PREHISTORIC RESEARCH IN NORTHWESTERN PUNJAB ANTHROPOLOGICAL RESEARCH IN CHITRAL

ITALIAN EXPEDITIONS TO THE KARAKORUM (K2) AND HINDU KUSH
Prof. A. DESIO Leader

V - PREHISTORY - ANTHROPOLOGY

Volume I

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ON BEHALF OF THE ITALIAN NATIONAL COUNCIL OF RESEARCH

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by
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PREFACE

The expedition to the Karakorum range which, during the summer of 1954 conquered K2 (8611 m) — the second highest peak in the world — had, according to Italian traditions, a scientific as well as a mountaineering objective.

Besides the actual ascent, the programme of the expedition included research and study in the geographical, geophysical, geological, anthropological and ethnographical problems of the area. Also, a collection of specimens of local flora and fauna from elevated heights was made.

The expedition was carried out in three campaigns. A preliminary reconnaissance was made by Professor Desio with a guide (Mr. Riccardo Cassin), during the summer of 1953. The main stage followed in 1954 and lasted six months: it was carried out by an Italian team of five scientists (Professors Paolo Graziosi, Antonio Marussi, Bruno Zanettin, Ardito Desio and Dr. Guido Pagani, the physician of the expedition) eleven climbers and a photographer; a medical officer (Colonel Dr. M. Ata Ullah) and an assistant surveyor (Bad Shah Jan of the Survey of Pakistan), both from Pakistan also joined the staff.

The scientific research was continued in the 1955 campaign which lasted about three months. The team this time consisted of three Italian scientists (Paolo Graziosi, Antonio Marussi and Ardito Desio) and three Pakistani assistants (Dr. N. M. Khan of the Geological Survey, Mr. Javed, and Mr. M. Azizullah of the Survey of Pakistan).

The territory examined during the first campaign is to be found between the upper course of the Indus river, from Skardu as far west as the Stak valley, and the principal ridge of the Karakorum to the north. However, some reconnaissance was carried out westwards as far as Hunza and Gilgit and eastwards as far as Bagicha. The territory covered in 1955 lies between the Gilgit area and Chitral.

A new scientific campaign was organized by Professor Desio during the summer of 1961 in order to explore geologically the Wakhan territory placed between the Hindu Kush and the Pamirs, and to extend westwards the geophysical observations. The leader was accompanied by Professor Marussi and two assistants (Dr. Giorgio Pasquarè and Dr. Ercole Martina) and by an Afghan geologist (Mr. Ajruddin).

While the geophysical programme was completely performed, the geological one was reduced to the survey of Central Badakhshan, for the expedition was not allowed to visit Wakhan.

VI PREFACE

In order to complete the geological researches over an area which had been omitted from the itineraries of previous expeditions and to clear up a number of unsolved problems of its stratigraphical geology, Prof. Desio, accompanied by two assistants (Dr. Ercole Martina and Dr. Roberto Galimberti) organised in 1962 a further campaign to the Western Karakorum. The territory covered this time is to be found between the Chogo Lungma and the Sosbun glaciers, and the high valley of the Hunza river.

The present volume deals with the results of the anthropological and prehistorical researches made by Professor Paolo Graziosi during his travels in 1954
and 1955. It should be mentioned that the programme for the 1954 research
campaign could not be completed on account of certain misunderstandings which
arose with the local authorities. Professor Graziosi was not allowed to go into
the Hunza valley to carry out anthropological and ethnological researches among
the local inhabitants, and other engagements have made it impossible for him to
carry out the original programme which has, as a consequence, never been completed. During the 1954 campaign, he therefore devoted his time principally to
prehistoric research which, as can be seen from the contents of this volume, gave
excellent results. The 1955 campaign which, as mentioned above, took place in
the territory west of the Hunza valley, included amongst its aims, an anthropological and ethnographical study of the Kafirs, a particularly interesting people
living in North-Western Pakistan. This task was undertaken by Professor Graziosi with the assistance of Mr. Javed, a student at the University of Lahore.

To complete his ethnographical researches, Professor Graziosi visited the valleys of the Bomberet region again in 1960 where he collected further data and new material on the Kafirs.

It is not necessary to dwell here on the value of the scientific work carried out by Professor Graziosi during the 1954 and 1955 campaigns. The present volume amply proves it.

That part of the 1954 programme of the expedition which was not undertaken, i e. the anthropological and ethnographical study of the Hunzas, will no doubt be carried out by Professor Graziosi or others sometime in the future. The problems involved are too interesting to be left unsolved, as the last expedition in 1962 to that region confirms.

Before concluding this short preface, I would like to thank Professor Graziosi, Mr. Javed, and all others, in Pakistan or elsewhere, both authorities and scientists who by their willing collaboration enabled us to carry out our studies and complete our work.

I also wish to thank the Italian Consiglio Nazionale delle Ricerche which financed our expeditions to the Karakorum and also made it possible to publish the present volume.

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FOREWORD

The anthropological and prehistorical research with which I was entrusted by the Italian Expedition to Karakorum K2 was carried out, during the period in 1954 when the Expedition which reached the summit of K2 was operating on the mountain and during the following summer of 1955 in order to complete the work previously begun. Ultimately in 1960 during a further mission which involved ethnographical research amongst the Kafirs of Chitral I collected other anthropological measurements of this people.

The districts where research took place were those of the Punjab rivers, the Jhelum, Soan and Indus, for prehistory; and the valleys of the Chitral and part of Mastuj, as well as those inhabited by the Kalash and Kati tribes (in the state of Chitral) for anthropology.

The study of the peoples in the State of Chitral was included in my programme because the various peoples of the Karakorum district may be considered from an anthropological point of view as having been studied very little and numerous queries arise with regard to their relations with the well-known neighbouring peoples and their position, not only anthropologically but also ethnologically in the general picture of the population of Central-Western Asia.

The number of individuals measured both amongst the Kalash and Katis, as well as amongst the Chitrals, was sufficient to give me a fairly clear picture of Kalash and Kati anthropology. The mission brought back an abundance of photographic material regarding the anthropology and ethnography of the peoples visited and concerns subjects about which nothing has been previously published. There is also a vast and interesting collection of objects of ethnographical value.

With reference to prehistory, a considerable amount of palaeethnological records appertaining to various ages were collected during my mission and the observations from them allow us to trace a picture of the development of the typological evolution which, in certain aspects, integrates and completes the research and observations made 30 years ago by Anglo-American investigators in the same districts.

In conclusion during my travels in 1955 and 1960 I was able to collect a certain amount of human osteological material found in the Kati and Kalash cemeteries situated in the Bomberet, Rumbur and Birir valleys. Two complete skeletons were found in two ancient Dolmutse tombs in the Chitral valley. I was unable to ascertain the age of these skeletons owing to the complete absence of funeral furnishings in the tombs. I can only say that the tombs are pre-Islamic. The osteological material gathered in the Kati and Kalash cemeteries will be published in the near future in another publication. Owing to bureaucratic difficulties encountered in order to obtain permission to take the material collected in 1960 out of Pakistan this material arrived in Italy one year later and this fact delayed the study of the same.

Notwithstanding the impediments which arose in 1954 in order to obtain permission to visit Chitral, in 1955 and 1960 matters improved greatly as the Pakistan Government aided and facilitated our mission and I was cordially welcomed and effectively assisted by the civil and military authorities at the various places visited by the mission.

In 1955, after Professor Ardito Desio left us in Chitral in order to continue his geological itinerary I was joined for a few days during my stay in the Kafir valleys by my colleague, Professor Antonio Marussi, who afterwards continued his journey to Gilgit in order to carry out his programme of geophysical and gravimetric research. Mr. Javed, a young medical student from Lahore University, who had been assigned to the mission as Liaison Officer, remained with me. He was a great help to me in carrying out my anthropological work, especially in regard to the compilation of cards reporting the various measurements which I dictated to him. I wish to express my thanks to him and also to his brother Major Rashid of the Rawalpindi Health Service, who in 1955 assisted me greatly in dealing with the many matters involved in the organization of the journey. I should also like to take this opportunity of thanking Mr. Askar Ali Shah of Peshawar with whom I spent some time when visiting the Kalash of Bomberet for the assistance he gave me during my work carried out there.

In connection with the 1955 mission I wish to thank the political and

military authorities in Chitral and in particular, Prince Burar Ed Din Khan whose guest I was at his home in Berumuster while investigating the ancient tombs situated on his property.

I should like to extend my gratitude to the Tehsildar of Chitral Mr. Mohamed Sufeid Khan who was of great help to me by giving me advice about the organization of the caravans amongst the Kalash and in Chitral, during my missions in 1955 and 1960.

Although the 1960 mission carried out a series of anthropometric measurements of the Kati and Kalash peoples of Rumbur and Birir in order to complete the measurements taken in 1955, the main object of the mission was to gather ethnographical data relating to these peoples. These data are now being classified and will be published shortly.

The 1960 mission was carried under the auspices and owing to the generous contribution of the ISMEO, the Consiglio Nazionale delle Ricerche and the Italian Ministry of Foreign Affairs, as I shall be able to illustrate more fully in my next publication. I must also mention the sincere and intelligent interest taken in the mission by Dr. Dehlavi Samiullah Kahn who was Pakistan Ambassador to Italy at the time. It was due to his zeal that all difficulties connected with obtaining permission for a foreign mission to enter distant isolated border territory at a rather delicate moment in international affairs were removed and it is due to him that I was able to complete my programme of anthropological and ethnographical studies amongst the peoples of Karakorum.

Dr. Simone Velluti Zati di San Clemente and Mr. Giovanni Verusio took part in the mission and they were of inestimable help in collecting anthropometric measurements, ethnological data and material. Owing to their collaboration the mission was able to obtain better results.

The 1960 mission was also indebted to the collaboration of the Department of Archeology at Karachi, which is directed by Dr. Khan whom I wish to thank for his assistance. I must also mention Mr. Shakur, Director of the Peshawar Museum, Mr. Idris Sidiqi, an official of the Department of Archeology and Mr. Sidiqi the photographer of the same department. They were excellent companions during our travels and collaborated in the collection of data and specimens of ethnological interest.

There are many other people who gave us their invaluable assistance during the 1960 mission and their names will be included in the publication dedicated to the results of this mission.

In conclusion, I wish to express my deepest thanks to Professor J. C. Trevor

of Cambridge University for his invaluable assistance in advising me on English anthropological terminology and also to Mrs. Raymond Allchin of Cambridge University for her assistance in advising on English prehistoric terminology.

My gratitude must also be expressed to Dr. Henry Field, Research Fellow, Peabody Museum, Harvard University, for a number of minor editorial changes throughout the text.

Finally, I particularly wish to thank my assistant, Miss Claudia Massari, who carried out all statistical elaboration of anthropometrical data which I collected in the course of my missions in 1955 and 1960.

Prehistory

Research in northwestern Punjab

CONTRIBUTIONS TO PREHISTORY OF PUNJAB

The region in which I carried out my main investigations during the summer of 1954, was the northwestern Punjab, in an area between the Jhelum and Indus rivers to the east and west, the Soan and Haroy rivers to the south and to the north. The same region had been a field of investigation twenty years before, for the Yale North India Expedition (1932–33) and later for De Terra, Paterson and Teilhard de Chardin in 1935, to whom we are indebted for the fundamental monograph "Studies on the Ice Age in India and associated human cultures".

Before investigations were carried out by the Anglo-American Mission it was already known that paleolithic artifacts existed in the Punjab: (Theobald 1880, Swinnerton 1880, Wadia 1928). The latter states that they were found in the Soan Valley (1).

The purpose of my investigations was to locate further sites not mentioned in American publications, visit some of the most important and well known sites, and, above all, to collect new material and become familiar with the typology of the various facies "in situ", which had already been found and described by Anglo-American authors. To this end I carried out my investigations at the site at Rohri, which is situated on the lower reaches of the Indus near Khaipur.

The investigations which De Terra, Paterson and Teilhard have carried out have created a solid geological basis for the prehistory of the Punjab. Indeed it is really the study of the Quaternary fourfold glacial cycle of North-West India, and the creation of a vast system of correlation between the glacia-

⁽¹⁾ WADIA D. N., The geology of Poonch state (Kashmir). « Mem. Geol. Surv. India », 51, 1928, pp. 185-370.

tions of the Kashmir Himalayas and the alluvial formations of the big rivers of the Punjab, which forms the fundamental part of the Anglo-American author's studies and which takes up nearly the whole of the volume above mentioned.

Starting from the works of Giotto Dainelli, who in 1913–1914 established for the first time the existence of four great climatic cycles in the Glacial cycle of Kashmir (1) De Terra, Teilhard de Chardin and Paterson developed and extended the study of this subject and created chronological charts of the alluvial deposits and the terrace system of the Punjab river, in relation to the glaciations and interglaciations above-mentioned (2). If all this demonstrates a long and laborious analysis of local facts and a very notable effort of synthesis, on the other hand the surprising clearness of these charts leaves one rather perlexed, especially in regard to the simple systematization of the various lithic cultures. This perplexity is also present when one is on the site and wishes to classify the artifacts on the basis of their physical state in relation to their typology, and place them in the perfect stratigraphical and chronological structure presented by the Anglo-American authors.

The observations which I made during my short period of investigation in the Punjab valleys, were only for the purpose of recognizing the typological origin of various cultures typologically and any intent to revise the fluvial Quaternary glaciation of the region must be excluded as this would have necessitated a long residence in the area and a very different plan of research. I have therefore referred to the vast and weighty geomorphological work carried out by De Terra and Paterson during my various researches in the field, and the following study of the morphology of the lithic industries which I collected in the Punjab is based upon their work.

According to De Terra, Teilhard de Chardin and Paterson a succession of fluvial terraces are present in the Western Punjab due to glaciations and interglaciations and these are related to the human cultures of the Stone Age.

These authors also state that it is possible to distinguish clearly in the West Punjab a terrace sequence of the big local rivers which relates to the glacial and interglacial phases and also to the human industries which develop

⁽¹⁾ DAINELLI G., Studi sul Glaciale in « Spedizione italiana De Filippi nell'Himalaia, Karakorum e Turkestan cinese ». Serie II, III (8), Bologna 1923.

⁽²⁾ DE TERRA H., PATERSON T. T., Studies on the Ice age in India and associated human cultures, Washington, 1939; DE TERRA H., TEILHARD DE CHARDIN P., Observations on the Upper Siwalik formation and Later Pleistocene deposits in India. «Proceedings of the Amer. Philosoph. Soc.», 76, 1936, pp. 791-822.

with the successive phases. To these the authors have given, as is already known, particular names derived from the name of the Soan river (Pre-Soan, Early Soan, Late Soan, Evolved Soan). The charts drawn up by the above-mentioned authors have been accepted by Movius and he has referred to them in recent publications. The geo-paleontological chart starts with the powerful fluvial deposits of the "boulder conglomerate", these deposits appertain to Upper Siwalik, that is to say at the beginning of the Early Middle Pleistocene. In the upper layers of the boulder conglomerate there have been found, according to the Anglo-American authors, the oldest implements which belong to the so called "Pre-Soan Culture" "which suggests that these implements were manufactured whilst the conglomerate was still in process of deposition" (1). This "boulder conglomerate" belongs to the Second Glaciation.

During the Second Interglacial phase a terrace, (T1) 220 feet above the present level of the river was formed, and on the surface of T1 a strata of boulder conglomerate, which was recemented, was deposited. During the Third Glaciation, this deposit was cut into and a second terrace (T2) was formed, on the surface of which a conglomerate 30 feet thick was deposited, and this then covered by a thick layer of overlying loessic silt, which forms the surface of the second terrace at 1200 feet. The authors have called this silt "Potwar Loessic Silt" after the region, but rather than a true loess it is "a precipitate of the semi-arid monsoon regions south of the Himalayas" (2).

During the Third Interglacial stage a long period of erosion created a third terrace (T₃) at 80 feet which presents a deposit of gravel at the base covered by a layer of redeposited Potwar Loessic Silt. There is also present a fourth terrace at 40 feet, which corresponds to the fourth ice advance in Kashmir, formed by gravels and a fifth terrace, the lowest, at 15-30 feet, which has been assigned to the Post-Pleistocene Stage and which is sometimes inundated by flood waters of the river.

The Anglo-American authors have created, as mentioned before, an evolved chart, which is not only chronological but also typological, of the industries which they found in various localities of the Punjab. They have synchronized these with the geo-chronological succession of the alluvial formations. As previously mentioned exact reference is made to each typological cycle which they have created to a precise terrace of the river system of the Punjab, and

⁽¹⁾ DE TERRA, PATERSON, 1939, p. 303.

⁽²⁾ Movius H. L., The Lower Palaeolithic cultures of Southern and Eastern Asia, «Transactions of the Americ. Philos. Society», New Series, vol. 38, part 4, 1948, p. 342.

in consequence to each of the glacial and interglacial stages, to which they have attributed the formation of the terraces. If on one hand this appears to be suggestive and acceptable, anyone who strives for clarity and symmetry in statements regarding natural phenomena, is not always satisfied owing to excessive schematization. It must be kept in mind that the Anglo-American authors have created their system of the evolution of prehistoric cultures in the Punjab by means of a laborious complex which is certainly a valuable work of documentation of facts, which have been gathered in very different localities and sites. The study of the physical state and patina of the artifacts has been a fundamental element in this reconstruction, together with direct stratigraphical observation, where this has been possible, in relation to the typology of the artifacts.

We have already pointed out the existence of a very primitive industry in the "boulder conglomerate", which owing to the degree of rolling of the artifact leads one to presume that this industry dates back to the period when the conglomerate was in the process of decomposition, that is to say, during the Second Glaciation stage. This "so-called" Pre-Soan industry, consists of large, rough weathered flakes made of quartzite which exhibit a large striking platform which forms an angle of 100°-125° with the large axis of the implement. With the exception of a few irregular scars, the upper surface is unflaked and retains a large part of the original cortex of the pebble.

The term "Pre-Soan" is used to indicate a chronological precedence of the cruder cultures rather than to designate an early industrial stage of the Soan culture which does not appear to have any true cultural relationship with the former. The Soan industries, which are sub-divided into Early Soan, Late Soan and Evolved Soan appear during the Second Interglacial stage, continue into the Third Glacial stage (Late Soan) and terminate in the Fourth Glacial stage (Evolved Soan). Early Soan has been found in association with deposits of the first terrace and has been sub-divided by Paterson into three groups, based on the physical state of the artifacts: Group A — worn and heavily patinated; Group B — deeply patinated but unworn; Group C — less patinated and fresher. It must be remembered however that these subdivisions are not connected with stratigraphical data. It appears that the older implements are more massive and crude but become progressively finer.

A characteristic of Early Soan culture is the form of the choppers and chopping tools. The former are defined by Movius (1) as being unifacial

⁽¹⁾ Movius, 1948, p. 350.

artifacts made on pebbles or pointed, sharp lithic fragments with a cutting edge whose profile is round, semi-oval or almost straight. This has been created by flaking carried out on the upper surface of the artifact. Also, according to Movius, chopping tools are made on pebbles (or crude lithic fragments which are more or less tubular in shape) and these may be considered bi-facial because the cutting edge of the artifact has been flaked on both sides in order to obtain a sinuous cutting edge. These implements generally retain a large part of the original surface of the pebble. In the Early Soan, together with implements made on pebbles, there are also flake implements which exhibit unfaceted striking platforms. These form an angle of about 100° with the axis of the artifact. Retouched forms are rare. According to Paterson, this flake industry has a general resemblance to the Early Clactonian of Europe. Flakes of this type have not been found with a physical state referring to Group A, but only to Group B and C. This latter group having been more carefully executed, showing a more accurate preparation of the core, prior to detachment of the flake. There are also flakes which have a striking platform summarily retouched which suggests a sort of "Proto-Levalloisian" tendency. In the Early Soan there are also discoidal cores, elongated in shape with flaking on their surfaces. These are cruder in Group A, but become progressively finer in Group B and C.

In addition to "chopping tools" there appear in the "Early Soan" stations of the rivers of the Punjab bi-facial industries which are clearly "Abbevillian-Acheulian". There are true hand-axes which in form resemble the "Abbevillian – Early – Middle Acheulian and European" hand-axe industries. It is therefore evident that during the Second Interglaciation, two industries developed at the same time in the Punjab, one "pebble type", the Soan, the other with hand-axes of the "Abbevillian-Acheulian – Euro-African" type. It appears that the Anglo-American authors wish to keep these two cultures distinctly apart, at least from a genetic point of view and consider them as having developed independently.

The Anglo-American authors consider the stations at Chauntra on the Soan river, about 20 miles to the southwest of Rawalpindi, as being very important: here excavations were made in a deposit of gravel, probably of the Third Interglacial times, where industries of various ages were found, some of which came from the higher terraces and were therefore older. The artifacts are in different physical states, and on this basis Paterson has divided them into three groups: Oldest, Middle, and Youngest. There are also found, mixed together, industries of the "Abbevillian-type and Early-Middle and Late

Acheulian type with characteristic "Soan" implements. Paterson states that (1) "So far, these two entirely distinct cultures (Soan flake and pebble industries and Abbevillian-Acheulian complex) have been found in contact at one site only, Chauntra, where hand-axes of late Acheulian type are associated with cores and flakes of Late Soan age".

During the Third Glaciation, the late Soan is developed, and this culture has been sub-divided into two cycles, A and B. The first is found, according to the Anglo-American authors, incorporated in the Potwar basal gravels of the Second Terrace, T2, and yield a great variety of "chopping tools" and scraping types, which, on the whole, are smaller and of better manufacture than those of the Early Soan. There also exist a large number of flake and core implements. In group A, Late Soan, the implements have a "Proto-Levalloisian" tendency, similar to that in the Early Soan culture and show characteristics which are always more decidedly "Levalloisian". There are also present implements with retouched striking platforms of the "Chapeaugendarme" type; true blades also appear. In Late Soan B, the artifacts which lie in the basal portion of the Potwar Loessic Silt, of the second terrace, T2, are found in a very fresh condition and consist mainly of flakes, blades and various kinds of cores. About 50% of the flake artifacts display prepared striking platforms and the upper surface of the implement shows large flaking carried out on the original pebble prior to detachment of the flake. There are also pebble choppers. These industries are widely diffused in the Punjab.

⁽¹⁾ DE TERRA, PATERSON, 1939, p. 312.

THE TYPOLOGY OF NORTHWESTERN PUNIAB INDUSTRIES

The stations of Northern Punjab, which are marked on Paterson's map of distribution (1) are situated along the course of the Soan river, from near Rawalpindi up to the conjunction with the Indus river, and from there up to Attock along the course of the Indus: that is to say, in the region between the Soan and Jhelum rivers, and along the course of the latter. The stations in Kashmir are also marked on the above-mentioned map.

The stations which the present author has located are for the most part situated along the banks of the Soan river, between Rawalpindi and the conjunction of the Soan river with the Indus. Some stations are to the south of Rawalpindi near the Jhelum river. The author has also carried out investigations in the field and collected artifacts in various localities mentioned by the American Mission, eg. Makhad, Dok Patan and on the banks of the Haro river. All the new stations which I have mentioned have produced palaeolithic artifacts, with the exception of two stations where I found a late lithic industry associated with pottery.

As has already been stated, a stratigraphical localization of the industries collected at the above-mentioned stations, presents great difficulty, as they were not found in stratified deposits, but on the surface, and in many cases at the same place were mixed with artifacts of different epochs owing to the heterogeneousness of their physical state and typology. But in some other cases the uniformity of the patina in relation to the typological affinity have constituted a valid element in order to define a culture and establish a correlation between one place and another.

⁽¹⁾ DE TERRA, PATERSON, 1939, fig. 180, p. 302.

In this preliminary study of the industries collected by the Italian Mission, we have certainly not the pretence of forming a picture of the evolution of the Stone Age in the Punjab. Our scope is simply to illustrate, from a typological point of view, some stations in addition to the ones mentioned by previous authors, to complete certain observations which they have made and to accomplish an examination of the evolution of the industrial technique and of possible links and typological derivations between the various forms of the implements.

The terminology used and the method of classifying the various types of Lower Palaeolithic industries of the Punjab and the rest of the Indo-Pakistan subcontinent are not very clear. Many authors use different nomenclatures for the same category of implements and a certain confusion exists regarding the typological classification and the nomenclature of the old industries. This is due to the fact that some implements are difficult to define and fall into more than one category owing to the crude workmanship of these primitive artifacts which in many cases leaves one perplexed as to whether they are primitive human artifacts or natural forms. It must also be kept in mind that the English and American terminology adopted for certain types of Lower Afro-Asiatic Palaeolithic, is not always satisfactory as it is based on the presumed use of the implement and is, in some cases, certainly mistaken as Lal (1) asserts. This only leads to perplexity and confusion.

The basic forms of Lower Palaeolithic found in the industries of the Indo-Pakistan sub-continent (2) and in the African continent, may be classified as follows: 1. Pebble Tools. 2. Flake implements both large and small manufactured by splitting the pebble, which were used with or without retouching. 3. Hand-axes and cleavers. 4. Cores with flaking.

1. The Pebble Tools are the most difficult to classify for many reasons and because this term has a very limited use and is used to describe only a part of the artifacts made on pebbles. For example hand-axes are excluded. The category of pebble tools, according to various authors, is made up of two basic implements, the chopper and the chopping tool.

According to the Anglo-American authors, the chopper is a pebble with a flat ventral base and a convex upper surface with flakes struck upwards

⁽¹⁾ LAL B. B., Palaeoliths from the Beas and Banganga Valleys, Punjab, « Ancient India », n. 12, 1956, pp. 58-92.

⁽²⁾ Movius, 1949, p. 350.

from the edges of the flat platform, a cutting edge is thus formed. It is therefore a unifacial tool. Lal(1) has divided this group into four categories, according to the various types of cutting edges: viz. (straight, half-moon, fan-shaped etc.), the steepness of the same and the extent of retouching.

According to Sen, the term "chopper" is improper; instead the term "pebble scraper" or unifacial pebble chopper should be adopted (2). I am of the same opinion because choppers are, in conclusion, true and proper crude scrapers, even though they may be of large dimensions. They may not originate from untouched pebbles but from a hemilith or a thick flake and therefore may be classified in Group 2 (flakes) or Group 4 (cores).

According to the Anglo-American authors, the chopping tool is made on a pebble whose cutting edge has been manufactured by flaking on both sides which are more or less convex. The cutting edge is thus formed by alternate flaking and the intersection of the alternate flake scars presents a scalloped appearance (3). Sometimes when one examines one of these artifacts there may be some doubt as to whether it is a primitive hand-axe owing to the greater or lesser extent of retouching.

Let us deal briefly with other definitions applied to pebble tools, and what their origin may be, from a purely technical-morphological point of view, by taking into account what is noted outside of Asia. By studying the Kafuan industries of Uganda, Van Riet Lowe (4) has distinguished in the "pebble cultures" of the African Lower Palaeolithic, three principal types of split pebbles: the hemilith, an oval pebble (ovate), split in half transversely, the plagiolith, a pebble split obliquely; the ortholith, a pebble split straight down its major axis. These three types may also give rise to other types of artifacts owing to secondary work.

If flaking is carried out on one face along the edge of a flattish hemilith a chopper may be obtained which, according to the steepness of the cutting edge, may be considered as an implement used for cutting or as a convex unifacial scraper. If a chopper is shaped by the removal of flakes from the opposite flat ventral surface a "chopping tool" with flaking in two directions may be obtained. The "chopping tool" is the characteristic artifact of the

⁽¹⁾ LAL, 1956, pp. 75-76.

⁽²⁾ SEN D., The Soanian and the pebble-tool complex in India, «Man in India», vol. 37, n. 2, 1957, pp. 158-159.

⁽³⁾ Movius, 1949, p. 350.

⁽⁴⁾ VAN RIET LOWE C., The Pleistocene Geology and Prehistory of Uganda. Part. II, Colchester, 1952.

Oldowan culture in Tanganyika. When flakes are removed from one end of an ortholith, segmental points are obtained and these are prototypes of the rostro-carinates. If an ortholith is split longitudinally "pebble wedges" and "finer pebble wedge blades" and "pebble wedge points" with flaking at one end are obtained. The latter are characteristic of developed Kafuan.

Leakey during his study of the splendid Olduvai gorge site, where 12 successive stages cover the whole of the Chelles-Acheul Culture up to Evolved Acheul Culture, considers the industries of Bed 1, the oldest geological horizon, which belong to the Oldowan culture to be synonymous with the final stage of the Kafuan Culture (1). Here more chopping tools are found (75%) than choppers with unifacial flaking. The latter are predominant in the true Kafuan Culture.

From chopping tools one passes on to very simple "coup-de-poing" Abbevillian forms and according to Leakey this indicates the true commencement of Chelles-Acheul Culture of Africa (2).

With reference to the stations which I studied in Punjab it seems evident that the presence of prototypes similar to the ones found in East Africa shows that these formed the basis from which other industries were technically evolved. To be more precise, these prototypes are untouched pebbles, ortholiths, wedges, "slices" and flakes of various sizes and forms.

2. The group of flakes resulting from the splitting up of pebbles into fragments, offer a certain variety of types, depending on whether the flakes are wedge-shaped or of more or less uniform thickness. These slices or wedges were used for the manufacture of bi-facial artifacts: viz. hand-axes and cleavers. The study of the industries of the Punjab, particularly the station at Morgah, permits us to establish that the large "pebble wedges" were not only used to make bi-facial artifacts but were also used as artifacts themselves. This may be established owing to the numerous marks of usage which appear on the cutting edge. (Pls. 39; 40). To this group of wedges and slices must be added the "Clactonian-Abbevillian-Mousterian" group of artifacts. The latter were manufactured from smaller flakes which were struck from cores using the classic technique for working on flakes, that is to say, either with or without a prepared striking platform.

⁽¹⁾ LEAKEY L. S. B., Olduvai Gorge, Cambridge, 1951, pp. 34-35.

⁽²⁾ LEAKEY, 1951, p. 41.

It must be kept in mind that the flake may have had two different origins:
(a) it may have been struck from an untouched surface of the pebble or,
(b) from a core which had been extensively flaked previously, as may be observed in the European Levalloisian technique.

3. The group of hand-axes and cleavers is certainly the most easy to define from a typological point of view although sometimes it is not easy to place an artifact in the right category. The fact that many bi-facial artifacts originated from ortholiths may be clearly seen in the industries of the Punjab in order to determine their origins, we can refer, in many cases, to what has been established for the Lower Palaeolithic Culture in East Africa and in other localities on the continent of Africa and elsewhere. By examining the tables which are included herewith, it may be seen that many hand-axes including the most evolved types, have the previously mentioned techno-morphological origin.

Example no. 11. (Pl. 9). This shows a primary working stage of a handaxe, in which the split surface of the ortholith has been completely flaked whilst the rest of the pebble exhibits the original cortex.

Example no. 12. (Pl. 10). This shows a more working stage of a handaxe: one surface, the split surface of the ortholith, is completely flaked and the opposite surface is in an advanced working stage. The upper part of the artifact has a definitely pointed form.

It must not be excluded, and indeed is highly probable that the ortholith or hemilith, which is worked only on the split surface, was an artifact in itself, and was used in the same state in which it was found and therefore represents an industrial type. The great number of these objects, which are found in the terraces of the Punjab, seem to demonstrate that these artifacts were used in the same condition in which they have been found. The fact that they were used is evident by the marks of use which are found round their edges. Not only were the hemiliths and ortholiths the basis of the technique of bifacial implements in the Punjab. Hand-axes could be made on untouched pebbles and in this case they appear, from a genetic point of view, to represent a more advanced working stage in the manufacture of the chopping tool. On the other hand, as Leakey has already stated, the same derivation exists for the Oldowan industries.

In reference to the simplest forms of pebble tools, it may be noted that the type of artifact, which Van Riet Lowe considers as having been derived, generally speaking, from the hemilith, is found in the Punjab industries. This artifact is made on a pebble from which two or more large flakes have been struck in the same direction to form a rudimentary unifacial point called "Kafuan point", which has a screwdriver type of variation caused by alternate flaking on both sides of the pebble. In the Punjab industries pointed pebbles of this type are present, but the examples which I collected were not only hemiliths but intact pebbles whose points were manufactured by the above mentioned technique. Primitive hand-axes of this type are called "pebble hand-axes" by Lal (1). He found them on the Gular site in the Punjab and they were all of a flat ventral type. The evolution of these artifacts to the form of implements with bi-facial flaking of the "coup-de-poing" type, may be traced.

A third origin is clearly visible in the hand-axe category as these artifacts originated from large pebble wedges and large slices which were made by splitting the pebble longitudinally. In fact, there are hand-axes on the surface of which incomplete flaking has been carried out which shows clearly the bulb of percussion of the slice from which they have been manufactured. Lastly hand-axes may have been made from large flakes struck from the original pebble without a prepared striking platform.

From what has been previously stated, the polymorphous origin of every type of hand-axe, from the point of view of technique, is very clear in the stations of the Indo-Soan Region. The natural pebble, ortholith, wedge and the large flake, with or without a prepared striking platform, may all have served for the manufacture of hand-axes. It also seems to be evident that the various origins have not really influenced the ultimate form of the hand-axe. The only influence exerted has been due to size, and to the greater or lesser degree of flatness. In conclusion, the opinion expressed by the preceding authors that, from a genetical point of view, the "Soan" pebble culture should be considered separately from the "hand-axes", should be excluded. On the contrary, it seems that we have established an absolute technical-morphological and genetical interdependence between the two. On the other hand the origin of the Abbevillian-Acheulian from the Oldowan culture has been affirmed by Leakey.

If one considers the typology of the older stages of the Palaeolithic Cultures of Africa and the Soan Culture of the Punjab, there may be seen in these primitive cultures rudimentary, basic industrial prototypes (split pebbles, flaked pebbles, large and crude flakes) from which various evolved forms of objects of the hand-axe type owe their origin.

⁽¹⁾ LAL, 1956, p. 66.

The variety of artifacts with bi-facial flaking is not exhausted in the Punjab with hand-axes of different types. There is a category of implements named "cleavers" which I have found in abundance at Morgah near Rawalpindi. These implements are well known and numerous in Old Palaeolithic Cultures in North, South and East Africa, as well as in India(1). They are found in the Punjab in slightly different forms which on the whole exhibit a rather crude and undeveloped technique. From a morphological point of view they appear to be connected with hand-axes, as has been mentioned previously, so much so that when one is confronted by certain examples (Plate 36 c) there is some doubt as to whether they are to be considered as connected with hand-axes, with an enlarged and narrower base, or cleavers.

In some of the examples of cleavers collected at Morgah, the transversal section has a parallelepiped form whilst in others it is oval or lenticular. The cutting edge is obtained by the convergence of a few large flake-scars which has been carried out on both surfaces at the largest end of the implement or one of the cutting edges may be entirely made up by a part of the original cortex, whilst the other cutting edge is made by the previously mentioned flaking. The implement may be u-shaped with a round base or v-shaped with a pointed base, or parallelepiped-shaped and may have the widest part in correspondence with the cutting edge or towards the middle of the implement. At Morgah it has been noted that the implements which present a fresher physical state and a cruder working technique are generally v-shaped.

Nearly all these cleavers are made on large flakes which generally display prominent bulbs and striking platforms. There is no doubt as to their origin. In certain cases they appear to have been manufactured from large wedges, whose cutting edge, resulting from the oblique and converging surfaces of the wedge, has served as the cutting edge of the cleaver.

4. "Cores" represent a large category of artifacts which are difficult to classify. The flaking has been carried out on the edges of the upper and lower surfaces, which are more or less steep, round, elongated or rhomboid resulting from working on a pebble or any type of rock fragment. In this category, true and round cores with flaking over the complete surface are placed. Various authors include in the category of "cores" the most different forms

⁽¹⁾ SANKALIA H. D., Animal fossil and Palaeolithic industries from the Pravara Basin at Nevasa, district Ahmadnagar, «Ancient India», 12, 1956, pp. 35-52.

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which do not exhibit characteristics of "choppers" or "chopping tools". We have already stated our reservations regarding the definition of "choppers". According to our point of view, they may be classified, depending upon circumstances, with cores or implements made on large flakes. It must be remembered, as before mentioned, that an artifact which may be considered as appertaining to a stage of hand-axe manufacture, was definitely used as an implement on its own behalf. We refer to the ortholith which displays flaking on the split surface. Also the hemilith may exhibit the same characteristics and therefore assume the form of a true scraper.

THE NORTHWESTERN PUNJAB PREHISTORIC SITES VISITED BY THE ITALIAN MISSION

MORGAH (Site 6,7)

The most important station, owing to its respective size and the variety of type specimens which I was able to find and study there, is situated between the village of Morgah (about 4 miles south of Rawalpindi) and the installations of the Attock Oil Company.

I collected the industries on a site whose area was about I square mile not only on the summit of the high Soan terrace but also on its slopes, as well as the lower terrace system. The implements were lying separately on the surface of the ground, but I also found some "in situ" on the upper terrace. They were cemented in a bed of small conglomerate gravels, the depth of which ranged from 30-40 cms. This bed covers up, here and there, the deposit of reddish Potwar loessic Silt which forms the body of the terrace. The top of the high terrace of Morgah may be considered to be the highest point of the terrace system of this zone. In certain places it may be clearly seen that the Potwar loessic silt is deposited above ancient deposits of boulder conglomerate.

A typological difference does not appear to exist between artifacts gathered at differents levels, because many different industries may be found mixed together not only on the highest terrace but also on the lower levels where they appear to have been washed down and redeposited.

However a series of artifacts gathered on the lower terrace system (2nd terrace), about 1 mile towards the river in a southerly direction, in the neighbourhood of the prehistoric village, which will be mentioned later on, has revealed artifacts, which in general have weathered surfaces. In this series, which was not very numerous, there seems to be a prevalence of implements having larger dimensions such as choppers (chopping tools) and massive ortholiths with one surface extensively flaked. I have called this site Morgah II.

Bi-facial implements seem to predominate amongst the implements which

I gathered at Morgah. These tools presented the typical appearance of the hand-axe industries of the old European Palaeolithic, as well as the pebble culture with a decidedly chopping tool aspect. However, one may find, less frequently and not so clearly defined, a flake industry with unifacial working of the Clactonian-Levalloisian European type.

The majority of the implements found at Morgah are unrolled, but a large number present a somewhat worn and weathered surface. In particular, as already mentioned, this not very numerous group was gathered on the lower terrace named Morgah II. However, it is not possible to establish any large-scale correlation between the physical state and the industrial typology of the implements I collected, because, although some appear to be older owing to their weathered appearance, they may have the identical form of implements which have a fresh appearance. It does not therefore seem possible to make a chronological selection of the implements based on their physical state, except in certain cases mentioned previously.

CHOPPING TOOLS AND CHOPPERS

In conformance with the nomenclature used generally, which does not express at all clearly the true typology and function of the implement, we shall use the term chopping tool to indicate an implement made on a pebble or an ortholith with a working edge or cutting edge formed by the intersection of flake scars struck from each side. This flaking may be found on any part of the perimeter of the pebble. By "chopper" it should be understood that one is referring to a simpler form of implement made on a pebble or on a fragment of a pebble, with unifacial flaking forming a cutting edge along the periphery of the implement.

At Morgah, an intermediary form between the chopping tool and a true hand-axe is found. This is present when flaking is carried out on one entire surface of the pebble, or when as we are dealing with an ortholith, retouching which has been carried out on the natural original surface, converges with the striking surface. The chopping tools collected at Morgah are mostly in a rather fresh or very fresh physical state. Those collected at Morgah II have in general surfaces more abraded and weathered.

1. Chopping tool on a large pebble with ample retouching on the upper edge and on part of the sides. A great deal of the original cortex is

- maintained. This is one of the largest "chopping tools" found at Morgah Station (site). Very fresh physical state. (Pls. 1; 70 b).
- 2, 3, 4. Chopping tools on pebbles of medium size with a great deal of the original cortex preserved. Very fresh physical state. (Pls. 2, 3 a; 70 a, e, c).
- 5. Chopping tool with a great deal of the original cortex preserved. Rather weathered. (Pl. 3 b).
- 6. Crude implement made on a hemilith. The split face exhibits extensive flaking. Some flakes have been struck from the edge of the convex surface. (Pl. 4 a).
- 7. Pebble of semi-ovoid form, crudely flaked on one surface, with the opposite surface retaining the original cortex. Physical state rather fresh. (Pl. 4b).
- 8. Round pebble with crude flaking on one surface, the other surface preserves the original cortex. Fresh physical state. (Pls. 5 a; 70 d).
- 9. Crude bi-facial implement on a split pebble. One surface entirely worked with crude flaking and the other surface partially flaked. Intermediary form towards a hand-axe or an incompleted hand-axe. Fresh physical state. (Pls. 5 b; 70 f).
- 9a. Large chopping tool made on an untouched pebble, flat ventral surface, and the opposite surface convex. Crude, deep flaking on the convex surface which converges with the flat surface which exhibits some flake scars. (Pl. 6).
- 9b. Chopping tool made on an untouched pebble with extensive flaking which covers almost the whole of one surface and a part of the opposite surface. (Pl. 7).

HAND-AXES

The tools collected at Morgah are generally bi-facial, and are very notably evolved from a typological point of view. There are a great many hand-axes which may be clearly referred to the typology of the Acheulian European hand-axe. The retouch, which is less perfect, is due without doubt to the material they were made from, which is usually a granular quartzite. Lanceolate implements of large dimensions (21 cms) in length with somewhat convex surfaces and without perfectly straight edges are found, as well as very small implements (about 7 cms. long) with semi-oval, round flattened forms with perfectly regular edges. There are a variety of forms and types

which are also found in the most evolved phases of the hand-axe industries of Europe and Africa, and in many cases of the Micoquian phase.

As already stated, hand-axes are made both on pebbles and large crude flakes. In some cases of the latter the striking platform may still be observed, when flaking on the surfaces of the implement has not removed it. These flakes are large wedges obtained by splitting the pebble into slices and in particular they are side wedges and they include part of the cortex.

- 10. Large hand-axe implement in process of completion, made on a large pebble ortholith, oval in shape, which has been retouched by the removal of a few large flakes on one side, whilst the opposite side shows the original cortex of the pebble. One of the edges is complete whilst the other is partly worked and the rest continues to show, for the greater part, the natural edge of the pebble which has not yet been worked at all. It is an example of the working technique used for a large hand-axe implement made on a whole pebble. The surfaces present deep strong traces of scalloping. This implement comes from Morgah II. (Pls. 8; 71 b).
- 11. A large flake struck from a large pebble or elongated ortholith, with one side made up of the original cortex and the other side with large flakes removed. This may be considered as the first working stage of a handaxe. Fresh physical state. (Pls. 9; 71 a).
- 12. Lanceolate hand-axe amply convex on one side with a tendency to be concave on the opposite side. Edges more or less regular. The original cortex may be seen on the lower half of the convex side of the pebble. This implement has been clearly made on half of a large river pebble. Fresh physical state. (Pls. 10; 72 a).
- 13. A large hand-axe with convex surfaces, with one edge straight for three-quarters of its length and the other edge wavy. Large irregular flake scars may be seen on both sides with slight retouching and marks of use may be observed along the edges. This is the largest specimen found at Morgah (21 cms in length). The physical state is fresh. (Pls. 11; 72 b).
- 14. Hand-axe of regular oval shape with almost straight edges and large irregular flaking on both sides. Fresh physical state. (Pls. 12; 73 a).
- 15. Lanceolate hand-axe with rather flattened straight edges, summary flaking carried out. Physical state fresh. (Pls. 13; 74 d).
- 17. Bi-facial elongated implement, rather crudely worked, with irregular flaking. Very fresh physical state. (Pl. 14 a).
- 18. Hand-axe with lanceolate tendency, straight edges; small portion of the

- butt shows the original cortex of the pebble, which is an oblique plane. Quite fresh physical state. (Pl. 14 b).
- 19. Small very crude hand-axe shaped implement, elongated oval in outline with irregular flaking. Physical condition rather fresh. (Pl. 14 c).
- 20. Oval hand-axe with edges more or less straight and equally convex sides with large flaking. Fresh physical state. (Pl. 15).
- 21. Small flattened hand-axe, oval shaped, regular edges, not very much visible flaking. On one side at the butt there appears to be a hollow notch. This implement is of the Acheulian-Micoquian type. (Pl. 74 g).
- 22. Small hand-axe very much flattened with regular edges, semi-oval outline. Physical state quite fresh. (Pl. 16 a).
- 23. Small Abbevillian type hand-axe very scalloped. (Pl. 16 b).
- 24. Oval shaped hand-axe with regular edges, with extensive light flaking, equally curved on both sides, clearly Acheulian type. Physical state not very fresh. (Pls. 17 a; 74 e).
- 25. Regular lanceolate hand-axe, regular edges, large flaking, with one surface considerably more convex than the other. Not very fresh physical state. (Pl. 17 b).
- 26. Hand-axe with one side flattened and the other curved, which reveals its origin from a large flake. Straight edges. Physical state not very fresh. (Pl. 18).
- 27. Hand-axe, regular oval shape, with large, not very deep flaking, flattened, preserving towards one of its edges a part of the original cortex of the pebble. Physical state fresh. (Pl. 19).
- 28. Hand-axe, regular lanceolate form with regular edges, one surface more convex than the other, small, shallow flake scars, typically Acheulian. Physical state quite fresh. (Pl. 20 a).
- 29. Lanceolate hand-axe, straight edges, not much apparent flaking on either side, flattened, obviously made on a large flake, of which remains the probable striking platform interrupting one of the edges of the implement. Physical state quite fresh. (Pl. 20 b).
- 30. Hand-axe tending to be oval in outline flattened, regular edges, made on a large flake; one side convex and the other almost flat, ample crude flaking on the former but flaking almost absent on the latter, evolved Acheulian type. Physical state quite fresh except for the |lower part of one of the sides which shows some degree of wear. (Pl. 21 a).
- 31. Lanceolate hand-axe, with straight edges, outline rather asymmetrical, one side very curved, the other almost flat; small flake scars along the edge. Physical state not very fresh. (Pl. 21 b).

