

## Excavations at the Mugharet Kebara, Mount Carmel, 1931: The Aurignacian Industries

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THE cave known as the Mugharet Kebara opens at the western foot of Mount Carmel, 13 km. to the south of the Wady el-Mughara, and  $1\frac{1}{2}$  km. south of the railway station of Zikhron Yaaqov<sup>1</sup>. It faces north-west on the 60 m. contour line, at  $2\frac{1}{2}$  km. from the sea, from which it is separated by a strip of marshy land and a wider belt of sand dunes.

The first sounding on this site was made in 1927 by Dr M. Stekelis, who was unable to continue owing to lack of funds. In 1930, unaware that Dr Stekelis had already tested the cave, I went over from the Wady el-Mughara with Dr Theodore McCown and spent one day in digging a trial trench (Garrod 1932), which revealed the presence of a Natufian layer with an underlying level containing an industry then unfamiliar, but since described under the name Kebaran (Turville-Petre, 1932). At the bottom of the trench we found a number of typical Aurignacian implements. In the summer of 1931 Francis Turville-Petre and Mrs C. A. Baynes undertook a three months' season at Kebara on behalf of the British School of Archaeology in Jerusalem and the American School of Prehistoric Research. During this time they camped with us at the Wady el-Mughara, so the two expeditions were in close touch and able to compare results throughout the campaign. The work at Kebara revealed a very rich Lower Natufian horizon (Layer B) with a thin underlying level (Layer C) containing the new Kebaran industry. This culture, which has proved to be fairly widespread in Palestine, Lebanon and Syria, is Neuville's Upper Palaeolithic VI (Neuville, 1951)<sup>2</sup>. Turville-Petre published the material from Layers B and C in the year following the excavation (Turville-Petre, 1932), but the Aurignacian industries of Layers D and E which were dug to contact with an underlying Levalloiso-Mousterian, have for various reasons never been studied or described in print. The death of Francis Turville-Petre in 1941, followed some years later by that of Mrs Baynes, ended the hope that the excavators themselves might eventually be able to complete the publication of the 1931 season at Kebara; I am taking up this task in their place because I followed the dig fairly closely at the time, and because the material from the Aurignacian layers compares very closely with the Aurignacian of the Mugharet el-Wad, with which I am familiar. Since making this decision I have learned that excavations at Kebara have been re-opened by the Hebrew University and the Israel Department of Antiquities under the direction of Dr Stekelis, which makes it more than ever desirable to render available the results of previous work on the site.

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<sup>1</sup> On the 1 : 20,000 series Topocadastral Map printed in February, 1922, at the Survey Office, Jaffa, the cave is marked as Mugharet Kabāra and in a summary of recent excavations in Israel (*Revue Biblique*, 1955, LXII, p. 84) it is spelt Kabbara. I have kept the transliteration used in Turville-Petre's publication (Turville-Petre, 1932) but have suppressed the final h.

<sup>2</sup> It is described by A. Rust under the name of Nebekian in his publication of the Jabrud rock-shelters in Syria (Rust, 1951).

In 1931 the collections from Kebara were divided into three approximately equal lots, of which one remained in the Palestine Museum of Archaeology, while the other two were ultimately divided between museums in Great Britain and the United States respectively. I have examined personally and made detailed inventories of the Aurignacian material in the Palestine Museum, in the British Museum, the Cambridge University Museum of Archaeology and Ethnology, and the Pitt-Rivers Museum at Oxford. For the collections in the Manchester University Museum and the Glasgow University Museum I am indebted to Mademoiselle Suzanne de St.-Mathurin, who has allowed me to use notes and sketches made by her some years ago. All this represents approximately two-thirds of the material found and is included in the descriptive catalogue which forms the bulk of this article. It has not been possible to incorporate the remaining third, now in the United States, but thanks to Professor H. L. Movius I have been able to obtain lists showing its distribution in various museums.

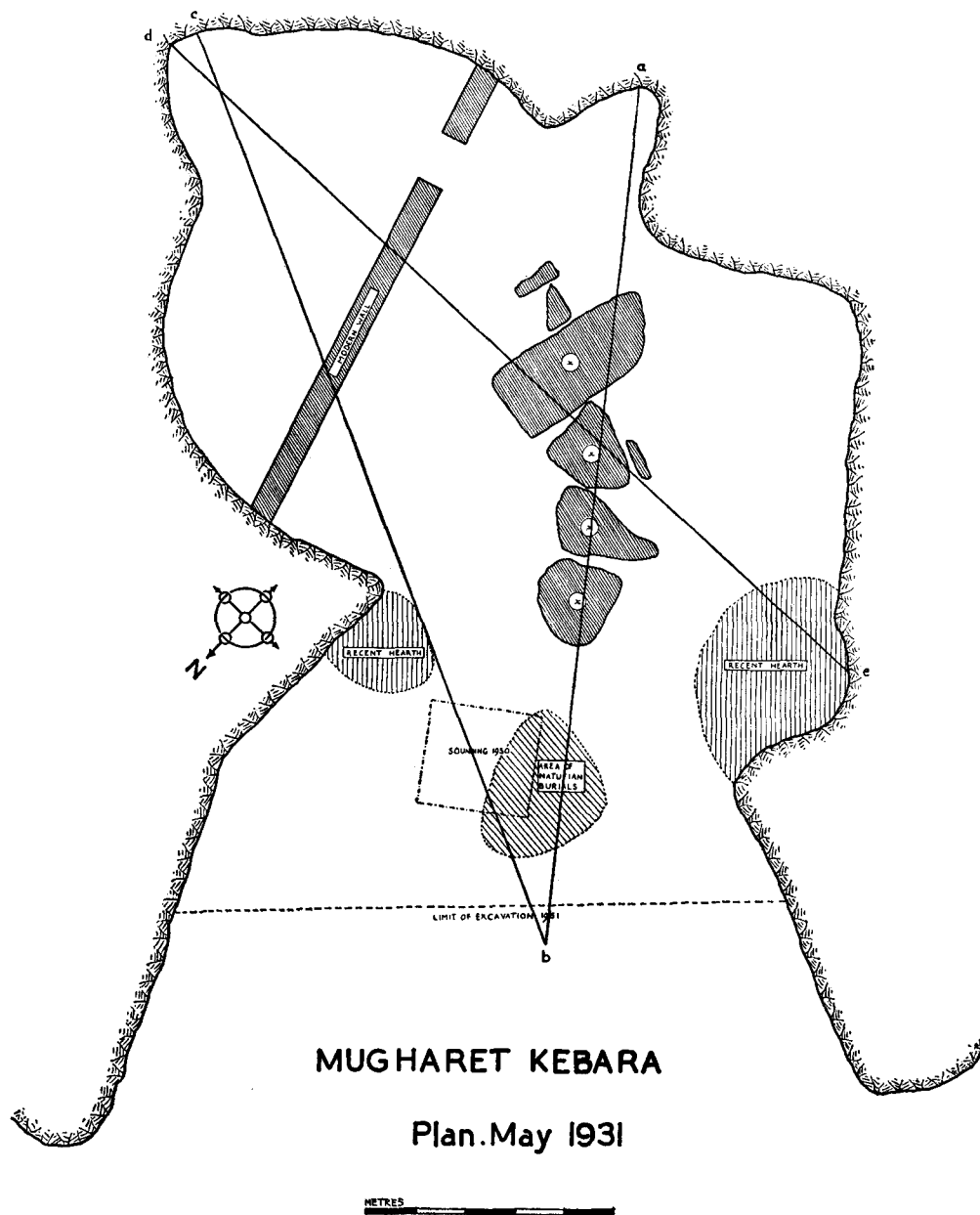
My thanks are due to the Wenner-Gren Foundation for Anthropological Research for a grant which enabled me to spend the winter of 1953-4 in Jordan working on this and on another project, and to the following who have facilitated my work in various ways: Mr G. L. Harding, Director of Antiquities in the Hashemite Kingdom of Jordan; Mr Joseph Saad, Secretary of the Palestine Museum of Archaeology; Père Roland de Vaux, Director of the École Biblique et Archéologique Française in Jerusalem; Mr John Brailsford of the Department of British and Medieval Antiquities in the British Museum; Dr Geoffrey Bushnell and Mr Miles Burkitt of the Cambridge University Museum of Archaeology and Ethnology; Mr T. K. Penniman and Mr J. S. P. Bradford of the Pitt-Rivers Museum, Oxford. I am also much indebted to Dr John Waechter, who has been able to procure for me the list of fauna from Kebara left among her papers by Miss D. M. Bate, and to Professor Hallam L. Movius, of the Peabody Museum of Archaeology and Ethnology of Harvard University; Dr Frank M. Setzler, of the United States National Museum, Washington; Miss Geraldine Bruckner of the University Museum of Pennsylvania; Mr A. Lang Baily, of the Davenport Public Museum; Dr Irving Rouse of the Peabody Museum of Natural History, Yale University, and Dr David P. McAllester, of Wesleyan University, Middletown, Connecticut.

Of the illustrations, figs. 1, 2, 5, 6, 9, 10 were drawn by me in Jerusalem in 1954; figs. 3, 4, 7, 11, 12 were drawn by Mrs Miles Burkitt in 1932, and reproduce specimens now in the Cambridge Collection; fig. 8, also by Mrs Burkitt, shows bone objects now in the Palestine Museum. The plan and section were drawn from Mr Turville-Petre's drafts, and the account of the excavation is based on a summary which he gave me in 1932.

## EXCAVATION AND STRATIGRAPHY

(Pl. XXIII; Plan; Section)

The cave before excavation consisted of a single irregular chamber, 26 m. long from back to front, with a maximum width of 14 m. The height of the roof was very variable, at the cave-mouth it was 4 m. above the surface of the deposits, rising to 6.50 m. at the back, but in the area enclosed by the modern wall shown on the plan there was a large chimney which opened on to the ground above the cave. Below the surface of Layer B the cave expanded considerably; to the left of the entrance a large recess developed in the area on the plan occupied by the compass rose, and the whole back wall receded to a maximum depth of 5.50 m.



Five archaeological horizons were distinguished, *viz.* :—

- A. Bronze Age to recent. A mixed stony layer, very variable in thickness.
- B. Lower Natufian, with black hearths in the upper part. 0–2.20 m.
- C. Kebaran (Upper Palaeolithic VI). 0.20–0.30 m.
- D1. } Aurignacian (Upper Palaeolithic IV). Dry, reddish cave-earth, with a slight
- D2. } difference in colour between the two sub-layers. 0–0.80 m.
- E. Aurignacian (Upper Palaeolithic III). Dry, red cave-earth. 0–0.40 m.
- F. Levalloiso-Mousterian. Unexcavated.

These deposits were very unevenly distributed. The whole area below the chimney was disturbed to a depth of 4 m., and there were pits cutting into the Palaeolithic horizons at two points (one can be seen in Section AB). Apart from this the Aurignacian layers were present from the outer limit of the excavation to a distance of 12–15 m. inwards, where they petered out on the surface of F, which was here directly covered by C. They were particularly rich in the recess on the left of the entrance, and Turville-Petre considered this to be the centre of habitation in Aurignacian times.

The results obtained by Dr Stekelis are not yet fully available, but two brief notes<sup>1</sup> make it clear that his excavations in 1952–4 confirm the sequence observed by Turville-Petre for Layers B, C, D and E, and add to it an Emiran horizon below E which was not spotted in 1931. In addition he has excavated the Levalloiso-Mousterian to a depth of 'several metres.'

## DESCRIPTIVE CATALOGUE

The material from Layers A, B and C is adequately described and illustrated in Turville-Petre, 1932; I am here concerned only with the Aurignacian from D and E.

The raw materials used in these layers includes the same varieties of flint and chert, all of local origin, as were found at the Wady el-Mughara. A distinctive feature is a flint with contrasting piebald patination, *viz.*, grey or brown with sharply defined white patches. As at the Mugharet el-Wad, much use is made of tabular flint which occurs abundantly, in places in the rock or weathered out on the surface, at various points on the western side of Mount Carmel, and which is particularly suitable for making burins and narrow steep scrapers. Bone artifacts are always rare in the Upper Palaeolithic of the Near East, and in the Aurignacian horizons at Kebara only two were found, though they were abundant in the Lower Natufian of Layer B.

The description of the material begins with the oldest horizon, Layer E.

### LAYER E.

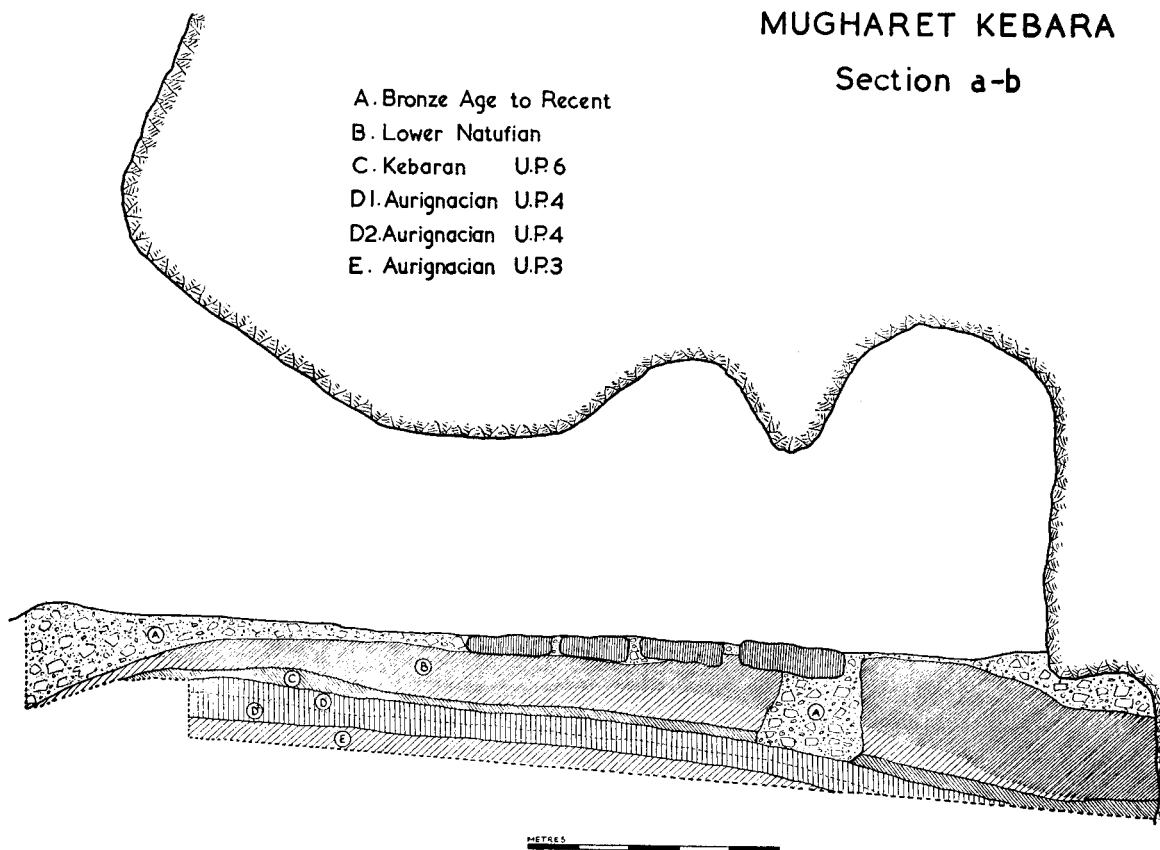
The industry of Layer E is substantially the same as that of Layer E at the Mugharet el-Wad (Garrod and Bate, 1937), and falls into Neuville's Upper Palaeolithic III. It contains Font-Yves points and a number of characteristic Aurignacian artifacts, such as the prismatic burin, the thick or 'semi-steep' scraper with lamellar retouch, and a considerable variety of steep scrapers which form the largest single class of tool.

<sup>1</sup>*Revue Biblique*, 1955, LXII, p. 84; *L'Anthropologie*, 1955, LIX, p. 90.

## MUGHARET KEBARA

### Section a-b

- A. Bronze Age to Recent
- B. Lower Natufian
- C. Kebaran U.P. 6
- D1. Aurignacian U.P. 4
- D2. Aurignacian U.P. 4
- E. Aurignacian U.P. 3



A small Levalloiso-Mousterian group does not, for the most part, differ in patina or condition from the rest, but it must be borne in mind that material from the Emiran horizon, unrecognized in 1931, may be included in E. It should be noted, however, that Le Moustier points, racloirs and Levallois flakes occur also in Layer D<sub>2</sub>, and even in D<sub>1</sub>, though there the proportion is lower. At the Wady el-Mughara I was inclined to explain the presence of such types in the Aurignacian as due to intrusion from older levels—perfectly possible in view of the quantity of Levalloiso-Mousterian material which must have been lying about the site—but I have come round to the view that the association of flake and blade elements which we now know to have marked the Emiran (and which was foreshadowed by the occasional presence of Upper Palaeolithic forms in the Levalloiso-Mousterian) did, in fact, survive into the Aurignacian, though with the flake element very greatly reduced.

