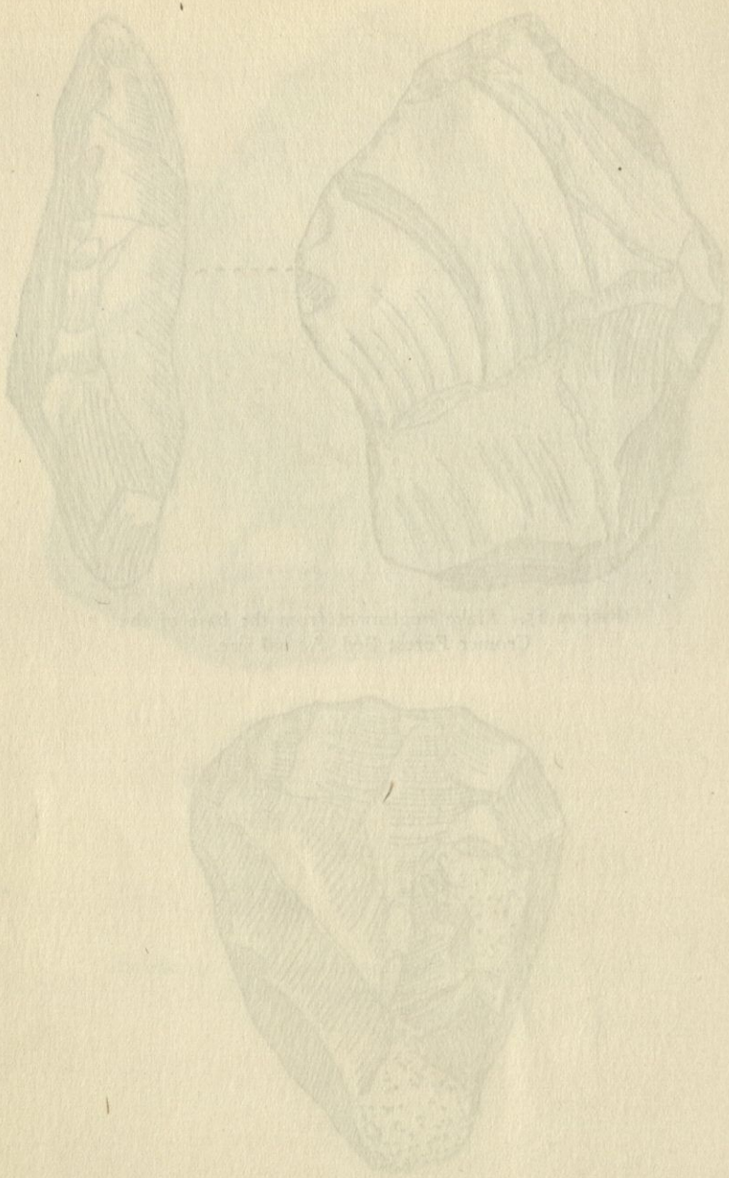

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Edited by GEORGE GRANT MACCURDY, Director

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REPORT OF THE DIRECTOR

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

THE preparation for and the study of the material excavated from the Wady Mughara group of caves near the foot of Mount Carmel, Palestine, has gone steadily on. It is difficult to realize the magnitude and importance of this work, which is based on seven seasons of joint excavations by the British School of Archæology in Jerusalem and the American School of Prehistoric Research. The remains found come under three heads: 1) cultural, 2) fossil animal other than man and 3) human skeletal remains. The specialists studying these are: Dorothy A. E. Garrod and Theodore D. McCown, for the cultural, Sir Arthur Keith and T. D. McCown, for the human skeletal, and Dorothea M. A. Bate, for the fossil animal remains. The volume on the cultural and the fossil animal remains is now with the printers (The Clarendon Press, Oxford); the one on the human skeletal remains will be ready for the press some time in 1937. Each volume will consist of about 100,000 words and will be profusely illustrated.

Additional cultural remains from the Natufian (Mesolithic) deposits of the Mugharet el-Wad have been received by our School and distributed to its participating member institutions. There remain to be received additional cultural remains from the Mugharet es-Skhūl and human skeletal (as well as fossil animal) remains from all three of the caves in question. Chief among the specimens yet to be received are the rare skeletal remains of *Homo neandertalensis* and our School's share will be the first ever to have been shipped across the Atlantic. Casts are to be made of the most complete skeletons.

Your Director and Secretary spent three months of the past summer in Europe. They had conferences with Dr. John Beattie, head of the Royal College of Surgeons of England, whose laboratories have been at the disposal of the two Schools over a period of several years and to whom the Schools are much indebted. They also spent a day with Sir Arthur Keith and Mr. McCown at Buckston Browne Farm, Downe, Farnborough (Kent), for a special inspection of the Neandertal skeletons and to assist in the allocation of the material after the study of the same shall have been completed. Before leaving England they attended the first meeting of the newly founded British Speleological Association. Later they went to Oslo, Norway, to

attend the Second Session of the International Congress of Prehistoric and Protohistoric Sciences, to which your Director had been accredited as Chairman of the American Delegation; he likewise served as a Vice-President of the Congress.

Bulletin No. 12, our School's largest Bulletin to date (151 pp., 30 plates and 16 text figures) was published in May, 1936.

Respectfully submitted,

GEORGE GRANT MACCURDY.

NOTICE—Bulletins 3 to 10, inclusive, of the School are now out of print. There is still a demand for them. All who have copies, of which they have no special need, will confer a favor to the School by sending such copies to the Director: Dr. George Grant MacCurdy, Old Lyme, Conn.

MOUNT CARMEL MAN. HIS BEARING ON THE ANCESTRY OF MODERN RACES

By Sir Arthur Keith, F. R. S., and Theodore D. McCown

THE ancient Palestinians upon whom we are reporting were discovered in 1931 and 1932 in limestone caves in the western slope of Mount Carmel. A little over a mile to the west across the coastal plain is the Mediterranean. Haifa lies fifteen miles to the north. Here the joint Expedition of the American School of Prehistoric Research and the British School of Archæology in Jerusalem, under the direction of Miss Dorothy Garrod, worked for seven seasons between 1929 and 1934, bringing to light a vast quantity of flint artifacts, providing a new basis for the Pleistocene palæontology of the Middle East, uncovering and preserving a unique collection of human fossils; in short, opening a new and extraordinarily full chapter concerning the activities and development of mankind during the latter third of the Pleistocene period.

