. Kirkbride, "A Kebaran Rock Shelter in Wadi Madamagh, Near Petra, Jordan, 1958, p. 57.

[2]Ibid., p. 56.

[3]Perrot, "Prehistory," p. 365.

[4]Ibid.

Madamagh were reported at Jabrud.[1]

Point 104 in the Negev seems to be slightly earlier than the Kebaran. The industry was made up of 37 percent scrapers (13 percent on blades), 3 percent burins, 23 percent blades and only 14 percent was microlithic similar to Kebara.

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[1]Kirkbride, "A Kebaran Rock Shelter," p. 57.

CHAPTER IV

PALAEOLITHIC LIFE IN PALESTINE

As one studies the sequence of Palaeolithic industries a limited picture of early man in Palestine emerges. There are few fossil remains of man himself from the Lower Palaeolithic. Rather we must concentrate on his tools and the environment in which they were found to understand man himself.

The earliest men camped by rivers, lakes, wadis, and the sea where they found excellent hunting. There is a cluster of important Acheulian sites in the Upper Jordan Valley. These include Ubeidiya, Jisr Banat Yaqub, Ma'ayan Baruckh and Eynan. The flow of the Jordan River and the size of the Sea of Galilee were subject to considerable variation and at times greatly exceeded those of the present. The rich vegetation attracted a great variety of large and small vertebrates which in turn brought our early hunters to the valley.

The men from these early Acheulian camps seem to have been the most courageous hunters one is ever likely to find. While the main source of meat seems to have been hippopotomi, several species of deer, horses, and bovids, the faunal remains from their hunting camps also include

wild cats, hyaenas, small wolves, bears, sabre-toothed tigers, wild boar, wild oxen, giraffes, rhinoceros, and elephants plus smaller mammals, amphibians and fish.[1] The hippopotamus, rhinoceros, and elephant are commonly found at other Early and Middle Acheulian sites. The Early Acheulian tools of the Evron Quarry were associated with the remains of elephants, wild pig, hippopotami, a cervid andhyaena.[2] The excavations at Jisr Banat Yaqub were instigated by the discovery of a fossil elephant.[3] A comparison of their choppers, picks, spheroids, hand-axes and crude flake tools with their prey immediately raises questions. While Ofer Bar-Yosef suggests that they mayhave scavenged for food it is difficult to imagine that this accounted for most of the meat which these people apparently consumed in such substantial quantities. Furthermore, the tools aside from the spheroids, are more suited to butchering than to the actual hunt. It would seem then that the weapons used to down these animals have long since disappeared. Certainly wooden projectiles would readily suffer decomposition.

The Early Acheulian tools also show a lack of uniformity which is overcome in the remainder of the Palaeolithic. It would seem that the first tools from Ubeidiya

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[1]Bar-Yosef, Archaeology, p. 36.

[2]IEJ 27 (1977): 162.

[3]Stekelis, "The Palaeolithic Deposits," p. 61.

were made without any clear standards guiding their manufacture. Also the use of limestone and basalt into the Middle Acheulian would suggest that flaking traditions were not firmly set and experimentation was acceptable. With the later layers of Ubeidiya we find the original uncertainties overcome. We also note the presence of lighter tools made on flakes. These include scrapers, burins and awls, tools which are characteristic of the Upper Palaeolithic, but show up in small numbers throughout the Lower Palaeolithic. These suggest at least a limited domestic use of hides in these camps.

The use of fire in the Early and Middle Palaeolithic has not been clearly proven, but there is ample evidence of its use in the Late Acheulian.[1]

Of more interest is the nature of a living floor in the Layer I-15 of Ubeidiya.

> Professor Stekelis was of the opinion that the living floor was artifically made by the men who lived in the area. This theory is substantiated by the following observations. It is a uniform horizon of one or two pebbles thickness. The sharp-edged angular shape of the stones suggests that they were not carried by water action, but brought deliberately and placed with the intention of making a surface. Further, the natural form of the local basalt boulders (especially those of large size) is of one convex and an opposite flatter side. These were chosen and laid with their flat surfaces upwards, side by side with the flat-surfaced limestone blocks. In this way men constructed a flat, continuous, dry surface on the marshy bed. On top of this surface, according to Stekelis' theory,

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[1]Gilead, "Early Palaeolithic Cultures," pp. 318, 322.