## INVENTORY—LAYER E

<i>Le Moustier points</i>	..	..	..	..	..	..	13
<i>Aurignacian points</i>	..	..	..	..	..	..	2
<i>Font-Yves points</i>	..	..	..	..	..	..	37
<i>Blunted back knives</i>	..	..	..	..	..	..	8
<i>Racloirs</i>	..	..	..	..	..	..	12
<i>Flake-scrapers</i>	..	..	..	..	..	..	33
Round and rounded, 9; elliptical, 4; fan-shaped, 2; pear-shaped, 2; ogival, 1; rostrate, 3; various 12							
<i>End-scrapers on flakes and flake-blades</i>	..	..	..	..	..	..	22
<i>End-scrapers on blades</i>	..	..	..	..	..	..	9
<i>Semi-steep scrapers</i>	..	..	..	..	..	..	11
Rounded end, 6; ogival end, 3; rostrate 2							
<i>Steep scrapers</i>	..	..	..	..	..	..	58
Oblique front, 31; double front, 8; nucleiform, 19							
<i>Massive scrapers</i>	..	..	..	..	..	..	2
<i>Burins</i>	..	..	..	..	..	..	13
Prismatic, 5; angle, 3; single-blow, 1; prismatic + scraper, 3; single-blow + scraper, 1							
<i>Borers</i>	..	..	..	..	..	..	2
<i>Nibbled blades</i>	..	..	..	..	..	..	14
<i>Notched blades</i>	..	..	..	..	..	..	2
<i>Chisel</i>	..	..	..	..	..	..	1
<i>Retouched flakes and flake-blades</i>	..	..	..	..	..	..	9
<i>Retouched blades and bladelets</i>	..	..	..	..	..	..	12
<i>Levallois cores</i>	..	..	..	..	..	..	2
<i>Blade cores</i>	..	..	..	..	..	..	4
<i>Levallois flakes</i>	..	..	..	..	..	..	3
<i>Flakes</i>	..	..	..	..	..	..	2
<i>Flake-blades</i>	..	..	..	..	..	..	4
<i>Blades and bladelets</i>	..	..	..	..	..	..	42
Total	..	..	..	..	..	..	317

*Le Moustier points*, 13. (Fig. 1, no. 1; Fig. 4, nos. 4, 6, 7). These are typical, the majority on triangular flakes with faceted platform, of which three are definite Levallois flakes. Three rather narrow specimens have extensive flaking over the upper face. In most cases the edge-retouch is resolved, but a few have very neat flat trimming.

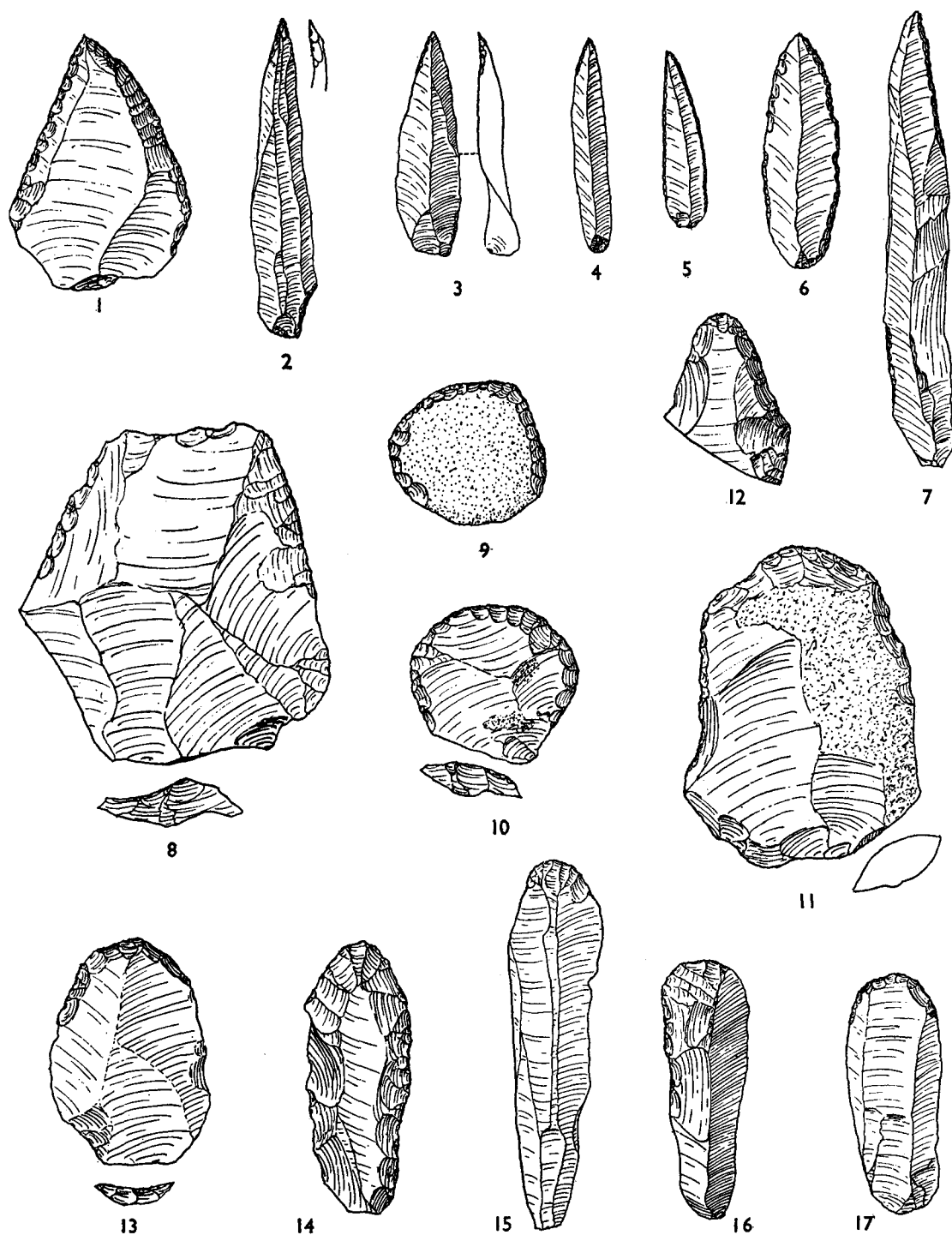


Fig. 1

Implements from Mugharet Kebara, Layer E. (Palestine Museum).

*Fig. 1, no. 1.* Pale grey lustrous flint. The striking-platform was probably plain, but most of it has been removed by rough blows; the bulb is prominent. The edge-trimming is neat and rather flat. This is one of two exceptionally elegant pieces. *Fig. 4, no. 4.* Dove grey flint with plain striking-platform, and delicate flat edge-flaking. *Fig. 4, no. 6.* Piebald grey and white flint, with faceted striking-platform and resolved edge-flaking. *Fig. 4, no. 7.* Cream flint, with striking-platform on a patch of cortex. The bulbar face is much broken by squamous flaking at the base.

*Aurignacian points, 2.* (Fig. 3, no. 10). The points described under this name differ from the Le Moustier points in the character of their retouch, which is broad and flat. They tend also to be leaf-shaped rather than triangular. This is a type which occurs also in the Aurignacian of Central and Western Europe. One of the specimens from Kebara E is small, rather squat, and leaf-shaped, retouched all round. The figured specimen cannot be traced in any of the collections examined.

*Font-Yves points, 37.* (Fig. 1, nos. 2-5; Fig. 4, nos. 8-11). A perfectly typical group, very evenly graduated in length from 29.5 mm. to 90 mm. The majority have nibbled retouch at the upper end only, often merely at the tip. All are made on blades produced by the method of placing a punch between the striking-platform and the hammer.

*Fig. 1, no. 2.* Fawn flint with white patches. Steep retouch on both edges at the tip. The striking-platform and bulb have been removed by nibbling round the base which has produced a rudimentary shoulder. *Fig. 1, no. 3.* Twisted blade of mottled grey flint, with very slight retouch at the tip. *Fig. 1, no. 4.* Grey cherty flint. A very narrow bladelet with excessively fine nibbling at the tip. *Fig. 1, no. 5.* Dark grey flint, with fine, regular nibbled retouch at the point and along both edges. *Fig. 4, no. 8.* Grey semi-translucent flint, with border patinated white. Though made on a punched blade, it is broader than most Font-Yves points, but has the characteristic sharp nibbled tip. *Fig. 4, no. 9.* Dark grey lustrous flint. Steep retouch at the tip and nibbling along both edges. *Fig. 4, no. 10.* Buff chert. Steep retouch on the left edge, nibbled on the right. *Fig. 4, no. 11.* Buff chert. Steep retouch on both edges at the tip.

*Blunted-back knives, 8.* (Fig. 1, nos. 6, 7). None of these are true Chatelperron knives. They vary in size, but most are rather narrow, with straight or slightly curved back, two only being retouched down the whole length. In the majority it is the right edge which is blunted.

*Fig. 1, no. 6.* Punched blade of brown lustrous flint. The right side forms the back, and is blunted, from the bulbar face only, along its whole length. The left edge is nibbled towards the base, and bears a very slight scaled retouch on its upper half. This appears to be intentional rather than due to use and may have been designed to renew the cutting edge. Although slightly aberrant, this piece appears to be a knife rather than a point. *Fig. 1, no. 7.* Punched blade of cream flint, with back blunted from the bulbar face only down a third of its length, and with nibbled retouch towards the base on the cutting-edge.

*Racloirs, 12.* (Fig. 1, no. 8; Fig. 3, no. 14). These are of Mousterian type, the majority double-sided with convex working edges. One is on a broad Levallois flake (Fig. 1, no. 8). Four have the bulbar end broken or trimmed away: in those where it is intact plain and retouched striking-platforms are approximately equal in number.

*Fig. 1, no. 8.* Levallois flakes of pale grey patinated flint, translucent at the edge. The scraper retouch is flat, more extensive on the right side than on the left. This specimen which is completely Levallois-Mousterian in type is in fresh condition. *Fig. 3, no. 14.* Cream patinated flint. The faceted striking-platform was probably chipped after removal from the core.

*Flake-scrapers, 33.* (Fig. 1, nos. 9-13; Fig. 3, no. 5). The majority fall into fairly well-defined categories, as shown in the inventory. Some of the rounded scrapers are very neatly made. In the rostrate group the beak is not very well defined, though two have good lamellar flaking. The category 'various' covers broad, rather shapeless flakes with rounded scraper end (e.g. Fig. 1, no. 11).



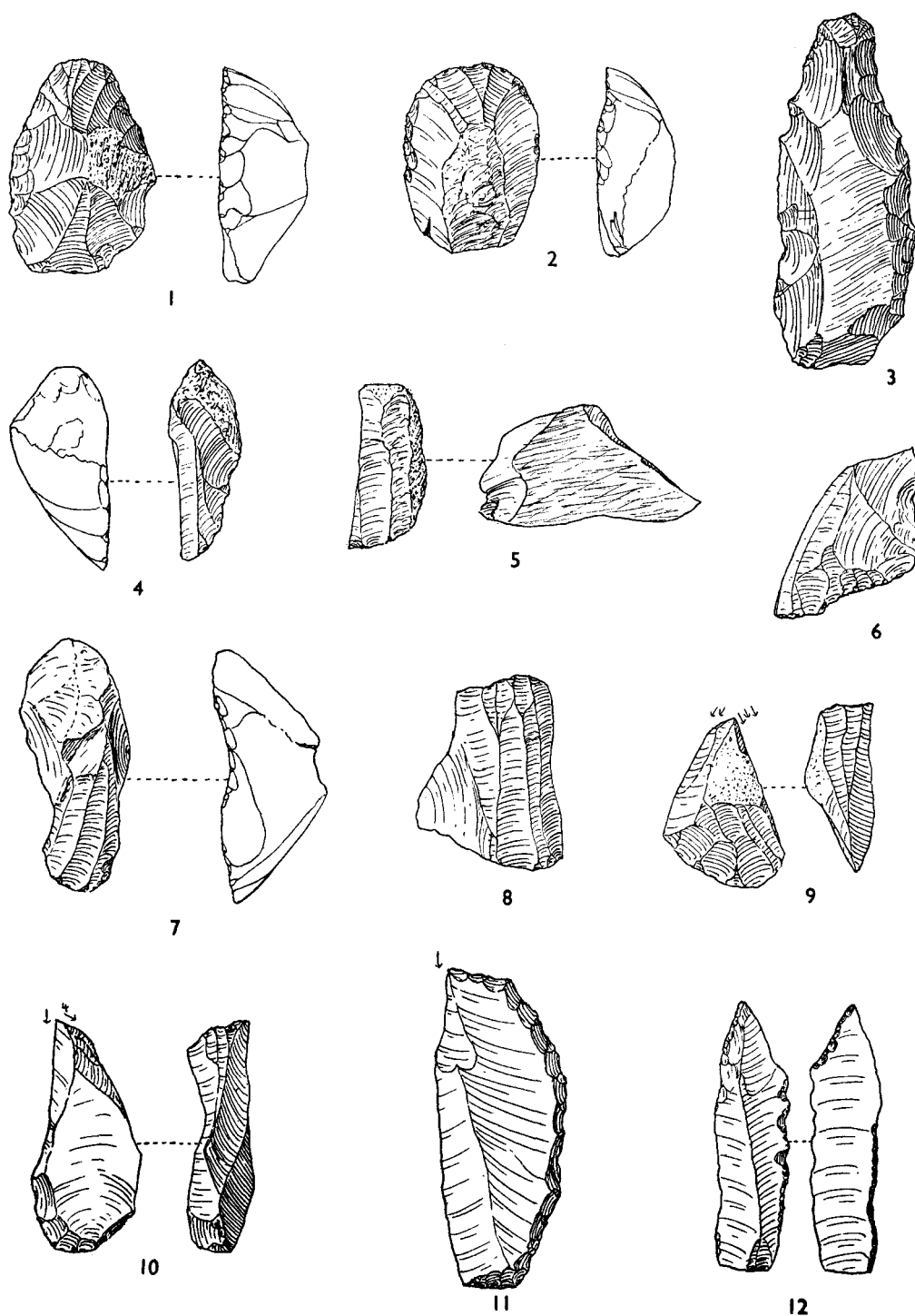


Fig. 2

Implements from Mugharet Kebara, Layer E. (Palestine Museum).

*Fig. 1, no. 9.* Light brown glossy flint, with cortex over the whole of the upper face. The striking-platform is on the cortex, with prominent bulbar swelling. The edge-trimming is exceptionally neat, with very small flake-scars. *Fig. 1, no. 10.* Off-white patinated glossy flint, with small patches of cortex on the upper face. A deep scar has removed part of the faceted striking-platform and most of the bulb. The edge-trimming is flat and neat. *Fig. 1, no. 11.* Coarse-grained cream chert, with a large patch of cortex on the upper face. The large plain striking-platform, with projecting conical bulb, is off the main axis of the tool. The scraper end is well retouched, but the edge-flaking is rather rough. *Fig. 1, no. 12.* Banded fawn flint. The bulbar end is broken away. This can be described as a rostrate scraper, but the beak, although shaped by neat lamellar retouch, is only slightly detached. *Fig. 1, no. 13.* The main flake is mottled yellow, lustrous and slightly worn, with faceted platform and prominent bulb; the scraper trimming is more recent, in fresh condition and patinated pale pink. The chipping on the right edge and at the base of the left is contemporary with the main flake. *Fig. 3, no. 5.* Pink chert, with faceted platform and prominent bulb. The edge-trimming is very neat, with lamellar retouch at the scraper end.

*End-Scrapers on flakes and flake-blades, 22.* (*Fig. 1, no. 14*; *Fig. 3, nos. 6-9, 11*; *Fig. 4, no. 5*). These are on the whole broad, as would be expected, and there is no perfectly clear boundary between certain rather elongated flake-scrapers and the shorter, wider specimens in this group. As a rule of thumb, a length-breadth index of 60 can be taken as the dividing line. On the other hand, most of the scrapers in this category are broader than those on punched blades described below. Half-a-dozen are very well made with extensive edge-flaking and lamellar retouch of the scraper end, which may be rounded, ogival or slightly rostrate. In three of these the opposite end is chipped to a blunt point (*e.g.* *Fig. 4, no. 5*).

*Description of figured specimens.* *Fig. 1, no. 14.* Buff chert, with bulbar end broken away. The good lamellar retouch of the scraper end and the resolved flaking down the right side is in contrast with the state of the left edge, on which coarse flaking has probably destroyed the original trimming. *Fig. 3, no. 6.* Pinkish grey mottled flint, with striking-platform removed by bulbar face chipping. The scraper end is much used. *Fig. 3, no. 7.* White patinated chert, elaborately retouched all round, with ogival scraper at one end and blunt point at the other. *Fig. 3, no. 8.* Mottled grey-green flint, with faceted striking-platform and prominent bulb. The retouch of the scraper end is more recent than the main flake. *Fig. 3, no. 9.* Double-ended scraper of buff chert, very neatly retouched all round. The striking-platform was probably at the rostrate end. *Fig. 3, no. 11.* Massive flake of mottled grey cherty flint, with the bulbar end broken away. The edge-flaking is rather coarse, but there is good lamellar retouch on the scraper end. *Fig. 4, no. 5.* Dark brown flint with patch of cortex on the back. At one end (the lower in the drawing) there is an ogival scraper with fine lamellar retouch, at the other a point. Both edges are elaborately retouched.