The sites from which come the human fossils with whom we are concerned now are the Mugharet es-Skhūl (Cave of the Kids) and et-Tabūn (the Oven), lying at the mouth of the Wady Mughara. Et-Tabūn is a huge, rather open cave and was filled almost to its top when excavation began. The total depth of the well stratified deposit was 15.5 metres (61 ft.). There were no sterile layers; the occupation had been continuous from a time just anterior to the Palestinian Upper Acheulean (the Tayacian) down to the end of the Levalloiso-Mousterian period. The human remains from this site come from two horizons. The middle-most Levalloiso-Mousterian layer, Layer C, provided a nearly complete female skull and skeleton, and a massive mandible, undoubtedly male. The other remains are fragment of the shaft of a right femur and a single molar tooth, both specimens having been recovered from the Acheulean deposits of the Tabūn. It is with the Levalloiso-Mousterian human remains that we are chiefly concerned.

The Mugharet es-Skhūl is a rock shelter with an extensive terrace. The small cave from which the site takes its name played only a small part in the life of the site's inhabitants. The deposit averages two and a half metres in thickness; this is small when compared with the Tabūn accumulations but at least two thirds of this archæological deposit was extremely hard and refractory lime breccia. In this breccia, on the terrace, were found ten individuals, men, women and children. Five of these had suffered no important dis-

turbance since the time of their interment and they provide us with much new information regarding the burial customs of early man.

The Levalloiso-Mousterian flint industry of the Skhūl cave is uniform in character; it shows only a very slight development from the lowest level to the uppermost one. All of its typological features are so similar to the artifacts in Layer C of et-Tabūn that we may regard it not only as belonging to the same industrial tradition but as contemporary.

Because of the novel physical features of the Skhūl fossil humans it is necessary to make clear what witness the archæological and palæontological record will bear regarding their temporal relationships with the Tabūn human individuals. As we have seen, the two peoples used the same kinds of tools. The data we may derive from the animal remains from the two caves points in the same direction; namely, that the Skhūl people and the Tabūn people were contemporaries. In et-Tabūn the faunal sequence is remarkably full, being represented by hundreds of specimens from a long period of the Acheulean, and another long period during the three phases of the Levalloiso-Mousterian. Miss Dorothea Bate's careful analysis of the character and especially of the changes in the fauna indicates two things. First, that gazelle and *Dama mesopotamica* (the Fallow deer) were numerically most important. Secondly, her studies show that there was a shift in the proportions of Dama and gazelle; the moist climate of the earliest part of the Acheulean, with Dama most abundant, is replaced gradually by a climate drier and probably cooler, with gazelle the most common animal. This is the condition in the time when Layer C of et-Tabūn was being formed. When we come to the last phase of the Levalloiso-Mousterian in et-Tabūn—Layer B—we find two differences which separate it sharply from the preceding Layer C times. The first is that the remains of *Dama mesopotamica* are again extremely abundant; the second is the absence of rhino, hippo, a new Pleistocene wild pig and certain other animals, forms characteristic of all the earlier periods. The Skhūl fauna we know belongs to the older, archaic faunal category. But its most characteristic and abundant animal is a large wild ox, suggestive of a wooded terrain and a moderately moist climate. Gazelle and Dama, however, are present. Briefly we think that the evidence indicates quite clearly that the faunas, the industries and, most important, the people of the Skhūl and the Tabūn are pre-Würmian in time. The marked change in the character of the fauna in Tabūn "B" is later than the human remains, and we believe this change to have been part of the larger series of changes which affected Europe and the Mediterranean at the time of the last glaciation. Our people, therefore, lived in the latter half of the Riss-Würm interglacial period; by stressing the differences between the faunas of the Skhūl and of et-Tabūn, the Skhūl people may be considered to be slightly later than the inhabitants

of the Tabūn whom we find in Layer C. If, on the contrary, we emphasize the similarities of the flint industries and of the faunas we may consider the two groups of human remains to be contemporary.

Turning now to the anatomy of the Skhūl and Tabūn fossil people, we are confronted with two types of humanity. The Tabūn type is represented by the skull, jaws and nearly complete skeleton of an adult woman of small stature. In addition to this splendid specimen there are a single, very large, male mandible; an incomplete but unworn set of teeth from the right half of the maxilla of a child of ten years; there are various miscellaneous teeth; part of the right radius of another woman; a fragment of the shaft of a right femur; a left os hamatum.

The other type, the Skhūl type, is abundantly represented by the nearly complete skulls and skeletons of two very tall men, and the skull and skeleton of an infant aged three and a half to four years. Then there are the more fragmentary cranial and skeletal remains of two more adult males and a female. Another woman, a man and two more children are represented by fragments reclaimed from the breccia. Finally there are a number of individuals—six at least—represented by parts of long bones, teeth, a patella, a mandibular fragment, all found singly in the less consolidated uppermost metre of the deposit.

The Tabūn and the Skhūl types of the Mount Carmel races provide us with some striking contrasts and some significant resemblances. Many of the physical features of the Tabūn woman are familiar to us: they are like those we meet with in the Neanderthal skeletons of Western Europe. Nor are the anatomical characters of the Skhūl type wholely unfamiliar: not a few of them are known to us in the skeletons of living native races or in the bones of the Upper Palæolithic inhabitants of Europe. Hitherto there has been no convincing demonstration of the existence of a Neanthropic form of man before the time of the last Ice Age; a modern form of man of the middle Pleistocene, if we accept the shorter chronology proposed by one of us.

Our study of these fossil people has been made possible by the very liberal joint support of the American School of Prehistoric Research and the Royal College of Surgeons of England, both institutions sharing equally in the division of the material. For a variety of reasons we began our survey of Mount Carmel Man from the ground up, beginning with the feet and progressing systematically up the skeleton. It is already evident that we have been favoured with a marvelously well-preserved group of remains, a series unique in that respect alone. Because of this we have had to break fresh ground in many places, anatomists and anthropologists in so many cases having devoted their attention to jaws and crania, either due to the lack of

other skeletal material or because these parts seemed more rewarding for the labour expended upon them.