> they built windbreaks, shelters or other installations. Between the area excavated in 1965 and that excavated in 1966 a two-meter wide strip of soil was found (Squares 67-68) without stones. This again, supports the concept of an artificial origin of the living floor.[1]

This living floor is of special interest inasmuch as no walls have been found constructed in the Palaeolithic cave deposits, and until now the earliest structures have been associated with the Neolithic or perhaps the Kebarian, a transitional culture between the Palaeolithic of Palestine and the Natufian or Mesolithic.[2]

Dr. Leakey also reports the remains of what appeared to be a circular stone habitation or hut at the bottom of Bed I in Olduvai Gorge.[3] Like the living floor of Ubeidiya this structure has seemed so far ahead of its time that it is rarely mentioned beyond the initial report.

There is also some indication that the typological and technical advances at Ubeidiya occurred over a relatively short period of time, inasmuch as they all preceded the last transgression of the lake and the subsequent folding which has left the valley in its present condition.[4] The total number of tools is comparatively small and would tend to limit the length of the period in which

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[1]Stekelis, Ubeidiya, pp. 15, 16.

[2]Wreschner and Ronen, IEJ 25 (1975).

[3]M. I. Leakey, Olduvai Gorge vol. 3. (London: Cambridge University Press, 1971), p. 272.

[4]Bar-Yosef, Archaeology, pp. 32-34.

they were produced. However, this sort of calculation cannot be relied on too heavily.

The transition from the camps beside the water resources to the caves and rock shelters in the Late Acheulian implies several changes. But first of all we may note some evidence to indicate population patterns. When studying the deposits of the three Palaeolithic caves of Mount Carmel and the cluster of caves in the wadis below Bethlehem, it was observed that the occupation continues in each area without interruption though the occupation moves from cave to cave within the area. Secondly, occupation from any given period is usually represented at only one cave in each area. This was first noted at Mount Carmel where there are only three caves and the evidence is fairly clear due to the long succession of occupational layers in two of the caves. In the Judaean desert the evidence is more complicated by the large number of caves but the results are quite similar with some minor exceptions possible. The inference in each area is that all the deposits for that area were left by a single group which occupied the area continuously.

The transition to the settled life fixed about a cave was no doubt preceded by an increased hunting confidence. At Mount Carmel the grassland gazelle and woodland deer became the special subjects of what must have been regularly successful hunts. As with the open camps, we

OCCUPATION CHART ONE: MOUNT CARMEL

Stage	Tabun	El-Wad	Es Skhul	Kebarah
Natufian		B2		
6				C
5		C		
4		D		D
3		E		E
2				
1		F		
Up. Lev.	B	G		
Mid. Lev.				
Low Lev.	C,D		B,C	
Mic	E			
Up Acheul.	F			
Tabunian III	G			

Chart 10

OCCUPATION CHART TWO: JUDAEAN DESERT

Stage	E.Ahmar	O.Qatafa	U.Naqus	E.Khiam	Sahba	A.Sif Tabban
Natufian	A2			C		
6				D		
5				E		
4	B,C			F		
3	D					
2	E,F					
1			B			B
Up Lev.			C	B		C
Mid.Lev.				C	B	
Low Lev.	H				C	
Mic.		D1				
Up. Acheul.		D2				
Mid. Acheul		E,E2				
Tabunian II		E3,F				
Tabunian I		G				

(Terminology and information from R. Neuville, "Le Paleolithique du desert de Judee," p. 261)

Chart 11

have no evidence to indicate the weapons used in these hunts. The spheroids which may have been used earlier as bolas were not found at any of the caves. The choppers, hand-axes and racloirs were more suited to butchering, and the smaller tools were not used for hunting. Even the rare points were not designed for hafting. We must still guess at the means by which they secured meat. Scavenging seems out of the question. Bone points only appear much later. If wooden points were not used an ingenious system of traps, of which we will likely remain ignorant, is the only obvious alternative.

