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REPORT OF DIRECTOR

ACCOMPANYING PAPER

Edited by George Grant MacCurdy, Director

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CONTENTS

Report

Accompanying Paper

REPORT BY THE DIRECTOR ON THE WORK OF THE NINTH SUMMER SESSION

To the Board of Trustees of the American School of Prehistoric Research:

The Ninth Summer Session of the American School of Prehistoric Research opened in London on July 1st. Some ten days were spent in conferences, a study of museum collections and field trips. In this work the Director had the benefit of valued assistance from certain of his British colleagues including: Sir Arthur Keith of the Royal College of Surgeons, O. Hawkes of the British Museum, A. T. Hopwood and F. O. Barlow of the Natural History Museum, South Kensington, J. Reid Moir and Guy Maynard of Ipswich, and J. E. Sainty of Norwich.

The next point for study was the region about Amiens where sand and gravel pits in the terraces of the Somme valley are still exploited at St. Acheul, Cagny, and Montières. The students were able to obtain a number of Paleolithic flint implements from the terrace nearest the river, also the one at a somewhat higher level. The specimens having been found in situ, the students were able to refer them to their proper cultural epochs in the Paleolithic Period.

A few days were spent in Paris for study of collections at the *Institut de Paléontologie Humaine,* the *Museum d'Histoire Naturelle,* and the *Musée des Antiquités Nationales* at St. Germain-en-Laye, after which we devoted a week to Brittany studying the megalithic monuments, particularly in the region about Carnac and in making use of the Museums at Carnac and Vannes.

Our next objective was northern Spain with its incomparable caverns of Altamira and Castillo. While in Spain we had the assistance of the Abbé Jesus Carballo, Curator of the Prehistoric Museum in Santander, who is carrying on excavations in the cave of El Pendo, and who has kindly invited our School to coöperate with him in digging at El Pendo during the summer of 1930. Aurignacian, Solutrean, Magdalenian and Azilian cultures are all represented at El Pendo, which has also yielded some fine examples of cave art, the most recent being a beautifully decorated baton.

From northern Spain, we went direct to Toulouse and the principal caverns of the Pyrenees including Niaux, Portel, Mas d'Azil, and Trois-Frères. Opportunity was given for a study of the prehistoric collections

not only in Toulouse but also at Foix and the latest finds from Trois-Frères. On August 1st we reached St. Léon-sur-Vézère for the usual season of digging at the rock shelter of *Les Merveilles,* leased for the purpose by the Archæological Society of Washington. There we remained until the end of August. During our stay in France, we received much valuable assistance from such well-known prehistorians as Le Rouzic in Brittany, Comte Begouen and his son Louis in the Pyrenees, and Dr. Raymond Vaufrey in Paris.

Eight students were enrolled: Professor and Mrs. Frank Carney, Baylor University; Professor James B. Bullitt, University of North Carolina; Professor H. R. Fairclough, Stanford University; Dean Homer P. Little, Clark University; Henry M. Kendall, University of Michigan; Anthony D. Eastman, Amherst College; and Malcolm Lloyd, Jr., Philadelphia. Two additional students joined our party for part of the time: Dean Harriet M. Allyn, Mount Holyoke College, and Dr. Martha Hackett, South Hadley, Massachusetts. Of the 49 conferences given, 29 were by the Director, 19 by foreign specialists, and 1 by one of our students: Dean Harriet M. Allyn of Mount Holyoke College. Specimens dug from the rock shelter of *Les Merveilles* were sent to institutions entitled to receive them on account of contributions to the School Fund.

Expeditions

In addition to training students, the School has another function to perform. It should take advantage of every opportunity to extend our knowledge of prehistory. This can best be done by means of expeditions manned in part at least by students trained in our School. We have already completed a season of exploration in Iraq (1928), jointly with the British. The results of this expedition, which was in charge of Miss Dorothy Garrod of Cambridge University, are published in this Bulletin.

During April, May and June, 1929, we coöperated with the British School of Archæology at Jerusalem in excavating three caves in the Wady el Mughara at Jebba, near Athlit and south of Haifa, Palestine: Mugharet el Wad (Big Cave), Schief el Tabone (Oven Cave), and the Cave of the Kids. Here again Miss Garrod, representing the British School, was in charge while our School was represented by Dean Harriet M. Allyn of Mount Holyoke College and Dr. Martha Hackett. The cave deposits have proved to be exceedingly rich in relics not only of Paleolithic age but also of the Mesolithic age. The superficial deposits have yielded remains

of the Hellenic, Roman, Arab and Byzantine cultures. Our School's share of the specimens from Iraq as well as from Palestine will be distributed to institutions entitled to receive the same as participating members. At least one more season will be required to complete the excavation of these three caves. Work will be resumed there during the coming spring jointly by the British School and our School of Prehistoric Research. Bulletin No. 5 (27 pp.) has been published.

Respectfully submitted,

GEORGE GRANT MACCURDY,

Director.

NEW HAVEN, December 26, 1929.

FIGURE 1. Map of Iraq and adjoining countries.

THE PALÆOLITHIC OF SOUTHERN KURDISTAN: EXCAVATIONS IN THE CAVES OF ZARZI AND HAZAR MERD

By D. A. E. Garrod

With notes by D. M. A. Bate and F. Turville-Petre.

The prospection and excavations in the Sulaimani liwa, North-eastern Iraq, described below, were undertaken as a Joint Expedition of the American School of Prehistoric Research and the Percy Sladen Memorial Fund. The members of the party were as follows:

Miss D. A. E. Garrod
(Representing the Percy Sladen Memorial Fund)
Mrs. C. A. Baynes
(Representing the Percy Sladen Memorial Fund)
Mr. Robert A. Franks, Jr.
(Representing the American School of Prehistoric Research)
Mr. F. Turville-Petre
(Representing the American School of Prehistoric Research)

In March, 1928, at the request of Mr. Cooke, Hon. Director of Antiquities, I went over to Baghdad from Jerusalem, in order to discuss our plans for this expedition. At Mr. Cooke's suggestion I went north to Kirkuk to make enquiries about the possibility of work in the Sulaimani liwa, and while I was there I had the good fortune to find a number of Mousterian implements in surface spreads of gravel near the town. On my return to Baghdad, I made a definite arrangement with Mr. Cooke that the expedition should be given a permit to excavate caves in the Sulaimani liwa during the following autumn.

The members of the expedition left Baghdad on the 15th October, 1928, going by rail to Kirkuk, and thence by car, arriving at Sulaimani on the 18th October. A base camp was set up in the Air Force compound at Sulaimani, and eleven days were spent in reconnoitring, in order to decide which sites were most promising before making a definite move. A group of six caves near the village of Hazar Merd, eight kilometers south-west of Sulaimani, were visited and slight traces of Mousterian occupation were found. On the advice of Captain Lyon, Administrative Inspector of the Sulaimani liwa, Mr. Franks and Mr. Turville-Petre made a scouting trip to the Surdash area, 35 kilometres to the north. They visited a number of

caves and rock-shelters, and made soundings in those which appeared in any way promising, but only one yielded traces of occupation during the Stone Age. This was a very small cave near the village of Zarzi, from which a large number of flint implements of Upper Palæolithic type were obtained.

On the 1st November camp was moved to Zarzi, and excavations were begun on the 3rd November, the workmen being Kurds from the neighboring villages. Excavations were brought to an end on the 11th November, and on the 14th we returned to Sulaimani. Camp was moved to Hazar Merd on the 18th November, and excavations began on the 20th. Owing to bad weather and shortage of funds, digging was closed down on the 6th December, and on the 10th we left Sulaimani, arriving in Baghdad on the 13th. In accordance with the Iraq Law of Antiquities, Mr. Lionel Smith, in the absence of the Honorary Director, made a division of the material obtained, taking a half-share for the Baghdad Museum. The remaining half has been equally divided between the American School of Prehistoric Research and the Percy Sladen Memorial Fund. By kind permission of Mr. Smith the Iraq Government's share was taken to Jerusalem for study, and returned later to the Baghdad Museum.

We have to express our gratitude to the Iraq Government for providing us with police escort, and to thank the following officials and others who helped us in various ways: Mr. Cooke, Honorary Director of Antiquities; Mr. Lionel Smith, Department of Education; Major Lloyd, Administrative Inspector, Kirkuk; Captain Lyon, Administrative Inspector, Sulaimani; Captain Sheppard, Inspecting Officer of Police, Sulaimani; Ahmed Beg, Mutasarrif of Sulaimani; Murad Beg, Commandant of Police, Sulaimani; Mr. T. F. Williamson, Geologist to the Iraq Petroleum Company.

From the Shatt-al-'Arab northward to Khanikin, a distance of some 500 km., the dividing-line between Persia and Iraq runs west of the foothills of the Zagros arc, the great mountain wall which supports the southwestern border of the Persian plateau, but at Khanikin it turns N.E. and follows the Diala valley for 120 km. before taking again its general N.W. trend. By this setting-back of the frontier, a part of the hill-country of Southern Kurdistan is included in the kingdom of Iraq, although geographically it is continuous with Luristan, over the Persian border to the S. of the Diala. The town of Sulaimani, which lies in this pocket 265 km. N.E. of Baghdad, and 45 km. west of the Persian frontier, has sometimes been called the capital of Southern Kurdistan. It has a population of about 10,000, including small communities of Arabs, Jews, Sabæans, and Assyrian Christians of the Nestorian and Chaldæan churches. The surrounding country, however is peopled entirely by

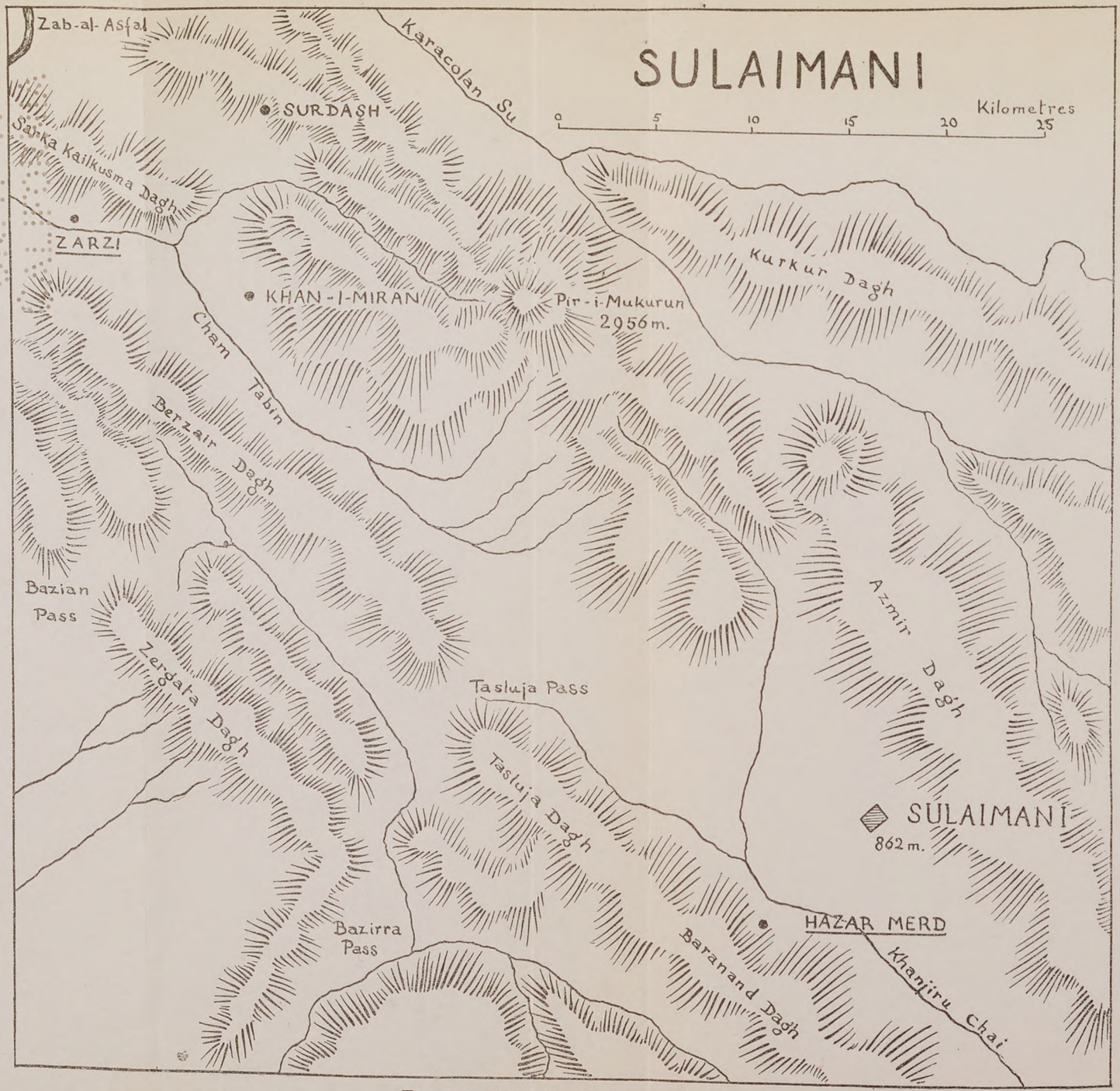

FIGURE 2. Map of the Sulaimani district.