Let us turn our attention to the stature, the posture and the gait of these two types of humanity as revealed by their feet, their legs, the pelvis and the spinal column. One of the most striking features which distinguishes our two Carmel types is stature. The Tabūn woman with a femur length of 416.0 mm., had an estimated stature of just over five feet but her short, stout tibia (315.0 mm) brings her height to half an inch less than five feet (1514 mm), when we employ Pearson's formula for stature based upon combined femoral and tibial length. The Skhūl males have femora which vary from 518.0 mm. to 477.0 mm., in length (Pl. I). Stature ranges from 1791 mm., (5′ 10½″) to 1733 mm., (5′ 8″). The Skhūl women appear to have been short; 5′ 2″ (1580 mm) is our estimate for the height of Skhūl VII. The medial convexity of the shaft, noted as a characteristic of the European Neanderthal femora by Dr. Hrdlicka, is to be observed in the femora of the ancient Palestinians. In some of our specimens the anterior convexity of the shaft is pronounced. Yet when we examine the relative proportions which the articular extremities form to the total length of the bone, both types of people are modern. The absolute dimensions of the Skhūl men are comparable to those found among the tall Cro-Magnon males. The linea aspera, or more properly, the femoral pilastre of the Skhūl males shows an immense development; in all the Tabūn specimens this feature is conspicuously absent. The latter also are platymeric, the former pronouncedly stenomeric, though both forms show a great degree of antero-posterior flattening in the subtrochanteric region of the shaft.

The tibia reveals a similar story in many ways. At the extremes in the range of variability in our material we have the massive and very long bones of the tall Skhūl men and at the other, the short and stout tibiæ of the Tabūn woman. Concerning the cnemic index, we find that most of the Skhūl tibiæ fall into the middle group between 65 and 70, as do Spy and La Chapelle. Skhūl V, with an index of 63, is platycnemic, while the Tabūn woman, with an index of 77 for her left tibia is eurycnemic. In the proportions of the articular extremities to the length of shaft both Tabūn and Skhūl types are modern. Yet the former, in certain features of the knee joint, namely, the "set-back" and inclination of the articular condyles, is reminiscent of the Neanderthalians, whereas the Skhūl people are not.

The posture and gait of the ancient Palestinians as shown by the two remarkably preserved feet—one of the Tabūn woman, the other of Skhūl IV, a tall man—was modern. In neither of these feet is there any trace of the condition which M. Boule has described in the La Chapelle foot, a condition in which the heel and foot are intermediate in certain respects between

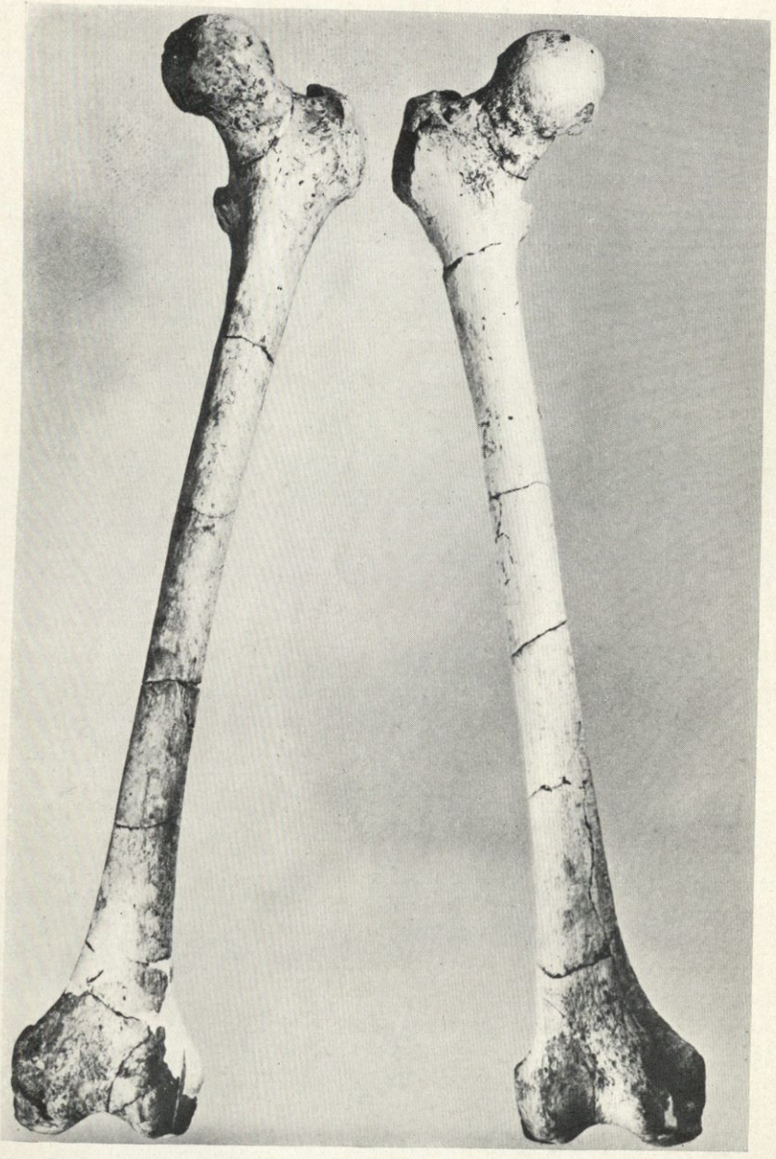

PLATE I. Left and right femora of Skhūl IV. Anterior aspect.