*End-scrapers on blades, 9.* (*Fig. 1, nos. 15-17*). As at Emireh (article in the press) I have placed under this heading all end-scrapers made on punched blades, but the contrast between this and the preceding group is less marked than in the Emiran, as the punched blades are on the whole broader and less delicate. All are single-ended, with characteristic minute striking-platform and flattened bulb.

*Fig. 1, no. 15.* Grey and brown piebald flint, with very small platform and flattened bulb. The notch in the right edge is accidental. *Fig. 1, no. 16.* Cream-patinated glossy flint. The striking-platform is on a small patch of cortex. Two broad flake-scars on the left edge come from the shaping of the core, but the chipping on the upper end of the crest seems to have been done after the scraper was made. *Fig. 1, no. 17.* Dark grey glossy flint with very small striking-platform and flat bulb. Some bulbar-face scaling caused by use has truncated the neat lamellar scars of the scraper end. Both edges are slightly nibbled by use.

*Semi-steep scrapers, 11.* (*Fig. 2, nos. 1-3*; *Fig. 3, nos. 12-13*). These are made on small chunks of flint or thick flakes, the majority more or less elliptical in plan, with rounded or ogival front shaped by neat lamellar retouch. Similar scrapers are among the most characteristic tools in the Aurignacian of Europe.

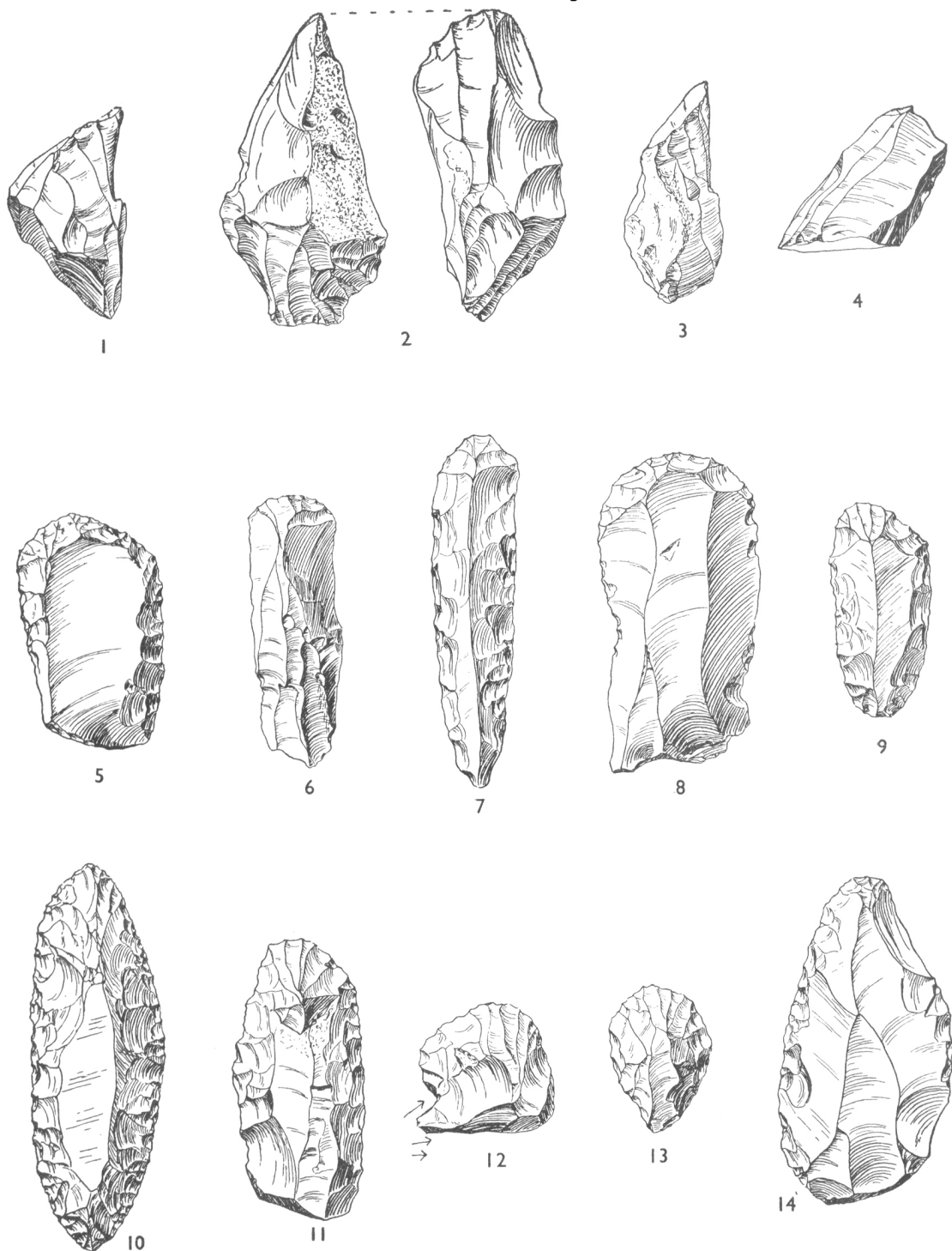


Fig. 3  
Implements from Mugharet Kebara, Layer E. (Museum of Archaeology and Ethnology,  
Cambridge).

*Fig. 2, no. 1.* A thick flake with mahogany patina has later been re-worked at the end and down the left side. The patch of cortex on the right side and the three flake-scars below it belong to the original tool, which was probably a scraper not very different from the present one. *Fig. 2, no. 2.* Glossy grey patinated flint, with patch of cortex on the back. The plain striking-platform is slightly battered. The scraper end is less well finished than in no. 1. *Fig. 2, no. 3.* This elongated rostrate scraper differs from the others in the group. It is made on a thick flake of mottled grey cherty flint from which the striking-platform has been scaled off by lateral blows. The implement is shaped by bold, rather coarse flaking along both sides. The scraper tip must originally have been rounded, but the lamellar retouch has been partially removed by a blow which may have been struck to renew the edge. *Fig. 3, no. 12.* Light grey lustrous flint. Thick flake with rounded scraper front formed by lamellar retouch. A bec-de-flûte burin, several times revived, has been struck across the lower end, but as this seems to have been added as an after-thought, the implement is classified here, and not with the burins. *Fig. 3, no. 13.* Buff cherty flint. The front is rounded, with long lamellar flaking; at the opposite end is a sharply pointed beak.

*Steep scrapers, 58.* (*Fig. 2, nos. 4-8*; *Fig. 3, nos. 1-4*). This is the largest group of implements, forming 22.3 per cent of the whole. In the majority, the scraper front falls obliquely from a heel which may be roughly shaped by flaking, but which is more often formed of cortex, or an old pebble surface (*Fig. 2, nos. 4-7*; *Fig. 3, nos. 1, 3, 4*). The working edge may be rounded, in which case the scraper is usually rather broad, or ogival (*Fig. 2, no. 6*), or acute-angled, *i.e.* with an oblique edge forming an acute angle with one side of the tool (*Fig. 2, no. 5*). The scraper front itself, in all these forms, may be twisted or splayed to right or left (*Fig. 2, nos. 4, 7*). These acute-angled and twisted scrapers seem to be special to the Syro-Palestinian region; they occurred in fair numbers at the Mugharet el-Wad (Garrod and Bate, 1937), and Neuville mentions the twisted type at el-Khiam, in the Judaeian desert (Neuville, 1951). They certainly exist in the Lebanon, though not yet described.<sup>1</sup> A number of oblique-front scrapers have hollow flake-scars on one or both sides of the tool, forming thumb and finger holds (*Fig. 2, nos. 6, 7*). The eight specimens listed in the inventory as double-fronted have as a common feature that the second scraper front is usually placed at the opposite end, and laterally in relation to the first (*Fig. 3, no. 2*). Apart from this there are various combinations—double acute-angled, acute-angled with rounded, and so on. The nucleiform scrapers (*Fig. 2, no. 8*) appear in most cases to be re-utilized bladelet cores, and are on the whole rather rough. The majority are double-ended, with blades removed on one side only, leaving a back of cortex or pebble.

*Fig. 2, no. 4.* Off-white patinated glossy flint, with pebble surface on the heel. The scraper front is splayed to the right (as viewed in the drawing), the left side being formed by a single flake-scar. The base is a single slightly convex surface. *Fig. 2, no. 5.* Cream patinated flint. The front forms an acute angle with the left side, which is an old plane surface; the right side is covered with cortex. The heel is a curved fracture surface, the base a single irregular surface with a subsidiary scar at the scraper end. *Fig. 2, no. 6.* Buff flint. The scraper front has an ogival working edge, and there is a small thumb-hold on the right side. The base and heel are formed by a single irregular saddle-shaped surface with subsidiary scars. *Fig. 2, no. 7.* Buff flint. The front is twisted to the left, with hollow flake-scars forming thumb and finger grip on either side. The heel is an old pebble-surface, the base a single flake-scar. *Fig. 2, no. 8.* Mottled grey patinated flint. A double-ended nucleiform scraper with cortex at the back. The front is fashioned by lamellar flaking from both ends. *Fig. 3, no. 1.* Grey cherty flint. Double-ended, with twisted acute-angled fronts. *Fig. 3, no. 2.* Pale grey mottled flint. Large double-ended scraper, with one front placed laterally in relation to the other. *Fig. 3, no. 3.* Yellowish-cream patinated flint, with twisted acute-angled front and cortex on the heel. *Fig. 3, no. 4.* Dove-grey flint, with rounded front and pebble surface on the heel.

<sup>1</sup> I picked up an acute-angled steep scraper in the cave of Adlun, near Sidon in 1954.

*Massive scrapers*, 2. One is a thick oval flake of cream chert,  $75 \times 60$  mm., with striking platform on a patch of cortex. Both edges are boldly flaked, but the scraper end is formed by a single scar without secondary trimming. The other is a one-sided convex racloir,  $90 \times 58$  mm., on a block of cream chert.

*Burins*, 13. (Fig. 2, nos. 9-11; Fig. 4, nos. 1-3). The prismatic type predominates with eight specimens, of which three have opposed scrapers (Fig. 2, nos. 9, 10; Fig. 4, nos. 1, 2). Two are on tabular flint with cortex on both faces. Three angle-burins are quite neatly made (Fig. 2, no. 11; Fig. 4, no. 3), one at the bulbar end of a narrow plunging blade. On the whole the burins are inferior in quality to the points and scrapers.

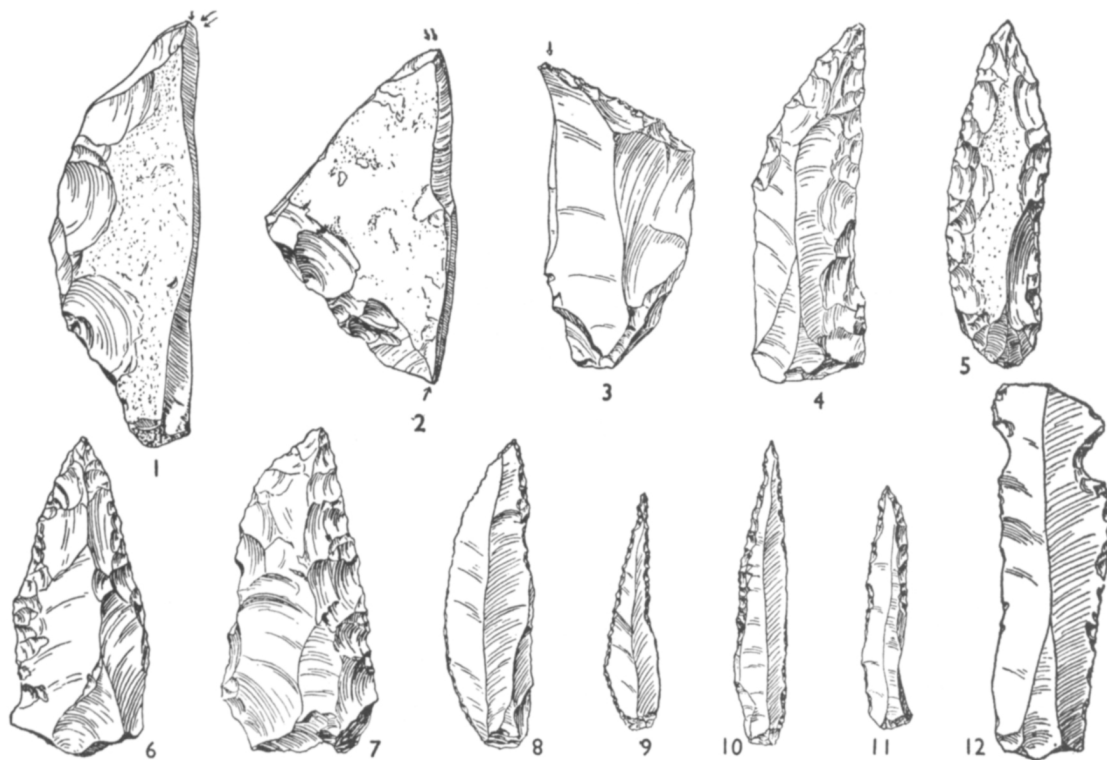


Fig. 4

Implements from Mugharet Kebara, Layer E. (Museum of Archaeology and Ethnology, Cambridge).

*Fig. 2, no. 9.* Prismatic burin made on a thick flake of honey-coloured flint with a small patch of cortex on the upper face. At the opposite end is a neatly trimmed scraper. *Fig. 2, no. 10.* Prismatic burin made on a tablet of grey patinated flint struck from a steep scraper. *Fig. 2, no. 11.* Grey flint. This is a three-purpose tool. At the upper end (as drawn) is an angle-burin, with the burin-blow turning on to the upper face of the flake, at the lower end is a transverse scraper with neat lamellar retouch, while the right edge of the flake is steeply trimmed as a racloir and shows signs of heavy use. *Fig. 4, no. 1.* This could almost equally well be described as a prismatic burin or a very narrow carinated scraper. It is made on a plaque of buff tabular flint with cortex on both faces. This has been split, and at the upper end of the break have been struck three burin facets which

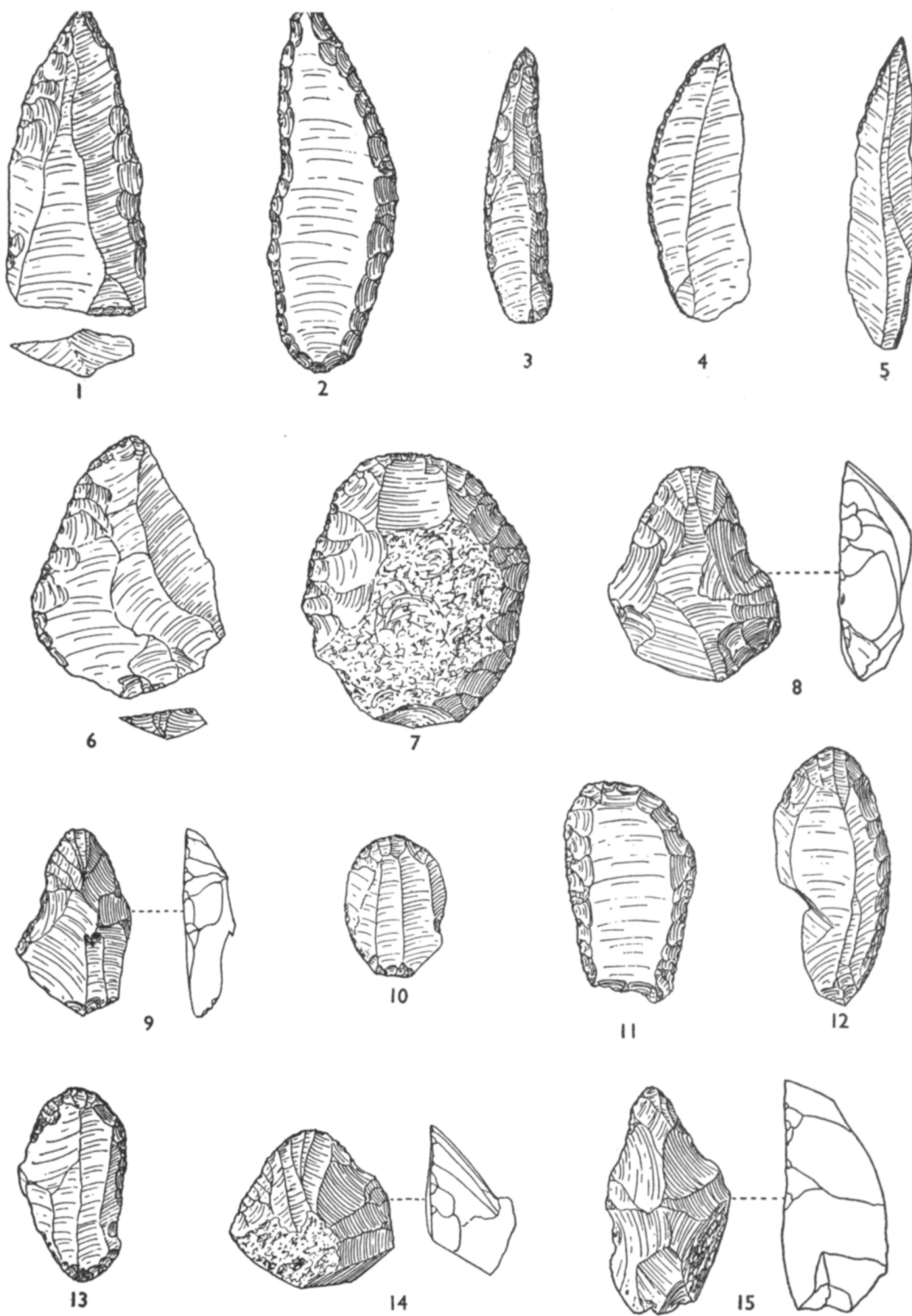


Fig. 5  
Implements from Mugharet Kebara, Layer D2. (Palestine Museum).

tail off on to a boldly flaked crest. *Fig. 4, no. 2.* Dove-grey patinated tabular flint with cortex on both faces. The double-ended prismatic burin is backed by a flaked crest at one end, and by a natural fracture surface at the other. *Fig. 4, no. 3.* An angle-burin on a flake of lustrous fawn flint.