- 32. Crude oval hand-axe with both sides convex. (Pl. 22 a).
- 33. Fine lanceolate hand-axe, regular outline, edges straight, sides flattened, steep retouch towards the edges. Highly evolved Acheulian-Micoquian type. Physical state quite fresh. (Pls. 22 b; 74 h).
- 34. Small hand-axe with regular outline, slightly scalloped. (Pl. 23 a).
- 35. Small crude hand-axe type of implement. Rather worn. (Pl. 23 b).
- 36. Small hand-axe, very flattened, rather crude working technique. Rather worn. (Pl. 23 c).
- 37. Small hand-axe crudely flaked. (Pl. 23 d).
- 38. Hand-axe on a pebble; convex sides, with a few large flake scars, regular edges, broken obliquely at the point, the original cortex of the pebble may be seen at the base. Very weathered. (Pls. 24 a; 75 g).
- 39. Large bi-facial ovate, regular edges bearing flake scars, ample irregular flaking on the surface. Very worn surface. A large oblique fracture of half-moon shape at the extremity. The surface of this large fracture shows a fresher patina than the upper surface of the implement and it may be considered as appertaining to a later epoch. (Pls. 24 b; 75).
- 40. Oval flattened hand-axe, regular edges, with a notch near the butt. Physical state not very fresh. (Pls. 25 a; 75 e).
- 41. Very much flattened oval bi-facial implement, with regular edges, irregular flaking; made on a large flake obtained from a flat pebble. Surfaces show a great deal of wear. (Pls. 25 b; 75 h).
- 42. Hand-axe shaped implement oval in outline, biconvex in section jagged flaking along the edges. Notch at one of the extremities. Very rolled. (Pl. 26 a; 75 d).
- 43. Hand-axe shaped implement, oval in outline, regular edges with jagged flaking biconvex in section. A notch on one of the extremities. Physical state less rolled than the preceding specimen. (Pls. 26 b; 74 c).
- 44. Lanceolate hand-axe of regular shape, more or less regular edges with large flakes struck from both sides. Heavily rolled. (Pls. 26 c; 75 b).

CLEAVERS

In the field of bi-facial implements, we pass from the true hand-axe to the large cleaver. That is to say an implement with a straight cutting edge at one end, which is produced by the convergence of the two sides of the implement. The opposite end or butt is generally pointed. From a genetic point of view, these implements, as previously stated, are also derived from working on large flakes rather than single pebbles. The flakes were obtained by splitting up large pebbles into suitable wedge or segment shaped fragments. Some of the specimens leave no possible doubt as to their morphology and, we may add, their use. Others are at a more elementary working stage and may be considered as an intermediary form between the flake obtained from the abovementioned technique and the true hand-axe. The implements are of various dimensions from small cleavers 9 cms in length up to those of 17 cms in length.

As previously mentioned, when confronted by some of these "cleavers" it is doubtful whether to assign them to the category of cleavers or hand-axes, owing to slight evidence of a convex or rounded cutting edge which could be the widest end of a hand-axe. (Pl. 36 c). The percentage of true hand-axes (from a morphological point of view) found in the series from Morgah, was very high (40% bi-facial implements).

We have already stated that the cleavers were found showing different working stages; we wish to point out that on some of the implements, flaking is more fine and accurate, whilst others are summarily flaked and the outline of the implement is less regular. Some of the implements have one or both sides formed by the flat surfaces at the original cortex of the pebble from which the flake was obtained. In these cases we are refering to a rather crude implement which shows summary working with large flaking, which under some aspects, is similar to the Campignian technique.

- 45. Large cleaver with one surface made upon the original cortex of the pebble. The butt tends to be oval. Cutting edge rather oblique and curved, sides show large flaking. General shape fairly regular. Physical state fairly fresh. (Pls. 27; 76 b).
- 46. Cleaver made on a large, thick flake. The original cortex may be seen on both sides. Cutting edge oblique, showing marks of use, lateral sides worked with large flaking. General shape fairly regular. (Pls. 28 a; 77 b).
- 47. Crude cleaver on a thick flake. One surface roughly retouched, the other smooth with evident bulb of percussion and retaining a part of the original cortex of the pebble which can be seen as a large oblique plane. Physical state fresh. (Pl. 28 b).
- 48. Large cleaver with straight, oblique cutting edge, obtained from a very thick flake which retains the bulb of percussion on the flake surface. Crude retouching on one surface and at the edges. Not very fresh physical state. (Pls. 29; 76 a).

- 49. Cleaver, semi-rectangular in outline, straight, oblique cutting edge made on a large thick flake which still exhibits the large bulb of percussion and perhaps the striking platform which forms one of the flattened lateral sides. The greater part of the opposite side shows retouch. The buttend is semi-triangular in shape. Not very fresh physical state. (Pls. 30; 77 a).
- 50. Cleaver made on a flake which retains the bulb of percussion; almost straight cutting edge showing marks of use; rather flattened with the characteristics common to the other cleavers. Fresh physical state. (Pls. 31; 78 d).
- 51. Large cleaver, trapezoidal in shape, rather crudely worked, made on a thick flake roughly retouched; irregular cutting edge due to use, lateral sides steep and flattened. More retouch towards the pointed butt end. One of the surfaces is smooth with bulb of percussion. Physical state fresh. (Pls. 32; 78 b).
- 52. Cleaver of the same type as the preceding one, smaller in size, with more pronounced flaking on both surfaces. Lateral sides steep and flattened. Slightly recalls certain types of Campignian. Not very fresh physical state. (Pls. 33; 78 a).
- 52a. Narrow cleaver, pointed at one end, oblique cutting edge, very worn, with rough, irregular flaking. More or less straight sides. Made on a large flake. Physical state fresh. (Pl. 34 a).
- 52b. Implement, hand-axe in shape, bi-facial working, one surface convex, the other flat. Appears to be an intermediary form between a hand-axe and a cleaver. Physical state not very fresh. (Pl. 34 b).
- 53. Cleaver of medium size, long and narrow, with rather convex cutting edge. Pointed butt end. Very weathered surfaces. (Pls. 35 a; 78 c).
- 54. A bi-facial implement which appears to be an intermediary form between the cleaver and the hand-axe. This implement is bi-convex in section with regular retouch on both surfaces, which converge to form straight cutting edges, the two shorter cutting edges at the opposite end of the implement may be considered as functional. Fairly fresh physical state. (Pls. 35 b; 78 f).
- 55. Small cleaver, with straight cutting edge; fairly thick, roughly flaked, rather pointed at the butt end. (Pls. 36 a; 77 c).
- 56. Small cleaver with a pointed base, one side flattened, the other showing deep retouch. Not very fresh physical state. (Pls. 36 b; 77 d).
- 57. Intermediary form between the hand-axe and the cleaver. This is a

small bi-facial implement, with straight edges, fairly accurate retouch. One of the ends is narrower and more pointed than the other end, which is wider and slightly curved and forms the cutting edge of the cleaver. (Pl. 36 c).

- 58. Sub-rectangular crude, thick cleaver, with the cutting edge narrower than the base of the implement which exhibits the original cortex. (Pls. 37 a; 78 e).
- 59. "Cleaver-shaped" rectangular implement whose functional end shows on one surface the original cortex of the pebble. (Pl. 37 b).

WEDGES OBTAINED BY SPLITTING PERBLES

These implements are made on "wedges" obtained from pebbles of various sizes. They are manufactured by splitting the pebble longitudinally. By this process, wedge-shaped objects, which retain the original cortex all along their curved edges, are produced. The opposite edge, which is more or less sharp, is produced by the convergence of the two oblique fractured surfaces. They exhibit the bulb of percussion. This type of artifact is very common in the Lower Palaeolithic in various parts of the world, particularly "pebble wedges" of the Kafuan Culture of Africa, the "quarters of a Mandarin".

These objects were certainly used as implements or have been used to manufacture different types of artifacts such as cleavers and hand-axes.

- 59a. Crude wedge, sub-triangular in shape, with two edges made up of the original pebble cortex, thick, one edge is vertical and the other oblique. The third edge shows marks of use. All the surfaces of the implement are heavily weathered. (Pl. 38).
- 60. Wedge showing the original cortex of the pebble along 3/4 of its curved edge. Not very fresh physical state. (Pls. 39 a; 79 c).
- 60a. Large, crude wedge largely and roughly flaked on both surfaces, showing parts of the original cortex on its outside edge. Its form is rounded and it may be considered a true bi-facial implement. (Pl. 79 a).
- 61. Wedge, which retains a small part of the original pebble cortex on its curved edge. Very weathered surfaces. (Pl. 39 b).
- 62. Wide wedge which retains two-thirds of the original pebble cortex along its curved edge. The opposite edge shows retouch or marks of use. Roughly square in outline. Physical state not very fresh. (Pls. 40; 79 b).

63. Large wedge retaining the original cortex all along the curved edge. Ample retouch along the opposite edge where the two surfaces converge producing a very wavy cutting edge with evident marks of use. Physical state not very fresh. (Pls. 41; 79 d).

IMPLEMENTS MADE ON CLACTO-LEVALLOISIAN TYPE FLAKES

These implements are not very numerous. They are made on not very large flakes with striking platforms which are either plain or summarily worked. There are points, or scrapers which are rounded or elongated with retouch which is sometimes steep along the edges. Their physical state is generally quite fresh.

- 64. Scraper made on flakes with ample retouch on the lower surface, the upper surface is convex and exhibits a large area of the original cortex of the pebble. Steep edges with ample flaking. Rather fresh physical state. (Pl. 42 a).
- 65. Pebble fragment which exhibits the original cortex on one surface. Smooth, plain Clactonian type striking platform. Fresh physical state. (Pl. 42 b).
- 66. Flake scraper, rounded in shape with some retouch along the edges. Large, elongated striking platform with retouch. Fresh physical state. (Pl. 42 c).
- 67. Flake sub-triangular in shape resembling a point or a scraper with one steep edge showing retouch, the other edge is sharper and thicker with extensive retouch. The prepared striking platform is narrow and elongated. Quite fresh physical state. (Pl. 42 d).

GOLA AND RIWAT (Sites 3, 4, 5)

Gola and Riwat villages are situated at about 8 miles along the route of the grand Trunk Road, which runs from Rawalpindi to Jhelum. Between the Soan river and the village of Riwat I located three principal sites where lithic industries were present. They were situated on the high alluvial formations.

GOLA (Site 5). At this station rather evolved hand-axes are found. Some of them have one flat surface (68 & 70) (Pls. 43; 44 b) and are crudely flaked, or they may be rather flattened but with both surfaces equally convex (69), (Pl. 44 a) with a regular outline. They are generally rather weathered. There are also ovate bi-facial implements in a fresher physical state, with equally convex surfaces. Some of the small bi-facial implements show large bulbs of percussion and striking platforms of the outer surface of the slice from which they were being made. There are also some wedges of quite fresh physical appearance.

On the whole, this is quite an evolved industry, which may possibly be referred to as having two stages: the first stage produced smaller implements in a fresh physical state, the second stage, which is older, produced larger implements.

- 68. Large, flattened lanceolate hand-axe with ample retouch, one surface slightly convex, the other flattened. Greatly weathered. (Pls. 43; 80 c).
- 69. Hand-axe, regular ovate in outline, flattened, bi-convex, with large flaking. Greatly abraded. (Pls. 44 a; 80 b).
- 70. Implement of the hand-axe type, with one surface flattened, the other convex. Steep retouch along the edges and on the flat surface. Very abraded surfaces. (Pls. 44 b; 80 a).
- 71. Wedge, with curved edges exhibiting the original cortex of the pebble. On one surface the bulb of percussion may be clearly seen. Edges show some retouch and marks of use. Physical state fresh. (Pls. 45 a; 80 f).
- 72. Small bi-facial implement, with large flake scars, sub-oval in shape. Both surfaces are convex. Fresh physical state. (Pls. 45 b; 80 d).
- 72a. Large flake with plain oblique striking platform. Extensive flaking on one surface and primary working on the fractured surface. Probably the first working stage of a bi-facial implement. (Pl. 80 e).

BETWEEN GOLA AND RIWAT (Sites 3, 4). Implements were found in a fresh physical state appertaining to the same stage. These implements are crude flakes (76), (Pl. 46 b), flakes of Mousterian aspect (74, 75), (Pls. 45 d; 46 a) and crude bi-facial implements resembling massive scrapers or probably fragmentary bi-facial implements.

73. Small, steep flake, with plain, oblique striking platform. Very fresh physical state. (Pl. 45 c).

- 74. Small triangular point showing marks of use along the edges, a large striking platform with two surfaces. Fresh physical state. (Pl. 45 d).
- 75. Large, lanceolate flake, steep on one surface, flat on the lower fractured surface. Plain striking platform. Very fresh physical state. (Pl. 46 a).
- 76. Wedge with a curved edge, exhibiting along a little more than half its total length the original cortex of the pebble. (Pl. 46 b).
- 77. Oblong scraper, very steep, worked along its edges with large flaking. One end is rounded, more regular retouch. Lower surface flat. (Pl. 46 c) (Riwat).

KHASALA (Sites 8, 9, 10, 11)

This rather large area extends up to the system of terraces on the right bank of the Soan River. I collected implements at four different sites (stations 8, 9, 10, 11) situated on a stretch of some kilometres in length along the banks of the Soan River but at a considerable distance from the river itself, probably two or three miles.

The terrace is formed of redeposited heavy gravels and may be referred to the 4 a terrace of the Anglo-American authors, but the stations where implements may be found are about 15 feet higher upon a terrace which cuts into the gravel deposit.

At stations 8 and 9 in this locality the majority of implements were found in a very weathered condition. They included large bi-facial tools, some Abbevillian type hand-axes (83), (Pl. 50), other bi-facial hand-axes with large crude flaking with one flat surface and sometimes with a "notch" at the extremity which forms a sharp cusp (84) (Pl. 51).

There are also some crude ortholiths which have a very weathered appearance, with more retouch along one of the edges like the chopping tool (85 a) (Pl. 81 d). There are also pebbles with flaking like the chopping tool (87 a) (Pl. 82 d). Some of these exhibit a more recent physical state.

Amongst the objects in quite a fresh physical state found at this station there are: a very large core, a chopping tool made on an outer external slice with two deep flake scars on the upper and lower edges, and also some crude scrapers.

Stations 10 and 11 have yielded in general implements that are not very weathered and in a fairly fresh physical state. These implements were made up of large crude flakes somewhat Levalloisian in form (80, 81) (Pls. 48 b; 49 a) with some bi-facials implements which appear to be unfinished hand-axes (79) (Pl. 48 a) as well as other large crude bi-facials implements resembling chopping tools with flaking on the upper part of the two converging sides. Their physical state was also fresh. There was a large wedge on which a sort of scraper or cleaver was made (78) (Pl. 47); this object was rather more weathered. On the whole, these industries are typologically archaic but a certain number of implements are in a fairly fresh state.

- 78. Wedge exhibiting the original cortex of the pebble along the curved edge. The cutting edge is fairly thick with some deep retouch. The bulb of percussion is clearly visible. This implement may have been employed as a cleaver. Physical state fairly fresh. (Pls. 47; 83 d).
- 79. Pebble, partially flaked on both surfaces with deep, crude flaking. Both surfaces converge at the edge producing a wavy, cutting edge. The opposite edge exhibits the original cortex of the pebble. The general shape of the implement is that of a hand-axe. This implement appears to be a bi-facial implement at a working stage rather than a "chopping tool". If this is the case, the technique appears to be a working stage on a pebble and not on a flake or a slice. Fresh physical state. (Pls. 48 a; 83 a).
- 79a. Crude chopping tool (Pl. 83 b).
- 79b. Flake of Clactonian type (Pl. 83 c).
- 80. A slice struck from a small pebble which exhibits a great deal of the original cortex. Fairly fresh physical state. (Pl. 48 b).
- 81. Implement made on a large flake which has been struck from a core previously prepared owing to the removal of large flakes on the upper surface. Square-shaped. One edge is steep with crude retouch, the other edge exhibits marks of use. Fairly fresh physical state. (Pl. 49 a).
- 82. Large scraper, with coarse retouch and with a very steep edge. The lower surface is covered by extensive concave flaking. Fairly fresh physical state. (Pl. 49 b).
- 83. Large Abbevillian-type hand-axe with extensive flaking. Wavy cutting edges. Very weathered. (Pls. 50; 81 b).
- 84. Large implement made on an ovate pebble, with partial bi-facial working, with extensive retouch on one edge which also affects a part of either

- surface. This implement is pointed at one end owing to a notch on the side. Very weathered surfaces. (Pls. 51; 81 a).
- 85. A large hand-axe, made on an ortholith. One surface flattened, the other convex with extensive retouch. Relatively regular edges. Very weathered surfaces. (Pls. 52; 81 c).
- 85a. Large bi-facial implement made on a pebble. Working limited almost exclusively to one of the edges and a part of one of the flat surfaces. It appears to have one very old working stage which is very weathered and much fresher later flaking along the edge. (Pl. 81 d).
- 86. Chopping tool with extensive flaking on one surface and on a part of the other surface. This implement is an intermediary form between a unifacial and a bi-facial implement. Sub-circular outline. Very weathered. (Pls. 53 a; 82 b).
- 86a. Pebble with large flakes removed along one edge and on one surface. Form of a chopping-tool. Very weathered. (Pl. 82 a).
- 87. Large, sub-spherical scraper with two convex sides (one more convex than the other), the two sides meet forming a zigzag outline. The under surface is more flattened and exhibits fresher flake scars (this is probably due to protection from the weather). (Pls. 53 b; 82 c).
- 87a. Chopping tool. One of the surfaces exhibits some older flake scars, which are more weathered, these extend over the greater part of the surface. There is fresher flaking over a part of the other surfaces. (Pl. 82d).
- 88. Sub-rectangular wedge, exhibiting the original cortex of the pebble along one of the edges and a part of the original cortex along the other edge. The other two edges show retouch and marks of use. Fairly weathered appearance. (Pl. 54).

CHHOCAR (Sites 12, 13, 14)

This locality is on the right bank of the Soan river, between the villages of Chauntra and Chhocar. The site is nearer the latter. The implements were "in situ" on the high Soan terrace about 2 or 3 miles from the banks of the river, on the surface of the loessic silt. I found implements at three different places (sites 12, 13 and 14).

With reference to the geology of the Chauntra area in relation to the lithic industries, this has been the subject of an exhaustive study carried out by the Anglo-American authors.

This station has yielded, for the greater part, hand-axe implements, some having a fairly fresh physical state, others having a less fresh aspect. The technique is of fairly evolved Acheulian type. There is a cleaver with somewhat abraded surfaces (91 a) (Pl. 84 d), some flakes and crude scrapers of the Mousterian-Levalloisian type, as well as circular scrapers of more or less the same type. On the whole, it is a fairly evolved industry.

- 89. Hand-axe type of implement, with two equally convex sides, straight cutting edges, with a broken upper extremity which was probably used as a cleaver edge. Very used surfaces. (Pl. 55).
- 90. Lanceolate hand-axe, with large flaking, on a split pebble ortholith exhibiting at the base the bulb of percussion. The original cortex may be seen on a part of one of the two surfaces and at the base of the pebble. The cutting edges are straight. Fairly fresh physical state. (Pls. 56; 84 a).
- 91. Hand-axe implement made on a whole pebble, in an advanced working stage. Straight edges; one of the two surfaces exhibits for 2/3rds of its entirety the original pebble cortex. Fairly fresh physical state. (Pls. 57; 84c).
- 91a. Cleaver, with straight cutting edge showing marks of use. The butt is broken. The surfaces are somewhat weathered. (Pl. 84 d).
- 92. Hand-axe, fairly crudely worked, with more or less straight edges. One of the two surfaces is convex and exhibits a part of the original cortex of the pebble, which extends to the base of the implement. The other face is flat and slightly concave towards the apex. (Pls. 58; 84 e).
- 94. Small, bi-facial, sub-circular scraper with slightly convex sides. Fairly fresh physical state. (Pl. 59 b).
- 95. Steep, sub-ovate scraper with much jagged retouch along the edges. Lower surfaces is smooth consisting of the original cortex of the pebble. Not very fresh physical state. (Pl. 59 c).
- 96. Flake, square in outline, with crude retouch, smooth, curved striking platform. Not very fresh physical state. (Pl. 59 d).

WARWAL (Site 15)

This station is situated at about 8 miles from Khaur, on the lower terrace system on the right bank of the Soan river, on the opposite side to the village of Warwal at about 30-40 feet above the level of the river, which in this area has cut deeply into alluvial deposits of loessic silt. These deposits are covered

by re-deposited gravels and implements, which in general show signs of heavy weathering, are found here. This is probably terrace 4a, of the Anglo-American authors. It is certain that the majority of implements were not originally deposited where they have been found, and this is confirmed by their very worn appearance. They were probably brought here together with large pebbles and stones during the levelling up process of the above-mentioned terrace. As we shall now see, their typology seems to denote an older origin.

Nearly all the implements found, as previously mentioned, had very much weathered surfaces, and the majority were large in size. There were no evolved hand-axes among them. Bi-facial implements of the hand-axe type have deep crude flake scars pointed at the end. Number 97 (Pl. 60) is a sort of large chopping tool, ending in a cusp formed by two large flake scars. There were also implements in a fairly fresh physical state, e.g. (102) (Pl. 85 d). This implement is a bi-facial sub-ovate and is intermediary in form between a chopping-tool and a hand-axe. Implement (100) (Pl. 63) is a chopping tool in a fresh physical state with four or five flake scars at the upper surface which form a sort of cusp.

Other implements such as crudely flaked ortholiths and hemiliths were in a fresh physical state.

In conclusion, this may be considered to be a relatively old industry, because some of the implements are heavily weathered but also those which present a fresher physical state appertain to a relatively old industry or, at least, an industry without a highly evolved hand-axe typology.

- 97. Chopping tool on a large pebble, pointed owing to the existence of two deep flake scars which take up two-thirds of one surface. Heavily weathered. (Pl. 60).
- 98. Massive chopping tool, with two large flake scars on the convex surface of the pebble, forming a point at one extremity. Weathered surfaces. (Pls. 61; 85 a).
- 99. Chopping tool with a pointed end, produced by a few large flake scars. Weathered appearance. (Pl. 62).
- 100. Pointed chopping tool made on a large pebble, with large flaking at one extremity. Fairly fresh physical state. (Pl. 63).
- 101. Small chopping tool made on a pebble. Irregular flaking. Weathered. (Pls. 64; 85 c).
- 102. Bi-facial implement, oval in outline, with one surface flaked all over with large flaking, the other surface is partially flaked. Probably an inter-

mediary form between the chopping tool and the hand-axe. Fairly fresh physical state. (Pls. 64 b; 85 d).

- 102a. Chopper made on a hemilith; plain split face; convex surface with deep flaking on the opposite edges which converge with the split face. (Pl. 65).
- 103. Large pebble shaped like a hand-axe, with deep, crude flaking. This implement may be considered an intermediary form between the chopping-tool and the true hand-axe with a strong tendency towards the latter. Zigzag cutting edge. Very weathered surfaces. (Pls. 66; 85 b).

KOT MALIARAN (Site 16)

This station is situated to the south of Warwal on the right bank of the Soan river, at about 8 miles from Khaur. The implements are found on the surface amongst the stones and pebbles of the higher level Soan terraces, in what seem to be Tertiary deposits. These terraces are about half a mile away from the river bank and are quite deeply cut into, with large undulations.

At this station we noted the existence of two series of objects, the first series being pebble implements, very weathered hemiliths or ortholiths, of old archaic appearance. Some of these implements were chopping tools with a deep notch which produces a large cusp (104) (Pl. 67 a) as well as crudely flaked wedges which are also much weathered.

There is also a series of smaller objects, which are generally less weathered. These objects are wedges (106, 107) (Pls. 68 a, b; 85 e) or Mousterian flakes, made on larger flakes with large striking platforms (108) (Pl. 65 c); some of these objects have a fresh appearance. (Pl. 68 d, c).

On the whole, it appears possible to identify two groups, one archaic group of chopping tools, the other a later group made up of implements in a fresher physical state and rather Mousterian in appearance.

- 104. Chopping tool with a pointed end created by large flaking almost all over one surface of the pebble and partial flaking on the other. The point is produced on one side of the implement owing to a large hollow notch. This is an intermediary form leading up to a true bi-facial implement. Heavily weathered. (Pl. 67 a).
- 105. Small implement, sub-oval in shape, made on a flake with a large twosided striking platform which occupies one third of the implement. Edges with regular retouch and with flaking on the opposite surface to the strik-

- ing platform. This implement appears to be a rough copy of a small bi-facial implement. Very weathered in appearance. (Pl. 67 b).
- 106. Small wedge, with a curved edge exhibiting the original cortex of the pebble. Cutting edge with extensive marks of utilization. Very weathered appearance. (Pl. 68 a).
- 107. Wedge exhibiting the original cortex of the pebble along the curved crescentic edge. Cutting edge with extensive marks of utilization. Evident bulb of percussion. Fairly weathered appearance. (Pl. 68 b).
- 108. Triangular flake Mousterian in type, large, oblique striking platform. Very weathered appearance. (Pl. 68 c).
- 109. Plain flake with marks of use along the edges. Fairly fresh physical state. (Pl. 68 d).
- 110. Flake, sub-ovate in shape, with large, plain striking platform and large bulb. Retouch on the opposite surface to the striking platform. Fresh physical state. (Pl. 68 e).

MAKHAD (Site 19)

At this station near the village of Makhad, on the high terrace of the Indus river, some massive, crude bi-facial objects of the hand-axe type were found. There were also some round chopping tool types of implements but these were flaked on the two weathered surfaces. There were also some crude chopping tools (Pl. 69) and small crude wedges in quite a fresh physical condition. I did not collect more than eight implements.

The implement no. 111 (Pl. 69) is a large hemilith. It greatly resembles the "unifacial choppers" of the Banganga terraces situated near Guler (Kangra) in India, published by Lal (1). However flaking may be observed on both surfaces instead of on only one surface, such as is noted on the implements found at Guler.

DINA (Site 1)

At this station near the village of Dina on the road to Jhelum, I collected massive implements in the form of scrapers and bi-facial cleavers in a fairly fresh physical state.

⁽¹⁾ LAL, 1956, Pls. 23, 24 and following.

- 112. Massive, steep pyramidal shaped scraper, lower surface flat. Large vertical flaking with jagged retouch at the edge.
- 113. Massive, steep scraper with slightly convex lower surface, some crude retouch along the edges.

At this station there were some other scrapers and similar objects, but they were very crude and of uncertain technique.

114. Massive bi-facial implement with a great deal of the original pebble cortex visible on one surface of the pebble. This pebble is split in half and has a curved outline

* *

From what has been already stated about the industries which I collected and studied in the Soan-Indus region it may be clearly seen that flake implements were found alongside pebble tools, hand-axes and cleavers. This means that unifacial and bi-facial industries are found at the same time mixed together.

I was unable to find any one site where there was evidence of only one industry (i.e. that named Pre-Soan by the Anglo-American authors). The Anglo-American authors consider that this is the oldest culture of the Punjab and is made up of "large, massive flakes with little retouch". According to them this industry exists in "the upper portion of the boulder conglomerate and is stratigraphically of the Second Glacial Age". Everything I found gave evident proof that the flake industry existed in the same period as the pebble tools and hand-axes. I think that this signifies that I only found Soan stations.

I do not believe, at least from a genetic point of view, that the flake technique may be separated from the pebble tools and the hand-axes, although others do not share my point of view. There are some colleagues who although they admit that these industries are contemporaneous prefer to consider the first two industries as being made by people who did not use hand-axes. They also assert that hand-axes have a technically different origin. As previously stated in this paper, it appears that this assertion is erroneous. I believe that we have demonstrated that there is an absolutely clear technical-morphological derivation of hand-axes and cleavers from wedges, large flakes, etc. as well as a direct connection between hand-axes, cleavers and pebble tools, as the latter may be derived from either hand-axes or cleavers.

One may certainly admit that the pebble culture originated before handaxes and cleavers, this means to say that an industrial stage of pebble tools preceded that of hand-axes. This has been demonstrated, as previously mentioned, in the Kafuan and Olduvai beds. Therefore it may be considered evident that there was an evolution from chopping tools first to primitive hand-axes, and then to finer and more developed forms. At Olduvai, however, it may be noted that at one point chopping tools disappear and are completely substituted by hand-axes and other similar forms. This does not appear in the Punjab where numerous hand-axes are found together with chopping tools. This may clearly be seen at Morgah where both chopping tools and handaxes exhibit the same physical state.

From my own observations on the relationship between the types of implements and the Soan terraces and with particular reference to the typology and physical state of the implements, it appears that one may establish the existence of a more primitive industrial stage as the basis of the evolution of the hand-axes, which are represented by their proto-types, already described in this paper. These proto-types are large pebbles which are pointed owing to a few oblique flake scars at one extremity. Lal calls them "pebble handaxes" (Pls. 60, 61, 62). At the Warwal station for example, an implement of this type was very much weathered and was found together with crude implements of the same type, but the latter were either flaked or crudely flaked all over one surface (Pl. 66). These may certainly be well named primitive hand-axes (Abbevillian type). Their physical state was very weathered. There were no evolved hand-axes of the Acheulian type present at this station. I am therefore of the opinion that, as Lal states with regard to the Gular bed in the Indian Punjab (1), one may establish the existence of a previous stage or period which produced proto-hand-axes, which, as in our case, could be connected with the second Terrace system.

One may roughly refer to the above-mentioned implements as forming part of the Oldest Group (2), that is to say the first of three groups of implements into which Paterson divided and classified the industry found at Chauntra which he calls "Early Soan". The large number of hand-axes exhibit a great variety of types, particularly at Morgah which produces two different forms, or, if one prefers, two different fundamental types. The first type

⁽¹⁾ LAL, 1956, p. 76 and following pages.

⁽²⁾ DE TERRA, PATERSON, 1939, p. 310.

being true hand-axes, which are generally of large dimensions, lanceolate, bi-convex and rather thick with deep irregular flaking. One might say that the former exhibit a rather hasty technique. (Pls. 10, 11, 12, 13 etc.). By taking into account this aspect, as well as the very fresh physical state of the hand-axes found at Morgah, these may be classed together with the cleavers found at the same station because they exhibit the same characteristics with regard to flaking and physical state. The second type are characterized by a far more accurate technique. The implements are in general flatter with a regular lanceolate outline (Pls. 20, 22, 23) and with more regular and finer retouch. In this category there are also objects of smaller dimensions (Pls. 23). To sum up, a facies which may be referred to as very evolved European Acheulian or true Micoquian. There is no need to add that there are numerous intermediary forms between the first and second groups, it is sufficient to peruse the plates published together with this paper.

Owing to the fact that I was unable to establish a stratigraphical systemization of this assemblage, and also owing to the fact that both types of implements are found lying together on the surface of the same terrace system, it would be rash to establish a chronological precedence between these two implements. All that may be said is that with regard to the material I collected at Morgah, the hand-axes of the first type appear to be more often in a fresher physical state. They are also larger with less accurate technique, whilst the implements which have a more evolved technique exhibit an older physical state.

This may lead one to suppose that the less elaborate forms of hand-axes and cleavers found at Morgah are older than the more evolved forms, but with the facts at our disposal it is better to maintain a prudent reserve. I wish to recall, however, that Leakey noted in the Olduvai bed a more perfect technique of the hand-axes found in Layer 8 in comparison with the higher and more recent stratum. He interprets this fact as a sudden progress in technique probably due to external influences from outside of this region. This progression was partly lost by human beings of the higher stratum (1).

⁽¹⁾ LEAKEY, 1951, p. 158.

PREHISTORIC SITE WITH LATE STONE CULTURES IN THE VICINITY OF MORGAH. (SITE 7).

At a short distance from the village of Morgah, half-way between the installations of the Attock Oil Company and the Soan river, I found a prehistoric dwelling with abundant evidence of pottery and lithic implements (Site 7). This prehistoric dwelling is situated on a Soan terrace about 70-80 metres above the level of the river and 15-20 metres below the highest terrace where there is an accumulation of Palaeolithic implements described in this paper.

At this point the thick loess deposit has been deeply cut into by the small outlets of the Soan river, which have formed small hillocks which are still suffering from the effects of erosion. On the summit of one of these hillocks, which is from eight to ten metres in height, I found the remains, which were well-preserved in parts, of a wall made up of rough stones regularly placed, one on top of the other, which encircled the top of the hillock. There were also other remains of a wall of the same type which defined the limits of rectangular rooms.

When I observed the walls in 1954 they had fallen down for the greater part, and the stones were lying on the sides of the hillock as they had been redeposited together with the soil by the rains. When I returned to visit the site in the summer of 1960 I noted that the remains had suffered great deterioration and only a few parts were still standing up. The local inhabitants had tilled the soil on the summit of the hillock inside the perimeter of the wall thereby interfering with the remains.

According to what I observed in 1954 and the sketch I made at that time, the wall was of an irregular sub-oval shape, and at one point was interrupted

by a large landslide caused by rains and streams which had removed a great deal of the loessic formation of which the hillock was composed.

On the summit and sides of the hillock and at the bottom of the small hollows which encircled it, there was a large quantity of fragments of terracotta of various sizes; mixed together with lithic implements and flakes which exhibited a very different working technique from these of other Palaeolithic sites.

However, at the foot of the hillock and in the surrounding area I collected some large crude Paleolithic implements which had originated from the higher stations.

I must state that I was unable to carry out accurate research and investigation at this site, which appears to be a fortified dwelling, or in any case a dwelling situated in a highly defendable position. I may only state that the perimeter of the walls had an extension of 2000 feet (610 metres) in 1954. The breadth of the wall, where the wall was intact, was from 15 to 20 feet.

The area was strewn with innumerable fragments of various types of pottery as well as lithic implements which were used for milling, elongated stones heavily weathered and millstones made up of pebbles exhibiting evident signs of use.

I am content to simply point out the existence of this prehistoric dwelling and to reproduce some of the objects which I gathered there together with a short description of the same. I am unable to accomplish more than this as it has not been possible to study the material on hand, which was gathered on the surface of the ground, more accurately. A deep study of the objects which I collected would have involved an intensive amount of excavation and digging in order to bring to light the eventual different stratifications of the material collected. I hope that these primary researches may interest some qualified colleague to make a further study of the Morgah site.

STONE IMPLEMENTS

With the exception of a certain number of atypical flakes and pebbles which appear to have been used as cleavers and hammers there were only two types of implements, which seem to have been technically derived one from the other, collected at Morgah.

The first type of implement is a sort of large, sub-circular scraper, thick with retouch along the outside edges and with a perfectly flat lower surface due to the steepness of the flaked edge. These objects which were very nu-

merous vary in length from 17 cms to 7 cms and are for the greater part made on sandstone which is very calcareous, and subject to rapid deterioration by the elements. Many of the objects in question exhibit a very weathered surface. If one wished to establish purely typological similarities they may be compared to certain Mousterian-Levalloisian implements, but there is no doubt that no connection exists with cultures of this type. This typological sequence repeats itself with extraordinary uniformity in all the numerous series of objects which I collected.

I gathered one of these scrapers (in another station at Khasala on the Soan river) lying together with Paleolithic implements.

The second type consists of a sort of stone "ring", with a hole which generally is not very large, biconical in section, as one may see in the "club headed type" of prehistoric times or from the present ethnography of many countries of the world. This type is also generally made on sandstone which is strongly calcareous. All the objects of this type which I collected were broken in half, and are therefore all "half rings". One is lead to ask if this semicircular form was accidental or not. Some of these half rings or half discs perforated centrally have smooth surfaces and edges, others exhibit more or less deep flaking along the edge similar to the previously mentioned scrapers.

On the other hand there appears to be no doubt as to the origin of the scrapers. Some scrapers exhibit at their centre, on both sides, a hollow which is more or less deep. This appears to be the commencement of perforation of the implement (Pl. 86 f). In other cases it may be noted that two opposite cavities are deeper and almost meet to form a biconical perforation (Pl. 87 a). To conclude it is only necessary to glance at the series which I have collected and study the tables appended herewith (Pls. 86, 87, 88) to realize that the discoidal "scrapers" are the first working stage of the "rings".

However, owing to the large number of "rings" and the marks of use which they exhibit, it appears that these were true implements, and were used in themselves and are not a working stage of the "rings".

I do not wish to deal with the use these two implements were employed for as I have not all the facts in my possession, but I wish to state that some "rings" or hollowed stone discs have been found in the old Indus cultures; a "broken stone ring" during manufacture from Nandi Kanama Pass (Andhra State) is mentioned by Gordon in a table which illustrates Levalloisian type blades and points (1).

⁽¹⁾ Gordon, 1958, Pl. I.

I gathered a series of "rings" which exhibit different working stages at a locality situated about 5 miles to the west of Dinati on the right bank of the Gahan river (Site 2) mixed together with lithic flakes and fragments of pottery.

Finally, I wish to mention the existence of large oval pebbles which were used as grinding stones at Morgah. These are objects common to prehistoric people and still used today by primitive peoples.

POTTERY

The pottery which I collected at Morgah was very similar with regard to the paste used and the thickness and structure of the walls of the vases. In general the fragments were made of well-baked red terra-cotta, of good paste, rather thick and not levigated, I also found fragments of gray paste which were less thick and with a smoother polished surface, as well as a few fragments of beautiful red ware of excellent paste with thin walls and a smooth polished surface. There were also other fragments of poor paste unevenly fired. Owing to the lack of stratigraphical data I am unable to state whether these different types were contemporary or not.

It is only possible to partially reconstruct the shape of the vases, owing to their fragmentary state. However, it may be deduced that the majority of the vases were either of large or medium size. Globular shapes, bulged bodies with an ample wide neck, flat based recur frequently. In these types of urns the lips may be too amply everted, slightly marked or not exist at all. In some cases, the vase has a narrowed neck with everted lips (Pl. 92).

To these vases which are more or less large in size and rounded in shape, must be added others shaped like glasses, cups or dishes, with or without everted rims, some of which are very large and of low girth. Vases also exist with bases which are more or less high and flat (Pl. 89, u, z). It is not possible to say to which form of vase the former appertain.

Two vase fragments of fine paste with thin walls have permitted me to reconstruct a form with a wide conical mouth, a cylindrical body and a rounded base.

There are also handles, which are not very frequent. These are a result of the widening of the cord-like band of decoration around the sides of the vase. Lug handles are also noted.

The decoration of the vases is varied and consists of motifs in relief or incised. I did not find any fragments of painted ware at Morgah.

Cordoned bands which encircle the vase near the rim are very common. They usually exhibit finger-nail incisions, finger impressions and finger-nail tips (Pls. 90; 94). Finger-nail incisions may be carried out directly on the surface of the vase. Some fragments are decorated with a band of small rings (Pl. 93 lower to the right) or dots. Rough incisions all round the perimeter of the vase, are obtained by using a pointed instrument with either a single, double, or multiple point. These incisions are either zigzag or undulating.

Impressed or incised decorations of the previously mentioned type have been widely adopted from prehistoric times up to the present day, not only on the sub-continent of India but all over the world. Finger impressions and finger-nail incisions in bands or small bands are the usual ornamental decoration found in European prehistoric pottery. With reference to Pakistan, similar decoration has been found on fragments of pottery collected by Fair-servis on the surface of the ground in the Quetta region (1).

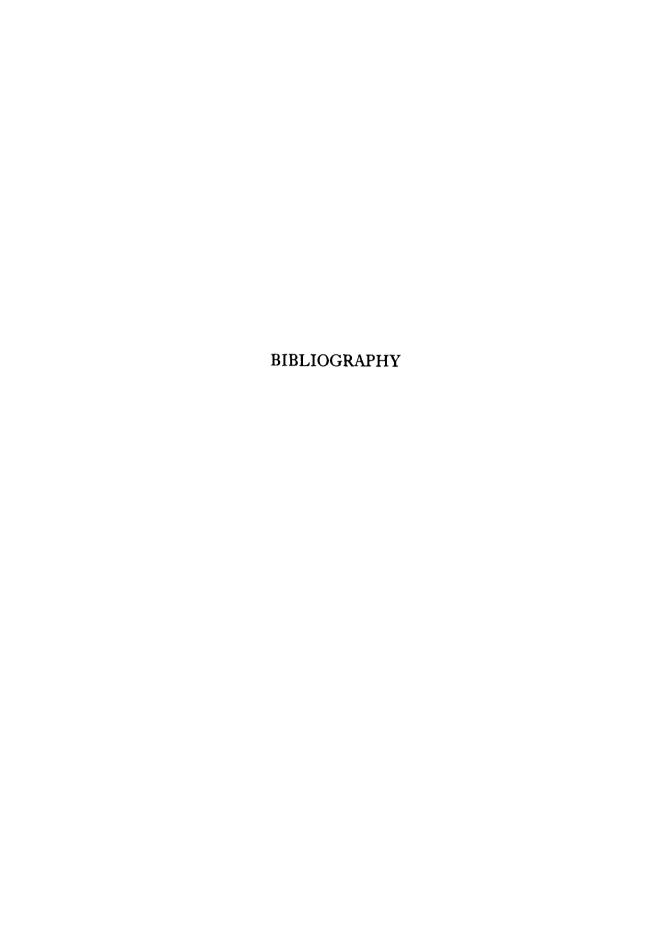
Finally we wish to indicate the existence at Morgah of sherds obtained by cutting a circle from fragments of terra-cotta and effecting a central perforation; some sherds have no central preforation (Pl. 94 lowest line).

To conclude, I wish to point out that I did not find any fragments of black polished ware or painted pottery. The cultures at Morgah are on the whole rather poor and crude and give the impression of relative simplicity and primitivity. This impression is borne out by the large quantity of lithic implements which are found together with fragments of pottery. These implements are certainly of the same period of at least a part of the fragments of pottery.

I do not wish to dwell on this argument any longer and as I have previously stated, I only intend to point out the existence of a prehistoric dwelling and pottery at Morgah and present the reproduction of some of the objects I gathered there. I leave to others the study and description of this material. I do not feel able to comment on the chronology or the culture or cultures that the pottery site at Morgah may be related to, as I have insufficient material in my possession and this was collected after a summary examination of the surface of the ground. On the other hand, a study of the prehistory and protohistory of the Indo-Pakistan sub-continent presents serious difficulty and great gaps. The chronology is not at all clear owing to the great lateness of many of the cultures.

It may not be excluded that the prehistoric dwelling at Morgah belongs to a more recent era and therefore represents a greatly retarded culture, even though the pottery found there is simple in form and lithic industries are also present.

⁽¹⁾ Fairservis, 1956, Pl. 12, 19, 20.

