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THE LOWER PLEISTOCENE OF THE CENTRAL JORDAN VALLEY
THE EXCAVATIONS AT 'UBEIDIYA, 1960-1963

Directed by M. Stekelis

ARCHAEOLOGICAL EXCAVATIONS
AT 'UBEIDIYA

1960—1963

by

M. STEKELIS

JERUSALEM 1966

THE ISRAEL ACADEMY OF SCIENCES AND HUMANITIES

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INTRODUCTION

AN ARCHAEOLOGICAL DISCOVERY in the Central Jordan Valley in July 1959 has completely changed our concept as to the Old Stone Age period in Israel and in South-West Asia. As with almost every other important archaeological discovery, it was made by accident: in this case, by a bulldozer turning up animal bones while the ground was being prepared for a vineyard on the western bank of the Jordan River near Tell-'Ubeidiya. The driver, Y. Merimsky, a member of Kibbutz Afqim, realized the importance of the discovery and sent the bones to the Zoology Department of the Hebrew University, where G. Haas identified some of them as those of extinct mammals and other fossils including fragments of hominide.

In August 1959, G. Haas and the author, accompanied by M. Prausnitz of the Department of Antiquities, visited the site. Further fragments of fossilized animal bones were found, and some flint pebbles were identified by the author as having been used by a human being typical of so-called 'pebble culture'. In the course of the visit it became clear that the bulldozer had struck a Pleistocene stratum. L. Picard made a geological examination, thereby clarifying that the finds were in a deposit of the so-called 'Melanopsis Stage', which he had described in 1932 and assigned in 1952 to the Villafranchian.

Archaeological examination of the bone-tools and palaeontological study of the fossil bones confirmed the early date of the site. The conclusion was formed that systematic archaeological excavations were likely to provide 'documentation' of the first order in respect to the study of Early Man, his environment and material culture in the Jordan Valley and in South-West Asia.

Following that, grants from the 'Centre de Recherches Préhistoriques en Israël' and the Hebrew University permitted an archaeological expedition, under the author's direction, to begin its first season of work in the spring of 1960. G. Haas dealt with the study and identification of faunal remains, L. Picard and N. Schulman carried out geological surveys, while students of the Archaeology and Zoology Departments of the Hebrew University took part in the field work. The first season lasted about four weeks, during which time further fossilized remains were found: teeth and skull fragments of a human being, many fossilized animal bones and a large number of worked stones and bones.

In the spring of 1961 we enlisted volunteers and students of the Hebrew University, who worked with us through a second but very brief season which revealed the necessity of a large-scale archaeological 'dig'. To that end, we applied to local and foreign institutions for grants. The Israel Academy of Sciences and Humanities provided the funds for an extensive operation, which began in the following spring. L. Picard and U. Baida resumed the geological survey. G. Haas dealt again with the

identification and definition of faunal remains already unearthed. The excavations in the spring of 1962 were given up to close scrutiny of the Lower Pleistocene beds and their stratigraphy in general, and the bone-bearing and implementiferous beds in particular. These beds had only been reached in limited soundings of the previous seasons. In our field work, we successfully employed the method of washing and sieving the limnic deposits when searching for microfauna. Besides, we transported about forty tons of deposit to Jerusalem to be washed in our laboratories.

In 1963, the Israel Academy of Sciences and Humanities, the American Philosophical Society and the Wenner-Gren Foundation for Anthropological Research made further grants extending over three years. Our expedition then became officially known as 'The Research of the Pleistocene and the Prehistory of the Jordan Valley, under the auspices of the Israel Academy of Sciences and Humanities'.

Excavations have been carried out so far in three sites—A, B and C, and have by no means yet exhausted the implementiferous and bone-bearing beds in the Central Jordan Valley.

The beds cover an area of about 8 km. from north to south and about 1.5 km. from east to west. This vast space has been archaeologically 'scratched' in no more than three spots and a lot of work will have to be done there in the future. Among the exciting finds was a living floor of early tool-makers with a profuse collection of stone tools, broken used animal bones and fauna, which was brought to light in 1963 when we had two field seasons.

The rich archaeological and palaeontological finds uncovered in undisturbed beds of the Lower Pleistocene justify, we believe, the continuation of the excavations.

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

MEMBERS OF THE EXPEDITION

1960—1963

M. Stekelis	Director
G. Haas	Palaeontologist
L. Picard	Geologist
E. Tzur	Architect

1960

N. Schulman	Assistant Field Geologist
T. Yizraeli (Miss)	Assistant Field Archaeologist
E. Tchernov	Assistant Field Palaeontologist
B. Ahrensburg	} Field Assistants
O. Bar-Yoseph	
D. Gilead	
M. Kabani (Miss)	
Y. Merimsky	
T. Welikowsky (Miss)	

1961

O. Bar-Yoseph	Assistant Field Archaeologist
D. Gilead	Assistant Field Archaeologist
B. Ahrensburg	Assistant Field Archaeologist
E. Tchernov	Assistant Field Palaeontologist
D. Gertz	} Field Assistants
D. Bahat	
G. Baki (Miss)	
D. Remar (Mrs.)	
M. Kabani (Miss)	
D. Shani (Miss)	
Z. Zarchi (Miss)	

M. STEKELIS

1962

O. Bar-Yoseph	Assistant Field Archaeologist
D. Gilead	Assistant Field Archaeologist
U. Baida	Assistant Field Geologist
A. Hurwitz	Assistant Field Geologist
E. Tchernov	Assistant Field Palaeontologist
M. Friedlender	} Field Assistants
J. Ginath	
R. Gerson	
M. Horwitz (Miss)	
D. Weinberg (Miss)	
Y. Prath	

1963 — *Spring Season*

H. Schaefer (Basel)	Palaeontologist
O. Bar-Yoseph	Assistant Field Archaeologist
E. Tchernov	Assistant Field Palaeontologist
U. Baida	Assistant Field Geologist
L. Beniamini	} Field Assistants
M. Ginzburg (Mrs.)	
M. Friedlender	
Y. Prath	
S. Shina	
Z. Zarchi (Miss)	

1963 — *Autumn Season*

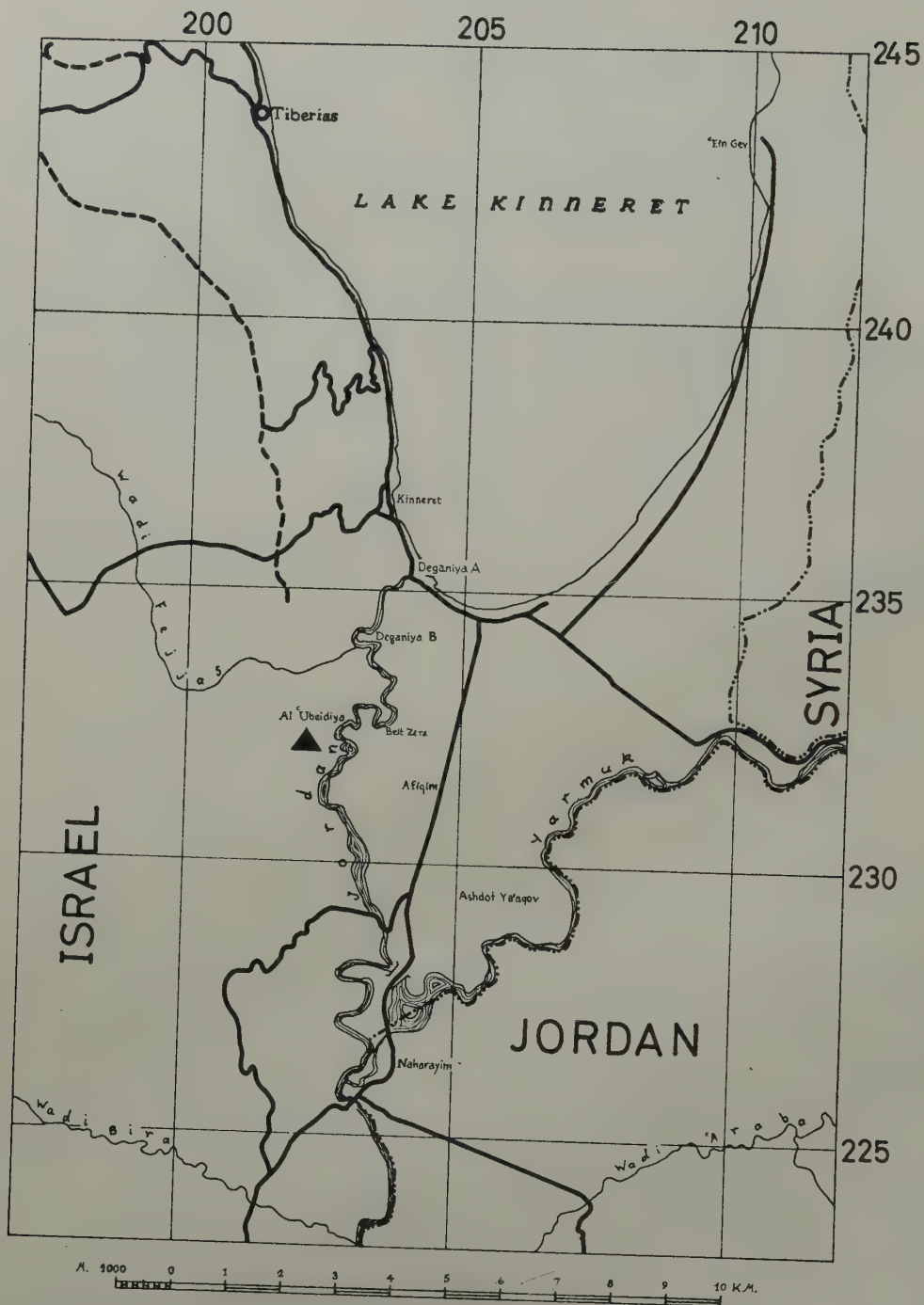
O. Bar-Yoseph	Assistant Field Archaeologist
D. Ben-Ami	} Field Assistants
Y. Roth	
S. Shina	
Z. Zarchi (Miss)	

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

ACKNOWLEDGMENTS

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Sincere thanks are due to the Regional Council of the Jordan Valley; Kibbutzim Degania A, Sha'ar ha-Golan and Afqim for provision of housing to the staff of the expedition; Kibbutz Afqim, owners of the excavated site, for allowing us to dig in the very area of their vineyards; O. BAR-YOSEPH and D. GILEAD, who helped in the field work and in the laboratories; Engineer E. TZUR, member of Kibbutz Sha'ar ha-Golan, who drew up the plan of excavation; U. ZET-URI, E. ARIEL and O. BAR-YOSEPH, who sketched the stone artifacts and the plans; Mr. M. NUROCK, who saw to the final rendering of the text; Dr. L. S. B. LEAKEY, who read the manuscript and made valuable suggestions; and all the others who made our venture possible.



Map of Central Jordan Valley Showing Location of the Site

THE CHIEF PURPOSES of the excavations were (a) to discover whether the stone industry, the fauna and the fossilized human remains recovered occurred *in situ*; (b) to ascertain their exact place in the formations of the Lower Pleistocene of the Central Jordan Valley; and (c) to procure substantial samples of the stone industry from the implementiferous beds for typological and quantitative analysis.

Excavation in Sites A, B and C afforded valuable documentation of the history of the Jordan Valley in the Lower Pleistocene, its environments, Man's way of life and his material culture.

LOCATION OF THE SITE

The site where the discovery was made in 1959 is on the 'western downslope of the Central Jordan Valley, near 'Ubeidiya on the western bank of the Jordan River, approximately 3 km. south of Lake Kinnereth (Sea of Galilee). *

There are three outcrops of *Melanopsis* deposits, descending in three steps to the river itself. The bulldozer struck the second outcrop and turned up a portion of the *Melanopsis* stratum. Here, the first finds were made of fossil animal bones and stone artifacts. This was the starting point of our archaeological excavations, and it was named Site A. The second site was in the vineyard, some 300 metres to the south of Site A, and was marked B. In 1963, we started archaeological excavations in a new site situated between A and B, and named it Site C.

* Grid reference of the 1 : 20,000 map of Israel—coordinates 20245/23286—205 m. below MSL.

SITE A

This site was divided into squares of 5×5 m. which were marked by the letters A–E from south to north, and by the numbers 1–15 from west to east.

STRATIGRAPHY

Digging began in squares A–5, B–5 and C–5. Soon after they had been delved into, we observed tilted beds in the sections. This rendered us liable to confuse the cultural layers and involved us in all kinds of difficulties. The composition of the beds was of fluvio-limnic origin, deposited under varying conditions. To get a clear picture of the implementiferous beds and their stratigraphical sequence, and to keep the cultural finds in them apart, an auxiliary stratigraphical trench, 20 m. long, 2 m. wide and 1.5 m. deep, was dug by a bulldozer.

SCHULMAN did the geological description of this section of the trench, recognized twelve different beds, all of limnic origin, of a total thickness of 12.90 m., and numbered them provisionally 1–12. He found that the beds in the trench lay at a dip of 65° S 45° E; this signifies that at the time of their deposition, when men lived there, the beds were horizontal and that their present position is due to a subsequent local tectonic movement.

These implementiferous beds were formed under water, probably in a lake, as is indicated by the presence of fresh-water shells, bones of fish and turtle. The discovery of unrolled artifacts in them suggests that the water of the Pleistocene lake fluctuated in level from time to time, while the beds were forming clay; this could signify a period of slow deposition. It also appears that the marshy shores of the lake were periodically inhabited by Man.

We eventually found that the first auxiliary trench was not long enough to solve the archaeological problems of stratigraphic order which cropped up during the field work. This became especially manifest after the second season. It was also evident that further spot-investigations depended on digging more trenches if we were to find a clear stratigraphy of the Lower Pleistocene deposits and, if possible, recover more bone-bearing and implementiferous beds in them. With this in mind, three main stratigraphical trenches were dug by mechanical equipment, one on Site A, named Trench II (86 m. long, 2 m. wide and 2 m. deep), the second between Sites A and B, named Trench I (80 m. long, 3.5 m. wide and 3 m. deep), and Trench III, west of Trench I in the direction of the western slopes of the hill (see general plan of excavated areas, Pl. I). The trenches not only enabled us to discern the local stratigraphy of the Lower Pleistocene deposits, but also rendered possible recognition of further bone-bearing and implementiferous beds in them. A lithological descrip-

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

tion of the beds in the trenches is given by L. PICARD and U. BAIDA. In Site A, the following nine superposed beds were excavated:

Bed	Surface Excavated (in sq. m.)
II - 21	—
II - 22	105
II - 23	105
II - 24	105
II - 25	30
II - 26	25
II - 27	20
II - 28	15
II - 29	15

TERMINOLOGY

Stone artifacts of the Pre-Chellean (Abbevillian) Age suffered from lack of a clearly defined terminology. The term 'pebble tools' or 'pebble culture' was generally used to describe such groups. The term was introduced to our literature by E. J. WAYLAND and used by African prehistorians until Dr. L. S. B. LEAKEY discovered, in Bed I of Olduvai Gorge in Tanganyika, a Pre-Chellean assemblage of artifacts. LEAKEY named this group 'Olduwan Culture'; it was the oldest hitherto recovered in a stable stratigraphical position in East Africa.

When we came to describe our Early Stone Age culture, unearthed in the Lower Pleistocene beds of the Central Jordan Valley, we found that it contained artifacts very similar to, and characteristic of, those found in Olduvai Gorge, Bed II.

The stone industries of the Jordan Valley were embedded in limnic or fluvio-limnic Pleistocene deposits and we suggest that the name 'Israel Variant of Olduwan II Culture' (= IVO II) be used in designating the earliest industry recovered in the beds. Stratigraphic evidence from the excavated sites suggests a separation of the IVO II culture into three phases: I, II, III.

IVO II, PHASE I

Twenty artifacts were found in three superposed beds with a total thickness of about 60 cm.: Bed II - 21 (*Gastropodo-Rhombunio* bank), Bed II - 22 (light grey, nearly clay with limonite stains), and Bed II - 23 (rusty brown limonitic clay). A chopping tool was turned up in Bed II - 21 under the skull of a *Hippopotamus*, and many bones of large mammalia and microfauna were unearthed in Bed II - 23. Neither spheroids nor polyhedrons have been discovered amongst the artifacts.

M. STEKELIS

Inventory of Tool Classes Discovered in IVO II, Phase I

Stratigraphic order of beds:	II-21	II-22	II-23
Choppers and chopping tools	1	2	4
Cores	—	—	3
Flakes	—	—	11
Varia	—	—	2
Total	1	2	20

In view of the small collection of artifacts, a quantitative analysis of the industry was not done.

The assemblage discovered in these beds is the earliest.

IVO II, PHASE II

This second phase, stratigraphically superposed on Phase I, was recovered from Beds II-24-29. The stone industry was embedded in different limnic deposits and comprised 296 artifacts. Besides chopping tools and cores, it included spheroids, polyhedrons and picks, which were not found in IVO II, Phase I.

Inventory of Tool Classes Discovered in IVO II, Phase II

Stratigraphic order of beds:	II-24	II-25	II-26	II-27	II-28	II-29
Choppers and chopping tools	15	3	6	—	2	1
Polyhedrons	13	2	6	1	—	1
Spheroids	2	—	—	—	—	—
Picks	1	—	—	—	—	—
Cores	17	1	3	—	—	1
Cuboids	4	—	1	—	—	—
Flakes	91	—	65	2	—	17
Varia	21	2	16	—	—	2
Total	164	8	97	3	2	22

Thus, the majority of the 164 specimens were discovered in Bed II-24: they were found upon a thin layer of gravel, together with animal bones. As to the finds from the other beds, there was a concentration of 97 specimens in Bed 26; distribution in other beds was between 2 in Bed 27 and 22 in Bed 29.

The typological analysis of the artifacts from Beds 25-29 shows no difference between them and those from Bed 24, except that the pick is absent in the former.

The discovery of nine superposed beds of limnic origin might suggest that this area was at one time a marsh in which left over artifacts sank into the slime. If we regard the artifacts in the superposed beds as belonging to one or more generations

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

of tool-makers and assume that Bed II – 24, from which we took 164 artifacts, was inhabited, then why did only one chopping tool sink into the slime and reach Bed II – 21? Furthermore, why did we find, in the same Bed II – 24, a giant spheroid of limestone, weighing 15 kg., which, paradoxically, did not sink in the slime?

Consequently, it seems far more realistic to solve the problem on the basis of the stratigraphic and typological evidence. Bed II – 24 had a thin layer of gravel and divided the beds as a whole into two distinct archaeological layers from which two cultural assemblages — the work of two generations of tool-makers — were recovered. The kit of the tool-makers of the lower Beds 21–23, which we have already assigned to IVO II, Phase I, was poor in artifacts. On the superposed Beds 24–29 we found a stone industry which included such advanced artifacts as polyhedrons and picks which were absent in IVO II, Phase I.

SITE B

This site is situated about 300 m. to the south of Site A on a slope recently levelled by Kibbutz Afqim for the planting of a vineyard. The test pits— 6×6 m.; 2×5 m.; 2×5 m.—were dug between the rows of vines so as not to destroy the saplings.

STRATIGRAPHY

In the test pits we found a river gravel (conglomerate) deposit, whose dip was about 45° and which consisted of a considerable amount of basalt, limestone, flint pebbles, boulders and clay, together with fossilized animal bones and stone artifacts. The gravel bed in the lower portion of the pits was of a yellow colour marked $\kappa - 5$, and in the upper one a grey-green colour, marked $\kappa - 6$.

IVO II, PHASE III

Bed $\kappa - 5$ was about 0.45 m. thick. We excavated 15 sq. m. of it and found a homogeneous stone industry packed with fossil animal bones. On comparative study, the artifacts from Site B and the assemblages from Site A show a close resemblance to each other, while the total absence of hand-axes in Bed $\kappa - 5$ definitely dates it as Pre-Abbevillian. Stratigraphical evidence indicates that Bed $\kappa - 5$ lay on a higher level than the implementiferous beds in Site A of IVO II, Phase II. We accordingly assign the assemblage of $\kappa - 5$ to IVO II, Phase III.