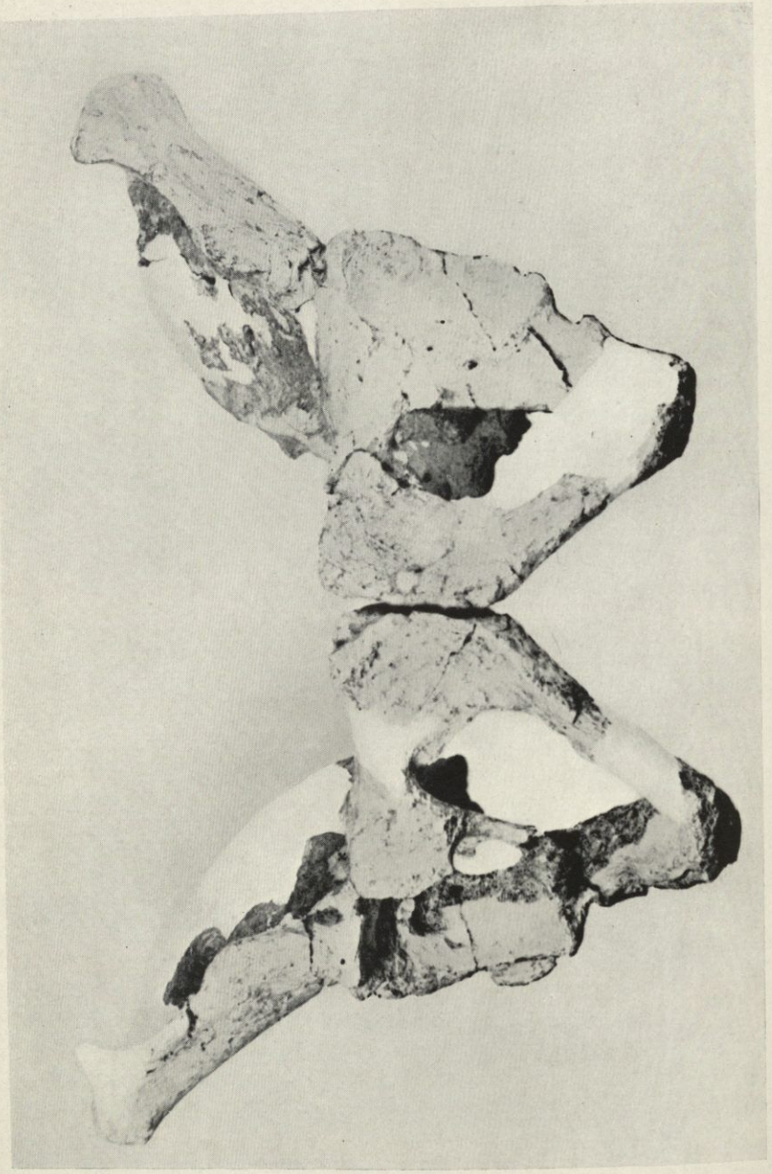

PLATE II. Pelvis of Skhūl IV in pubo-acetabular plane. Anterior aspect.

ape and man. The heels of our specimens are stout, compact, short and perfectly upright. In some details the Carmel feet retain traces of their anthropoid heritage; the tarsal element is short relative to the metatarsal, the middle phalanges of Skhūl IV do not show the reduction so common amongst modern races, the joint between the hallux and the first cuneiform retains the saddle-shaped anthropoid form more perfectly than do most modern feet but there was no greater mobility of the great toe; it was human in every respect. The transference of both size and power from the third to the second metatarsal has taken place in both feet. Lengths, breadths, the proportions of these to each other, the degree of arching of the foot, all vary, but within quite modern limits.

The remaining chief components of stature, posture and build of body are the pelvis and the vertebræ. Let us turn first to the pelvis. The chief conclusions which our study of the os coxæ have led us to formulate are that the anatomical details of the Skhūl type agree with those found in the pelvis of Neanthropic man, particularly the Cro-Magnon pelvis, rather than with those of the pelvis of Neanderthal man. Within the total assemblage of characters, however, we meet with a larger proportion of Neanderthal features than are to be found in any modern race. The woman from the Tabūn cave presents an altogether peculiar pelvic picture. Her pelvis differs not only from those of the Skhūl type but presents features, particularly in the conformation of the pubic bones, which have not been described before either in living or in fossil man. The nearest parallels to her pubic architecture is to be met with in the anthropoids, particularly the gorilla. In other respects her pelvis agrees with the Neanthropic rather than with the Neanderthal type, and yet Neanderthal features are preserved. We cannot think that her pelvic features are merely a manifestation of individual variability; they seem too sharply defined for that.

One of the facts which warrants our first consideration is the proportion of pelvic height to length of thigh. The absolute pelvic heights of the Skhūl people do not differ markedly from those of the Neanderthalians (Skh. IV, 218 mm.; Skh. V, 205 mm.; Neanderthal, 225 mm.;) but the proportions in respect to femur length (Skh. IV. 42%; Skh. V, 39%; La Chapelle, 56%; Neanderthal, 51%) indicates a considerable divergence from the Neanderthals (Pl. II). The femur-pelvic width ratios show that the Skhūl type was not only short in the hips but relatively small and narrow across the waist as well. The Skhūl pelves in other features have distinct Neanderthal leanings; the great downward area for sacral attachment, the greater approximation of the ischial tuberosities towards the acetabulum, the massive development of the anterior inferior iliac spine, and with this the deep groove situated on the lateral aspect of the spine, created by the outward

extension of the upper margin of the acetabulum. Yet the Skhūl pelves are modern in the size of their acetabular cavity, not Neanderthalian.

The extraordinary features of the Tabūn pelvis are not its Neanderthal features, but its primitive anthropoid ones. The extreme length and plate-like form of the pubic parts is clearly evident. The true pelvis was very shallow. The sections across the horizontal part of the pubis again emphasize the anthropoid similarities. You will agree with us that the differences which distinguish the Tabūn woman's pelvis are of such a nature and of such a degree that neither sexual nor individual variability can be held to account for them. They are differences of type—of race.

As we have seen, the Skhūl type is narrow waisted while the Tabūn woman is relatively wide across the hips. The characters of the trunk, the thoracic girdle and the arms make fuller our story of the strange mosaic of physical traits which constitute the two Carmel types. The ribs of the Skhūl people vary from a condition found in Skhūl V which is very like that which prevails in the ribs of Neanderthal man to a state, best exemplified in the very complete series belonging to Skhūl IV, which is closer in form to the Neanthropic variety of rib than it is to the Neanderthalian. The Tabūn woman again exhibits traits like those found in Neanderthal man and others altogether peculiar to herself. She was barrel-chested, with horizontally placed first to third ribs which made the top of the thorax dome-shaped. The Skhūl men were relatively narrow chested with thinner and wider ribs than those of Tabūn I. Her ribs, especially the diaphragmatic ones, are very thick relative to their width.

The vertebral column of the woman is ill-preserved and we have been able to glean only a little information concerning it. For the Skhūl men we have a much fuller account; Skhūl V, our tallest male, has a relatively well-preserved set of vertebræ, particularly the cervical ones. As with his ribs, so his vertebræ show many resemblances in detail to those few known and described for the Neanderthal race of Europe. The shortness of the spinal column is a Neanderthal feature, yet relative to their stature the Skhūl people were very short in the back, especially in the loins and the neck. Skhūl V with a cervical vertebral height of 55.7 mm, is much below the mean measurement for this feature in Europeans (68.4 mm). Mobility seems to have been sacrificed to obtain strength and rigidity, this despite the slender character of the individual bones. Yet if we except the primitive features which these people share with the Neanderthalians of Europe we can find no sure evidence of the vertebral specializations, particularly in the lumbar region of the spine, which are attributed to Neanderthal man. The Skhūl spinal column might well evolve into the modern form.