*Borers, 2.* (*Fig. 2, no. 12.*) The figured specimen is on a blade of brown flint with the base broken away. The borer is shaped by alternate retouch at the tip; the right edge is roughly notched, the left is nibbled on the bulbar face. The unfigured specimen is made on a chunk of buff chert, the borer being a natural spall slightly shaped by chipping from one face.

*Nibbled blades, 14.* The majority are narrow punched blades with nibbled retouch, often very slight, on one or both edges, or occasionally at the tip. In most cases it is difficult to see what purpose can have been served by the retouch, and it is possible that it is not intentional, but the result of use.

*Notched blades, 2.* (*Fig. 4, no. 12.*) The figured specimen is a flake-blade of cream-patinated flint with retouched striking-platform and tip broken away. The opposed notches at the upper end are rather roughly made, but show signs of much use. The specimen which is not figured is a punched blade with a single shallow notch in one edge.

*Chisel, 1.* This is a flake-blade of grey patinated glossy flint, retouched along one edge, with the upper end broken by use as a chisel. The base is retouched on both faces in the same fashion as an Emireh point; it is interesting, therefore, that the excavations directed by Dr Stekélis have revealed an Emiran horizon at the base of the Aurignacian.

*Retouched flakes and flake-blades, 9.* This is a mixed group, containing pieces which do not readily fit into any well-defined category, but it includes four flake-blades with flat Aurignacian edge retouch of a type well represented in Layer E of the Mugharet el-Wad (Garrod and Bate, 1937, p. 48; Pl. XXIII, nos. 9, 11).

*Retouched blades and bladelets, 12.* These have areas of rather irregular retouch on one or both edges, but do not fall into any defined class of implements.

*Levallois cores, 2.* One is rather rough, with a single flake detached. The other is a well-made disc, 60 mm. in diameter, with two opposed prepared platforms. From one of these a broad flake was successfully detached, but a second flake, struck from the opposite platform, broke short at 19 mm. from the striking point.

*Blade-cores, 4.* All are double-ended, rather small, with blades round half to two-thirds of the periphery. In one, both platforms are faceted.

*Levallois flakes, 3.* Of these, one is rectangular, one oval and one triangular. All are in fresh condition, and do not differ in appearance from the rest of the material in Layer E.

*Flakes, 2.* Both have retouched striking-platforms.

*Flake-blades, 4.* Two have retouched striking-platforms. The largest is 102 mm. long and 50 mm. wide.

*Blades and bladelets, 42.* The majority are produced by punching technique.

Only a small amount of debitage seems to have been kept from each of the horizons at Kebara. The number of flakes and blades therefore gives no information about the relative proportions of each type, or of unworked to worked material. Nearly all unworked flakes were probably discarded and only the more shapely blades kept.

## LAYER D

The industry of Layer D is similar to that of Layer D at the Mugharet el-Wad. In both sites the lower division, D<sub>2</sub>, shows slightly more finished workmanship—though this distinction is less marked at Kebara—together with a higher proportion of steep and semi-steep scrapers and a lower proportion of burins, but there is no fundamental difference between the two divisions, and the industry as a whole corresponds with Neuville's Upper Palaeolithic IV as seen at Erq el-Ahmar and el-Khiam (Neuville, 1951). Typologically it seems to be more or less comparable with the second and third stages (Breuil) of the

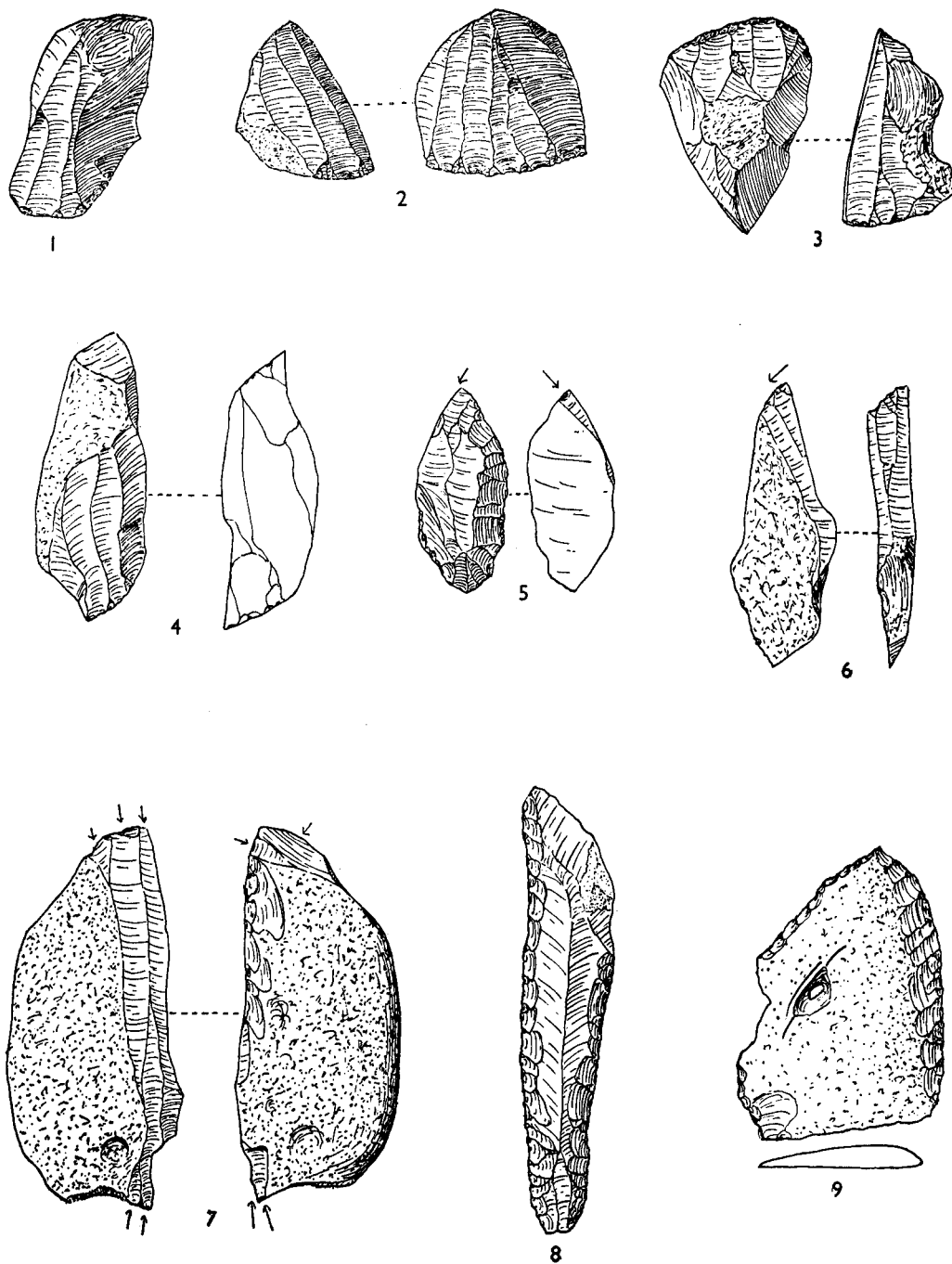


Fig. 6

Implements from Mughareet Kebara, Layer D2. (Nos. 1-8 Palestine Museum ; No. 9 Pitt-Rivers Museum, Oxford).



Aurignacian of Western Europe, though the characteristic bone artifacts are lacking (Garrod, 1953). In comparison with Layer E, the Font-Yves point has virtually disappeared and there is a marked evolution towards rostrate forms in the flake-scrapers and semi-steep scrapers. In D2 Levallois-Mousterian types are still present, in approximately the same proportions as in E.

# INVENTORY—SUB-LAYER D2

<i>Le Moustier points</i>	..	..	..	..	..	..	..	9
<i>Aurignacian points</i>	..	..	..	..	..	..	..	5
<i>Font-Yves points</i>	..	..	..	..	..	..	..	2
<i>Blunted-back knives</i>	..	..	..	..	..	..	..	6
<i>Racloirs</i>	..	..	..	..	..	..	..	11
<i>Flake-scrapers</i>	..	..	..	..	..	..	..	34
Round and rounded, 8; elliptical, 5; pear-shaped, 2; ogival, 5; rostrate, 11; various, 3								
<i>End-scrapers on flakes and flake-blades</i>	..	..	..	..	..	..	..	22
<i>End-scrapers on blades</i>	..	..	..	..	..	..	..	2
<i>Semi-steep scrapers</i>	..	..	..	..	..	..	..	21
Rounded end, 8; ogival end, 4; rostrate, 9								
<i>Steep scrapers</i>	..	..	..	..	..	..	..	45
Oblique front, 25; double front, 4; pyramidal, 2; nucleiform, 14								
<i>Massive scrapers</i>	..	..	..	..	..	..	..	2
<i>Burins</i>	..	..	..	..	..	..	..	10
Prismatic, 4; angle, 3; bec-de-flûte+scraper, 1; single-blow+scraper, 2								
<i>Borers</i>	..	..	..	..	..	..	..	4
<i>Chisel</i>	..	..	..	..	..	..	..	1
<i>Denticulated bladelet</i>	..	..	..	..	..	..	..	1
<i>Chopping-tools</i>	..	..	..	..	..	..	..	2
<i>Retouched flakes and fragments</i>	..	..	..	..	..	..	..	15
<i>Retouched flake-blades and blades</i>	..	..	..	..	..	..	..	19
<i>Levallois core</i>	..	..	..	..	..	..	..	1
<i>Levallois flakes</i>	..	..	..	..	..	..	..	6
<i>Flakes</i>	..	..	..	..	..	..	..	2
<i>Blades and bladelets</i>	..	..	..	..	..	..	..	10
Total								230
<i>Bone points</i>	..	..	..	..	..	..	..	2

*Le Moustier points*, 9. (Fig. 5, no. 1; Fig. 7, no. 14). These are as typical as those of Layer E. The majority have faceted striking-platforms, and of these two are on Levallois flakes, and rather broader than the rest. With one exception—a Levallois point of ochre-stained flint—they are in the same condition as the rest of the material from D2.

*Fig. 5, no. 1.* Light green chert, with bi-faceted striking-platform ('*en toit*'), and prominent bulb with striations. The edge-retouch is rather rough. *Fig. 7, no. 14.* Thick flake of white patinated flint, with faceted platform and resolved edge-flaking.

*Aurignacian points*, 5. (Fig. 5, nos. 2, 3; Fig. 7, no. 13). With one exception these are well made, with extensive flat edge retouch. One (Fig. 5, no. 3) is narrower than usual.

*Fig. 5, no. 2.* Cherty off-white patinated flint. It is flat on both faces, with a uniform thickness of 5 mm., and is carefully retouched all round. The point, which is blunt and strong is fashioned at the bulbar end, the bulb and striking platform having been trimmed away in the process. *Fig. 5, no. 3.* This very elegant point is made on a punched blade

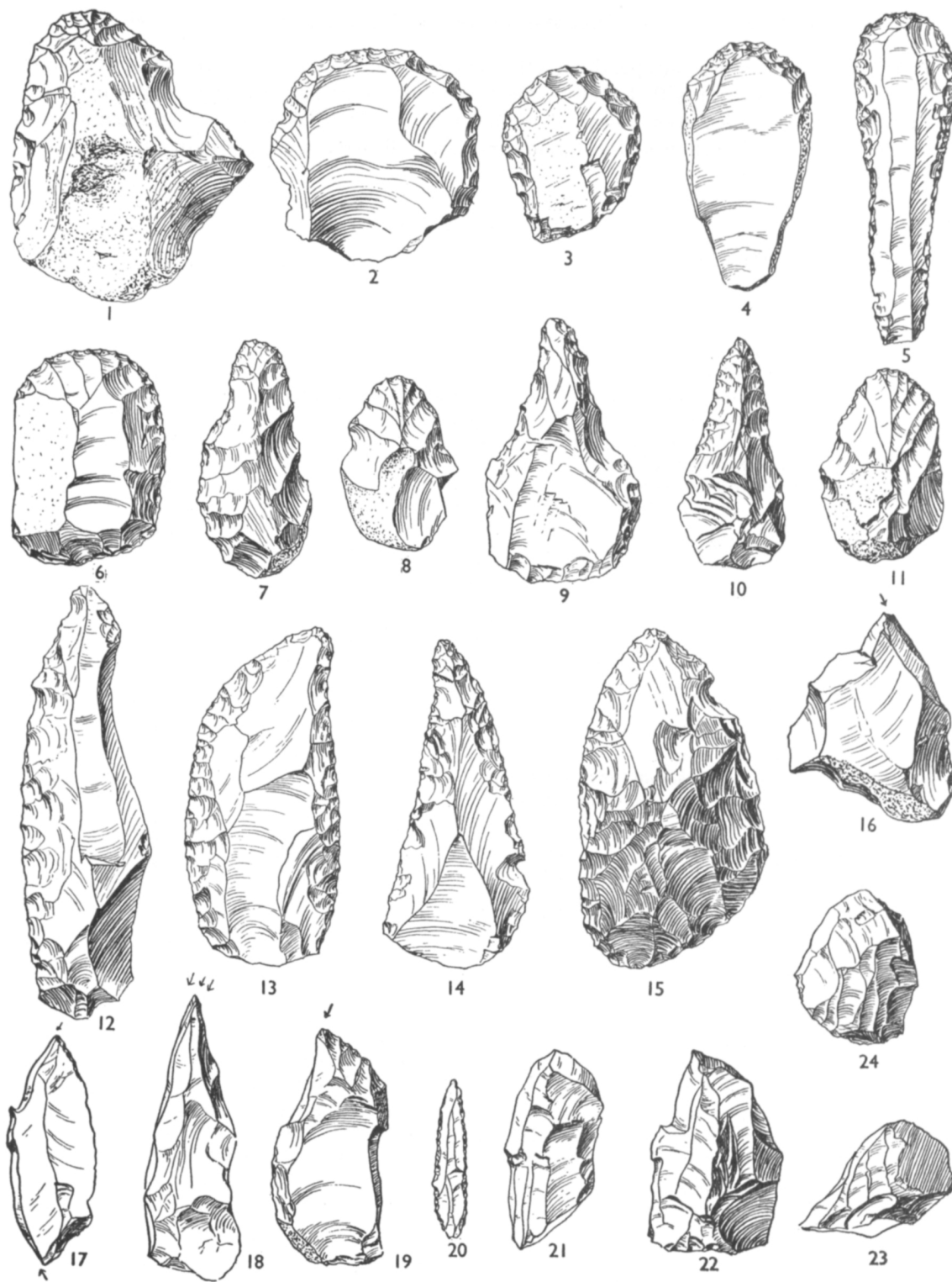


Fig. 7  
Implements from Mugharet Kebara, Layer D2. (Museum of Archaeology and Ethnology, Cambridge).

of blue-grey patinated flint. The edge-flaking is particularly regular and neat. *Fig. 7, no. 13.* Thin flake of mottled cream and grey patinated flint, with faceted striking-platform and flat edge-flaking, forming an obtuse curved point.

*Font-Yves points, 2.* (*Fig. 7, no. 20.*) The figured specimen is a punched blade of light brown flint, nibbled all round, with tip more obtuse than is usual in this type. The specimen not figured is 40 mm. in length, with fine nibbling retouch at the tip and along both edges.

*Blunted-back Knives, 6.* (*Fig. 5, nos. 4, 5.*) All have curved backs, the left edge being blunted in four cases and the right in two. In one, the tip is at the bulbar end. On the whole these knives are closer to the Chatelperron type than are those from E.