Kermanji-speaking Kurds, of whom some are settled in villages, while others belong to semi-nomadic pastoral tribes, such as the Jaf and the Hamavand, who spend the summer in the mountains, and migrate to the Tigris plain in the winter. The district has long had the reputation of being disturbed and lawless, the Hamavand in particular being notorious raiders with a bad record of violence and crime. Twice since the end of the war, Southern Kurdistan, under the leadership of Shaikh Mahmud, head of the priestly family of Sulaimani, has revolted successfully against the central government, and it is only within the last three years that really effective control has been established. The banishment of Shaikh Mahmud, who now lives in exile just across the Persian frontier, has, however, brought peace and the beginning of prosperity to the district, and the fact that we were allowed to move freely about the Sulaimani liwa (though always, of course, with an armed escort) is a most striking sign of changed times.

The structure of the region is clearly shown on any good physical map. The Zagros arc is built up of a succession of folded concentric bands, forming long ridges which rise somewhat abruptly from the foothills of the Tigris plain to the high mountains which fringe the Persian plateau, and run with remarkable regularity from Mt. Ararat south-eastward to Shiraz. The rock-sequence ranges from the Pliocene of the foot-hills to the Archæan, the older geological elements appearing in regular succession as the Tigris plain is left behind.

The segment of this arc with which we are immediately concerned is that which lies between the Lesser Zab and the Diala, with Sulaimani as its centre. (Map, Fig. 2.) A general idea of the lie of the country will best be given by a short description of the journey of 100 km. from Kirkuk, which stands at 304 m. above sea-level on the edge of the Tigris plain, to Sulaimani, at 862 m. above sea-level.

On leaving Kirkuk the road immediately enters a country of low, bare hills, formed of the gypsiferous rocks of the Fars series,—a peculiarly desolate landscape of the Bad Lands type. A number of not very well defined ridges are crossed in the 40 km. between Kirkuk and Chemchemal, and these show a sequence ranging from calcareous gypsum through red and brown sands and sandstones to loosely cemented limestone conglomerate. Chemchemal itself is a rather miserable Kurdish village lying among low hills of red standstone and sand, and notable only for a curious high artificial mound, at the foot of which the houses are grouped. From a rise in the ground beyond the village one has a fine view over the country which lies ahead. The low sandstone hills stretch for another 15 km. up to the foot of a bare precipitous wall of limestone. A v-shaped depression in this

wall is the Bazian Pass, one of the principal gateways into Southern Kurdistan, and through this appears the massive summit of Pir-i-Mukurun, snow-covered for half the year. Far away to the north a group of high peaks marks the position of Rowanduz and the sources of the Greater Zab.

The ridge which is crossed by the Bazian Pass is the first of the Nummulitic limestone series, and marks the transition from the foothills to the true mountain country. Once through the pass, the folds which build up the Zagros are much more clearly defined than in the softer rocks below. We enter a succession of flat-bottomed valleys, separated by bold parallel ridges running S.E. and N.W. The hillsides are still rather bare, although dwarf oak begins to appear, and the only human dwellings visible are occasional police posts and the black tents of the Hamavand, whose country this is. After leaving the pass, we turn S.E. down the second of two parallel valleys, and travel for some 15 km. with the limestone ridge of the Berzair Dagh on our left, until we climb again to the Tasluja Pass, and from its summit look over the wide valley of Sulaimani.

The town itself lies to our right, at the foot of the Azmir Dagh, a bare range of indurated Cretaceous limestone which forms the eastern wall of the valley at this point. To the left is Pir-i-Mukurun, the highest mountain of the region (2965 m.), a wild-looking mass of dark rock which dominates the eastern side of the valley from the northern end of the Azmir Dagh to the rugged peaks of the Surdash district, which overlook the Lesser Zab 35 km. away to the N.W.

The valley bottom, which is 10 km. wide at the level of Sulaimani, keeps an even width as far as the eye can reach to the S.E. where it is bounded by the Auroman Mts., which dominate the upper reaches of the Diala, 70 km. away. To the N.W., on the contrary, it narrows rapidly, and the country is much more broken and varied. Immediately opposite the Tasluja Pass is the line of watershed of two rivers: the Khanjiru Chai, which flows S.E. past Sulaimani to the Diala, and the Cham Tabin, which comes down from the western slopes of Pir-i-Mukurun, and flows N.W. to the Lesser Zab.

The prospect from the Tasluja Pass is markedly bare and desolate, but if we climb the Azmir Dagh by the pass immediately behind Sulaimani a very striking contrast is revealed. Behind us lies the barren valley of the Khanjiru Chai, with hardly a tree in sight, but in front, right away to the Persian frontier and beyond, the hills are covered with a forest of dwarf oak.

Sulaimani is built in the Persian style, the mud-brick houses having flat roofs made of branches, and open balconies, but the trees and gardens of the true Persian town are wanting. Formerly it was a prosperous place, and a centre of trade, but thanks to the misrule of its priestly family, and

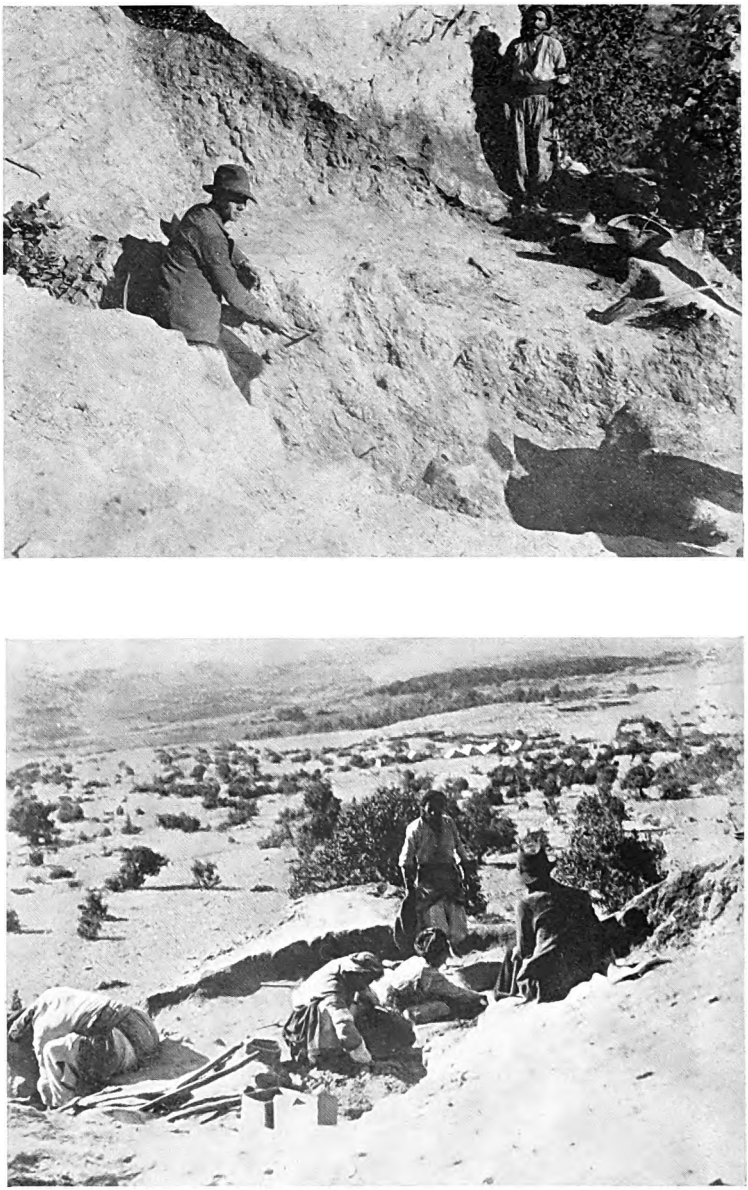

FIGURE 4. Cave of Zarzi. (a) Trench γ, east side. The seated figure is pointing to the base of the archæological level B. (b) Trench γ, west side.

more especially of Shaikh Mahmud and his father Shaikh Said, it was half-ruined by the end of the 19th century. Now, with the return of peace and ordered government, it is beginning to recover, and it is a rather amusing sign of better times that its metal-workers, once famous as makers of firearms, are now devoting their whole talent and industry to the production of excessively ornate brass sugar hammers.

For political reasons the country round Sulaimani has long been more or less inaccessible to the archæologist, and although it was visited by J. de Morgan, and in 1927 by Dr. Speiser, of the University of Pennsylvania who made a reconnoitring trip in search of proto-historic remains, ours was the first regular archæological expedition to enter the district, which from the point of view of prehistory was virgin soil. We had, however, certain "pointers" which encouraged us to hope for good results. We knew that there were caves in the ridges of nummulitic limestone, and that these were not at too great an altitude to be inhabitable, even in a glacial period. Moreover the discovery in 1926 by Mr. L. H. D. Buxton and Mr. Henry Field of Palæolithic implements on the surface of the N. Arabian desert, (afterwards confirmed by the Marshall Field Expeditions of 1927-8), pointed to Palæolithic migrations between Syria and Upper Mesopotamia (Lower Mesopotamia, of course, being at that time covered by the Persian Gulf), while my own discovery, in 1928, of Mousterian implements in gravels near Kirkuk brought the trail right up to the foot of the Zagros arc.

Our excavations in the caves of Zarzi and Hazar Merd justified these hopes, and proved the presence of both Mousterian and Upper Palæolithic man in the Sulaimani region.

The Cave of Zarzi (figs. 3, 4).

The village of Zarzi lies 50 km. N.W. of Sulaimani, in the valley of the Cham Tabin, about 20 km. above its junction with the Lesser Zab. The valley is here quite narrow, and the country, as I have already said, is much more broken and varied than in the immediate neighborhood of Sulaimani, and also less bare, the hillsides being sparsely wooded with dwarf oak. The village consists of five or six houses grouped close together on the right bank of the river, at a point where the steep slope of limestone which forms the northern wall of the valley widens out into a fine natural amphitheatre. The cave, which faces south, lies approximately in the centre of this amphitheatre, near the foot of the slope, and 95 metres above the river. It is a small shallow chamber, 8 m. x 8 m., with a maximum height of 2.25 m., formed in a horizontal joint of the limestone, and would perhaps be more correctly described as a rock-shelter.

Before excavation the ground fell steeply from the mouth of the cave to the foot of the slope, and on the surface of this talus flint implements of Upper Palæolithic type were fairly abundant. Our diggings subsequently made it clear that the main archæological deposit lay in the terrace at the mouth of the cave and in the upper part of the talus, the chamber itself containing only a thin and much disturbed layer of earth.

In the course of excavation the cave was emptied completely and digging was carried down to the rock in the middle portion of the terrace and in a narrow trench running down the slope (Z on plan, fig. 5). As this showed that the lower part of the terrace deposit was sterile, the lateral extensions of the trench (Y, Y, on plan) were carried deep enough to clear the base of the archæological layer, but did not touch the rock, while in the extreme south-western angle of the trench (X, on plan) where the surface of the rock rose rather steeply and implements were rare, a still shallower excavation (50 cm.) was sufficient.

The system of digging adopted consisted in deepening the trenches by a series of *décapages,* each about 30 cm. in depth, the earth being carefully searched on the spot.

The longitudinal section (fig. 6) shows the following disposition of layers in the shelter and on the terrace, from above downwards: A. Mixed. B. Upper Palæolithic. C. Sterile.

A. Hard whitish earth, capped with dust; average depth 50 cm. This layer yielded a small amount of rough pottery and some flint implements similar to those found in the Palæolithic layer B. A few animal bones, apparently not very ancient, were also found. This mixed layer occurred only inside the cave. It did not completely cover the rock floor, which rose rather steeply and emerged from the deposit along the east wall of the chamber.

B. White calcareous earth, containing numerous angular fragments of limestone; depth 50 cm.—1.50 m. This took the place of A in the mouth of the cave, (no clear line of demarcation being visible between the two) and spread on to the terrace and down the slope. Flint implements and flakes belonging to an Upper Palæolithic industry of Aurignacian type were scattered all through this layer in great abundance. No traces of hearths were visible, but some of the flints had been cracked by fire. Animal remains were rare and badly preserved, consisting for the most part of unidentifiable chips of bone. In many cases both flints and bones were covered with a white calcareous concretion. No pottery was found in any part of the terrace, and it was obvious that B contained a single unmixed archæological level, later occupations of the site not having extended outside the cave.