Inventory of Tool Classes Discovered in IVO II, Phase III

Choppers and chopping tools	20
Polyhedrons	18
Spheroids	2
Picks	—
Cores	10
Cuboids	4
Flakes	63
Varia	26
Total	143

ISRAEL VARIANT OF ABBEVILLIAN CULTURE (IVA)

The stone industry recovered from the test pits in the bed of grey-green colour, superposed on $\kappa - 5$ and marked $\kappa - 6$, was different from the typological point of view and, among other tools, yielded a group of crude hand-axes and tools of the

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

pick family with definite Abbevillian affinities. Bed κ - 6 was about 0.35 m. thick, and we excavated 15 sq. m. of it. We associate this assemblage with the Abbevillian stage. In one of the test pits we observed a thin layer of chalky clay, about 0.10 m. thick, which divided the beds as a whole into two sets; unfortunately this layer was absent in other pits. In any case, the different stone assemblages recovered in it warranted a subdivision of this conglomerate bed into two different layers.

Inventory of Tool Classes Discovered in the IVA Stage

Choppers and chopping tools	44
Polyhedrons	2
Spheroids	—
Picks	27
Hand-axes	46
Cores	14
Cuboids	2
Flakes	48
Varia	25
Total	208

SITE C (Living Floor)

This area is situated between Sites A and B, grid 20245/23286 on the map of Israel, about 204 m. below MSL.

STRATIGRAPHY

During the early spring of 1962 we excavated, with mechanical tools, an auxiliary trench (vii) at right angles to Trench I on this site. While searching in the trench exposures for stone artifacts, one of the author's assistants extracted stone implements of flint and limestone from a bed of grey marl. The flake scars on them were quite fresh and unabraded. After this discovery we decided to approach this bed, whose dip was 45° , by a parallel trench dug at a distance of 1.50 m. from the stratigraphic trench. The result was most rewarding, as the method enabled us to unearth a living floor, about 21 m. long, with a surface of 45 sq. m., which has been excavated.

The living floor was covered with a sealed deposit of calcified coarse sand, which proves that the bed was not removed by erosion or re-deposited from its place.

Good samples of such stone artifacts as chopping tools, spheroids, polyhedrons and proto-trihedrals, and fractured animal bones were discovered. The material culture was embedded in a clay bed mixed with small boulders. The artifacts were of limestone, flint and basalt, the latter being now also used as raw material for the first time. The high proportion of flakes and other classes of artifacts demonstrates that a hunter-gatherer group lived on the site and made the artifacts on the spot: all the artifacts had remained *in situ* since being made and left lying about by the tool-makers (see Pls. III, XLII).

The bed where the living floor was discovered is, stratigraphically, probably correlated with Bed 15 in Section I (VII – 15) and with Bed 26 in Section II (see PICARD & BAIDA, Table of Correlations, Pl. III); the stone assemblage of the living floor may be identical with that recovered in Bed II – 26, which we recognized as belonging to IVO II, Phase II, and may thus appertain to the same cultural phase.

Inventory of Tool Classes Discovered on the Living Floor of IVO II, Phase II

Choppers and chopping tools	29
Polyhedrons	10
Spheroids	7
Picks	8
Cores	12
Cuboids	11
Flakes	154
Varia	26
Total	257

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

A brief remark on Beds II – 30–35 (Section II), which were superposed on Beds 24–29 and in which the IVO II, Phase II culture was recovered. Beds 30–35 were archaeologically only searched, not excavated. We assume that they are sterile; it must be left to future excavations either to confirm or refute the assumption.

Bed II – 36 was again implementiferous and the following artifacts were recovered in a trial pit :

Chopping tools	4
Polyhedrons	1
Picks	1
Cores	1
Flakes	5
Varia	2
Total	14

Correlation of this implementiferous bed with that in Trench K (5 or 6) will remain problematical until excavation on a large scale is carried out in Bed 36.

In Trench III, Beds 24, 25, 34, 44 and 50 were implementiferous. They were searched for artifacts, of which some were collected :

Stratigraphic order of Beds:	24	25	34	44
Chopping tools	1	2	6	–
Cores	–	–	3	1
Flakes	3	1	1	–
Varia	–	2	–	1
Total	4	5	10	2

The study of this collection has been postponed until excavation of the area takes place.

THE IVO II CULTURE

Our study of the stone artifacts recovered in these Lower Pleistocene beds presented a number of problems of which we have not yet found solutions. Apart from their typological and technological examination and classification, a quantitative analysis is required. Existing methods of quantitative analysis deal mostly with the Acheulean or later assemblages, but not with Pre-Acheulean stone industries. The method hitherto practised for Pre-Acheulean assemblages is imperfect, and it is desirable that international agreement on nomenclature and technique be soon reached by scholars.

Raw Material and Technique

In analysing the primitive artifacts discovered, we had to take into consideration the types of raw material used in their making.

There were four types: flint, chert, lava and limestone. Flat, round, spheroid or oval-shaped water-worn pebbles, between 40 cm. and 120 cm. long, were selected, gathered and used to a great extent. In IVO II, Phase I, the majority of artifacts were of flint; in IVO II, Phase II, 55% were of flint, 40% of limestone and only 5% of basalt. It would appear that the hunters and collectors of the IVO II culture preferred flint and limestone for their purposes. It is difficult to say whether the 'block on block' or stone-hammer technique was used, since the flake scars found on the artifacts are deep.

Some artifacts betray evidence of use, because the sharpness of the cutting edge has been lost by battering; on others the edges show obvious signs of repeated sharpening in the short flakes struck on one or both faces.

'État physique'

All the artifacts of flint are absolutely fresh, those of lava or limestone are somewhat abraded or weathered. Among the artifacts recovered there were finished and unfinished specimens found in a context of many flakes, which confirms the hypothesis that the artifacts were manufactured on the spot.

Choppers and Chopping Tools

Assortment and forms are restricted, because, as is well known, the original shape and dimension of the water-worn pebbles suggested the forms and sizes of the artifacts which emerged. The technique of manufacture seems to have been very primitive. There were choppers either of split pebbles or of pebbles with a natural cleavage fracture which provided a suitable platform for striking the flakes. The chopping tools were made of rolled river pebbles, either on the longitudinal or on

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

the transversal axis of the pebble. The working edge was made by removing flakes from both faces, thus obtaining a sharp cutting edge, straight or convex, and more or less sinuous.

Two specimens not actually found *in situ* are illustrated here to show the flaking from the transversal or longitudinal axis (Pl. IX : 1-2).

We classified the choppers and chopping tools into nine classes: A, B, C, D, E1, E2, F, G1, G2 (see schema in Pl. IV).

Class A — a monoface artifact with a straight cutting edge, trimmed on the transversal or longitudinal axis of the pebble.

Class B — an artifact with a straight cutting edge, trimmed on the transversal axis of the pebble from both faces.

Class C — an oblique cutting edge, trimmed on the transversal axis of the pebble from both faces.

Class D — a straight cutting edge, trimmed on the longitudinal axis of the pebble from both faces.

Class E1 — as D but, in addition, a flake has been struck from the transversal axis.

Class E2 — as B but, in addition, a flake has been struck from the longitudinal axis.

Class F — a rounded cutting edge, trimmed on both faces of the transversal axis.

Class G1 — rostro-carinate pointed artifact.

Class G2 — rostro-carinate artifact, trimmed on the transversal axis.

Classification of Chopping Tools and Raw Material

Phase	Types											Raw Material			
	A	B	C	D	E1	E2	F	G1	G2	Var.	Total	Flint	Limestone	Basalt	
IVO II, Phase I	—	1	2	1	—	2	—	—	—	2	7	5	1	1	
IVO II, Phase II	9	10	—	14	3	6	4	1	3	6	56	36	15	5	
IVO II, Phase III	2	5	—	3	2	1	2	1	1	3	20	19	1	—	

Flint and limestone were used for making choppers and chopping tools. In IVO II, Phase II, 64.2% of them were of flint, 26.8% of limestone and 9% of basalt. In IVO II, Phase III, 95% were of flint and 5% of limestone; basalt was not used at all. Lengths varied from 40 mm. to 120 mm.

The percentage frequency of length-width for IVO II, Phases II-III is shown in Pl. VI.

Polyhedrons

This class of artifacts was made of flint or limestone pebbles. Flakes were struck in several directions to prepare specimens of polyhedral shape, which vary in diameter

M. STEKELIS

from 40 mm. to 110 mm. The diameter percentage frequency of spheroids and polyhedrons is given in Pl. VIII : 2.

Distribution of polyhedrons in IVO II, Phases II-III, according to raw material, is as follows:

Phase	Total	Flint	Limestone
IVO II, Phase II	34	9%	91%
IVO II, Phase III	18	6%	94%

The majority of polyhedrons was of limestone. In both phases, we recovered incomplete specimens which must have been abandoned in the process of manufacture.

Spheroids

A few spheroid and abraded balls from IVO II, Phases II-III, were collected and distributed according to raw material as follows:

Phase	Total	Flint	Limestone	Basalt
IVO II, Phase II	9	1	6	2
IVO II, Phase III	2	—	2	—

In view of the small number of samples, they have been added to the polyhedrons for diameter analysis (Pl. VIII : 2).

Anvils

On site A (Beds II - 24 and II - 26), we found two giant pebbles of limestone, one of 200 mm. in diameter and weighing 10 kg., the other 240 mm. in diameter and weighing 15 kg., which are believed to have served as anvils because large flakes have been removed from various spots to impart a spheroid shape, and traces of battering were found on their surfaces.

Cores

Cores are considered waste products, but those found in our assemblages have damaged edges which were most probably affected by use and tend to prove that these artifacts, too, were used as working tools. Some of them, with roughly alternative flaking, probably served as chopping tools, and have traces of use. The flake scars are long and wide. The cores were single-platformed, double-platformed and multi-platformed, and their distribution in the IVO II culture is as follows:

IVO II, Phase I:	Single-platformed	1	
	Double-platformed	1	
	Multi-platformed	1	
	Total	3	all of flint.

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

IVO II, Phase II:	Single-platformed	23
	Double-platformed	10
	Multi-platformed	1
	Total	34

Apart from a single one of limestone, all were of flint.

Cuboids

Twenty cuboids were recovered in IVO II, Phases II-III. They vary in length from 20 mm. to 120 mm. Their damaged edges prove that they had been in active use. In IVO II, Phase II, 16 cuboids were found, of which nine were of flint, five of limestone and two of basalt. In IVO II, Phase III, four were recovered, three being of flint and one of basalt. The percentage of frequency of length-width is shown in Pl. VIII : 1.

Flakes

The flakes have plain, unfacetted striking platforms and display a well defined bulb of percussion. The striking platform is at a high angle to the long axis of the tool; it is impossible to say whether this is connected with anvil technique in any way. Many flakes display cortex on the upper surface. There are end-struck as well as side-struck flakes, on which no retouch affected by use was found.

Typology of Flakes in IVO II, Phases I-III

IVO II, Phase I:	Long quadrilateral	—
	Short quadrilateral	2
	Short triangular	—
	Long triangular	—
	Irregular	9
	Total	11

Ten flakes are of flint, and one of basalt.

		Bed II - 24	Bed II - 26
IVO II, Phase II:	Long quadrilateral	9	—
	Short quadrilateral	13	6
	Short triangular	5	6
	Long triangular	1	3
	Irregular	66	50
	Total	94	65

M. STEKELIS

IVO II, Phase II: (Living Floor)	Long quadrilateral	3
	Short quadrilateral	33
	Short triangular	10
	Long triangular	—
	Irregular	108
Total		154

147 flakes are of flint, two of limestone and five of basalt.

IVO II, Phase III:	Long quadrilateral	6	
	Short quadrilateral	12	
	Short triangular	7	
	Long triangular	—	
	Irregular	38	
Total		63	all of flint.

The percentage of length-width frequency is shown in Pl. VI. The frequency in IVO II, Phase II (Beds II — 24, II — 26 and I — 15) is between 0.28 mm. and 0.32 mm. In IVO II, Phase III, it is about 0.32 mm. There is, therefore, no difference between the two phases. The short length of the flakes shows that they were too small to be used as tools and were not struck as tools, and we may consider them as waste products of tool-making; they have been unaffected by use.

The percentage of all irregular flakes in all phases is between 60% and 70%. The percentage of other classes of flakes fell in comparison with that of the irregular ones; the square flakes were relatively unchanged and did not rise more than 20% in all phases (Pl. VII : 2).

The angle of the striking platform is shown in Pl. VIII : 4. 37% of the flakes from IVO II, Phase II, have an angle of 115° — 120°, 3% have an angle of 95° and 4% an angle of 130°.

Of the flakes recovered from the living floor of IVO II, Phase II, 33% have an angle of 115°—120°, and only 8% an angle of 130°.

In IVO II, Phase III, 27% of the flakes have an angle of 120°—125°, only 3% an angle of 130°.

THE IVA STAGE

We have mentioned that the IVA stage was discovered in gravel Bed κ - 6 in Site B, superposed on IVO II, Phase III. This bed was of particular interest in tool assemblage, since it contained not only tools characteristic of IVO II, Phase III, but also new types—crude hand-axes and trihedral picks. This might prompt the conclusion that hand-axe makers continued to shape their tools according to tradition where form was concerned, while at the same time beginning to produce and develop artifacts of more utilitarian nature by a choice of new material found in their locality, near a river where gravels accumulated.

The Hand-axes

The hand-axes are heavy, massive and of irregular configuration, with thick butt-end and crust left on both surfaces. Only two pieces were found where the butt-end was worked on. It is difficult to say whether the anvil or the stone-hammer technique was used, as both cause wide and deep flake scars. Each specimen has from five to six large, deep, concave and irregular flake scars on both faces; each displays extremely well defined negative bulbs of percussion. Both edges are sinuous.

The hand-axes were classified from the typological point of view into seven groups (A to G), two main forms being recognized, namely, a pointed axe on the one hand and a proto-cleaver lined axe on the other (Pl. v : 1).

Length-width frequency was combined with that of picks and is shown in Pl. VIII : 3. The length varies from 80 mm. to 201 mm.

Distribution of Hand-axes in the IVA Stage

Types	A	B	C	D	E	F	G	Varia	Total
	1	10	14	5	3	2	2	9	46

Scholars have suggested that artifacts discovered in gravel beds were re-deposited from the living-floor of the tool-makers. On examining the specimens from Bed κ - 6, we found that the raw material and *état physique* of the artifacts made of basalt or limestone showed signs of abrasion, whereas those of flint were in a fresh condition. If we assume that this assemblage was re-deposited from the living floor, it could not have been very far, because the re-deposition did not affect the tools at all.

The Pick Class

This class was made of flint, limestone and basalt. It is a heavy and crude artifact with a pointed working edge, of which several types were recognized and named, respectively, proto-trihedral pick, quadrilateral pick and picks made of elongated

M. STEKELIS

pebbles with a trimmed pointed edge. The subdivision was made according to working edge and section. The pick-family is illustrated in a schematic table (Pl. v : 2), where the arrows show direction of flaking. The sections of the picks are triangular, trapezoidal, quadrangular, bifacial and irregular. The proto-trihedral pick, which appeared for the first time in the IVO II, Phase II, is far less developed by comparison with that of the IVA stage.

In IVO II, Phase II (Bed II – 24), one proto-trihedral pick of flint was recovered. Yet, in the same phase (Bed I – 15), which, as mentioned, belongs to the living floor, eight specimens of the following types were found :

Proto-trihedral a	1
Proto-trihedral b	1
Trihedral a	2
Trihedral b	1
Picks	3

Four specimens were of flint, two of limestone and two of basalt. The number of artifacts rose in the IVA stage, where 27 specimens were recovered: 15 of flint and 12 of basalt. The following types were recognized among them :

Proto-trihedral a	1
Proto-trihedral b	1
Trihedral a	8
Trihedral b	9
Bifacial	3
Quadrilateral	4
Picks	1

The other types were as follows :

Polyhedrons: One of limestone and the other of basalt.

Spheroids: Two of basalt.

Choppers and chopping tools: 44 were recovered.

Classification of Choppers, Chopping Tools and Raw Material

Types										Raw Material				Total
A	B	C	D	E 1	E 2	F	G 1	G 2	Varia	Flint	Limestone	Basalt		
3	3	4	5	4	2	5	3	1	14	37	3	4	44	

In this stage, 84% of choppers and chopping tools were made of flint, 6.9% of limestone and 9.1% of basalt. The artifacts vary in length from 40 mm. to 120 mm. and the length-width frequency is about 80–90 mm.

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

Cores: 14 were collected from the IVA stage.

Single-platformed	5
Double-platformed	7
Multi-platformed	2

Thirteen specimens were of flint and one of basalt.

Cuboids: Two, both of flint.

Flakes: 48 were recovered in this stage, the following forms being recognized:

Long quadrilateral	2
Short quadrilateral	10
Short triangular	5
Long triangular	—
Irregular	31

79.4% were of flint and 20.6% of basalt. Length varies between 20 mm. and 110 mm. There were some specimens more than 110 mm. in length, which were probably manufactured as flake tools. Length-width frequency is about 40–60 mm. The small number of samples available suggests that the artifacts were not made on the spot. 23% of the flakes have an angle of 110°–120°, 15% an angle of 120°–130°, and only 7% an angle of 100°.

Is the Hand-axe an Evolution or an Invention?

Some scholars suggest that the hand-axe is the evolution of a chopping tool. We do not possess sufficient evidence to prove this, although a chopping tool does, indeed, look like a very rude hand-axe. The impression that the proto-trihedral, quadrilateral, trihedral and simple picks are the result of experiments in tool-making which eventually helped to evolve the hand-axe, is supported by the implication that the range of tools produced by the early tool-makers was wide enough to render feasible the emergence of a new artifact. But, on the whole, it seems that the IVA hand-axe was an invention rather than an evolution from the chopping tool.

GENERAL CHARACTERISTICS OF THE STONE INDUSTRIES

a. The IVO II Culture

Tool types recovered in IVO II, Phases I–III, are presented in the following table, giving the total number of tool classes in each phase, waste material and, under 'varia', unclassified specimens.

	Phase I	Phase II	Phase III
Choppers and chopping tools	7	56	20
Polyhedrons	—	34	18
Spheroids	—	9	2
Picks	—	9	—
Cores	3	34	10
Cuboids	—	16	4
Flakes	11	329	63
Varia	2	67	26
Total	23	554	143

The Percentage of Chopping Tools to Cores and Flakes

IVO II, Phase I — not calculated in view of the small quantity of samples available.

IVO II, Phase II — 5%.

IVO II, Phase III — 15%.

The quantitative analysis of the stone assemblages is shown in Pl. VII : 1. Choppers and chopping tools occurred in all phases; the percentage of this tool-class is equal in IVO II, Phases II–III, and, so too, with cores and cuboids.

The polyhedron and spheroid classes were not found in IVO II, Phase I, but occurred in IVO II, Phase II, and were more numerous in IVO II, Phase III. The pick-class was found in IVO II, Phase II, but has vanished in IVO II, Phase III. The most significant feature of IVO culture is the complete absence of hand-axes, which means that this assemblage is definitely pre-hand-axe (Pre-Abbevillian) and that men, at that time, did not contrive this type of artifact but only made chopping tools, polyhedrons and picks. This fact cannot be correlated with the raw material existing on the spot and used in making artifacts, but might be explained by the low standard of living of the inhabitants of the Jordan Valley.

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

b. *The IVA Stage*

<i>Tool Types</i>	
Choppers and chopping tools	44
Polyhedrons	2
Spheroids	—
Picks	27
Hand-axes	46
Cores	14
Cuboids	2
Flakes	48
Varia	25
Total	208

The percentage of chopping tools to cores and flakes is 26%. The quantitative analysis of tool classes is shown in Pl. VII : 1 ; the percentage of chopping tools is the same as in IVO II, Phase III, whereas the percentage of cores, cuboids, polyhedrons and spheroids is low.

Stratigraphic evidence from implementiferous beds dug out in the Central Jordan Valley pointed to a two-stage separation of the cultural sequences recovered : (a) the IVO II stage, definitely pre-hand-axe, in which three phases were observed ; (b) a hand-axe stage characterized by crude hand-axes and picks which we named Israel Variant of Abbevillian (IVA).

The stone industries of the Jordan Valley were recovered on sites which were living floors of the hunters and gatherers responsible for the artifacts. The valley attracted them on account of its game and edible vegetation, on the one hand, and its handy and accessible 'industrial' raw material, on the other.

They were, however, only middling hunters, since their artifacts were very rudimentary. Each of the living floors yielded, besides stone artifacts, bones of animals which had been killed for food. The inference is that the people of the Central Jordan Valley were also carnivorous and not just vegetarian. They killed large and small animals to enrich their diet. They also ate substantial amounts of marrow from the bones of large animals, methodically breaking them up to extract it. Many bones show signs of striking and scratching, and bear witness to having been cut with sharp stones. Some of the fractured bones were used as tools for performing other tasks, as is shown by marks on the margins and by traces of abraded and used edges (Pl. XLI : 1).