The great increase in the racloir class is probably due to the opportunities settled life gave for the development of domestic pursuits. It should be noted that the move to the caves and rock shelters was not associated with any developments in technique. The step-flaking introduced to finish the racloirs was not an improvement over the finish already obtained on the Middle and Late Acheulian hand-axes. Rather it was a very simple way to get a satisfactory edge on a tool. Men were, however, finding more uses for flint.

The Late Acheulian seems to have been interrupted by the influx of new elements into the Near East. The Jabrudian with its lack or shortage of hand-axes is not technically different than the other Acheulian cave deposits. The pre-Aurignacian, however, marks the abrupt

introduction of a new blade technology at Jabrud and a temporary disruption in the increasing use of the Levallois technique. The temporary nature of this industry and the isolation of its technique from that of the surrounding layers suggests that it was brought into the area, probably from Europe but perhaps from elsewhere in the Near East. The pre-Aurignacian of Jabrud I dominated on two occasions, layers 15 and 13. At Tabun it was twice found mixed with the Late Acheulian industries of Layer E. This difference may be accounted for by the different occupational patterns at the two sites. The rock shelter at Jabrud was never occupied as heavily as the E layer of Tabun. In fact the density of tools at Tabun is about one hundred times greater. At Jabrud there were several layers where the occupational remains were very scarce. Thus it appears that the migrant bearers of the pre-Aurignacian were able to occupy the shelter at Jabrud as sole tennants. The groups which occupied Tabun on a continuous basis were influenced by the pre-Aurignacian but never dominated by it. Horizons where the pre-Aurignacian influenced Tabun are at the base of Eb and at the upper Eb and lower Ea.[1]

If one accepts the theory that the pre-Aurignacian was introduced from Europe then it would date from Wurm II

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[1]Howell, "Upper Pleistocene Stratigraphy," p. 25.

and the Mousterian of the Near East follows in Wurm III.[1] This is a very late date for the industries of the Near East; over 20,000 years later than the industries of Europe. However, Bordes argues that the similarities between the pre-Aurignacian and the real Aurignacian are so great that the time between them must be relatively short.

An alternative theory is that the pre-Aurignacian is "the earliest occurrence of blade technique and typology anywhere in the Old World."[2] Howell suggests the development of the blade technique in the levels Ea and Eb of Tabun along with the Acheulian. Only at Jabrud was it divorced from this Acheulian.[3] Such a theory would place the pre-Aurignacian in the last inter-pluvial or at about 70,000B.P.[4] This is the position taken by J. Perrot who argues that the Carbon 14 dates for the Levallois-Mousterian are at around 45,000B.P. and earlier, or at least 10,000 years before the Upper Palaeolithic of Europe. The pre-Aurignacian is clearly a Late Acheulian phenomenon prior to the Levallois-Mousterian, and therefore, earlier than the Upper Palaeolithic of Europe.[5]

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[1]Bordes, "Le Paleolithique," pp. 502-505.

[2]Howell, "Upper Pleistocene Stratigraphy," p. 25.

[3]Ibid.

[4]Gilead, "Early Palaeolithic Cultures," p. 335.

[5]Perrot, "Prehistory," p. 339.

The current examination of the E layer of Tabun should be of value in deciding between these positions. Even so we may suspect that the question of the pre-Aurignacian and its relationship to the Upper Palaeolithic industries of Europe will continue to be a thorny problem for some time to come.

The Middle Palaeolithic industries present a picture of life which is remarkably uniform. The period is dominated by the adoption of the Levallois technique in all areas. However, a certain regional variety is also present. The Mousterian industries of various facies seem to have developed side by side. In retrospect the very neat typology by David Gilead for the Lower Palaeolithic which we have presented above is perhaps somewhat artificial. We may also be observing the onset of a regionalism which will become stronger in the Upper Palaeolithic.