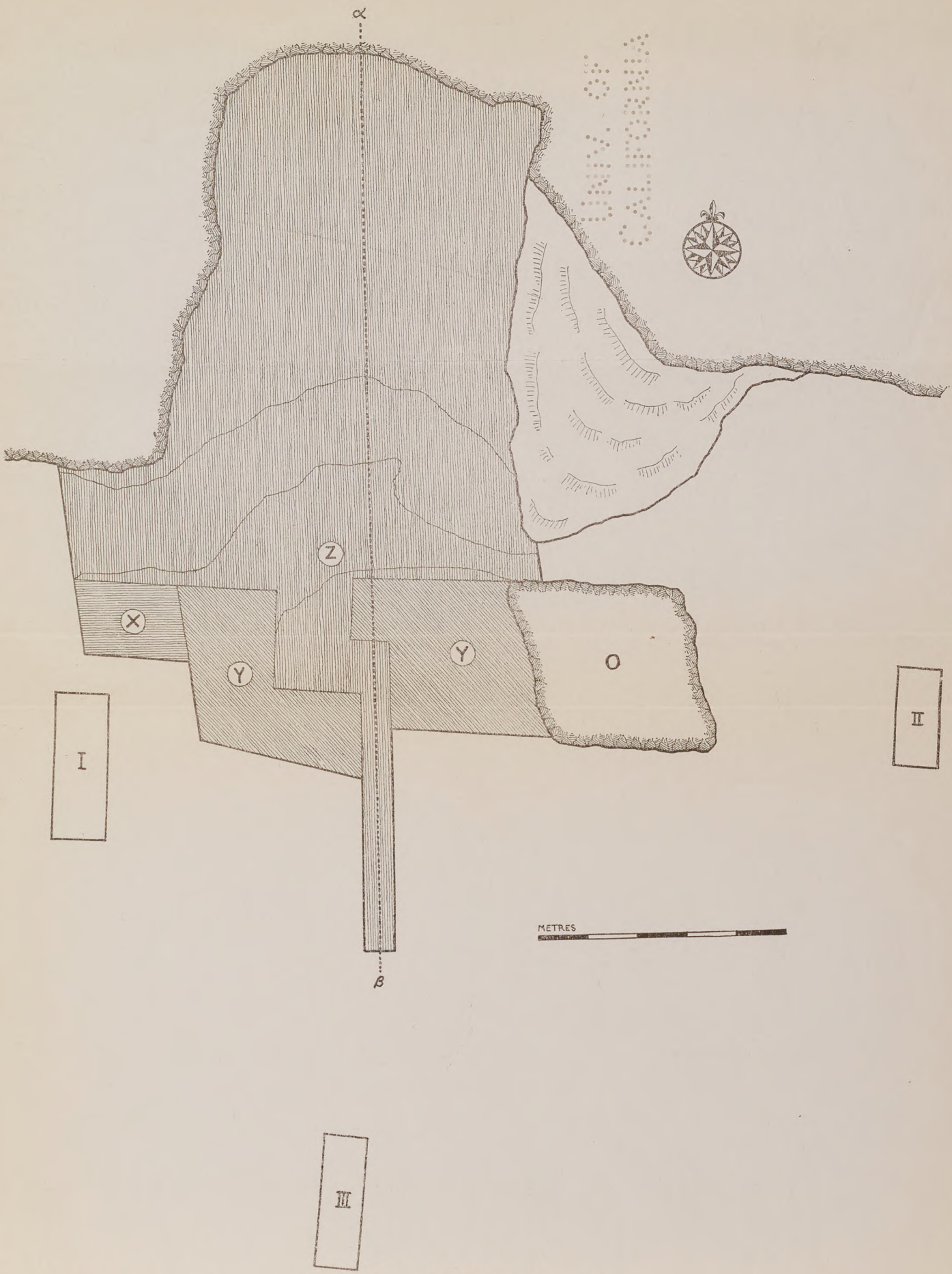

FIGURE 5. Cave of Zarzi. Ground plan.

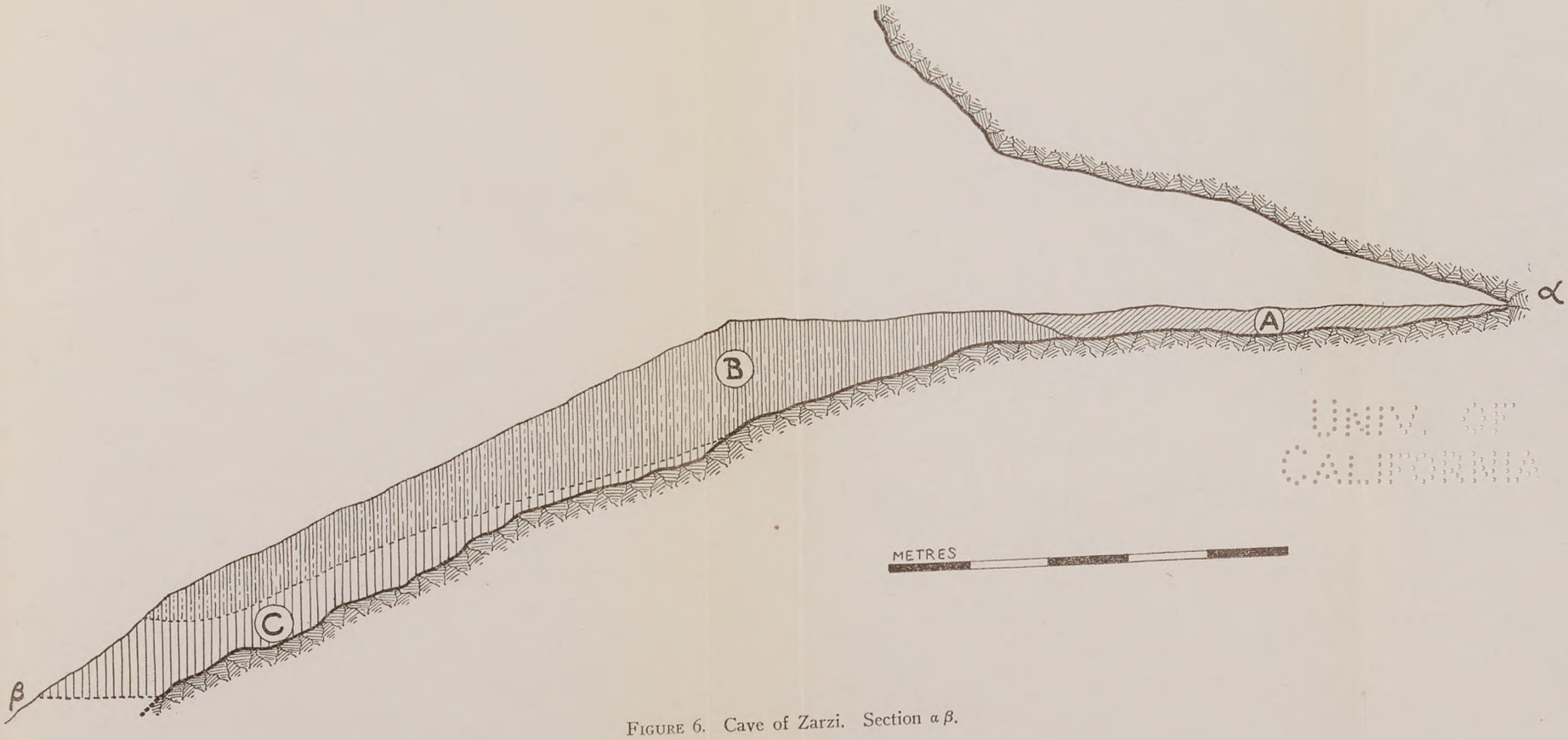

FIGURE 6. Cave of Zarzi. Section $\alpha\beta$.

In the mouth of the cave, B rested immediately on the rock, and had a maximum thickness of 1.30 m., but further down the slope it became shallower, and an underlying layer (C) separated it from the rock. In appearance C was hardly distinguishable from B, but in consistency it was considerably tougher, and was completely sterile.

Implements were most abundant immediately outside the mouth of the cave, and became more and more rare further down the slope, until they disappeared altogether 1.50 m. north of the point β (Figs. 5, 6). To the west of the cave-mouth also, where the rock cropped out on the slope, the archæological level died out very rapidly, so that for all practical purposes the western and southern limits of the excavation appeared to agree with the limits of the archæological site. In the east wall of the excavation, on the other hand, B passed under a very large fallen block of limestone (0 on Plan) and along this line implements were still fairly abundant. There is therefore no doubt that a part of the archæological deposit still lies in place under this block, which must have fallen after the Aurignacian occupation of the site had come to an end.

As a precaution, three soundings were made outside the limits of the main excavation (I, II and III on Plan), but these proved completely sterile.

The position of the Zarzi cave, in a sheltered amphitheatre, facing south, and less than a quarter of a mile from the river, made it an ideal camping-place for palæolithic man, and explains why so small and shallow a chamber was chosen for a habitation in preference to larger ones in the same region which are less favorably placed. Its sheltered aspect also explains the abundant traces of occupation outside the cave mouth, a feature in which it differs very markedly from the northward facing caves of Hazar Merd.

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The flint implements and other archæological remains from level B belong to a single industry, the only sign of change or development being the appearance of microlithic geometrical forms in the uppermost part of the deposit.

Flint Implements.

The material used is very varied both in color and in texture, and has evidently, for the most part, been obtained in form of pebbles, since a number of the cores still bear portions of the original pebble surface. Red and green jasper, grey and buff flint and red and grey chert are the

most common, but a fair number of flakes and implements are made of silicified foraminiferous limestone. Two small fragments of obsidian were found.

The industry is a small one, on the whole; the longest implements do not exceed 10 cm., and the majority are under 6 cm., while the blades are delicate and narrow. This is probably due in part to the small size of the local flint pebbles; the majority of the larger implements, such as the Gravette points, and the massive scrapers are made of red chert, which must have been obtainable in larger nodules, or of silicified limestone.

The implements belong to the following leading types.

Shouldered point (fig. 7, no. 6). There is one complete example of the single-shouldered point, and a small fragment of a second. In the complete specimen the tang has been shaped by an inverse retouch which is prolonged right up the left-hand edge of the blade to the tip.

Gravette points (fig. 7, nos. 1-4). These are of classic type, with the back battered more or less at right angles to the surfaces of the blade. The complete specimens are all rounded at the tip, but among the fragments there are a number of sharp points. In every case the bulb has been chipped away, and in nos. 2 and 3 the bulbar end has been thinned by retouch on the underside of the flake.

Dos rabattu blades (blades with back worked down, fig. 7, no. 5). The ordinary *dos rabattu* "pen-knife" blade is scarce, and the few specimens are much smaller than the Gravette points. No. 5 is the only one which is squared at the tip.

Inverse retouch (fig. 7, nos. 7, 8). A small number of implements belonging to various categories show more or less working on the bulbar surface, but although occasional attempts at thinning are visible, as in no. 7, in no case does this working really resemble the characteristic proto-Solutrean retouch.

Notched blades (fig. 7, nos. 9-15). These are very abundant and very varied, but they can be divided roughly into two categories. In the first, the notches are small and affect only the edge of the blade; in the second they are much larger, and bite deeply into the blade, modifying its shape. The implements in the first category range from flakes with a single notch to those in which one or both edges are coarsely serrated (no. 14); the second includes the blade with opposed notches *"lame étranglée"* (no. 9), and a number of irregular shapes (nos. 10-12).

Gravers (fig. 7, nos. 16-24).

(a) Angle gravers (nos. 16-20). This is the leading type. All specimens except one are single, the majority having the graver-blow to the left.