Let us turn now for a brief glance at the scapulæ, the arms and the hands of these prehistoric people. We have quite well preserved scapulæ from two of the tall Skhūl men and the important parts of the left scapula of the Tabūn woman. In absolute and relative size of bone the Skhūl examples are little different from modern bones; if anything, they are on the small side in relation to stature. It is when we come to study the detailed conformation of these bones, especially of the axillary border, that we at once notice certain significant features. The Tabūn woman bears on the dorsal margin of the axillary border the groove which M. Boule described nearly thirty years ago. He found it in the Neanderthal scapula, in his La Ferrassie specimens and also it was represented in some of the Krapina fragments. At first glance the Skhūl scapulæ—those of Number V are the most perfectly preserved—seem to lack this feature. The axillary border is very thick—a rounded massive bar. Closer examination, however, reveals a peculiar condition which is intermediate in character between the distinctive, ultra-human Neanderthal condition and the unspecialized, anthropoid state prevailing in the modern scapula. One of our specimens—the scapula of a Sikh—which we have used for comparison with the ancient bones, shows a degree of development of the marginal groove very like that which we find in Skhūl V. In contrast to this the coracoid process in the Skhūl type is definitely modern in form. The Tabūn woman, on the other hand, shows distinctive, Neanderthaloid characters in this part of the scapula.

Our attention is immediately taken by the extreme length and slenderness of the humeri, particularly of the Skhūl people. The females had less long arms but they were equally slender in build, which brings to mind the Krapina examples. The Tabūn woman has a relatively short humerus but the proportions of the extremities to the length of the shaft link it with the Skhūl type rather than with the western European Neanderthals. Yet in its curvature, and the inclination of the head of the bone, it is closer akin to the European Mousterians.

The forearm bones serve to distinguish the two types more clearly. The bowing of the ulna and radius in the Tabūn woman, with the resulting great interosseous space, is Neanderthal. (Pl. III). The Skhūl males have long and exceedingly straight forearm bones. Skhūl VII—a small woman—in the size of her forearm bones, in their curvature and in certain other features, tends towards the Tabūn type. We may mention briefly that in the head and upper part of the shaft of the Palestinian ulna we have a series of changes, evolutionary in character and concerned with the finer development of the powers of pronation and supination, which bridge the gap

between the condition preserved in the bones of the anthropoids and that which prevails in modern man. (Pl. III).

Our great fortune in having two nearly intact wrists and hands—one of the Tabūn woman and the other of Skhūl IV—we have utilized in studying the Pleistocene fossil hand fully and, it may be added, for the first time. Skhūl V provides us with another fairly complete, composite hand made up of right and left bones, and with the addition of the fragmentary material from both sites we have been able to amass a comprehensive body of information concerning this important organ. Here it must suffice to say that the anatomical evidence from the carpus alone allows us to distinguish between the Tabūn and the Skhūl hand. Also the former is long and narrow while the Skhūl hand is relatively shorter, broader and very robust, with its resemblances closest akin to the hands of the tall man from the Grottes des Enfants described by Verneau. With these facts in mind, we may add that our survey of the wrist and hand has not led us to any positive conclusions regarding the kinship of the Palestinians to other races. The Tabūn woman stands nearer to what appears to have been the Neanderthal form of hand, the Skhūl men to Neanthropic types; yet both the Palestinian types were closely related.

At this point the evidence which we have presented to you concerning the skeleton of Carmel Man may be conveniently summarized. We have attempted to make clear that the two types are separable, the differences being due neither to sex nor to the variation inherent in all living populations. Yet we are impressed by the number of resemblances between the two Carmel races. The Skhūl type is a mosaic of primitive features, some of them to be met with in the Neanderthal remains from Western Europe. The greater number of the type's physical characters, however, are those which we find in the modern races of man, the native races especially. When we examine closely these neanthropic characters we see that of known races, living or extinct, their closest analogies are with the tall Cro-Magnons of France and the Riviera. The Tabūn type possesses a curious complexity of primitive and of specialized features in her skeleton. Shorter and stouter than the Skhūl type, one cannot but be impressed by the slenderness of her bones and by the tendency for the articular extremity length ratios to approach the Skhūl figures. The greater number of this type's physical characteristics are primitive and not neanthropic. Of the known fossil types of man, the Neanderthalians of Europe seem to be nearest akin to the Tabūn woman.

Our studies concerning the details of the anatomy of the teeth, the jaws and the skulls has not yet progressed as far as with the other parts of the skeleton, but we may consider briefly the evidence from them as it appears to us now. The teeth in none of these ancient Palestinians show the degen-

erate, taurodont condition of the roots which occurs in the molars of Neanderthal man. The teeth in the adult palates and mandibles, even the younger ones, are greatly worn and the crown patterns are difficult of decipherment. Fortunately we have part of an unworn set from the maxilla of a Tabūn juvenile individual. The primitive character of the cusp pattern is evident, and there are many resemblances to the teeth of the youth from Le Moustier and to some of the Krapina teeth. The unworn permanent teeth which we possess from the Skhūl cave belong to young children: even so, the pattern, though primitive, is apparently less definitely Neanderthaloid than the Tabūn examples.

The mandibles confront us with a most puzzling series of relationships. The Skhūl type with its upstanding ascending ramus and the well defined mental eminence contrasts very sharply with the mandible of the Tabūn woman, which is chinless, with a lowly corpus and backward sloping ramus. Miss Garrod discovered in the same layer with the Tabūn woman the massive male mandible, Tabūn II. It exceeds in its dimensions all of the Skhūl jaws and equals or even surpasses the Heidelberg mandible in many measurements. There is an incipient chin, however. The character of the damaged internal symphyseal area, as well as other features, appears to link it to the Neanthropic Skhūl type. It is a more primitive form to be sure, but more closely related to these than to the Tabūn race.

The skulls of these Carmel people serve us very well in illustrating the peculiar nature of the Palestinian races. The skull of the tall man, Skhūl V, is the best preserved. One notices the supra-orbital torus, the combination of facial and alveolar prognathism, the well marked vaulting of the frontal and the parietals. Skhūl IX presents a somewhat different set of features, noticeably a greater length with relatively less height. The Tabūn woman's skull is more primitive than either of these, smaller, low and flat-topped. Skhūl IV, on the other hand, is low and flat-topped, though absolutely greater in nearly all dimensions than the skull of Tabūn I. Its mandible has the characteristic bony chin, however. None of them have the protruding occiput which is so noteworthy a feature of the European Neanderthals.

We give in tabular form a few of the chief measurements and indices of the skull vault for four of our adult skulls. The variability in the measurements of all the Palestinians is remarkable. The cranial capacities are obtained by using Pearson's inter-racial formulæ for the different sexes. In this point the Tabūn and Skhūl types are sharply demarcated; unfortunately we have no measurable female skulls from the Skhūl. The absolute measurements are less informative than the indices. You will notice that only one skull is more long headed than the mean (about 74) for European Neanderthal man; the Tabūn woman approaches the upper limits of meso-

cephaly. Skhūl V is a low hypsicephal; the others tend in the opposite direction and with this goes a tendency towards tapeinocephaly. If we take the calotte height index as representing the proportions of the chief cerebral containing portions of the skull vault, we discover that the Palestinian skull is close to the mean of 42.7 for Neanderthal man; Skhūl V is a notable exception. His index for these characters is 52, approaching those of some of the early Upper Palæolithic inhabitants of Europe. (Pls. IV and V.)