The Mousterian industries indicate changes in hunting equipment. Perhaps this period marked the advent of composite weapons. While this may have occurred earlier with the Early Acheulian spheroids which were possibly used as bolas or in slings, we may claim for the Mousterian an industry dominated by projectiles with flint points. While the system of hafting is still unknown, and the fact that these points were indeed mounted is only assumed, certain lines of evidence make this most likely. Triangular

points manufactured by the Levallois technique and other methods were most common. Their butts were often trimmed to reduce the bulb of percussion, and it is difficult to explain an alternate use for these points if they were not used on projectiles. Their frequency of manufacture must relate to the consumption of projectiles by our Middle Palaeolithic hunting industry.

E. Anati also suggests that the elongated triangular points were used for daggers.[1] It should first be noted that the early knives were generally backed, that is, the edge opposite to the cutting edge was blunted to allow the holder to apply considerable pressure. These knives were never meant to be attached to any holder but the human hand. This is true of the backed knives generally and of the Chatelperron and Audi knives specifically. In fact a Chatelperron knife recovered from the fringe of the Tabun terrace has not only a blunted back but also a groove for the second finger. This allows not only the exertion of pressure downward but a firm grasp on a very small tool. The greater bulk of the Audi knife and many Chatelperron knives made them easily grasped without such a groove.

The frailty of flint and the efficiency of backed knives seem to militate against the mounting of elongated

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[1] E. Anati, Palestine Before the Hebrews (New York: Alfred A. Knopf, 1961), p. 82.

points as daggers with handles as we know them. Their use as spear points is more likely.

1:1

Figure 47: A Chatelperron knife with a groove for the second finger.

There is a change in the fauna of Palestine toward the end of the Mousterian or at the first interstadial. This change concerns the general replacement of archaic types like elephants, hippopotami and rhinoceroses with grassland types like oxen, horses, gazelle and especially fallow deer.[1] This change is not as dramatic as the corresponding "faunal break" of Europe because the climatic fluctuations of Palestine were less severe.

The climate of Palestine seems to have been more moderate and damper than at present. This is indicated by the presence of Mousterian finds throughout Palestine and into the desert regions. The Judaean caves south of Bethlehem are in a rain shadow area that is today only marginally habitable but in the Middle Palaeolithic witnessed an increasing population. The development of a lake extending from the Salt Sea to the Sea of Galilee is a further indication of the humid climate of Palestine which apparently corresponded to the onset of the last glaciation.[2]

A most rewarding area of research in the Middle Palaeolithic centers around the numerous human fossil remains from the Near East. The largest collection of evidence comes from Tabun, layer C, and Skhul, layer B of

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[1]Ibid., p. 97.

[2]Perrot, "Prehistory," p. 354.

Mount Carmel where eleven individuals were recovered. Another skull was found at Zuttiyeh in Galilee, and parts of five individuals were recovered from layer L of Jebel Qafzeh near Nazareth. Since their discovery the Mount Carmel remains have by their variety given rise to divergent opinions. As summarized from Perrot these remains include the following:[1]

> Tabun C—The Neanderthaloid skeleton of a woman of about 5 foot 5 inches in height and part of a man's mandible.
>
> Skhul B—
>
> I a male of about four years, well preserved
> II a female of thirty to forty years, fragments of skull, mandible and arms
> III adult male, fragments of legs
> IV,V males, good preservation
> VI male of thirty to thirty-five years, fragment of skull and mandible
> VII female of thirty-five to forty years, back of skull
> VIII male of eight to ten years, parts of legs
> IX male of fifty years, skull cap and part of skeleton
> X male of five years, mandible and part of upper arms

These remains fluctuate between two poles, the Neanderthaloid type of Tabun C and the Cro-magnon type of Skhul B, individual V. Individuals II, IV, V and IX are of the Cro-magnon type whereas individual VII is Neanderthaloid. Individual VI contains strong features from both groups.[2]

Five individuals from Jebel Qafzeh exhibit some

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[1] Ibid., p. 350.

[2] Ibid.