CONCLUSIONS

A summary follows of the results of the archaeological excavations in 1960–1963; field-work continues on the site and we hope to bring further archaeological, palaeontological and anthropological material to light. We can already assert, however, that archaeological material has by now been unearthed that belongs to the earliest cultures and that it has been unearthed in a stable stratigraphical context.

A clear sequence of two cultural assemblages has been found in the Lower Pleistocene beds: the IVO II stage, succeeded by an Abbevillian stage with rich Pleistocene fauna, and small fragments of a human skull and two human teeth. These archaeological data provided us with a basis for establishing a strict comparative chronology of Lower Palaeolithic assemblages in our area and the whole Near East.

The chronology of Palaeolithic cultures in Israel and the Near East has been based hitherto on excavations in cave deposits which disclosed cultural complexes of Upper Pleistocene. The age of the Levallois-Mousterian culture and of the human skeletons found in the caves of Mount Carmel and Upper Galilee, as well as in the cave of Jebel Kafzeh near Nazareth, is still debated by scientists.

Cultural remains earlier than the Upper Pleistocene have not been discovered in cave deposits so far in stable stratigraphic order, either in Israel or elsewhere in South-West Asia. In fact, the archaeological remains of the Lower Pleistocene beds found in the Central and Northern Jordan Valley are the first of their kind. They have opened a new chapter in the earliest history of Man and his culture and have established beyond doubt that the penetration of early tool-makers into South-West Asia was already evident in the Lower Pleistocene period.

A succession of beds was excavated archaeologically, in which extinct fauna and stone industries were recovered *in situ*. We were thereby enabled to settle the sequence of the Early Palaeolithic cultures in Israel, a determination which is fundamental in fixing a time-scale to date Early Man and his attainments in this area.

THE FIRST VERTICAL PROFILE

We have now a vertical profile of the Central Jordan Valley, where the IVO II and IVA cultures reveal superposition of two early stages. It shows that Palaeolithic hunters and gatherers settled in the Jordan Valley at a very early epoch, in fact earlier than in any other area outside Africa.

The IVO II Stage

As the stone industry of this stage is similar to the one discovered in Bed II in Olduvai Gorge, we suggest that Early Palaeolithic hunters of African origin, following game

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

in the Rift Valley, reached the Jordan Valley in Lower Pleistocene times and settled there because they found plenty of water, game and edible vegetation.

It is apparent that this very primitive and unspecialized group of hunters and gatherers continued to exist in the Central Jordan Valley during the Lower Pleistocene period.

The close similarity between classes of artifacts recovered from the implementiferous beds in Sites A, B and C suggests that the collection could be viewed as a single cultural assemblage in which we distinguished, typologically and stratigraphically, three phases of the IVO II culture which were definitely pre-hand-axe. The tool-makers' capacity was very limited in IVO II, Phase I, but improved during IVO II, Phases II-III.

The tool-makers collected pebbles which they found in their vicinity and used them as raw material—a feature characteristic of all cultural phases. The tool-kit of the IVO II tool-maker consisted of choppers and chopping tools, polyhedrons and occasional picks.

The IVA Stage

The IVO II group was followed by one manipulating crude hand-axes of IVA technique. This is demonstrated both by stratigraphic evidence and by the advanced forms of tools. The tool-kit of the IVA group included hand-axes of basalt, besides artifacts similar to those of the IVO II culture. This class of artifacts is of extreme interest, since basalt, which was a comparatively new raw material, had seldom been used before, whereas it was employed during the IVA stage for making crude and heavy hand-axes. Furthermore, the fact that the new tools are akin to Abbevillian technique and are numerous in cultural assemblages of that period attests their primary importance as being the first assemblage of its kind discovered *in situ* in a Lower Pleistocene deposit in the Near East.

THE SECOND VERTICAL PROFILE

Another vertical profile was recovered by us during the excavations carried out in collaboration with PICARD (1936-1950) at a site named Gesher Benot Ya'aqov in the northern part of the Jordan Valley, where the excavated implementiferous and bone-bearing beds lay on the 'Old Jordan Terrace'. The excavations yielded a sequence of six beds with extinct mammalian fauna, stone artifacts of Acheulean technique and, on the top layer, flakes of a Levallois technique. In the lowest gravel bed (VI), an assemblage of basalt was found: the artifacts consisted of hand-axes so heavily rolled and abraded that it was difficult to recognize them; only their shape and S-twist recalled their purpose. The assemblage has been re-deposited from a very distant living floor, and the bed could be contemporary with the Na-

harayim formation (Middle Pleistocene) which rested unconformably on the tilted Villafranchian beds.

From the point of view of cultural sequence, there are gaps between the IVA stage of the Central Jordan Valley and the implementiferous beds of the northern part of the valley. We suggest that the rolled and abraded industry of Bed VI of Gesher Benot Ya'aqov might fill in one of the gaps.

The superposed Bed V* yielded an evolved stone industry of basalt, pertaining to the Early Acheulean technique. The tools were fresh and almost unaffected by abrasion. The animal bones discovered were neither abraded nor rolled, and included many fragments of deliberately fractured bones and osteodontokeratic artifacts. According to Dr. HOOIJER, the mammalian fauna included *Stegodon* spec. and *Elephas trogontherii*. The tool-kit of the Early Acheulean hunter group was more progressive and consisted of artifacts diversified in form and type, showing technical improvement in comparison with the IVA stage.

The three superposed Beds IV—III—II, apart from bones of such extinct animals as *Elephas trogontherii*, yielded hand-axes of flint. The stone industry is fresh and unrolled and was certainly not re-deposited by river action. Stone assemblages were found with affinity to the Middle and Upper Acheulean stages. On the top, we recovered a gravel bed with a blade industry of Levallois technique.

The archaeological records of the northern and central parts of the Jordan Valley are very important, since they build up a Palaeolithic cultural sequence of the Lower and Middle Pleistocene periods.

In the northern part of the Hula basin, Mr. A. ASAF of Kibbutz Ma'ayan Baruch discovered a very interesting Acheulean site in the fields known by the kibbutz as el-Hammarrah. In ten years of systematic search of stone artifacts he collected about three thousand fresh and unabraded specimens—mostly beautiful hand-axes, cleavers, cores and flakes, a fragment of an elephant molar and more pieces of tusks and bones. This is by far the finest collection of the Upper Acheulean stage known in the Near East.

According to PICARD, it was embedded in *terra rossa* soil covering a travertine stratum which has 'Hasbani basalt underneath'. We may, therefore, conclude that the Jordan Valley has been witness to an uninterrupted continuity of hunters' and gatherers' groups from the beginning of the Lower Pleistocene down to the Upper Pleistocene.

We would like to make it plain that, even taking the Lower Pleistocene of the Jordan Valley into consideration, we do not profess to solve all the problems relating

* We have no statistical records on flakes, because we paid more attention to hand-axes, cleavers and mammalian bones; the site is on the border between Israel and Syria and members of the expedition were the target of Syrian snipers.

ARCHAEOLOGICAL EXCAVATIONS AT 'UBEIDIYA

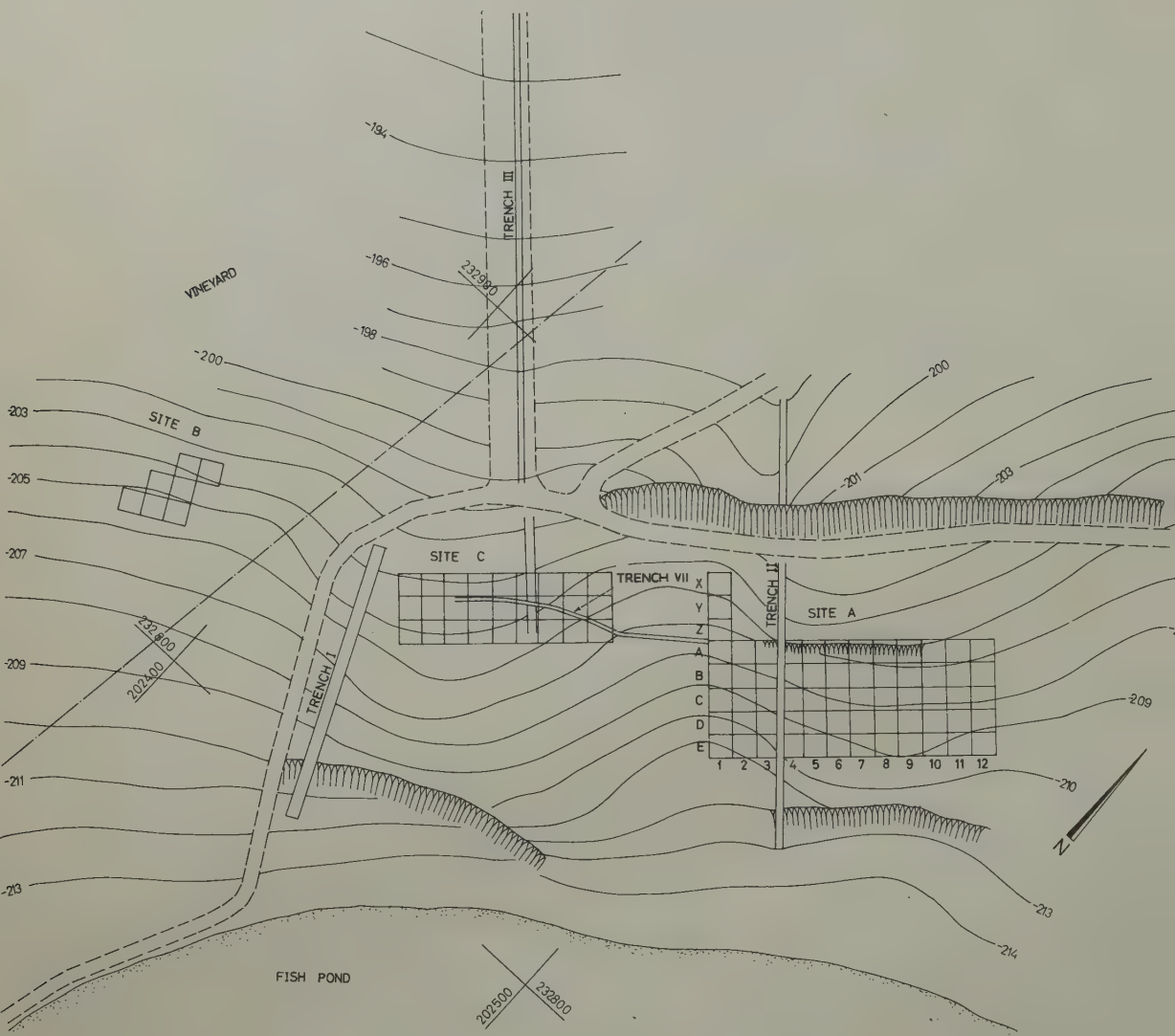
to the prehistorical period. Still, our work has broadened the knowledge of prehistorical assemblage in South-West Asia, providing a basis for understanding the sequence of prehistoric culture in the area and throwing new light on the question of the antiquity of Man.

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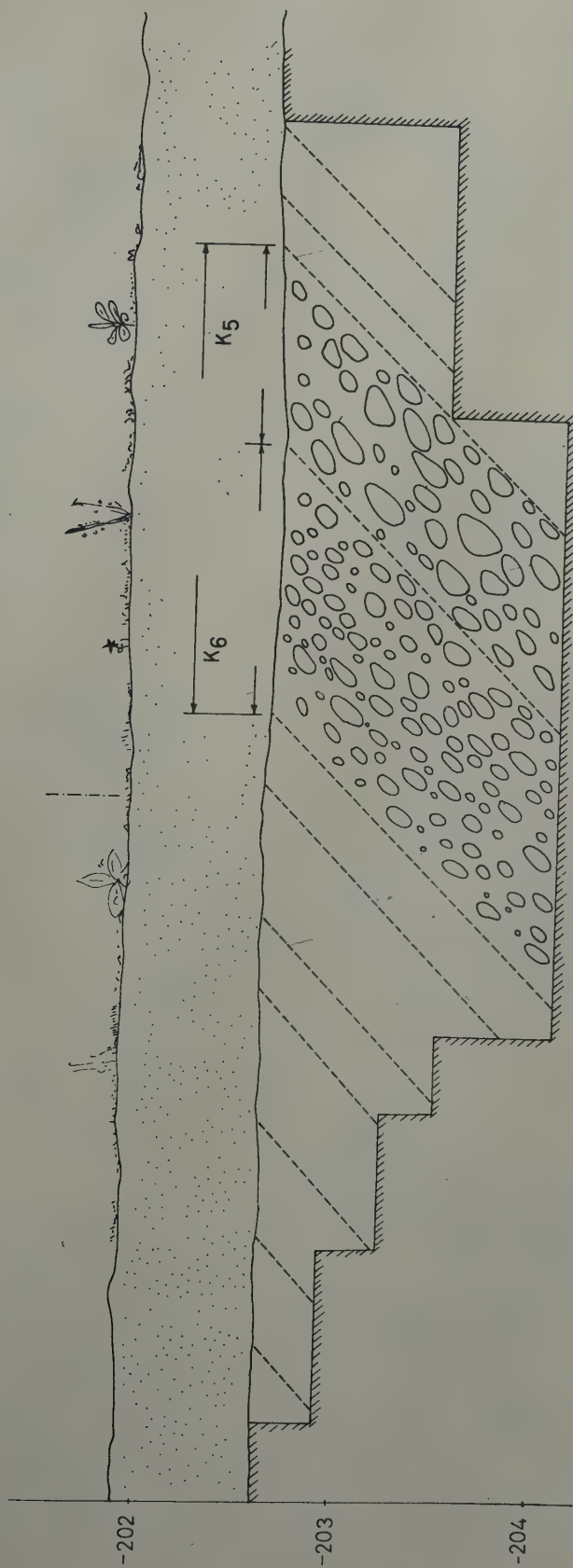
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PLATES

General Plan of Excavated Areas



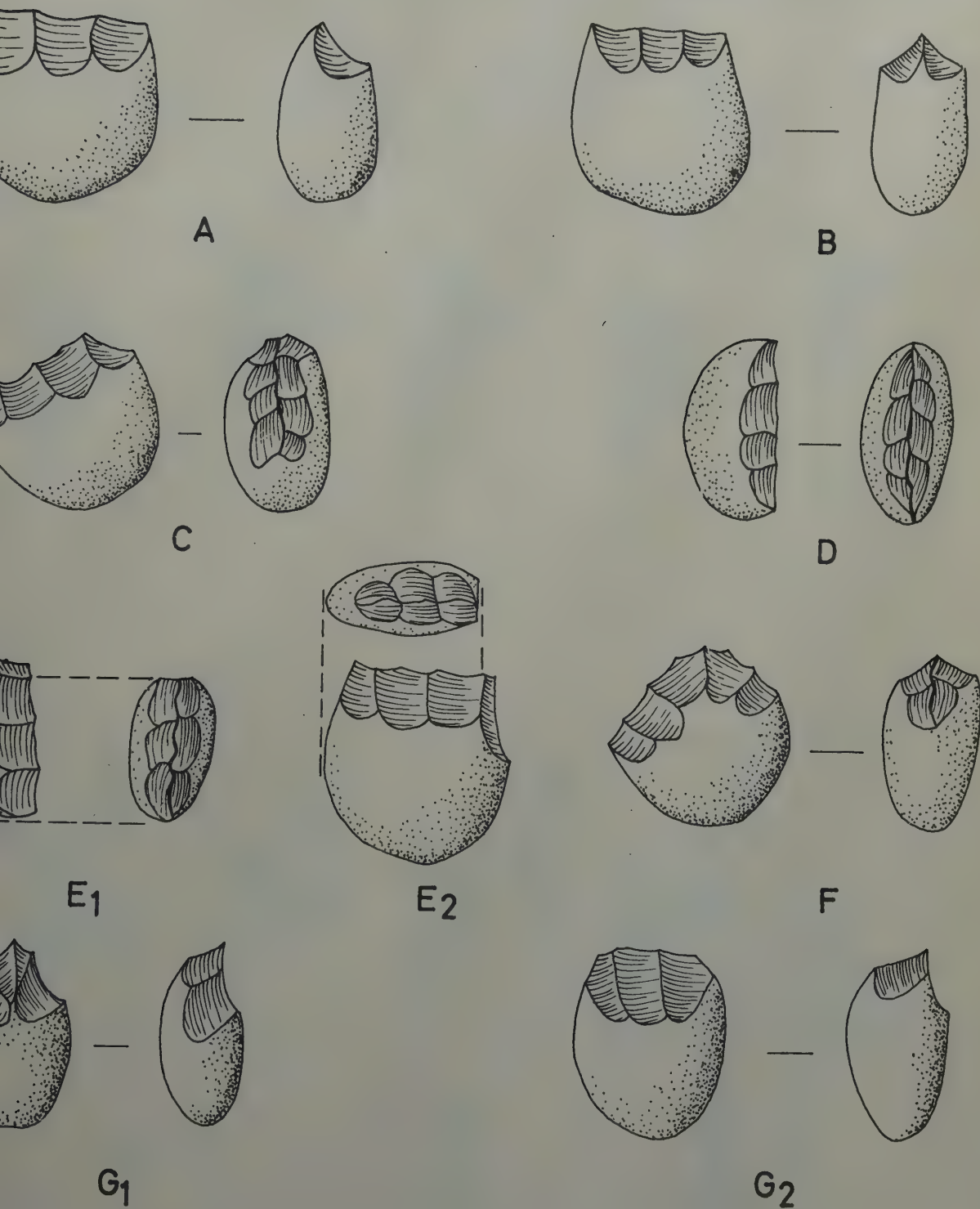
Section of Site B



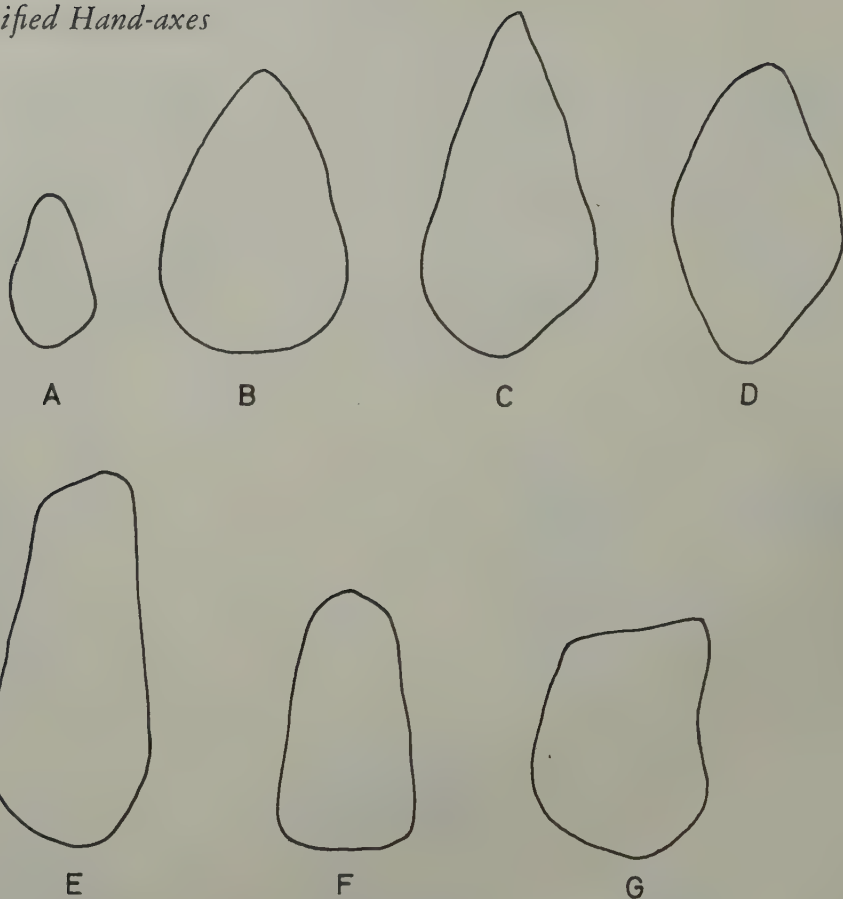
Plan and Section of Site C (Living Floor)