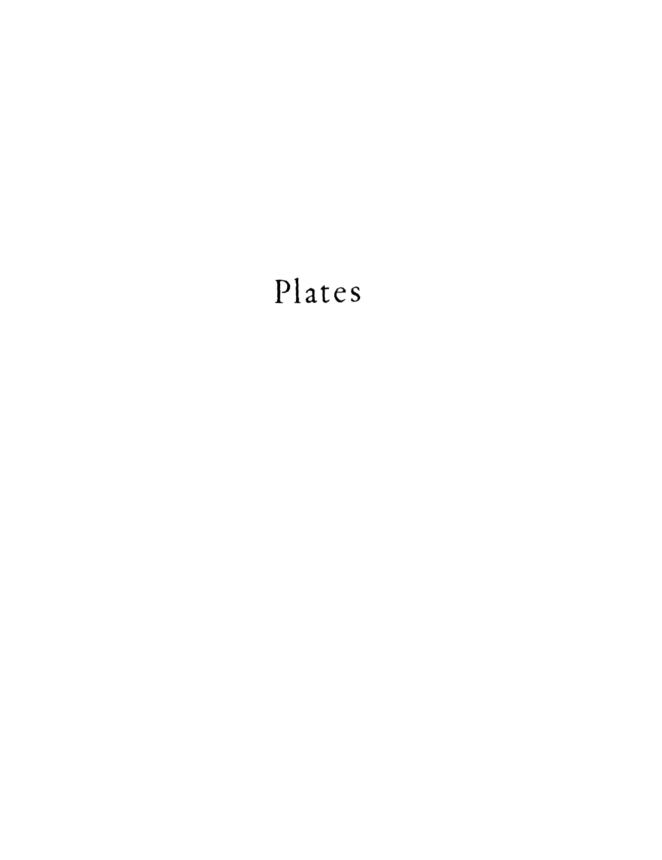


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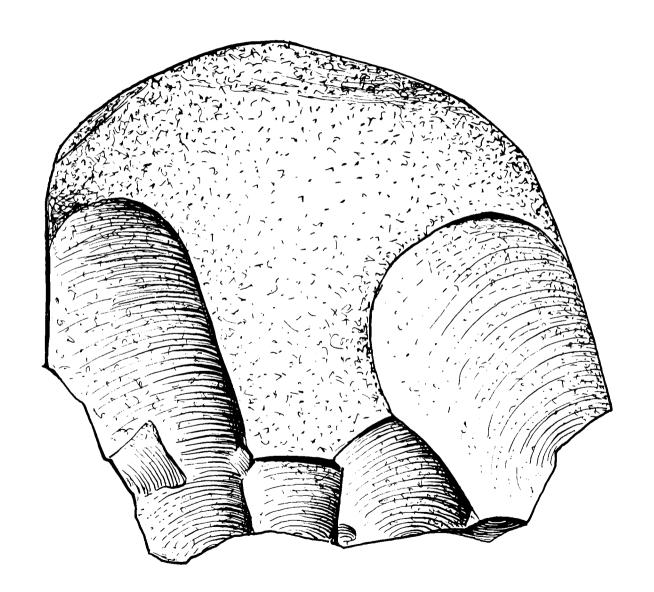


The numbers mentioned at the foot of the plates correspond to the numerical order of the implements in the text.

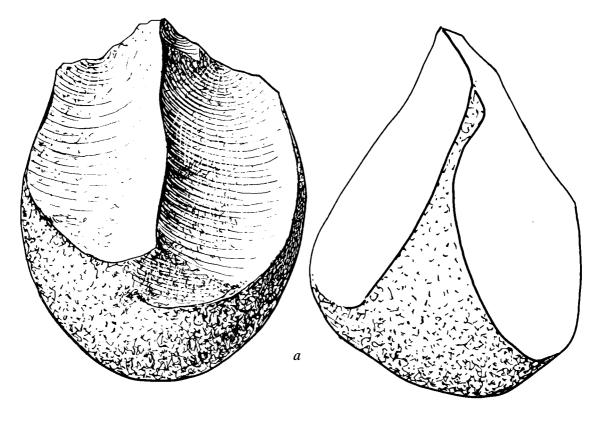
The drawings of lithic implements reproduced in Plates 1-69 are life size, whilst the drawings reproduced in Plates 86 and 87 are half their real size.

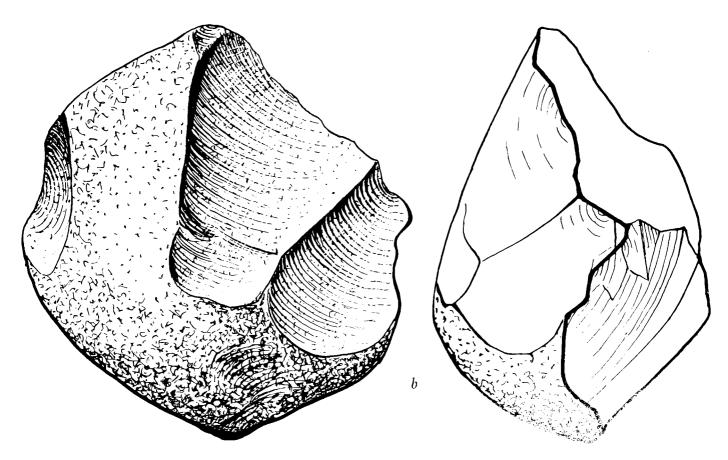
The photographs of lithic implements shown in Plates 70-85 and 88 are reproduced at about half of their real size.

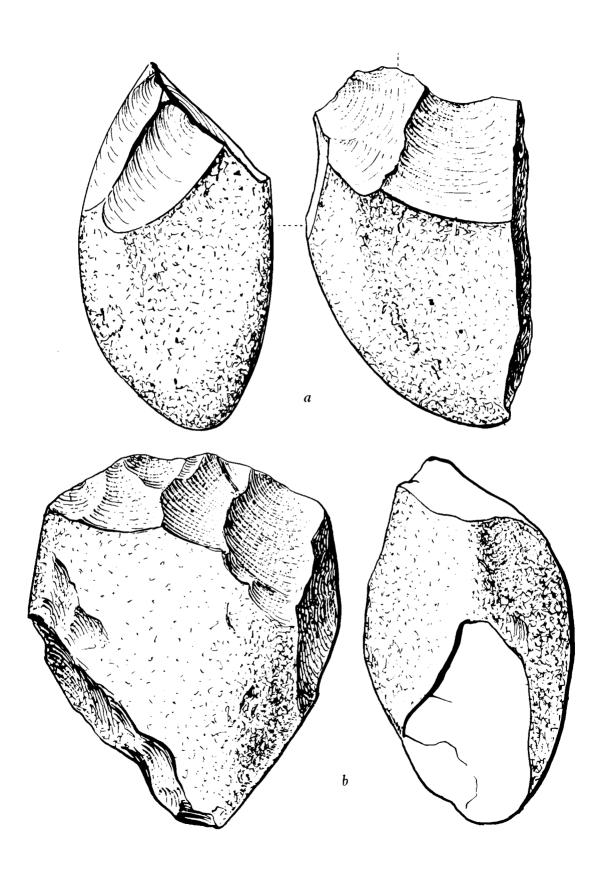
The drawings of pottery reproduced in Plates 89-91 are shown at one fifth of their real size. The photographs of pottery reproduced in Plates 92-94 are shown at slightly more than one third of their real size.



P. Graziosi - Prehistory pl. 2

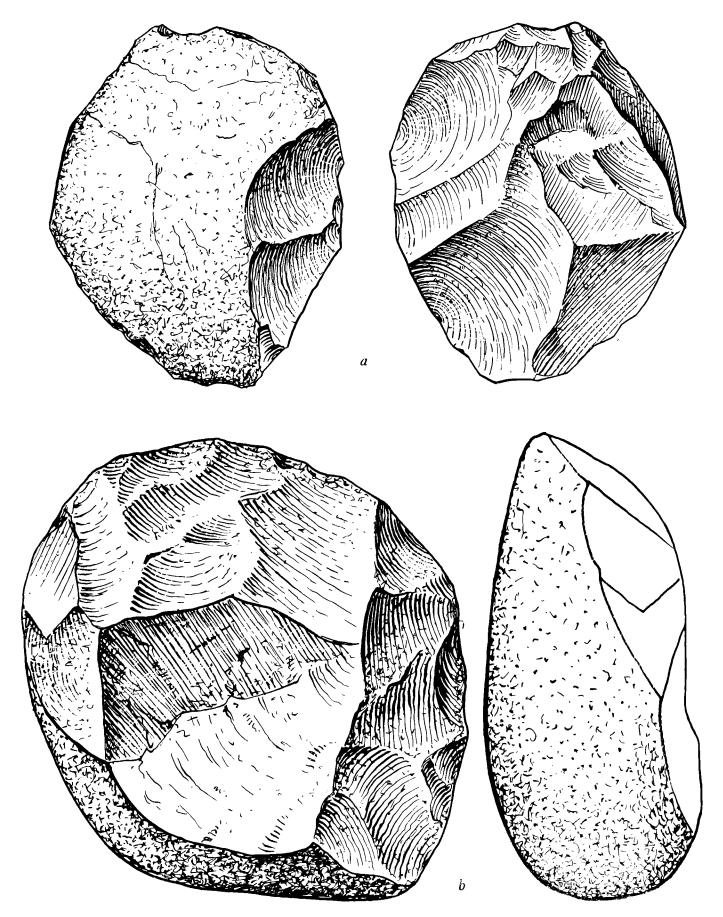




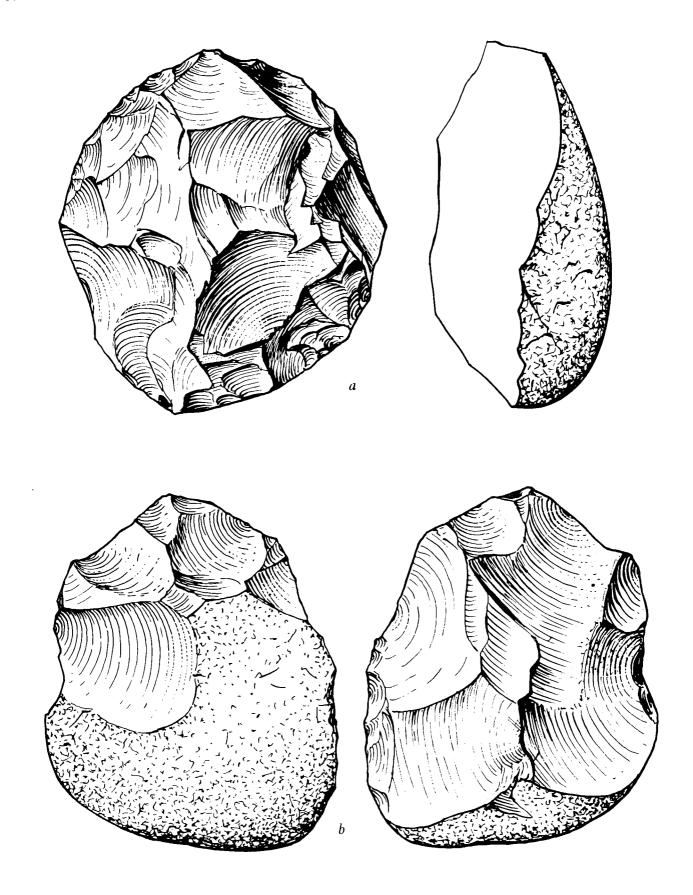


Morgah a 4; b 5.

P. Graziosi - Prehistory PL.

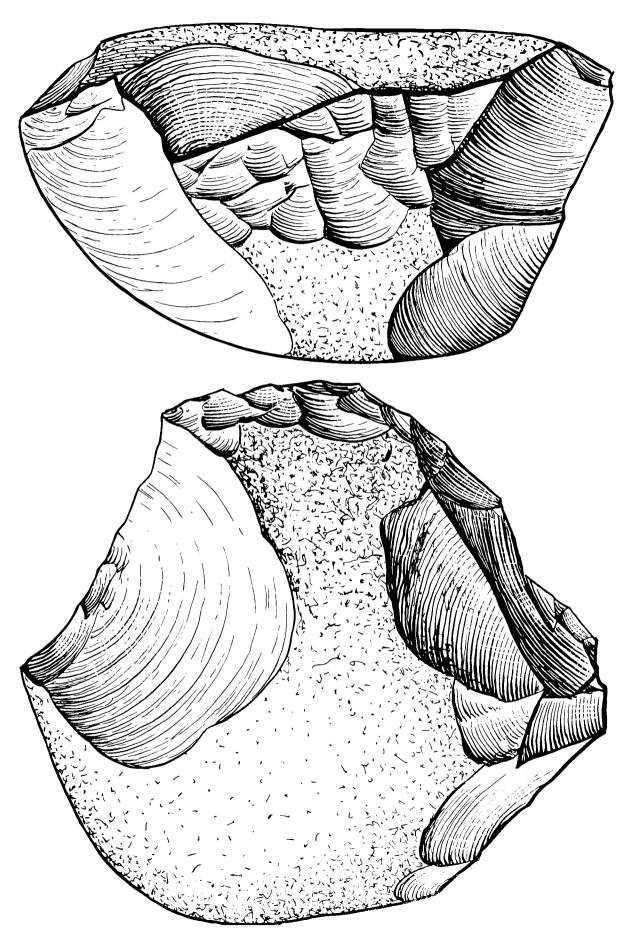


Morgali a 6; b 7.

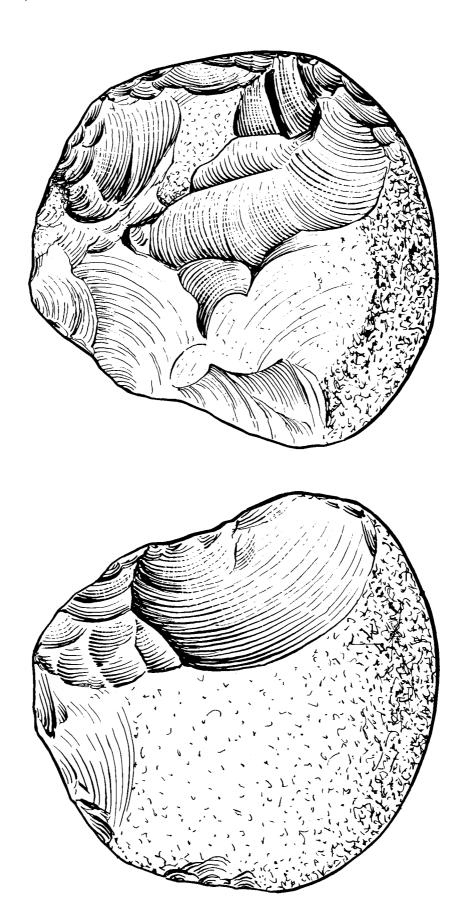


Morgah a 8; b 9.

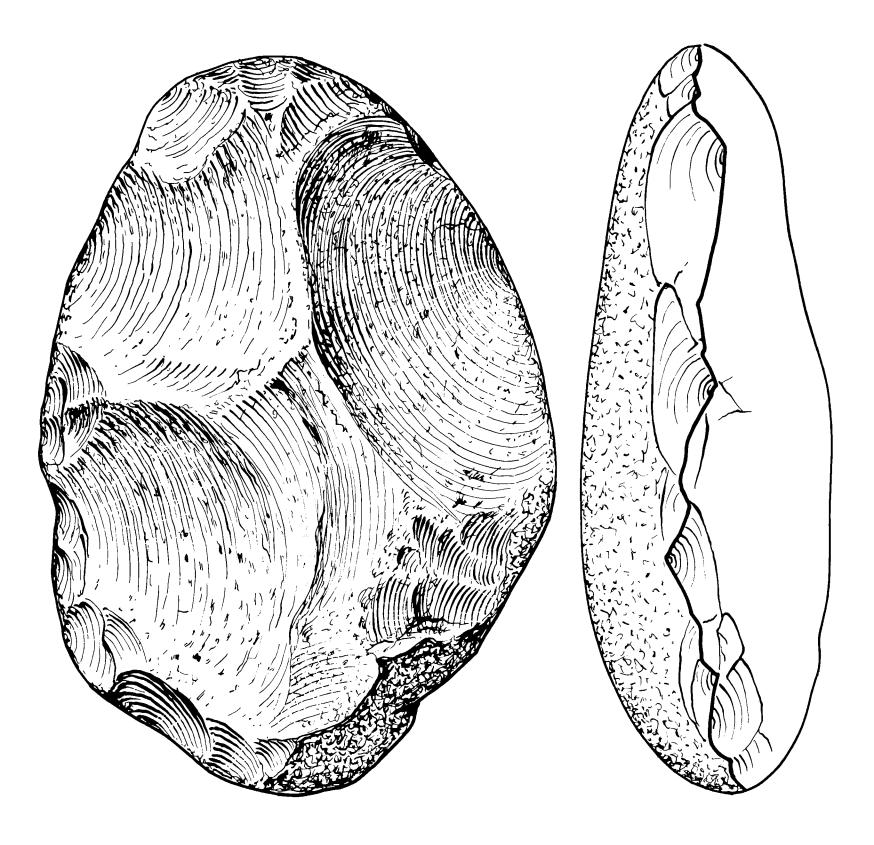
P. Graziosi - Prehistory

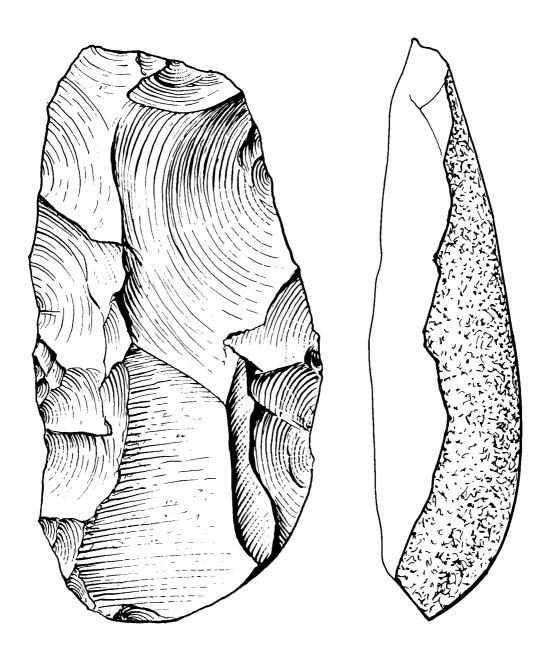


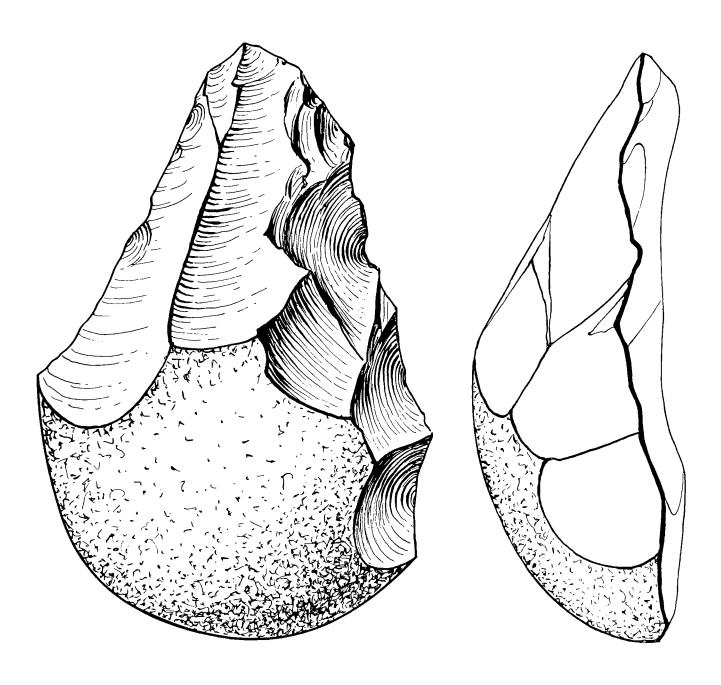
Iorgah II 🛭 9.

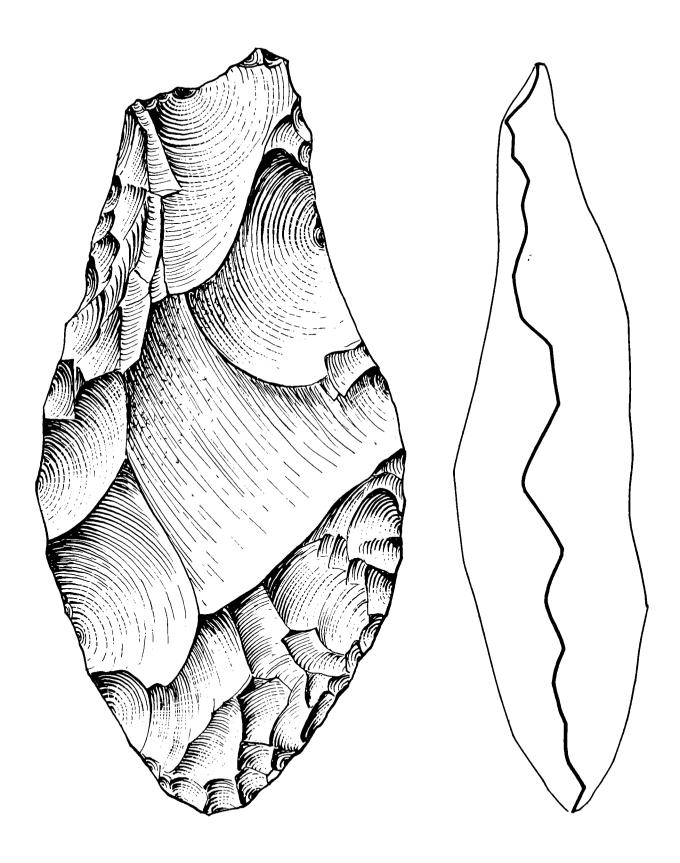


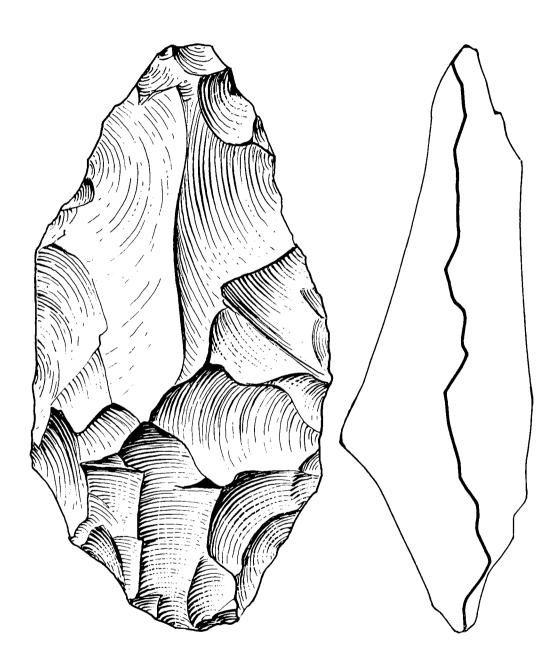
P. Graziosi - Prehistory Pl. 8

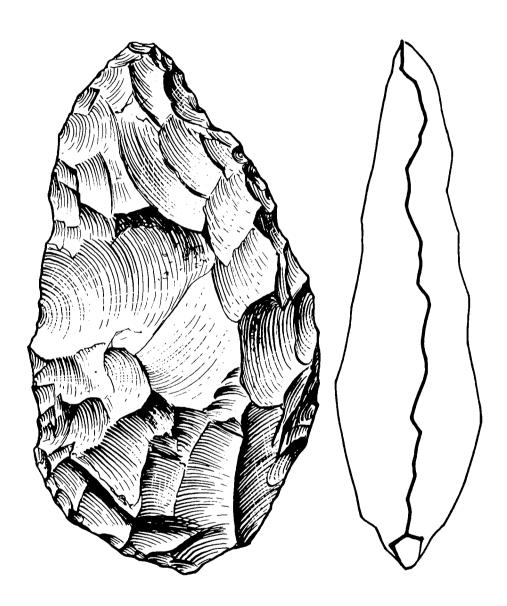


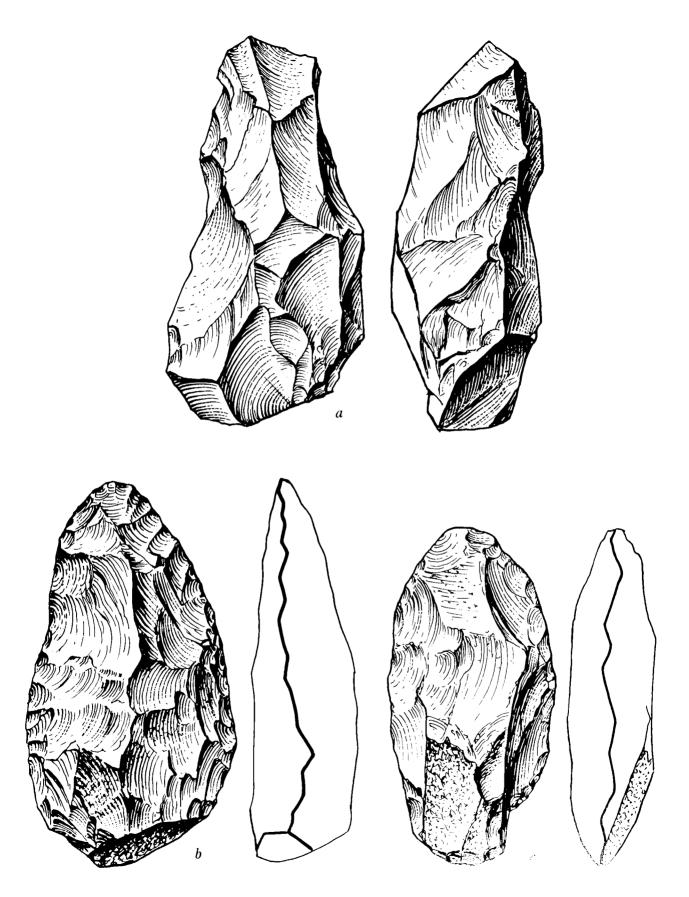


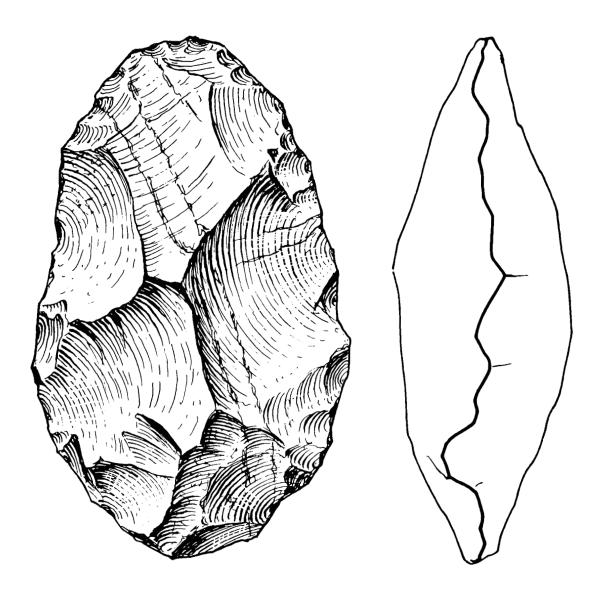


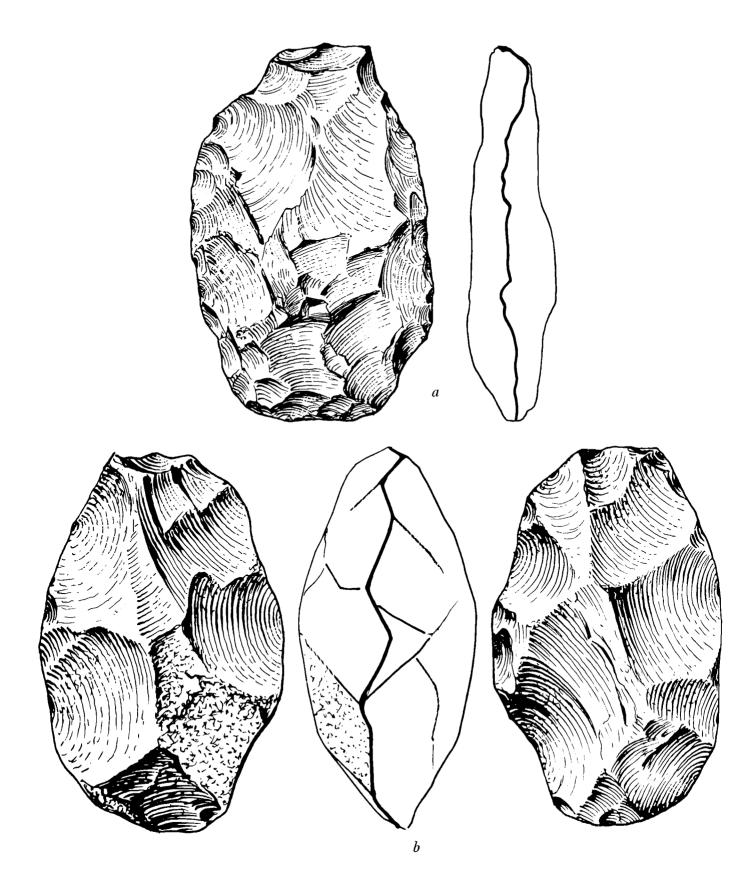


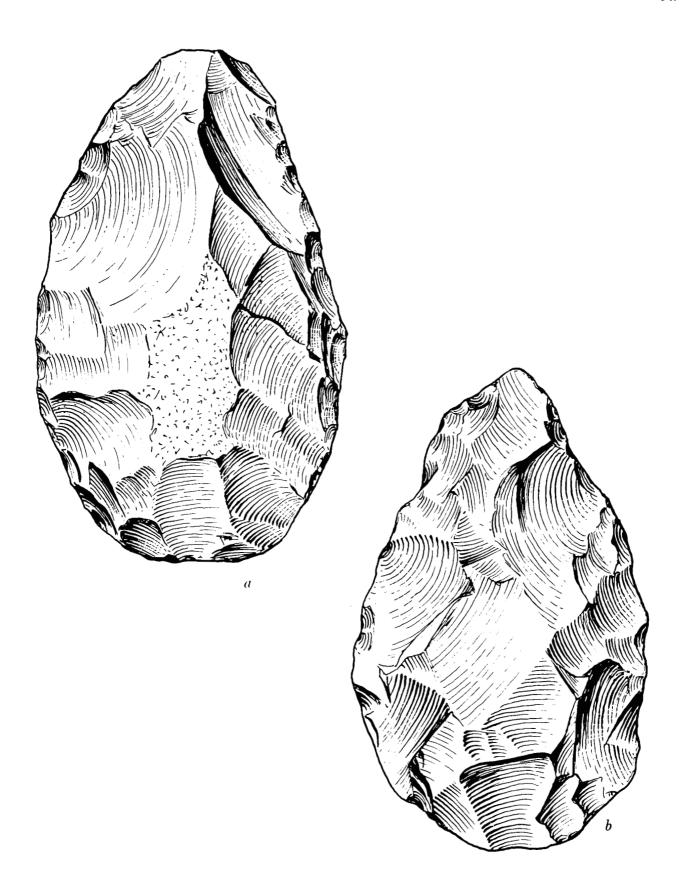




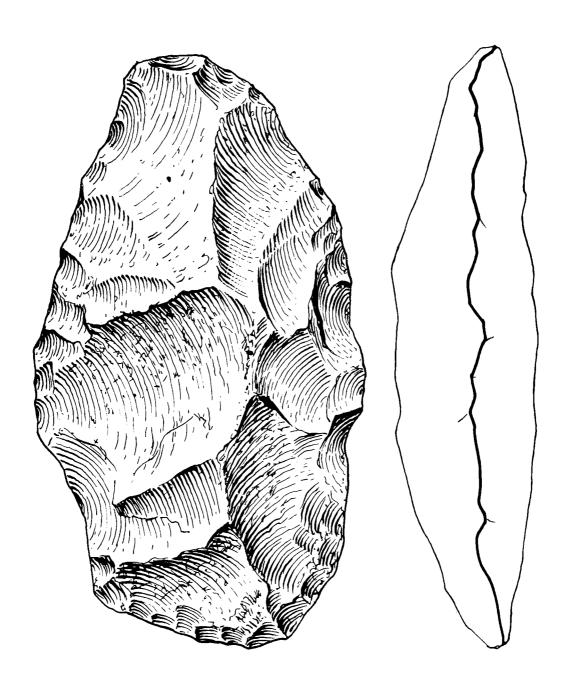


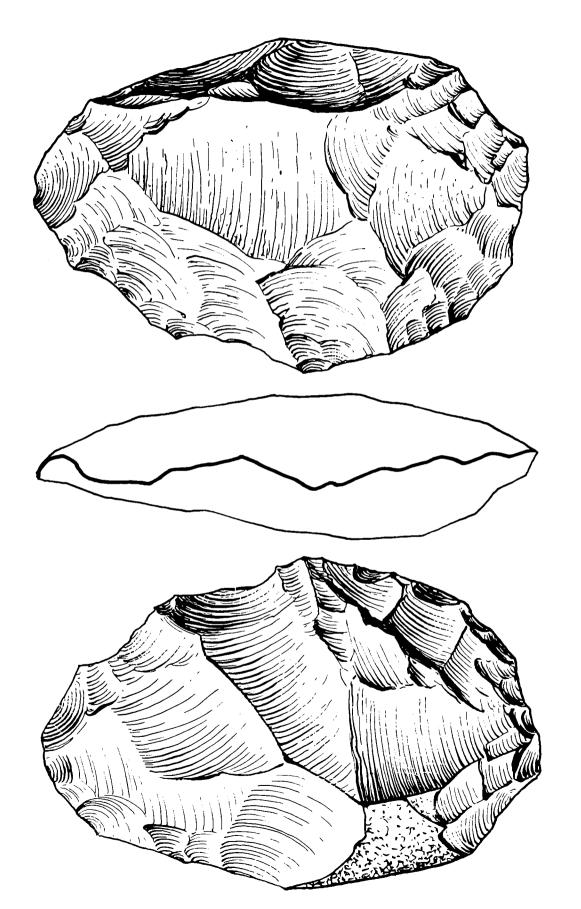


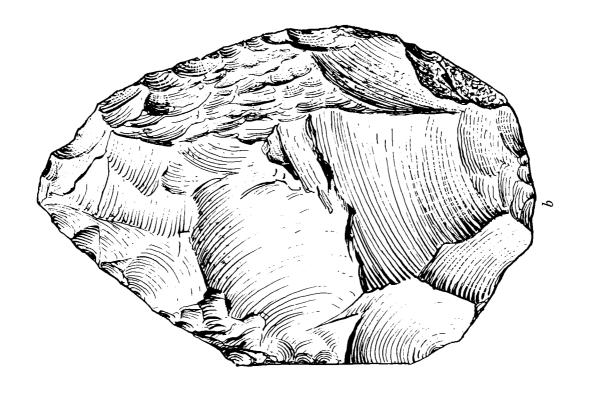




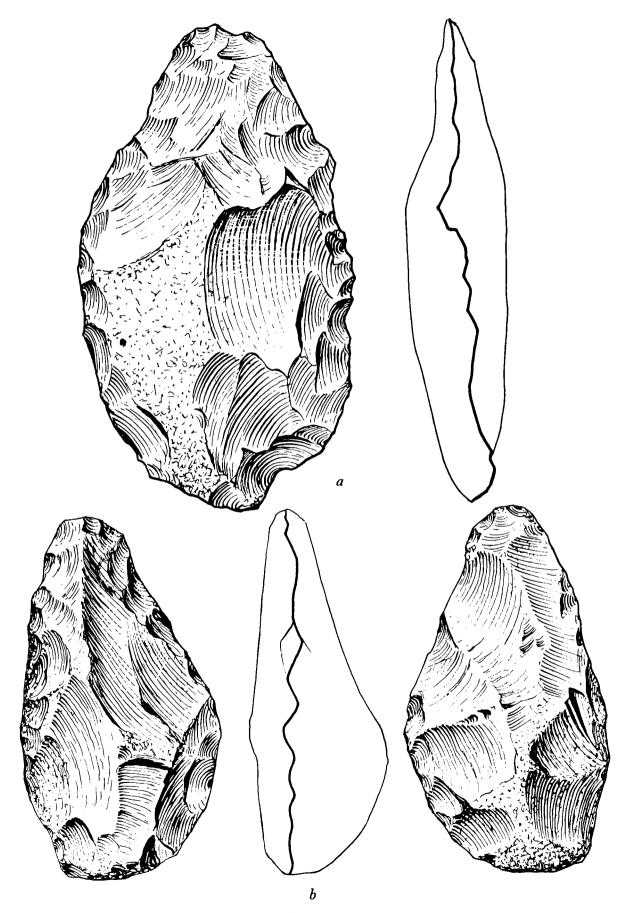
Morgali a 24; b 25.



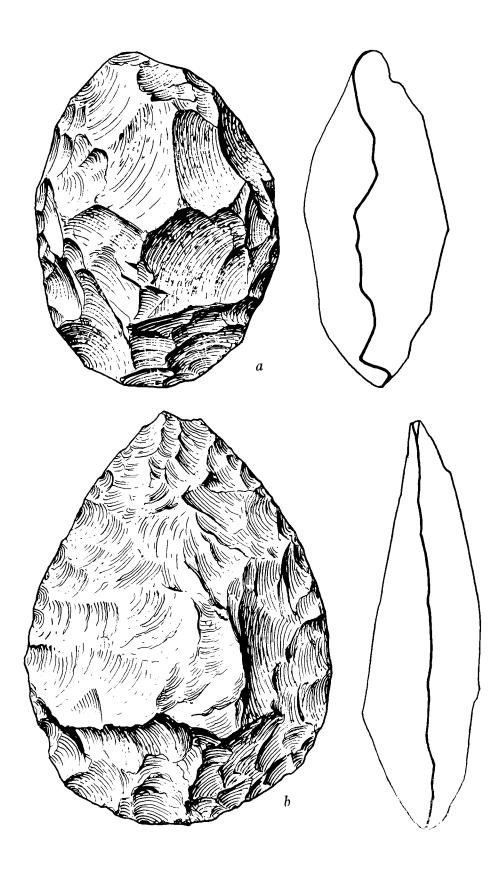


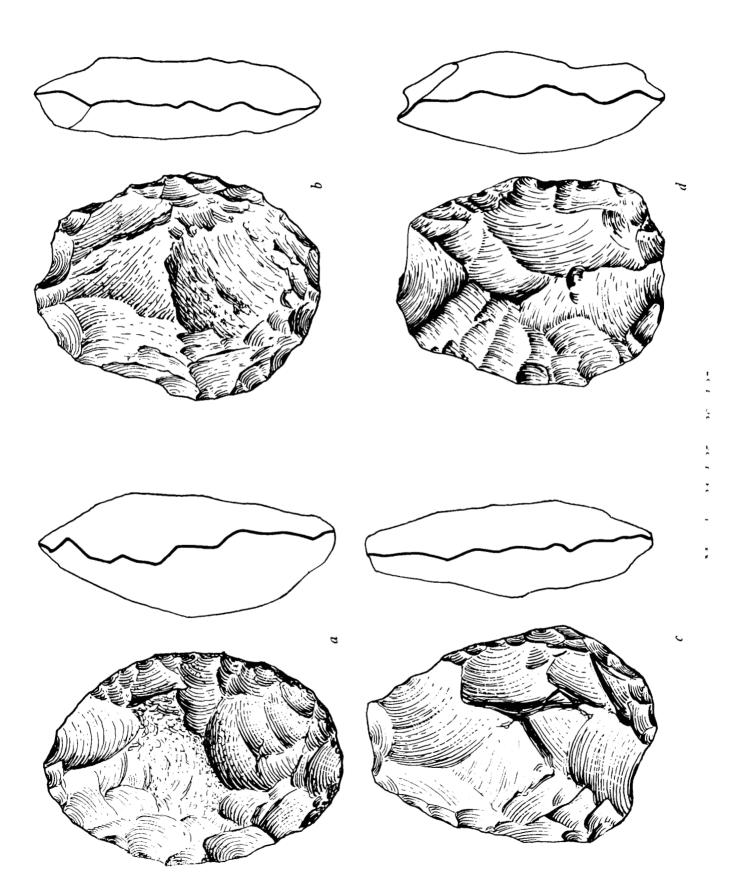


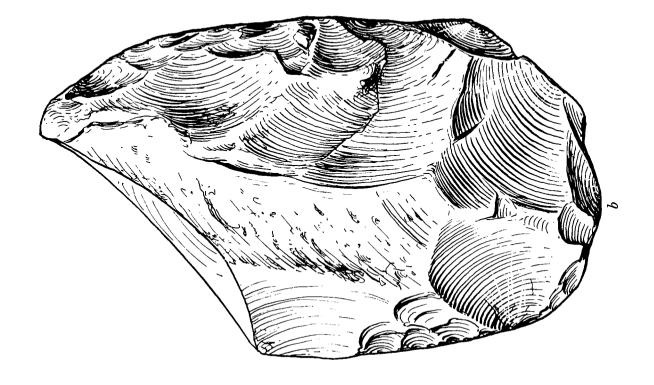




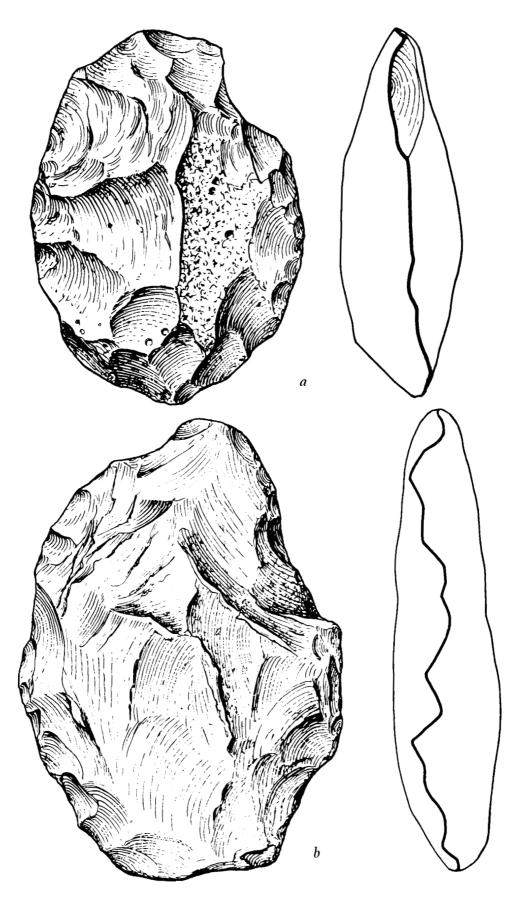
Morgah a 30; b 31.