Let us now summarize our observations concerning this extraordinary group of people. We hope that we have made clear to you the great variability in the physical composition of these ancient Palestinians. The difference between the sexes was very marked, not only between the Tabūn woman and the Skhūl men but also between the Skhūl females and the males. More striking even than this is the unexpectedly great variability in the Skhūl population. It is no exaggeration to say that if these individuals had been found in different sites at different times, and each one described by a different anthropologist or anatomist, we should have had a corresponding number of fossil races. Considered not in detail, however, but as a whole, the Skhūl individuals do form a well marked type of humanity. Admittedly it is a variable one but in this fact we see significance. Morphologically the Skhūl type is intermediate between Neanthropic and Neanderthal man, yet the variations are mainly indicative of an evolution towards the modern types of man. In no essential point or complex of features can we exclude the Skhūl people from a position among the ancestors of the modern races. Of these modern varieties of man, the Skhūl type appears to be the most likely ancestor of the Cro-Magnon form of the prehistoric peoples of Europe. His physical characteristics are too well defined and he is too late in the Pleistocene to provide us with an ancestor for Homo sapiens in the widest sense of that term.

The Tabūn type, despite its undoubted kinship with the Skhūl type of humanity, is Neanderthaloid. At the same time, it differs in many significant particulars from the Western European Neanderthals and so far as the evidence permits, it seems to be more akin to the Krapina Neanderthaloids. The European Neanderthals are undeniably primitive; in addition to this they possess certain specialized anatomical traits which we believe must exclude them from the direct ancestry of modern man. The Tabūn woman we know to be chronologically earlier than the Western European Neanderthals and her anatomy, though primitive, is less specialized. She represents an Eastern variety of the Neanderthaloid family. We believe also that she is probably closer to the form of humanity which was the parent of both the Palæanthropic and Neanthropic branches of mankind, than is the case with her western cousins. If evolution is true, we should expect to find from

time to time such a state of affairs as it has been our good fortune to discover in the Holy Land.

PROVISIONAL SKULL MEASUREMENTS

	Tabūn I	*Skhūl V*	*Skhūl IV*	*Skhūl IX*
Maximum Length	183.0	193.0	205.0?	205.0
Maximum Breadth	143.0	143.0	160.0?	145.0
Auricular Height	105.0	122.0	105.0?	120.0
Cephalic Index	78	74	78	70
Length-height Index	57	63	51	58
Breadth-height Index	73	85	65	82
Cranial capacity in cubic centimetres	1263	1588	1616	1610
Glabello-inion length	182	192	205	205
Calotte height	78	100	88	88
Calotte height Index	42.8	52	42.4	42.4

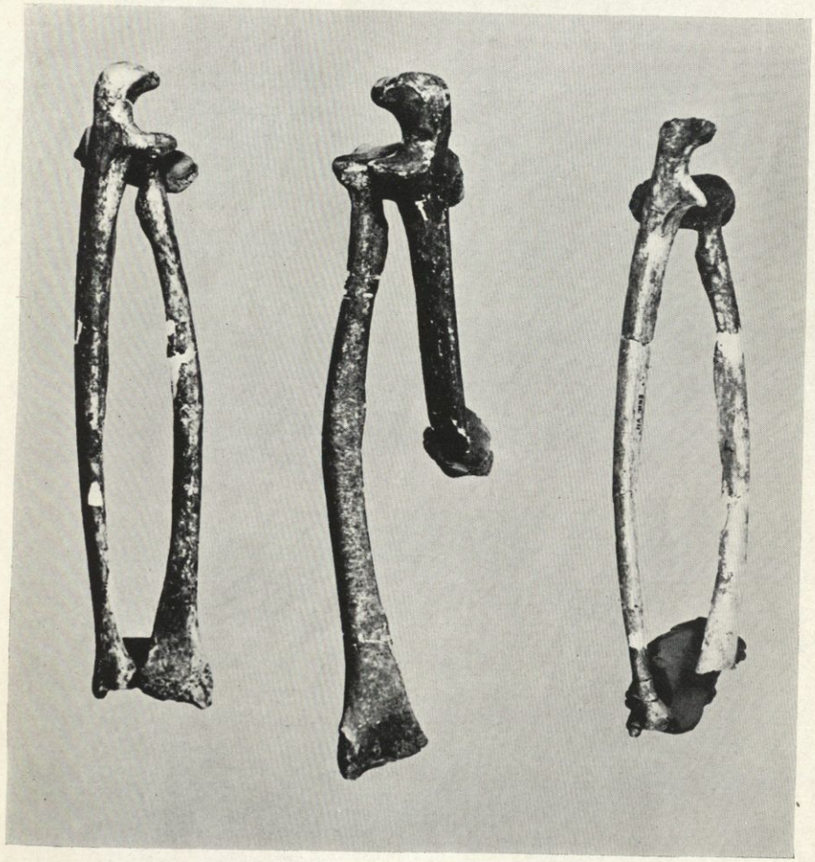

PLATE III. Forearm bones (left to right) : a, left forearm of Tabūn I ; b, right, of Neanderthal; c, left, of Skhūl VII.

PLATE IV. Skhūl V. a, norma lateralis dextra; b, norma lateralis sinistra.