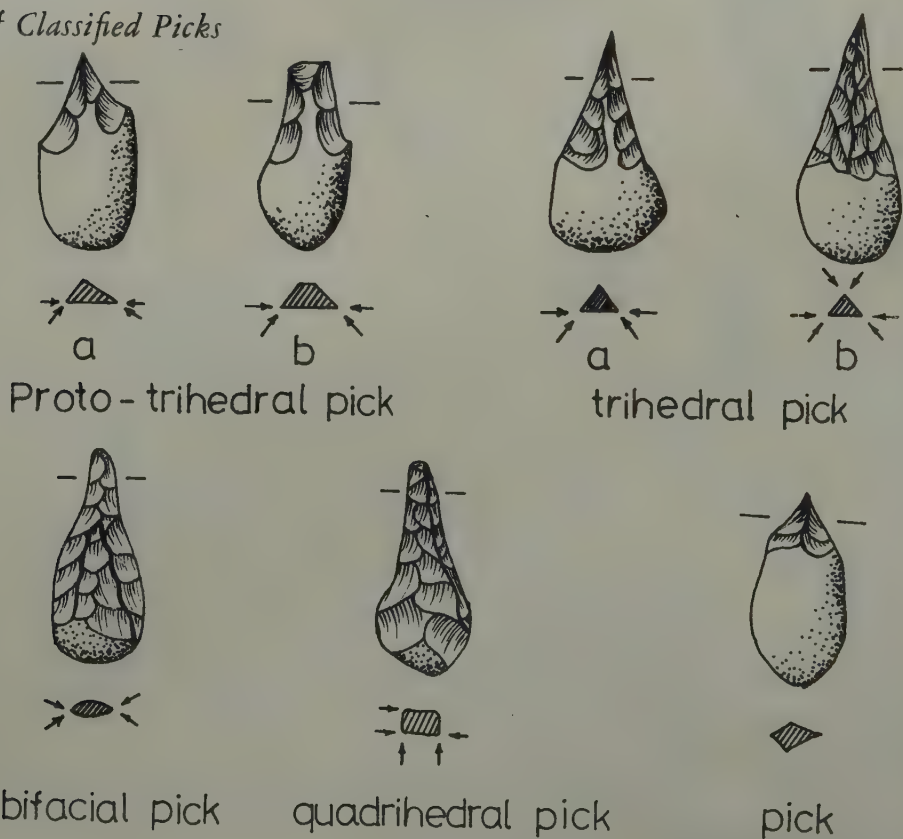
Schema of Classified Choppers and Chopping Tools



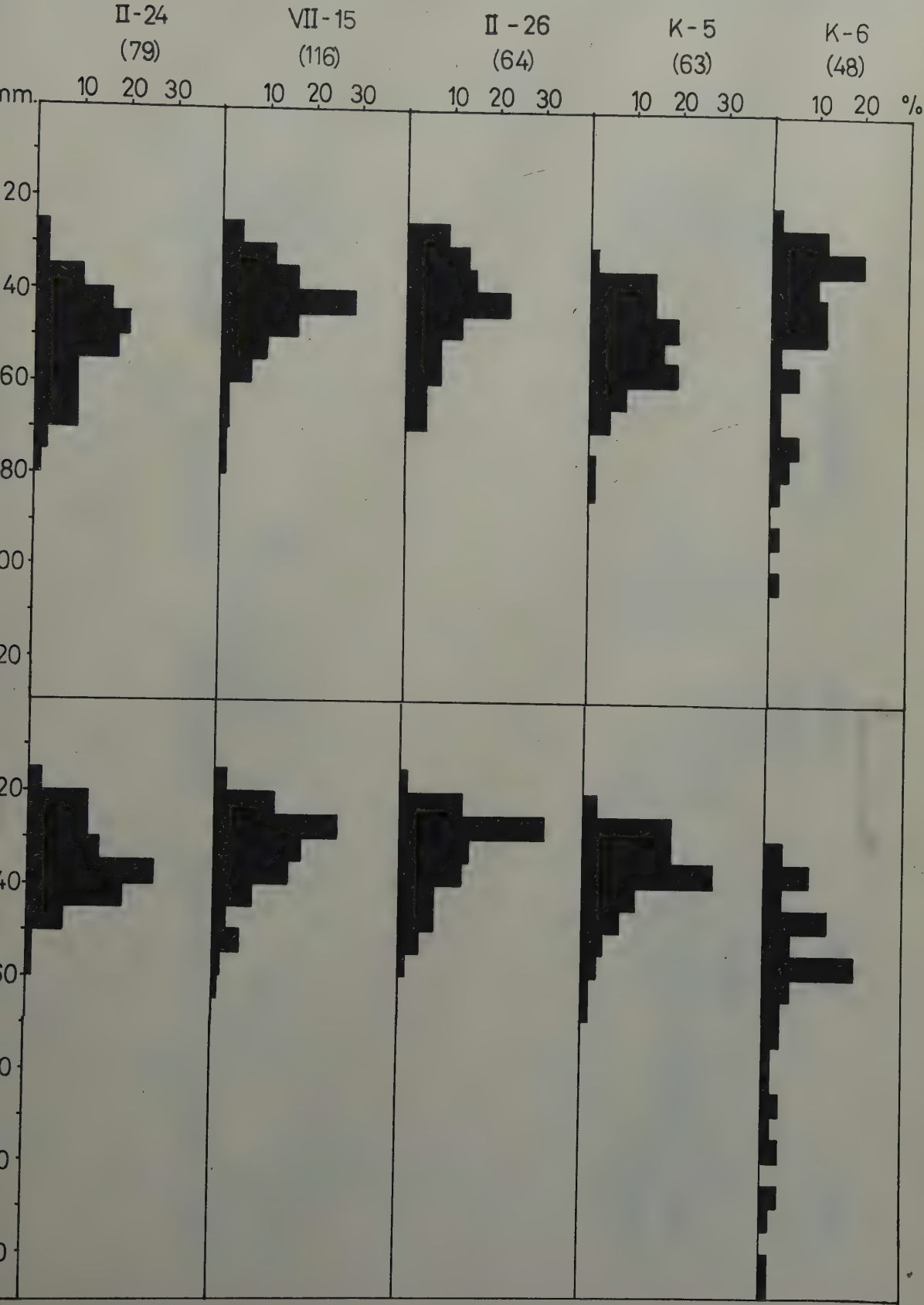
1. Schema of Classified Hand-axes



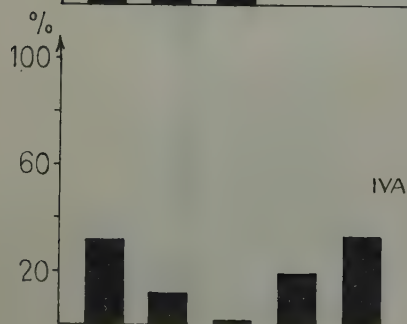
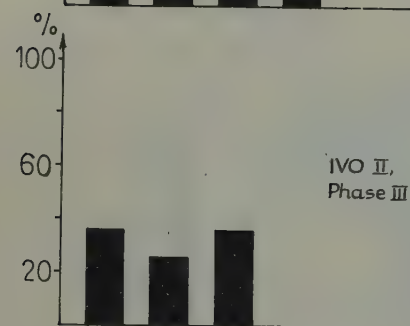
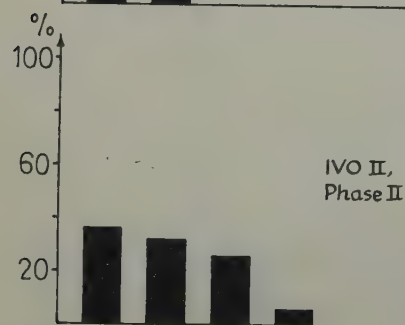
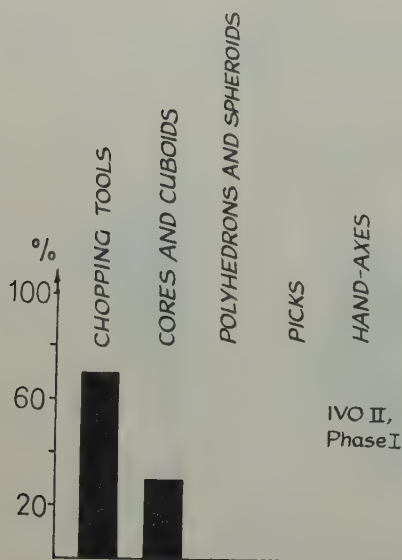
2. Schema of Classified Picks



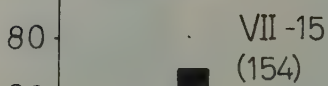
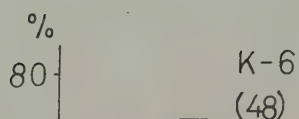
The Percentage Frequency of Length-Width for IVO II, Phases II and III



1. Quantitative Analysis of the Stone Assemblages

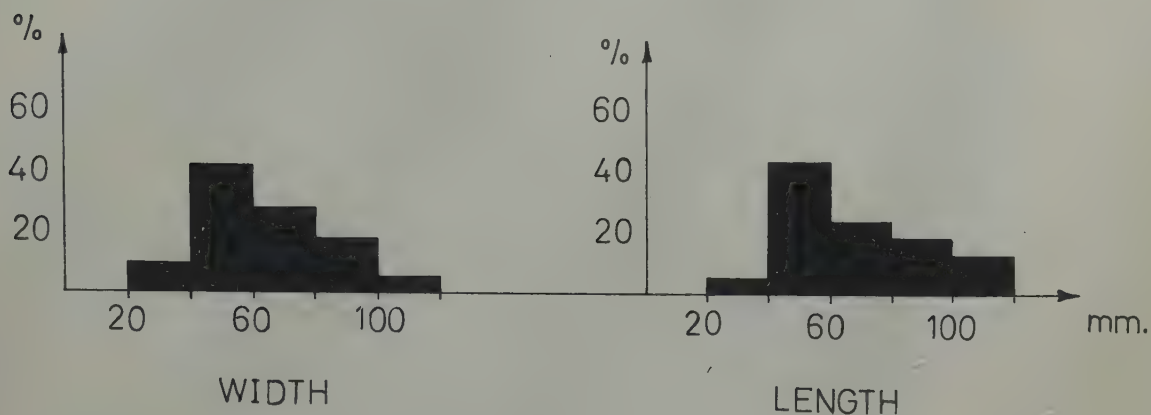


2. Percentage of Flakes

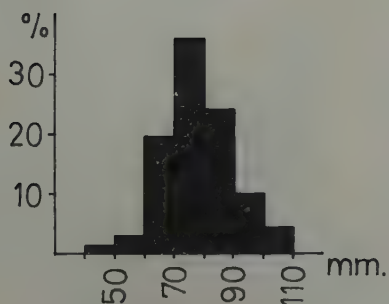


L, S, q, Lt, S, IF.

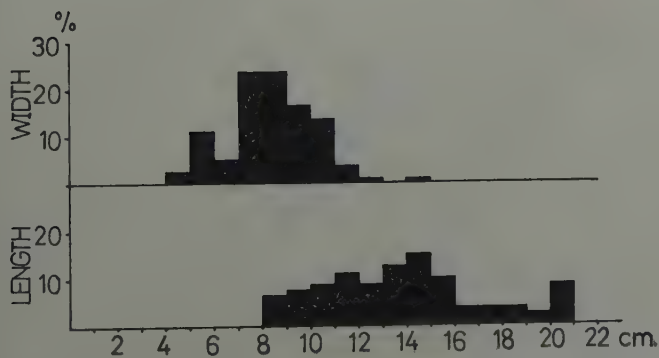
1. Cuboids — Percentage of Frequency of Length-Width



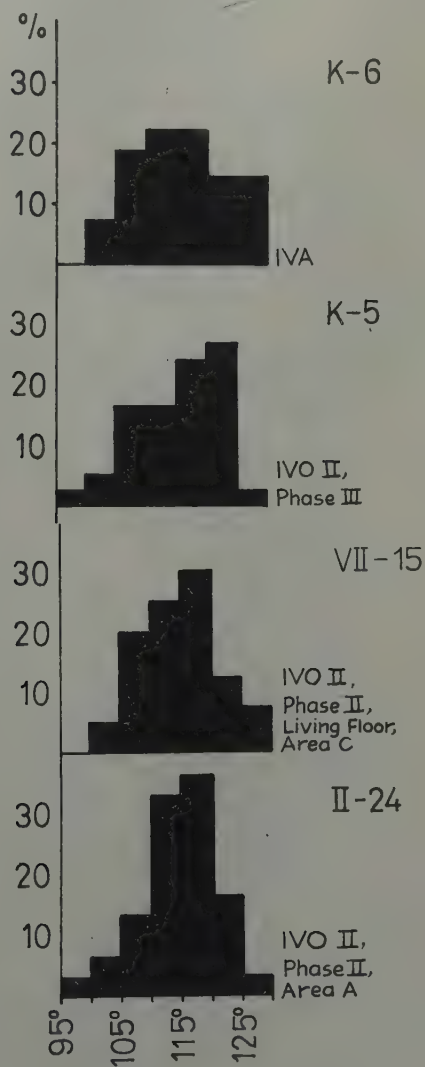
2. Diameter of Polyhedrons and Spheroids



3. Length-Width Frequency of Hand-axes and Picks



4. The Angle of the Striking Platform



M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

- 1 Chopping tool made on the transversal axis of a flint pebble.
Not found *in situ*.

- 2 Chopping tool made on the longitudinal axis of a flint pebble.
Not found *in situ*.

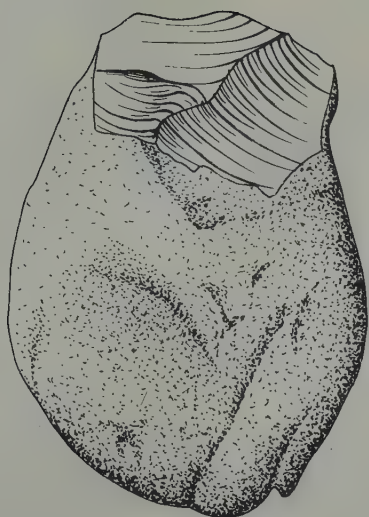
IVO II, Phase I

- 3 Chopping tool made on the transversal axis of a flint pebble. The cutting edge was made by three major flakes, which have been struck from both faces. The butt-end of the specimen preserved the natural cortex of the pebble.

GL 62 mm.; GW 59 mm.; GT 40 mm. Type C.

- 4 Chopping tool made on the transversal axis of a flint pebble. Three major flakes have been struck from one face and three from the other. The artifact is related to type E2, since two additional flakes have been struck on the transversal axis.

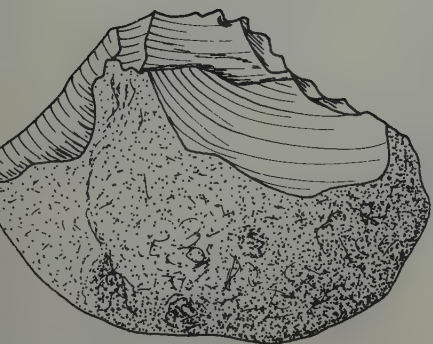
GL 76 mm.; GW 57 mm.; GT 41 mm.



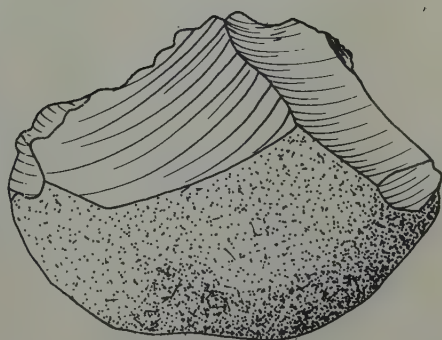
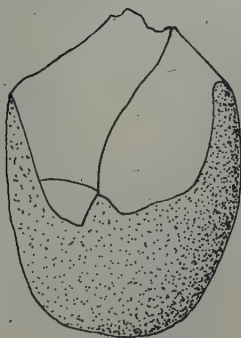
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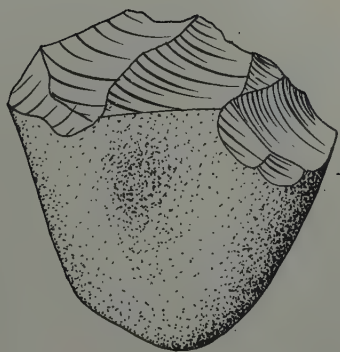
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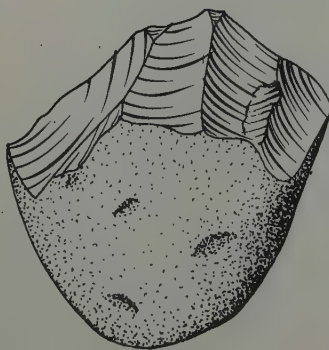
3



0 5 cm.



4



M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVO II, Phase II (Living floor)

- 1 Chopping tool made from a flint pebble. Three major flakes have been struck on both faces and on the transversal axis of the pebble, forming a convex working edge. The flake scars are fresh. The butt-end preserved the natural cortex of the pebble.

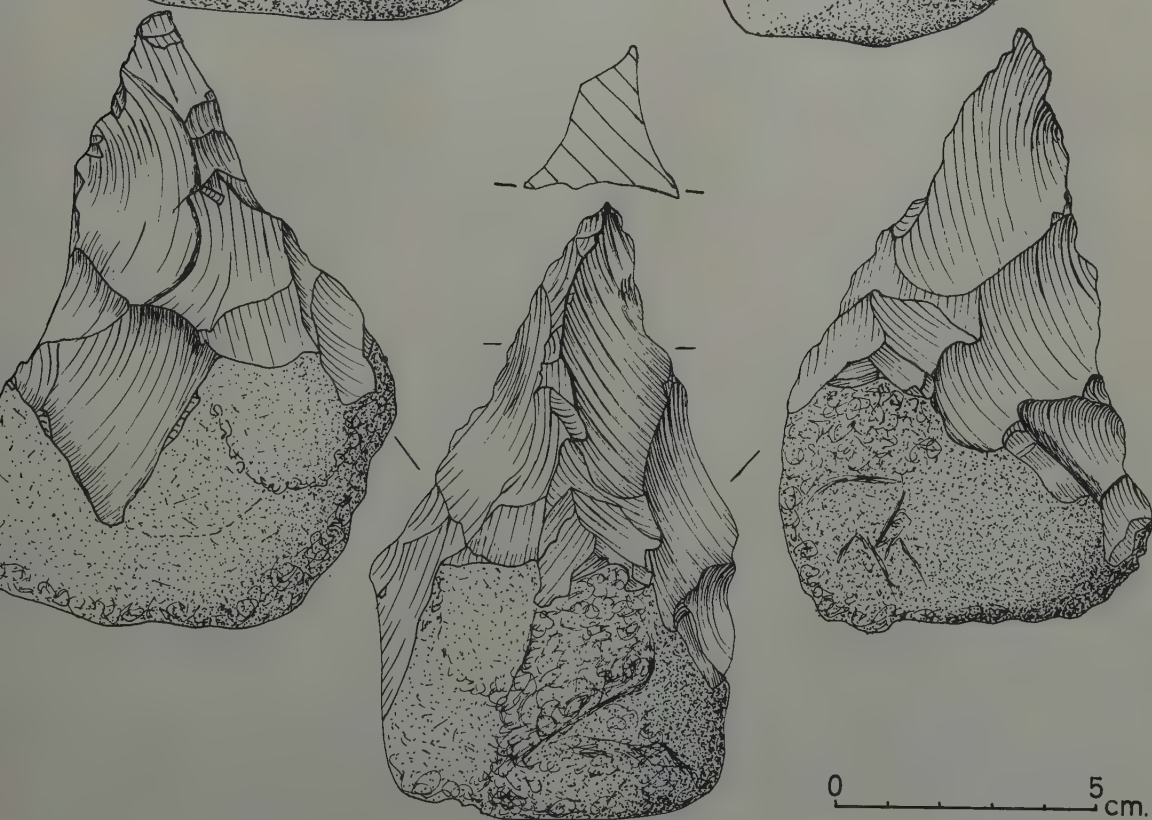
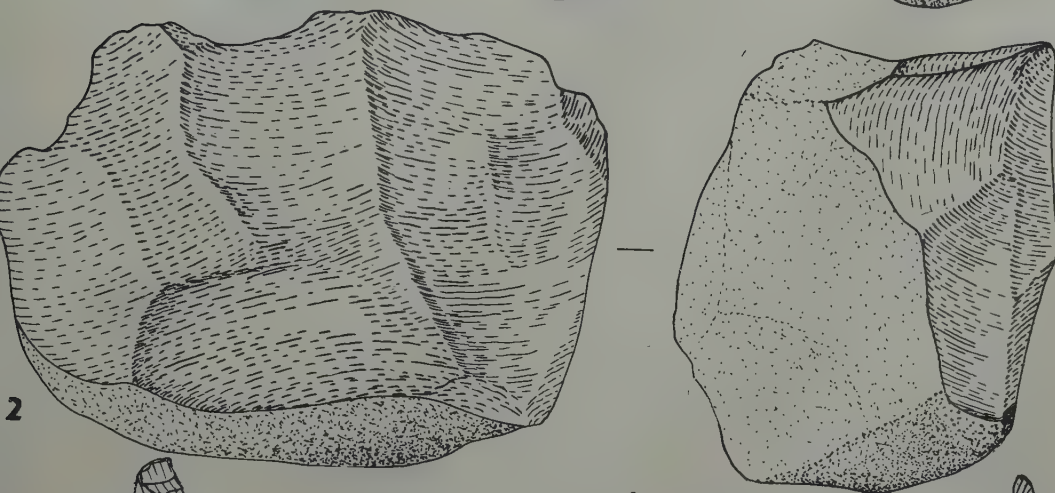
GL 85 mm.; GW 78 mm.; GT 59 mm.