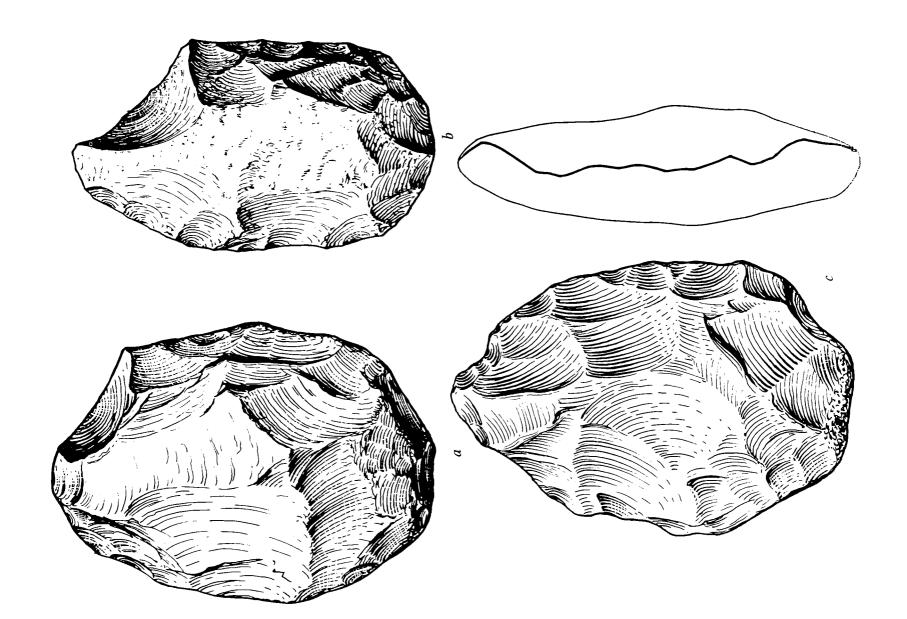




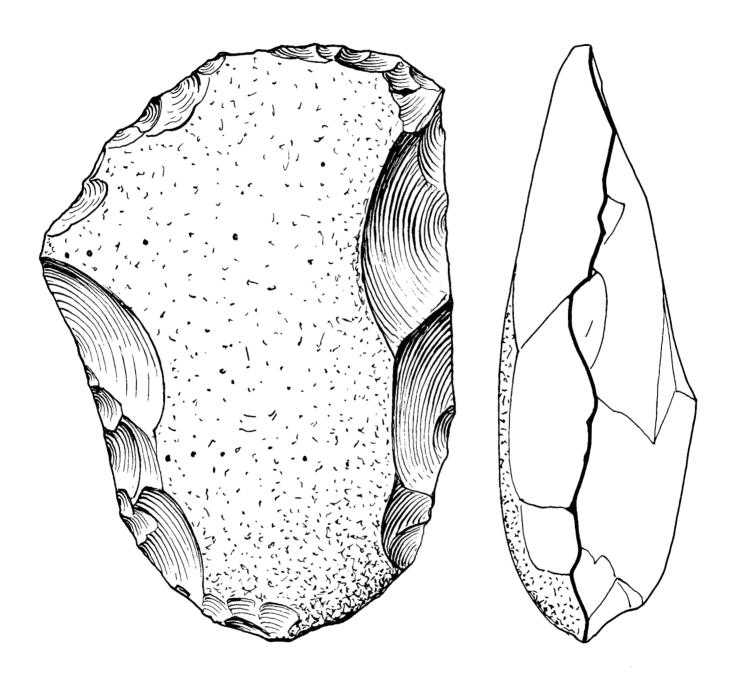


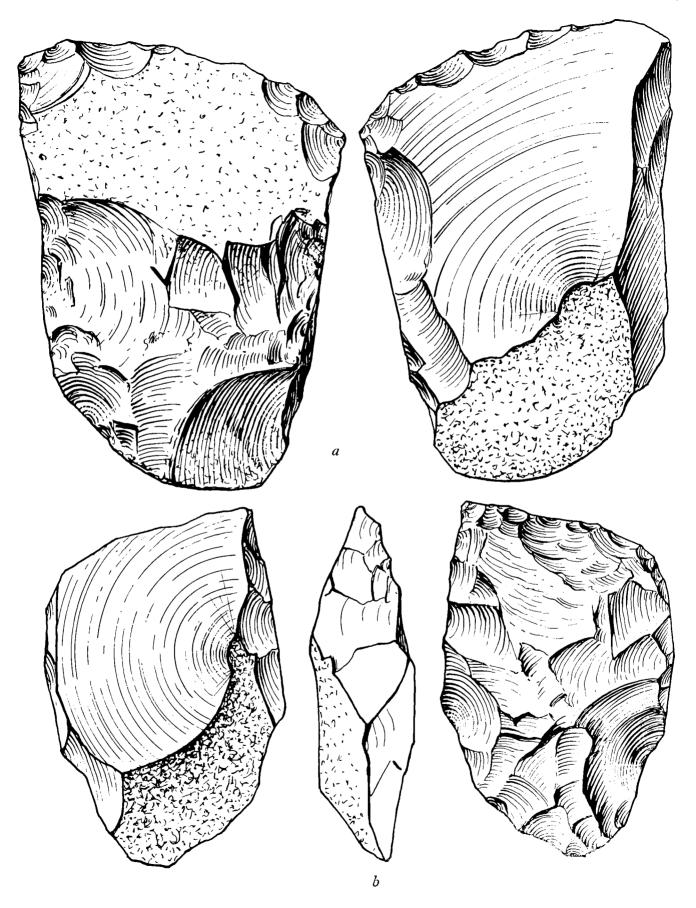


Morgah a 40; b 41.

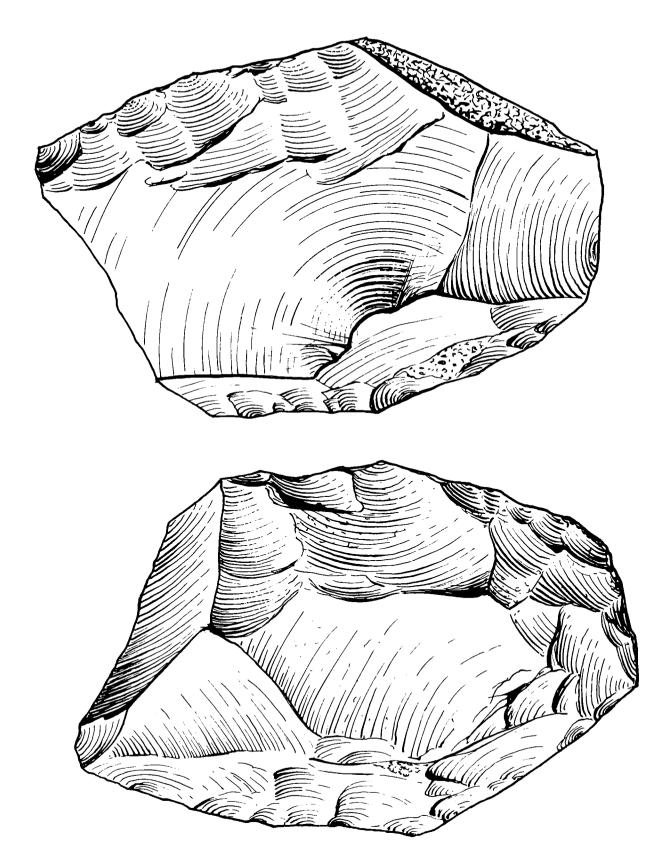


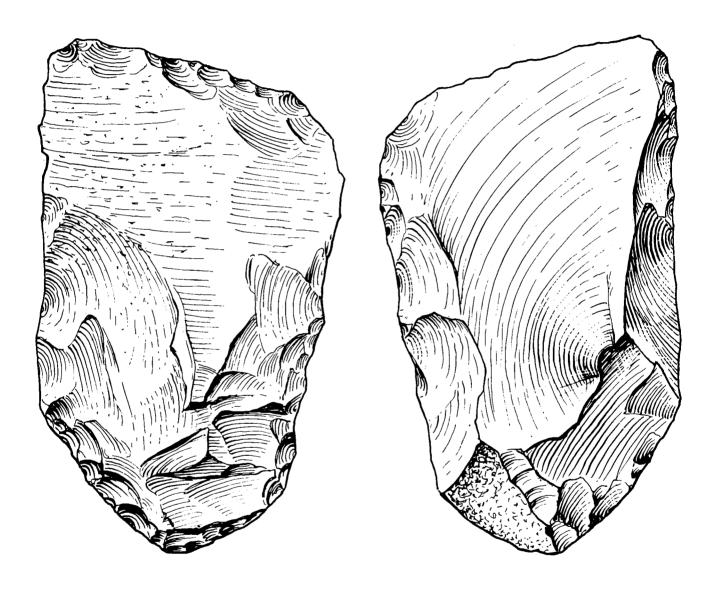
Morgali a 42; b 13; c 44.

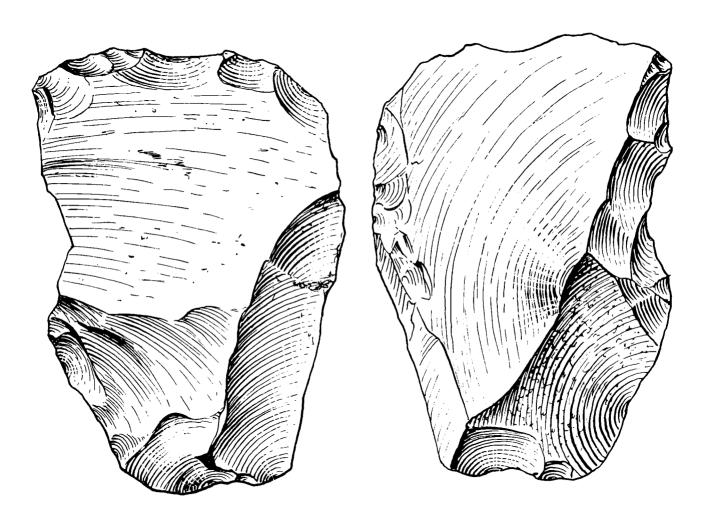


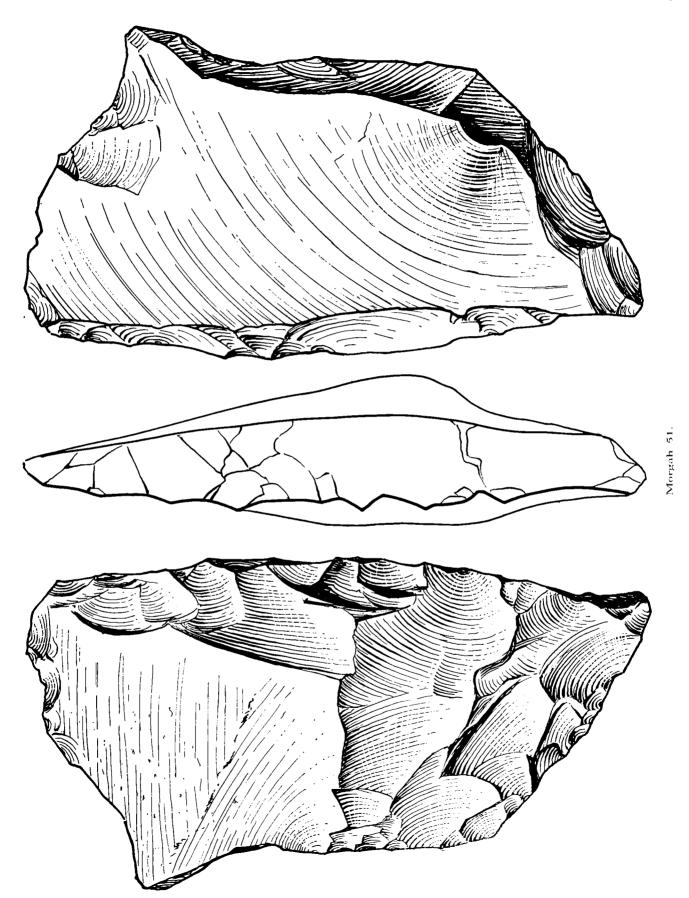


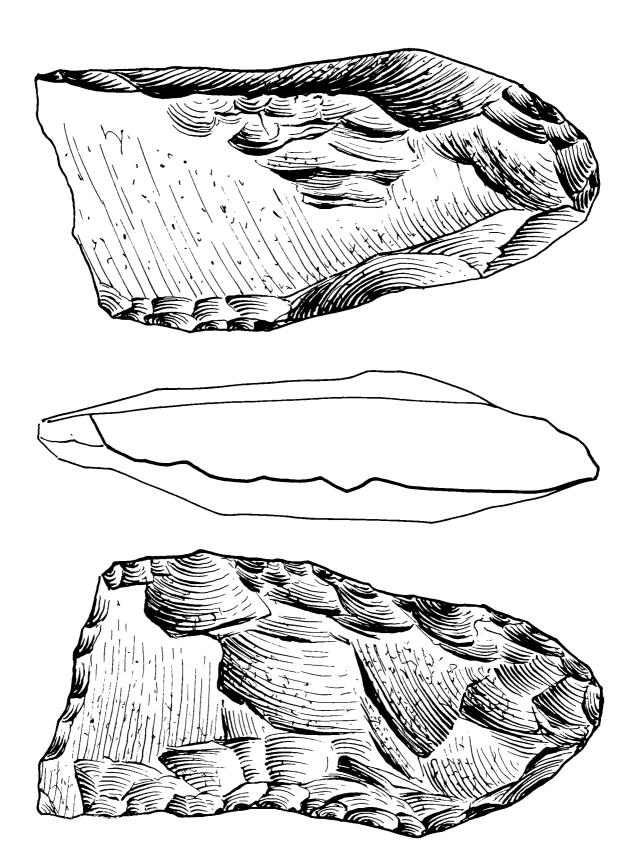
Morgah a 46, b 47.



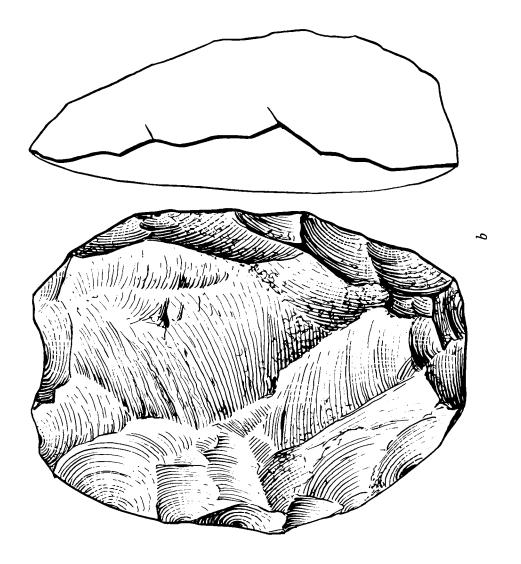


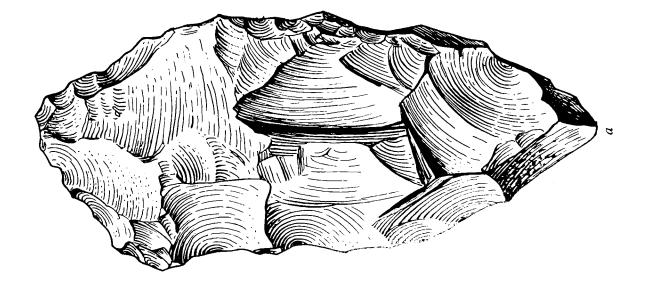




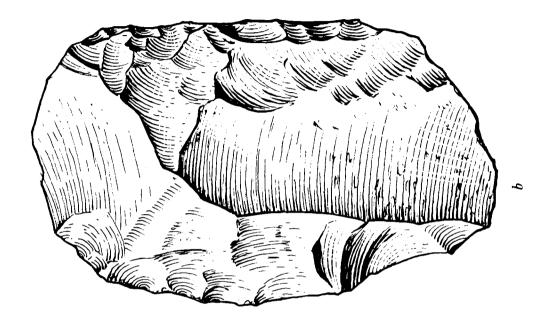


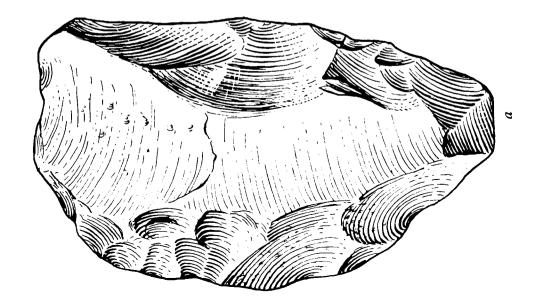
Morraah 59



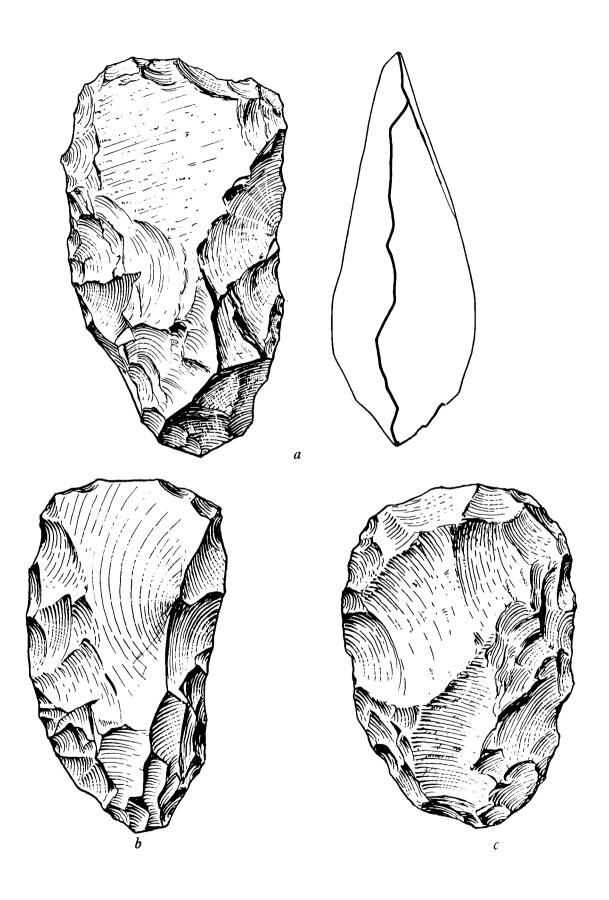


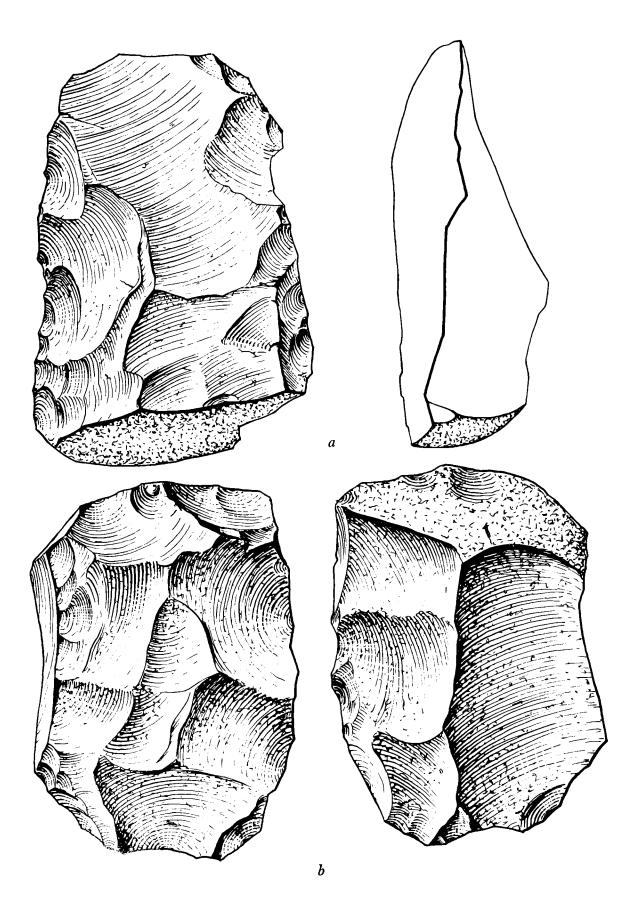
P. Graziosi - Prehistory Pl. 3^e



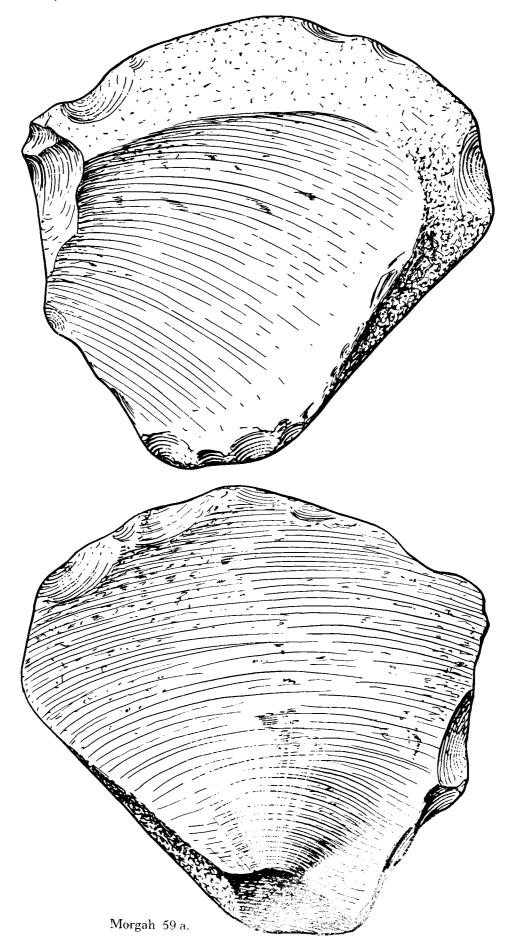


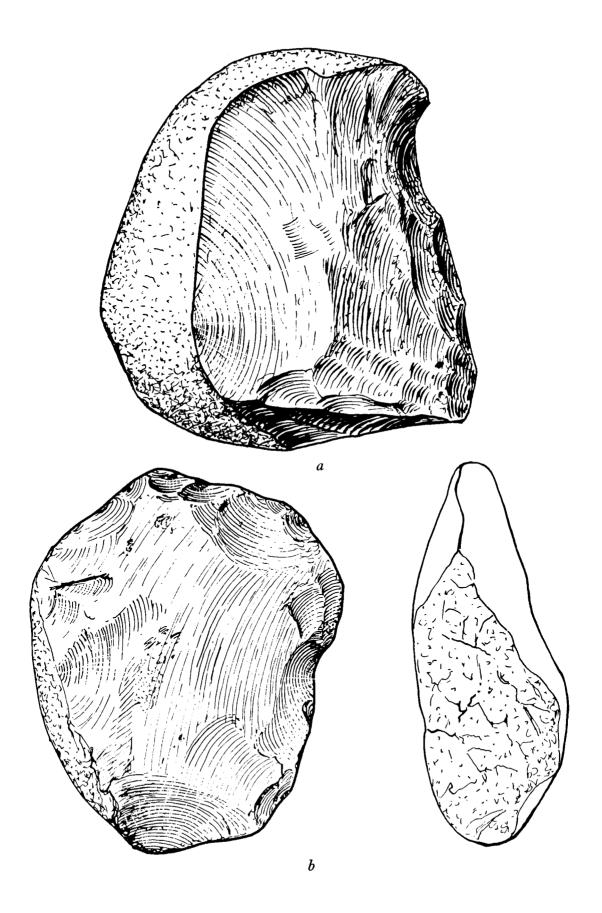
Morgah a 53: b 54.



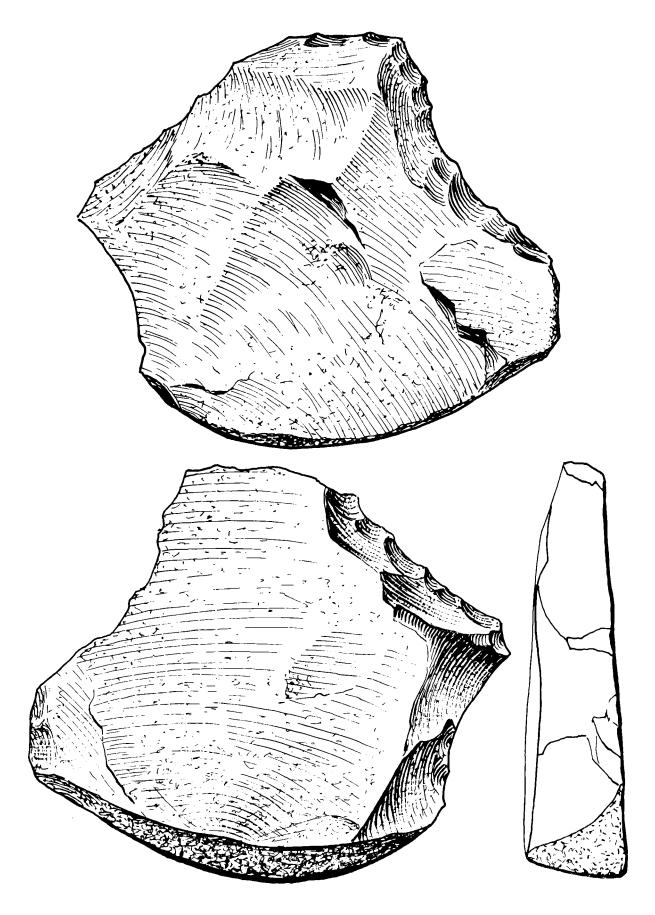


Morgah a 58; b 59.

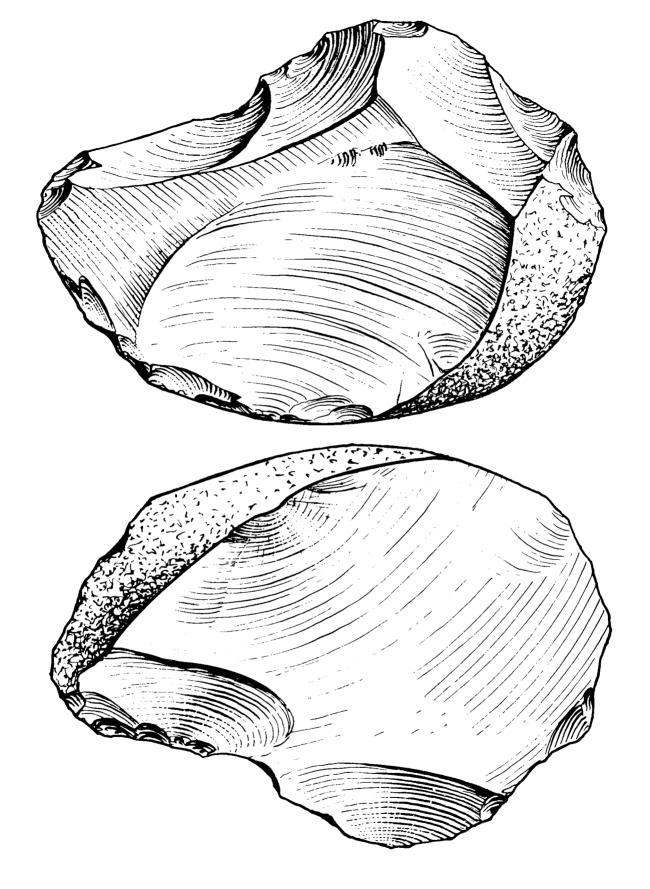


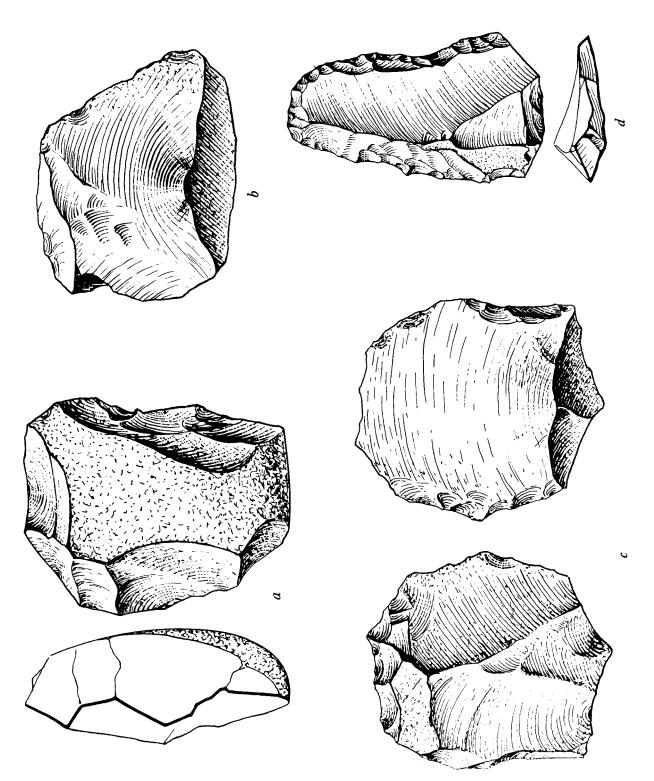


Morgah a 60; b 61.

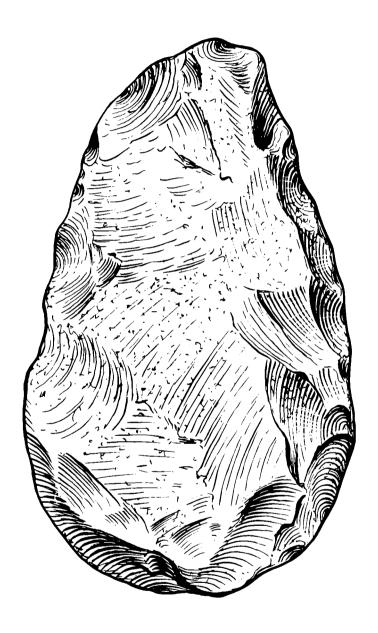


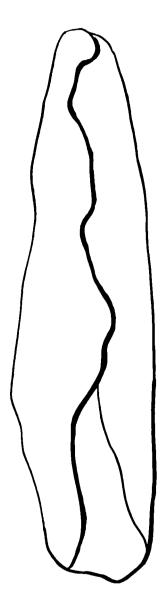
Morgah 62.

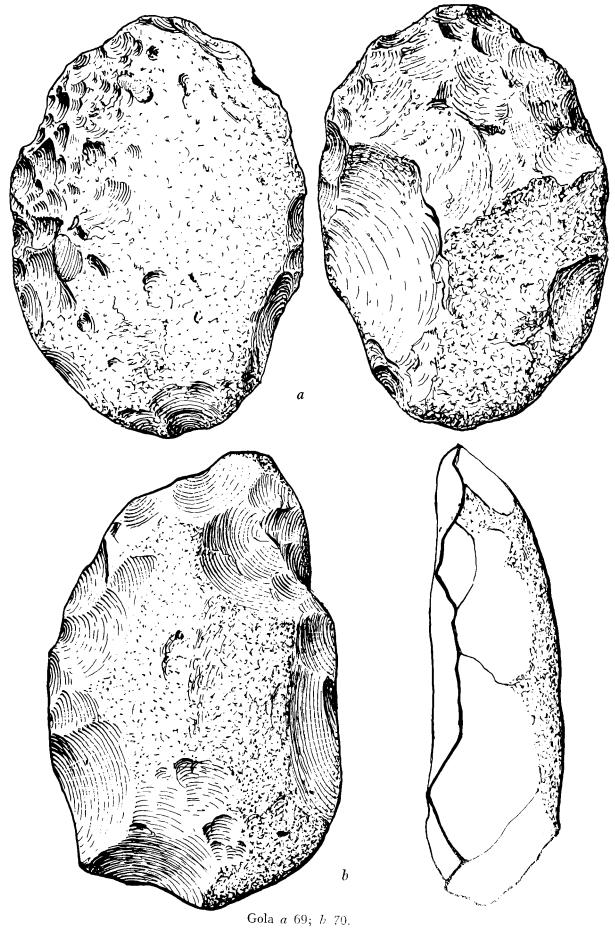




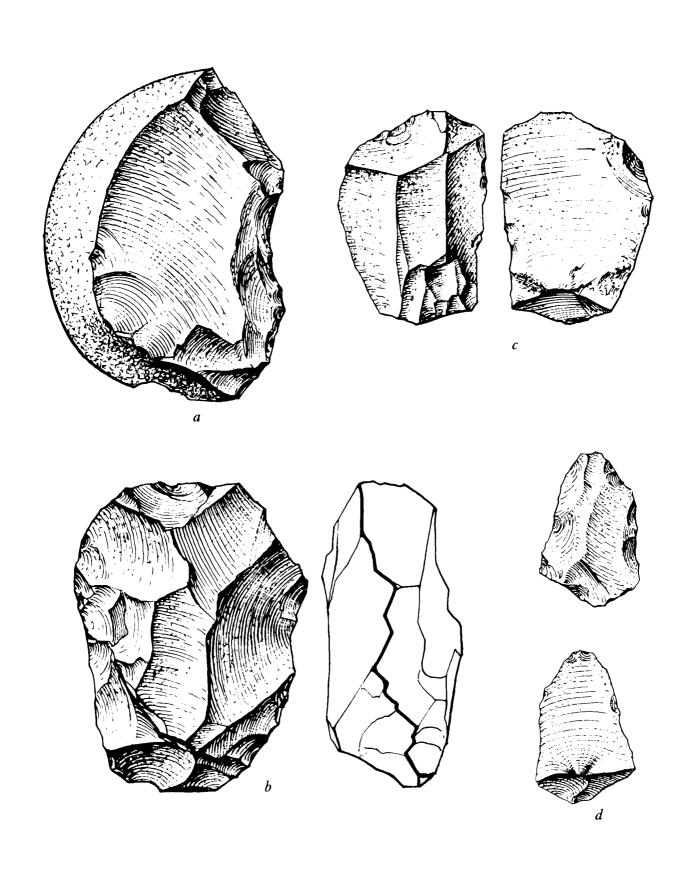
Morgah a 64; b 65; c 66; d 67.



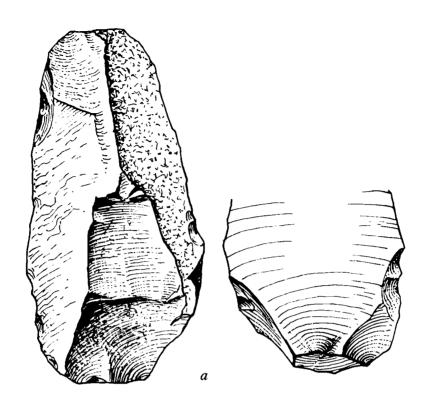


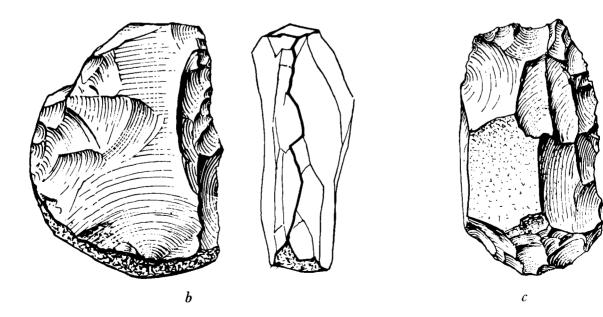


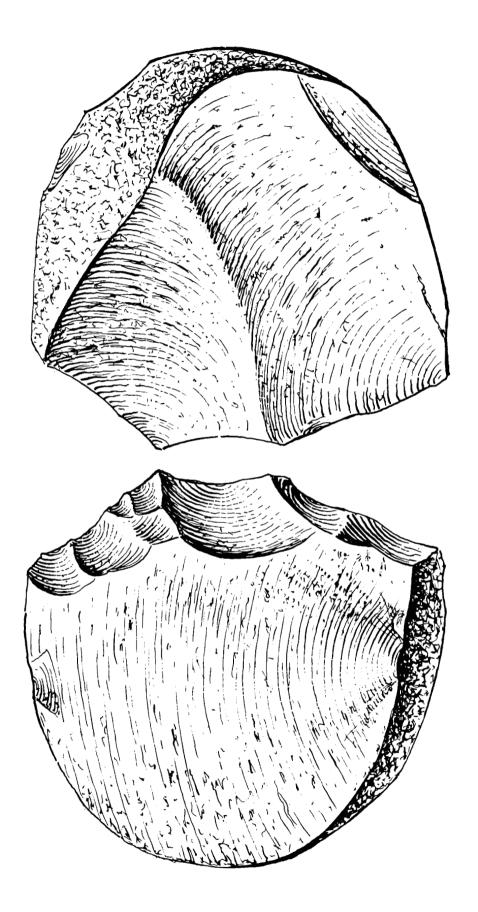
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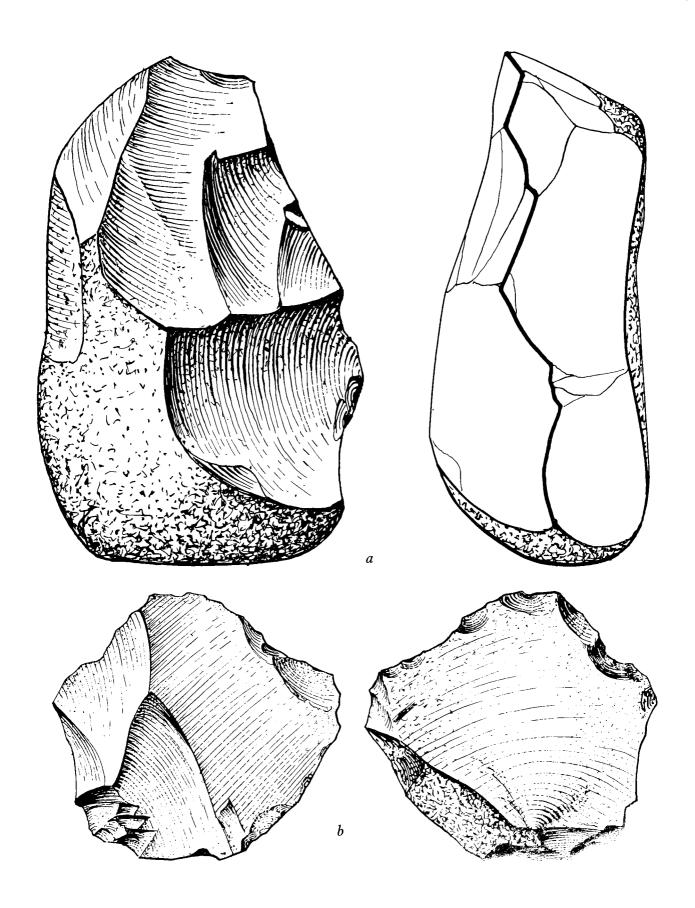
Golaa71; b72. Between Gola and Riwat c73; d74.

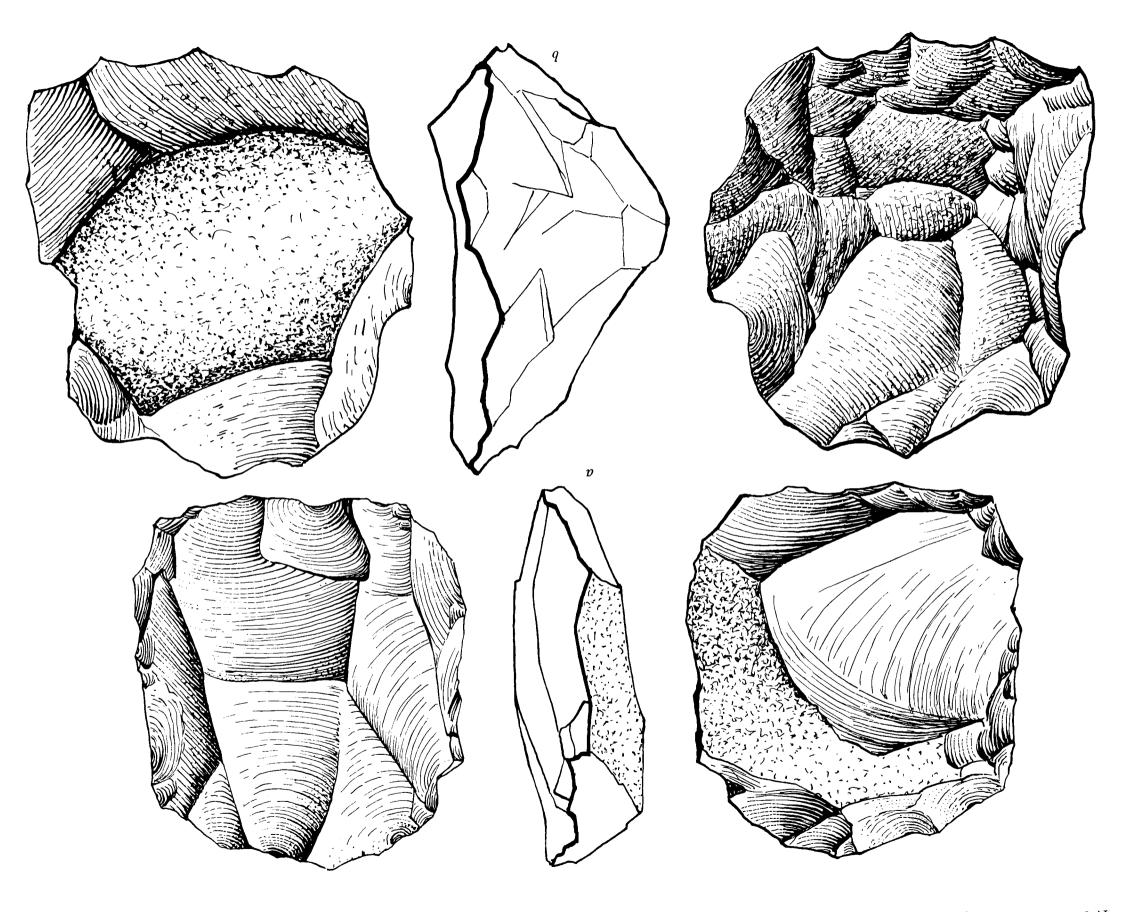


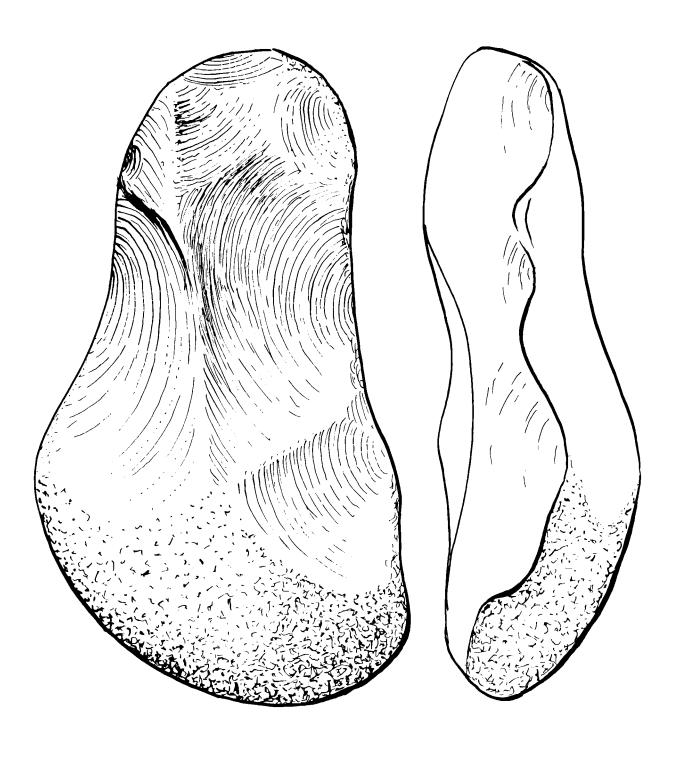


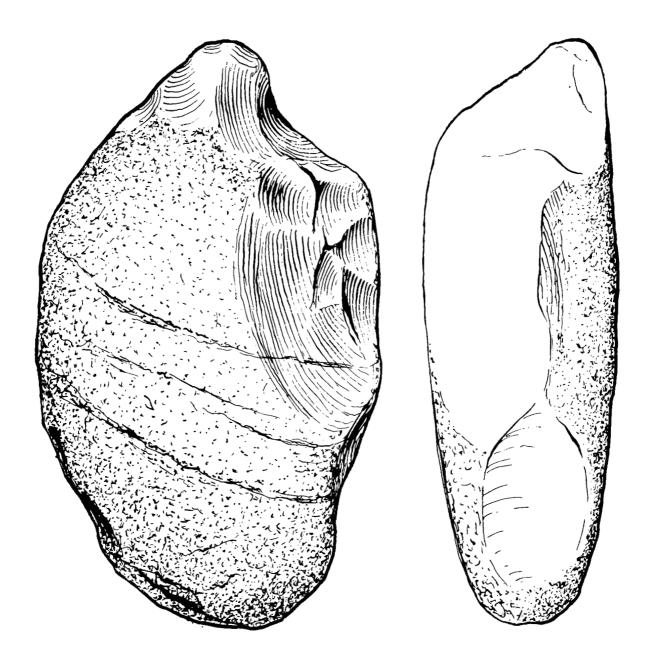


Khasala 78.