*Fig. 5, no. 4.* Thin flake of mottled buff flint, with very small striking-platform partly removed by a bulbar face chip. The back is neatly blunted along its whole length. *Fig. 5, no. 5.* Punched blade of grey-white patinated flint with pinhead striking-platform and flat bulb. The blunting is confined to the upper third of the left edge; the tip is finely trimmed on both sides. This is the piece which is furthest from the Chatelperron type.

*Racloirs, 11.* (*Fig. 5, no. 6; Fig. 7, nos. 12, 15.*) The majority are on flakes with plain striking-platform, or with the bulbar end broken away. In some the edge-trimming is resolved, in others rather flat and broad, a difference which does not appear to be necessarily related to the thickness of the flake.

*Fig. 5, no. 6.* Grey mottled flint, with small faceted platform and prominent bulb with double scar. Apart from the bulbar area the flake is rather thin, with flat retouch of the working edge. *Fig. 7, no. 12.* Flake-blade of pale grey flint with the base broken away, and with extensive resolved flaking along the left edge. *Fig. 7, no. 15.* Thick flake of grey-brown flint with plain wide-angle striking-platform and prominent bulb. It is flaked all over the upper face and retrimmed round the edges. An exceptional piece in this context.

*Flake-scrapers, 34.* (*Fig. 5, nos. 7-10; Fig. 7, nos. 1-3.*) As the inventory shows, nearly all the types of Layer E are present here, but the proportion of ogival and rostrate scrapers has gone up, and the latter are better defined and more typically Aurignacian. Round scrapers, on the other hand, are less good, without the very neat edge-trimming of such specimens as nos. 9, 10 of *Fig. 1.* The two pear-shaped scrapers are rather rough, as were those of E.

*Fig. 5, no. 7.* Cream patinated flint with large area of cortex. The flake is thick with prominent bulb; the striking platform has been removed by a blow which has left a fan-shaped scar on the upper face, possibly an accident which occurred at the moment of striking off the flake from the core. The edge-flaking is elaborate and extensive. *Fig. 5, no. 8.* Rostrate scraper on a thick flake of grey lustrous flint, with a patch of old ochreous surface remaining at the base. The general form is defined by bold flaking, the scraper front being finished with long lamellar retouch. *Fig. 5, no. 9.* Rostrate scraper on a flake of mottled grey flint, with small striking-platform and flat bulb. A narrow bladelet struck from the upper face either before or after removal from the core has broken short, leaving the beak-like projection seen in the profile drawing. The scraper front has delicate lamellar retouch. *Fig. 5, no. 10.* Chocolate-brown flint. The flake, although relatively rather broad, has the very small striking-platform, flat bulb and basal chipping usually produced by punching. The scraper end is neatly retouched, the edges are slightly broken by use. *Fig. 7, no. 1.* An older flake with dirty white patina has later been roughly retouched into a round-ended scraper. The notch on the right side is more recent still, and was probably made in excavation. *Fig. 7, no. 2.* Rounded scraper on a Levallois flake of orange chert. The scraper retouch and main flake are contemporary. *Fig. 7, no. 3.* Rounded scraper on a flake of banded grey flint with plain striking-platform and prominent bulb, and with patch of cortex on the upper face.

*End-Scrapers on flakes and flake-blades, 22.* (*Fig. 5, nos. 11-13; Fig. 7, no. 4.*) As in E these tend to be broad, and the majority are retouched along both edges. Four excellent specimens on thick flake-blades have steep retouch all round and lamellar flaking on the scraper end.

*Fig. 5, no. 11.* White patinated flint. Both faces are flat, the bulbar end having been trimmed away, leaving two notches at the base. The all-round trimming is more careful on the left edge than on the right. *Fig. 5, no. 12.* Cream patinated flint, with small striking-platform and flat bulb. The scraper end has neat lamellar retouch and there is resolved flaking along the right edge. The left edge is deformed by a natural break. *Fig. 5, no. 13.* Lustrous grey flint. A double-ended scraper with slight retouch on the right edge. *Fig. 7, no. 4.* Grey patinated flint. A tablet, apparently taken from a steep scraper with cortex on both sides, has been neatly re-fashioned into an end-scraper by lamellar retouch at the heel end.

*End-scrapers on blades, 2.* (*Fig. 7, no. 5.*) Both are on punched blades, but are broader and less delicate than similar scrapers from the Emiran (*cf.* Mugharet el-Emireh and Mugharet el-Wad). The figured specimen is on a punched blade of off-white patinated flint, retouched all round, and with lamellar trimming of the scraper end.

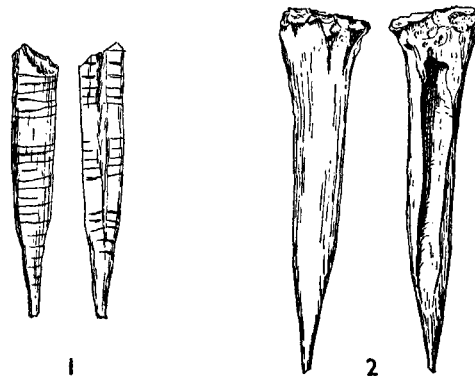


Fig. 8

Bone objects from Mugharet Kebara, Layer D2. (Palestine Museum).

*Semi-steep scrapers, 21.* (*Fig. 5, nos. 14, 15; Fig. 7, nos. 6-11.*) This is an outstanding group, in which there are two principal categories. In the first the scraper is short, with long lamellar retouch rising to a heel of cortex or pebble (*Fig. 5, no. 14; Fig. 7, nos. 8, 11*); in the second it is more or less pear-shaped, extensively flaked over the upper face, with the scraper front at the narrow end. (*Fig. 5, no. 15; Fig. 7, nos. 7, 9, 10*). Most of the rostrate scrapers fall into the second category.

*Fig. 5, no. 14.* Split nodule with cortex remaining on the heel. The plain striking-platform is large, with wide flaking-angle and projecting bulb—a feature which is characteristic of this type of scraper in the Aurignacian of Europe. The scraper front is formed by excellent lamellar retouch. *Fig. 5, no. 15.* Split chunk of cream chert, with small plain striking-platform, and with a patch of cortex remaining on the right side. The tool is shaped by bold flaking rising to a crest, with lamellar retouch of the ogival scraper end. *Fig. 7, no. 6.* Thick flake of grey flint with patch of cortex on the left side. There is steep scraper retouch at both ends and resolved flaking down the right edge. *Fig. 7, no. 7.* Thick flake of honey-coloured flint, slightly worn, with patch of pebble surface at the base. The retouch, which covers the whole of the upper face, appears more recent than the main flake. *Fig. 7, no. 8.* Thick flake of buff cherty flint, with pebble surface at the base. The scraper end is formed by good lamellar retouch. *Fig. 7, no. 9.* Broad flake of mottled off-white patinated chert, with plain striking-platform placed obliquely to the main axis. The pointed rostrate scraper end is shaped by bold flaking. *Fig. 7, no. 10.* Thick flake of mottled off-white patinated flint, with plain striking-platform. The pointed scraper end is very elaborately retouched. *Fig. 7, no. 11.* Split pebble of speckled buff flint, with cortex on the heel. The scraper end is formed by long lamellar retouch.

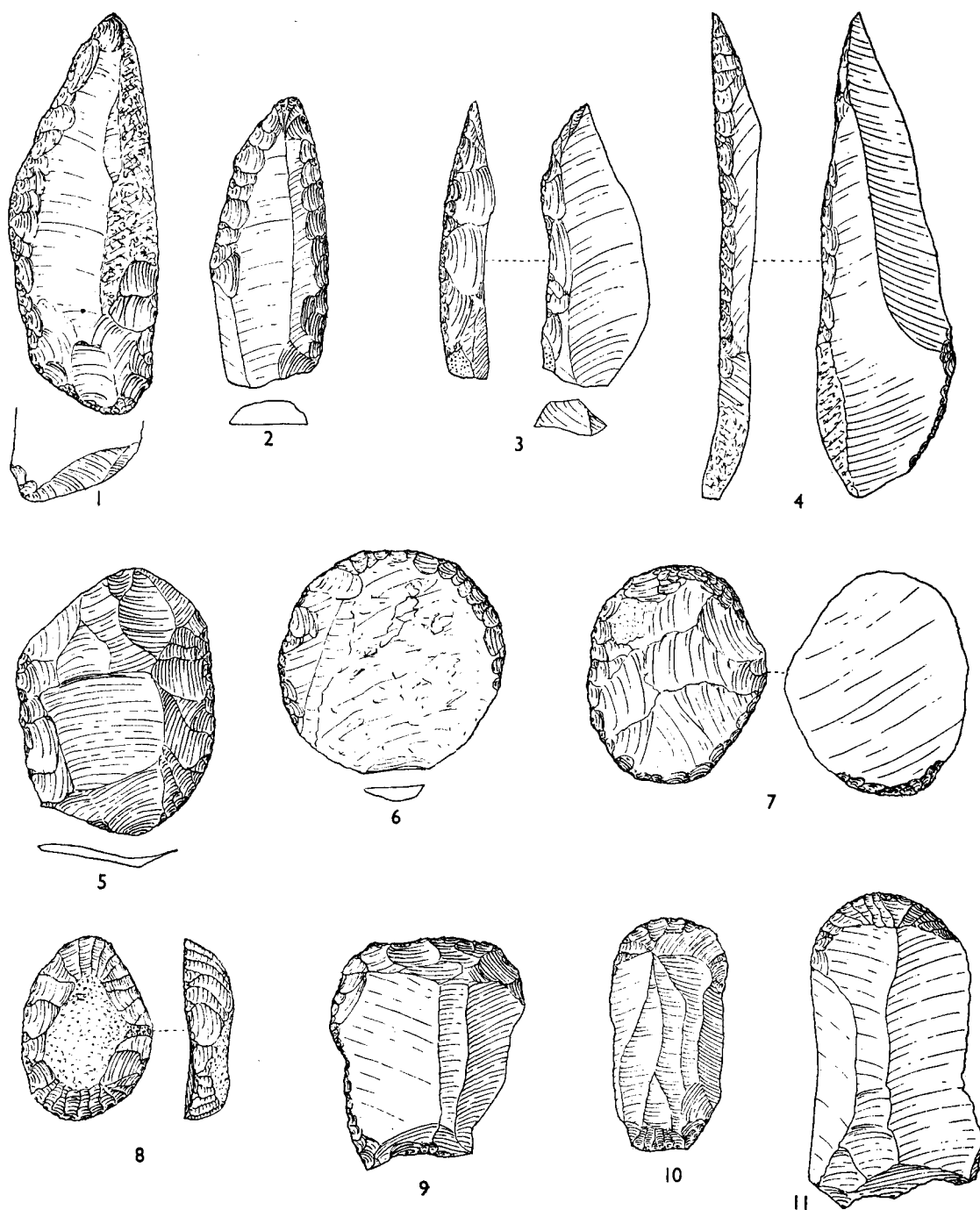


Fig. 9  
Implements from Mugharef Kebara, Layer D1. (Palestine Museum).

*Steep scrapers*, 45. (Fig. 6, nos. 1-4; Fig. 7, nos. 21-24). As in E, this is the largest group of implements, forming 22 per cent of the whole, and as the inventory shows, the same types are present in approximately the same proportions.

*Fig. 6, no. 1.* Irregular block of mottled grey flint, with scraper front formed by four lamellar scars. The base is a single flake surface. *Fig. 6, no. 2.* Block of mottled grey-white flint with pebble surface on the heel. The broad scraper front is formed by six lamellar scars; the base is a single flake-surface with conical bulb. *Fig. 6, no. 3.* Double ended scraper on a block of dove-grey flint with patch of cortex remaining in a hollow. The scraper fronts are placed laterally in relation to each other. *Fig. 6, no. 4.* Double-ended scraper on a block of grey-brown chert with a large patch of cortex. The twisted acute-angled scraper fronts are placed on opposite sides of the block. *Fig. 7, no. 21.* Double-ended nucleiform scraper of pale grey patinated flint with pebble surface at the back. *Fig. 7, no. 22.* Double-ended nucleiform scraper of mottled brown flint. *Fig. 7, no. 13.* Twisted acute-angled scraper on a block of fawn and grey piebald flint with cortex on the heel. *Fig. 7, no. 24.* Nucleiform scraper on a block of grey mottled flint, with cortex at the back.

*Massive scrapers*, 2. One is a large pyramidal scraper of coarse buff chert, boldly flaked, with a projecting beak on one side; the other is a thick flake of grey chert, flaked all round the edge and battered at the bulbar end.

*Burins*, 10. (Fig. 6, nos. 5-7; Fig. 7, nos. 16-19). As the inventory shows, although the number of burins is small, the prismatic is again in the leading form, and one massive specimen on tabular flint (Fig. 6, no. 7) is a familiar Palestinian type (*cf.* Garrod and Bate, 1937, Pl. xxvi, nos. 11-12). The angle-burin which is not figured is made on a flake-blade extensively retouched over the upper face; the bec-de-flûte, also not figured, is small and neat, with opposed ogival scraper.

*Fig. 6, no. 5.* A small well-made ogival scraper of lustrous grey flint has received a single burin-blow at the bulbar end. *Fig. 6, no. 6.* Oblique-edged prismatic made on the bulbar end of a flake of pale buff flint, with cortex on the upper face. *Fig. 6, no. 7.* Massive double-ended prismatic on buff tabular flint with cortex on both faces and round the back. The lower burin (as drawn) has been once renewed. *Fig. 7, no. 16.* Slightly abraded thick flake of buff chert, roughly re-fashioned as a prismatic burin at a later date. *Fig. 7, no. 17.* Neat double-ended angle-burin on a flake of buff flint. *Fig. 7, no. 18.* Prismatic burin, rather rough, made on a naturally broken fragment of buff flint. *Fig. 7, no. 19.* Thick flake of grey cherty flint with lamellar retouch at the upper end and burin blow on the left side. This may perhaps be a converted scraper, as the lamellar end-trimming is unusual for a burin. The striking-platform, which is plain, has been much battered.

*Borers*, 4. These are all rather delicate. Three are on punched blades, the borer tip being shaped by chipping on both sides from the bulbar face only. The fourth, on a slightly broader blade, is fashioned by alternate trimming at the acute end of an oblique break which has removed the base of the blade.

*Chisel* 1. A thick flake-blade with faceted striking-platform has resolved retouch down one edge, and bulbar face trimming forming an oblique chisel edge across the upper end.

*Denticulated bladelet*, 1. A narrow blunted back bladelet has three saw-teeth on the cutting edge.

*Chopping tools*, 2. One of these is a very good tool. It is a flattish pebble of buff cherty flint, measuring 65 mm × 60 mm. in diameter, with flaking on both faces round half the perimeter forming a regular zig-zag edge. The other, much smaller, is worked over both faces, with a cutting edge on which the zig-zag has been regularized by minute chipping.

*Retouched flakes and fragments*, 15. (Fig. 6, no. 9). These are too shapeless to be placed in any definite category, but many bear good retouch of the flat Aurignacian type. One flake fragment (Fig. 6, no. 9) with cortex on one face is pierced by a natural hole which has the shape of an eye, and this evidently caught the attention of its owner who heightened the resemblance by a few strokes engraved on the cortex.

*Retouched flake-blades and blades*, 19. (Fig. 6, no. 8). Many of these have good Aurignacian-type flaking on one or both edges; others are more sketchily retouched.

*Fig. 6, no. 8.* Blade of pinkish-brown mottled flint, with regular flat retouch down both edges.

Dorothy A. E. Garrod. Excavations at the Mugharet Kebara, Mount Carmel

*Levallois core*, 1. Rather rough discoidal core, 110 mm. × 70 mm., from which one broad flake has been removed.

*Levallois flakes*, 6. Two are broad, and four triangular with long retouched striking-platforms.

*Flakes*, 2. Without interest.

*Blades and bladelets*, 10. They are small and narrow, the majority punched.

As in E, the debitage is too scanty to give any information. The relatively greater number of Levallois flakes and of blades and bladelets as against simple flakes is clearly due to choice.

*Bone implements* (Fig. 8, nos. 1, 2). Two bone points or awls in the Palestine Museum are marked as coming from Kebara D2. No. 1, of which the upper end is broken, is lightly engraved with parallel encircling lines. No. 2 is made on a fragment of tibia with the articulation remaining as a handle, a type which occurs also in the Natufian, where it is very common.

## SUB-LAYER D1

The industry is substantially the same as that of D2, but there is a fall in the proportion of semi-steep scrapers (4.4 per cent as against 9.9 per cent) and a rise in the proportion of burins (8.1 per cent as against 4.7 per cent). Reference to the comparative tables and diagrams (pp. 187-91) shows that a similar movement occurs between D2 and D1 at the Mugharet el-Wad, where the percentages were based on a much larger number of implements, and may therefore be considered more reliable. D1 also shows a small reduction in the percentage of steep scrapers in both sites. At Kebara the fall in semi-steep scrapers is at the expense of the rostrate form, which becomes rare also among the flake-scrapers. Apart from this, there is not much difference in the quality of workmanship between D2 and D1. The Levallois-Mousterian element is now much reduced, but has not entirely disappeared.