- 2 Core made from limestone. The specimen is slightly abraded.

GL 114 mm.; GW 86 mm.; GT 85 mm.

- 3 Trihedral pick made from a flint pebble. The most interesting feature of this artifact is that it has been made from a pyramidal pebble with a triangular base. Three major flakes have been struck on each face, since both sides have been used as striking platforms. The butt-end preserved the natural cortex of the flint. The specimen is triangular in section. The flake scars are sharp.

GL 117 mm.; GW 82 mm.; GT 70 mm. Type A.

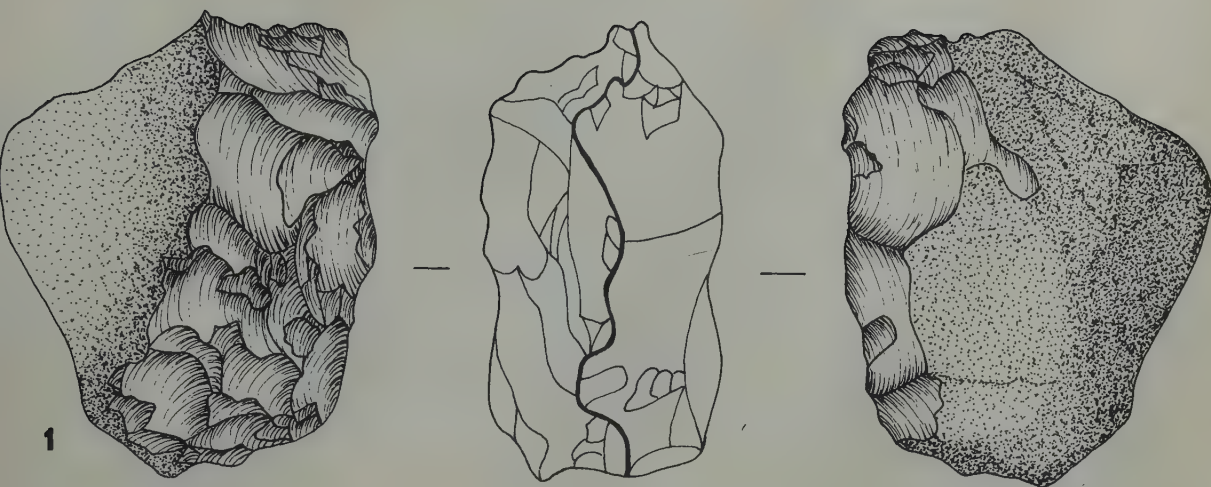


0 5 cm.

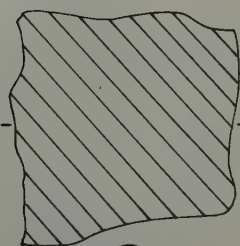
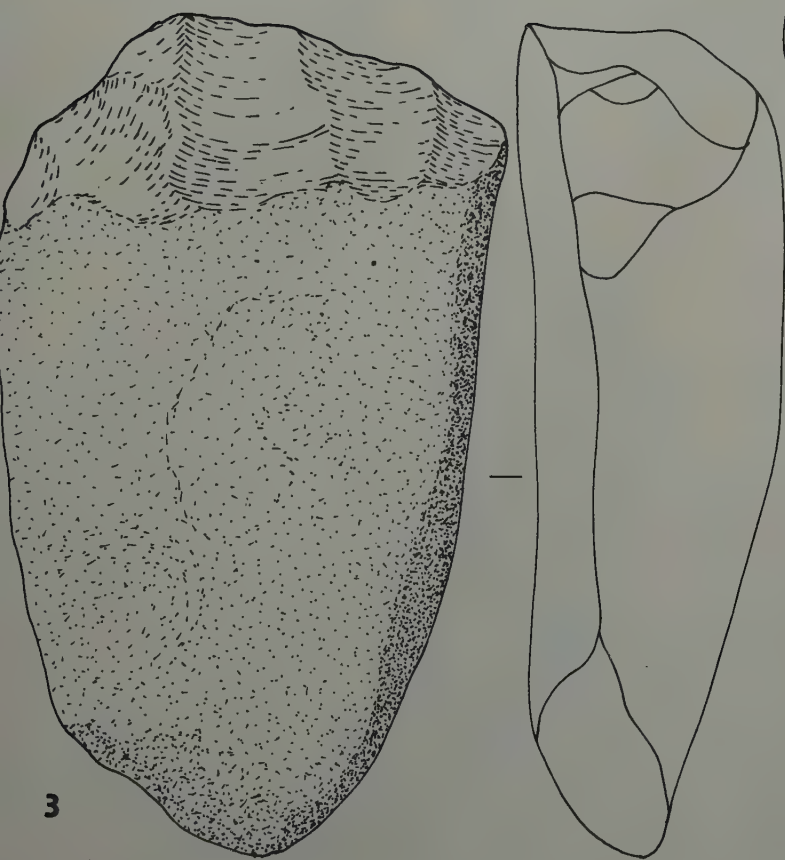
M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVO II, Phase II (Living floor)

- 1 Chopping tool made on the longitudinal axis of a flint pebble. Four major flakes have been struck from one face and three from the other. One side of the pebble preserved the natural cortex. The flake scars are fresh. The artifact has been much used. It is related to Type E1.
GL 90 mm.; GW 70 mm.; GT 45 mm.
- 2 Chopping tool made from a limestone pebble, on its transversal axis. The cutting edge was made by three major flakes which have been struck on both faces. The butt-end preserved the natural surface of the pebble. The flake scars were slightly abraded.
GL 80 mm.; GW 75 mm.; GT 62 mm. Type E.
- 3 Chopper made from a split basalt pebble. The flat surface has been used as a striking platform from which, on the transversal axis, flakes have been struck. The upper surface of the pebble preserved the natural cortex. The flake scars are slightly abraded.
GL 160 mm.; GW 95 mm.; GT 50 mm.
- 4 Cuboid made from a flint pebble.
GL 75 mm.; GW 50 mm.; GT 50 mm.



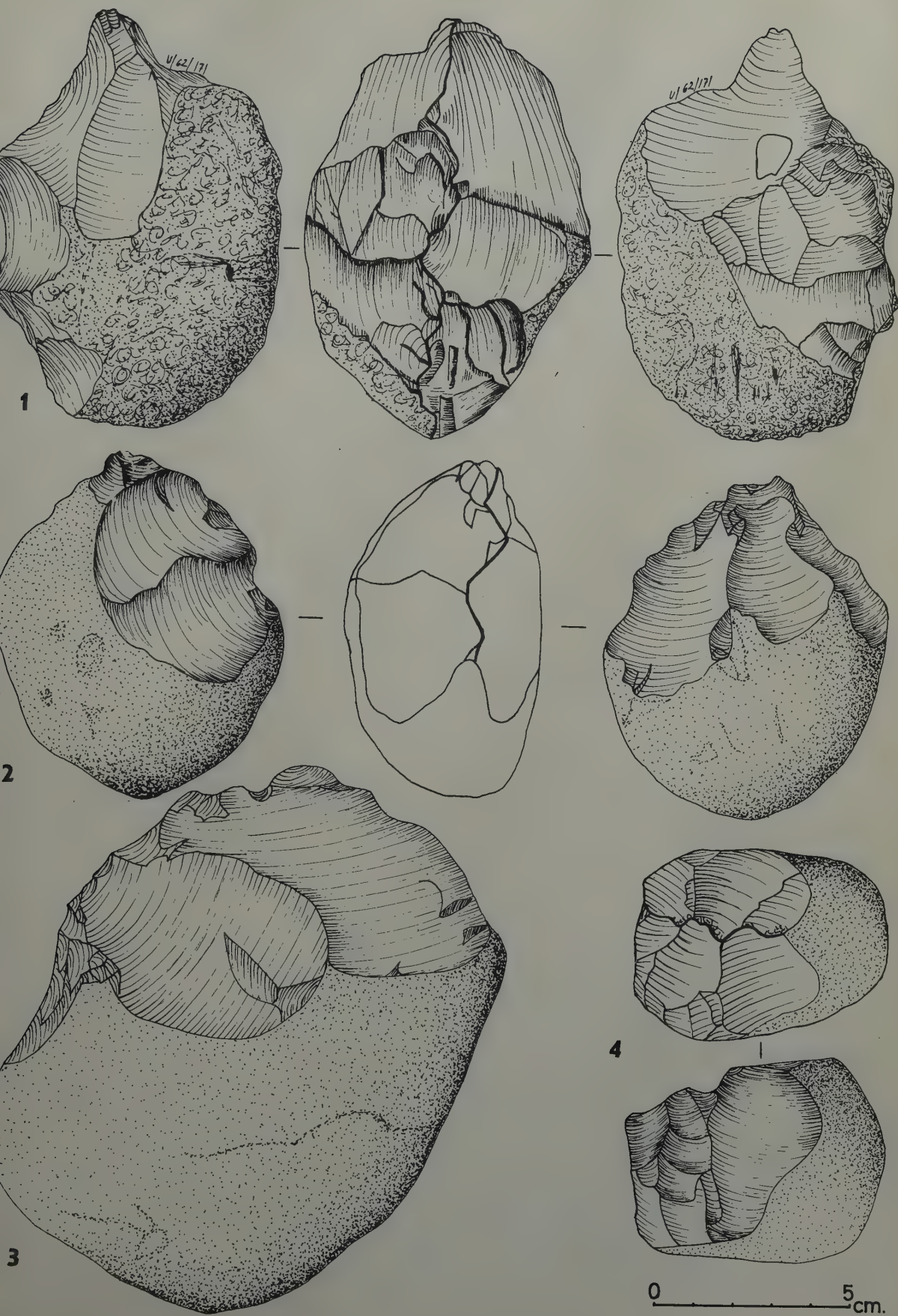
0 5 cm.



M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVO II, Phase III

- 1 Chopping tool made from a flint pebble. Three major flakes have been struck on one face and four on the other—on the longitudinal axis of the pebble. The flake scars are fresh. The specimen preserved a portion of the natural cortex.
GL 100 mm.; GW 71 mm.; GT 71 mm. Type G1.
- 2 Chopping tool made on the longitudinal axis of a flint pebble. Three major flakes have been struck from each face, which formed a sinuous cutting edge. The butt-end of the pebble preserved the natural cortex.
The artifact is related to Type D.
(See Pl. xxxII)
GL 84 mm.; GW 68 mm.; GT 48 mm.
- 3 Core made from a flint pebble. Two major flakes have been struck on one face and four on the other. The flake scars are slightly abraded.
GL 140 mm.; GW 130 mm.; GT 80 mm.
- 4 Chopping tool made from an oval-shaped flint pebble. The working edge has been struck on the longitudinal axis of both faces of the pebble. In addition, one flake has been struck on the transversal axis. The butt-end of the specimen preserved the natural cortex.
GL 63 mm.; GW 50 mm.; GT 41 mm. Type E1.

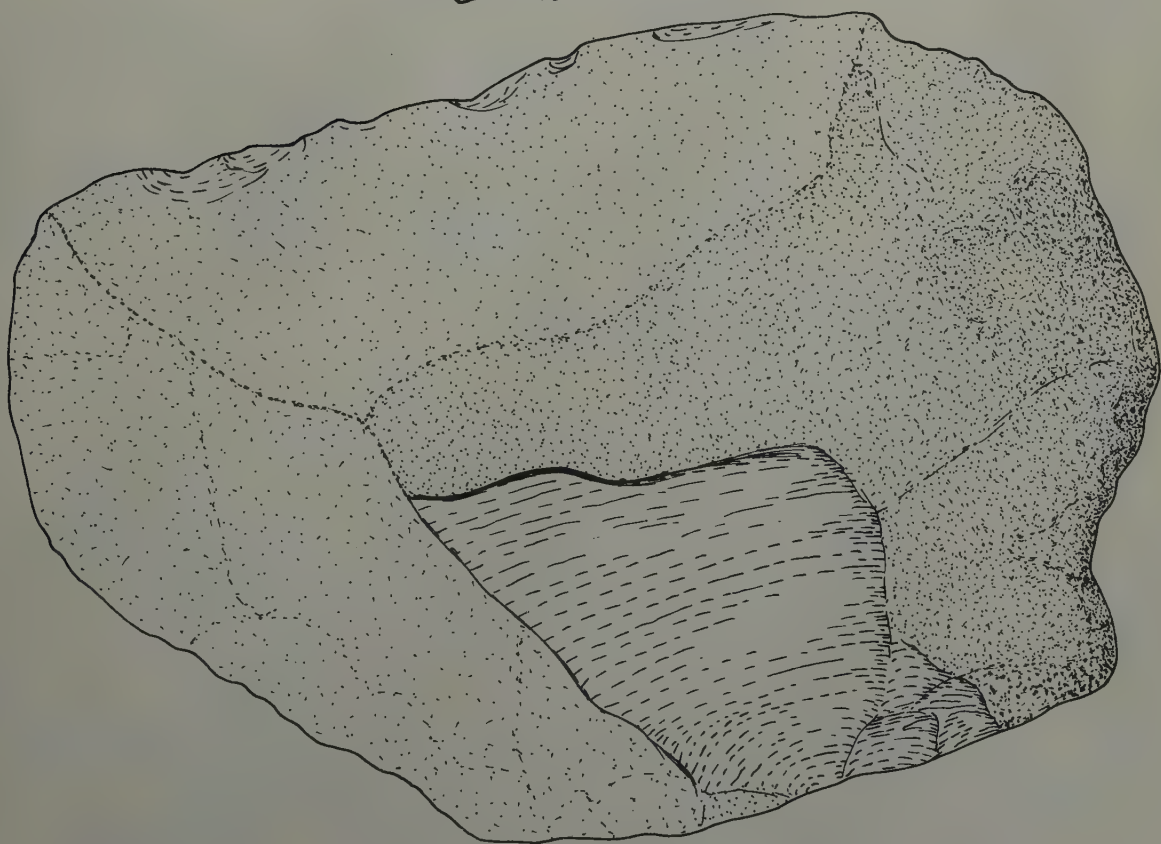
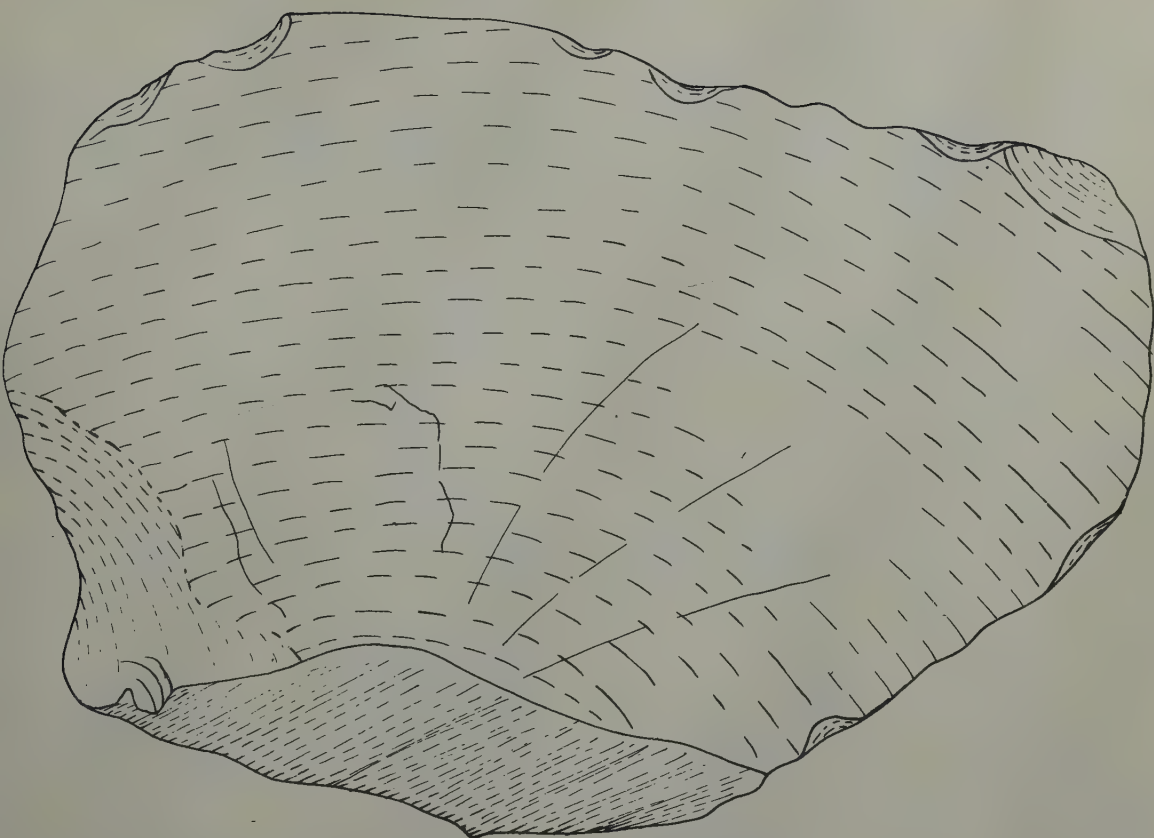


M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

ivo II, Phase II (Living floor)

Flake split from a lump of limestone; it is a side-struck flake with a plain striking platform forming an angle of 120° . The specimen is slightly abraded.

GL 230 mm.; GW 160 mm.; GT 175 mm.



0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVO II, Phase II

- 1 Chopper made from a split limestone pebble. The flat longitudinal axis surface of the split pebble has been used as a striking platform from which flakes have been struck. The upper surface of the pebble preserved the natural cortex.
GL 95 mm.; GW 67 mm.; GT 46 mm.
- 2 Chopping tool made from an oval-shaped flint pebble. Three major flakes have been struck on one face and one on the other — on the transversal axis of the pebble. The specimen preserved a large portion of the natural cortex.
GL 700 mm.; GW 52 mm.; GT. 48 mm. Type G2.
- 3 Chopping tool made on the transversal axis of a flint pebble. The cutting edge was made by three major flakes which have been struck on both faces. The butt-end of the specimen preserved the natural cortex.
GL 45 mm.; GW 44 mm.; GT 43 mm. Type B.
- 4 Chopping tool made on the transversal axis of an oval-shaped flint pebble. Three major flakes have been struck on one face and two on the other, at an angle of more than 45°. The butt-end of the specimen preserved the natural cortex.
This artifact might be related to Type B.
- 5 Polyhedron made from a flint pebble.
GL 70 mm.; GW 60 mm.; GT 52 mm.
- 6 Cuboid made from a spherical flint pebble. One flattish side has been used as a striking platform for detaching flakes. The intersection of the flake scars formed a sinuous edge. This specimen was discovered near the vertebra of a large mammal.
GL 69 mm.; GW 79 mm.; GT 75 mm.
- 7 Proto-trihedral pick made from an oval-shaped flint pebble. It differs only a little, by its pointed end, from the chopping tools discovered in the same bed. Four major flake scars on one face and two on the other have been chipped on the transversal axis along two sides of the pebble. The working edge is triangular in section and meets at the tip of the specimen in the form of a point. The flake scars are fresh. The butt-end of the specimen preserved the natural cortex of the flint.
GL 82 mm.; GW 57 mm.; GT 55 mm. Type A.
- 8 Chopper made from a limestone pebble with one flat surface. The cutting edge was made on its transversal axis by three major flakes struck from the flat face of the specimen. The flake scars are slightly abraded.
GL 116 mm.; GW 79 mm.; GT 73 mm. Type A.