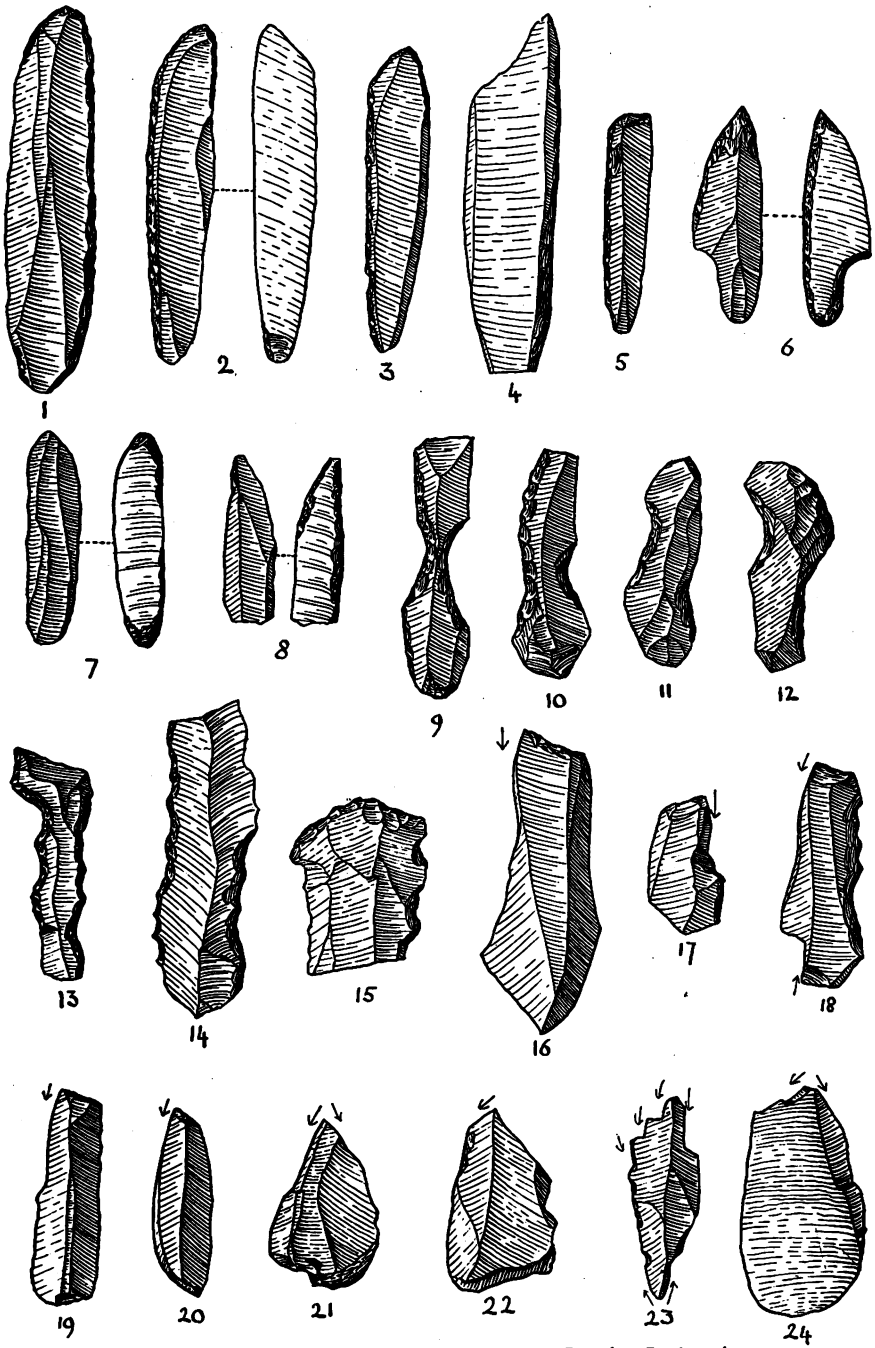

FIGURE 7. Implements from layer B. Zarzi. Scale ⅔.

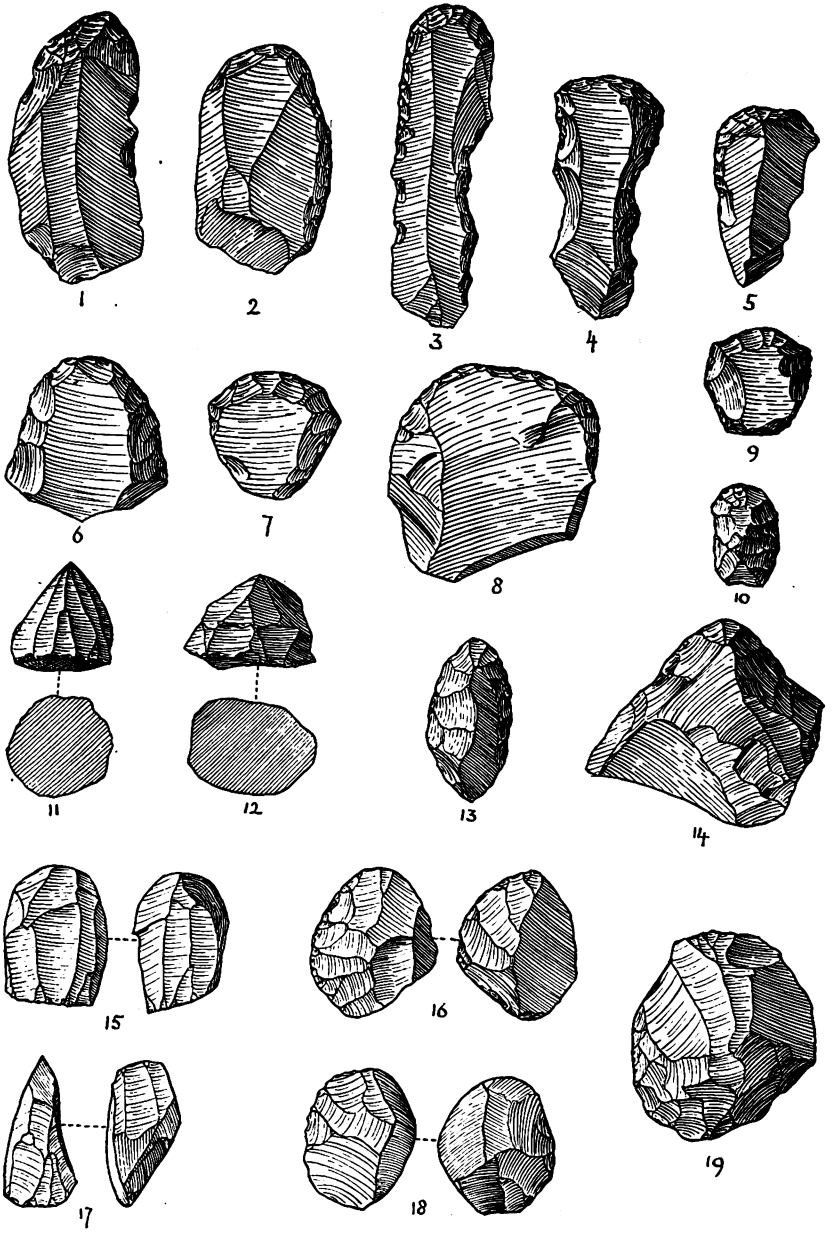

FIGURE 8. Implements from layer B. Zarzi. Scale ⅔.

The double specimen has the graver-blows to right and left at the same end of the flake. There are three examples of the small Noailles graver (no. 20).

(b) *Bec-de-flute* (flute mouthpiece) gravers (nos. 21-24). No. 23,

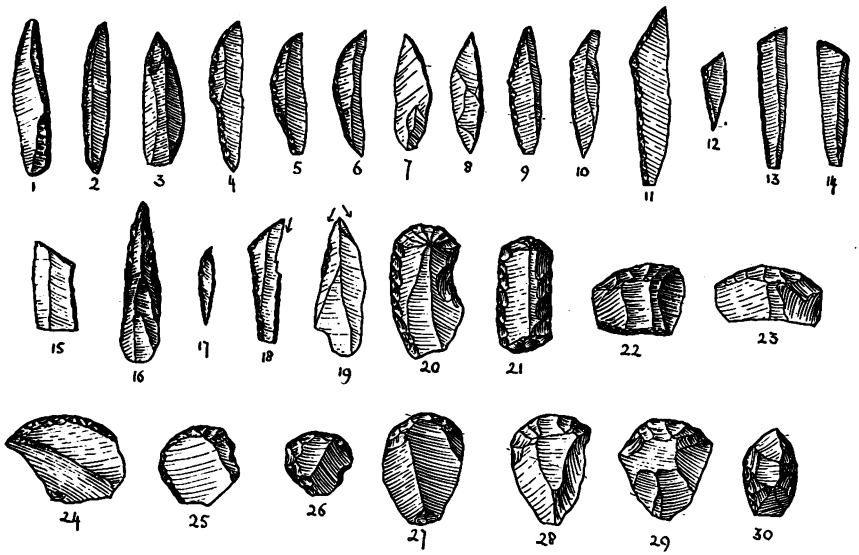

FIGURE 9. Implements from layer B. Zarzi. Scale ⅔.

which is double, has been renewed several times at both ends.

(c) Prismatic gravers.

(d) Plane-graver. A single specimen.

In addition to these there are a few single-blow gravers of no special interest.

Scrapers.

(a) End-scrapers (fig. 8, nos. 1-5). The majority are single, and are made on rather wide blades, more or less retouched along the edges. A few (nos. 3, 4) are deeply notched. Some of the smaller specimens, made on flakes, are roughly pear-shaped (no. 5).

(b) Discoidal scrapers (fig. 8, nos. 6, 7, 8). These vary in size and shape, but the majority are small and roughly circular.

(c) Rostrate scrapers (fig. 8, nos. 10, 14). A small series, and not very typical.

(d) Hollow scrapers. A few chunks of flint are notched so as to make rough spoke-shaves.

(e) Steep scrapers (fig. 8, nos. 9, 13). A small series, intermediate in form between the flat discoidal scrapers and the true core-scrapers.

(f) Core-scrapers (fig. 8, nos. 11-16). This is the largest series and can be sub-divided into a number of classes, each of which contains, at

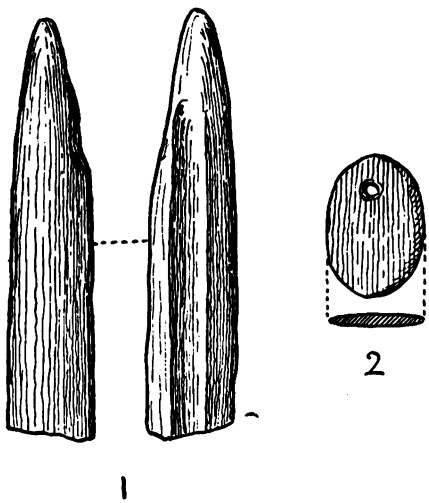

FIGURE 10. Bone point and schist pendant, layer B. Zarzi. Scale $\frac{1}{1}$

one end, specimens which are evidently deliberately fashioned as scrapers, and at the other, re-utilised cores and core-fragments, often very rough, which repeat, more or less, the types of the finished implements. The sub-divisions are as follows:

(i) Pyramidal scrapers (no. 11). Good specimens are very rare.

(ii) Plane scrapers (*rabots*) (nos. 12, 15). In these the lamellar retouch does not go right round, but is limited to a curved front, more or less semi-circular. In many, the part that is not retouched retains the cortex of the pebble.

(iii) Double scrapers (nos. 16, 17, 19). In these, two or more scraping edges are placed at various angles.

(g) Massive scrapers. The majority are large flakes or chunks of chert or limestone, with a roughly fashioned scraping edge.

Core-Choppers (fig. 8, no. 18). A few pebbles bear a strong, sinuous chopping-edge, produced by alternate retouch.

Squamous flakes. Three specimens.

Microlithic industry. There is a fairly large microlithic series, and these, with the exception of the triangular forms, were found all through the archæological level.

(a) *Dos rabattu blades* (fig. 9, nos. 1-8). A few specimens are straight-backed, but the majority are slightly curved, and approach, more or less, the crescentic form, although no true crescents were found.

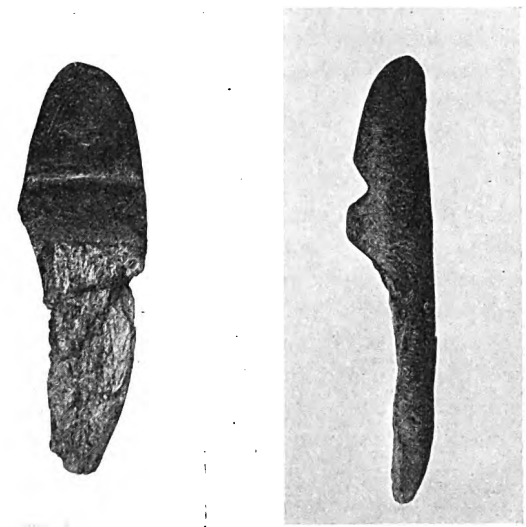

FIGURE 11. Schist polisher from layer B. Zarzi, Scale $\frac{1}{1}$

(b) Sub-triangular points (fig. 9, nos. 9-15). The elongated triangle, which is the only geometric form found at Zarzi, was confined to the upper part of the archæological level.

(c) Borers (fig. 9, nos. 16, 17).

(d) Gravers (fig. 9, nos. 18, 19). No. 18 is a minute angle-graver made on a triangle; no. 19 is a bec-de-flute. In addition to these one micro-graver of true Tardenoisian type was found.

(e) Scrapers (fig. 9, nos. 20-30). There is a large and varied series of micro-scrapers. Nos. 20 and 21 are miniature end-scrapers. Short, wide ones are made either on small flakes of a suitable shape or on the bulbar end or tip of a broken blade (nos. 22, 23, 24). The remaining specimens

The Dark Cave, Hazar Merd (fig. 12).

The caves of Hazar Merd lie about 8 km. S.W. of Sulaimani in the Baranand Dagh, the ridge of Nummulitic limestone which faces the Azmir Dagh on the western side of the valley of the Khanjiru Chai. The two villages which bear the name of Hazar Merd* lie about a kilometre apart, near the foot of the Dagh, which rises behind them in a steep but somewhat broken slope, culminating in a limestone cliff facing N.E. at about 1200 m. above sea-level. The six caves lie close together in a row at the foot of this cliff, and at the top of a grassy slope which falls very steeply to a little plateau 120 m. below. A small torrent rises on the north-eastern edge of this plateau and runs through a charming valley down to the more northerly of the two villages of Hazar Merd. The terrace in front of the caves commands a wide view over the valley of Sulaimani, from Pir-i-Mukurun and the wild peaks of Surdash on the north to the splendid line of the Auroman Mountains behind Halabja in the south.