### INVENTORY—SUB-LAYER D1

<i>Le Moustier points</i>	..	..	..	..	..	..	..	3
<i>Aurignacian points</i>	..	..	..	..	..	..	..	3
<i>Blunted-back knives</i>	..	..	..	..	..	..	..	9
<i>Racloirs</i>	..	..	..	..	..	..	..	6
<i>Flake-scrapers</i>	..	..	..	..	..	..	..	49
Round and rounded, 17; elliptical, 10; fan-shaped, 2; pear-shaped, 4; ogival, 4; rostrate, 2; various, 10								
<i>End-scrapers on flakes and flake-blades</i>	..	..	..	..	..	..	..	45
<i>End-scrapers on blades</i>	..	..	..	..	..	..	..	16
<i>Semi-steep scrapers</i>	..	..	..	..	..	..	..	10
Rounded end, 2; ogival end, 8								
<i>Steep scrapers</i>	..	..	..	..	..	..	..	34
Oblique front, 19; double front, 5; pyramidal, 2; nuclei- form, 8								
<i>Massive scrapers</i>	..	..	..	..	..	..	..	3
<i>Burins</i>	..	..	..	..	..	..	..	18
Prismatic, 10; bec-de-flûte, 2; beaked, 1; plane, 1; single- blow, 1; prismatic+scraper, 1; Angle+scraper 2								
<i>Nibbled blades</i>	..	..	..	..	..	..	..	9
<i>Disc</i>	..	..	..	..	..	..	..	1
<i>Chopping-tools</i>	..	..	..	..	..	..	..	3
<i>Chisel</i>	..	..	..	..	..	..	..	1
<i>Retouched flakes and flake-blades</i>	..	..	..	..	..	..	..	12
<i>Blade-cores</i>	..	..	..	..	..	..	..	3
<i>Flakes</i>	..	..	..	..	..	..	..	6
<i>Flake-blades</i>	..	..	..	..	..	..	..	2
<i>Blades</i>	..	..	..	..	..	..	..	24
<i>Burin spall</i>	..	..	..	..	..	..	..	1
Total .. .. .								258

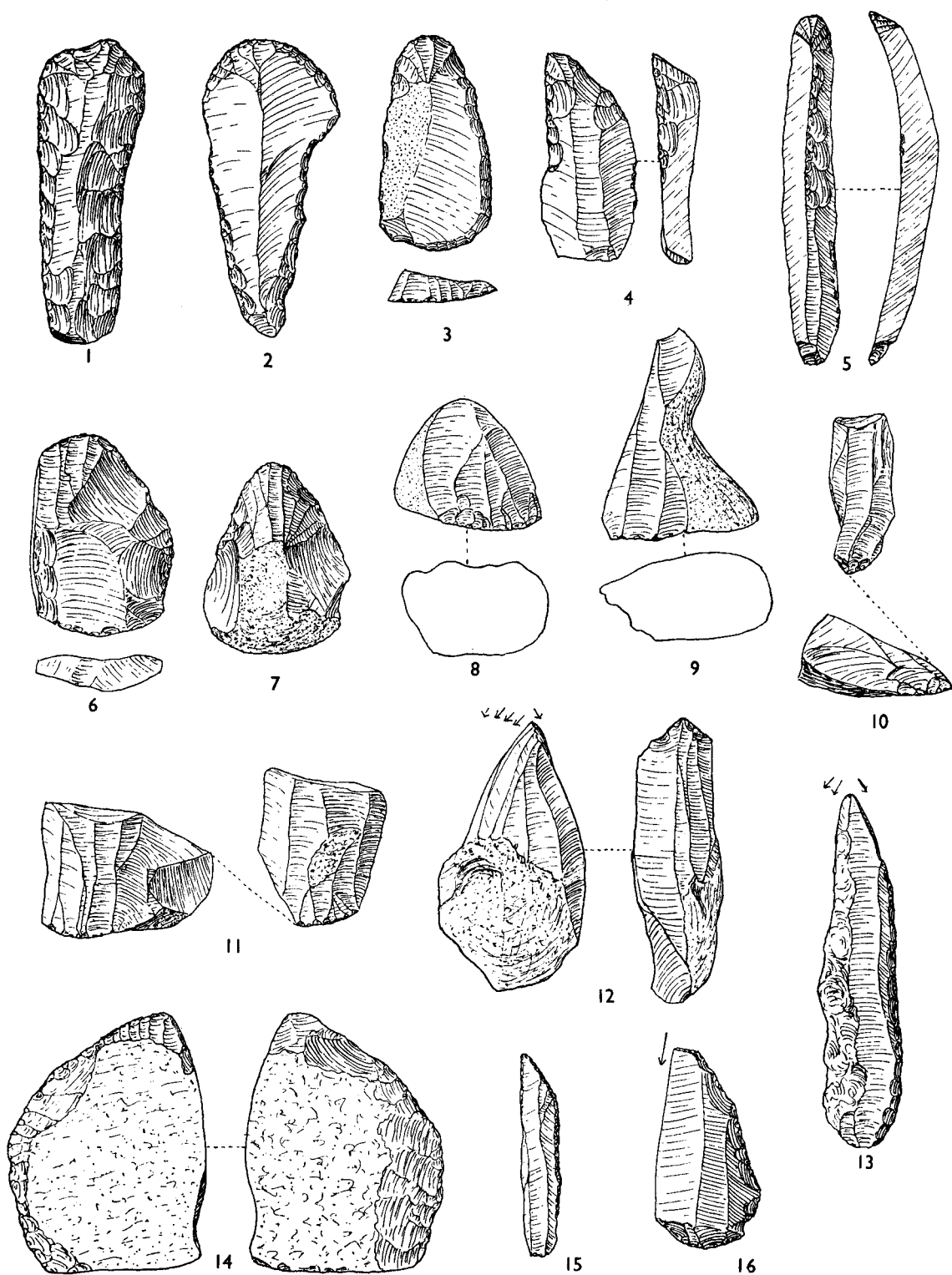


Fig. 10  
Implements from Mugharet Kebara, Layer D1. (Palestine Museum).



*Le Moustier points*, 3. These are typical specimens, two made on triangular Levallois flakes, the third on a flake with slightly retouched platform. They are in fresh condition and there is nothing to indicate that they do not belong to this horizon.

*Aurignacian points*, 3. (Fig. 9, nos. 1, 2). One of these (not figured), a point made on the bulbar end of a plunging flake, is not very typical, but is included here because of its careful flat retouch.

*Fig. 9, no. 1.* Leaf-shaped point of buff flint, with strip of cortex on the right side. The left edge has elaborate flat retouch along its whole length; the partial retouch on the right edge is coarser. The striking-platform and bulb have been destroyed by battering which has scaled the base of the flake. *Fig. 9, no. 2.* Buff flint. The point and both edges are shaped by careful flat retouch, lamellar at the tip; the base is broken away.

*Blunted-back knives*, 9. (Fig. 9, nos. 3, 4). These are variable in size and type; some are narrow, others broad and massive. A specimen in the Pitt-Rivers Museum has a rudimentary shoulder which may be accidental.

*Fig. 9, no. 3.* Thick flake of grey and white piebald flint, with bi-faceted striking-platform and prominent bulb with scar and striations. The broad back is formed by heavy resolved flaking. *Fig. 9, no. 4.* Large flake of light grey glossy flint, with strip of cortex at the base of the left edge. The blunting retouch of the back is from the bulbar face only except at the tip, which has been trimmed from both faces. The bulbar end of the flake was at the top (as drawn). The base of the knife is slightly polished, as though it had been hafted or wrapped in leather.

*Racloirs*, 6. (Fig. 9, no. 5). These are of Mousterian type, with resolved flaking, but on the whole rather coarsely made. One of the Cambridge specimens has been used as a wedge or chisel. The figured specimen is of green cherty flint, with plain striking-platform and prominent bulb with scar. The rather coarse edge-flaking and a large scar at the base which has reduced the depth of the striking-platform appear to be more recent than the main flake.

*Flake-scrapers*, 49. (Fig. 9, nos. 6-9). The majority fall into the categories already established in D2 and E, but there is a group of ten which are too formless to be precisely classified. On the whole they are well made, shaped by careful flaking, and a few are outstanding (e.g. Fig. 9, no. 8). In contrast with D2, the two rostrates, one with pointed and one with rounded nose are not very typical.

*Fig. 9, no. 6.* Circular scraper of dove-grey flint, with large patch of white cortex on the upper face. The striking-platform is small, with prominent bulb. The edge is very neatly trimmed round two-thirds of the circumference. *Fig. 9, no. 7.* Lustrous grey flint with small patch of cortex. The striking-platform was probably at the upper end (as drawn), but has been removed in the shaping of the tool. The upper face is extensively flaked and the edge is retouched nearly all round. The upper end shows signs of much use as a scraper, and the lower is heavily battered. *Fig. 9, no. 8.* This outstanding specimen is made of buff flint with a patch of red cortex on the upper face. It is shaped by exquisite lamellar retouch all round the edge. *Fig. 9, no. 9.* The main flake is ochre-stained, but the whole of the edge working and the facet on the right side are later, and show the original light buff colour of the chert. There is a transverse scraper at one end and a hollow scraper at the other, both boldly flaked.

*End-scrapers on flakes and flake-blades*, 45. (Fig. 9, no. 11; Fig. 10, nos. 2-4). On the whole these are well made, though there are some rough specimens. The best have lamellar retouch of the scraper end and trimming on one or both edges. A high proportion (32.5 per cent) are double-ended.

*Fig. 9, no. 11.* Flake of streaky buff chert with the base broken away. The scraper end has neat lamellar retouch; both edges are slightly chipped by use. *Fig. 10, no. 2.* Red flint. The scraper end is neatly trimmed and both edges are retouched. The blunt point at the base seems to have been produced by banging, and not shaped deliberately. *Fig. 10, no. 3.* Lustrous buff flint with patch of cortex. The scraper is double-ended, with neat lamellar retouch at both ends and trimming on the right edge, the left being slightly chipped by use. *Fig. 10, no. 4.* Light grey mottled flint; the only rostrate scraper in this group. The beak is formed by bold flaking, lamellar at the tip. The base has either been trimmed away, or a broken end has been regularized by chipping, giving the false appearance of a faceted striking-platform.

*End-scrapers on blades*, 16. (Fig. 9, no. 10; Fig. 10, nos. 1, 5). All are on punched blades but the majority are rather broad, as in D2 and E.

*Fig. 9, no. 10.* Mottled greenish-brown cherty flint. This blade has a very minute striking-platform at the left end of the base; the right end has been nibbled by use which was vigorous enough to detach a quite large flake from the under face, leaving a scar in place of the bulb. The upper face carries a number of narrow facets produced by the previous removal of bladelets from the core. *Fig. 10, no. 1.* This again is broad and rather thick for a punched blade, but it has the characteristic minute elliptical platform, this time with twin bulbs, showing that the punch had jumped when the detaching blow was struck—a feature found also at the Mugharet el-Emireh. The upper face is extensively flaked and the edges and slightly rostrate scraper end are neatly trimmed. The left edge has been much used. *Fig. 10, no. 5.* *Lame-de-dégagement* of greenish-brown flint with pin-head striking-platform. The scraper-end shows very fine lamellar retouch; the edges are slightly chipped by use. This is the narrowest of the punched blades.

*Semi-steep scrapers*, 10. (Fig. 10, nos. 6–7). These are less well-made than in D2. The majority are on split pebbles, the rest on thick flakes. There are no rostrates, but the proportion of ogival forms is higher than in D2 and E.

*Fig. 10, no. 6.* Thick flake of buff cherty flint, struck from a pebble whose abraded surface remains on the striking-platform and along the left side. The ogival scraper front is formed by rather broad lamellar retouch. There is considerable battering along the upper edges of the striking-platform and lateral pebble-surface. *Fig. 10, no. 7.* Split nodule of cream and grey piebald flint with cortex remaining on the heel and part of the upper face. Two hollow flake scars form a thumb and finger grip behind the ogival scraper front.

*Steep scrapers*, 34. (Fig. 10, nos. 8–11). On the whole they are less well made than in D2, but the types are the same, though with a larger number of narrow forms.

*Fig. 10, no. 8.* Greenish grey lustrous flint, with cortex on the heel. The front is neatly made, but on the side not shown in the drawing a violent blow has produced a hollow flake-scar which truncates the lamellar retouch. *Fig. 10, no. 9.* Acute-angled scraper on a narrow block of grey flint. Owing to the shape of the nodule, the cortex on the heel, forms a natural handle. The base is a natural fracture surface, much worn and patinated. The upper end of the tool has been used as a chisel or burin. *Fig. 10, no. 10.* Scraper with twisted front on a small block of lustrous grey flint with pebble surface on the heel. The base is a single flake-scar. *Fig. 10, no. 11.* Double-fronted scraper on a block of grey flint with patches of pebble surface and cortex. Two vertical scraper fronts are set at right angles to each other on opposite sides of the block.

*Massive scrapers*, 3. These are coarsely worked steep scrapers or choppers on very thick flakes of chert. On one, the hollow flake-scars form a spurred edge which has not been re-trimmed.

*Burins*, 18. (Fig. 10, nos. 12, 13, 16). As in E and D2 the prismatic type, often rather massive, predominates; they are coarsely made, on pebbles or blocks of flint, with much cortex remaining. The bec-de-flûte and angle types are more delicate. There is one beaked burin made on an older flake.

*Fig. 10, no. 12.* Prismatic on a block of buff flint with cortex on one face and a natural fracture surface on the other. The working edge is pointed, a feature which occurred also in two burins from E. *Fig. 10, no. 13.* Bec-de-flûte on blade of grey flint with knobbly red cortex on the left edge and resolved flaking on the right. *Fig. 10, no. 16.* Oblique-ended angle-graver with opposed scraper on a thick flake of dark grey flint with steep retouch along the right edge.

*Nibbled blades*, 9. (Fig. 9, no. 15). The majority are small. A few have retouched points, but in general the nibbling is confined to a part of the edge, and is sometimes very slight. The figured specimen is an oblique-ended punched blade of grey cherty flint, with pin-head striking-platform. There is nibbled retouch on both sides of the tip and down the right edge.

*Disc 1.* This is to be compared with two specimens from Layer F of the Mugharet el-Wad, in which parallel blade scars occur down one edge of a disc (Garrod, 1951, Pl. II, nos. 10, 11), giving the impression of a double purpose flake and blade core, or alternatively of a steep scraper fashioned on a disc.

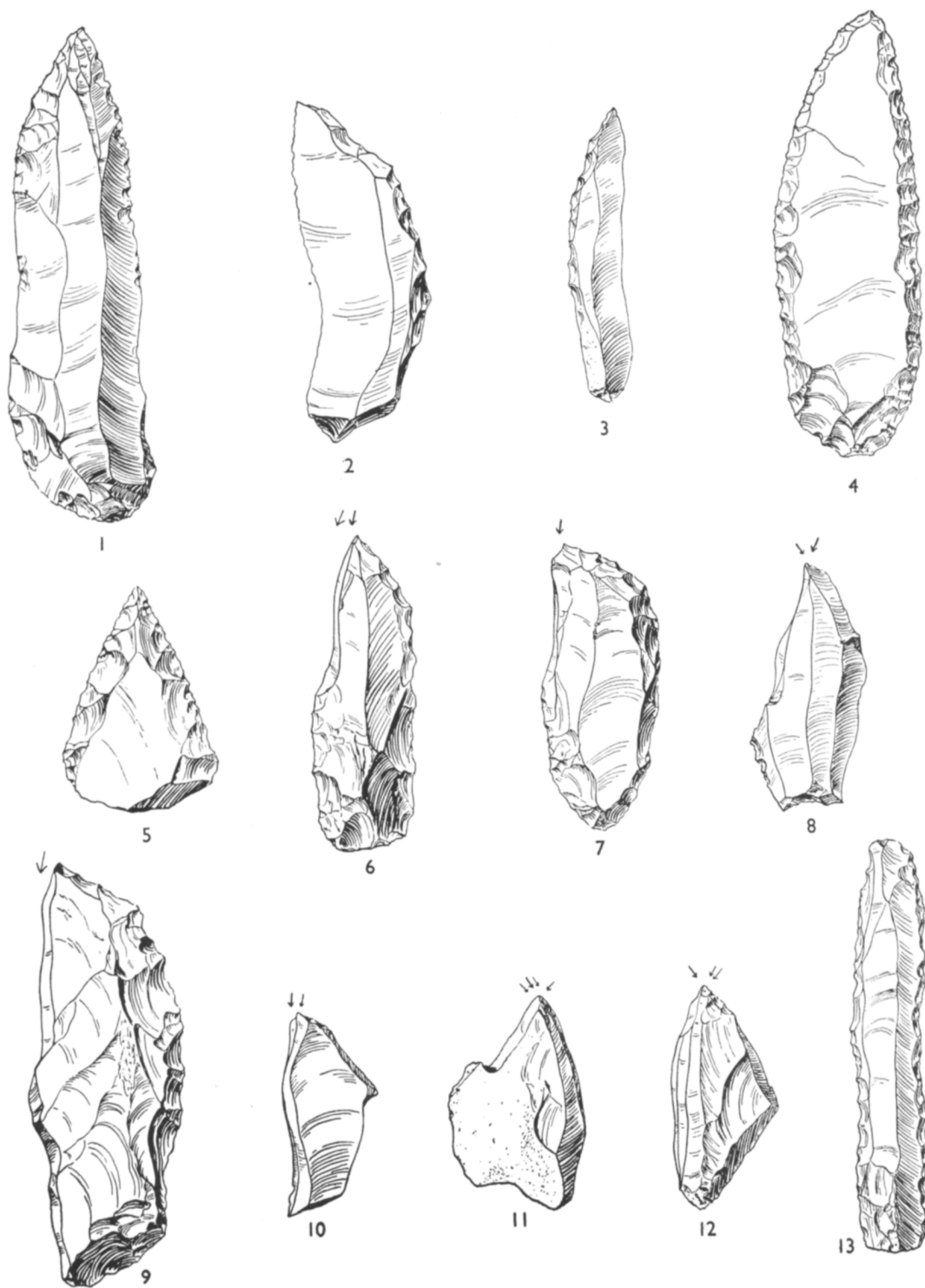


Fig. 11  
Mugharet Kebara, Layer C ; implements derived from Layer D. (Museum of Archaeology  
and Ethnology, Cambridge)

*Chopping tools*, 3. (Fig. 9, no. 14). Although these have been grouped together, their only common feature is a cutting or chopping edge formed by flaking from both faces. Of the two not figured, one—the most orthodox chopping tool of the three—is a large, roughly flaked discoidal object of brown flint, with cortex on both faces. The chopping-edge is formed by the intersection of two coarse flake-scars, and the opposite edge is heavily battered. The other is a small oval chunk of lustrous grey flint, both faces completely covered by careful flaking, with a long convex working-edge extending down one side and round both ends. The figured specimen is a thin tabular buff-grey flint with cortex on both faces. The carefully worked chopping-edge is abraded by use.