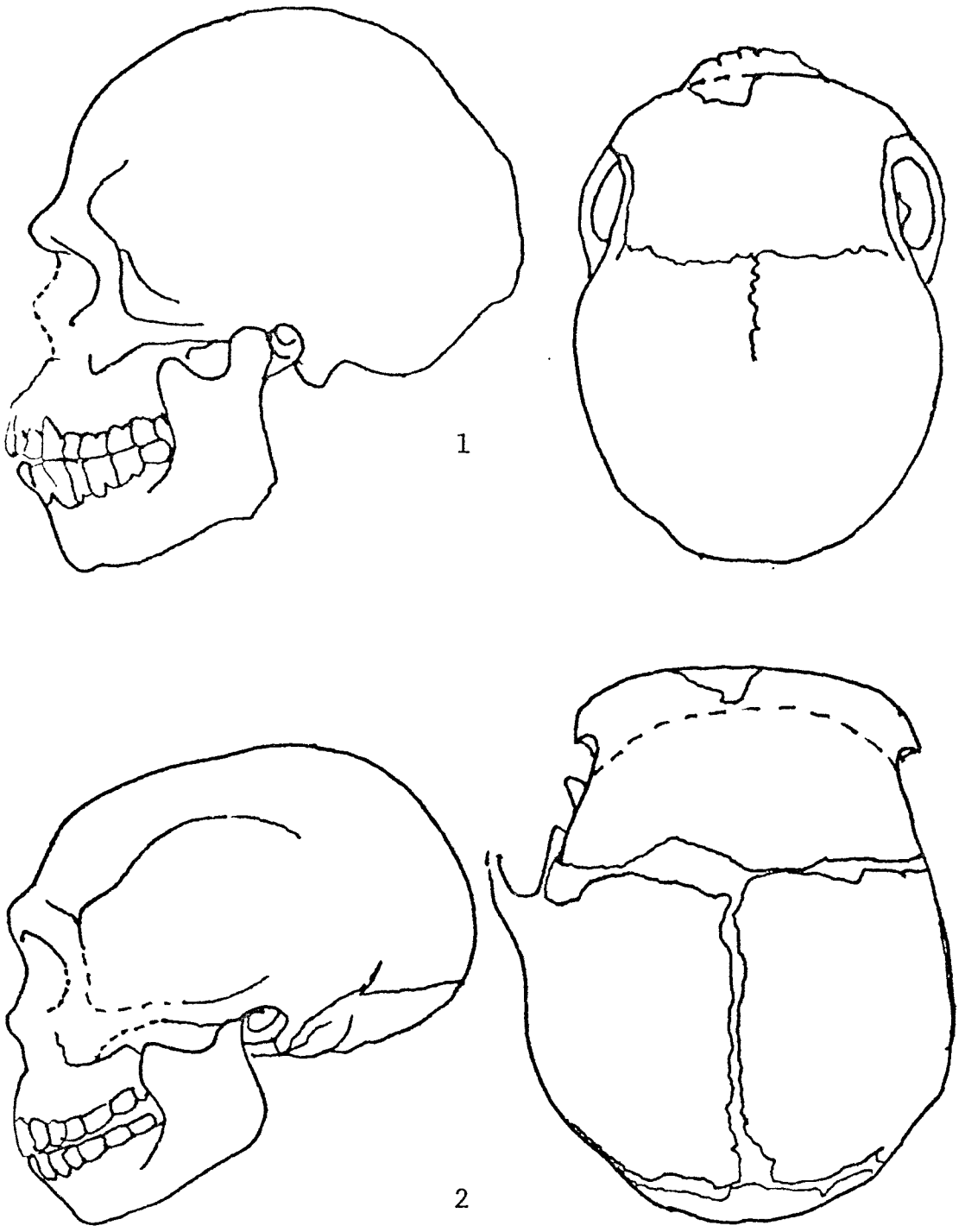

Figure 48: 1. Skull of individual V of Skhul. 2. Skull of individual I of Tabun, from McCoron, Keith, Mount Carmel II, 1939, figures 181, 187, 165, 166.