The following is a brief description of the caves from north to south:

1. A small open shelter with a short corridor running back from it, unnamed.
2. The Cave of the Weaver (*Ashkot-i-Jola*), almost identical in shape with 1.
3. The Dark Cave (*Ashkot-i-Tarik*). This is the cave excavated by us, and described in detail below.
4. The Water Cave (*Ashkot-i-Au*). A large open cave with passages running a short distance into the rock. There was no water in the cave at the time we were there.
5. The Cave of the Cattle (*Ashkot-i-Galaga*). A small opening leads into a corridor through which a large and lofty chamber is reached.
6. A very small cave or shelter, unnamed.

Soundings were made in nos. 1-5, but only the Dark Cave and the Water Cave yielded any traces of Palæolithic occupation. In 1 and 2 trenches were dug on the terrace and inside the shelters. The deposit was red stony earth, and rock was reached at depths varying from 1 to 2 metres. In all the trenches only a few fragments of pottery and some untypical flints were found. In 5 a trench was made across the entrance and the deposit was found to be a soft brown earth containing pottery. The

* The Kermanji name Hazar Merd means "A Thousand Men," or "A Thousand Husbands," and local tradition says that the two villages are all that remain of a much bigger town which could formerly boast of containing a thousand men of marriageable age.

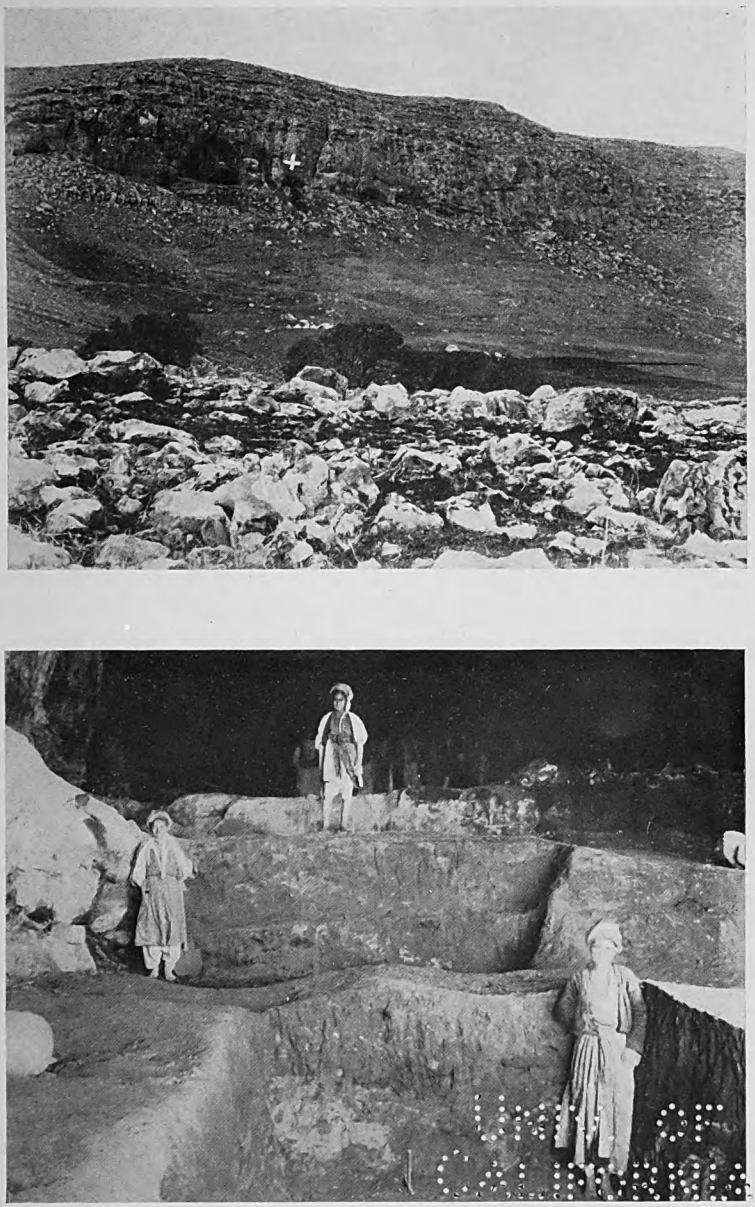

FIGURE 12. (a) Caves of Hazar Merd. The Dark Cave is marked with a +.
(b) The Dark Cave. Hazar Merd. Interior during excavation. The boy in the foreground is standing just above the rock floor of the cave; the boy in the background is standing on the surface of the Mousterian deposit C.

sounding was not carried below 1 m., as it became necessary to concentrate on the excavation of the Dark Cave.

In the Water Cave remains of a very hard breccia were visible in places against the rock wall. Minute fragments of bone and charcoal could be seen in this breccia, and on our first visit a broken disc of Mousterian type was obtained from it. A trench dug across the large chamber of the cave reached the surface of this breccia after passing through very fine dry earth with an average depth of 50 cm. It was evident that the cave had formerly been filled to a greater height, and that the breccia on the floor and walls was all that remained of an eroded deposit. The fact that the rock floor cropped out over a large part of the cave showed that the breccia left in place could not be more than a thin coating on the surface of the rock, and as archæological remains appeared to be very sparse, we decided not to attempt the difficult work of chipping out this intensely hard deposit. From the very scanty material obtained it is impossible to judge whether or not the Mousterian of the Water Cave belongs to the same phase as that of the Dark Cave, described below. The fact that in one case there has been formation and subsequent erosion of breccia, while in the other the Palæolithic layer is made up of undisturbed earth does not necessarily mean that the former is older than the latter. The two caves differ so much in construction that it is quite possible local conditions may have favored the rapid formation and erosion of breccia in the one while the other remained unaffected.

The Dark Cave. This cave had a very well-filled appearance in marked contrast with the other five. A sounding made at the mouth was, however, not encouraging. A well-marked hearth with pottery appeared quite near the surface, but below this came 2 metres of red earth, containing only a human skeleton, in perfect preservation and evidently recent. At the base of the red earth was a very tough red clay, and on the surface of this was found a fragment of well-mineralised bone, evidently broken by man. A second sounding, made inside the chamber, gave better results, reaching a Mousterian hearth at a depth of 90 cm., and we then decided to concentrate our forces on this cave and excavate it as far as was possible in the time at our disposal.

The Dark Cave consists of a single chamber, 30 m. long, with a fairly constant width of 11-12 m. At the far end a recess 5.50 m. deep opens in the N.W. wall. The roof at the cave mouth was not more than 5 m. above the surface of the deposits before excavation, but inside the cave it rises fairly rapidly, ending in a lofty vault, of which the top is invisible from below. The entrance of the cave faces north, but the chamber itself runs in a south-westerly direction into the rock. The result of this change

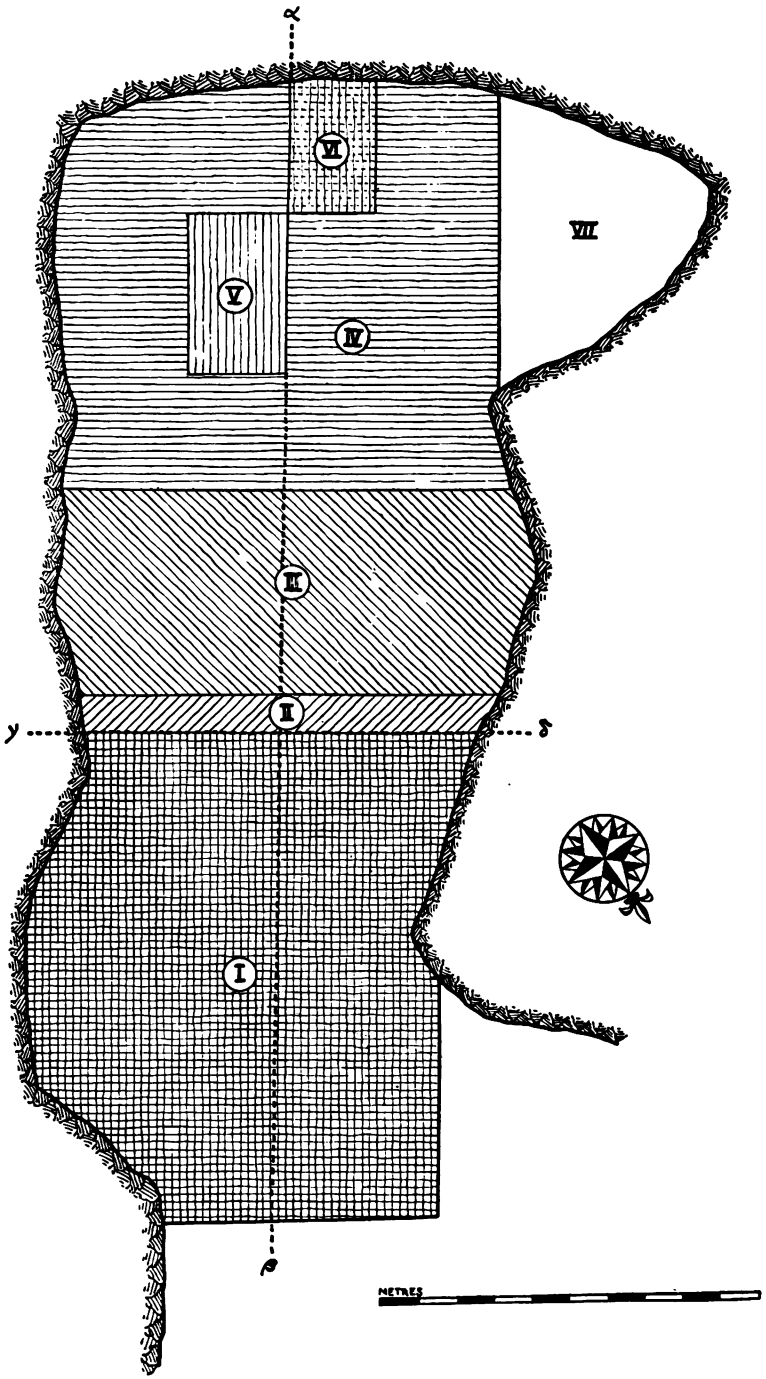

FIGURE 13. The Dark Cave. Hazar Merd. Ground plan.

of axis is that the inside of the cave is very dark, but comparatively sheltered. At our first visit its warmth was very noticeable. The cave and its deposits were markedly dry, very little drip appearing, even after a week of heavy rain.

The surface of the deposit before excavation was quite level in the inner part of the cave, but at 20 m. from the back wall it began to slope downwards towards the mouth, from which it fell rapidly for 6 m. finally abutting against a mass of fallen rock.

In the course of excavation the front part of the chamber was emptied either to the surface of the rock, or to a sterile tough red clay which rested on the rock in the cave mouth (I on plan fig. 13); the deposits in the back part were partially excavated in terraces, the first (II on plan) 1 m. wide and 1 m. deep; the second (III on plan), 5.50 m. wide and 1.60 m. deep; the third (IV on plan), which occupied the greater part of the back of the cave, 1 m. deep. The recess (VII on plan) was left untouched. Two soundings (V and VI on plan), 1.50 m. and 3 m. deep respectively, were made near the back wall.

Lack of funds made it impossible to carry the work any further, but we should in any case have been obliged to break camp at this point, owing to severe weather conditions.

The sections $\alpha\beta$ and $\gamma\delta$ (plan and sections, fig. 14) show the following sequence of deposits from above downwards:

A. Bronze Age to recent. 1-2 m.
B. Upper Palæolithic. 1-2 cm.
C. Mousterian. 50 cm.-3.90 m.

A. Fine reddish earth—1-2 m. In the front part of the cave a single hearth was visible at a depth of 40 cm., but toward the back other hearths appeared, and over the whole area marked IV on the plan these were visible all through A in bands and patches of bright yellow, pink, white and black. In this back part A was thicker than in front, reaching a depth of 2 m. in the sounding (VI) against the back wall.

Pottery ranging from the Early Bronze Age to modern times was very abundant everywhere in A, but the stratification was much disturbed, and in the region of the brightly colored hearths flint implements of Mousterian type occurred fairly frequently side by side with the potsherds. This disturbance was partly due to the burrowing animals whose holes ran right through the deposit into the underlying Palæolithic layers.

Three burials occurred in A. Of these one, evidently quite recent, found

in the sounding at the mouth of the cave, has already been described.* The second consisted of a skeleton in bad condition buried at a depth of 50 cm. in the back part of the cave close to the S.E. wall, without pottery or accompanying objects. The third, which lay near the back wall of the cave, at the same depth as the second, contained the bones of a young child associated with three pots, viz., a large store jar and two single-handled jugs with round bases. The store jar, which lay immediately to the east of the skeleton, stood upright in the deposit, its mouth covered with a large stone which had effectually sealed it, so that it contained only a handful of earth when found. None of these pots could be dated with any certainty. A second store jar, closed in the same way, and also undatable, was found near the back wall a few metres from the first and about 50 cm. deeper in the deposit, but in this case there was no accompanying burial. An isolated skull, evidently comparatively recent, was found near the surface of A in the middle part of the cave.

B. A thin Upper Palæolithic layer, which can hardly be said to constitute a true archæological level, its presence being indicated merely by a small series of implements of Upper Aurignacian type, found thinly scattered at the junction of A with C.