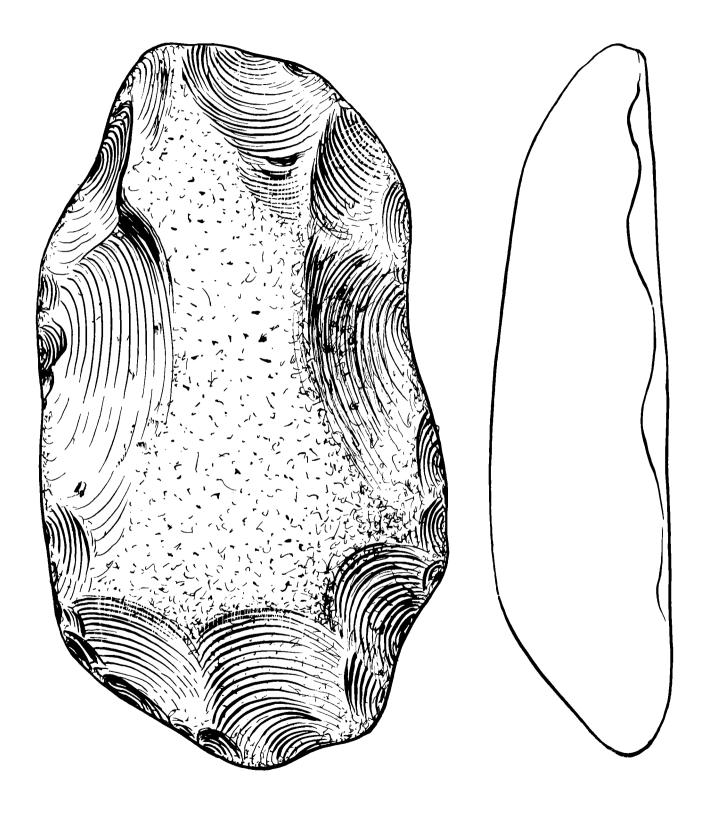


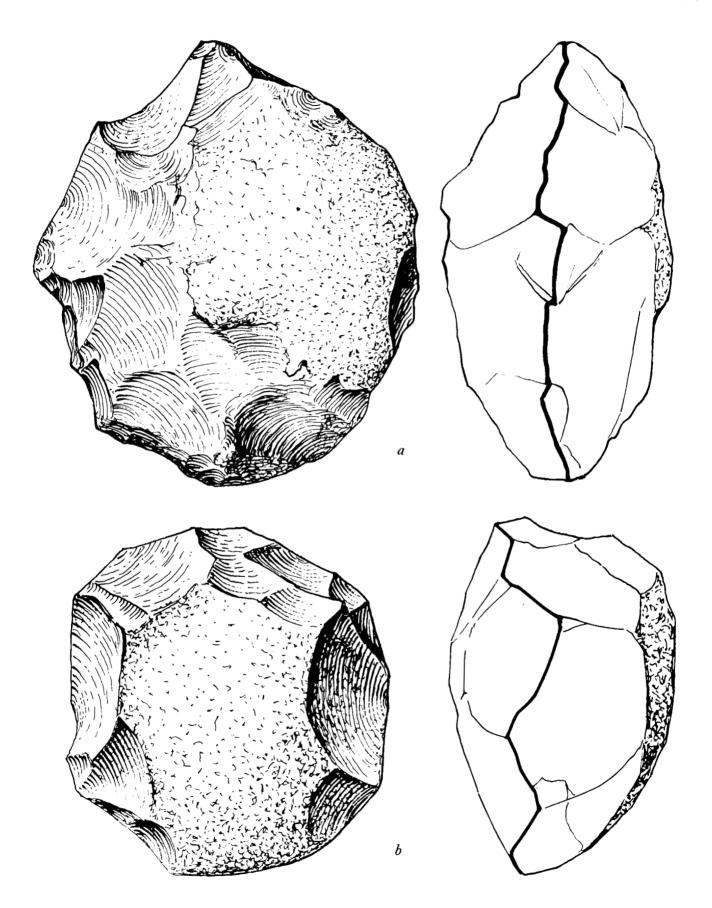




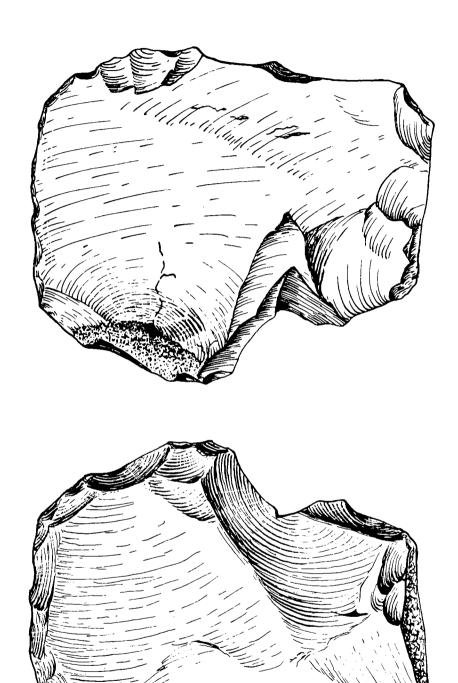


Pl. 52

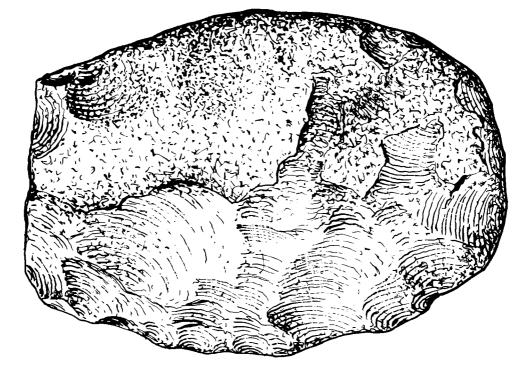


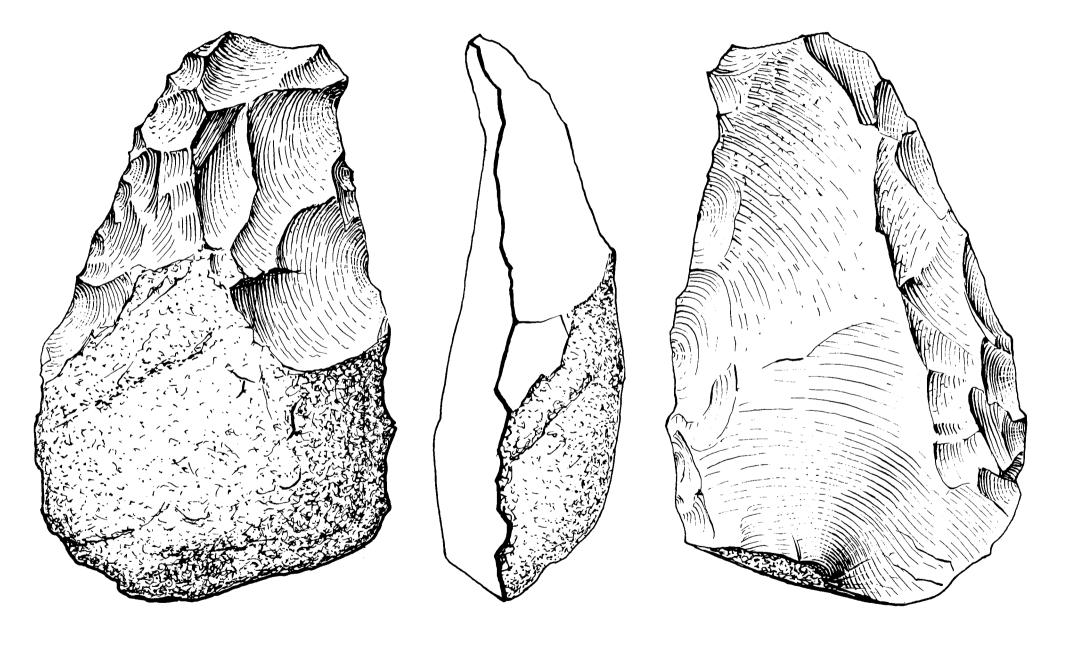


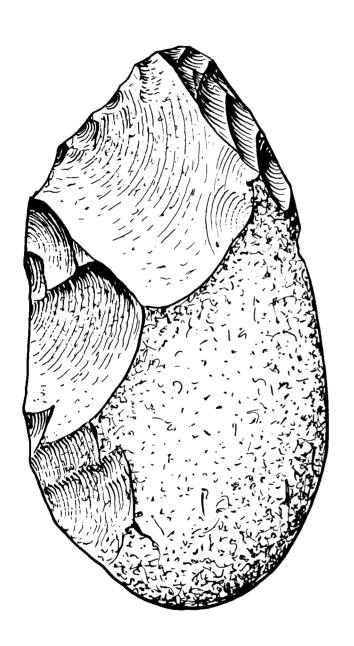
Khasala a 86; b 87.

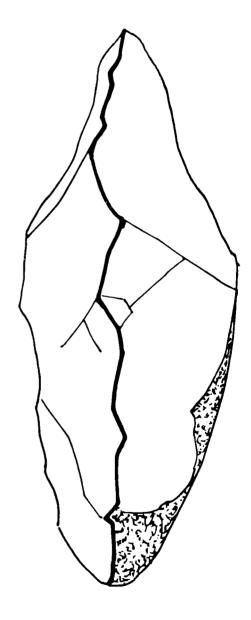


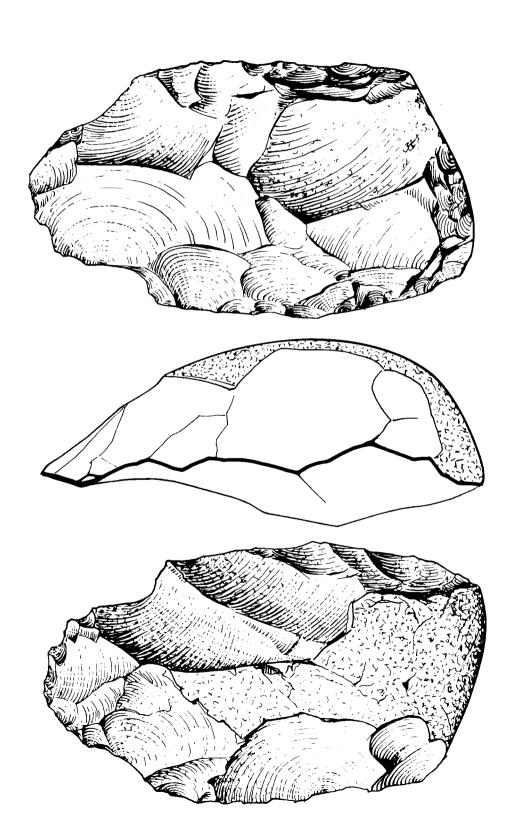


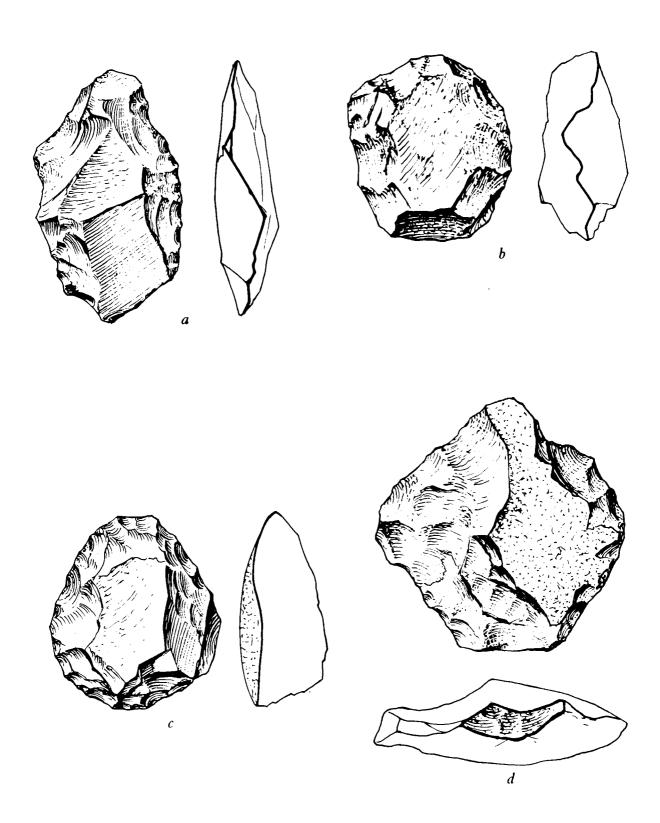


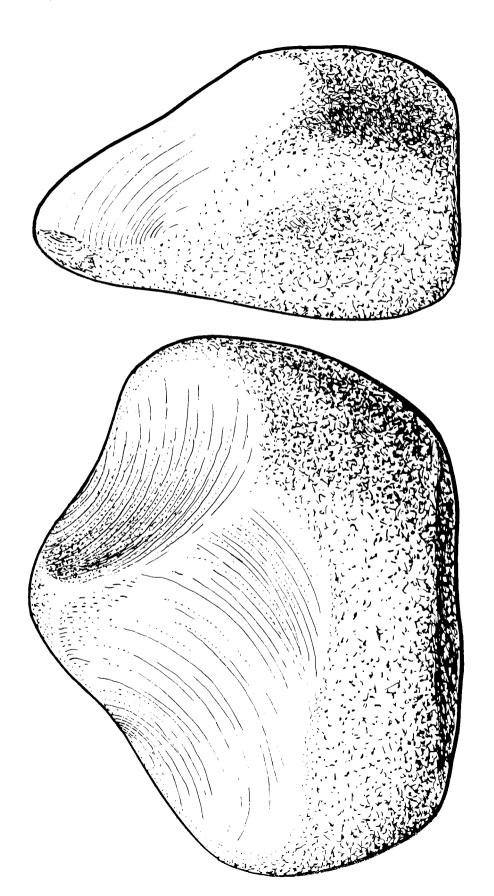




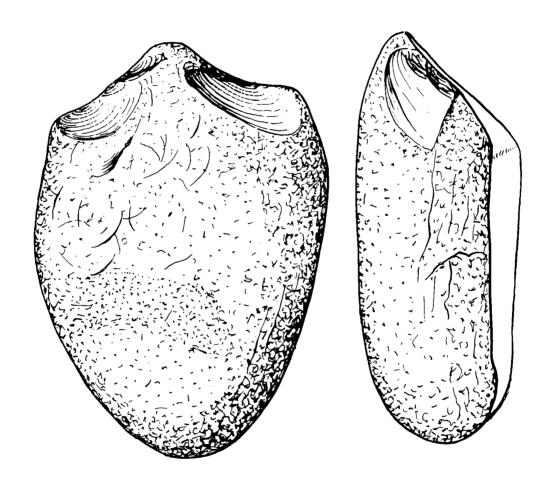


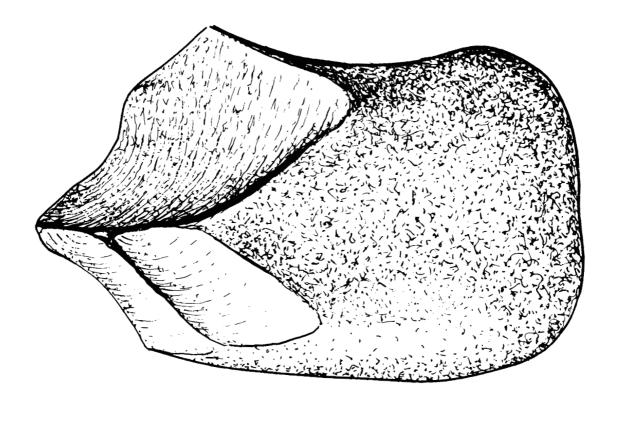


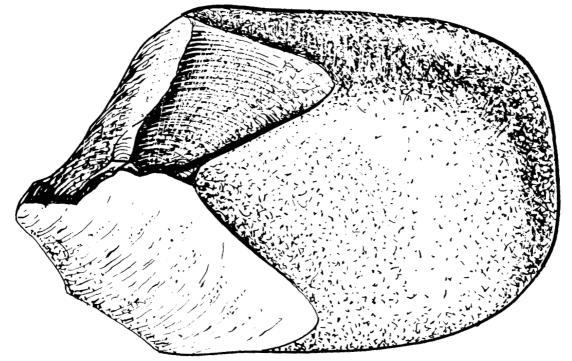




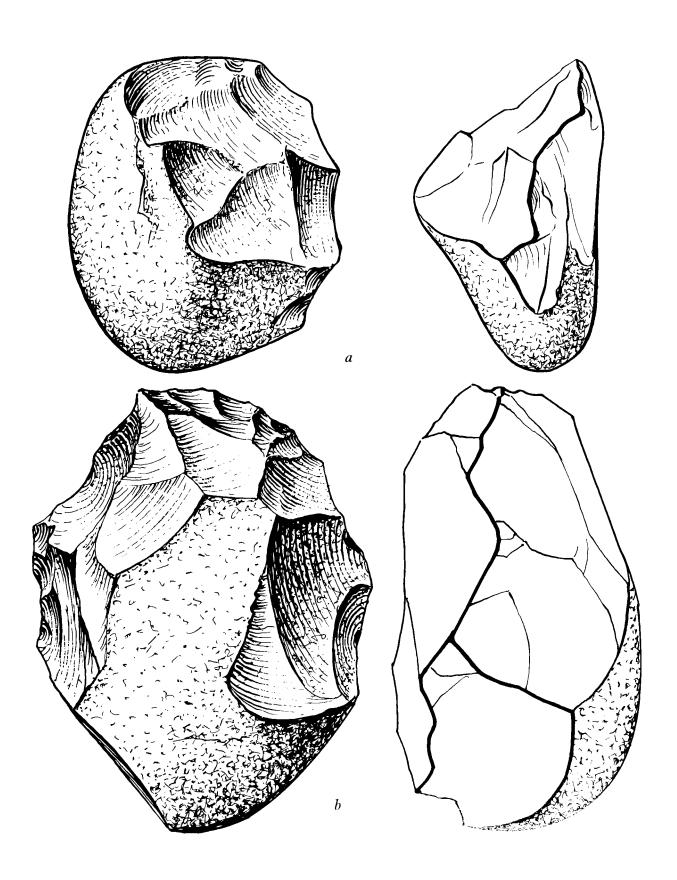


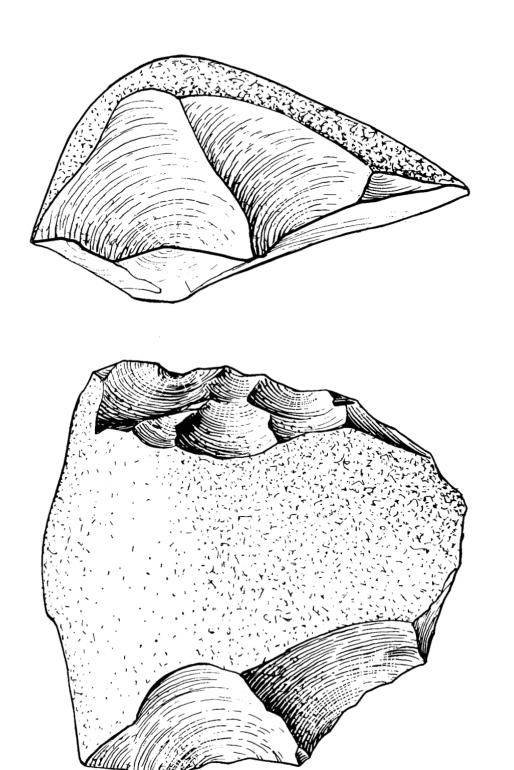




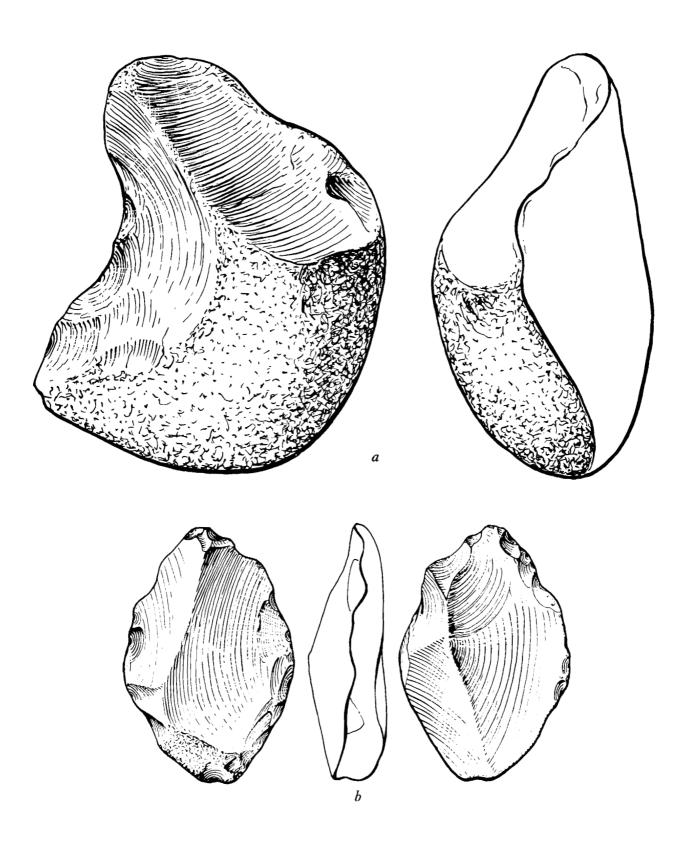


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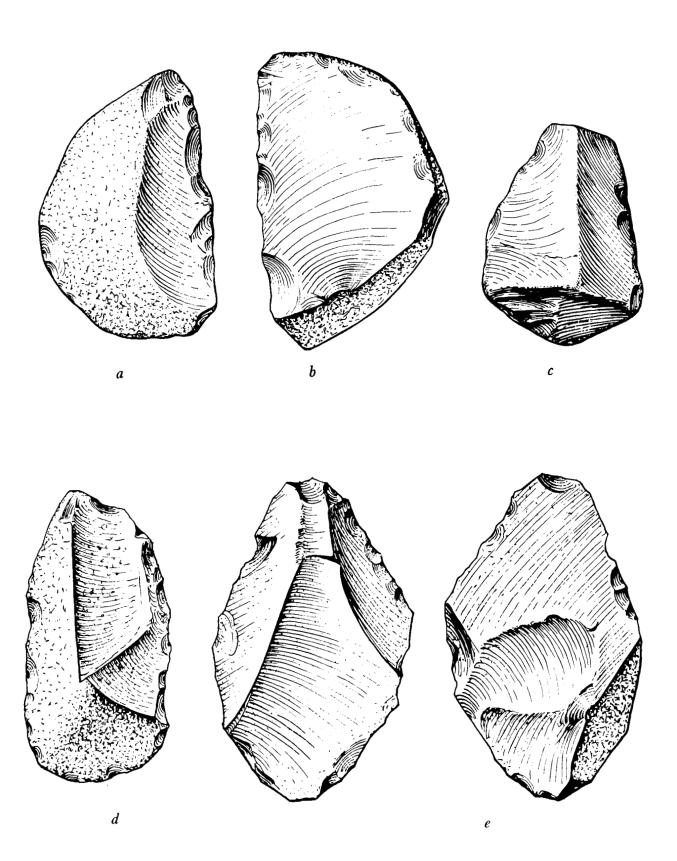


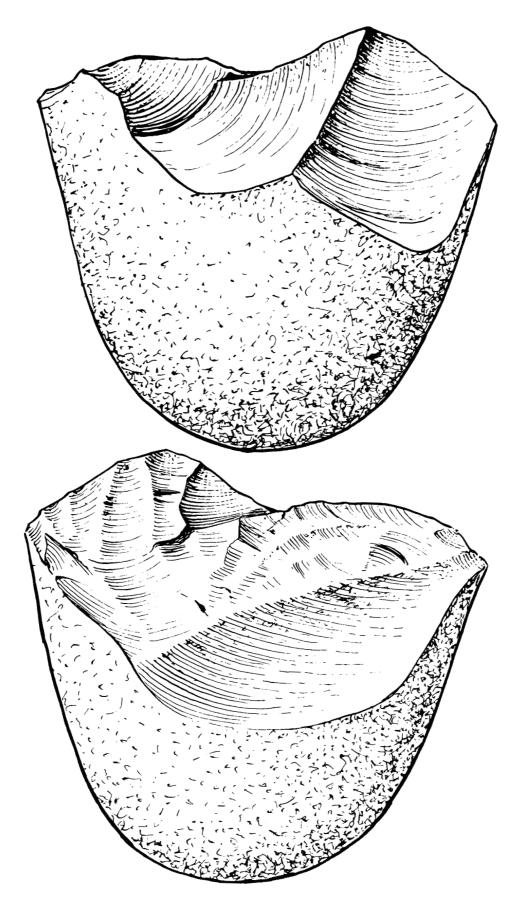




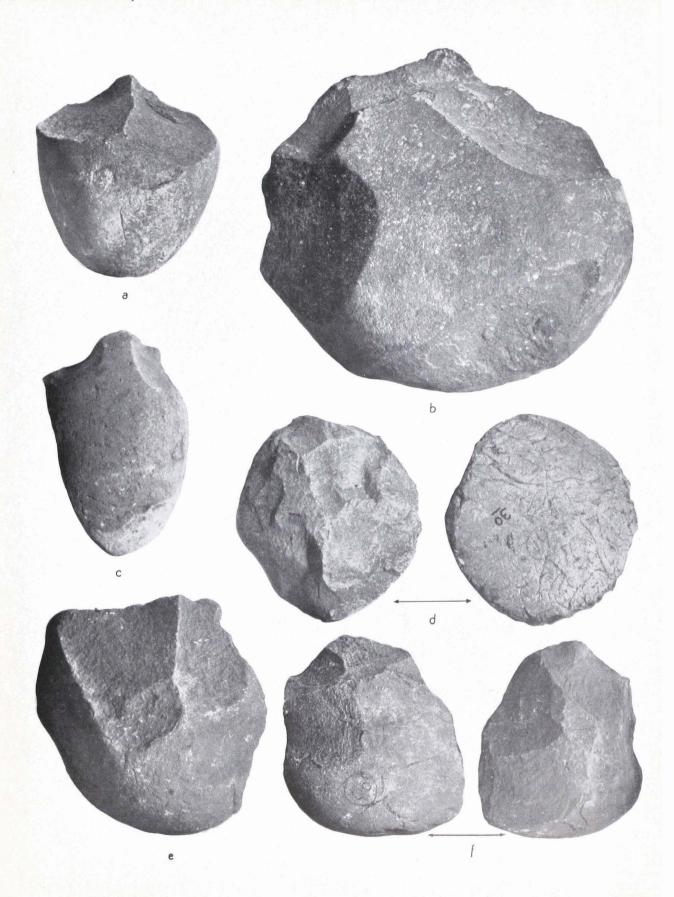


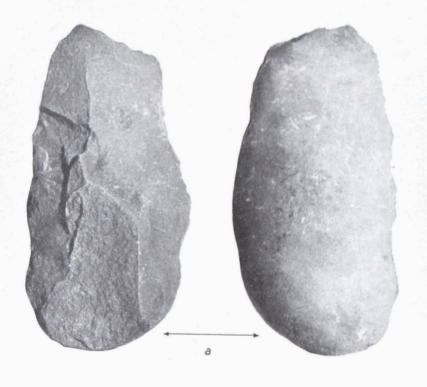
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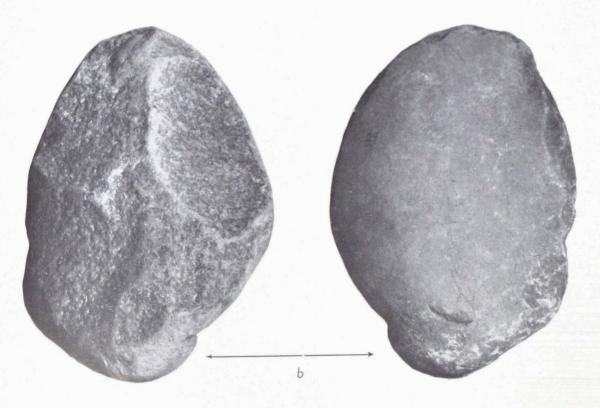


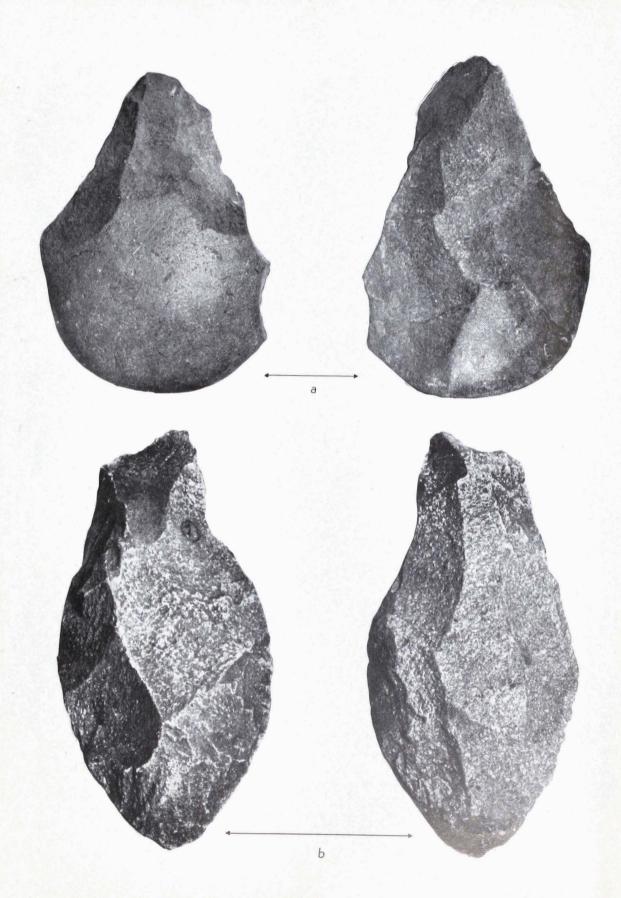


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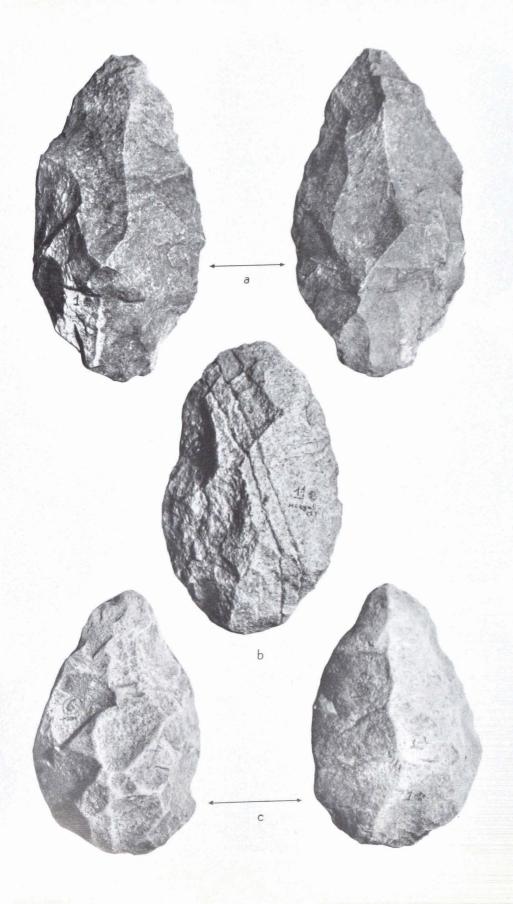




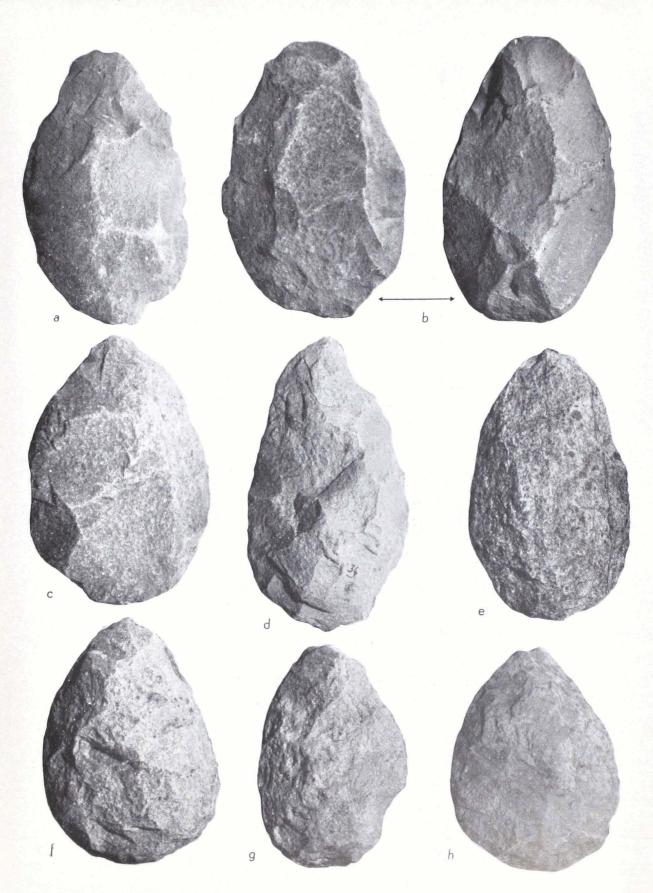




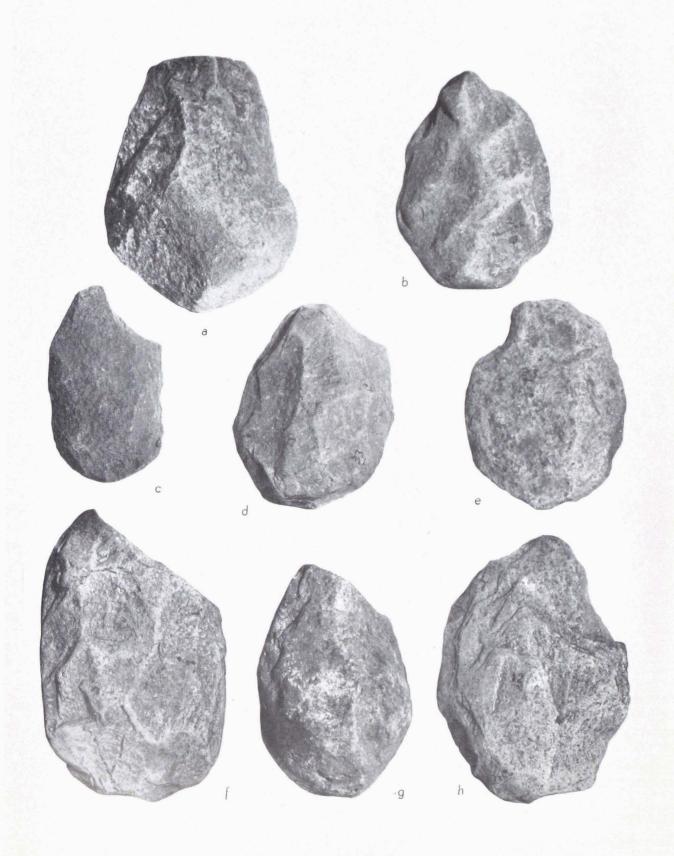
Morgah α 12; b 13.



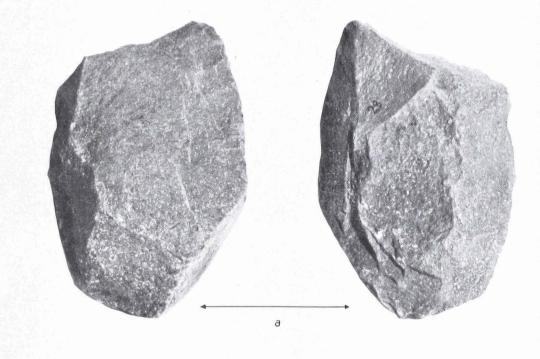
Morgah a 14; b 21; c 25.



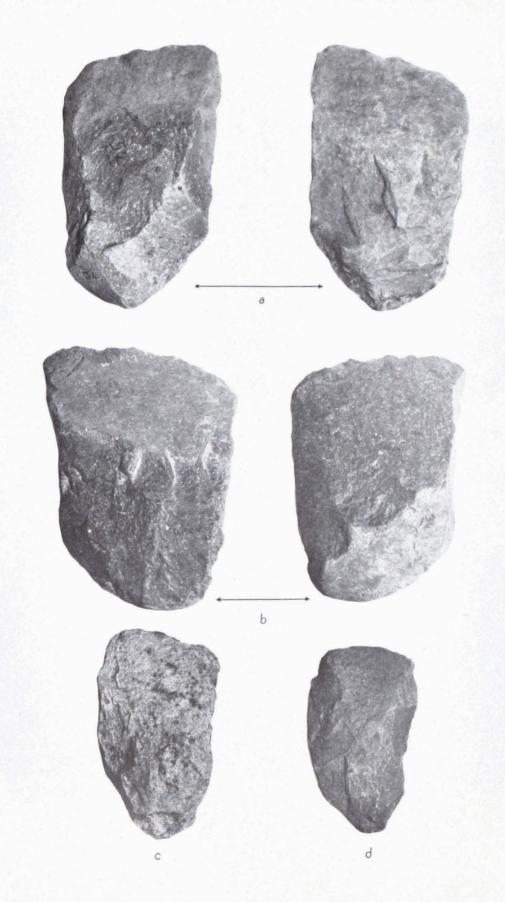
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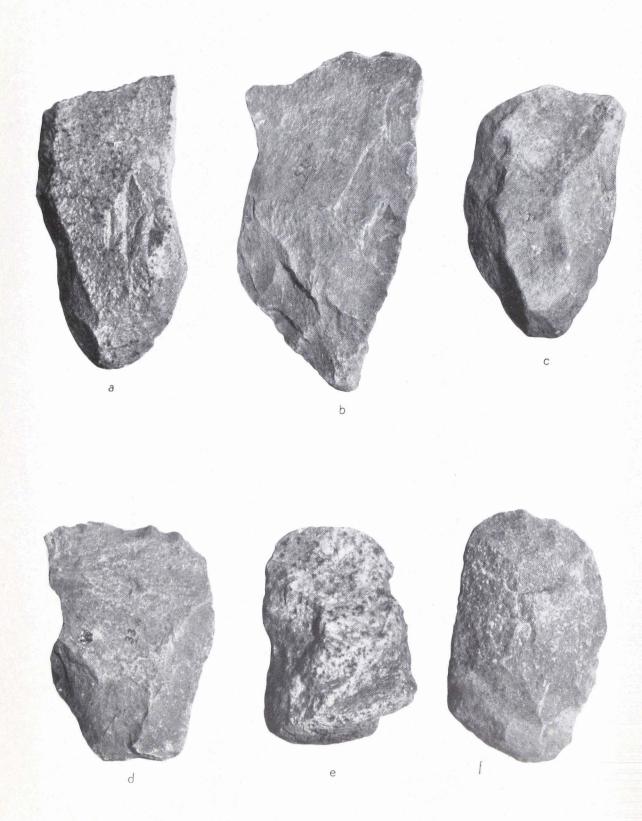
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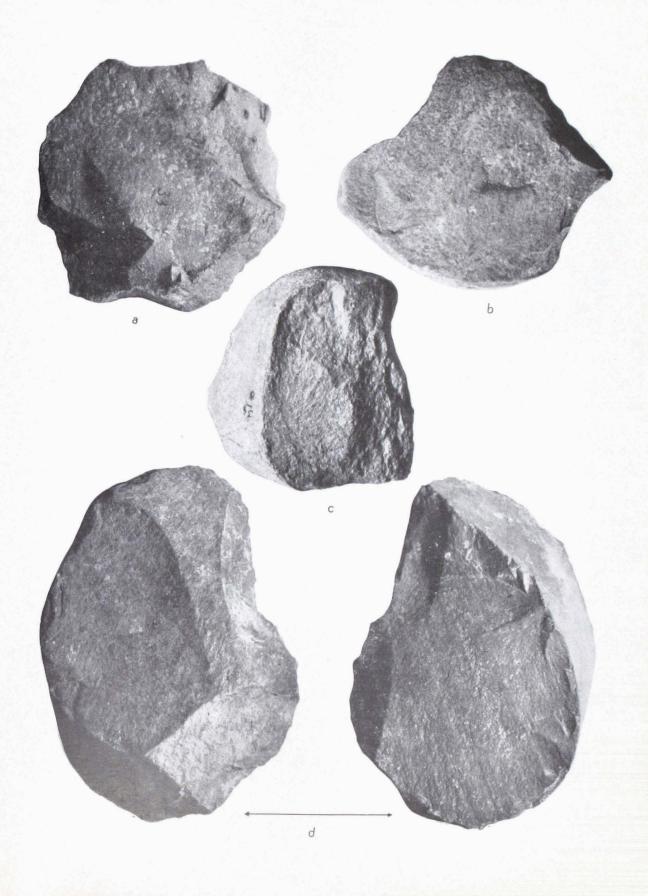


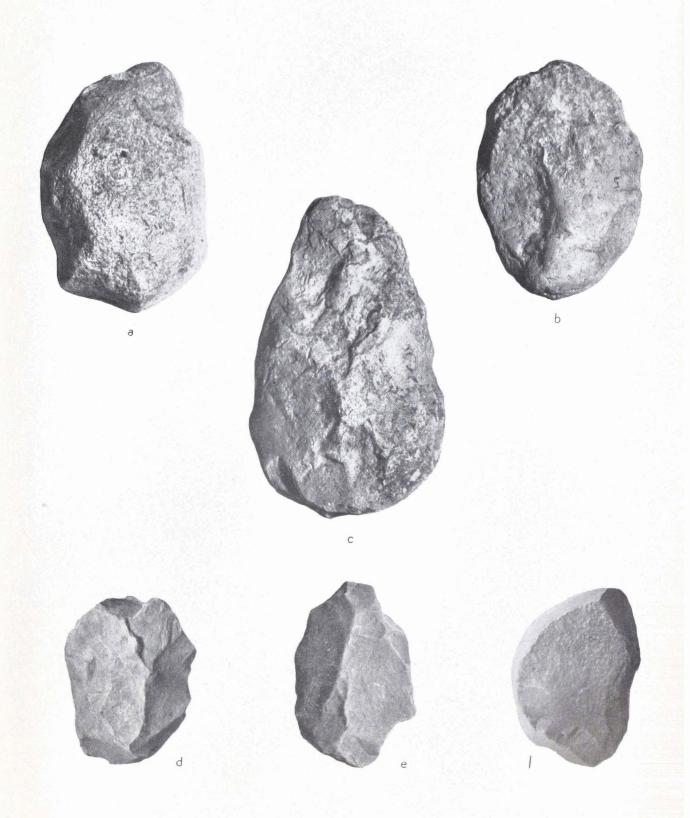


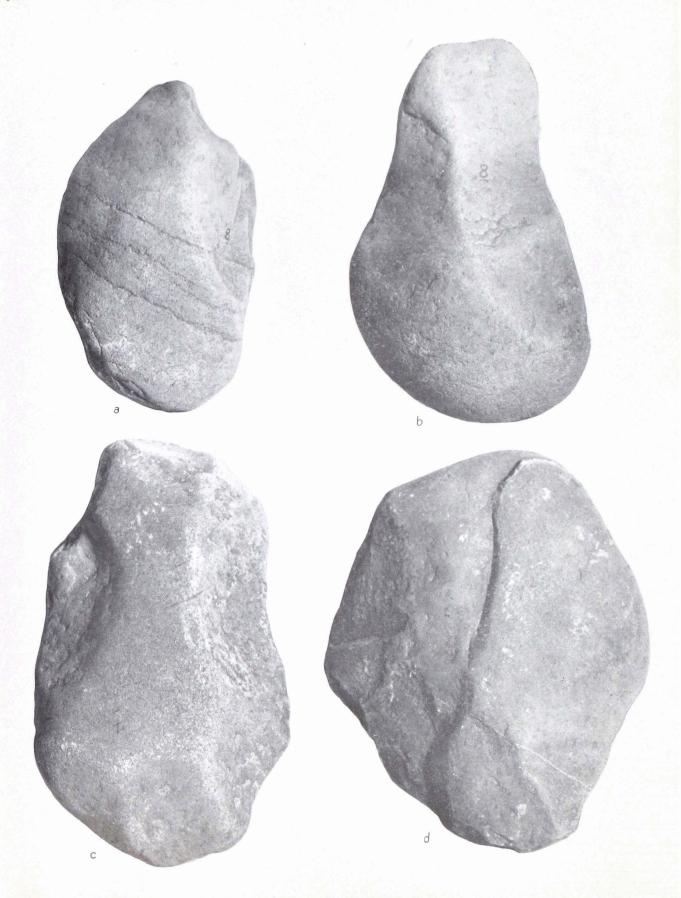
Morgah a 49; b 46; c 55; d 56.



Morgah a 52; b 51; c 53; d 50; e 58; f 54.



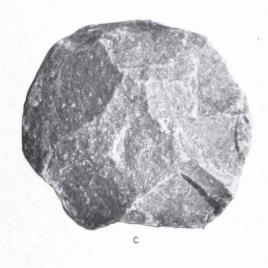




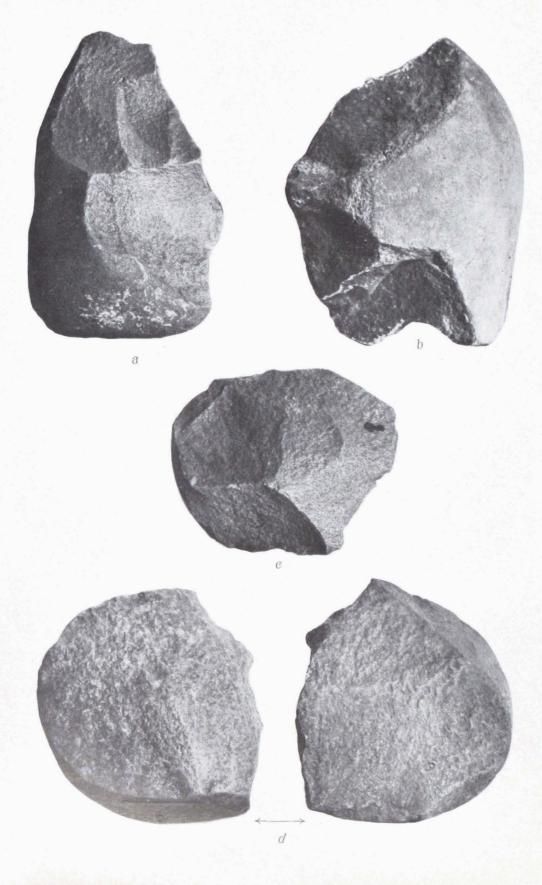
Khasala a 84; b 83; c 85; d 85 a.