Neanderthal features, including marked brow ridges. They are much like the variety of forms from Skhul B. One Neanderthaloid individual has been recovered from Amud and one from Kebara.[1]

While the Upper Palaeolithic of Palestine offers us no fine bone and antler tools nor any array of cultures comparable to those of Europe it does end rather well. In fact, the Upper Palaeolithic of Palestine blends evenly into the Natufian, which corresponds to the Mesolithic. Typologically there is no break, but rather a smooth transition from one industry to the next.

Accompanying this transition there are a few unusual developments. It would seem that the earliest suggestions of settled argicultural life come from Ein Ǧeuv by the Sea of Galilee. There associated with the remains of a hut, a basalt mortar and two pestles was discovered an industry similar and perhaps slightly earlier than the Kebaran.[2] Although harvesting can be safely inferred from this, the date assigned to the find would be five to seven thousand years prior to that elsewhere given to the Neolithic.

Remains of the men of this period are not numerous. On the basis of present evidence, however, they are not

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[1]Ibid.

[2]Ibid., p. 366.

significantly different than we are.

With the close of the Upper Palaeolithic we notice the tremendous change which occurred in man's appreciation of the potential use of stones as tools. Beginning with roughly flaked tools whose final shape was reflected in the natural pebble, Palaeolithic man eventually developed flaking techniques which allowed him to produce delicate tools like the microlith, whose shape was predetermined, consistent and unrelated to the shape of the core. Moreover, these flints were now parts of such composite tools as missile points or barbs.[1]

We must still guess at the role played by other material in the Upper Palaeolithic tool kit. Certainly much evidence for the use of wood and bone must have disappeared.

We can also observe that during the Palaeolithic regional variations were the exception rather than the rule. Although variations had appeared as early as the Mousterian and became entrenched with the last phases of the Upper Palaeolithic there were some strong indications of the tendency of flaking methods to be diffused faster than they were developed regionally.

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[1]Kirkbride, "Kabaran Rock Shelter," p. 56.

CHAPTER V

AREAS OF FURTHER RESEARCH

At several points our understanding of the Palaeolithic of Palestine is obviously incomplete. The basic nature of the Middle and Upper Palaeolithic developments of typology is uncertain. Were the variations within these periods essentially consecutive or were they parallel? To what degree may we allow regional variations at this time? Should even the neat typological work of Gilead for the Early Lower Palaeolithic be questioned?

These considerations lead us immediately to a much more basic consideration. Do we have the data to procede or are we going to need new sites to provide solid answers? Much of the data for the earlier excavations is deficient. This was brought out in our chart I by the columns which lack percentages, and for some of our figures no scale was given.

Not only was reporting of the data incomplete but the interpretation of it must be re-examined to see if suspect presuppositions were involved. Perhaps the best example of such a revision is the work of M. Stekelis in deposing the Emireh point from its assured position as an indicator of the Upper Palaeolithic stage I.[1]

In conjunction with a major review of the Palaeo-

Schick T, and Stekelis M, "Mousterian Assemblages in Kebarah Cave, Mount Carmel", Eretz-Israel, vol.13 1977,pp 110-113

lithic of Palestine there must be introduced a uniform system of description for the lithic data. This should not only remove the duplication of terms but also seek to eliminate the subjective element in classification. This could be accomplished through computer identification of clusters of attributes characteristic of a given layer. Not only should such a uniform system of attribute analysis be applied to all new materials, but also older sites and catalogues should be reclassified where possible, or excavated further to confirm or adjust earlier reports.

Beyond these basic problems there remain details that are not yet properly understood. These include the question of the pre-Aurignacian industries and their implications for chronology and cultural mixing, the question of the relationships between Palestinian, Near Eastern, and other Palaeolithic industries, and the question of an absolute chronology for these industries as indicated by climatic conditions and Carbon 14 determinations.

Finally we may see the day when the related disciplines of botany, geology, and osteology will supplement our studies in stratigraphy and typology to produce a much more vivid picture of Palaeolithic life in Palestine then we have here been able to sketch.