C. Tough reddish earth containing numerous hearths, 50 cm.-3.90 m. On the slope at the entrance to the cave this deposit was practically non-existent, and A, which was slightly thicker here than inside the chamber, made up the greater part of the section, but immediately inside the mouth C became much thicker, and contained a certain number of Mousterian implements. At 3 m. from the entrance dark hearths began to appear, first at the base of the section, then higher up, until at 10 m. from the entrance they were visible from top to bottom of the deposit as a continuous series of sharply contrasted black and white bands, dipping from each wall to the middle of the cave, the hollow in their surface being filled with light reddish earth which yielded implements of the same type as those found in the hearths themselves. Many of the bones and flints found in the black hearths are badly burnt, but the white bands seem to belong to periods when the fires inside the cave were kept at a specially intense heat, as the bones found in them are bluish-white in colour and ring like porcelain.

In the 1.50 m. sounding (V) at the back of the cave, layer C, which here

* When it was discovered the work-people claimed to recognise the bones as those of a Persian Kurd who was murdered in the cave during the war. The skull shows the characteristic deformation practised by the Kurds, but the state of the bones, fresh though they were, made it certain that they had been buried too long to be those of the victim of this story.

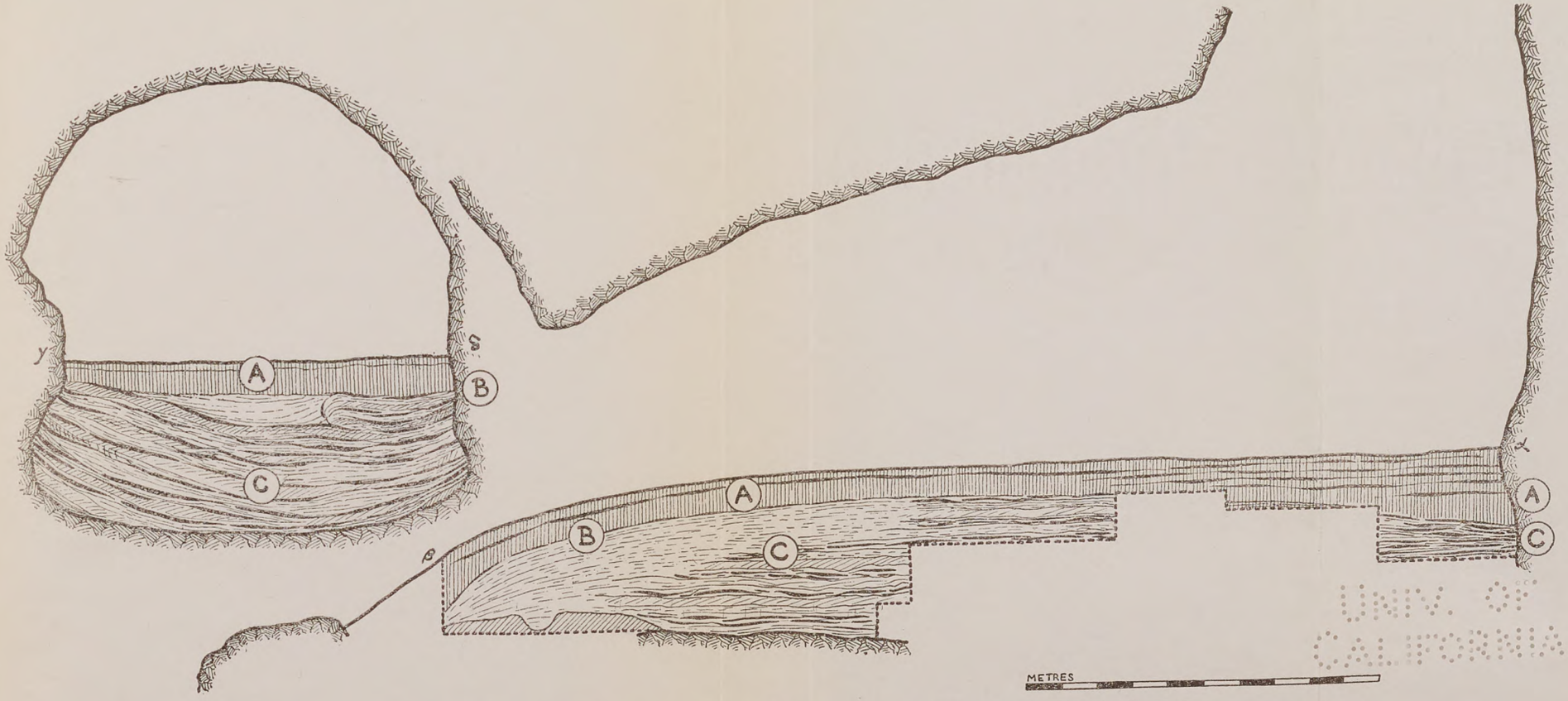

FIGURE 14. The Dark Cave. Hazar Merd. Cross sections. (a) Section $\alpha\beta$; (b) Section $\gamma\delta$.

occurred at a depth of 1.25 m., consisted of a thin crust of red bone-breccia overlying harsh red earth containing quantities of small rodent bones. These are strictly localised deposits; the red earth does not occur at all in the adjoining trench VI, and the breccia, which is probably due to dripping from the vault, is present only at its N.E. end. In trench VI, where A had a maximum depth of 2 m., the underlying Mousterian hearths did not show as definite bands, but as blacker zones in a deposit which was uniformly dark in colour. These soundings were made for the purpose of discovering whether the rock floor rose appreciably towards the back wall, but when VI had been carried to a depth of 3 m. without result it was decided to leave them, and concentrate on the excavation of the front part of the cave.

Flint implements of Mousterian type were found all through C. but not in very great abundance. In the front part of the cave they were rather rare, and in the zone of the hearths they were scarce in the middle of the trench but relatively abundant along the walls.

Animal remains were rare, and consisted chiefly of unidentifiable fragments of bone broken by man and much burnt.

§

Level A. The pottery from Level A has been studied by Mr. F. Turville-Petre, who gives the following account of it:

The stratification of this layer had been so much disturbed as to be practically useless as a criterion for the relative dating of the objects found there, and the pottery can consequently only be dated with reference to known types from stratified sites. Unfortunately the Sulaimani district is practically unexplored archæologically, and for comparisons we have to look mainly to the pottery types from Mesopotamia.

The three pots found with the infant burial described above are undecorated, and of too undifferentiated a type to be datable in the present state of our knowledge of the local pottery. One of the jugs rather closely resembles an example figured by de Morgan from a dolmen at Tchila Khané, and which he dates to the Early Bronze Age. The second store jar described above is of unpolished red ware. It has a rounded base, and is decorated with a raised rope pattern round the centre and an incised notched design just below the neck. Near it was a typical pilgrim bottle of unpolished pink ware with two vertical handles near the neck. This form seems to have originated very early in Western Asia Minor, and is common in Egypt and Palestine about the middle of the second millennium

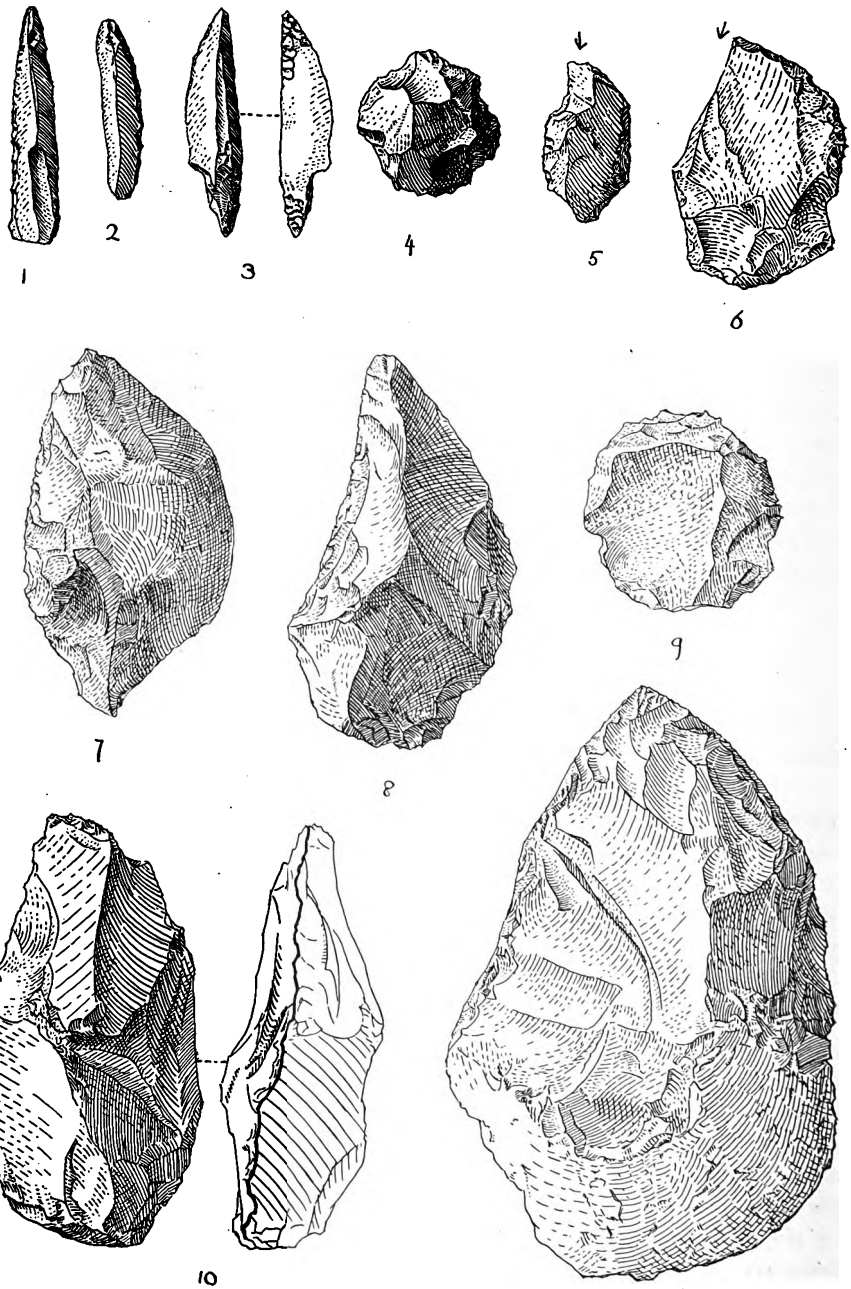

FIGURE 15. Implements from the Dark Cave. Hazar Merd. Nos. 1-6, layer B; Nos. 7-11, layer C. Scale ⅔.

B.C., but since it continued in use till a late period it is not very useful for dating purposes.

Throughout Level A, and also in the adjoining caves and shelters, a light red ware predominated. This was never polished or painted, but was frequently decorated with incised designs of straight and wavy lines. This is a type of pottery made to-day by the local Kurdish population, and the greater part may be of quite recent origin, but it differs very little from much older pottery found in Northern Mesopotamia, and some may be as early as the middle of the second millennium B.C.

A few fragments of blue and one of brown glazed ware were found and one small fragment of blue porcelain "Celadon" ware (14th Century A.D.). Below a depth of about 1 metre sherds of a yellowish or greenish clay were frequent. These were principally fragments of large jars the rims of which were usually decorated with horizontal ribbed bands broken by vertical notches, while the lower part of the jars were sometimes heavily but roughly decorated with pittings or vertical grooves produced before baking either with the finger or with the rounded end of a stick. One large jar belonging to this group was decorated on the shoulder with two or more rectangular stamp seal impressions showing a ram or ibex, a scorpion and a conventional design. Above the seal impression is a roughly scratched cross the four arms of which terminate in crescents. This seal impression closely resembles similar stamps on early Islamic pottery from Samarra and other Mesopotamian sites where it is common during the 7th and 8th centuries A.D.

A lamp in rough undecorated red pottery is probably of the same period.

Towards the bottom of the pottery levels in various parts of the cave, fragments of a coarse badly baked pottery with a brown or grey burnished surface were found. These, together with a few much better made sherds with a red burnished slip, are probably of the early Babylonian period.