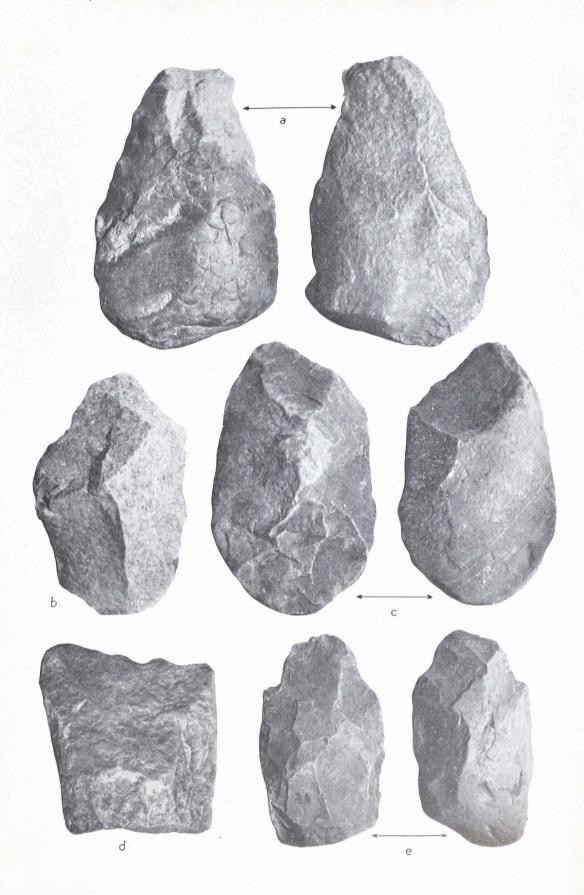


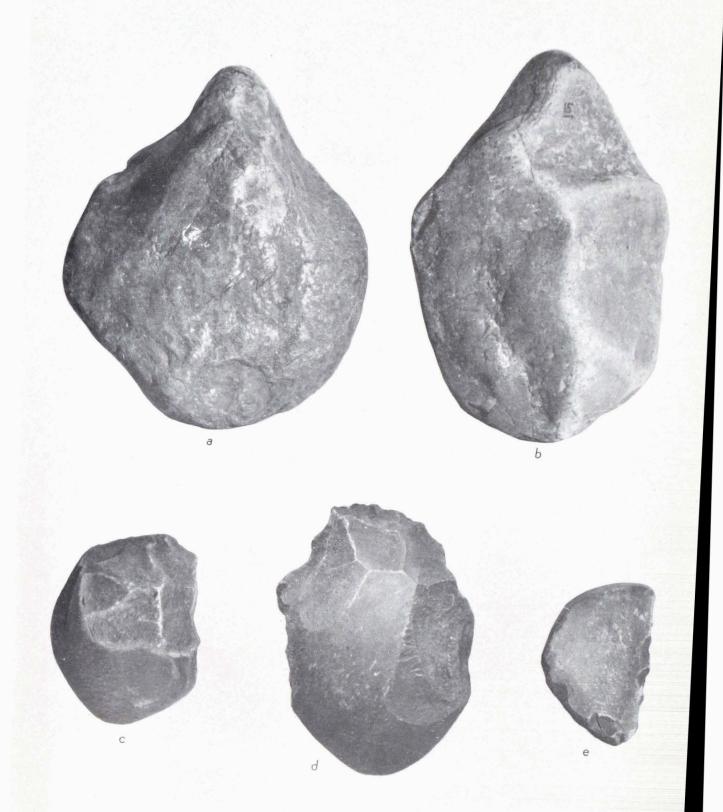


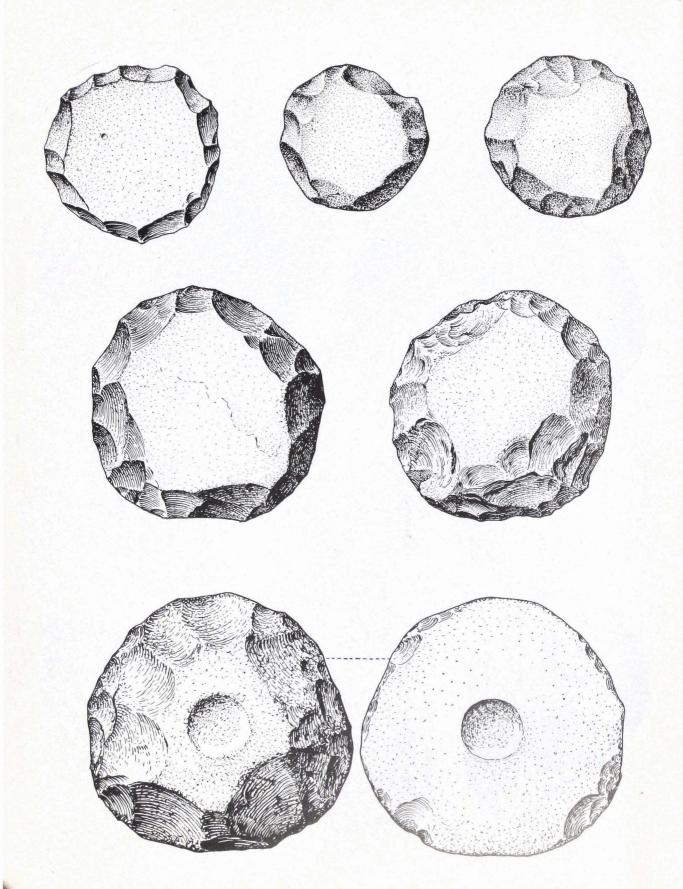




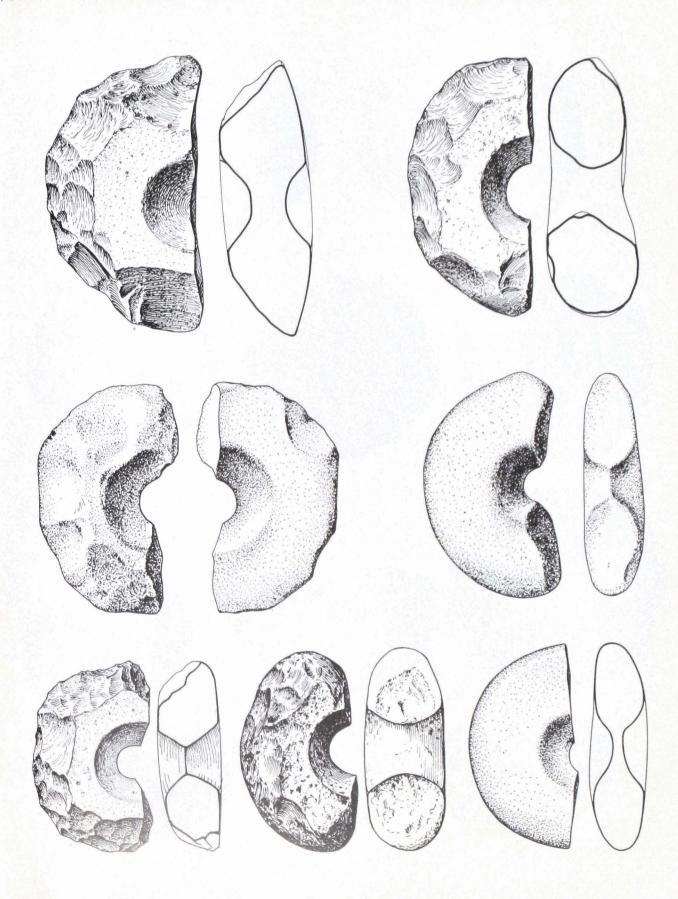
Khasala a 79; b 79 a; c 79 b; d 78.

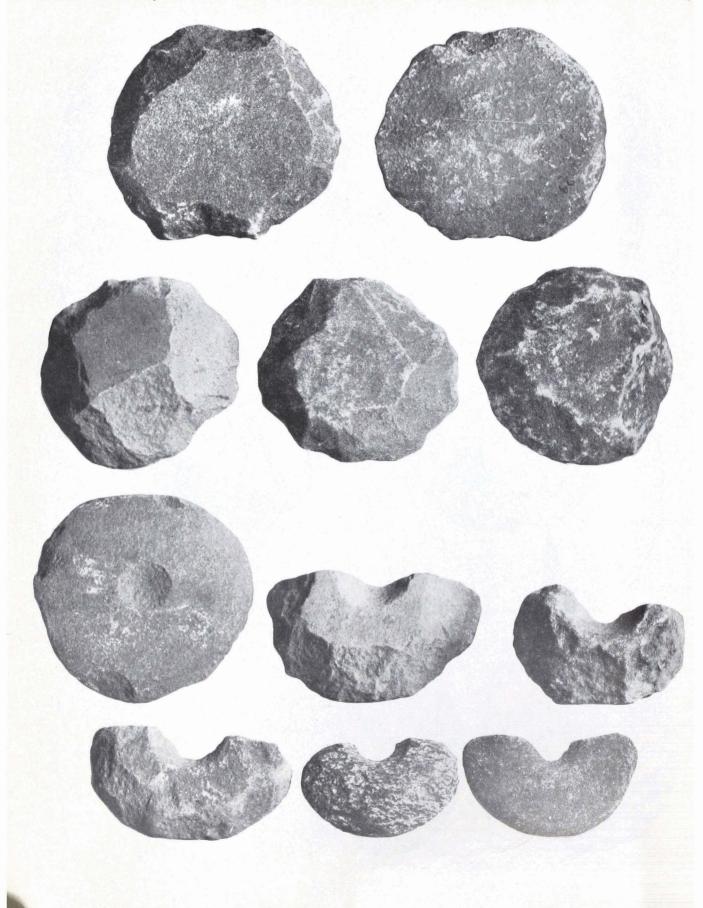




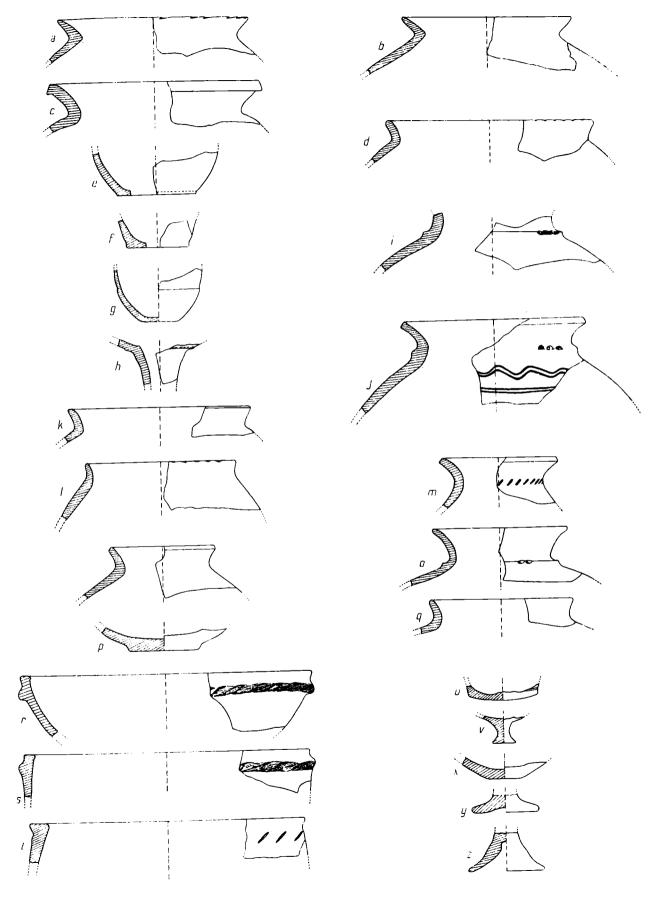


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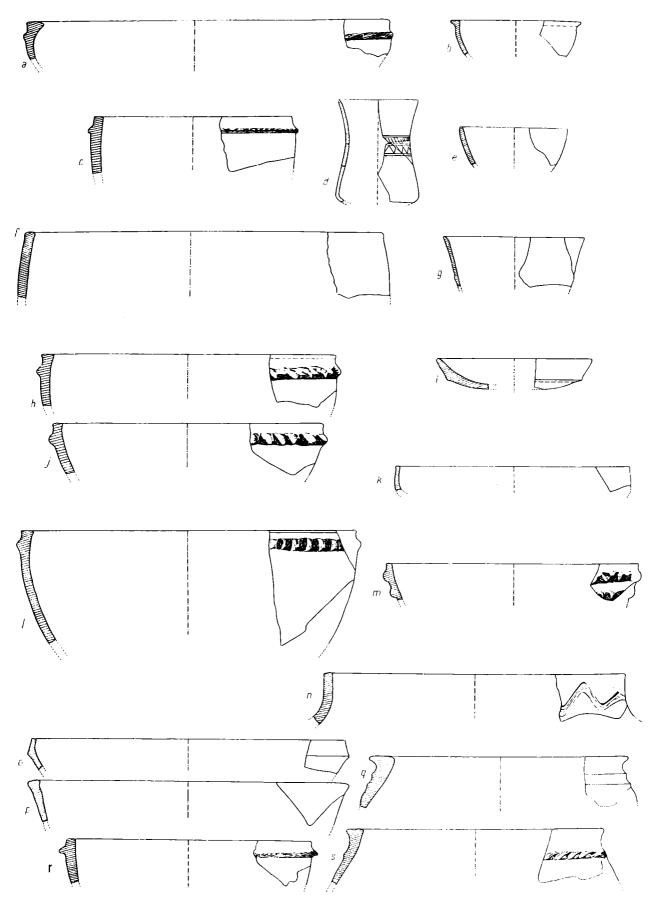




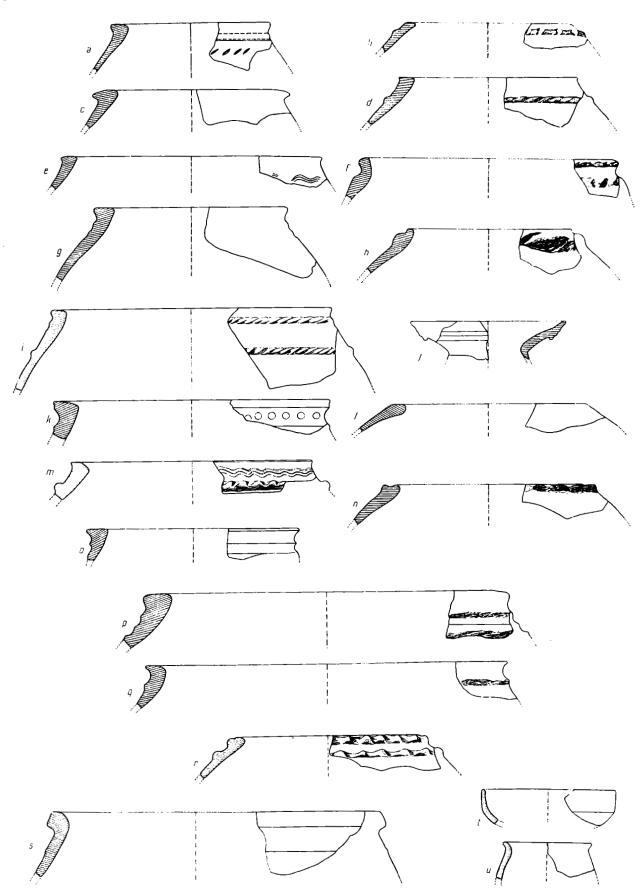
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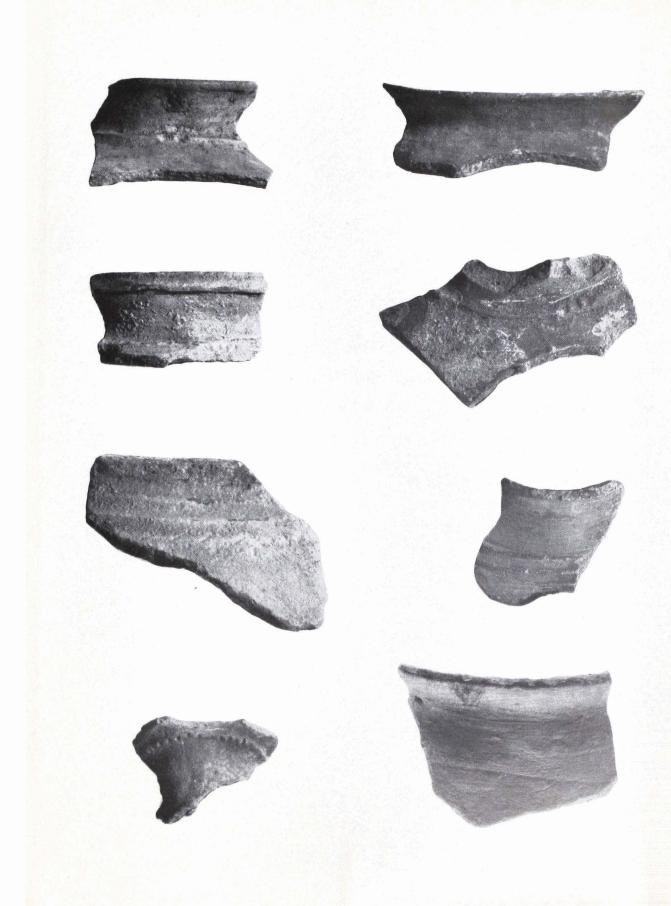
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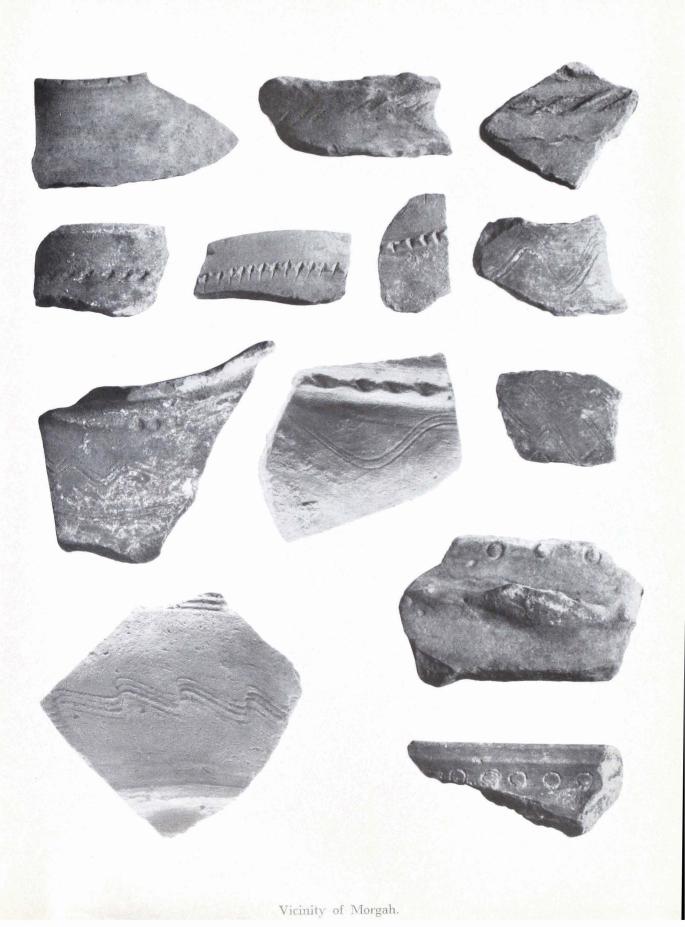


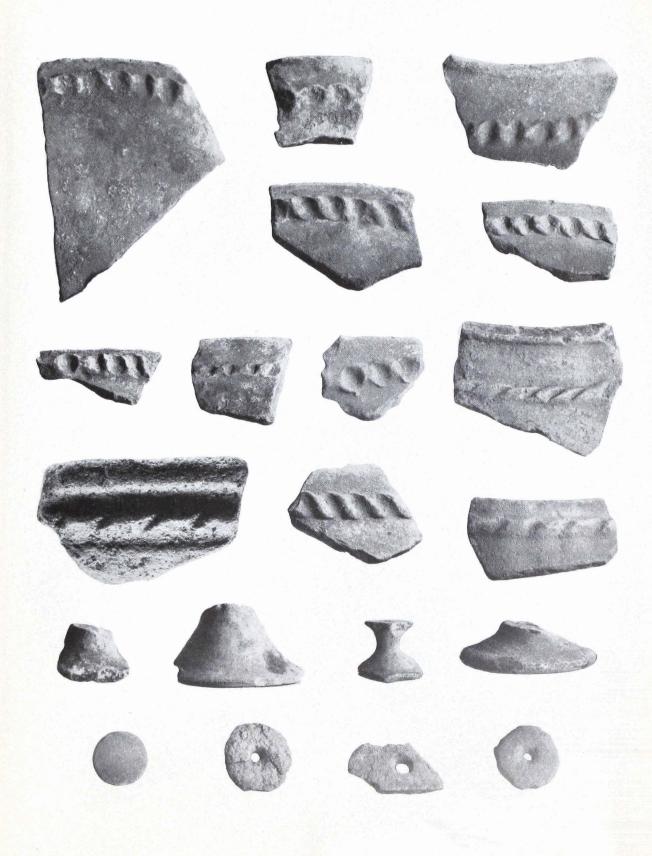
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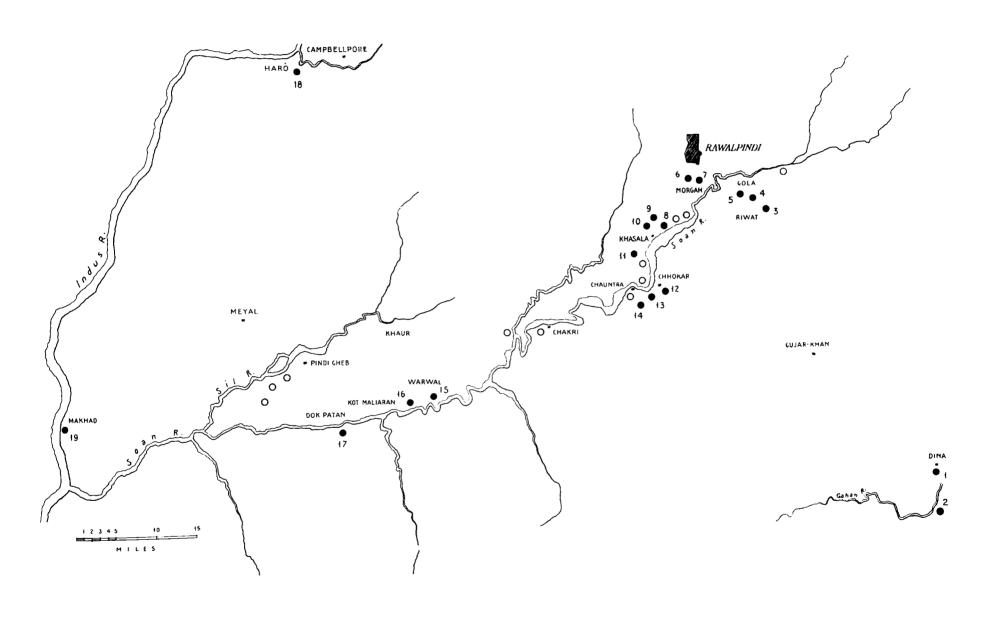


Vicinity of Morgah.









Prehistoric sites in the Soan area.

- Sites visited by the author (1954).
- O Sites visited by De Terra and Paterson (1935).

Anthropology

Research in Chitral

ANTHROPOLOGICAL RESEARCH ON KALASH, KATIS AND CHITRALS

The Kalash, also called "Black Kafirs", still preserve their pagan beliefs, and live today in a fairly limited district of the State of Chitral, namely in the valleys of Birir, Bomberet, Rumbur. These three valleys run more or less parallel with each other, converging on the great Chitral valley, and each of them can be reached in half a day's journey from the latter.

The Kalash are today the only people in the whole of the huge territory occupied by the religion of Islam stretching without a break from the shores of the Mediterranean to the banks of the Ganges who have preserved their ancient polytheistic religion together with the rites and traditions connected with it — an ethnical relic of extraordinary interest, even though they have already lost many of their original cultural elements and are destined to disappear, perhaps in a very short time.

In the nearby Hindu-Kush in Afghan territory, another much more numerous people, the Kafirs, who in general presented the same type of culture as the Kalash and were their close neighbours, were forced to accept Islam in 1895 by the energetic action of the Emir of Kabul, Abdur Rahman Khan, thus losing in the course of a few years their religion and many of their cultural characteristics. Fortunately we have Sir G. Scott Robertson's account of them in his well-known book, in which he describes his stay among the Kafirs from 1889 to 1890 (1).

Very few observers have so far visited this small Kalash population and spoken about them. Robertson mentions them in his book as he crossed their territory on his way to the Hindu-Kush Kafirs. Georg Morgenstierne stayed among them in 1929 on a linguistic mission from the Norwegian Institute for Comparative Research in Human Culture (2), together with Dr Guha who went to study the anthropometry of the people. In 1935 R.C.F. Schomberg stayed

⁽¹⁾ ROBERTSON G. S., The Kafirs of the Hindu-Kush., London, 1896 (1st ed.), 1900 (2nd ed.).

⁽²⁾ MORGENSTIERNE G., Report on a Linguistic Mission to North-Western India, « Institutet for Sammenlignende Kulturforskning », serie C, III, I, 1932.

some time among the Kalash of Bomberet, Rumbur and Birir during his journey to the Chitral, about which he published a enjoyable book in 1938 (1). Finally in March 1948 Halfdan Siiger (2) who was a member of the Third Danish Expedition to Central Asia visited the Kalash and remained the whole spring with them before continuing his journey to Sikkim.

Seven years later in the summer of 1955, the Italian Expedition took place, in which the present writer took part. To my knowledge during this interval no one else visited the Kalash country for the purpose of anthropo-ethnographical research. Finally, in 1960, the author returned as already stated, amongst the Kalash and Kati peoples, in order to carry out ethnographic research (3).

As regards the results of these missions, nothing of a definite character has so far been published. Schomberg's description of the Kalash is that of a travel story.

The three valleys mentioned — Birir, Bomberet and Rumbur — are almost entirely occupied by the Kalash, who still possess their ancient traditions and their pagan religion. Another group, the Katis (also called Red Kafirs), who were completely converted to Islam a few years ago, dwell at the end of the Bomberet valley in the village of Brumbutul and Shekandé and at the end of the Rumbur valley in the village of Kunisht (moslem name Shekandé).

The Katis arrived in the Chitral to escape from the Emir of Kabul's forced conversion drive against the Kafirs of Afghanistan at the end of the last century. Here in territory under British jurisdiction they found refuge and were able to continue professing their religion. However, apparently in consequence of a work of persuasion carried out by friends and relatives who had remained in Afghan territory and become Mohammedans and with whom they kept up contact, in the course of a few years they also turned to Islam. In 1933 Morgenstierne still found 20 pagans in the village of Brumbutul including the headman and the priest. Six years later, in 1935, Schomberg found only three. Today the whole village is Mohammedan; nevertheless traditions going back

⁽¹⁾ SCHOMBERG R. C. F., Kafirs and Glaciers, London 1936.

⁽²⁾ SIIGER H., Ethnological field-research in Chitral, Sikkim and Assam « Historisk filologiske Meddelelser udgivet af Det Kongelige Danske Videnskabernes Selskab », B. 36, n. 2, 1956.

⁽³⁾ In the late autumn of 1955, after my departure from Chitral Professor Friederich of Mainz University, visited the Kalash and Katis together with his disciple Mr. Peter Snoy, and passed the winter of 1956 there. Unfortunately, as it is well-known, he became gravely ill and died in Rawalpindi during the spring.

to the old Kafir culture are still alive, such as dances, songs, and the particular style used in making household objects, etc.

As has been said, the term Red Kafirs and Black Kafirs is very probably an English invention. The Kalash got the name, perhaps, from the dark colour of the garments still worn by the women, and it is thought that the term « Red » for the Katis may have its origin in their haughty and aggressive nature.

The findings of a linguistic nature published by Morgenstierne are preliminary to a final publication announced by the author. Siiger has so far published two preliminary notes on the Kalash. The writers mentioned were interested from an ethnographical and linguistic point of view; Siiger also, an ethnographer of the Copenhagen Museum, devoted himself especially to the study of their ethnography, collecting a great deal of information about the spiritual culture of this people.

When Morgenstierne visited the Chitral in 1929, the Kalash language was spoken in the Rumbur, Bomberet and Birir Valleys, as well as in those of Jinjoret and Urtsun and in a few villages near Drosh by converts to Islam, where he would have expected it to be assimilated by Khowar, the most important language in the Chitral.

Kalash is, as Morgenstierne points out, an Indian language and closely related to Khowar, of which it is not, however, simply a corruption but forms a separate well-defined language. Both languages belong to the first wave of Indo-Aryan immigration from the south (1). Khowar is the language of the Kho people who live in the north of the Chitral State in the Mulikko and Turiho valleys.

The differences between the Kalash dialects spoken in the three valleys are slight, but in the southern part of the Kalash territory, especially at Urtsun, a different dialect is spoken. Kalash is not the language spoken by the Kafirs of Hindu-Kush and the Katis of the Chitral, which has an intermediate position between Indo-Aryan and Iranian (2).

The historical problems regarding the Kalash are very complicated and the origins of the group are a mystery. The same can also be said for the history of the Chitrals; according to Schomberg the first historical date we have is 1570, the year of the death of Sangin Ali whose son Mohammed Bey was the first ruler of the Kator dynasty, the present-day Mehtars of the Chitral (3).

⁽¹⁾ MORGENSTIERNE, 1932, p. 51.

⁽²⁾ idem, p. 63.

⁽³⁾ SHOMBERG, 1938, p. 264.

Local traditions say that the Kalash formerly had a king and their rule extended as far as Reshum on the frontier between the Chitral and Mastuj but they were gradually driven back by the expansion of the Kho.

What is certain is that they must have been confined in comparatively recent times to the present small territory in which they live, formed by the three valleys of Rumbur, Bomberet and Birir, and driven there from the surrounding districts by the Islamisation of the country. As I have often had occasion to note, all over Chitral when anyone wants to indicate a long-past age they say "in the time of the Kafirs"; and some tombs of the pre-Islamic age which I dug up at Dolmutse near Chitral on the estate of Prince Buran ed Din Khan were described by local inhabitants as being of Kafirs. All this seems to speak of the memory of a much greater extension of this people in the Chitral, while local tradition is even more precise — for instance that they originate from an unidentified place called Tsiyam which lies towards the south. Tradition further states that Shaluk Shah, the greatest Kalash king, invaded and conquered the Chitral, coming from this place, and he was succeeded by his four sons who divided the territory into four parts. This, according to Siiger, took place in the 15th century (1).

Later driven back and isolated in their present high valleys, the Kalash came down very low in the social scale and were, and still are exploited by the government of the Chitral for rough work, and lived until quite recent times in a state of semi-slavery.

Their economy is the same as the Katis and is based on the breeding of animals and small husbandry.

Anthropological data on the Kalash, Katis and Chitrals, obtained during the 1955 mission, were collected on 105 record cards, corresponding to an equal number of adult male subjects. Twenty-one of these relate to Red Kafirs (Katis), measured at Brumbutul in the Bomberet Valley; forty to Black Kafirs (Kalash), measured in the Birir and Bomberet valleys; and forty-four to Chitrals, measured at Barmas, Koghozi, Khuyu and Chitral.

In the necessarily limited time I spent among the Kafirs and Chitrals of Pakistan in 1955, I was unable to complete more cards because of the difficulties, already described, of securing an adequate number of Kalash and Katis. During my visit many of the men were away in the mountains with their herds, and owing to the smallness of the population, the percentage of adult males present in the villages willing to allow themselves to be measured was quite

⁽¹⁾ Siiger, 1956, p. 34.

low. I was unable in 1955 to measure the women, a fair number of whom, however, I was able to photograph; but I was of the opinion that with a longer stay on the spot, which would allow relations with the population to become more intimate, it should not be impossible to achieve this end, at least as regards stature measurements.

Finally in the summer of 1960, during my second mission to Chitral, the scope of which was to collect data regarding the ethnography of Kafirs of Pakistan, I was able to carry out further measurements of the Kalash and Kati peoples. I measured 20 Kalash from the Rumbur valley that I was unable to measure in 1955 as well as 12 Kati from the same valley, inhabitants of the village of Shekandè (old Kafir name Kunisht). I was also able to measure the height and chromatic annotations of the eyes, hair and skin of 22 Kalash women, 7 from the Bomberet valley and 15 from the Birir valley.

Therefore it is possible to publish the measurements of 60 males Kalash from the three valleys they inhabit and 33 Kati from the two valleys they inhabit.

Unfortunately, the anthropometric data collected during my previous mission had been elaborated before my departure on my last mission. The relative tables and text had already been drawn up and for this reason I have been unable to combine the data collected during the two missions, as this would have involved a new statistical elaboration and the setting up of new types. I am therefore compelled to present the latest statistical data here separately, and combine the principal averages of the data collected during my first and second missions, in one table.

Nevertheless, the total of 93 cards for the Pakistan Kafirs is sufficient, when the smallness of the population is taken into account, to give a fairly complete picture of the anthropological features of the group, based as they are on quite reliable averages.

The 44 Chitrals measured in 1955 have likewise permitted some useful comparisons to be made with the Kalash and Katis, leading to a better appreciation of certain peculiarities in the two latter groups and of others which they appear to share with neighbouring peoples.

The record card referred to is that adopted by the Institute of Anthropology of Florence and corresponds with the one always as a general rule used in the past by research-workers trained at this School of Anthropology. It includes all the essential particulars and gives a clear picture of the anthropological characteristics of the individual without being overburdened with superfluous measurements and observations.

It contains the following measurements (1):

- (17) Span
- (45) Total arm length
- (1) Stature
- (23) Sitting height
- (14) Trochanteric height
- (35) Biacromial breadth
- (40) Bicristal breadth, i.e. distance between iliac tubercles
- (61) Chest circumference
- (45) Horizontal head circumference
- (1) Head length
- (3) Head breadth
- (6) Maximum bizygomatic breadth
- (13) Nasal breadth
- (18) Total facial height
- (21) Nasal height
- (14) Maximum breadth of mouth
- (25) Lip height
- (15) Auricular height (2).

The descriptive features recorded were pilosity of trunk, extremities, and face; form and colour of hair; colour of skin and eyes; form and size of ear; size and form of eye; nasal profile; and form of lips and forehead. Each subject measured was further tested for ability to taste P.T.C., or taste reaction to phenylthiocarbamide, administered usually in small doses. It was also possible to obtain a sample of hair from the majority of individuals.

Besides measurements and morphological observations, each card notes the name, sex, and age of the subject; his group, language, religion, trade or job, place of birth and of usual residence, and place of origin of father and mother.

The elaboration of the anthropometric data was undertaken by my assistant

⁽¹⁾ The figures in parenthesis refer to measurements defined in R. MARTIN, Lehrbuch der Anthropologie (2nd edition), Jena, 1928.

⁽²⁾ The following indices have been determined from these measurements: relative span; upper extremity index; cormic index, i.e. relative sitting height; trochanteric height index; intermembral index; relative shoulder breadth; relative hip breadth; acromio-cristal index; relative chest circumference; cephalic index; length-height index; breadth-height index; total facial index; cephalo-facial index; nasal index; labial index.

Miss. C. Massari, keeping the three groups of Katis, Kalash, and Chitrals separate, since these showed significant differences in some important aspects.

The respective percentage frequencies of the classes of metrical features have been analysed both for each group and for other groups with which it is compared. The statistical constants calculated are the range (maximum-minimum), the arithmetic mean, the standard deviation (σ) , and the coefficient of variation (v) the last for the absolute measurements only. The anthroposcopic observations have also been classified and analysed.

The classes relating to the head indices, upper extremity height, relative sitting height, relative chest circumference, as well as the divisions of the skeletal indices follow the schemes of Martin and Martin-Saller (1). The classes relating to stature and relative span are those adopted by Biasutti (2). The classes relating to the trochanteric height index, the intermembral index (percentage ratio of total arm length to trochanteric height), and the acromio-cristal and labial indices are those adopted by Puccioni for the Somali and North African groups studied by him (3).

The available published anthropometric information on the Kati, Kalash and Chitral peoples which I have been able to find is certainly not abundant; it is in fact quite scarce and, it may be said, hardly ever presented in full but generally only with averages and percentages.

The Katis of Bomberet and Rumbur Valleys were measured in 1929 by Guha, who had been sent by the Government of India to work with Professor Morgenstierne, then on a linguistic mission under the auspices of the Norwegian Institute of Comparative Research in Human Culture. So far Dr. Guha has published only some preliminary notes on this group, the most complete of which are those given in the Census of India 1931 and in his Presidential Address to the Twenty-Fifth Indian Science Congress, held in Calcutta in 1938. (4) Both the publications just mentioned contain graphs illustrating the percentage frequencies of the various divisions of stature, and the cephalic and nasal indices, together with tables showing the distribution of eye form and skin and hair colour.

⁽¹⁾ MARTIN, 1928; MARTIN, R. & SALLER, K., Lehrbuch der Anthropologie (3rd edition), Vol. I, Stuttgart, 1957.

⁽²⁾ BIASUTTI, R., Razze e Popoli della Terra (3rd edition), Vol. I, Torino, 1959.

⁽³⁾ PUCCIONI, N., Antropologia delle genti della Somalia, Vol. I, Bologna, 1931; Antropologia della Cirenaica, Vol. I, Firenze, 1934.

⁽⁴⁾ Guha B. S., Racial affinities of the Peoples of India in « Census of India 1931 », Vol. I, Part. III, Delhi, 1935. Idem., The racial composition of the Hindukush tribes in « Twenty-Fifth Indian Science Congress », Calcutta, 1938.

For the Kalash, as for the Katis, there are the graphs of the percentage frequencies of the various divisions of stature and the cephalic and nasal indices, and tables of the descriptive features in the shape of preliminary notes published by Guha who measured this group in the Bomberet and Rumbur valleys. In 1948 Siiger, who took part as ethnographer in the Third Danish expedition to Central Asia, measured numbers of Kalash in Bomberet, Birir and Rumbur, but neither the data collected nor the conclusions drawn from them have yet been published. In studying the measurements which I took of the Katis and the Kalash of Bomberet and Rumbur, I cannot therefore make use for comparative purposes of data obtained from other investigators, except the few of a statistical nature given by Guha. In the present work I also refer, for the purposes of comparison, to the information we have so far about the Kafirs of Afghanistan.

The earliest anthropological records of these people of Nuristan we have are from Ujfalvy, who measured only one Kafir and published his figures in 1896; Risley, who measured six and published his figures in 1908; and Stein, who measured eighteen in 1905-6 and whose measurements were published by Joyce in 1912 (1) and further elaborated by Morant (1936) (2).

The most recent measurements made among these peoples are those by Voigt in 1928 (3) who measured 318 individuals, of whom in 1933 he published only the means of the cephalic index and stature and a few notes on the colour of the eyes and hair and on facial morphology; those of Herrlich of the Deutsche Hindu-kush Expedition, who in 1935 measured 216, and of whom he published in 1937 the means of stature, the cephalic, facial, and nasal indices and others of the face, as well as some pigmentary and descriptive features (4). Herrlich in his work also refers to measurements taken of the people of Bomberet and Rumbur, without however separating them from the other Kafirs he measured. Heidelberg measured various Nuristani, but nothing again is yet known of his data, which will be published in the results of the Third Danish Expedition together with those collected by Siiger in Pakistan territory.

⁽¹⁾ JOYCE, T. A., "Notes on the Physical Anthropology of Chinese Turkestan and the Pamirs", J. R. Anthrop. Inst., Vol. 42, 1912, p. 450 ff.

⁽²⁾ MORANT, G. M., "A contribution to the Physical Anthropology of the Swat and Hunza Valleys based on records collected by Sir Aurel Stein", J. R. Anthrop. Inst., Vol. 66, 1936, p. 19 ff.

⁽³⁾ Voigt, M., Kafiristan, Breslau, 1933.

⁽⁴⁾ HERRLICH, A., "Beitrag zur Rassen und Stammestunden der Hindukusch Kafiren", in Deutsche im Hindukusch, Berlin, 1937, pp. 168-243.

As regards the Chitrals, the only measurements of which I am aware are those of 22 individuals taken by Stein whose means were published by Joyce 1912 (1) and further elaborated by Morant in 1936 (2).

* *

In the description and elaboration of the anthropometric data relating to the Katis or "Red Kafirs" of Bomberet and Rumbur Valleys, the Kalash or "Black Kafirs" of the Bomberet, Birir and Rumbur valleys, and the Chitrals, it has been considered useful to keep these three groups separate in view of a number of distinctions which, from certain aspects, are apparent between them and which seem to be confirmed, in the case of some measurements, by the results of the analysis of the probable errors of the differences between their means.

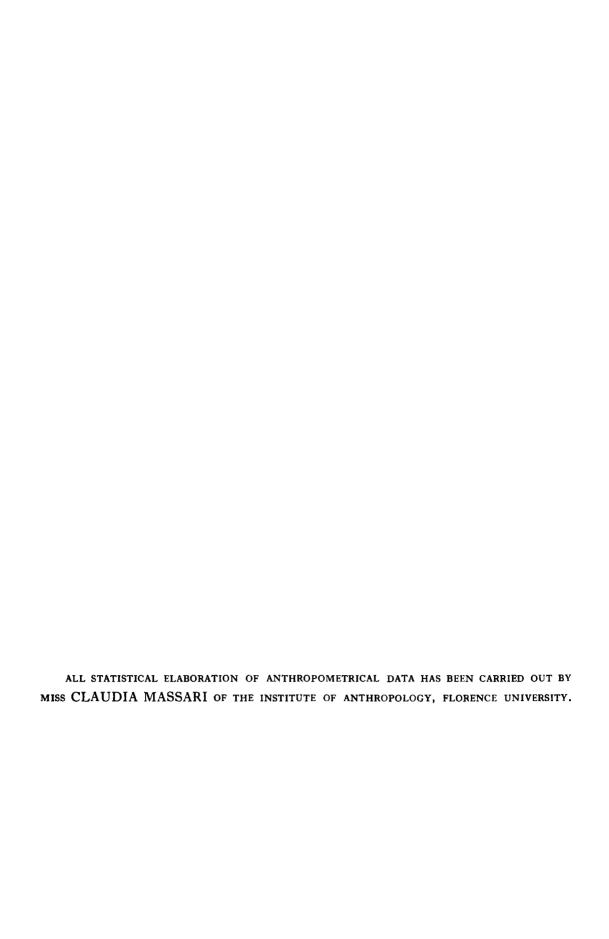
Comparisons of these three groups with one another, which bring out both the differences and the relationships between them, will be made after each has been studied separately.

The presence of the Katis in the Bomberet and Rumbur Valleys is, as already stated, of quite recent origin. Earlier the Kalash formed a socially inferior group in regard to the various tribes of Afghan Kafirs and hence also to the Katis, and this explains the state of isolation they found themselves in with respect to their neighbours.

The three groups will be described in accordance with the usual system of examining the various descriptive and metrical features one at a time.

⁽¹⁾ JOYCE, 1912.

⁽²⁾ MORANT, 1936.



THE KALASH

MEASUREMENTS TAKEN IN 1955

The 40 individuals measured in 1955 are inhabitants of villages in the Bomberet and Birir valleys: 27 from Bruhn and Krakar in the Bomberet Valleys, and 13 from Bihar and Guru in the Birir Valley. There were all natives of the places where they were measured, and the fathers and mothers were likewise local. Five Kalash alone in the Bomberet Valley reported their mothers as being of Afghan origin. The age group of the subjects measured is 20-49, with the exception of one of 18 and one of 55. On the whole, therefore, they were all adults and also physically well developed.

The language of all these people is Kalash and their religion polytheist (Kafir) with the exception of one individual who was a Mohammedan. They all said they were farmers except one who was a carpenter.

As already stated, all these people, as well as the Katis and the Chitrals, were tested for ability to taste P.T.C. For the Kalash the result was positive in 31 individuals and negative in 9; i.e. positive in 77,5% and negative in 22,5%.