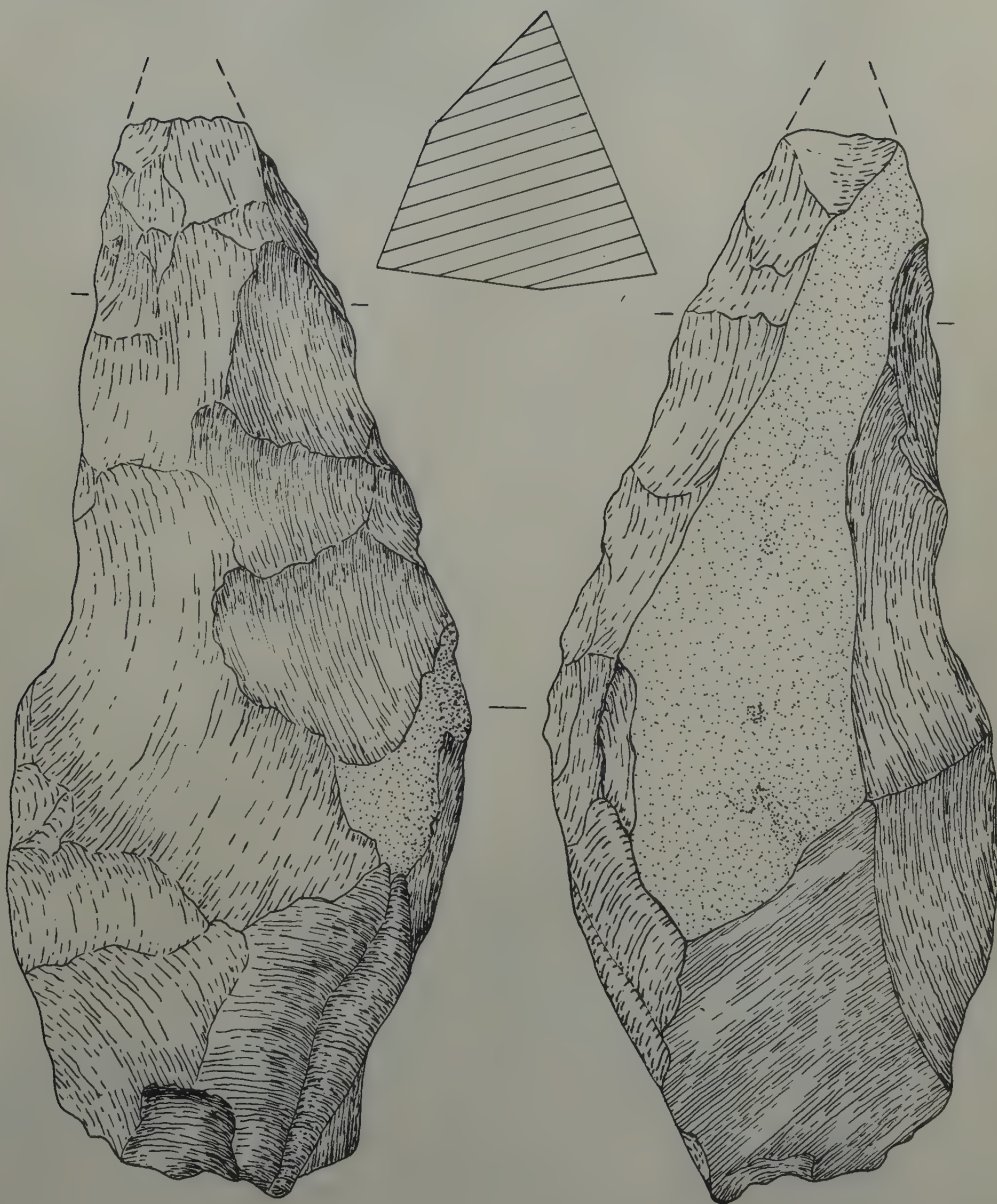


M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

Trihedral pick made from a split basalt pebble. The specimen has been worked on both faces and on the butt-end. A small portion of the natural surface of the pebble is preserved. The flake scars are slightly abraded. The artifact is triangular in section.

GL 230 mm.; GW 85 mm.; GT 75 mm. Type A.



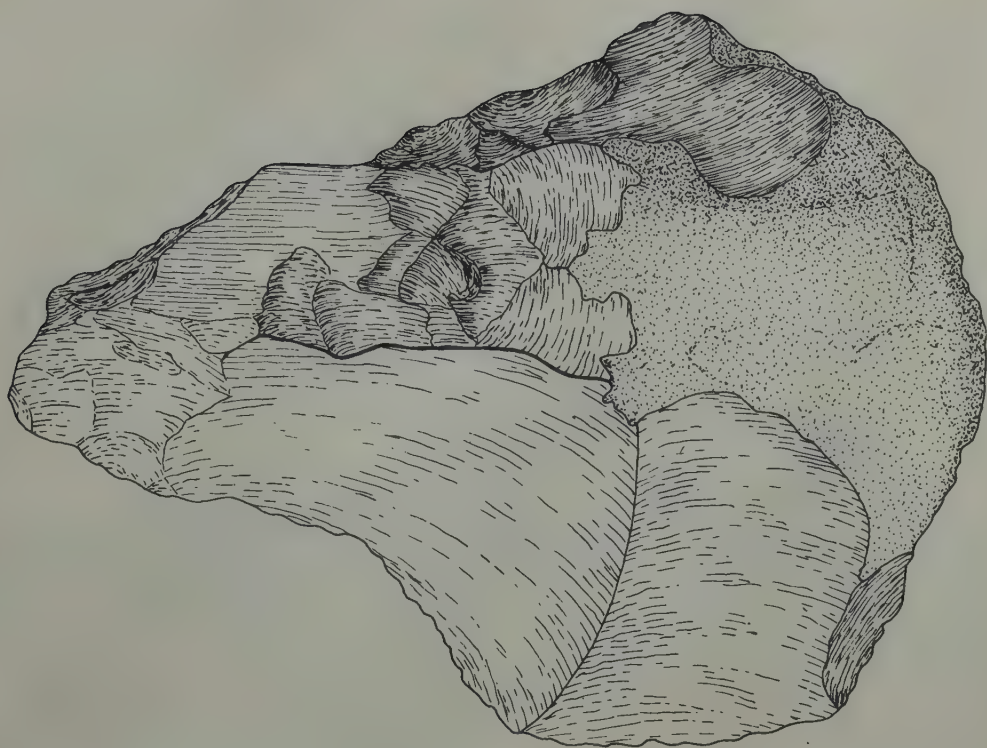
0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

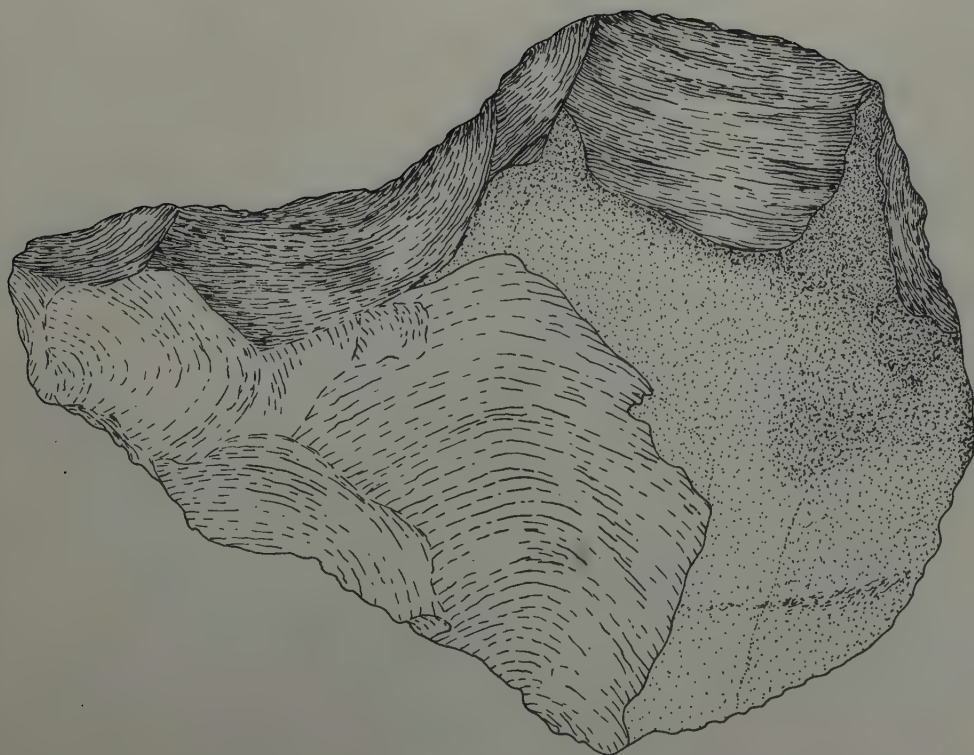
IVA

Hand-axe made from a basalt pebble. Six major flakes have been struck on one face and five on the other. The flake scars are deep and unabraded. (See Pl. xli : 2).

GL 185 mm.; GW 140 mm.; GT 75 mm. Type B.



0 5 cm.



M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

- 1 Hand-axe made from a basalt pebble. The pebble has been chipped by removing four major flakes on each face. A portion of the pebble surface has been left on the butt-end of the artifact. Unfortunately, the point of this specimen is broken and missing. The facettes are slightly abraded.

GL 147 mm.; GW 90 mm.; GT 81 mm. Type D.

- 2 Hand-axe made from a basalt pebble. The artifact has been chipped over both faces. The original surface of the pebble is left at the butt-end. The specimen is slightly abraded, biconvex, and has a more or less marked S-twist.

GL 190 mm.; GW 90 mm.; GT 74 mm. Type C.



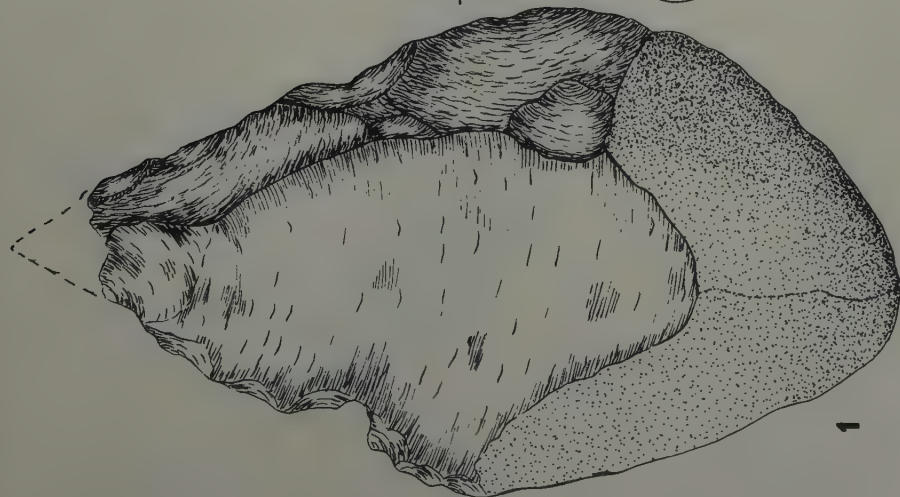
1



2



1



1

0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

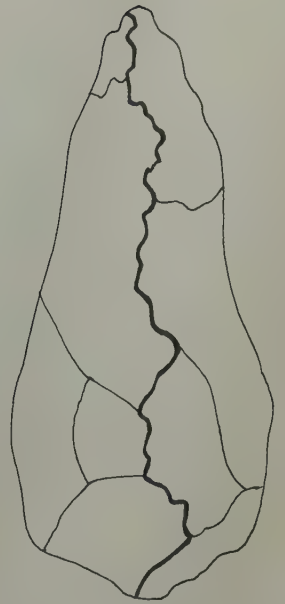
IVA

- 1 Hand-axe made from a flint pebble. A nice specimen trimmed on both faces and on the butt-end. Patches of natural cortex are preserved on both faces.

GL 115 mm.; GW 70 mm.; GT 50 mm. Type C.

- 2 Hand-axe made from a flat basalt pebble. Six major flakes have been struck on one face and four on the other. The flake scars are concave and slightly abraded. The artifact has a nice S-twist. The butt-end preserved the natural surface of the pebble.

GL 181 mm.; GW 105 mm.; GT 58 mm. Type B.



0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

- 1 Trihedral pick from a split basalt pebble. Six major flakes have been struck on one face and four on the other. The specimen is triangular in section and has a marked S-twist on the upper surface. The flake scars are slightly abraded.

GL 178 mm.; GW 70 mm.; GT 48 mm. Type B.

- 2 Proto-trihedral pick made from a flint pebble. Four major flakes have been struck on one face and two on the other — on the longitudinal axis of the pebble. The working edge is straight and trapezoid in section. The butt-end of the specimen preserved the natural cortex of the flint.

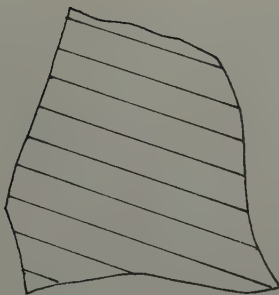
GL 93 mm.; GW 55 mm.; GT 50 mm. Type B.

1



0 5 cm.

2



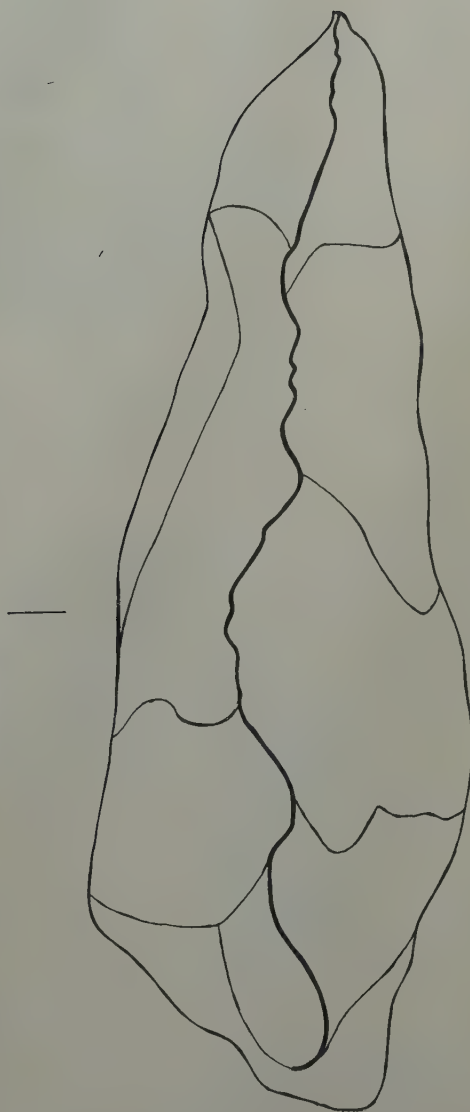
M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

Trihedral pick made from a lump of basalt. Five major flakes have been struck on one face. The flake scars are slightly abraded. The specimen is triangular in section and has a marked S-twist on the upper face.

(See Pl. xxxvii)

GL 208 mm.; GW 100 mm.; GT 71 mm. Type A.

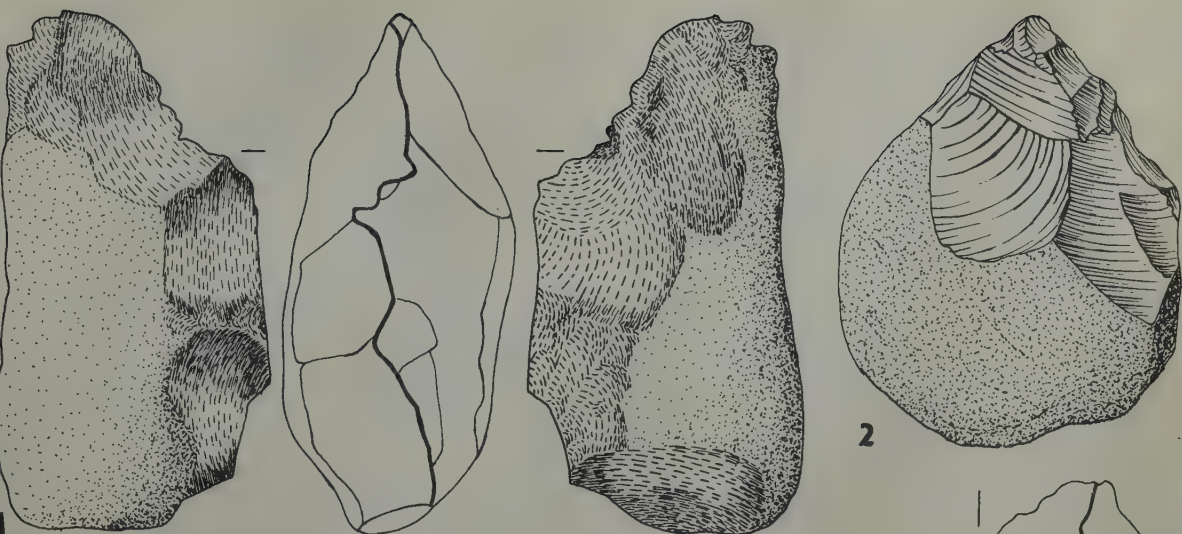


0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

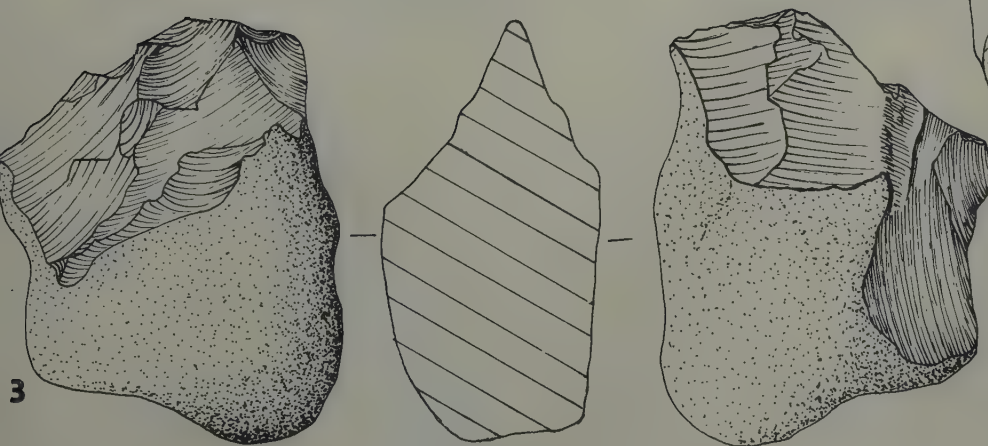
IVA

- 1 Chopping tool made on the longitudinal axis of a basalt pebble. Three major flakes have been struck from each face. The cutting edge is sinuous. The butt-end and one edge of the pebble preserved their natural rolled surface. The artifact is related to Type D.
GL 97 mm.; GW 51 mm.; GT 41 mm.
- 2 Chopping tool made from a flint pebble on the transversal axis. Two major flakes have been struck from one face and two from the other. The flake scars are slightly abraded. The butt-end preserved the natural cortex.
GL 85 mm.; GW 65 mm.; GT 42 mm. Type C.
- 3 Chopping tool made on the transversal axis of a flint pebble. Two major flakes on one side and three on the other have been struck to produce an oblique cutting edge at an angle of 45° . The flake scars are fresh; the butt-end preserved the natural cortex. The artifact is related to Type C.
GL 80 mm.; GW 80 mm.; GT 45 mm. Type C.
- 4 Chopping tool made on the transversal axis of a flint pebble. Four major flakes which have been struck from each face produced a straight cutting edge. The artifact has been used and signs of battering exist on both faces. The butt-end of the artifact preserved the natural cortex.
The artifact is related to Type E2, since an additional flake on the longitudinal axis has been struck.
GL 98 mm.; GW 85 mm.; GT 56 mm.