Towards the back of the cave, at the bottom of the pottery levels, and extending over a limited area, were a number of sherds of types earlier than any found elsewhere in the site. These fall into two groups (a) unpainted sherds sometimes with a red burnished slip, pierced lug handles, and frequently decorated with criss-cross incisions, sometimes forming triangular designs. This seems to be the type of pottery of the Earliest Bronze Age from Northern Mesopotamian sites (beginning of the third millennium B.C.). (b) A white or yellowish pottery with geometric designs in black paint resembling the coarser styles from Susa I and still more closely the earliest Chalcolithic pottery from Mesopotamian tells. A very

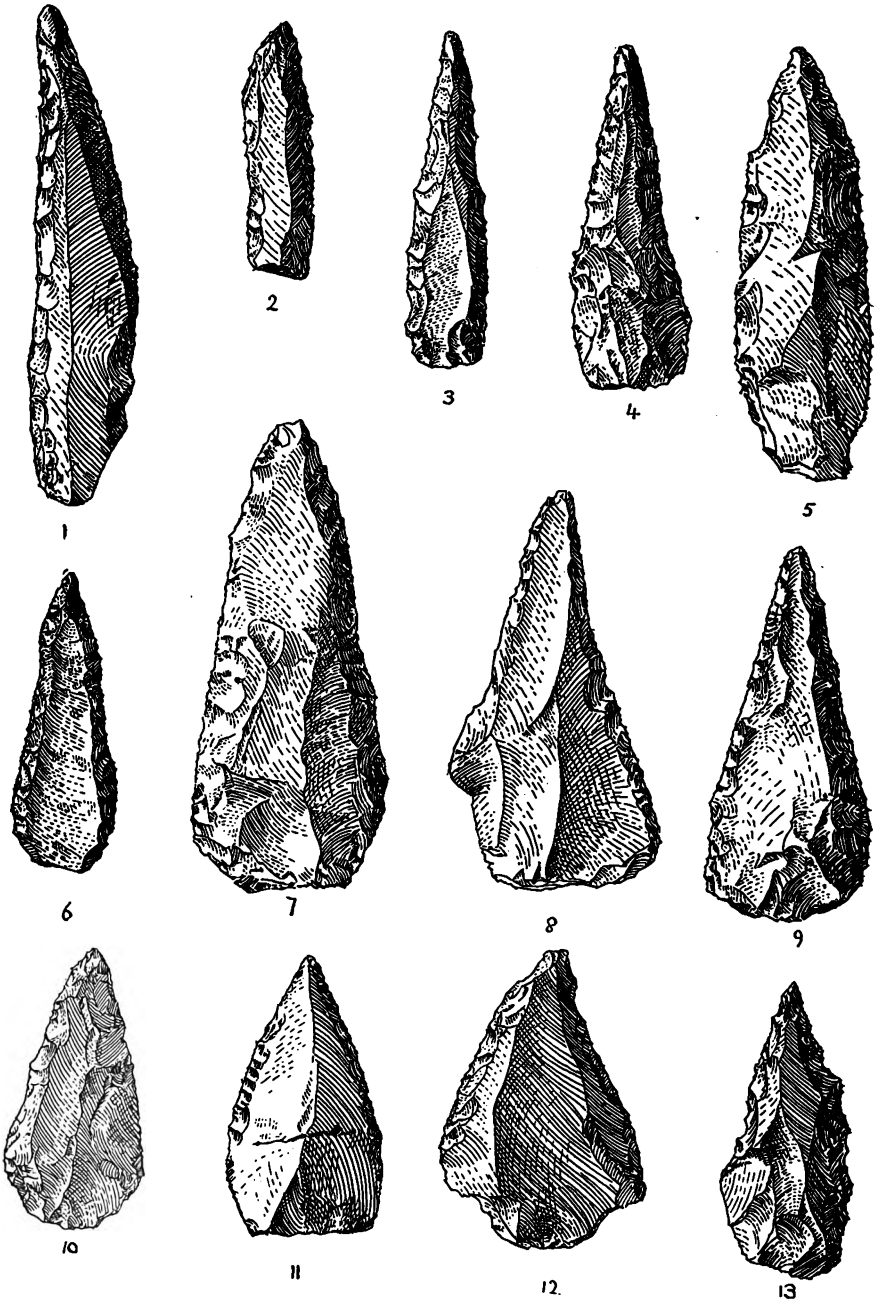

FIGURE 16. Implements from layer C, the Dark Cave. Hazar Merd. Scale ⅔.

rough undecorated hand-made dish in yellowish clay exactly resembles two from Susa, where they seem to belong to the earliest period.

One sherd with black and red polychrome decoration would seem to be of the same period or slightly later.

Iron Objects.

Three iron objects were found, (i) a leaf-shaped javelin head with centre rib, (ii) a small socketed hoe, and (iii) a small curved pruning knife.

Coins. (i) A silver Sassanian Coin of the VI Century A.D.
(ii) A Byzantine Follis of Justin I or Justinian (VI Cent. A.D.).

§

Level B (fig. 15, nos. 1-6). The number of implements found in Level B is very small. Nos. 1 and 2 are *dos rabattu* blades; no. 3 is a typical single-shouldered point of the same type as the one found at Zarzi; no. 4 is a small disc; nos. 5 and 6 are angle-gravers. In addition to these a narrow retouched blade, an end-scraper, a discoidal scraper and two core-scrapers were found. The shouldered point definitely links this industry with the Grimaldian of Zarzi, and the materials used, red and green flint and whitish chert, are identical with those found at Zarzi.

Level C. All the implements found in C appear to belong to a single Mousterian industry, the only noticeable variation being a slight decrease in the number of side-scrapers in the upper hearths. It should also be noted that the only two hand-axes found occurred at the very base of the deposit.

The materials used are flint and chert, with a wide range of color. The majority of the flints are more or less deeply patinated, the leading colors being white, cream, brown-grey, blue-grey, dark grey, yellow and reddish-brown. The cherts are mottled grey, light grey, brown and dark red. The variety of materials suggests that they were obtained from pebbles, but of larger size than those used at Zarzi. One of the hand-axes retains a large piece of cortex, and this shows a heavily battered pebble surface. A probable source for material of this kind is the limestone conglomerates in the region of Chemchemal. Many of the implements show signs of having been in fire, and are in consequence very brittle.

The proportion of finished implements to mere flakes is very high, and it is a remarkable fact that no cores were found. This suggests that the cave, on account perhaps of its north aspect, was never inhabited for very long at a time.

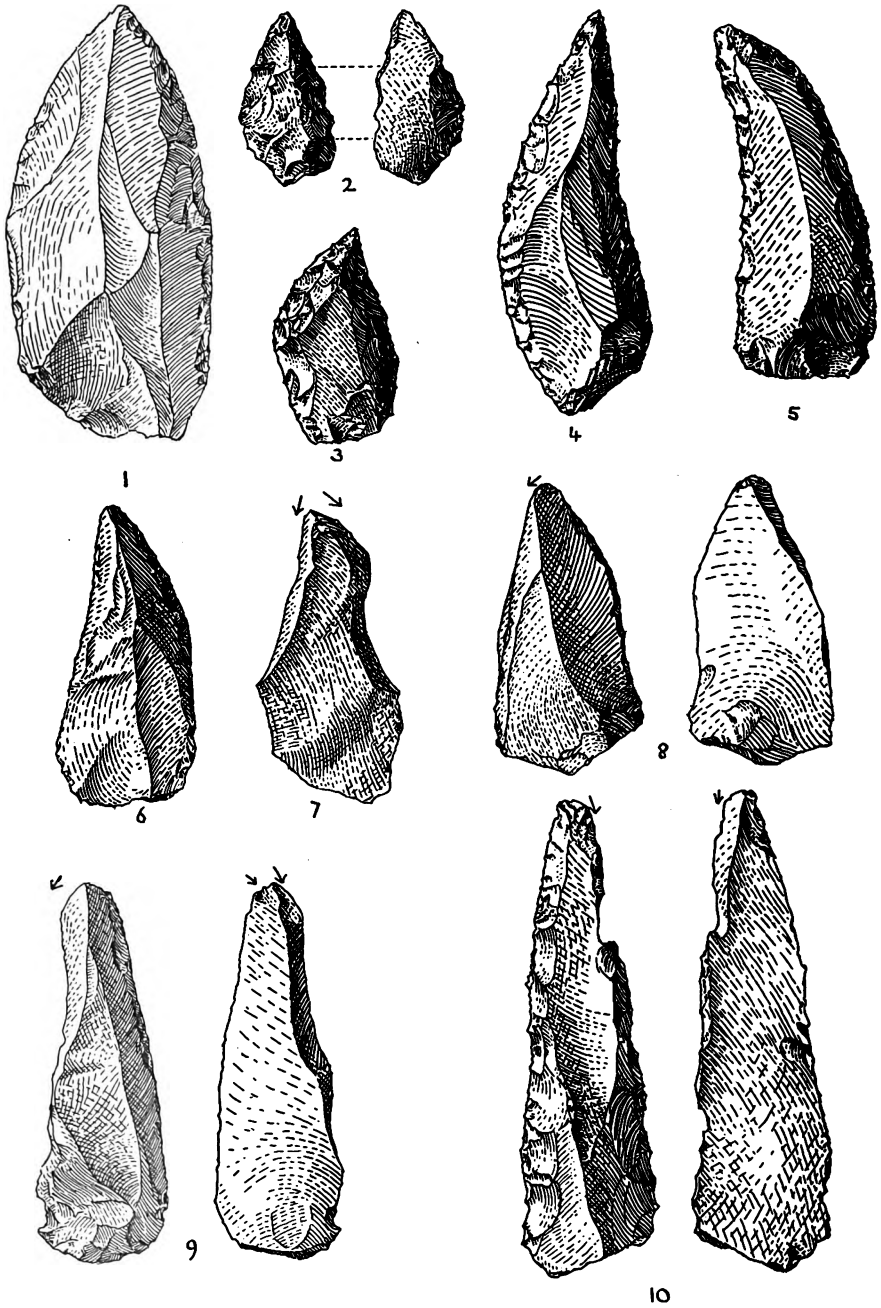

FIGURE 17. Implements from layer C, the Dark Cave. Hazar Merd. Scale ⅔.

The implements belong to the following types:

Points (fig. 16, nos. 1-13; fig. 17, nos. 1-6). These are relatively abundant, and for the most part very well-made. The shapes vary from the broad triangular point, common to all Mousterian sites (fig. 16, nos. 7-12; fig. 17, no. 1), to a series of unusually narrow ones, of which fig. 16, nos. 1-6 are specimens. There are a number of curved points (fig. 17, nos. 3, 4, 5), the majority having the tip to the left. The flakes on which these points are made are, for the most part, rather thin and delicate, and the retouch is flat, the resolved flaking which is so characteristic of the Mousterian of Europe being comparatively rare. About half have the striking-platform retouched.

Side-scrapers (fig. 15, nos. 7, 8; fig. 18, nos. 1-9). This series is not very well-defined. Practically, it includes all flakes that show intentional retouch down one or both sides, but a minority only are well-made and really typical. The thick *racloir* (scraper) of the classic Mousterian (fig. 15, nos. 7, 8; fig. 18, no. 1) is rare, and in one specimen only (fig. 15, no. 8) is the bulb at the side of the implement. The great majority are made on comparatively thin flakes, with the bulb at the end, and the retouch is often very slight, not much more than a nibbling of the edge, barely distinguishable from the chipping produced by use. A group of narrow, double scrapers made from thick flakes (fig. 18, nos. 5-6) is interesting.

Borers. There are two specimens of no special interest.

Gravers (fig. 17, nos. 7-10). Only four were found, but they are unmistakable. No. 7 is of bec-de-flute type; no. 8 is made with a single blow on a triangular point, and no. 10 with a vertical blow on a beautifully retouched double side-scraper. No. 9 was originally made with a single blow on a side-scraper, but has afterwards been improved or revived by the removal of two shorter flakes at the tip.

Inverse retouch (fig. 18, nos. 10, 11, 12). A number of flakes are retouched on the bulbar surface, down one or both edges. Of these, two show working on the upper surface as well, one along the inversely retouched edge and the other on the opposite edge. Nearly all these flakes were found close together, at the same depth in the deposit.

Hand-axes (fig. 15, nos. 10, 11). Two hand-axes were found, at the base of C. No. 10 is roughly fashioned over both surfaces. No. 11 is made on a thick flake, and the under-surface has been left untouched, except at the right-hand edge, where the bulb has been chipped away.