For the purposes of examination, the features of this group can be taken as a whole, since, even on the basis of the most important metrical features of the body, head, and face, it has been observed that the differences between the means of the groups from the two valleys (Bomberet and Birir) are less than three times their respective probable error, that is, they are not significant; hence it is extremely unlikely that, for the features in question, the two samples studied belong to different populations. It is thus statistically legitimate to pool the data relating to the Kalash of Bomberet with those of the Kalash of Birir, at least as far as metrical features are concerned (1).

⁽¹⁾ The same thing may be said for the Kalash of the Rumbur valley whom I measured in 1960: in fact, the probable margin of error between the averages of five measurements (height and cormic,

METRICAL FEATURES

Stature

The only previous data concerning stature are those of Guha for the Kalash, which however, as has been said, are confined to a diagram showing percentage frequencies. From this it appears that, according to Guha, frequencies lie round 162; the minimum value is 147 (3%) and the maximum 172 (1%).

As appears from the following tables, the highest frequency of stature in the individuals I measured seems to be above that of the subjects measured by Guha, whose highest frequency is 164 (12,5%), the range being from 149 (2,5%) to 176 (2,5%).

According to the current conventional divisions, stature is distributed thus:

	n	%
x-157	8	20,0
158–162	6	15,0
163-167	16	40,0
168–172	8	20,0
173-x	2	5,0
	40	100,0

The greater part of the series falls into the category of medium-tall statures; there are also high percentages of short and tall statures, and the percentage of tall statures is again considerable. The percentage of very tall stature is quite negligible.

min. = 149,1; max. = 176,0; mean = 163,2;
$$\sigma = 6,45$$

cephalic, morphological facial, nasal indices) of the 40 Kalash in 1955 and the 20 in 1960 has produced a slight difference as regards cormic index and no important difference in the other measurements. However, we have had to keep separate the individuals of the Rumbur valley measured in 1960 from those of the other valleys measured in 1955 owing to technical reasons mentioned above. The same applies to the two groups of Katis.

Relative Span Arms

In regard to relative span it is impossible to make use of the observations of others as there is no record of this character in Guha's work.

As is shown in the following table of the frequency distribution of relative span, the Kalash have fairly long arms, while the number of short arms is quite small.

According to the divisions in use, the figures for this index are distributed as follows:

	n	%
x-99,9	3	7,5
100,0-104,9	18	45,0
105,0-109,9	19	47,5
	40	100,0

A fair percentage of the arms in the Kalash sample measured is seen to be long, with a similar proportion falling into the medium category; percentage of short arms is very small indeed.

$$min. = 97.1$$
 $max. = 108.0$ $mean = 103.0$ $\sigma = 2.61$.

Upper Extremity Index

It was possible to obtain an absolute measurement of the upper extremity in only 20 individuals owing to the difficulty met with in inducing the subjects to remove their clothes. Consequently, relative observations which include this character refer to only 20 subjects.

The range of the length of the upper extremity relative to stature falls between 38 and 47.

In the subjects examined the total length of the upper extremity proves rather small in relation to the stature; the variability is also quite small.

min. =
$$38.4$$
 max. = 46.9 mean = 41.1 $\sigma = 1.78$

Cormic Index (Relative Sitting Height)

The cormic index is distributed as follows:

	n	%
x-48,0	2	5,0
48,1-51,0	15	37,5
51,1-53,0	16	40,0
53,1-55,0	7	17,5
	 40	100,0

Mesoskely appears to predominate in the series, though macroskely is also quite well represented. There is quite a considerable percentage of brachyskely. Hyperbrachyskely is absent and hypermacroskely hardly represented.

min. = 47,9 max. = 53,7 mean = 51,03
$$\sigma = 1,51$$

Trochanteric Index

The values for this index are divided as follows:

The lower extremity, measured to the trochanter, is rather short in relation to stature (75,5%). There is also a good average of medium indices.

min. =
$$47.8$$
 max. = 54.3 mean = 51.03 $\sigma = 0.97$

Intermembral Index

The divisions of this index are as follows:

	n	%
x-80,5	13	65,0
80,6-86,5	6	30,0
86,6-x	I	5,0
	20	100,0

The mean value falls in the short-armed class in respect to the trochanteric height; fewer than a third of the cases are of medium proportions.

min. =
$$76.6$$
 max. = 91.9 mean = 81.6 $\sigma = 4.48$.

Relative Shoulder Breadth

The difficulty already mentioned of inducing some of the subjects to remove their clothes prevented complete observation of all the subjects examined. Biacromial breadth, therefore, could only be taken on 20 individuals.

Figures for the resultant index, though partial, are divided as follows:

In the majority of the subjects measured the shoulders proved to be decidedly broad. The percentage of narrow shoulders is not excessive.

min. =
$$21,0$$
; max. = $24,6$; mean = $22,5$; $\sigma = 1,23$.

Relative Bi-iliac Breadth

The figures for this character are distributed as follows:

	n	%
14,6–16,5	22	55,0
16,6-x	18	45,0
		
	40	0,001

There is a predominance of medium-sized hips in relation to stature, but their percentage is almost equalled by that of wide hips (45%).

min. = 15; max. = 20,8; mean = 16,4;
$$\sigma = 0.96$$
.

Acromio-cristal Index

Obtained for twenty individuals of the total series, this index is distributed as follows:

min. =
$$65.6$$
; max. = 81.1 ; mean = 73.0 ; $\sigma = 4.00$.

Relative Chest Circumference

The divisions made under this heading are not always the same as those adopted in anthropometric description, but they are classified here as follows:

min. =
$$47.5$$
; max. = 57.9 ; mean = 51.5 ; $\sigma = 2.57$

The values for the chest circumference are rather small; the low mean (51,52) is also that of the highest frequency in the series. The variability is also rather low ($\sigma = 2,57$). Hence the Kalash show a medium to low-developed chest.

At this point, when all the available information concerning the Kalash is taken into consideration in regard to the main divisions of the body, we can delineate their somatic profile thus: a people of medium-to-tall stature, with medium-to-long arms in relation to stature, meso-macroschelic, with the lower extremity rather undeveloped in relation to stature but more developed in relation to the total length of the upper extremity.

For the transverse measurements, an appreciable development of the shoulders can be noted in relation to stature, while in the same respect the proportions of the pelvis are smaller.

On the other hand the two transverse dimensions (shoulders and hips) show medium proportions when compared.

The relation of chest circumference to stature shows a medium-developed chest. On the whole the Kalash are predominantly of medium stature, with a medium bust and well-developed extremities; their body structure is rather slender except for a noticeably great shoulder breadth.

THE VAULT OF THE HEAD

Maximum Head Length

	n	%
178-185	6	15,0
186–193	22	55,0
194-x	12	30,0
		-
	40	100,0

Extreme maximum lengths are in the majority. The percentage of very long ones is also great. There are few medium lengths.

Maximum Head Breadth

The division is as follows:

	n	%
x-139	14	35,0
140-147	26	65,0
	40	100,0

Breadths are narrow and ultra-narrow; medium ones are entirely absent.

Horizontal Cephalic Index

According to the divisions in use the figures are as follows:

	n	%
x-70,9	6	15,0
71,0-75,9	28	70,0
76,0-80,9	6	15,0
	40	100,0

ANTHROPOLOGY

The Kalash head is unquestionably dolichocephalic, the maximum frequency (62,5%) being found in this category. There is also a notable percentage of hyper-dolichocephaly (27,5%). The percentage of sub-dolichocephaly is small. The mean is also quite dolichocephalic.

min. = 69,5; max. = 78,6; mean = 73,6;
$$\sigma$$
 = 2,45.

Cephalic Length-Height Index

This index is distributed as follows:

	n	%
x-57,9	8	20,0
58,0-62,9	15	37,5
63,o-x	17	. 42,5
	40	100,0

The series is quite hypsicephalic; a fair percentage is also orthocephalic; platycephaly is low.

min. = 55,4; max. = 69,8; mean = 62,1;
$$\sigma = 3,55$$

Cephalic Breadth-Height Index

This is divided as follows:

	n	%
x-78,9	4	10,0
79,0-84,9	18	45,0
85,o-x	18	45,0
	40	100,0

There are roughly equal percentages of metriocephaly and eurycephaly and a low percentage of tapeinocephaly.

min. = 74,5; max. = 93,9; mean = 84,8;
$$\sigma = 4,18$$
.

Horizontal Head Circumference

Frequencies for this are:

	n	%
496-500	I	2,7
501-505	I	2,7
506-510	-	_
511-515	I	2,7
516-520	I	2,7
521-525	2	5,4
526-530	3	8,1
531-535	9	24,4
536-540	3	8,1
541-545	7	18,9
546-550	I	2,7
551-555	4	10,8
556–560	I	2,7
561-565	3	8,1
	37	100,0

The figures for horizontal head circumference are not very high; the interval of maximum frequency is between 531 and 535; a large percentage is also found for the category 541 to 545.

In accordance with the base-lines of Sera's diagram covering the first two cephalic indices, and by the use of Giardina's formula, $y = \frac{(15)}{\sqrt{(1) \times (3)}}$, which considers the third as well, the 40 Kalash individuals are divided thus:

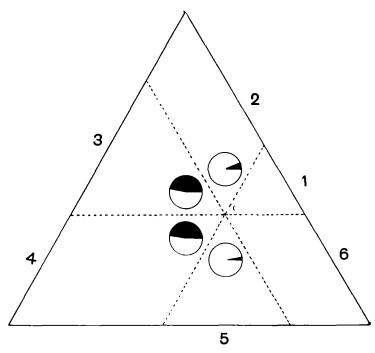
	n	%
dolicho-platycephalic	8	20,0
dolicho-ortho-platycephalic	9	22,5
dolicho-ortho-hypsicephalic	18	45,0
dolicho-hypsicephalic	4	10,0
brachy-platycephalic		_
brachy-ortho-platycephalic		
brachy-ortho-hypsicephalic	I	2,5
		
	40	100,0

The tendency to dolicho-ortho-hypsicephaly, therefore, appears to be general.

Let us now see how the Kalash appear according to the graph of head dimensions expressed as triangular co-ordinates.

The series of 40 individuals is projected on a graph in the form of an equilateral triangle by which the position of each individual is determined with regard to the relation of each head length to the sum of all three.

	n	%
Short, broad and high heads		
Short, narrow and high heads	3	7,5
Long, narrow and high heads	18	45,0
Long, narrow and low heads	18	45,0
Long, broad and low heads	1	2,5
Short, broad and low heads	_	_
	40	100,0



Division of head data of 40 Kalash according to triangular co-ordinates.

1. short. broad, high head

4. long, narrow, low head

short, narrow, high head
 long, narrow, high head

^{5.} long, broad, low head 6. short, broad low head

c. average human measurement

From this it can be readily seen that the heads of the Kalash tend to long and narrow shapes (high and low), but a certain percentage of short, narrow, and high heads is noticeable.

The horizontal head circumference of the Kalash is in general small; analysis of the absolute measurements (head length and breadth) shows their heads to be prevalently long and not only narrow but very narrow, so that the relation of the two horizontal dimensions (the familiar length-breadth or cephalic index) appears to tend towards dolichocephalic shapes. Height indices denote hypsicephalic and orthocephalic heads for the first index and metrio- to acrocephalic heads for the second; as already stated, metriocephaly is evident owing to general lack of development of head breadth. On the other hand, Giardina's index places the series prevalently between Sera's baselines, pointing to dolicho-ortho-hypsicephaly, and the distribution of the series in the triangular co-ordinate graph demonstrates that the Kalash heads are in the long and narrow class, both high and low occurring in equal proportions.

THE FACE

Morphological Facial Index

Figures for this index are as follows:

	n	%
x-78,9	2	5,0
79,0-83,9	6	15,0
84,0-87,9	II	27,5
88,0-92,9	10	25,0
93,o-x	11	27,5
	40	100,0

The Kalash face is absolutely long in the majority of cases, but a fair percentage of individuals (27,5%) have medium indices.

min. = 77,4; max. = 104,0; mean = 88,7;
$$\sigma = 5,86$$
.

Cephalo-facial Index

	n	%
87	I	2,5
		_
90	I	2,5
91	I	2,5
92	3	7,5
93	5	12,5
94	6	15,0
95	5	12,5
96	7	17,5
97	3	7,5
98	3	7,5
99	2	5,0
100	I	2,5
101	2	5,0
	40	100,0

Tor this series the index is fairly uniform, with a marked frequency at 96 and considerable frequencies also at 94, 93, and 95, in individual cases reaching very high values indeed (100 and 101). This corresponds to the result obtained from the examination of the figures for the morphological facial index: the bizygomatic breadth is somewhat pronounced in the Kalash. Hence the relatively short faces and the high figures for the cephalo-facial index.

min. = 86,8; max. = 101,5; mean = 95,1
$$\sigma$$
 = 2,88

Nasal Index

Figures for this index are:

	n	%
x-54,9	2	5,0
55,0-69,9	32	80,0
70,0-84,9	5	12,5
85,0-99,9	I	2,5
	40	100,0

The series is clearly leptorrhine; hyperleptorrhiny and platyrrhiny are scarce; mesorrhiny is present though only in a small percentage of cases (12,5%).

min. = 51.7; max. = 92.2; mean = 62.4; $\sigma = 6.10$.

Labial Index

The individual figures for this are distributed as follows:

	n	%
x-35,5	34	85,0
35,6-49,5	6	15,0
		
	40	100,0

The Kalash are all thin-lipped (85%); there is, however, a small percentage with medium lips (15%).

min. = 9,8; max. = 42,9; mean = 27,1;
$$\sigma = 8,11$$
.

The Kalash face is on the whole moderately long. The not inconsiderable facial breadth is also confirmed by the figures for the cephalo-facial index, which are high in that a rather large measurement (bizygomatic breadth) is associated with a rather small one (head breadth). Leptorrhiny is strongly prevalent and the lips, as regards their absolute measurements, appear to be rather thin.

DESCRIPTIVE FEATURES

Shape of Body

	n	%
Sturdy	5	12,5
Delicate	4	10,0
Robust	10	25,0
Slim	21	52,5
	40	100,0

On the whole the series shows a slim shape of body (52,5%), with a fair percentage of robustness as well; percentages of delicate and sturdy types are small.

Pilosity of Body

Degrees of body hair are divided as follows:

	n	%
Abundant	9	22,5
Medium	3	7,5
Scanty	I 2	30,0
Deficient	16	40,0
	40	100,0

Hairiness of the body is, in general, deficient; it is scanty and abundant in percentages which are not large though noticeable; medium hirsuteness is found in negligible quantities (7,5%).

Beard and Moustache

The categories used are as follows:

	n	%
Thick	9	22,5
Medium	3	7,5
Scanty	25	62,5
Deficient	3	7,5
	<u>——</u> 40	100,0

In the series examined, scanty moustaches predominate (62,5%) and next, after a large interval, thick ones (22,5%). Deficient and medium moustaches are quite negligible.

Hair form

Figures relating to the form of the hair of the individuals examined are not large owing to the frequent custom of shaving the head. Those available are as follows:

	n	%
Straight	8	38,1
Wavy	13	61,9
	21	100,0

From the samples available it can be concluded that wavy hair is most frequent in the series.

Eye Aperture

Figures are as follows:

	n	%
Small	3	7,5
Medium	12	30,0
Large	25	62,5
	40	100,0

Hence the eye aperture is as a rule large. The number of small apertures is low.

Inclination of Palpebral Fissure

	n	%
Horizontal	38	95,0
Oblique	2	5,0
	40	100,0

The line of the fissure is almost uniformly horizontal, only a small percentage being of the oblique type (5%).

Nose Base

	n	%
Upturned	6	15,0
Horizontal	20	50,0
Downturned	14	35,0
	40	100,0

In half of the individuals the tip of the nose is horizontal; in a considerable percentage it is downturned. There are, however, a few cases where it is upturned (15%).

Nose Bridge

	n	%
Concave	I	2,5
Straight	24	60,0
Convex	15	37,5
	40	100,0

The straight nose bridge predominates; a good percentage of cases of convex bridge is also found.

Depression of Nasal Root

	n	%
Deep	II	27,5
Medium	5	12,5
Small	22	55,0
Absent	2	5,0
		
	40	100,0

The nasal bones are prominent in 100% of cases.

Form of Lips

This is as follows:

	n	%
Thin	10	25,0
Medium	26	65,0
Thick	4	10,0
		
	40	100,0

The majority of lips are medium or thin in nine-tenths of the cases, with a very small percentage (10%) of thick lips in the remainder.

Development of Supraorbital Ridges

	n	%
Light	23	57,5
Unmarked	17	42,5
	40	100,0

The Kalash examined displayed no particular development of the supraorbital ridges. In more than half the series they were lightly developed, and in the rest unmarked.

Shape of Forehead

	n	%
Receding	22	55,0
Straight	18	45,0
	40	100,0

There is a slight excess of receding foreheads over straight.

PIGMENTATION

The observations relate to the hair, to the skin on forehead and inner surface of upper arm, and to the iris.

Colour of Hair

According to the Fischer-Saller colour-scale, the divisions are as follows:

	n	%
U	3	7,5
V	_	
X	6	15,0
Y	30	75,0
W	ı	2,5
		
	40	100,0

ANTHROPOLOGY

The hair is generally dark (75%) and there is only a very slight variation in its colour.

Colour of the Skin on Inner Side of the Upper Arm

According to the Von Luschan scale, the following divisions were noted:

	n	%
8	I	2,5
9		
10	I	2,5
ΙI	I	2,5
12	13	32,5
13	5	12,5
14	9	22,5
15	6	15,0
16	I	2,5
17	2	5,0
18	I	2,5
	40	100,0

Colours of maximum frequency are Von Luschan's categories Nos. 13, 14, and 15. Higher figures (darker) and lower (lighter) are infrequent.

Colour of Skin on Forehead

These are divided as follows:

	n	%
10	I	2,5
II	2	5,0
12	11	27,5
13	5	12,5
14	ΙΙ	27,5
15	5	12,5
16	3	7,5
17	2	5,0
	40	100,0

Maximum frequencies are found at categories nos. 12 and 14 of the Von Luschan scale; nos. 13 and 15 are also common.

Colour of Iris

This is divided as follows:

	n	%
2	I	2,5
3	6	15,0
4	14	35,0
5 6	3	7,5
6	6	15,0
7	5	12,5
8	3	7,5
9	I	2,5
	_	_
16	I	2,5
	40	100,0

While dark colours predominate, light and even very light colours also occur.

Kalash

Relative Span Arms	x — 99,9 Short arms	100,0 — 104,9 Medium arms	105,0—109,9 Long arms	Total	x-99,9 %	100,0–104,9	0,601-0,501 %	TOTAL
Stature								
x-157 Short	I	3	4	8	33,4	16,7	21,2	20,0
158-162 Medium inferior	I	4	I	6	33,3	22,4	5,3	15,0
163-167 Medium superior	I	8	7	16	33,3	44,5	36,7	40,0
168-172 Tall	_	2	6	8	_	11,2	31,5	20,0
173-x Very tall	_	I	I	2	_	5,2	5,3	5,0
TOTAL	3	18	19	40	100,0	100,0	100,0	100,0

TABLE II.

Relative Sitting Height	Нуреппаст. x — 48,0	Macroskelic 48,1 — 51,0	Mesoskelic 51,1 — 53,0	Brachyskelic 53,1 — 55,0	Тотаг	x-48,0 %	48,1-51,0 %	51,1-53.0	53,1-55, 0 %	Total
Stature										
x-157 Short	-	3	3	2	8	_	20,0	18,7	28,5	20,0
158-162 Medium inferior	-	2	3	I	6		13,3	18,7	14,3	15,0
163-167 Medium superior	1	6	6	3	16	50,0	40,0	37,5	42,9	40,0
168-172 Tall		3	4	I	8	_	20,0	25,1	14,3	20,0
173-x Very tall	1	ĭ			2	50,0	6,7	<u> </u>		5,0
Total	2	15	16	7	40	100,0	100,0	100,0	100,0	100,0

Relative Sitting Height	Нуреттаст. x — 48,0	Macroskelic 48,1 — 51,0	Mesoskelic 51,1 — 53,0	ls I	Тотаг	x-48,0	48,1-51,0 %	51,1-53,0	53.1-55, 0	Total
Relative Span Arms										
x-99,9 Short arms	_	1	I	I	3	_	6,6	6,2	14,3	7,5
100,0-104,9 Medium arms	I	7	6	4	18	50,0	46,7	37,5	57,1	45,0
105,0-109,9 Long arms	ı	7	9	2	19	50,0	46,7	56,3	28,6	47,5
Total	2	15	16	7	40	100,0	100,0	100,0	100,0	100,0

TABLE IV.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	x-51,9 %	5 2,0–54,9 %	TOTAL
Stature						
x-157 Short	6	2	8	23,2	25,0	23,5
158-162 Medium inferior	4	2	6	15,4	25,0	17,7
163-167 Medium superior	11	2	13	42,3	25,0	38,3
168-172 Tall	4	I	5	15,4	12,5	14,7
173-x Very tall	I	I	2	3.7	12,5	5,8
Total	26	8	34	100,0	100,0	100,0

Kalash

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	x-51,9 %	52,0-54,9 %	Total
Relative Span Arms						
x-99,9 Short arms	3	 	3	11,6	_	8,8
100,0-104,9 Medium arms	14	2	16	53,8	25,0	47,1
105,0-109,9 Long arms	9	6	15	34,6	75,0	44,1
Total	26	8	34	100,0	100,0	100,0

TABLE VI.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	Total	*-51,9 %	52,0–54,9 %	Total
Relative Sitting Height						
x-48,0 Hypermacroskelic	I	I	2	3.7	12,5	5,8
48,1-51,0 Macroskelic	9	5	14	34,6	62,5	41,2
51,1-53,0 Mesoskelic	11	I	12	42,4	12,5	35,3
53,1-55,0 Brachyskelic	5	I	6	19,3	12,5	17,7
Total	26	8	34	100,0	100,0	100,0

						1 FAIRDII
Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	Total	x-21,5	21,6-x %	TOTAL
Stature						
x-157 Short	_	5	5		29,4	25,0
158-162 Medium inferior	_	3	3	_	17,6	15,0
163-167 Medium superior	I	8	9	33,3	47,1	45,0
168-172 Tall	2	I	3	66,7	5,9	15,0
173-x Very tall			_	-		
TOTAL	3	17	20	100,0	100,0	100,0

TABLE VIII. Kalash

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	Total	x-21,5 %	21,6-x %	Total
Relative Span Arms						
x-99,9 Short arms	_	I	1	_	5,9	5,0
100,0-104,9 Medium arms	r	9	10	33,3	52,9	50,0
105,0-109,9 Long arms	2	7	9	66,7	41,2	45,0
Total	3	17	20	100,0	100,0	100,0

Acromial Index	x — 21,5 Nапоw shoulders	21,6 — x Large shoulders	TOTAL	x-21,5	21,6-x %	Total
Relative Sitting Height						
x-48,0 Hypermacroskelic	_	_	-	_	-	_
48,1-51,0 Macroskelic	2	6	8	66,7	35,3	40,0
51,1-53,0 Mesoskelic	I	8	9	33,3	47,1	
53,1-55,0 Brachyskelic	_	3	3	_	17,6	15,0
Total	3	17	20	100,0	100,0	100,0

TABLE X.

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	% x-21,5		
Trocantheric Index	2	12	14	66,7	70,6	70,0
Short legs	_	12		00,7	70,0	70,0
52,0-54,9 Medium legs	I	5	6	33,3	29,4	30,0
Total	3	17	20	100,0	100,0	100,0

Kalash

Bi-iliac Index	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	TOTAL	14,6–16,5	16,6-x	Тотаг	
Stature	- 						
x-157 Short	4	4 4 8 18,1		18,1	22,2	20,0	
158-162 Medium inferior	3	3	6	13,7	16,7	15,0 40,0 20,0	
163-167 Medium superior	11	5	16	50,0	27,8		
168-172 Tall	3	5	8	13,7	27,8		
173-x Very tall	I	1	2	4,5	5,5	5,0	
Total	22	18	40	100,0	100,0	100,0	

TABLE XII.

Bi-iliac Index	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	TOTAL	% 14,6–16,5	% 16,6-x	TOTAL
Relative Span Arms						
x-99,9 Short arms	I	2	3	4,5	11,1	7,5
100,0-104,9 Medium arms	11	7	18	45,5	38,9	45,0
105,0-109,9 Long arms	10	9	19	50,0	50,0	47,5
Total	22	18	40	100,0	100,0	100,0

Bi-iliac Index	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	TOTAL	% 14,6–16,5	% 16,6–x	TOTAL
Relative Sitting Height						
x-48,0 Hypermacroskelic	_	2	2	_	11,1	5,0
48,1-51,0 Macroskelic	11	4	15	50,0	22,2	37,5
51,1-53,0 Mesoskelic	9	7	16	40,9	38,9	40,0
53,1-55,0 Brachyskelic	2	5	7	9,1	27,8	17,5
Total	22	18	40	100,0	100,0	100,0

					-
T`A	BL	E	Х	L١	٧.

Bi-iliac Index	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	TOTAL	% 14,6–16,5	% 16,6-x	Total
Trocantheric Index						
x-51,9 Short legs	14	12	26	73,7	80,0	76,5
52,0-54,9 Medium legs	5	3	8	26,3	20,0	23,5
TOTAL	19	19 15 34 100,0		100,0	100,0	
Table XV.						Kalash
Bi-iliac Index	x — 21,5 Medium pelvis	21,6 — x Large pelvis	Total	x-21,5	21,6-x %	Total
Acromial Index						
14,6-16,5 Narrow shoulders	I	10	11	25,0	58,8	55,0
16,6-x Large shoulders	2	7	9	75,0	41,2	45,0
Total	3	17	20	100,0	100,0	100,0

Cephalic Index	Hyperdoli- chocephalic x — 70,9	Dolichoce- phalic 71,0 — 75,9	Meso- cephalic 76,0 — 80,9	Тотаг	x-70,9 %	71, 0- 75.9 %	76,0-80,9 %	Total
Stature								
x-157 Short	2	5	I	8	33,3	17,8	16,7	20,0
158-162 Medium inferior	_	5	I	6	_	17,8	16,7	15,0
163-167 Medium inferior	2	12	2	16	33,4	42,8	33,4	40,0
168-172 Tall	2	5	I	8	33,3	17,8	16,7	20,0
173-x Very tall		I	I	2	_	3,8	16,7	5,0
Total	6	28	6	40	100,0	100,0	100,0	100,0

TABLE XVII.

Total Facial Index	Hypereurypr. x — 78,9	Euryprosopic 79,0 — 83,9	Mesoprosopic 84,0 — 87,9	I II	Hyperleptop. 93,0 — x	Total	% %	79,0-83,9 %	84,0-87,9	88,0-92,9	% %	TOTAL
Stature												
x-157 Short	1	2		3	2	8	50,0	33,3	_	30,0	18,2	20,0
158-162 Medium inferior	I	_	I	I	3	6	50,0	_	9,1	10,0	27,2	15,0
163-167 Medium superior	_	3	7	3	3	16	_	50,0	63,6	30,0	27,2	40,0
168-172 Tall	_	ı	2	3	2	8	_	16,7	18,2	30,0	18,2	20,0
173-x Very tall		_	I	_	I	2	_	_	9,1	_	9,1	5,0
Total	2	6	11	10	11	40	100,0	100,0	100,0	100,0	100,0	100,0

Kalash

Nasal Index	Hyperleptorr. x — 54,9	Leptorrhine 55,0 — 69,9		1 55 1	6	x-54,9 %	\$5,0-69,9 %	70,0–84,9 %	85,0-99,9 %	Total
Stature										
x-157 Short		8	_	_	8		25,0	_	_	20,0
158-162 Medium inferior	_	5	_	I	6	_	6,2	_	100,0	40,0
163-167 Medium superior	-	14	2		16	_	43,7	40,0	_	15,0
168-172 Tall	2	3	3	_	8	100,0	9,4	60,0		20,0
173-x Very tall	_	2	<u> </u>	_	2					5,0
Total	2	32	5	1	40	100,0	100,0	100,0	100,0	100,0

T	_	37	TV
TAR	LE.	А.	IX.

Total Facial Index	Нурегецтург. x — 78,9	Euryprosopic 79,0 — 83,9	됩	ᇍ	Hyperleptop. 93,0 — x	Тотаг	x-78,9 %	79,0–83,9	84,0-87,9	88,0-92,9	93, o -x %	TOTAL
Cephalic Index												
x-70,9 Hyper- dolíchocephalic	_	I	I	I I	3	6	_	16,7	9,1	30,0	9,1	15,0
71,0-75,9 Dolichocephalic	2	3	7	6	10	28	100,0	50,0	63,6	60,0	90,9	70,0
76,0-80,9 Mesocephalic	_	2	3	I 		6		33,3	27,3	10,0		15,0
TOTAL	2	6	11	10	11	40	100,0	100,0	100,0	100,0	100,0	100,0

TOTAL	85,0-99,9 Chamaerrhine	70,0-84,9 Mesorrhine	55,0-69,9 Leptorrhine	x-54,9 Hyperleptorrhine	Nasal Index	Cephalic Index
6		ı	4	H		x — 70,9 Hyper- dolichoceph.
28	I	ω	23	H		71,0 — 75,9 Dolicho- cephalic
6		н	Ŋ	1		76,0 — 80,9 Mesocephalic
40	1	رن ن	32	2		TOTAL
40 100,0 100,0 100,0 100,0		16,7	66,6	16,7		x-70,9 %
100,0	3,5	10,8	82,2	3,5		71,0-75,9 76,0-80,9
100,0	1	16,7	83,3			76, 0–8 0,9 %
100,0	2,5	12,5	80,0	5,0		TOTAL

Тотаг	85,0-99,9 Chamaerrhine	70,0-84,9 Mesorrhine	55,0-69,9 Leptorrhine	x-54,9 Hyperleptorrhine	Nasal Index	Total Facial Index	TABLE XXI.
2	I		н			Hypereurypr. x — 78,9	
6		и	4	l		Euryprosopic 79,0 — 83,9	
1		н	0			Mesoprosopic 84,0 — 87,9	
10			9			Leptoprosop. 88,0 — 92,9	
=		H	∞	2		Hyperleptop. 93,0 — x	
40	-	51	32	2		TOTAL	
100,0	50,0		50,0			x-78,9 %	
100,0	1	33,3	66,7			79, 0– 83,9 %	
100,0		9,1	90,9			84,0-87,9 %	
40 100,0 100,0 100,0 100,0 100,0 100,0		10,0	90,0			88,0-92,9 %	
100,0		9,1	72,7	18,2		93, 0- x %	
100,0	2,5	12,5	80,0	5,0		TOTAL	Kalash

Kalash	латоТ		20,0	15,0	40,0	20,0	5,0	100,0
24	91 %			100,0	1	1	1	100,0
	% •			l	100,0			100,0
	~ %		1	33,3	2'99	1	1	100,0
	%		40,0	1	1	60,0	1	100,0
	% 9		16,6	1	33,3	16,6	33,3	100,0
	% 2		1	33,3	33,4	33,3	ı	100,0
	% 4		21,4	7,2	50,0	21,4	1	100,0
	3		33,3	33,4	33,3	1		100,0
	% 7		l	1	100,0	l	ı	100,0 100,0 100,0 100,0 100,0 100,0 100,0 100,0 100,0
	латоТ		x 0	9	16	æ	71	40
	91	 	-	н			i	-
	6			1	н		1	-
	∞		-	н	71	1	1	ĸ
	7		74	1	1	8	1	70
	9		н	1	7	н	4	9
	· v			H	н	н	1	n
1	4		c	Ħ	7	6	1	14
			7	77	74		1	•
	7		1	l	н	1	1	_
TABLE XXII.	Color Iris	Stature	x-157 Short	158-162 Medium inferior	163-167 Medium superior	168-172 Tall	173-x Very tall	TOTAL

15,0 70,0 15,0 1 | 40 || 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 Тота 50,0 10,00 100,0 100,0 100,0 % °2 ١ ł ١ % 1 % **%** 16,7 20,0 % 33,3 % 9 64,3 100,0 1 ١ % Ŋ 21,4 14,3 % 4 50,0 16,7 33,3 % 100,0 1 1 % 8 • 9 Тотуг H 1 1 91 1 Φ. (1) Į n 00 ď H 4 7 9 H 3 9 3 3 1 Ŋ 14 6 3 4 9 13 c -3 4 71,0-75,9 Dolichocephalic Cephalic Index x-70,9 Hyper-dolichocephalic 76,0-80,9 Mesocephalic TOTAL Color Iris

Kalash

TABLE XXIII.

TABLE XXIV.

ТотоТ		5,0	15,0	27,5	25,0	27,5	100.0
%		0,001	!		1	ı	1 40 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0
% 6		Ī	100,0	I	1	1	100.0
% &			1	2,99		33,3	100.0
2		1	20,0	20,0	20,0	40,0	100.0
% 9		1	1	16,7	50,0	33,3	100.0
- % 5				33,3	33,4	33,3	100.0
% 4		7,1	14,2	28,7	21,3	28,7	100.0
3 %			33,3	33,3	16,7	16,7	100.0
% 2					100,0	1	100.0
ТотоТ		7	9	11	10	11	40
91		H	1	1	1	1	_
6			н		1		-
00		1	l	77	i	ı	62
7		1	H	H	н	8	ĸ
9			l	н	3	8	9
w		l	ł	н	н	ı	60
4		H	77	4	6	4	14
ю			77	73	н	н	9
8		1	1	1	н	1	=
Color Iris	Total Facial Index	x-78,9 Hypereuryprosopic	79,0-83,9 Euryprosopic	84,0-97,9 Mesoprosopic	88,0-92,9 Leptoprosopic	93,0-x Hyperleptoprosopic	Total

Kalash TABLE XXV.

Color Iris	8	6	4	Ŋ	•		∞	6	91	татоТ ————		% Е	% 4	% v	% 9	% ^	% &	% 6	% 91	Тотаг
Nasal Index						<u> </u>			-											
x-54,9 Hyperleptorrhine		!	H	ļ		Ħ				~		1	7,2	I		20,0		1	1	5,0
55,0-69,9 Leptorrhine	H	9	01	3	λ.		ĸ	-		32	0,001 0,001	100,0	71,4	71,4 100,0	83,3		60,0 100,0 100,0	100,0	1	80,0
70,0-84,9 Mesorrhine			ω		H	н				rů.	l		21,4	I	16,7	20,0			1	12,5
85,0-99,9 Chamaerrhine		<u> </u>	1					ı	H	-	1		1	1	ı			1	100,0	2,5
TOTAL		•	14	6	•	NO.	€	-	-	40	0,001	100,0	100,0	100,0	100,0 100,0 100,0 100,0 100,0 100,0 100,0 100,0 100,0	100,0	100,0	100,0	100.0	100,0

CHIEF FEATURE ASSOCIATIONS

- Table I If stature is considered in conjunction with relative span, we note that tall statures are associated with high figures for relative span. Medium arms show no clear association with any particular stature.
- Table 2 If stature is compared with sitting height, we observe that high figures for sitting height go together with medium-to-high figures for stature. The few cases of macroskely are associated with rather tall statures.
- Table 3 From a comparison of relative span and relative sitting height it can be noted that macroskely is associated with long arms, while a tall sitting height goes with medium-to-short arms.
- Table 4 There appears to be no close correlation between the trochanteric index and stature. A not-too-high trochanteric index seems common to all statures. The few cases of really tall stature, however, are accompanied by high trochanteric indices.
- Table 5 This table, which expresses the relation of relative span to the trochanteric index, again gives no decisive information. It can be noted, however, that the subjects with a marked span have also a high trochanteric index.
- Table 6 Not much is to be learned from this table either; but it can be noted how medium-to-tall relative sitting heights are associated with a low trochanteric index. However the trochanteric index is higher in relation to low sitting heights.
- Table 7 Shoulders are wide for all classes of statures; the few cases of narrow shoulders are to be found among medium-to-tall and tall statures.
- Table 8 This shows no noteworthy correlations. The few narrow shoulders are associated with medium-to-high relative spans.
- Table 9 Broad shoulders are found through the whole range of relative sitting height. The cases of narrow shoulders occur in conjunction with low relative sitting height.
- Table 10 This table offers nothing particularly suggestive. However, the few cases of narrow shoulders seem to go with low trochanteric indices.
- Table II Stature in comparison with relative hip breadth shows that some higher relative hip breadths are correlated with medium, taller, and tall statures.

- Table 12 A comparison of relative span and relative hip breadth indicates an appreciable proportion of long arms accompanied by high relative hip breadths.
- Table 13 If we observe relative sitting height in relation to relative hip breadth, it can be noted that a rather high relative sitting height goes with a high relative hip breadth.
- Table 14 Comparison between the trochanteric index and relative hip breadth shows no definite associative tendencies. A rather high trochanteric index is associated with both high and low relative hip breadths.
- Table 15 A comparison of relative shoulder breadth and relative hip breadth also shows no definite association between them. Broad shoulders are found with both wide and narrow hips.
- Table 16 The higher figures for the cephalic index appear to be correlated with medium-tall statures.
- Table 17 Stature compared with the morphological facial index shows a slight preference for medium-to-tall and tall statures to be associated with long faces.
- Table 18 Considering the relation between the nasal index and stature, we observe that medium indicial values occur indifferently in all classes of stature, but higher nasal indices are found with tall statures.
- Table 19 Comparing the cephalic index with the morphological facial index, we note that medium and high face shapes go with all shapes of head but that a concentration of medium faces is found in conjunction with higher cephalic indices.
- Table 20 A comparison of nasal and cephalic indices shows that narrow noses accompany all shapes of head; some wider noses, however, are associated with narrower heads.
- Table 21 A comparison of the two indices of the facial region, namely the morphological facial index and the nasal index, shows that narrower noses are associated with all types of facial form. It can nevertheless be observed that some nasal indices in the rather high categories are combined with medium forms of face.
- Table 22 If we compare a pigmentary feature, such as the colour of the iris, with the stature, we find that a rather deep colour of the iris seems to be associated with small and medium-low statures, while irises of a little lighter colour go with taller statures.
- Table 23 The colour of the iris and the horizontal cephalic index show an association between low cephalic indices and deeper-coloured irises. The

ANTHROPOLOGY

somewhat lighter-coloured irises are found in conjunction with rather less narrow head shapes.

Table 24 – With the morphological facial index the irises show this grouping; dark irises, however, appear to correspond with slightly broader faces. In the class of narrow faces, we find rather more light-coloured irises.

Table 25 – If we consider the colour of the iris and the figures for the nasal index, we observe that fully leptorrhine nose forms are found in conjunction with all colours of the iris. But the fact can also be noted that lighter-coloured irises tend to correspond to wider forms of nose.

NEW MEASUREMENTS OF KALASH TAKEN IN 1960

During my mission in 1960, 20 Kalash of the Rumbur Valley (which is further north than Bomberet and Birir, precisely at Bathet), were submitted to measuring between 13th and 17th September 1960.

Of the 20 individuals, five were natives of Balankuru, five of Kalashgram, five of Bathet, three of Maldesh and two of Grom. In the majority of cases fathers and mothers were likewise local; in three cases mothers were reported to be from Anish, in four cases from Brun, in one case from Drosh, all of which are ethnically Kalash localities.

The age of the subjects submitted to measuring ranges from 18 (one case) to 50 (three cases). The others are between 20 and 40. All appeared in good conditions excepting one man affected with malaria and one with trachoma.

All reported their language to be Kalash, their religion polytheistic (Kafir) and their occupation agriculture.

This group was submitted to the same measurements as the 40 Kalash measured in 1955, excepting trocantheric height, owing to the subjects' objection, and the colour of skin on arms. The results of the elaboration of the anthropometrical data of this new Kalash group do not present notable variations in comparison to those obtained for the group measured in 1955.

Ability to taste P.T.C. proved positive in 14 (70% of cases) negative in 6 (30%).

As Balankuru and Kalashgram villages are near to each other, it was not considered necessary to proceed to a further fractioning of the group, based on birthplaces, therefore the 20 subjects are presented together.

METRICAL FEATURES

Stature

Stature, according to conventional divisions, shows the following results:

	n	%
x-157	3	15,0
158–162	6	30,0
163-167	2	10,0
168–172	8	40,0
173-x	I	5,0
		700.0
	20	100,0

All classes of stature are represented in the series, but the highest percentages fall in the tall (40%) and medium-low (30%) categories.

min. =
$$152.7$$
; max. = 174.0 ; mean = 164.9 ; $\sigma = 5.87$.

Relative Span Arms

The arms of the 20 subjects observed are rather long in relation to stature. Values are as follows, according to the usual division for this index:

	n	%
x-99,9	2	10,0
100,0-104,9	15	75,0
105,0-109,9	3	15,0
	20	100,0

The high frequency of very long arms is remarkable.

min. =
$$95.3$$
; max. = 106.1 ; mean = 102.8 ; $\sigma = 2.52$.

Upper Extremity Index

This index is distributed between values 37 and 42. According to the usual division:

Upper extremity development is therefore rather low, in relation to stature, for the whole group.

min. = 37,3; max. = 41,7; mean = 40,3;
$$\sigma = 1.08$$
.

Cormic Index (Relative Sitting Height)

Low values appear in the series, distributed as follows:

Macroskely may therefore be considered a characteristic of this group. min. = 47.2; max. = 52.4; mean = 49.5; $\sigma = 1.50$.

Relative Shoulder Breadth

The values obtained for this index give the following frequencies:

Shoulders, compared to stature, are broad, and we observe a low percentage of narrow shoulders.

min. = 17,8; max. = 24,9; mean = 22,3;
$$\sigma = 1,38$$
.

Relative Bi-iliac Breadth

The usual divisions give the following percentages:

	n	%
x-14,5	2	10,0
14,6-16,5	I 2	60,0
16,6-x	6	30,0
	20	100,0

ANTHROPOLOGY

Medium pelves prevail, with a significant percentage of broad pelves. min. = 14,4; max. = 17,1; mean = 15,5; $\sigma = 0,72.$

Acromio-cristal Index

The values related to this index are distributed according to the following table:

	n	%
x-64,5	2	10,0
64,6-77,5	16	80,0
77,6-x	2	10,0
	20	100,0

It appears that the proportion between shoulders and pelvis falls in the medium class.

min. =
$$62,3$$
; max. = $78,8$; mean = $71,0$; $\sigma = 4,02$.

Relative Chest Circumference

Results obtained from the examination of the 20 Kalash subjects are as follows:

	n	%
x-51	7	35,0
51-56	12	60,0
56-x	I	5,0
	20	100,0

On the whole, medium-low values are shown, with no significant percentage of high values.

min. =
$$45,6$$
; max. = $57,1$; mean = $52,2$; $\sigma = 2,72$.

Owing to their large bodily dimensions, the Kalash of Rumbur appear of medium-tall stature, with medium-long arms in relation to stature, and clearly macroskelic.

Shoulders are well-developed relatively to stature. The pelvis is narrower,

in comparison with stature. Relative chest circumference appears medium. The slender bodily structure already noted in the Kalash of Bomberet and Birir is confirmed here.

THE VAULT OF THE HEAD

Maximum Head Length

	n	%
178-185	6	30,0
186–193	I 2	60,0
194~x	2	10,0
		
	20	100,0

There is a majority of long, a fair incidence of medium and an absence of short crania.

Maximum Head Breadth

	n	%
x-139	9	45,0
140-147	10	50,0
140-155	I	5,0
	20	100,0

These figures indicate the narrow breadth of Kalash heads. In one single case we have a medium breadth, in the rest crania are narrow or extremely narrow.

Horizontal Cephalic Index

The values for this are divided according to the following categories:

	n	%
x-70,9	2	10,0
71,0-75,9	14	70,0
76,0-80,9	4	20,0
	20	100,0

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Dolichocephaly prevails in the series, with an incidence of 20% of mesocephaly.

min. = 69,6; max. =
$$78,9$$
; mean = $74,2$; $\sigma = 2,42$.

Cephalic Length-Height Index

The distribution is as follows:

	n	%
x-57,9	2	10,0
58,o-62,9	12	60,0
63,o-x	6	30,0
	20	100,0

The orthocephaly of the series is amply proved, with an incidence of 30% of hypsicephaly.

min. =
$$57.2$$
; max. = 68.2 ; mean = 60.3 ; $\sigma = 3.06$.