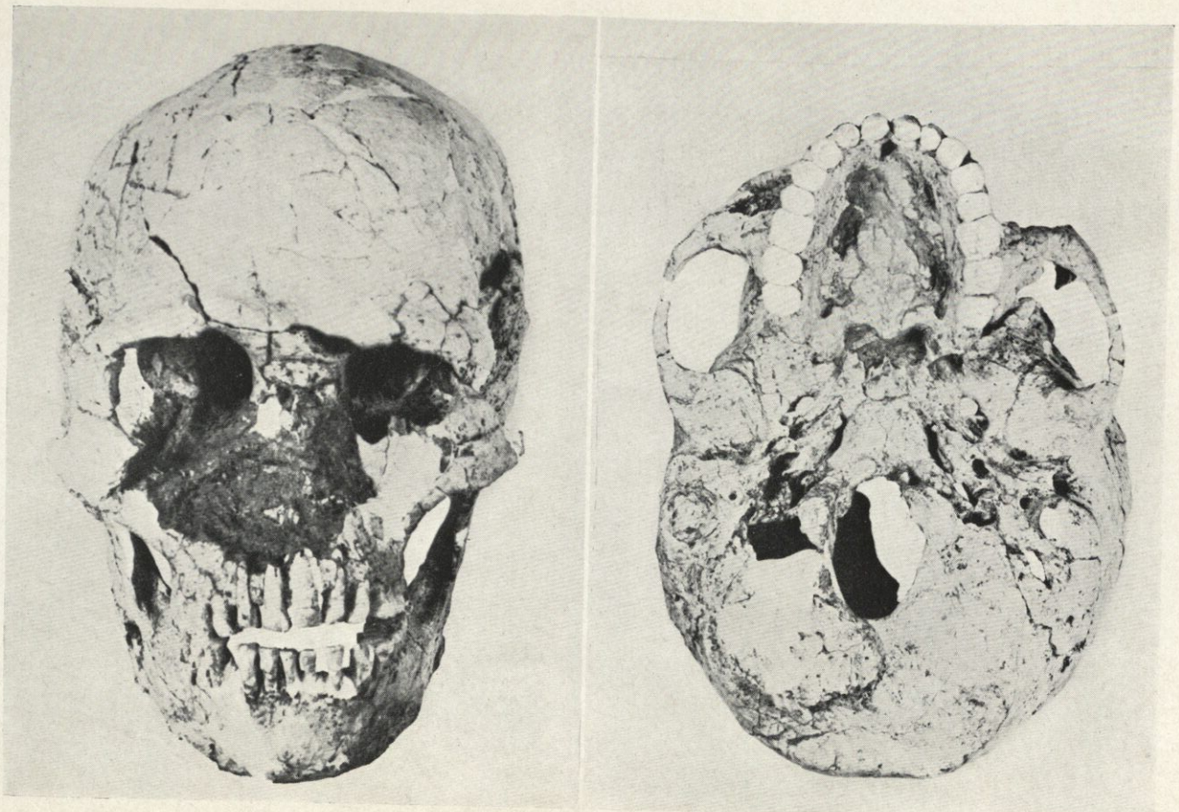

PLATE V. Skhūl V. a, norma frontalis; b, basal view.

THE NEAR EAST AS A GATEWAY OF PREHISTORIC MIGRATION

By Dorothy A. E. Garrod

REGARDED as a corner of the map, the patch of Asia known as the Near East seems very insignificant, but to the prehistorian it is a region of first-rate importance, since for him it is a possible highway of migration into Europe both from the Further East and from Africa.

Until comparatively recently, however, the rôle of the Near East in the Stone Age world has been largely a matter of speculation and hypothesis; to-day, as a result mainly of the work undertaken in the last eight years by the American School of Prehistoric Research, collaborating with the British School in Jerusalem and the Sladen Memorial Fund, by the Institut de Paléontologie Humaine of Paris, and by the Field Museum, we have a body of solid fact on which to build.

I can here only give a brief survey of the results of this work, and its bearing on the larger problems of prehistory. For this purpose the area studied can be divided broadly into three regions—the mountain country of the Zagros Arc, on the western frontier of Persia, the high land which to-day is the North Arabian Desert, and the coastal region of Syria and Palestine. I need not remind you that Mesopotamia proper, which is so rich in the remains of early civilisation, did not exist in Pleistocene times, when the head of the Persian Gulf lay close to where Mosul stands to-day.

I shall begin with the coastal region, because this has been most extensively worked, and so gives a standard of comparison for the other two. Our detailed knowledge of the Stone Age of Palestine begins in the middle Pleistocene, with the Tayacian industry which lies at the base of two great Palestinian caves. All older stages are known at present from surface finds only as far as Palestine is concerned, and in Syria, from deposits whose date and relation to each other have not yet been worked out. It seems likely, however, that the Chellean, the earlier stages of the Acheulean, and the Levalloisian were all present in this region.

The Tayacian is an industry of small rough flakes, first identified in Western Europe, at La Micoque. In Palestine, as at La Micoque, it is followed by a late Acheulean, which passes upward into the true Micoquian with its lanceolate hand-axes. In the Tabūn Cave, at the western foot of Mount Carmel, the Micoquian layer is immensely thick, and has yielded

more than eight thousand hand-axes, associated with an even larger number of flake tools, chiefly scrapers, more or less in the Clactonian tradition, and closely resembling those from High Lodge. A particularly significant feature is the presence at a certain horizon within the Micoquian of a group of blades and blade-tools, including end-scrapers, burins and Chatelperron points, in marked contrast with the hand-axes and flake-tools with which they are associated. I suggest that these should be explained by contact between the Micoquian and a very early blade-culture, possibly ancestral to the Chatelperron stage of Europe, whose centre of dispersion theoretically lies somewhere in southern Central Asia.

In its general lines, apart from the presence of this group of blade-tools, the sequence at the base of the Tabūn is astonishingly close to that of La Micoque—in fact the relationship with western Europe is far more strongly marked than that with the corresponding stages in the neighbouring regions of Egypt and North Africa, in so far as these are known at present. I do not pretend to explain the exact significance of this, but it should be noted that Central Asia and the Far East lie outside the area of distribution of the hand-axe cultures, whose place of origin is now generally assumed to be Africa. If the Acheulean of Palestine, therefore, should prove not to be derived immediately from Africa it must almost certainly be regarded as a kind of backwash from Europe. I must add here that the evidence of fauna as studied by Miss Bate, bears out the assumption that the Micoquian of the Near East is approximately contemporary with that of Europe, that is, it dates from the early phases of the Riss-Würm interglacial.

At Abbé Breuil's suggestion I have named the culture which follows the Micoquian in Palestine Levalloiso-Mousterian, to distinguish it from the true Mousterian of such European sites as La Quina, etc. This predominance of the Levallois tradition in the Middle Palæolithic is in harmony with what we know of Egypt and East Africa, and points therefore to movements from the south-west during a long period; movements which as we shall see, appear to spread into the two remaining areas with which I have to deal.

Judging once more from the evidence of animal remains the Levalloiso-Mousterian in all its stages appears to cover a considerable part of the Riss-Würm interglacial and the beginning of the succeeding glaciation. From its older levels comparatively abundant human skeletal remains have been obtained both by our own expedition and that of the Institut de Paléontologie Humaine. The description of these I leave to my colleague Mr. McCown, but I will note here that as a means of testing the theory of movements from Africa at this time it will be of interest to compare with the Mount Carmel and Nazareth men the human skull recently discovered by Dr. Kohl-Larsen

at Eyassi in Tanganyika Territory, in a deposit containing a rather late Levalloisian industry.