*Chisel*, 1. This is a flake-blade with rounded chisel-end, and squamous flaking produced by hammering at the base.

*Retouched flakes and flake-blades*, 12. Most of these have rather extensive resolved flaking on the edges, but a few show flat Aurignacian retouch, not of a very high order.

*Cores, flakes and blades*, 36. As in E and D2 the debitage is very scanty. Three small blade-cores have possibly been re-utilized as scrapers. A heavily rolled Levallois flake, and two others with ochreous patination are certainly derived from older layers, or from outside the cave.

## LAYER C : DERIVED MATERIAL

Layer C contained a certain amount of material which contrasted markedly in typology and patination with the Kebaran industry of the horizon. Whereas the Kebaran implements are for the most part made on small, very narrow blades and have a distinctive white patina, this other group differs in no respect from the Aurignacian of D1, and there can be no doubt that it derives from that layer. In sites like those of Mount Carmel, where flints are abundant and there are no sterile horizons, it is normal to find a mixed zone, about 20 cm. thick, at the contact of two layers, though the mixture can only be detected when there is a sufficient difference between the two industries concerned, *e.g.* between Layers D and E of the Mugharet et-Tabūn (Levalloiso-Mousterian and Final Acheulean), or here, Kebaran and Aurignacian. When the Kebara collections were examined at Cambridge in 1931, it was decided to make drawings of a selection of these derived implements and I reproduce here the two plates then prepared (Figs. 11 and 12). As, however, this material was not found in place, I have not included it in the descriptive catalogue or inventory, but give a separate account of the figured specimens.

*Fig. 11, no. 1.* Flake-blade of lustrous brown flint. The base forms a steep-ended scraper with lamellar retouch; at the upper end is a knife-point, with back blunted by steep flaking. The cutting edge is serrated in its upper half, perhaps in part by use. *No. 2.* Thick blunted-back knife of grey chert, with a rough steep-ended scraper at the base. *No. 3.* Blunted-back knife, on a punched blade of lustrous brown flint. *No. 4.* Aurignacian point, elegantly retouched all round, on a flake with plain striking-platform. *No. 5.* Le Moustier point on a flake of grey-green flint, with plain striking-platform and resolved edge-flaking. *No. 6.* Faceted angle-burin on a flake of grey patinated flint, with plain striking-platform and steep resolved flaking on both edges. *No. 7.* Buff flint. Angle-burin opposed to an ogival scraper with lamellar retouch. The right edge (as drawn) has steep resolved flaking along its whole length. *No. 8.* I have not been able to trace this specimen, but it is clearly a bec-de-flûte burin, apparently with opposed hollow scraper. *No. 9.* An older massive flake has been transformed into an angle-burin. The burin facet runs down the whole length of the left edge; there is steep resolved flaking down the right edge and across the base. The main flake has a mottled cream patina, all secondary retouch is brown. *No. 10.* I have not been able to trace this piece, which appears to be a faceted angle-burin. *No. 11.* Prismatic burin on the bulbar end of a white patinated flint flake with large patch of cortex. *No. 12.* Double-ended prismatic burin on a small block of brown and white piebald flint. *No. 13.* Flake-blade of fawn flint with the bulbar end broken away. The steep resolved flaking of the edges is more recent than the main flake.

*Fig. 12.* No. 1. Rough 'tea-cosy' steep scraper on a block of buff flint. No. 2. I have not been able to trace this steep scraper. No. 3. Pyramidal scraper of brown flint with neat lamellar flaking round two-thirds of the periphery. No. 4. Steep scraper with twisted acute-angled front on a block of cream patinated flint with cortex at the base. No. 5. Rostrate scraper, on an older flake with long faceted platform retouched after removal from the core. The beak is sharp and steep with lamellar trimming. The main flake is patinated cream, the secondary retouch is slightly darker and mottled. No. 6. Semi-steep scraper on a thick flake of grey lustrous flint with large wide-angle striking-platform. No. 7. Round scraper on a cream patinated flint flake with faceted striking-platform. The scraper retouch is more recent than the main flake. No. 8. Cream patinated flint. Double scraper, rostrate at one end and ogival at the other, with elaborate edge-retouch. No. 9. End-scraper on a large, rather thin flake of banded grey flint, from which the bulbar end has been removed by a transverse blow. No. 10. Flake-blade of pale buff flint. A well-made end-scraper is opposed to a rough single-blow burin. No. 11. End-scraper on a flake-blade of buff chert with the bulbar end broken away. Both edges are retouched. No. 12. Double-ended scraper of cream patinated flint. No. 13. End-scraper on a punched blade of cream and grey piebald flint. No. 14. Angular flake of grey lustrous flint with battered crest, retouched all round, with a scraper at one end and a strong point at the other. No. 15. A rather poor rostrate scraper on a flake of brown flint, slightly burned. No. 16. Well-trimmed round scraper of grey cherty flint, with large patch of cortex. Some bulbar face retouch is perhaps due to use.

### MATERIAL IN THE UNITED STATES

The information obtained by Professor Movius from museums in the United States shows a total of 483 flints from Kebara D and E.<sup>1</sup> Four of the six lists, *viz.* those from the Peabody Museum of Harvard University, the National Museum of Washington, the University Museum of Pennsylvania and the Davenport Public Museum are sufficiently precise to provide the following provisional inventory.

	<i>Layer E</i>					
Le Moustier points	..	..	..	..	..	2
Font-Yves points	..	..	..	..	..	16
Racloirs	..	..	..	..	..	2
Scrapers (type not specified)	..	..	..	..	..	25
End-scrapers	..	..	..	..	..	21
Steep scrapers <sup>2</sup> (may include cores)	..	..	..	..	..	52
Borer	..	..	..	..	..	1
Chopper	..	..	..	..	..	1
Flakes and blades (some retouched)	..	..	..	..	..	32
Total	..	..	..	..	..	152

	<i>Layer D2</i>					
Points (type not specified)	..	..	..	..	..	5
Font-Yves point	..	..	..	..	..	1
Blunted-back blade	..	..	..	..	..	1
Scrapers (type not specified)	..	..	..	..	..	12
End-scrapers	..	..	..	..	..	17
Steep scrapers (may include cores)	..	..	..	..	..	46
Borers	..	..	..	..	..	4
Flakes and blades (some retouched)	..	..	..	..	..	15
Total	..	..	..	..	..	101

<sup>1</sup> They are distributed among the museums to whom acknowledgment is made on p. 156.

<sup>2</sup> Only the Pennsylvania list separates semi-steep from steep scrapers.

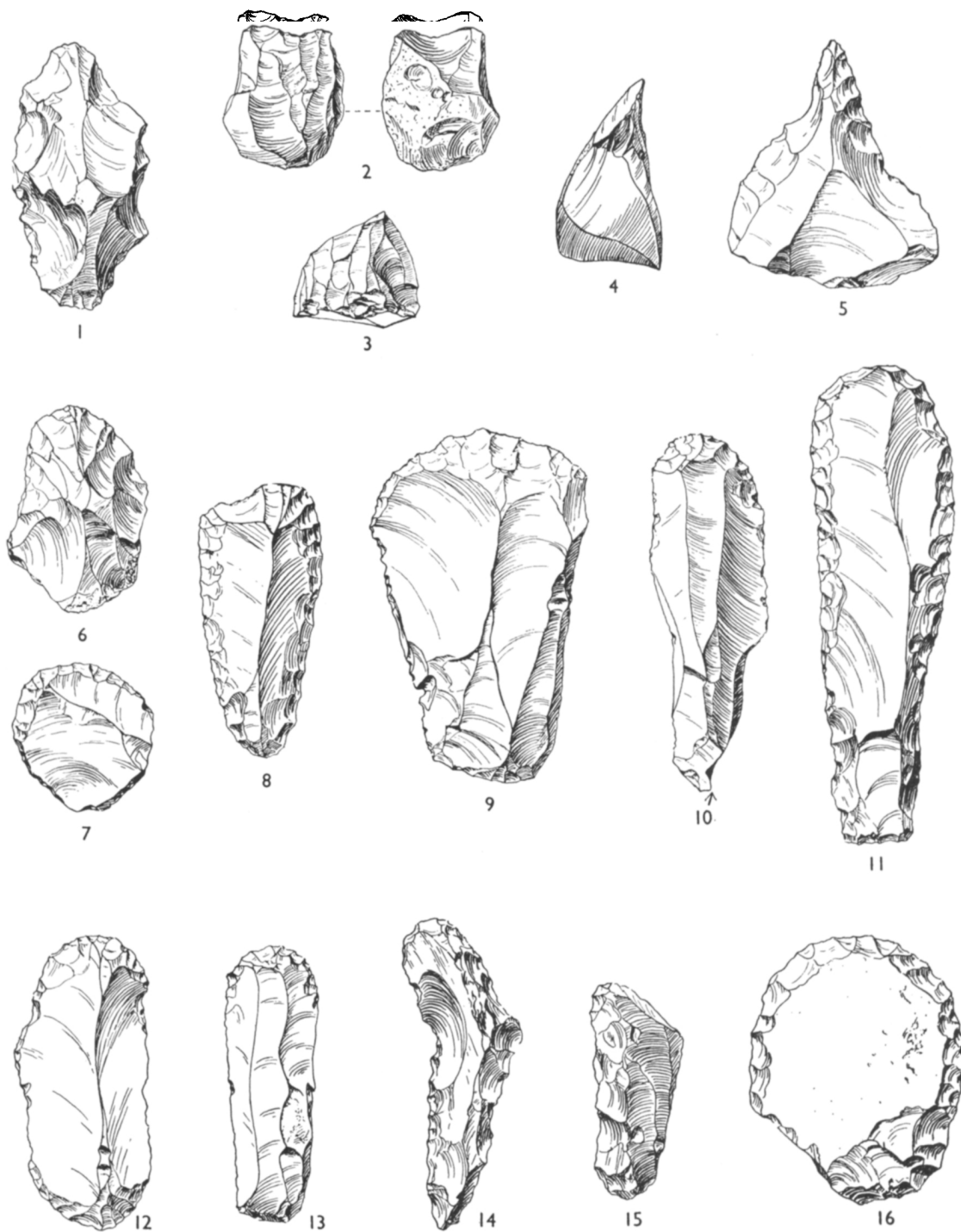


Fig. 12

Mugharet Kebara, Layer C ; implements derived from Layer D. (Museum of Archaeology and Ethnology, Cambridge).

Layer D <sub>1</sub>						
Blunted-back blades	..	..	..	..	..	2
Scrapers (type not specified)	..	..	..	..	..	14
End-scrapers	..	..	..	..	..	33
Steep scrapers (may include cores)	..	..	..	..	..	23
Burins	..	..	..	..	..	5
Flakes and blades (some retouched)	..	..	..	..	..	16
Total						93

Professor Movius hopes that one of his students may eventually incorporate a detailed study of this material in a thesis. Meanwhile it is recorded here for the sake of completeness.

### FAUNA

The amount of material was not large, and the final list left by Miss D. M. Bate treats the assemblage from D and E as a single unit, as had already been done for the Aurignacian of the Mugharet el-Wad (Garrod and Bate, 1937). A page of preliminary notes makes it clear that in fact there was no significant difference between the two horizons, and that in both the commonest forms were deer and gazelle. No species was found at Kebara which had not already been obtained from Layers D and E of the Mugharet el-Wad, and if the list is shorter, that is certainly due to the smaller size of the Kebara collection.

- Insectivora* : *Erinaceus* sp.
- Carnivora* : *Hyaena* cf. *crocuta*.
- Canis* sp.
- Meles* sp.
- Vulpes* sp.
- Ursus* sp.
- Martes* cf. *palaesyriaca*.
- Rodentia* : *Mesocricetus* cf. *auratus*.
- Ungulata* : *Sus* sp.
- Cervus* cf. *elaphus*.
- Dama* *mesopotamica*.
- Gazelle* sp.
- Bos* sp. (very large).
- Equus caballus*.
- Equus* cf. *hemionus*.
- Procapra* sp.

### COMPARISON WITH THE MUGHARET EL-WAD

The caves of the Wady el-Mughara are the nearest known Palaeolithic habitations in the neighbourhood of Kebara, and of this group only one, the Mugharet el-Wad, was inhabited in Upper Palaeolithic and Mesolithic times. A comparison of its sequence with that of Kebara shows that they do not correspond at all points. The industries of Layers

E and D are the same in both, as has already been made clear, but whereas at Kebara the Aurignacian of D<sub>1</sub> is followed by the Kebaran, apparently without a break, at el-Wad there is no trace of the latter, and in Layer C its place is taken by a very specialized form of Aurignacian with enormous numbers of steep scrapers and prismatic burins, to which on its discovery I gave the name of Atlitian and which is included by Neuville in his Upper Palaeolithic V<sup>1</sup>.

In saying that this industry takes the place of the Kebaran I do not mean to imply that the two are contemporary; on the contrary there was at el-Wad an appearance of disconformity between the Atlitian and the Lower Natufian of Layer B, whereas at Kebara the latter overlies the Kebaran without visible break. Moreover, at el-Khiam the Atlitian was actually found in place between an Aurignacian of D<sub>1</sub> type and a slightly modified Kebaran (Neuville, 1951). It is then most probable that following on the Atlitian there was an interval, corresponding to Layer C of Kebara, when the Mugharet el-Wad was not occupied. Logically, we should expect a similar gap at Kebara, this time between Layers D<sub>1</sub> and C, to correspond with the Atlitian episode at el-Wad, but in fact there was no visible discontinuity at this stage. This is the more surprising in that Layer C at el-Wad had a maximum thickness of 0.90 m. and yielded more artifacts than D<sub>1</sub> and D<sub>2</sub> together—which suggests a certain duration. If there really was no interval in the occupation of Kebara at this moment, we must suppose that its Aurignacian inhabitants were not affected by the very specialized development found at el-Wad, and continued to stick to their traditional ways until the break in culture represented by the arrival of the Kebaran. This together with certain percentile differences now to be considered, suggests that the two caves in Aurignacian times were not used by one family, which moved from one to the other in the course of the hunt, but by distinct, though related groups.

We come now to a closer comparison of the industries from Layers D and E in both sites. In considering the percentage tables and diagrams which follow it must be borne in mind that those for the Mugharet el-Wad are based on a much larger number of artifacts—approximately nine times as many—and should therefore be considered as the more reliable.<sup>2</sup>

I have already emphasized the close resemblance in appearance between the industries from both sites. It shows clearly if Plates XVIII-XXV of Garrod and Bate, 1937, are placed beside those of the present article. There are, however, certain percentile differences, which are brought out by the diagrams. Some of these may be due to the relatively small amount of material from Kebara, such as the reversal in Kebara D<sub>1</sub> of the normal relationship of end-scrapers to steep scrapers.<sup>3</sup> Where, however, all three levels show a consistent discrepancy between the two sites in the figures for a particular artifact, there we are probably faced with a real difference in working habits. This is the case with steep scrapers, which although very numerous at Kebara, are from 15 to 20 per cent more abundant in all three horizons at el-Wad, and with burins, in which there is a preponderance in favour of

<sup>1</sup> Industries of Atlitian type are known from only a small number of sites; Mugharet el-Wadi Fallah, 4½ km. to the north of the Wady el-Mughara (identified by Neuville when the talus was cut by road makers), el-Khiam in the Judean desert, and possibly the surface site of el-Khedeirat in the Negeb (Neuville, 1951, p. 147; Buzy, 1929). I do not agree with Rust's suggestion that the industry of Layer 2, Shelter 2 at Jabrud is possibly Atlitian (Rust, 1951).