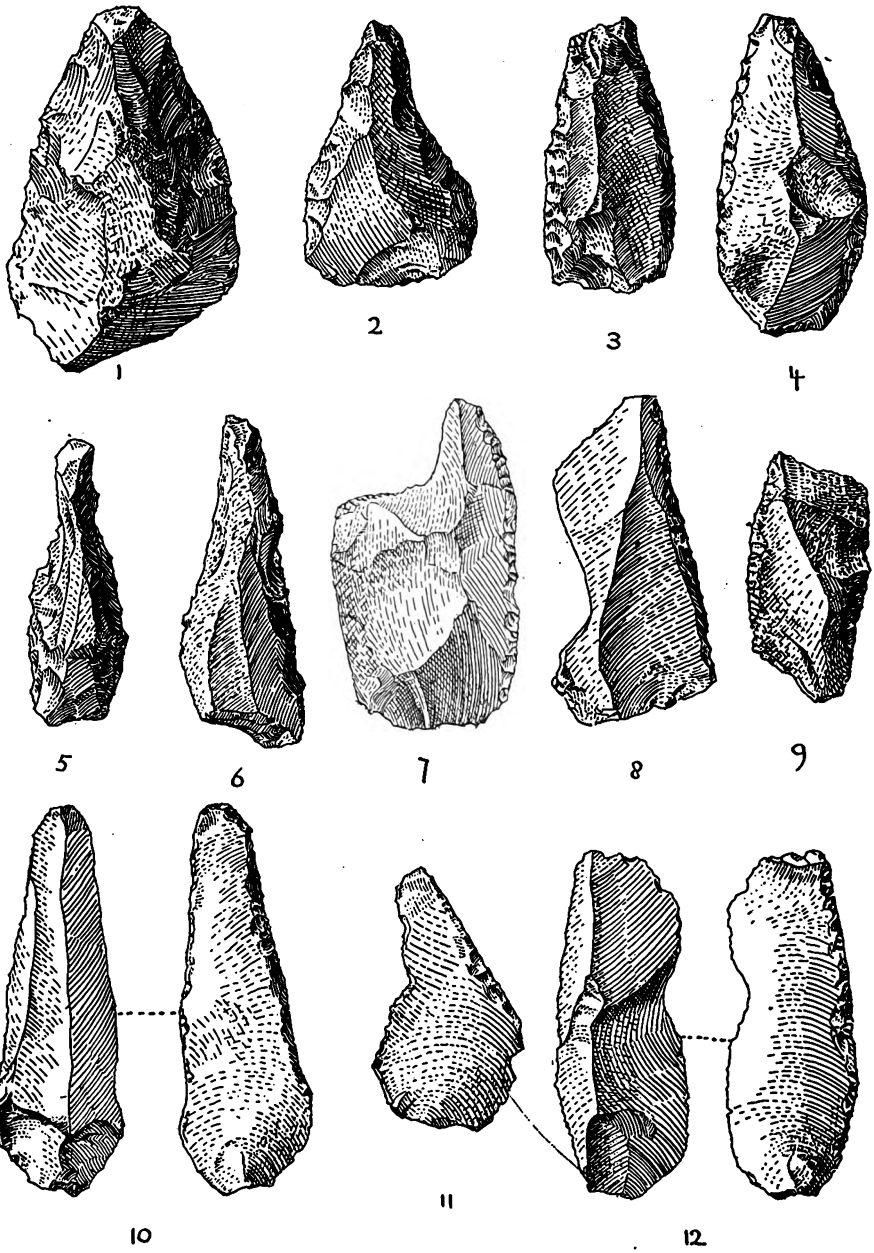

FIGURE 18. Implements from layer C, the Dark Cave. Hazar Merd. Scale ⅔.

The upper surface is worked all over, except at the base, where a patch of cortex remains, showing that the flake had been removed from a large, heavily battered pebble.

Discs (fig. 15, no. 9). Only three were found, all of small size.

Flakes. The majority of unworked flakes are triangular, rather narrow, with or without retouched striking platform, but in addition to these there is a small group of narrow parallel-sided flakes which may fairly be described as blades.

The Mousterian industry of the Dark Cave has marked affinities with the Mousterian of the caves of Palestine (e.g. the Mugharet-ez-Zuttiyeh, and the cave of Shukba, both excavated by the British School of Archæology). The features in which it differs from the Mousterian of Europe, i.e. the relatively large proportion of narrow implements and blades, the flat retouch and the presence of typical gravers, are all found in an even higher degree in the Mousterian of Palestine. We do not yet know whether this facies of the Mousterian covers a very long period, or whether it represents only its final phase in the Near East. If, as seems likely, it is the outcome of contact with a neighbouring Upper Palæolithic industry, the second alternative appears the more probable, but so far nothing has been found to bridge the gap between the Mousterian of Zuttiyeh and Shukba, and the much older Acheulio-Mousterian industry discovered by M. R. Neuville in a cave in the Wady Khareitun, near Bethlehem. It is worth noting, however, that M. Neuville found a few quite definite gravers associated with Upper Acheulian and Micoquean hand-axes; clearly, the graver, at least, dates from very far back in this part of the world and it is even possible that it was invented by Mousterian man in the Near or Middle East, and passed on to the Upper Palæolithic peoples.

Table of Implements from Level C, Hazar Merd

Points:	
Straight	95
Curved	19
Side-scrapers	115
Borers	2
Gravers	4
Inverse retouch	14
Hand-axes	2
Discs	3
	254

Animal Remains from the Dark Cave, Hazar Merd

By Dorothea M. A. Bate

The animal remains from Hazar Merd are few in number and are very fragmentary. With few exceptions the bones had been broken prior to excavation; no specimen is of greater length than 15 cm., and most of the limb bones had also been split longitudinally. The specimens are generally highly mineralized and when not calcined are a rich red brown colour and very similar in appearance to the material obtained from the Mousterian layers of the Mugharet-ez-Zuttiyeh in Galilee.

Bones of ruminants are more numerous than those of other animals, and the presence of another species, possibly *Bos,* not given in the list, is indicated by an imperfect rib of large size. Among the remains of the Wild Goat (*Capra*) is a nearly complete metacarpus which has a maximum length of 131 mm.; the maximum width of the distal articular end is 32 mm.

The remains of the Bat (*Myotis myotis*) and the Field Mouse (*Apodemus* sp.) are dark in colour, and occurred in some very fine black earth, and may not be of the same age as the other specimens. There is a nearly complete skull of the Mole Rat (*Spalax*) and it is possible that this is of more recent date than the other specimens.

Among the birds remains of pigeons are most plentiful and more than a dozen bones represent one or more species, either the Rock Pigeon (*Columba livia*) or Stock Dove (*C. oenas*), possibly both. The comparatively great width of the proximal end of the shaft in several tarsometatarsi suggests the presence of *C. oenas.*

Owing to the small number and fragmentary condition of the animal remains it has only been possible to give specific determinations in a few instances, but there is no indication of the presence of any form that might not be found living in the country at the present day.

Mr. M. A. C. Hinton very kindly identified the remains of the Vole (*Ellobius* sp.); and Lt. Colonel A. J. Peile the Mollusca, of which he reports that they can be matched from any collection from Mesopotamia of the present day.

A nominal list is given below of the sixteen species of mammals, birds and land-shells, of which remains were obtained from Hazar Merd:

MAMMALIA

1. *Myotis myotis.*
2. *Lepus* sp.
3. *Ellobius* sp.
4. *Apodemus* sp.
5. *Spalax* cf. *ehrenbergi.*
6. *Cervus elaphus* cf. *maral.*
7. *Gazella* sp.
8. *Capra* sp.

AVES

9. *Turdus viscivorus.*
10. Small passerine.
11. *Cypselus melba.*
12. ? *Falco* sp. (small accipitrine).
13. *Columba* sp.
14. *Alectoris chukor.*

MOLLUSCA

15. *Helix salamonica* Nægeli.
16. *Levantina* cf. *nægeli* Kob.

§

Our time in Kurdistan was necessarily short. We had gone there hoping to find Palæolithic remains, but without any assurance that we should do so; our journey was in fact one of prospection, and although we were fortunate enough to discover two Palæolithic sites almost at once, and so were able to devote the greater part of our time and funds to actual digging, the excavations at Zarzi and Hazar Merd by no means exhaust the possibilities of the Sulaimani district. They must be regarded merely as first indications of what future work may reveal. Even so, they make a definite contribution to prehistory by extending our knowledge of the distribution of two well-marked stages of the Palæolithic.

The appearance at Hazar Merd of a Mousterian closely resembling that of the caves of Palestine was what we might expect. The Field Museum Expeditions had shown that the great plateau which is now the N. Arabian Desert was inhabited in Palæolithic times, and it is obvious that the Mousterian peoples could pass easily from the foothills of the Zagros into Palestine, and vice versa, skirting the head of the Persian Gulf, which must then have stood not far south of Mosul. Moreover, the presence of Mousterian man in the neighbourhood of the Zagros arc had already been demonstrated by de Morgan, who in 1909 found obsidian implements of Mousterian type on the slopes of Mt. Alagheuz, 80 km. north of Ararat.

The question how far the cave-Mousterian of the Near East is contemporaneous with that of Europe remains unsettled. In Europe, the oldest Mousterian level of the caves can be correlated with the end of the Riss-Würm inter-glacial, while the more recent stages cover the whole length of the first Würmian maximum, just carrying over into the beginning of the interstadium in which the Aurignacian appears. In Palestine, any correlation that is attempted must depend on evidences for pluvial periods, if this can be obtained, since, owing to the region being beyond the direct influence of the glaciations, the fauna of the Mousterian caves does not differ very markedly from the local fauna at the present day. In Kurdistan the case is different; there it may ultimately be possible to establish the relation of the Mousterian to the last glaciation of the Zagros. De Morgan records traces of ancient glaciers, in the form of terraces, moraines and striated rocks, in Luristan and the Mukri region of Kurdistan, and points out that the extraordinary thickness of the alluvial deposits accumulated at the foot of the Zagros chain bears witness to the enormous mass of melted snow which came down when the glaciers retreated. The valley of Sulaimani lies outside the limit of the moraines, but its climate must have been very rigorous during the periods of glacial advance. Unfortunately the animal remains from Hazar Merd are too fragmentary to be of use as evidence of climatic conditions, and we have to fall back on other indications; I have already described how many of the bones and flints from the Mousterian level showed signs of having been subjected to intense heat; other significant facts are the concentration of implements along the walls, and especially behind projecting masses of rock (suggesting that the inhabitants were taking advantage of every bit of shelter they could find), and the absence of implements and hearths in the entrance of the cave. Taken as a whole, this evidence suggests that the Mousterian occupation of the Dark Cave coincided with a period of cold. We have, of course, to bear in mind that the cave has a N. aspect and that even to-day the winter at Sulaimani is severe, the district being often snow-bound till the end of March, but against this one may urge, in the first place, that it is unlikely that the cave was inhabited only in winter, and that under present conditions the summer is very hot; in the second, that the dryness of the cave (noticeable even after a week of heavy rain) and the shelter afforded by its change of direction away from the mouth, to some extent neutralize its unfavorable aspect. On the whole it seems safe to conclude that the temperature of the region in Mousterian times was lower than it is to-day, but stronger evidence will have to be found before we can decide that the cave-Mousterian of Kurdistan is contemporaneous with a glacial advance.

The discovery of an Upper Aurignacian industry of a Grimaldian type

at Zarzi was more unexpected, since the nearest station known which is really comparable typologically is the Grotte des Enfants, 3,500 km. away. The evolution and distribution of the Grimaldian facies, as far as it is known at present, is a very interesting problem. Of the two forms which are typical of it, the small deeply-notched blade and the single-shouldered point, the former is found in abundance in a fairly early Middle Aurignacian horizon at Krems, in Lower Austria, and at Pair-non-Pair in the Gironde, while the latter occurs, also in abundance, in a late Aurignacian level at Willendorf, and sporadically in most Upper Aurignacian sites in Western Europe. It is clear then that Grimaldian influences, from whatever source they may come, are at work from quite early stages of the Aurignacian all over Western Europe, and it is doubtful whether stations like Krems and Willendorf, which lie within the distribution areas of the Solutrean and Magdalenian, can properly be classified as true Grimaldian; it will probably be better to reserve that name for the peculiar facies *combining* the small notched blade and the shouldered point which in Italy, and most typically at Grimaldi, takes the place of the Solutrean and Magdalenian, surviving till the very end of the Upper Palæolithic.

The industry of Zarzi is clearly Grimaldian, in the full sense, even though it lies so far outside the distribution area as known at present, but until the intervening links of the chain have been found, it would be unwise to dogmatise about the possible centre of distribution from which this industry entered the Italian peninsula on the one hand and Kurdistan on the other.

APPENDIX

Caves Visited by Mr. Robert A. Franks Jr., and Mr. Turville-Petre in the Surdash District, October, 1928

The following brief account is taken from Mr. Turville-Petre's notes.

Jasana. To the north of the village there is a long dark cave of great height, facing west in a cirque of rock at the head of a narrow valley. The cave is sheltered from all winds, but never gets the sun. There is practically no terrace, and the soil in front of the cave is very stony, as the bed of the wady reaches practically to the entrance of the cave. No flints were found, and there were no traces of breccia at the entrance or on the walls of the cave.

In the same valley there is a small cave high up in the north cliff. A sounding was made, and rock was reached at 10 cm., the deposit being goat dung.

South of Jasana two small shelters were visited, one facing N.W., and the other S.S.W. Soundings were made, and the rock was reached at 50 cm. and 1 m. respectively, the deposits being sterile.

Qamchuga. Two caves were visited. The first, which was long and narrow, faced S.W. There was obviously no depth of deposit, and no signs of early habitation. The second was very small and contained no deposit.

Qauj Bulagh. Three shelters lying above the village were visited. The first was high up in the rock and faced north. A sounding was made, and rock was reached at 1 m., the deposit being sterile. The second and third lay side by side, facing N.W.W. and N.E.E. respectively. The soil was very stony, and there were no indications of habitation.

Goba. A large shelter with rock platform was visited. It was very exposed and there were no signs of Stone Age habitation. A sounding was made to rock in a small cave facing S.W. below the village. The deposit was sterile.

Susa. A large dark cave with S.E. aspect, opening at the foot of Pir-i-Mukurun, showed no signs of early habitation. The entrance and terrace were covered with large blocks of fallen rock which made digging impossible. A sounding was made in a small cave with S.E. aspect lying above the village. Rock was reached at 1 m., the deposit being sterile.

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