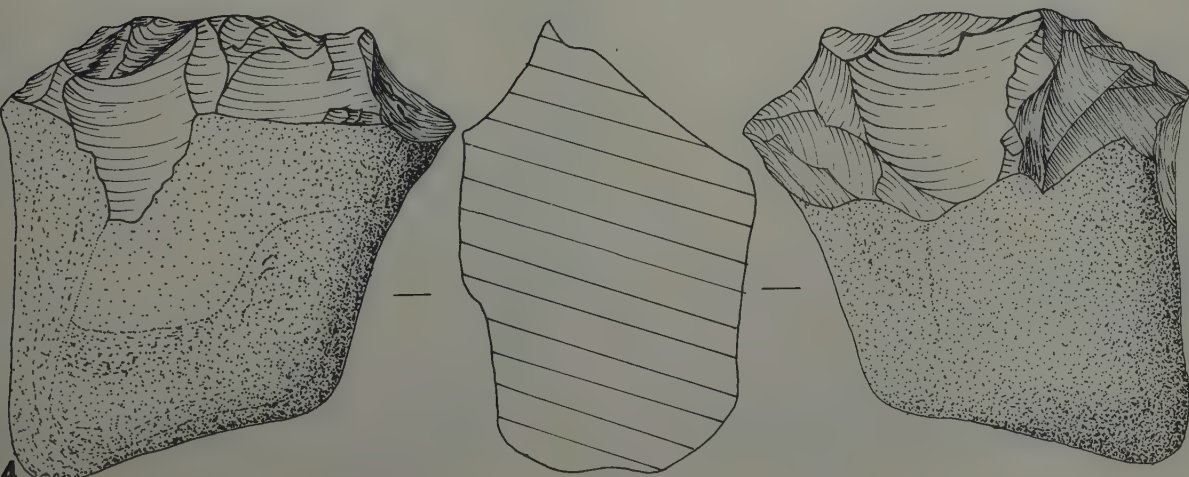


0 5 cm.

2



3



4

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

- 1 Hand-axe made on a flat basalt pebble. Five major flakes have been struck from one face and four from the other. The flake scars have been slightly abraded. The S-twist along both sides is slightly sinuous.

GL 144 mm.; GW 106 mm.; GT 45 mm. Type B.

- 2 Hand-axe made from a split flat basalt pebble. Five major flakes have been struck from one face and three from the other. The specimen had a pointed outline and three-quarters of the upper surface preserved the natural surface of the pebble. The flake scars are slightly abraded. Its most interesting feature is a very marked S-twist.

GL 165 mm.; GW 120 mm.; GT 53 mm. Type B.

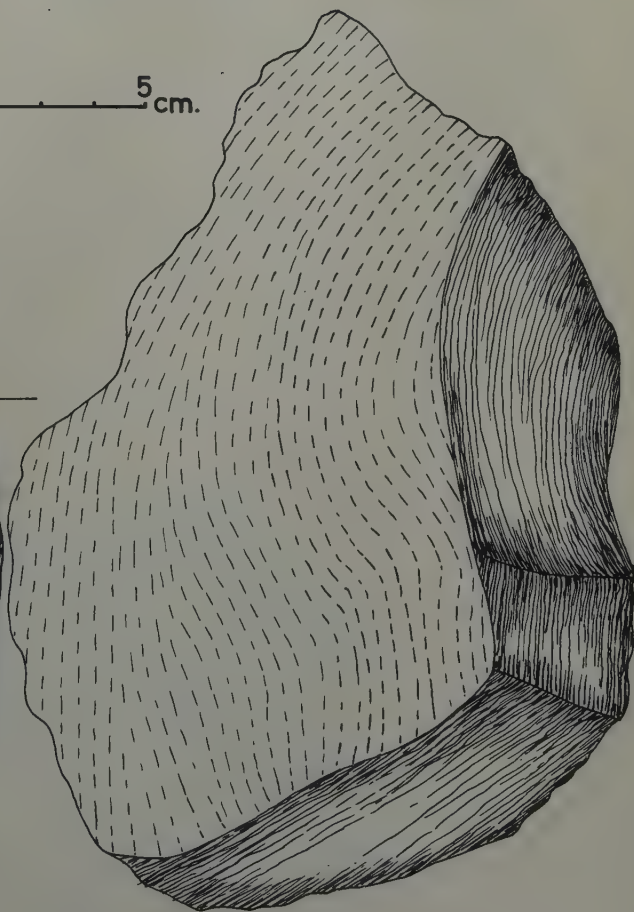


1



2

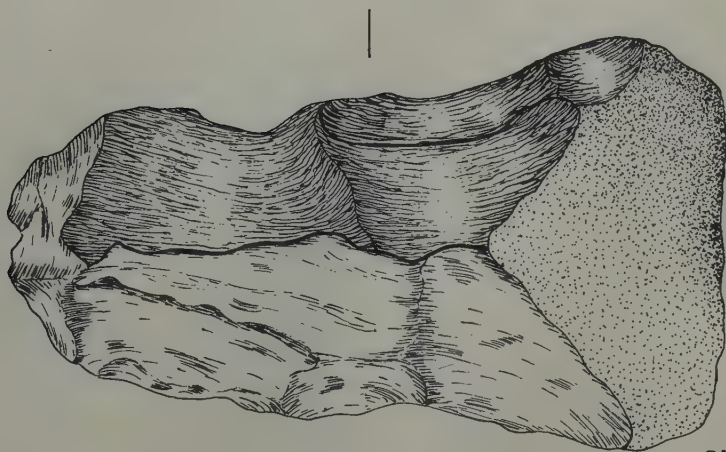
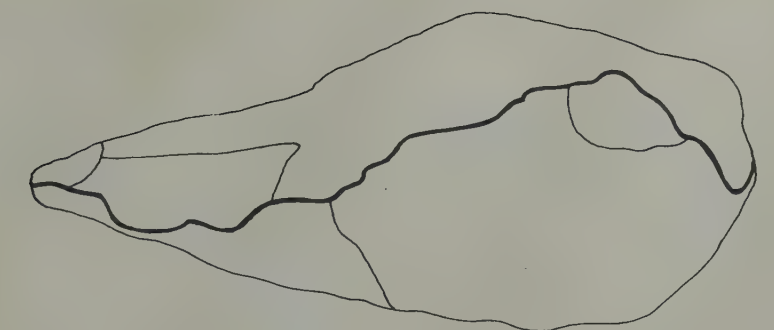
0 ————— 5 cm.



M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

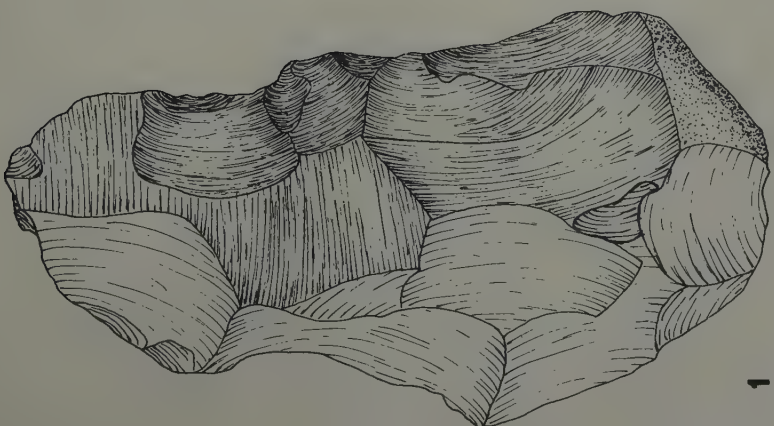
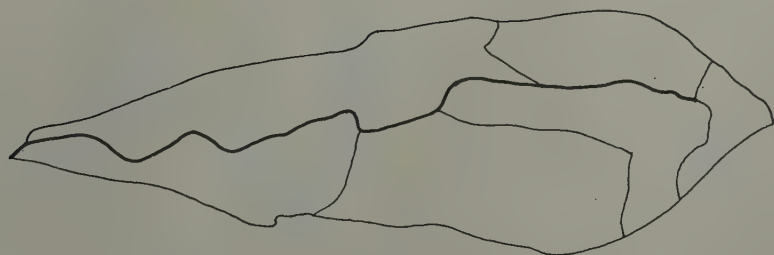
IVA

- 1 Hand-axe made from a flint pebble. Five major flakes have been struck on one face and six on the other. The flake scars are slightly abraded. A small portion of the natural cortex is preserved on the butt-end.
GL 143 mm.; GW 75 mm.; GT 36 mm. Type F.
- 2 Hand-axe made on a basalt pebble. Four major flakes have been struck on one face and five on the other. The flake scars are slightly abraded. The butt-end of the specimen preserved the natural surface of the pebble.
GL 135 mm.; GW 82 mm.; GT 62 mm. Type F.



2

0 5 cm.



1

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

Cleaver made from a rough lump of basalt. This is a very nicely-made specimen with a biconvex section in the centre. It has a sharp cutting edge all round and a marked S-twist. The facettes of the flake scars are slightly abraded.

(See Pl. xxxiv)

GL 203 mm.; GW 91 mm.; GT 70 mm. Type E.



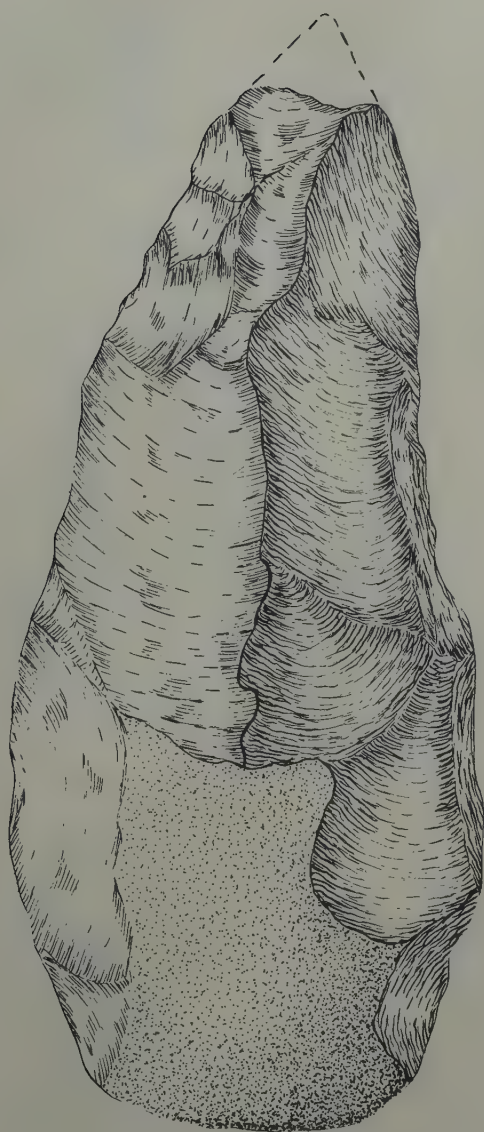
0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

This is a very nice hand-axe made from a basalt pebble. The point is unfortunately broken and missing. The chipping extends over each face; only a small area of the original surface of the pebble is left near the butt-end. The hand-axe is biconvex in section and pyriform in shape. It has a marked S-twist. The artifact is not abraded.

GL 200 mm.; GW 80 mm.; GT 80 mm. Type C.



0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

- 1 Trihedral pick made from a split basalt pebble. It has three cutting edges meeting at a point. The ventral surface is flat; the upper one has a keel running from the top-end to the butt-end which preserved a portion of the natural surface of the pebble. The specimen is triangular in section and the flake scars are slightly abraded.

GL 159 mm.; GW 90 mm.; GT 67 mm. Type A.

- 2 Trihedral pick made from a flint pebble. This specimen has three cutting edges which meet at a point by the use of each surface as a striking platform. The specimen is triangular in section. A small area of the cortex is left near the butt-end. The flake scars are fresh.

(See Pl. xxxiii : 2)

GL 147 mm.; GW 78 mm.; GT 53 mm. Type B.

- 3 Trihedral pick made from a flint pebble. The chipping extends over three surfaces of the specimen and it has three cutting edges, meeting at a point in such a way that it has a flat ventral surface with an S-twist running along the upper face. The specimen is triangular in section. A small area of the natural cortex of the flint is left on the upper face of the specimen and the butt-end.

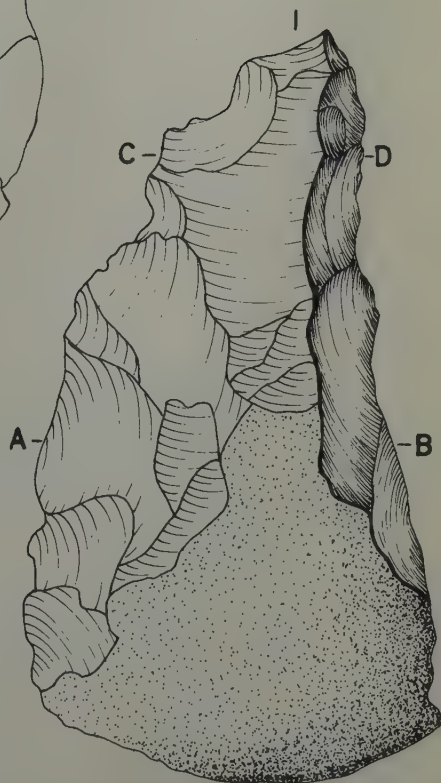
GL 142 mm.; GW 76 mm.; GT 56 mm. Type A.



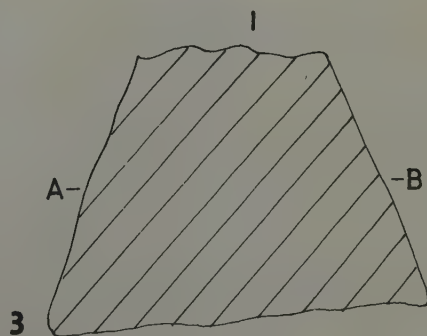
1



0 5 cm.



2



3

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

- 1 Hand-axe made from a flint pebble. The chipping extends over both faces with a very small area of the cortex left on one face. The specimen has a marked S-twist.

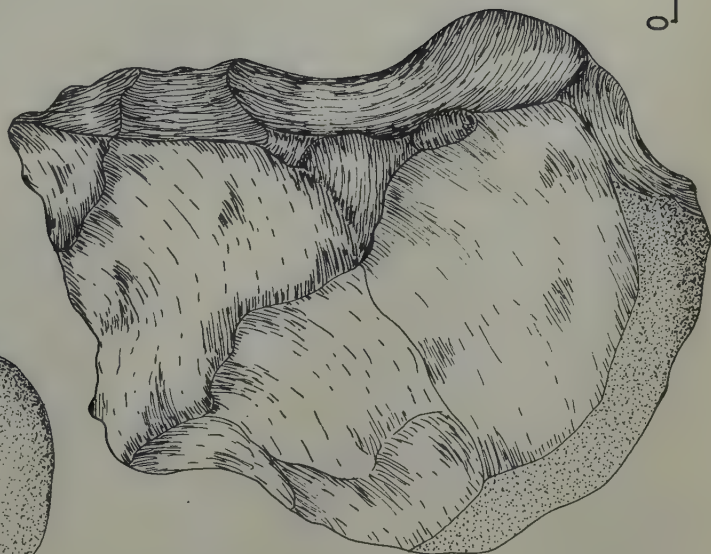
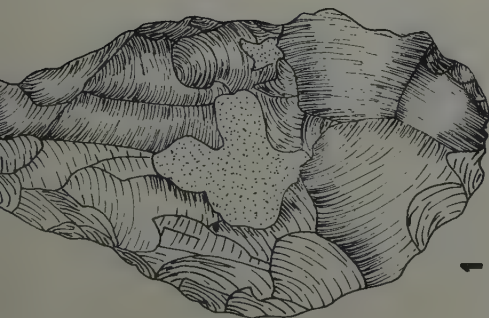
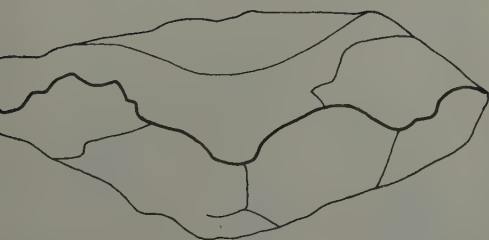
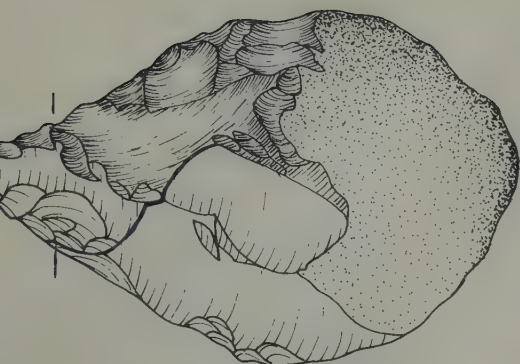
GL 97 mm.; GW 58 mm.; GT 42 mm. U/62/49. Type D.

- 2 Proto-trihedral pick made from a flint pebble. Three major flakes have been struck on one face and four on the other — on the transversal axis of the pebble. The specimen has a pointed edge and a triangular minor section. The lower part of the artifact preserved the natural cortex.

GL 100 mm.; GW 62 mm.; GT 60 mm. Type A.

- 3 Cleaver made from a basalt pebble. The chipping extends over both faces and a very small area of the original surface of the pebble is left at the butt-end. The specimen's end has a transversal cutting edge, which is very akin to a cleaver-type tool.

GL 135 mm.; GW 105 mm.; GT 65 mm. Type G.



0 5 cm.

M. STEKELIS: EXCAVATIONS AT 'UBEIDIYA

IVA

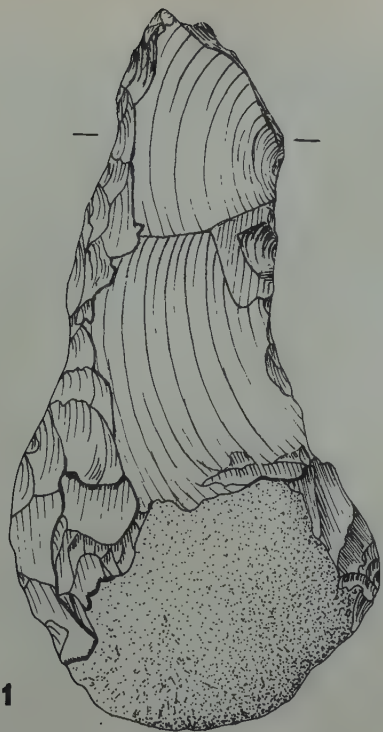
- 1 Quadrihedral pick similar to the one described below; the flake scars are fresh.

GL 135 mm.; GW 70 mm.; GT 55 mm.

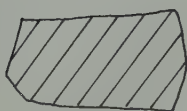
- 2 Quadrihedral pick made from a flint pebble. This specimen differs from a trihedral one in being quadrilateral in section. The top end of the artifact is broken. The chipping extends over both faces. Only the butt-end preserved the natural cortex of the flint. The flake scars are fresh.

(See Pl. xxxv)

GL 144 mm.; GW 85 mm.; GT 52 mm.



1



2



0 5 cm.