GLOSSARY

Abrade—To wear away the distinct flaking marks left at the time of a tool's production.

Acheulian—A European term used to denote Lower Palaeolithic industries in which the hand-axes have been retouched with a soft hammer. Thus the early phases of the Lower Palaeolithic are excluded. Acheulian may also refer to a segment of an industry having a significant proportion of hand-axes, as in an Acheulian facies of Mousterian.

Amygdaloid—Almond shaped. Generally with reference to the outline of a hand-axe.

Antelian—The fourth stage of the Upper Palaeolithic in which blades, scrapers, and burins are abundant. The El-Wad point is also common.

Aurignacian—The European industry which is most similar to stages III and IV of the Upper Palaeolithic of Palestine.

Biface—A tool which has been worked on both faces. Generally the reference is to a hand-axe.

Burin—A graver or flint tool with a cutting edge used to shave, cut or chisel.

Cleaver—A hand-axe with a straight transverse cutting edge, like a hatchet. Cleavers are generally from the Lower Palaeolithic.

Cordiform-Cordates—Heart shaped. Generally with reference to the outline of a hand-axe.

Denticulate—A tool with at least one edge flaked to produce jagged edges or teeth.

Emiran—The industry which marks the transition from the Mousterian industries of the Middle Palaeolithic to the blade industries of the Upper Palaeolithic, and in which the rare Emiran points are found.

Fossil beach—The remains of a beach which used to mark the shoreline of the sea showing one of the fluctuations of the occurred during the Pleistocene. These are also referred to as "raised beaches."

Graver—A flint tool with a transverse cutting edge used for shaving, cutting or chiselling.

Jabrudian—An industry from the Late Acheulian or the end of the Lower Palaeolithic of Palestine in which the hand-axes are rare or absent, but the remainder of the industry is typically Late Acheulian. It was discovered first at Jabrud by Rust.

Levallois technique—A French term referring to a technique of flaking in which the face of the core is trimmed to control the form and size of the intended flake which is then removed by a single blow. In the Near East the technique is introduced during the Lower Palaeolithic, it dominates the Middle Palaeolithic, and dies out during the Upper Palaeolithic.

Mousterian—A French term referring to the flint industries associated with Neanderthal man and the Middle Palaeolithic. These industries are characterized by scrapers and triangular points made on flakes. In the Near East the Mousterian is usually associated with the Levallois technique.

Natufian—The Mesolithic culture which in Palestine follows the Upper Palaeolithic. Some Natufian settlements have houses, sickles, ornaments, bone tools and other signs of the transition to agricultural life.