The Levalloiso-Mousterian in Palestine is immediately succeeded by the blade-industries of the Upper Palæolithic and these are predominantly of the type known in Western Europe as Middle Aurignacian. This culture, which in Palestine occupies nearly the whole of the Upper Palæolithic sequence, is unknown in Africa. In view of its remarkable development in the Near East I would suggest that we are there not far from its centre of dispersion, which may possibly lie in Iran, or even further east. From Palestine and Syria the Middle Aurignacian spread into the Caucasus, but did not apparently penetrate into the South Russian plain, where an industry of Upper Aurignacian type held sway from the early stages of the Upper Palæolithic. The route by which the Middle Aurignacian entered Europe must however have skirted the northern shore of the Black Sea, for the caves of the Crimea have yielded an Upper Palæolithic sequence closely resembling that of Palestine.

When we come to the Mesolithic, the Palestine culture is a specialised microlithic industry which I have named Natufian. Its older stages are characterised by small carvings, usually of animals, in bone or stone. Pottery is absent, but the presence of flint sickle-blades with hafts of bone suggests that these people may have practised a primitive form of agriculture. I am pretty sure that the origins of the Natufian must be sought somewhere to the north of Palestine, perhaps in Anatolia; certainly it is not an Egyptian culture, though it does just penetrate into Egypt, where it occurs in the surface station of Heluan.

With the Mesolithic I close my survey, because although the Neolithic and Chalcolithic periods do of course come under the heading of prehistoric, these obscure and complicated cultures demand a paper to themselves.

I turn next to the third of my regions, the mountain country of the Zagros Arc. The very slender knowledge which we possess of this part of the Palæolithic world is the result of an expedition undertaken jointly by the American School of Prehistoric Research and the Sladen Memorial Fund in the autumn of 1928, an expedition of which I had the good fortune to be the leader. In the caves of Southern Kurdistan we found the remains of two periods—a Levalloiso-Mousterian resembling the last stages of that industry in Palestine, and a blade-industry of Upper Aurignacian type with shouldered points and abundant small notched blades. The latter is quite unlike the Aurignacian of Palestine, but resembles the industry of Kostienki and Gagarino, and other stations of the South Russian plain. The presence of geometric microliths in the upper levels suggests, however, that the Kurdish industry is rather later than the Russian, dating probably from the very

close of the Palæolithic. Of any earlier Upper Palæolithic industry in this region we found no trace, but our survey was limited to a very small number of stations. If the theory of an Eastern origin for the Aurignacian of Palestine is correct, we should expect ultimately to find that culture in the Zagros, most probably in immediate succession to the Levalloiso-Mousterian.

Our third region, the North Arabian Desert, has yielded only surface finds. The Field Museum Expeditions have collected a large amount of material from this area, and I have had the privilege of studying and describing this, but as it is still unpublished I can only touch on it briefly here. The oldest industry which can be identified with certainty is an Upper Acheulean closely resembling that of Palestine. So far this has been obtained only from the western fringe of the area, but it is probable that it has in fact a wider distribution, since in 1928 I picked up a hand-axe of Upper Acheulean type from the surface at Chemchemal, in Southern Kurdistan. The Levalloisian and Levalloiso-Mousterian are well represented in the Arabian Desert, and there are a few Aurignacian stations of Palestinian type, but so far no trace of the Natufian has appeared. In its place we find a number of unfamiliar industries, of uncertain age, but probably ranging from the close of the Palæolithic to the Chalcolithic. No trace of these has been found either in Palestine or in Iraq, and it is possible that they may have penetrated northward as a wedge from the Arabian peninsula, a region up to the present unexplored by the prehistorian.

In an address to Section H of the British Association last summer I dealt with the blade-cultures of the Near East as part of a general study of the Upper Palæolithic, and it will be useful at this point to outline very briefly the conclusions which I then reached while insisting that they are merely tentative. In agreement with Peyrony I distinguished within the Upper Palæolithic a first fundamental division between the cultures based on the blunted-back blade—such as the Lower and Upper Aurignacian and the Capsian—and the Middle Aurignacian with its predominance of steep and carinated scrapers and *grattoirs à museau*. Peyrony retains the name Aurignacian for the latter culture, and with this I agree. The blunted-back blade industries, however, he groups together as Perigordian, whereas I am not convinced that there is an evolutionary sequence from the Lower to the Upper Perigordian—that is from the Lower to the Upper Aurignacian—in Western Europe. I have therefore, preferred to call the former Chatelperronian, and the latter Gravettian, and to regard the Capsian as an independent culture, not directly related to the Gravettian, but possibly derived independently from the Chatelperronian by way of East Africa, where we find an almost typical Capsian in the so-called Upper Kenya Aurignacian.

In Western Europe the Chatelperronian, Aurignacian and Gravettian follow each other, and to some extent intermingle, giving the classic French sequence which for so long was used as a standard for the rest of the world. If we trace them back to their hypothetical centres of origin, however, we find them more or less segregated into provinces. First we have the Chatelperronian, the earliest identifiable phylum of the blade-cultures, already emerging in Lower Palæolithic times in some as yet unidentified Asiatic centre, and making contact with the Acheulean in Palestine, and to some extent in East Africa. Ultimately it sends out a branch into East Africa to give rise to the Capsian, and possibly another into North-east Europe to develope into the Gravettian, though it is not inconceivable that the latter has an independent origin. Meanwhile another stock, the Aurignacian, pushes westward and separates these two great provinces of the backed-blade culture. From the Aurignacian and Gravettian centres migrations then pour into Central and Eastern Europe along the southern edge of the ice-sheet, and cultures which in their homelands tend to remain distinct and exclusive succeed and influence each other, until at the extreme limit of their journey we get, as I have said, the familiar French sequence. Meanwhile along the fringes of the original provinces interpenetration necessarily takes place, and we find the Upper Gravettian filtering along the valleys of the Zagros Arc into Southern Kurdistan, and the Aurignacian penetrating northward into the Caucasus and the Crimea. The only stages of the Upper Palæolithic of the West in which the Near East plays no part are the Solutrean, which apparently originates in Central Europe, and the Magdalenian, which arises as a specialised form of the Gravettian in Southern France.

To sum up; at the earliest stage for which we have detailed evidence, the Upper Acheulean, Palestine and Syria can be compared on general lines with Western Europe; in the Middle Palæolithic African influence predominates and apparently spreads eastward; with the Upper Palæolithic Asiatic influence gains the upper hand, and persists into the Mesolithic. That is the main outline of events, as we see them at present; further discovery alone can modify the framework or fill in the details.