<sup>2</sup> The categories used in these tables do not always correspond exactly with those of Garrod and Bate, 1937. This is because I have prepared new lists from the card catalogue of the M. el-Wad, to conform with the Kebara lists in which I have used a slightly different system of classification.

<sup>3</sup> At the same time, it should be noted that the provisional inventory of material in the U.S.A. (p. 183) shows the same feature in D<sub>1</sub>.



el-Wad of 14.2 per cent in E, 4.4 per cent in D2, and 10 per cent in D1. The figures for flake-scrapers and end-scrapers on the other hand, are consistently higher at Kebara, while semi-steep scrapers are about the same in both sites. We can only guess at the reason for the greater demand at el-Wad for implements which appear to be essentially gouges and planes, a demand which reaches its peak in the Atlitian, when steep scrapers and prismatic burins increase so enormously as to swamp all other types.<sup>1</sup> Perhaps this group specialized in working wood on a larger scale than did the Kebara people.

The preponderance of steep scrapers is not an Aurignacian character over the whole Syro-Palestinian area; we do not find it in the Aurignacian horizons of Jabrud or of Erq el-Ahmar. At el-Khiam, it is true, steep scrapers were relatively abundant in the Atlitian, but they were rare in the underlying Aurignacian, which otherwise was of the same type as Wad-Kebara D1. Whether a high steep scraper content is special to the Aurignacian of Mount Carmel, or possibly to the coastal region of Palestine and the Lebanon as a whole, as opposed to the more arid inland country, is a question which can only be answered when more excavated material is available.

#### COMPARATIVE PERCENTAGE TABLES

	<i>Layer E</i>				<i>Kebara</i>	<i>M. el-Wad</i>
Le Moustier points	..	..	..	..	5.0	0.8
Aurignacian points	..	..	..	..	0.4	—
Font-Yves points	..	..	..	..	14.2	7.4
Blunted-back knives	..	..	..	..	3.1	0.1
Racloirs	..	..	..	..	4.6	1.5
Flake-scrapers	..	..	..	..	12.8	7.2
End-scrapers	..	..	..	..	12.0	8.7
Semi-steep scrapers	..	..	..	..	3.9	4.9
Steep scrapers	..	..	..	..	22.3	36.5
Massive scrapers	..	..	..	..	0.8	1.0
Burins	..	..	..	..	5.4	21.6
Borers	..	..	..	..	0.8	0.1
Notched flakes and blades	..	..	..	..	0.8	1.4
Nibbled blades	..	..	..	..	5.4	0.7
Chisels	..	..	..	..	0.4	—
Discs and chopping-tools	..	..	..	..	—	1.7
Various retouched flakes and blades	..	..	..	..	8.1	6.4
					<hr/> 100 <hr/>	<hr/> 100 <hr/>

<sup>1</sup> The derivation of this industry from the Aurignacian is borne out by Diagram IV, in which Wad C is seen to have essentially the same pattern as Wad D1 (Diagram V), but with greatly exaggerated peaks for steep scrapers and burins.

<i>Layer D<sub>2</sub></i>					<i>Kebara</i>	<i>M. el-Wad</i>
Le Moustier points	..	..	..	..	4.2	} 0.8
Aurignacian points	..	..	..	..	2.3	
Font-Yves type points	..	..	..	..	0.9	
Blunted-back knives	..	..	..	..	2.8	—
Racloirs	..	..	..	..	5.2	4.8
Flake-scrapers	..	..	..	..	16.0	9.2
End-scrapers	..	..	..	..	11.2	12.4
Semi-steep scrapers	..	..	..	..	9.9	10.3
Steep scrapers	..	..	..	..	22.0	40.0
Massive scrapers	..	..	..	..	0.9	0.2
Burins	..	..	..	..	4.7	9.1
Borers	..	..	..	..	1.9	—
Notched flakes and blades	..	..	..	..	0.5	2.0
Chisels	..	..	..	..	0.5	—
Discs and chopping tools	..	..	..	..	0.9	1.7
Various retouched flakes and blades	..	..	..	..	16.1	8.5
					100	100

<i>Layer D<sub>1</sub></i>					<i>Kebara</i>	<i>M. el-Wad</i>
Le Moustier points	..	..	..	..	1.4	—
Aurignacian points	..	..	..	..	1.4	0.1
Font-Yves type points	..	..	..	..	—	0.3
Blunted-back knives	..	..	..	..	4.0	1.7
Racloirs	..	..	..	..	2.7	3.7
Flake-scrapers	..	..	..	..	22.0	9.9
End-scrapers	..	..	..	..	27.7	13.8
Semi-steep scrapers	..	..	..	..	4.4	3.6
Steep scrapers	..	..	..	..	15.2	36.0
Massive scrapers	..	..	..	..	1.4	0.5
Burins	..	..	..	..	8.1	18.0
Nibbled blades	..	..	..	..	4.0	0.6
Chisels	..	..	..	..	0.5	0.2
Discs and chopping-tools	..	..	..	..	1.8	1.6
Various retouched flakes and blades	..	..	..	..	5.4	10.0
					100	100

Dorothy A. E. Garrod. Excavations at the Mugharet Kebara, Mount Carmel

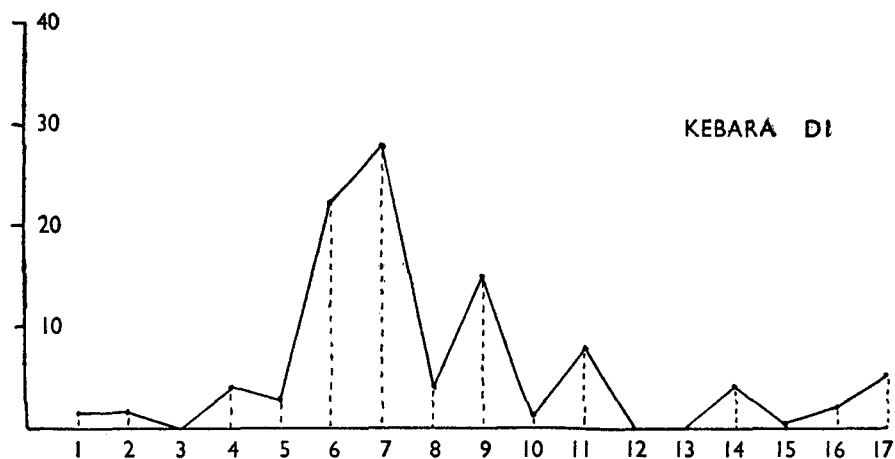


Diagram I

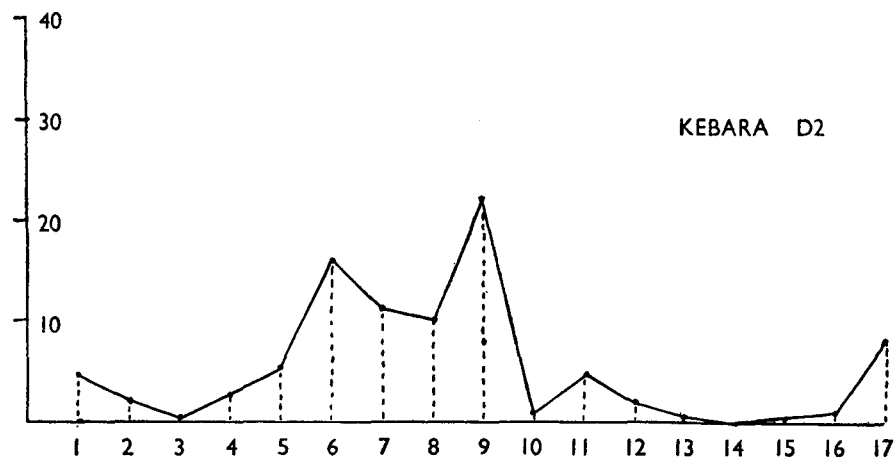


Diagram II

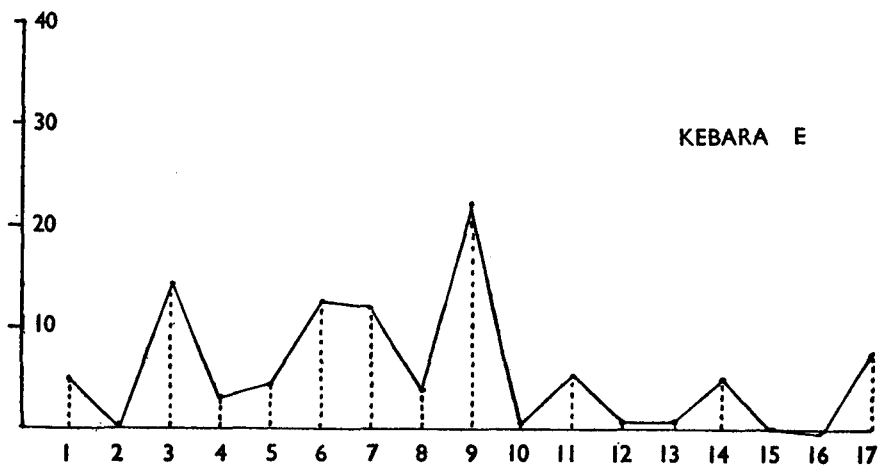


Diagram III

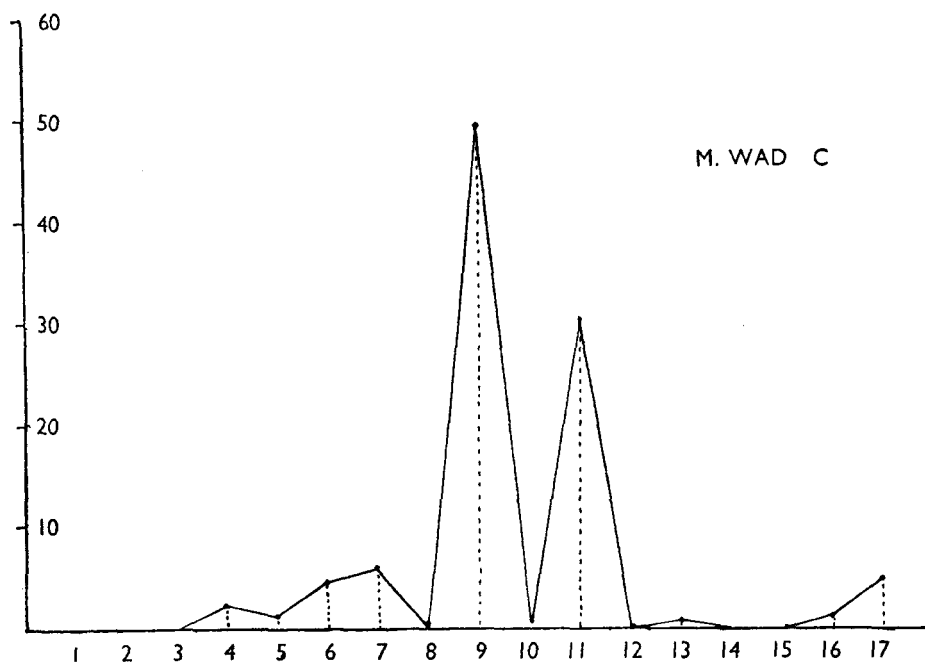


Diagram IV

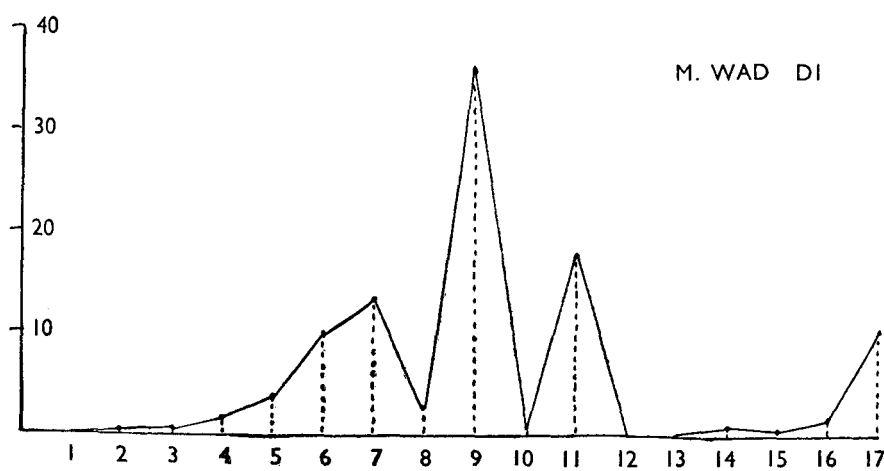


Diagram V

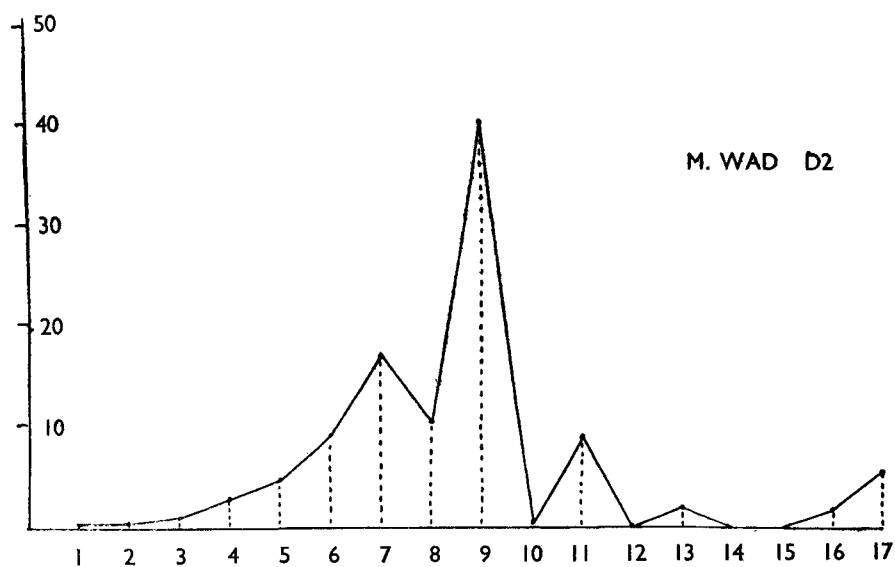


Diagram VI

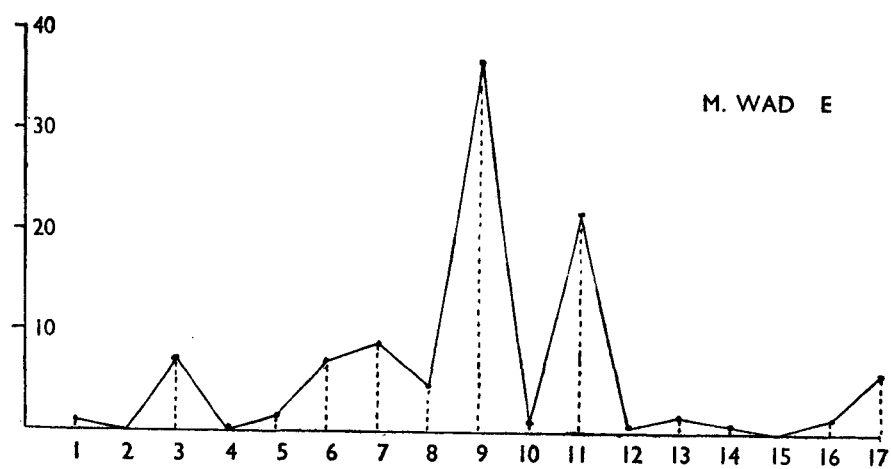


Diagram VII

## DIAGRAMS

In these, the ordinates represent percentages, the abscissae, which are numbered to correspond with the list given below, represent types of implements. In Layer C of the Mugharet el-Wad, 1,485 steep scrapers were kept out of a much larger number, at least as many again, mostly rough nucleiforms, being left at the Wady el-Mughara, buried in a pit at the foot of the talus. In making the diagram for el-Wad C<sub>1</sub>, I have allowed for these, bringing the number of steep scrapers up to 3,000, which is almost certainly an underestimate.

*List of Implement Types, Diagrams I-VII*

1. Le Moustier points.
2. Aurignacian points.
3. Font-Yves points.
4. Blunted-back knives.
5. Racloirs.
6. Flake-scrapers.
7. End-scrapers.
8. Semi-steep scrapers.
9. Steep scrapers.
10. Massive scrapers.
11. Burins.
12. Borers.
13. Notched flakes and blades.
14. Nibbled blades.
15. Chisels.
16. Discs and chopping-tools.
17. Various retouched flakes and blades.

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