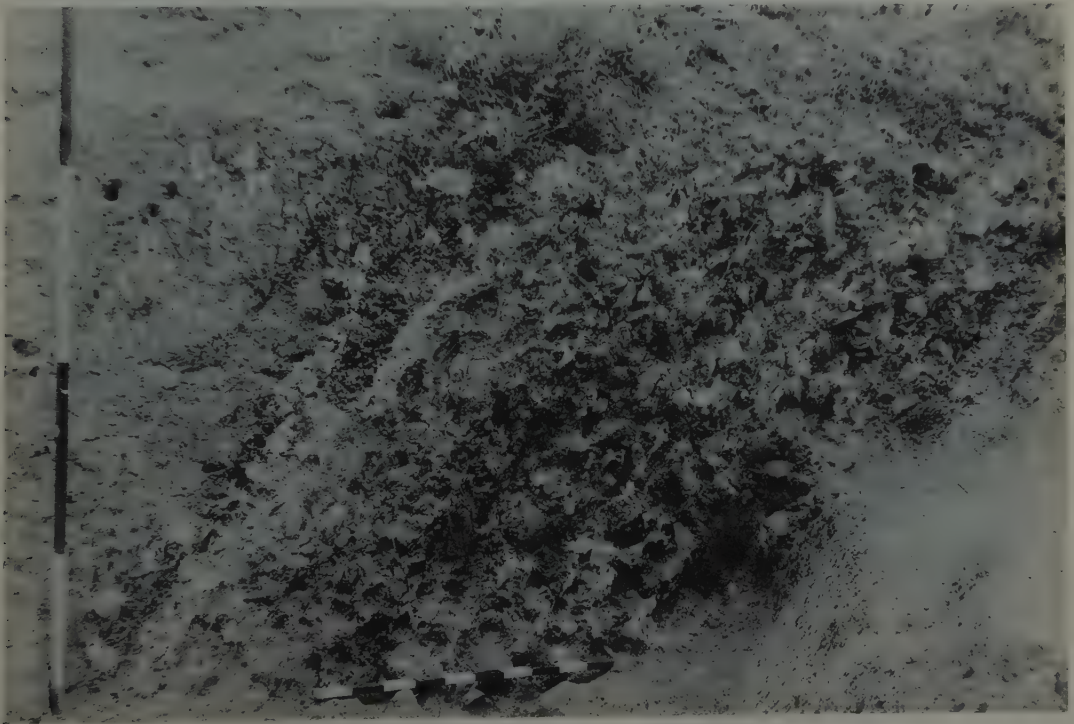
General View of Site A



1. *Section of Beds II - 21—26 Exposed in Squares A - 5, B - 5, C - 5 at Site A*



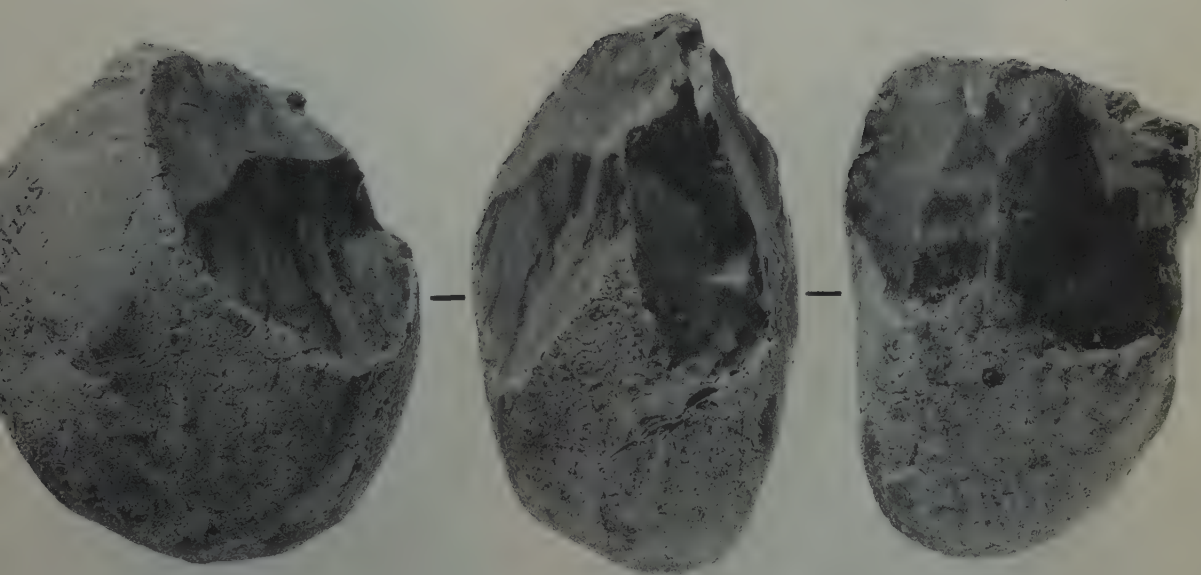
2. *Section of Beds K - 6 and K - 5 Exposed in the Pit Cut at Site B*



Stratigraphical Trench I Cut Between Sites A and B



Chopping Tool



0 5 cm.

Trihedral Picks

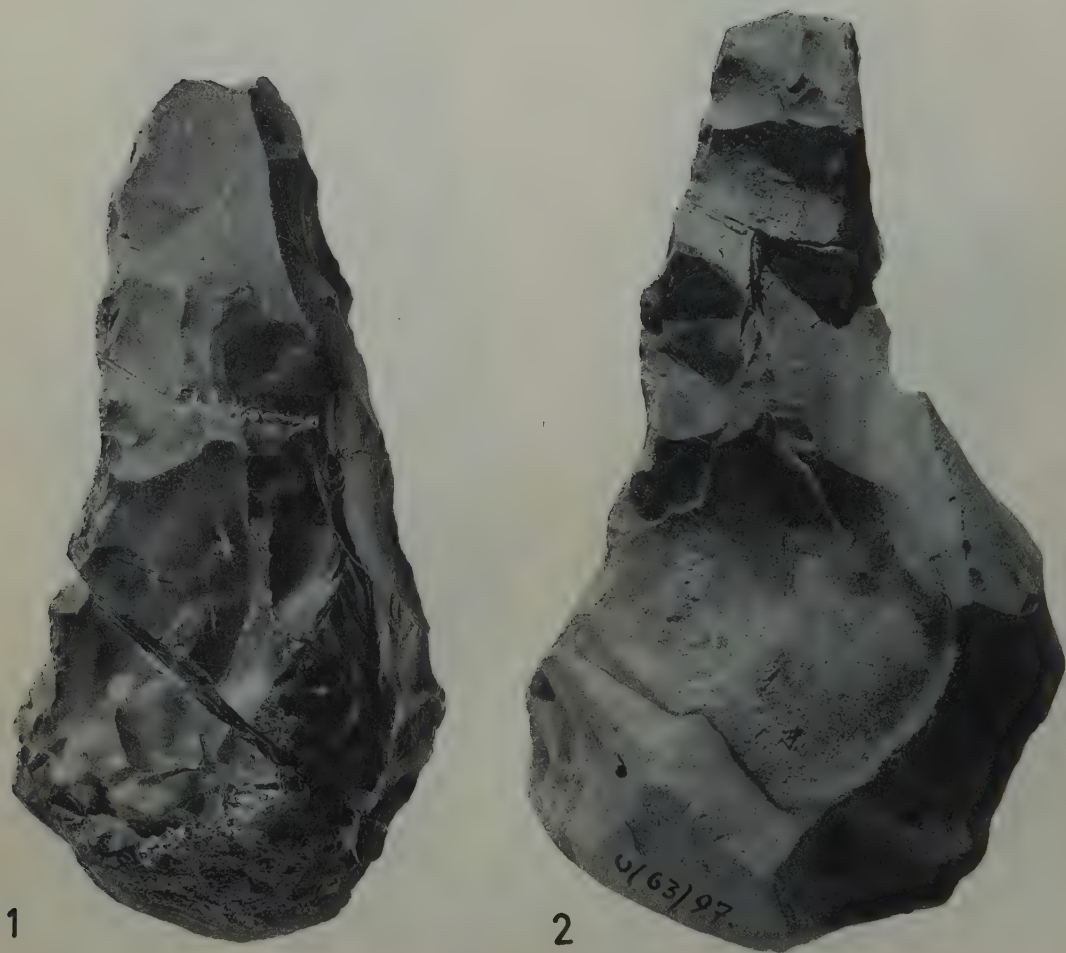


0 5 cm.



0 5 cm.

Quadrihedral Picks

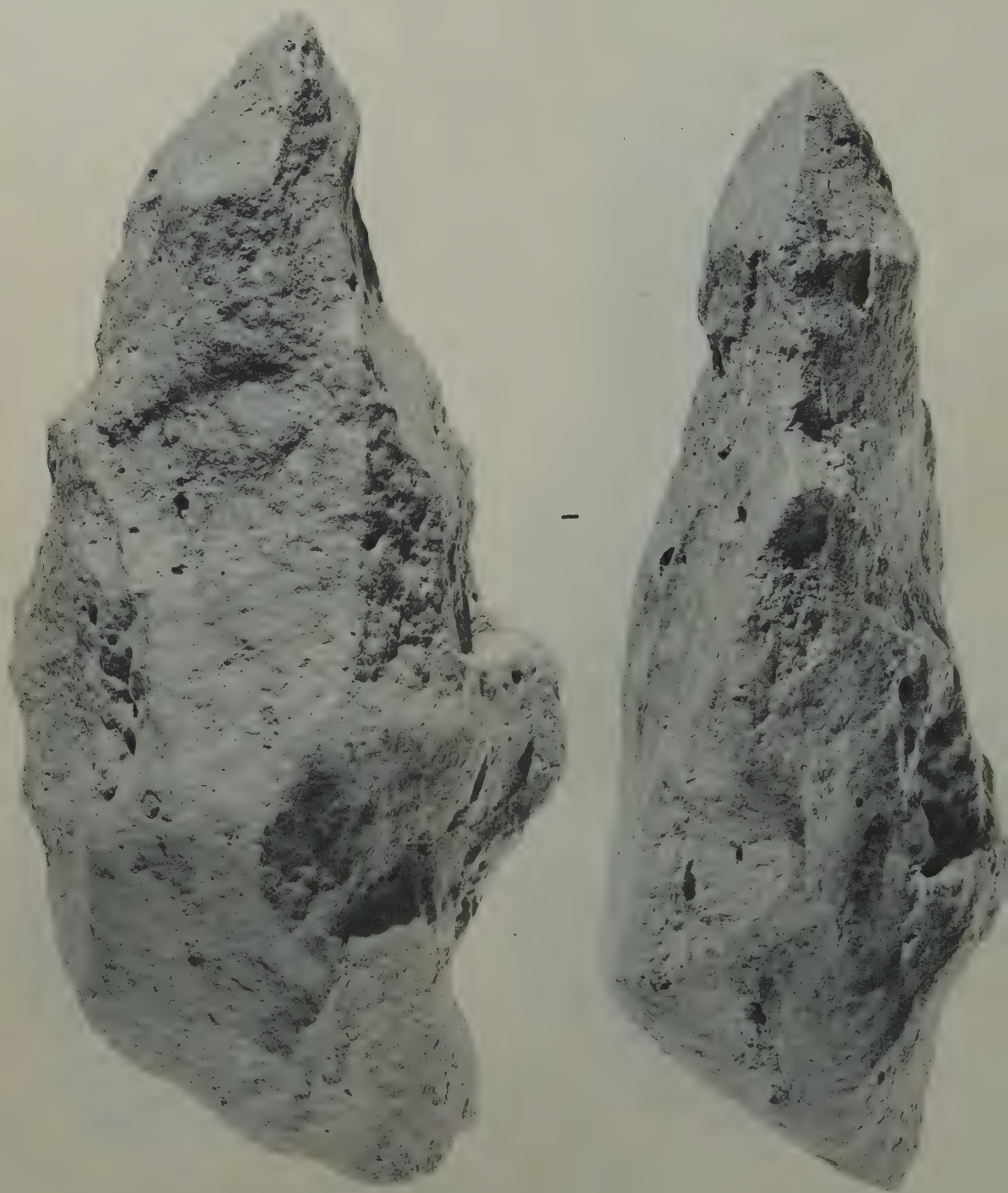


0 5 cm

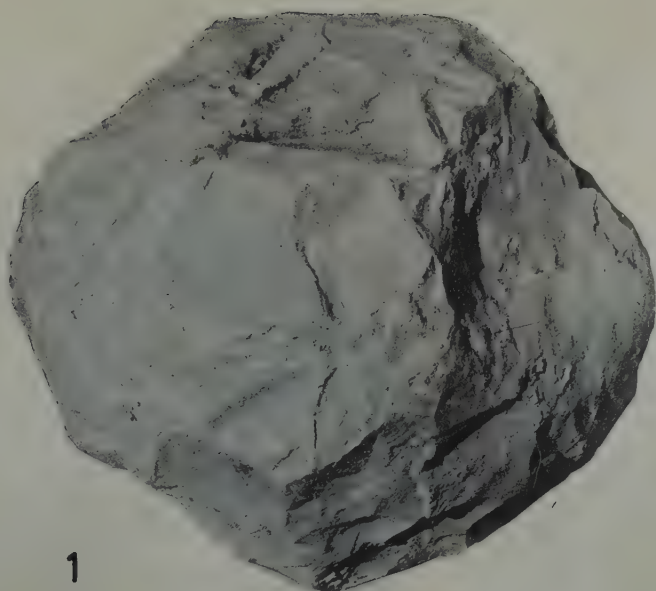


0 5 cm.

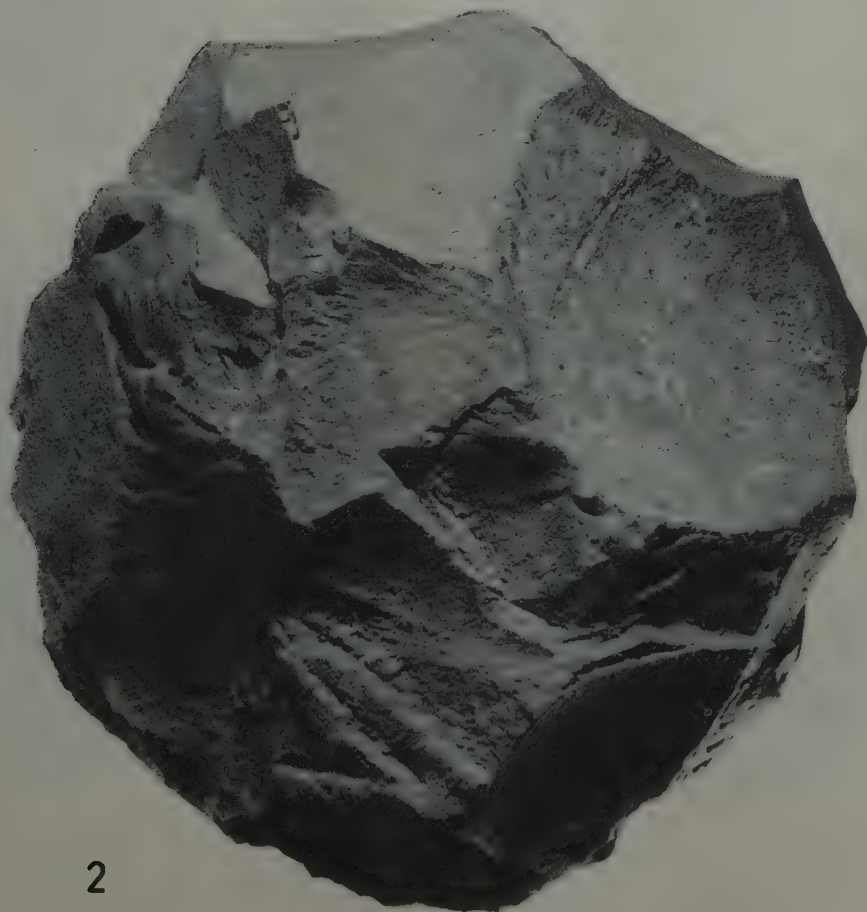
Tribedral Pick



0 5 cm.

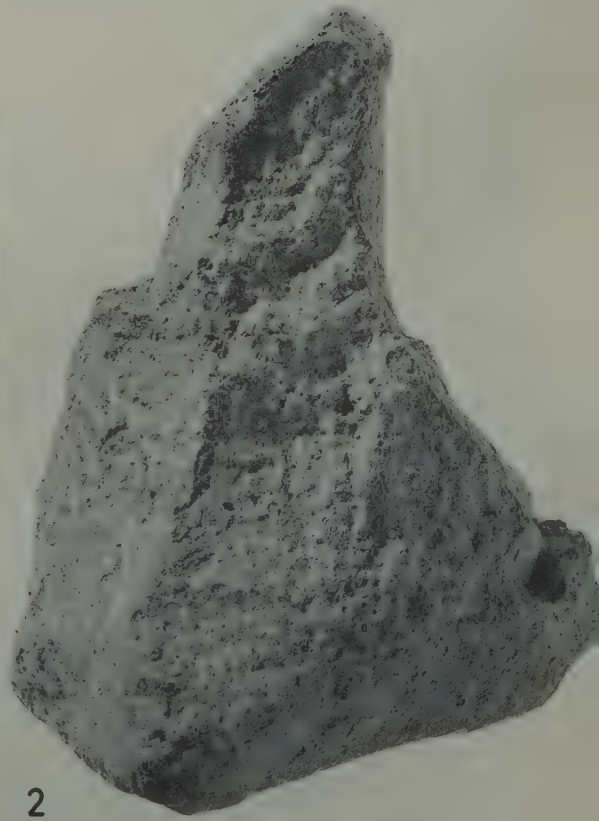


0 5 cm.

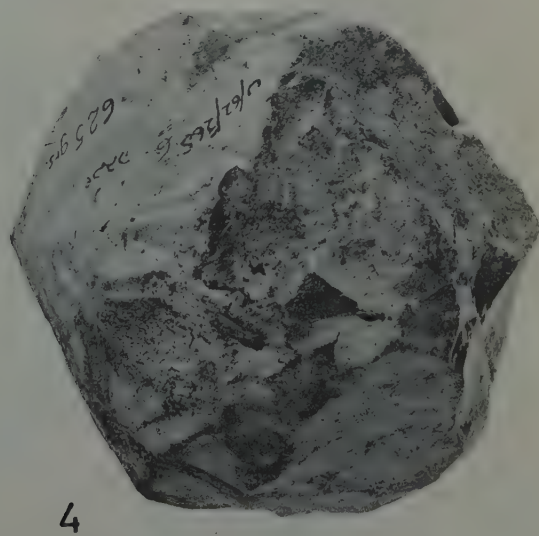
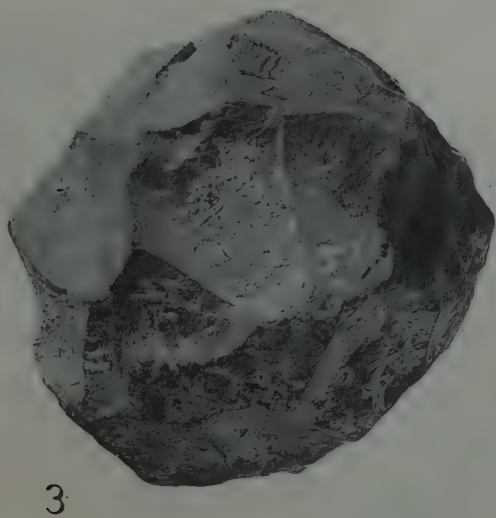
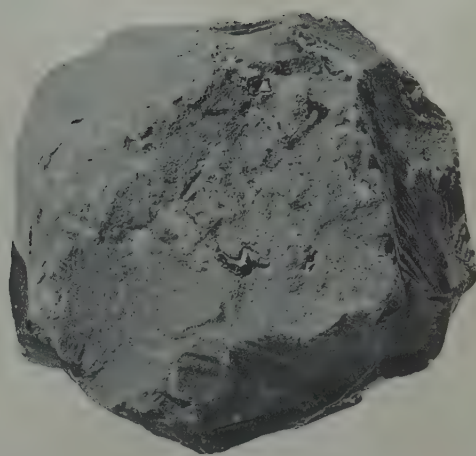
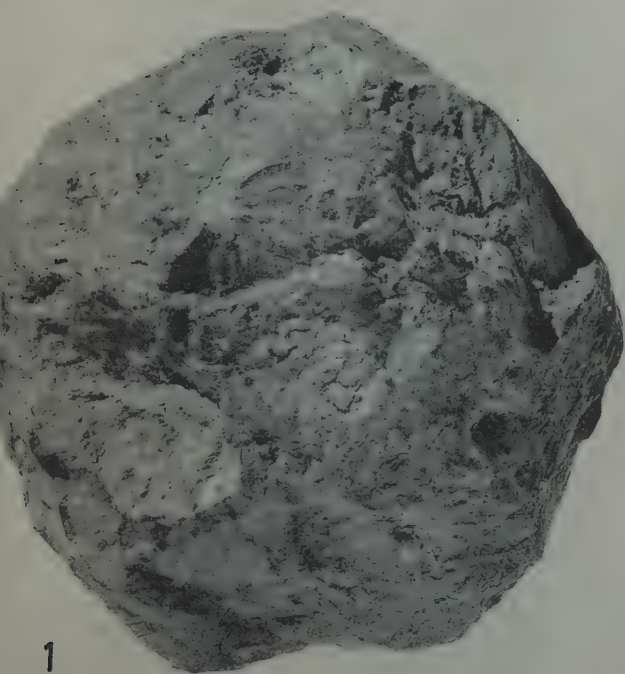


0 5 10 15 cm.

1. *Cleaver* 2. *Trihedral Pick*



0 5 cm.



1. Bone Tool 2. Hand-axe of Basalt



0 5 cm.



420