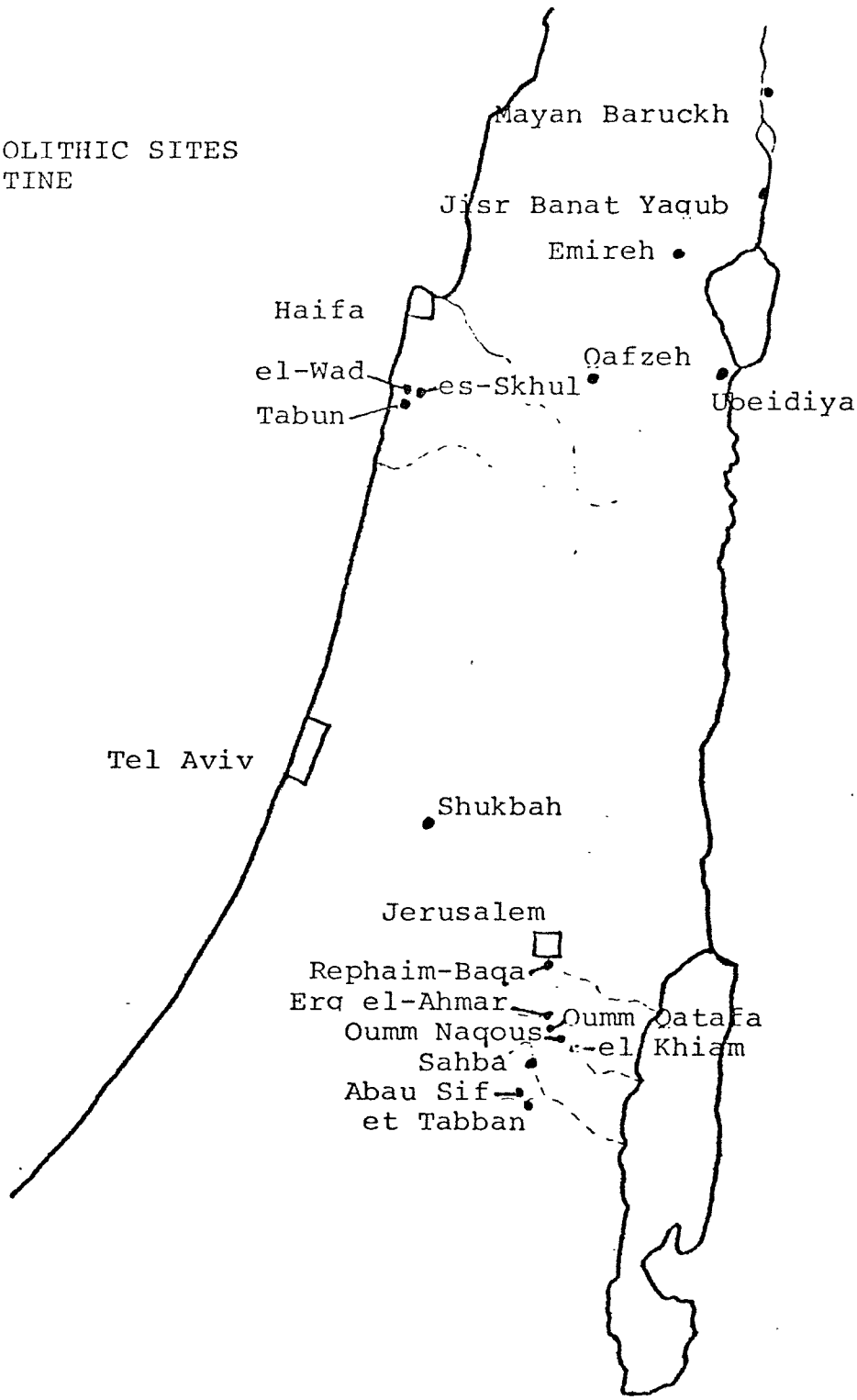
Ogival—A shape which resembles a pointed arch.

Patina—The skin of chemically weathered flint which has changed color.

Pleistocene—The period corresponding to the last four glaciations of Europe or the pluvials of Palestine. It is Potassium-Argon dated to begin at 1.3-3.5B.P. and dated by Radiocarbon to end at 8,300B.P.

Polyhedron—A stone which has been generally rounded by flaking. Usually limestone was used for these in Palestine. However, polyhedrons of flint and basalt have also been found. It may also be referred to as a spheroid.

MAJOR PALAEOLITHIC SITES
IN PALESTINE



Pre-Aurignacian-The industries of the Near East from the end of the Lower Palaeolithic and in which there are high proportions of blades and burins similar to those of the Upper Palaeolithic phase known as the Aurignacian in Europe.

Racloir-A French term used to refer to a scraping tool of the Cave Acheulian and the Mousterian periods of Palestine. It may also have served as a knife and chopper.

Rolled-A tool which has been worn by being moved by water.

S-Twist-The cutting edge of many early hand-axes, which edge is curved rather than straight due to the crude workmanship of the period.

Tabunian-A provisional designation for the earliest assemblages from several Lower Palaeolithic caves. The assemblages are dominated by crude flakes.

Tayacian-A European term referring to Lower Palaeolithic industries which are dominated by crude flakes and contain no hand-axes. In the Near East the term has been applied to the lowest levels of several caves but is now generally abandoned.

Transgression-The encroachment of the sea upon the land due to the rise of its level.

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