Cephalic Breadth-Height Index

According to the usual distribution, the following figures appear:

	n	%
x-78,9	5	25,0
79,0-84,9	9	45,0
85,o-x	6	30,0
	20	100,0

There is a prevalence of metriocephaly over the other classes, which are present in a fair incidence of cases.

min. = 75,3; max. = 95,6; mean = 82,6;
$$\sigma = 5,5$$
.

Horizontal Head Circumference

No divisions exist in relation to this measure. We therefore report the absolute and percentual frequencies corresponding to categories, with an

interval of 5 centimetres. The greatest frequency falls in the class 536-540. An incidence of higher values brings the average to 542,5.

	n	%
510-520	2	10,0
521-525	_	_
526-530	2	10,0
531-535	_	_
536-540	9	45,0
541-545		_
546–550	4	20,0
551-555		-
556-56o	2	10,0
561-565	_	_
566-570	I	5,0
	20	100,0

According to Sera's base-lines, and thanks to Giardina's formula

$$Y = \frac{(15)}{\sqrt{(1) \times (3)}}$$

which allows us to consider the three main cephalic measures at once, the 20 Kalash from Rumbur are divided as follows:

	n	%
Dolicho-platycephalic	6	30,0
Dolicho-ortho-platycephalic	8	40,0
Dolicho-ortho-hypsicephalic	3	15,0
Dolicho-hypsicephalic	2	10,0
Brachy-platycephalic		_
Brachy-ortho-platycephalic	I	5,0
Brachy-ortho-hypsicephalic	_	_
Brachy-hypsicephalic	_	_
	20	100,0

The series is prevalently dolicho-ortho-platycephalic and dolicho-platycephalic. High forms are rare. The average falls in the dolicho-ortho-platycephalic category.

ANTHROPOLOGY

The division of head data according to triangular co-ordinates (which compare each of the three cephalic diameters to their sum, in each of the 20 cases under consideration) leads to the following distribution:

	n	%
Short, broad and high heads	_	_
Short, narrow and high heads		_
Long, narrow and high heads	5	25,0
Long, narrow and low heads	10	50,0
Long, broad and low heads	4	20,0
Short, broad and low heads	I	5,0
	20	100,0

The dolicho-platycephalic character of the entire series appears evident in this distribution. The average falls in the class of long, narrow and low forms.

THE FACE

Morphological Facial Index

	n	%
79,0-83,9	2	10,0
84,0-87,9	I	5,0
88,0-92,9	I 2	60,0
93,o-x	5	25,0
	20	100,0

Long and very long faces are the rule, medium and short faces are few in this group.

min. =
$$80,3$$
; max. = $97,8$; mean = $90,7$; $\sigma = 4,8$.

Cephalo-facial Index

As no divisions are in use for this index, we will give frequencies for each class of the series:

	n	%
88	I	5,0
89	I	5,0
90	I	5,0
91	3	15,0
92	2	10,0
93	I	5,0
94	2	10,0
95	I	5,0
96	I	5,0
97	I	5,0
98	3	15,0
99		_
100	_	_
101	τ	5,0
102	_	
103	_	_
104		_
105	2	10,0
	20	100,0

The series ranges between values 88 and 105 with highest frequencies at 91 and 98: on the whole we note a certain homogeneity of distribution. min. = 87.8; max. = 104.9; mean = 94.9; $\sigma = 4.85$.

Nasal Index

Values for this are divided as follows:

	n	%
x-54,9	2	10,0
55,0-69,9	14	70,0
70,0-84,9	4	20
	20	0,001

ANTHROPOLOGY

The series is clearly leptorrhine with rare mesorrhine and hyperleptorrhine forms.

min. = 54.1; max. = 82.3; mean = 63.3;
$$\sigma = 7.7$$

Labial Index

The distribution of values is the following:

	n	%
x-35,5	17	85,0
35,6-49,5	3	15,0
	20	100,0

In the subjects observed, thin lips prevail with a slight percentage of medium lips.

min. = 13.7; max. = 47.8; mean = 27.9;
$$\sigma = 7.4$$
.

On the whole, the Rumbur Kalashes' face is medium-long; nasal forms are prevalently high and narrow, and lips rather thin.

DESCRIPTIVE FEATURES

Shape of Body

	n	%
Delicate	5	25,0
Robust	5	25,0
Slim	10	50,0
	20	100,0

Half the series shows a slim form of body; delicate and robust forms each represent 25% of the group.

Pilosity of Body

The incidence of each class is as follows:

	n	%
Abundant	4	20,0
Thin	9	45,0
Deficient	7	35,0
	20	100.0

Hairiness of body does not appear to be much developed in the Kalash from Rumbur.

Beard and Moustache

	n	%
Abundant	7	35,0
Thin	9	45,0
Deficient	4	20,0
		
	20	0,001

Hairiness of the face is notable. Hairless cases represent a low percentage.

Hair Form

Notwithstanding the practice of shaving the head, the following indications were obtained:

	n	%
Straight	4	20,0
Wavy	14	70,0
Curly	2	10,0
	20	100,0

Waviness prevails, a few subjects have straight hair and curly hair is the exception.

Eye Aperture

The frequency is as follows:

	n	%
Small	6	30,0
Medium	9	45,0
Large	5	25,0
	20	100,0

A clear prevalence of medium-small aperture is evident.

Inclination of Palpebral Fissure

	n	%
Horizontal	19	95,0
Oblique	I	5,0
	20	100,0

In nearly all cases the inclination of the eye is horizontal.

Nose Base

	n	%
Upturned	I	5,0
Horizontal	8	40,0
Downturned	11	55,0
	20	100,0

The highest frequency occurs in the category of downturned noses (55%). Upturned noses are rare.

Nose Bridge

	n	%
Concave	2	10,0
Straight	7	35,0
Convex	11	55,0
		
	20	100,0

In the main, the bridge of the nose is convex, with over 1/3 of straight noses and very few concave.

Depression of Nasal Root

	n	%
Deep	3	15,0
Slight	17	85,0
	20	100,0

In most cases the root of the nose is slightly depressed. Deep depressions rarely occur.

Nasal bones are upturned in 100% of the subjects examined.

Form of Lips

	n	%
Thin	4	20,0
Medium	16	80,0
	20	100,0

Hence, lips are mostly medium in the Rumbur Kalash. One fifth presents thin lips.

Shape of Forehead

	n	%
Receding	17	85,0
Straight	3	15,0
	20	100,0

A receding forehead clearly prevails on the straight form.

ANTHROPOLOGY

PIGMENTATION

Colour of Hair

The frequencies corresponding to the colour of hair were recorded according to Fischer-Saller's scale as follows:

	n	%
X	2	10,0
Y	17	85,0
W	I	5,0
		
	20	100.0

These figures represent an intense pigmentation. Three subjects (3, 10, 20) show traces of white on fundamentally dark hair (Y).

Colour of Skin on Forehead

In accordance with Von Luschan's scale the frequencies shown are:

	n	%
II	I	5,0
I 2	3	15,0
13	I	5,0
14	6	30,0
15	3	15,0
16	I	5,0
17	5	25,0
	20	100,0

The greatest frequencies are found at 14 and 17; at 12 and 15. Other shades are infrequent.

Colour of Iris

The following divisions follow the order of the Martin scale:

	n	%
2	2	10,0
3	10	50,0
4	5	25,0
5 6	2	10,0
6	_	
7	I	5,0
	20	100,0
	20	100,0

The frequency of dark shades is high. Only one case shows a lighter colour.

KALASH WOMEN

During the 1960 Mission I was able to collect some data regarding a group of individuals composed of 7 Kalash women from the Bomberet Valley and 15 women of the Birir Valley. During the preceding mission which took place in 1955 I was unable to collect this data although various tentatives were made unsuccessfully. I was only able to obtain the stature, the colour of the hair, the skin and the eyes of almost the females previously mentioned. A great deal has not been accomplished, however this is the only data that has been obtained regarding the Kalash women and I believe the whole Karakorum-Hindu-Kush territory; therefore the data is not only unique but exceptional of it's kind.

The average stature of the 7 women of Bomberet is 151,0 cm; but if two very young women are not taken into consideration, the average stature of the remaining 5 women is 151,6 cms. The average stature of the male Kalash of the Bomberet (27 individuals measured, all adults) is 163,8 cms. This demonstrates a difference between the sexes of 12,2 cms.

With reference to the colour of the iris, the most frequent was no. 3 (4 cases), no. 2 (2 cases) and no. 6 (1 case). The most frequent colour for the males was no. 4. The colour of the skin on the forehead may be classified from no. 12 to no. 15, with a maximum frequency of no. 14, which was also one of the maximums for the Kalash males.

The average stature for the 20 Kalash women from Birir is 147,0 cms. If five very young women are not taken into consideration, the average stature may be considered as 148,7 cms. The difference between the sexes, having measured the 13 Kalash adults of Birir is 14.0 cms. This difference appears to be very marked.

The irises of the Birir women range from no. 2 to no. 11, with no. 3 being the most frequent, as in the Bomberet women; the colour of the skin on the forehead has two extreme values from no. 8 to no. 16, with a maximum frequency of no. 12 and 15. Number 12 is most frequent among the males.

With reference to the colour of the hair, the two groups of individuals (22 persons in all) range from «R» on the Fischer-Saller scale to «W»; the women of Bomberet reveal a maximum at «T»; those of Birir have two maximums; one at «S» and the other at «V». The male groups, which has been previously pointed out, show darker notations, with a strong majority at «Y».

THE KATIS

MEASUREMENTS TAKEN IN 1955

The 21 Kati individuals (Red Kafirs) were all natives and reside in Brumbutul. In the majority of cases, fathers and mothers were likewise local. Few Katis reported their father to be of Afghan origin or their mothers as a Chitral. The language of all these people is the Katawari and their religion Mohammedan. It should be mentioned once more that the Islamization of the Red Kafirs is today complete and that the last pagans were encountered by Schomberg in 1935. The occupation of the subjects was given as peasants.

The lowest age recorded was 19 (in one case), the highest 55 (also in one case). The most frequent ages in decreasing order are 40, 35 and 26; hence almost all are adults.

As already stated, the Red Kafirs were subjected to the test of ability to taste P.T.C. The result was positive in 18 individuals and negative in 3, namely positive in 85,7% and negative in 14,3%.

METRICAL FEATURES

Stature

The only previous data concerning stature are those of Guha in 1929, but are limited, as far as the Kalash are concerned, to a diagram of frequencies. According to this, high frequencies lie around 165-175, the minimum value is 152 and the maximum 175.

As appears from the following table, the highest frequency of stature in the Katis I measured seems to be above that of the subjects measured by Guha, as small and medium-low statures were missing from it.

According to the current conventional divisions (Biasutti), stature is distributed thus (1):

	n	%
158-162	5	23,8
163-167	5	23,8
168-172	6	28,6
173-х	5	23,8
	21	100,0

Medium-low and small statures are absent in the group studied. The highest frequency lies in the tall range. High frequencies also occur in the medium-tall and very tall categories, so the average stature is decidedly tall.

Relative Span Arms

Values are as follows, according to the usual division for this index.

	n	%
x-99	2	9,5
100,0-104,9	8	38,1
105,0-109,9	II	52,4
	21	100.0

The greatest frequencies are found in the higher categories. More than half are in the class of the long arms, a good part in that of medium arms, while the proportion of short arms is negligible (9,52%). The average (104,0) falls in the class of medium arms.

min. =
$$91.8$$
; max. = 109.3 ; mean = 104.0 ; $\sigma = 2.95$.

Upper Extremity Index

The usual divisions give the following percentages

	n	%
48,1-51,0	8	38,1
51,1-53,0	I 2	57,1
53,1-55,0	I	4,8
	21	100.0

Fluctuation between extremes is small and the standard deviation very low; from the results obtained it can be concluded that the Katis have rather short arms.

Cormic Indix (Relative Sitting Height)

Trunk development in relation to stature is as follows:

Mesoskely is present in most of the series, of which, however, a third shows macroskely. Brachyskely is present in only one case.

Trochanteric Index

For this index we have the figures for 20 individuals divided as follows:

The lower extremity, as far as the trochanter is concerned, turns out to be rather short; the average occurs in the lower range.

Intermembral Index

The relation of the total length of the upper extremity to the trochanteric height in the same individuals gives the following values:

min, = 78,0; max. = 87,4; mean = 82,1;
$$\sigma = 2,75$$
.

In relation to the lower extremity, the arms are of medium length; there is a moderate frequency of short arms, while long ones are rare.

Relative Shoulder Breadth

From the transverse measurements of the trunk, relative shoulder breadth is as follows:

min. =
$$18,7$$
; max. $23,2$; $\sigma = 1,31$.

Only a small number of individuals (11) are available for determining this index. From the figures it will be observed that the majority of them are narrow-shouldered (mean 21,0), a rather low value.

Relative Bi-iliac Breadth

Values for this index are divided as follows:

In the majority of cases the pelvis is medium but a fair percentage of wide pelves also occurs. The number of narrow pelves is small. The average is found in the medium range (mean 16,2).

Acromio-cristal Index

The values for this, obtained for only 14 individuals, are:

They are high, their average being 72,2.

min. = 63,2; max. = 89,9; mean = 72,7;
$$\sigma = 7.05$$
.

Relative Chest Circumference

In spite of the difficulty experienced in obtaining these measurements, we were able to obtain them in 20 out of 21 cases:

	n	%
x-51	8	40,0
51-56	12	60,0
56-x		
	20	100,0

ANTHROPOLOGY

The absolute figures are rather small, as well as the mean (51,65). The variability also tends to be low.

min. =
$$43.2$$
; max. = 51.9 ; mean = 51.6 ; $\sigma = 2.22$

THE VAULT OF THE HEAD

Maximum Head Length

	n	%
178–185	4	19,1
186–193	10	47,6
194-x	7	33,3
	21	100.0

There is a majority of long crania, a moderate incidence of very extreme and a low one of medium lengths.

Maximum Head Breadth

	n	%
x-139	2	9,5
140-147	14	66,8
148-155	5	23,8
	21	100.0

Breadths in the series examined are rather narrow; only 23,8% are medium, high ones are few and extremely high ones absent.

Horizontal Cephalic Index

The values for this are divided according to the following categories:

	n	%
71,0-75,9	12	57,1
76,0-80,9	8	38,1
81,0-85,4	I	4,8
	21	100,0

The series is almost wholly dolichocephalic, with few examples of mesocephaly and only one case of brachycephaly. The average for the series falls in dolichocephalic.

min. =
$$71,2$$
; max. = $83,4$; mean = $75,5$; $\sigma = 2,45$.

The standard deviation is very low.

Cephalic Length-Height Index

This is divided as follows:

Only a third of the series examined is in the hypsicephalic group; the incidence of chamaecephaly is low; more than half the series is orthocephalic. min. = 57.4; max. = 70.5; mean = 61.75; $\sigma = 3.89$.

The average is distinctly orthocephalic. The prevalence of orthocephaly in a presumably hypsicephalic district is a fact of great importance.

Cephalic Breadth-Height Index

The division is as follows:

	n	%
x-78,9	8	38,1
79,0-84,9	7	33,3
85,o-x	6	28,6
	21	100,00

All three classes are all well represented in the series; there is a slight prevalence of tapeinocephaly. The mean is metriocephalic (82,7); $\sigma = 4,47$.

Horizontal Head Circumference

The distribution of the diameters is as follows:

	n	%
501-95	2	9,5
506-10	_	_
511-15	_	
516-20	I	4,8
521-25	3	14,3
526-30	3	14,3
531-35	2	9,5
536–40	4	19,0
541-45	I	4,8
546-50	2	9,5
551-55	ī	4,8
556-60	_	_
561-65	2	9,5
	21	100,00

Head circumference among the Katis is, therefore, on the low side with small intervals between classes.

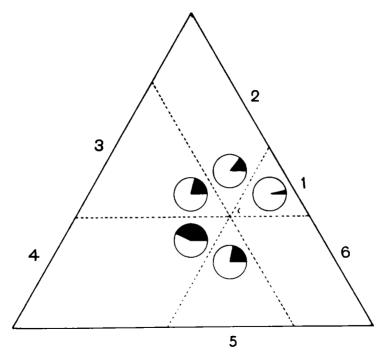
From the figures given above, the generally small size of the Kati head is evident, a special indication of this being the low value of the horizontal circumference. However, as the cephalic index, though on the whole dolichocephalic, is considerably small, the maximum head length in a certain number of cases is in the medium class, which brings down the figures for head circumference but keeps the cephalic index average around 75,5.

As it is possible to express the interrelationships of the indices by combining them (see Giardina) and by using the base-lines of Sera for the auricular height, we have the following distribution:

	n	%
Dolicho-platycephalic	8	38,1
Dolicho-ortho-platycephalic	5	23,8
Dolicho-ortho-hypsicephalic	6	28,5
Dolicho-hypsicephalic	1	4,8

Brachy-platycephalic		_
Brachy-ortho-platycephalic		
Brachy-ortho-hypsicephalic	I	4,8
Brachy-hypsicephalic	_	-
	21	100,00

From these divisions it can be observed that the series is prevalently dolicho-ortho-platycephalic with maximum frequencies in the dolicho-platycephalic and also in dolicho-ortho-hypsicephalic classes. There is only a small



Division of head data of 21 Katis according to triangular co-ordinates.

1. short, broad, high head
2. short, narrow, high head
3. long, narrow, high head
6. short, broad, low head

incidence of real hypsicephaly, which is found among both elongated and moderately wide head forms.

The average of the series (75,7; 61,7) for these indices falls in dolichoortho-platycephalic category.

In conclusion it can be said that if the heads of the Katis are not very

ANTHROPOLOGY

large, this is due to a reduction in height and maximum head breadth in relation to head length.

The division of head data according to the triangular co-ordinates leads to the following distribution:

	n	%
Short, broad and high heads	I	4,7
Short, narrow and high heads	3	14,3
Long, narrow and high heads	4	19,1
Long, narrow and low heads	8	38,1
Long, broad and low heads	5	23,8
Short, broad and low heads		
	21	100,00

The proportion of long and moderately long heads is considerable.

THE FACE

Morphological Facial Index

	n	%
79,0-83,9	7	33,3
84,0-87,9	5	23,8
88,0-92,9	3	14,3
93,o-x	6	28,6
	21	100,0

Medium long faces are the rule. The mean falls in the class considered as the upper limit for medium faces (87,9).

Cephalo-Facial Index

	n	%
82	I	4,8
83		
84		
8 ₃ 8 ₄ 8 ₅		

86	I	4,8
87	I	4,7
88	_	_
89	3	14,2
90		_
91	3	14,2
92	I	4,8
93	4	19,1
94	I	4,8
95	I	4,7
96	2	9,5
97	3	14,3
	21	100,0

In the higher classes, the maximum frequency is 93 with frequencies at 89, 91 and 97. The mean value is 90; $\sigma = 3.95$.

The rather high values for this index probably result from a comparative narrowness of the head in relation to the bizygomatic breadth, which, however, is not so small as might be thought. It must be remembered that the maximum frequency lies in the medium class, thus indicating that the bizygomatic breadth is not excessively small.

min. =
$$82,0$$
; max. = $97,2$; mean = 90 ; $\sigma = 3,75$.

Nasal Index

Values for this are divided as follows:

	n	%
x-54,9	2	10,0
55,0-69,9	16	80,0
70,0-84,9	2	10,0
	20	100,0

The series is clearly leptorrhine with a few values somewhat higher but also with two cases of hyper-leptorrhiny. The mean is also low (leptorrhine).

Labial Index

Values for this index are as follows:

	n	%
x-35,5	17	80,95
35,6-49,5	4	19,05
	21	100,00

Hence the lips, according to the categories employed, are thin, in some cases very thin; the average is also quite low. A certain percentage of medium lips (19,05%) can also be noted. Thick lips are entirely absent.

DESCRIPTIVE FEATURES

Shape of Body

The general form of the body in the 19 Red Kafirs who were able to be examined proves to be slim. Delicate and robust forms are also represented, in accordance with the following percentages:

	n	%
Delicate	5	26,3
Robust	4	21,1
Slim	10	52,6
	10	100.0

Pilosity of body

This is divided as follows in the 19 subjects examined:

	n	%
Abundant	4	21,1
Thin	7	36,8
Deficient	8	42, I
	ĮQ.	0,001

Reard and Moustache

	n	%
Thick	3	16,7
Thin	13	72,2
Deficient	2	11,1
	19	100,0

The pilous system of the Red Kafirs does not appear to be much developed, as the general hairiness of the body has a very high percentage of the thin and deficient classes and there is a notable lack of development in beard and moustache.

For the form of the hair, we have only five indications:

4 wavy, 1 straight (N. 10).

Only one case of incipient baldness was noted, viz. in the case of the aged 55.

The eye aperture is present in its three forms:

	n	%
Small	2	10,5
Medium	4	21,1
Large	13	68,4
		
	10	100,0

From the table a clear prevalence of large eye aperture can be observed. The presence of small aperture is negligible.

Inclination of Palpebral Fissura is as follows:

	n	%
Horizontal	15	75,0
Oblique	5	25,0
	20	100,0

The horizontal line of eye predominates. Individuals with oblique line have small or medium eye aperture (3 out of 5).

Nose Base

As regards shape of the nose we have four divisions: direction of the base, shape of the bridge, appearance of the root.

	n	%
Horizontal	8	40,0
Downturned	12	60,0
	20	100,0

The prevalent shape is down-turned, but generally not to a marked degree.

Nose Bridge

The shape of the bridge is divided as follows:

	n	%
Concave	2	9,5
Straight	12	57,1
Convex	7	33,4
	21	100,0

The highest frequency occurs in the category of straight noses, while in a third of the series, there is convexity. A slightly concave shape also occurs but is rare.

Depression of Nasal Root

	n	%
Deep	4	19,1
Slight	17	80,9
	21	100,0

Development of Supraorbital Bridges

	n	%
Marked	3	16,7
Slight	8	44,4
Absent	7	38,9
	18	100,0

Marked development of the supraorbital region is unfrequent.

Shape of Forehead

	n	%
Slightly receding	13	65,0
Straight	7	35,0
	20	100,0

A slightly receding forehead is almost twice as prevalent as a straight one.

Form of Lips

The shape of the lips is shown in its three principal divisions:

	n	%
Thin	6	28,5
Medium	12	57,2
Thick	3	14,3
	21	100.0

Hence the lips are mostly medium, with a notable frequency, however, of thin ones.

In conclusion, as regards the main elements of facial morphology in the Red Kafirs, the more prevalent features appear to be the intermediate, with the exception of the size of the eye aperture, which for the most part is large and horizontal.

ANTHROPOLOGY

Nasal morphology indicates the presence of prominent bones in all the individuals, and in the majority of cases, a small nasal cavity with a usually straight bridge, a horizontal base or one that is slightly downturned.

There are few individuals with marked super-orbital development. This, however, is generally slight or absent, while the forehead is slightly receding.

Taken as a whole, the morphological features of the face indicate the presence of physiognomies very similar to the prevalent types found today in the northern and eastern Mediterranean basin.

PIGMENTATION

It has been seen that for the hair, the greatest frequencies occur in categories X and Y of the Fischer-Saller scale, viz. dark chestnut and not quite brown.

Colour of the Hair

According to the Fischer-Saller scale, this is distributed as follows:

	n	%
V	3	15,0
X	8	40,0
Y	8	40,0
W	1	5,0
	20	100,0

Maximum frequency is found in the X and Y classes.

Card N. 8 (Y) also has a beard (Y).

Card N. 14 (V) also has a beard (V).

Other pigmentary features are found as follows:

Colour of the Skin on Inner Side of the Upper Arm

	n	%
3	I	4,8
_		
8	3	14,1
9	I	4,8
10	5	23,8
II	5	23,8
I 2	4	19,0
13	I	4,8
15	I	4,8
	21	100,0

The most frequent values occur between Nos. 8 and 12 of the Von Luschan colour scale. Three individuals are exceptions: those recorded on cards 18, 21 and 16. The first of these has a relatively light skin colour and the other two are somewhat darker. On the whole the series shows a tendency towards slightly more deeply pigmented shades than are found among Mediterranean peoples in general.

Colour of Skin of Forehead

	n	%
5	I	4,8
11	I	4,8
12	3	14,2
13	3	14,2
14	II	52,4
15	I	4,8
16	_	
17	I	4,8
		
	21	100,0

The lighest frequencies occur within the categories comprising Nos. 12 to 14, inclusive of the Von Luschan scale. Isolated cases correspond to Nos. 5,

11, 15 and 17. The series is therefore very homogenous in this respect, even though the colour shades of 3 individuals are a little depart from the norm.

Colour of Iris

	n	%
3	6	28,6
4	4	19,0
5 6	I	4,8
6	4	19,0
7	2	9,5
8	I	4,8
9	I	4,8
10	2	9,5
	21	100,0

The colour distribution of the iris may appear somewhat unusual, although this is a well-known polymorphic trait. A peak of dark shades (No. 3 = 28,58%) is followed by others at Nos. 4 and 6 each (19,04%), indicating light shades, which continue uninterruptedly up to No. 10 in the Martin scale; this means that 4 individuals (1 of No. 8, 1 of No. 9 and 2 of No. 10) are greyish in eye colour.

								INACIS
Relative Span Arms	x — 99,9 Short arms	100,0 — 104,9 Medium arms	105,0—109,9 Long arms	TOTAL	6'66—×	0,00001004,0	%	Total
Stature		ļ ļ						
158-163 Medium inferior	_	4	2	5	_	50,0	18,2	23,8
163-167 Medium superior	I	2	I	5	50,0	25,0	9,2	23,8
168-172 Tall	I	2 	4	7	50,0	25,0	36,3	28,6
173-x Very tall			4	4	<u> </u>		36,3	23,8
Total	2	8	11	21	100,0	100,0	100,0	100,0

TABLE II.

Relative Sitting Height	48,1 — 51,0 Macroskelic	51,1 — 53,0 Mesoskelic	53,1 — 55,0 Brachyskelic	TOTAL	% 48,1–51,0	% 51,1-53,0	% 53,1–55,0	TOTAL
Stature					<u> </u>			
158-162 Medium inferior	I	4		5	12,5	33,3	_	23,8
163-167 Medium superior	I	3	I	. 5	12,5	25,0	100,0	23,8
168-172 Tall	3	3		6	37.5	25,0	_	28,6
173-x Very tall	3	2		5	37,5	16,7		23,8
Total	8	12	1	21	100,0	100,0	100,0	100,0

Relative Sitting Height	48,1 — 51,0 Macroskelic	51,1 — 53,0 Mesoskelic	53,1 — 55,0 Brachyskelic	Total	% 48,1-51,0	% 51,1-53,0	% 53,1-55,0	Total
Relative Span Arms								
x-99,9 Short arms	1	I	_	2	12,5	8,3		9,5
100,0-104,9 Medium arms	1	6	1	8	12,5	50,0	100,0	38,1
105,0-109,9 Long arms	6	5	_	11	75,0	41,7		52,4
Total	8	12	1	21	100,0	100,0	100,0	100,0

TABLE IV.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	x-51,9 %	5 2,0 –54,9 %	Total
Stature						
158-162 Medium inferior	5	_	5	31,2		25,0
163-167 Medium superior	5	_	5	31,2	_	25,0
168-172 Tall	4	I	5	25,0	25,0	25,0
173-x Very tall	2	3	5	12,6	75,0	25,0
Total	16	4	20	100,0	100,0	100,0

						- Line
Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	x –51,9	5 2,0 –54,9	TOTAL
Relative Span Arms						
x-99,9 Short arms	2		2	12,6	-	8,0
100,0-104,9 Medium arms	7	I	8	43,7	25,0	42,0
105,0-109,9 Long arms	7	3	10	43,7	75,0	50,0
Total	16	4	20	100,0	100,0	100,0

TABLE VI.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	x-51,9 %	5 2,0–54,9 %	TOTAL
Relative Sitting Height						
48,1-51,0 Macroskelic	5	2	7	31,3	50,0	35,0
51,1-53,0 Mesoskelic	10	2	12	62,5	50,0	60,0
53,1-55,0 Brachyskelic	I	-	1	6,2		5,0
Total	16	4	20	100,0	100,0	100,0

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	x-21,5	21,6-x %	Total
Stature		ļ		!		
158-162 Medium inferior	3	I	4	37,5	33,3	36,4
163-167 Medium superior	I	2	3	12,5	66,7	27,2
168-172 Tall	2		2	25,0	_	18,2
173-x Very tall	2		2	25,0	_	18,2
Total	8	3	11	100,0	100,0	100,0

TABLE VIII.

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	x-21,5	21,6-x %	TOTAL
Relative Span Arms						
x-99,9 Short arms	I	 	1	12,5		9,0
100,0-104,9 Medium arms	I	3	4	12,5	100,0	36,5
1 05,0 -109,9 Long arms	6	 	6	75,0	<u> </u>	54,5
Total	8	3	11	100,0	100,0	100,0

Katis

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	X-21,5	2 1,6-x	Тотац
Relative Sitting Height					en e	1
48,1-51,1 Macroskelic	3	I	4	37.5	33,3	36,5
51,1-53,0 Mesoskelic	. 5	1	6	62,5	33,4	54,5
53,1-55,0 Brachyskelic	·	I	1	_	33,3	9,0
Total	8	3	11	100,0	100,0	100,0

TABLE X.

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	Total	X-21,5	21,6–x	TOTAL
Trocantheric Index						
x-51,9 Short legs	7	3	10	87,5	100,0	90,9
52,0-54,9 Medium legs	I		1	12,5		9,1
Total	8	3	11	100,0	100,0	100,0

Bi-iliac Index	x — 14,5 Narrow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	Total	% X-14,5	14,6-16,5	% 16,6–x	TOTAL
Stature								
158-162 Medium inferior	I	3	I	5	100,0	25,0	12,5	23,8
163-167 Medium superior	_	2	3	5		16,6	37,5	23,8
168-172 Tall	_	3	3	6	_	25,0	37,5	28,6
173-x Very tall		4	I	5	_	33,4	12,5	23,8
Total	1	12	8	21	100,0	100,0	100,0	100,0

TABLE XII.

Bi-iliac Index	x — 14,5 Narrow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	Total	x-14,5 %	14,6–16,5 %	16,6-x %	TOTAL
Relative Span Arms								
x-99,9 Short arms		2		2		16,5		9,5
100,0-104,9 Medium arms	I	4	3	8	100,0	33,5	37,5	38,1
105,0-109,9 Long arms		6	5	11		50,0	62,5	52,4
Total	1	12	8	21	100,0	100,0	100,0	100,0

Bi-illac Index	x — 14,5 Narrow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	Total	x-14,5	14,6–16,5	16,6-x	Тотац
Relative Sitting Height								1
48,1-51,0 Macroskelic	_	6	2	8		50,0	25,0	38,1
51,1-53,0 Mesoskelic	I	6	5	12	100,0	50,0	62,5	57,1
53,1-55,0 Brachyskelic		_	I	1	<u> </u>	. –	12,5	4,8
Total	1	12	 8	21	100,0	100,0	100,0	100,0

TABLE XIV.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	% x-51,9	% 52,0-54,9	TOTAL
Bi-iliac Index		<u> </u>	! !			
x-14,5 Narrow pelvis	I	_	1	6,2		5,0
14,6-16.5 Medium pelvis	10	2	12	62,6	50,0	60,0
16,6-x Large pelvis	5	2	7	31,2	50,0	35,0
Total	16	4	20	100,0	100,0	100,0

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	% x-21,5	% 21,6−x	TOTAL
Bi-iliac Index						
x-14,5 Narrow pelvis	-	I	1		33,3	9,0
14,6-16,5 Medium pelvis	5		5	62,5		45,5
16,6-x Large pelvis	3	2	5	37.5	66,7	45,5
Total	8	3	11	100,0	100,0	100,0

TABLE XVI.

Cephalic Index	71,0 — 75,9 Dolicho- cephalic	76,0 — 80,9 Mesocephalic	81,0 — 85,4 Brachy- cephalic	TOTAL	% 71,0–75,9	% 76,0–80,9	% 81,0–85,4	TOTAL
Stature								
158-162 Medium inferior	2	3	<u> </u>	5	16,7	37,5	_	23,8
163-167 Medium superior	3	I	1	5	25,0	12,5	100,0	23,8
168-172 Tall	4	2	_	6	33,3	25,0	_	28,6
173-x Very tall	3	2	_	5	25,0	25,0		23,8
Total	12	8	1	21	100,0	100,0	100,0	100,0

				_						ILACIS
Total Facial index	Euryprosopic. 79,0 — 83,9	Mesoprosopic 84,0 — 87,9	Leptoprosop. 88,0 — 92,9	Hyperleptopr. 93,0 — x	Тотаг	79,0–83,9 %	84,0–87,9 %	88,0-92,9 %	93, 0-x %	Тотаг.
Stature										-
158-162 Medium inferior	—	1	I	3	5	_	20,0	33,3	50,0	23,8
163-167 Medium superior	2	_	I	2	5	28,6	_	33,4	37,5	23,8
168-172 Tall	3	2	 —	I	6	42,8	40,0		12,5	28,6
173-x Very tall	2	2	I	_	5	28,6	40,0	33,3		23,8
Total	7	5	3	6	21	100,0	100,0	100,0	100,0	100,0

TABLE XVIII.

Nasal Index	Hyper- leptorrhine x — 54,9	Leptorrhine 55,0 — 69,9	Mesorrhine 70,0 — 84,9	TOTAL	x-54,9 %	55, 0-6 9,9	70,0–84,9 %	Total
Stature								
158-162 Medium inferior	ı	3	<u>—</u>	4	50,0	18,7	!	20,0
163-167 Medium superior	I	4	_	5	50,0	25,0	_	25,0
168-172 Tall	_	4	2	6		25,0	100,0	30,0
173-x Very tall		5	 	5		31,3		25,0
Total	2	16	2	20	100,0	100,0	100,0	100,0

Cephalic Index	71,0 — 75,9 Dolicho- cephalic	76,0 — 80,9 Mesocephalic	81,0 — 85,4 Brachy- cephalic	Тотац	71,0-75,9 %	76,0–80,9 %	81,0–85,4 %	Total
Total Facial Index		 						
79,0- 83,9 Еигургозоріс	4	3	_	7	33,3	37,5	_	33,3
84,0-87,9 Mesoprosopic	3	2	-	5	25,0	25,0	_	23,8
88,0-92,9 Leptoprosopic	2	ı	_	3	16,7	12,5	_	14,3
93,0-x Hyperleptoprosopic	3	2	I	6	25,0	25,0	100,0	28,6
Total	12	8	1	21	100,0	100,0	100,0	100,0

TABLE XX.

Nasal Index	x — 54,9 Hyper- leptorrhine	55,0 — 69,9 Leptorrhine	70,0 — 84,9 Mesorrhine	Total	x-54,9 %	55, 0-69,9 %	70,0-84,9 %	TOTAL
Cephalic Index					li			
71,0-75,9 Dolichocephalic	I	9	2	12	50,0	56,2	100,0	60,0
76,0-80,9 Mesocephalic	1	6		7	50,0	37,5	_	35,0
81,0-85,4 Brachycepalic	_	I	_	1	_	6,3	_	5,0
TOTAL	2	16	2	20	100,0	100,0	100,0	100,0

Total Facial Index	Euryprosopic 79,0 — 83,9	Mesoprosopic 84,0 — 87,9	ᆲ	Hyperleptopr. 93,0 — x	TOTAL	79,0-83,9 %	84,0-87,9 %	88,0-92,9 %	93, o –x %	TOTAL
Nasal Index	<u> </u>	2~	H-	<u> </u>	·					
Magar Indox				i	_		:			
x-54,9 Hyperleptorrhine	_	—	I	I	2			33,3	20,0	10,0
55,0-69,9 Leptorrhine	5	5	2	4	16	71,4	100,0	66,7	80,0	80,0
70,0-84,9 Mesorrhine	2	_			2	28,6			_	10,0
Total	7	5	3	5	20	100,0	100,0	100,0	100,0	100,0

TOTAL 23,8 23,8 23,8 28,6 21 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 50,0 50,0 | 2 % 100,0 | 1 % 100,0 I ^{),0} 50,0 50,0 l % 25,0 25,0 25,0 25,0 % ° 100,0 1 1 % 25,0 25,0 25,0 25,0 33,3 16,7 33,3 16,7 % 'n 'n Ŋ 9 TOTAL 7 0 1 6 ∞ 7 7 9 Ŋ 4 4 163-167 Medium superior 158-162 Medium inferior Color Iris TOTAL 173-x Very tall

Katis

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TABLE XXII.

Stature

168-172 Tall

Katis	Total		57,1	38,1	8.	100,0 100,0
	· · · · · · · · · · · · · · · · · · ·			100,0	1	100,
	° 6		100,0	I	ı	100,0
	% x		100,0		1	100,0 100,0
	%		50,0	50,0	1	100,0
	% 9		100,0	1		100,0
	°°° 2			100,0		100,0
	% 4		66,7		33,3	100,0
	% E		33,3	2,99	1	100,0
	льтоТ		12	œ	-	21
	2			7	1	7
	6		-		1	-
	∞		н	Ī	1	
	7		H	-	1	7
	9		4	1	1	4
	v			H	1	-
	4		3	1	I	4
	3		7	4	1	•
TABLE XXIII.	Golor Iris	Cephalic Index	71,0-75,9 Dolichocephalic	76,0-80,9 Mesocephalic	81,0-85,4 Brachycephalic	TOTAL

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Katis

Тотаг		33,3	23,8	14,3	28,6	0,001
% o I	. 	0,001	1		I	100,0
% o		0,001	1		1	100,0
% &				0,001	1	100,0
% ٢				50,0	50,0	100,0
% 9		25,0			75,0	100,0
% 5			100,0			100,0
% 4		33,3	66,7			100,0
% E		33,3	33,3	16,7	16,7	100,0
латоТ		7	ıū	m	9	77
01		77	1	1	1	7
0		н	1	1		-
œ			1	н	1	_
7		}	I	н	ı	~
9		н	1		6	4
'n			н		1	_
4		H	7		-	4
٣		4	71	H	-	•
Color Iris	Total	79,0-83,9 Euryprosopic	84,0-87,9 Mesoprosopic	88,0-92,9 Leptoprosopic	93,0-x perleptoprosopic	Total

TABLE XXIV.

TOTAL 10,0 80,0 10,0 20 100,0 100,0 100,0 100,0 110,0 110,0 100,0 100,0 100,0 9 ļ % 100,0 % 50,0 100,0 100,0 % % 1 50,0 75,0 100,0 % 25,0 100,0 % 16 латоТ 17 7 0 œ -7 Į 17 9 1 1 S x-54,9 Hyperleptorrhine Nasal Index 55,0-69,9 Leptorrhine 70,0-84,9 Mesorrhine TOTAL Color Iris

Katis

TABLE XXV.

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CHIEF FEATURE ASSOCIATIONS

Katis

- Table 1 Stature compared with relative span shows that high statures are generally associated with long arms; medium statures likewise go with medium arms.
- Table 2 Stature compared with relative sitting height shows that subjects with less tall statures have a high relative sitting height; tall statures are generally associated with low relative sitting height.
- Table 3 Comparison of relative span and relative sitting height shows agreement to a certain extent between long arms and medium relative sitting height.
- Table 4 Trochanteric index compared with stature shows that as a general rule rather high trochanteric indices are associated with high figures for stature.
- Table 5 The correlation of the trochanteric index is not very definite; however it can be noted that high figures for the trochanteric index are generally associated with long arms.
- Table 6 Trochanteric index compared with relative sitting height shows that low figures for the index correspond to medium or high figures for the relative sitting height.
- Table 7 The relation between stature and relative shoulder breadth shows rather low figures in the whole of the series. The few subjects with a high relative shoulder breadth have medium or medium to low statures.
- Table 8 Comparison of relative shoulder breadth and relative arm span shows a certain correspondence between a high relative shoulder breadth and a medium relative arm span.
- Table 9 There is no definite association between relative shoulder breadth and relative sitting height.
- Table 10 Comparison of relative shoulder breadth with trochanteric index shows a certain tendency for high relative shoulder breadth to be associated with rather low values of the trochanteric index.
- Table 11 As regards relative bi-iliac breadth, it can be observed that medium figures for this index are associated with all degrees of stature, although higher figures accompany medium, taller and tall statures.
 - Table 12 Relative arm span is found with all values of medium bi-iliac

breadth; a tendency can be observed, however, for high values of both indices to be associated.

- Table 13 Comparison of the relative bi-iliac breadth with relative sitting height shows that the highest values in the case of the first are associated with medium high relative sitting heights.
- Table 14 Comparison of the relative bi-iliac breadth with the trochanteric index shows little of significance; it is, however, apparent that the highest trochanteric indices correspond to a medium or high relative bi-iliac breadth.
- Table 15 This table also shows no clear indication of interrelationship between diameters; the only observation to be made in respect of it is that the few cases of high relative shoulder breadth correspond to higher values for relative bi-iliac breadth.
- Table 16 In regard to stature and horizontal cephalic index, this table shows that the low figures for cephalic index, and hence «true» dolichocephaly may be associated with all statures. A clear tendency of the tallest statures to be correlated with hyperdolichocephaly is, however, apparent.
- Table 17 The relationship between the morphological facial index and stature shows that the highest facial indices undoubtedly correspond with medium, medium higher and medium lower statures.
- Table 18 The nasal index is associated in general with all classes of stature. It can be noted, however, that hyperleptorrhiny and leptorrhiny go with medium statures (higher and lower), while tall statures are associated with both medium and broad forms of the nose.
- Table 19 Nothing positive emerges from a comparison of the facial and horizontal cephalic indices, though slightly less elongated heads seem to be associated with strong leptoprosopy.
- Table 20 A study of the values of the nasal index in relation to the horizontal cephalic index leads to the observation that strongly leptorrhine noses are found to correspond to slightly less elongated head forms; higher values of the nasal index are also found in association with "true" dolichocephaly.
- Table 21 The morphological index and the nasal index show a very clear association between high values of the morphological facial index and low figures ("true leptorrhiny") of the nasal index; medium figures of the nasal index also correspond with medium face shapes.
- Table 22 Dark irises are associated with medium and very tall statures. The few cases of light irises are found in combination with the taller statures.
- Table 23 The horizontal cephalic index has no very definite relationship to the colour of the iris. Dark irises go with "true" dolichocephaly and in

ANTHROPOLOGY

a few instances with mesocephaly; the same situation is found in the case of the few light irises encountered.

Table 24 – Irises in comparison with the morphological facial index are associated as follows: darker colours appear to go only with medium faces; light irises are found with narrow faces, but also with medium faces.

Table 25 - Comparison between nasal forms and the colour of the iris gives us little information of value. Various shapes of noses can be observed associated with both light and dark irises; the few light irises, however, are found in some cases with broad noses.

NEW MEASUREMENTS OF KATIS TAKEN IN 1960

On 10th and 11th September 1960, 12 Katis were measured and examined anthropometrically at Shekande, in the Rumbur valley. The results of the elaboration of the anthropometrical data of this new Kati group do not present notable variations in comparison to those obtained for the group measured in 1955.

All subjects were between the ages of 18 (2 cases) and 40 (1 case) and in good health. They all declared to be of Kati language and of Mohammedan religion. Excepting the oldest subjects, forty year-old Yuma Gul who said he was a blacksmith, all said they were peasants.

Shekandè was birthplace, resident and parents' birthplace for all, with the exception of No. 8's mother who was a Kati from Bomberet. No pathological peculiarities were evident.

Ability to taste P.T.C. proved:

	n	%
Positive	4	33,33
Negative	8	66,67
	12	100.0

METRICAL FEATURES

Stature

According to the usual divisions we have the following figures:

	n	%
163-167	7	58,4
168-172	4	33,3
173- x	1	8,3
	I 2	0,001

Medium tall and tall statures prevail, with an incidence of very tall subjects. min. = 163.6; max. = 173.0; mean = 167.7; $\sigma = 2.79$.

Relative Span of Arms

The 12 Katis are distributed as follows:

Rumbur Katis tend to medium arm length, with a few cases of long-armed individuals.

min. =
$$100.8$$
; max. = 108.0 ; mean = 103.4 ; $\sigma = 2.12$.

Upper Extremity Index

The 12 Rumbur Katis present a poorly developed upper extremity, related to stature.

Cormic Index (Relative Sitting Height)

The usual divisions show the following figures:

	n	%
48,1-51,0	5	41,7
51,1-53,0	3	25,0
53,1-55,0	3	25,0
55,1-x	I	8,3
	12	100,0

In relation to stature, sitting height falls into medium, with a few high values.

min. =
$$50,4$$
; max. = $55,4$; mean = $51,9$; $\sigma = 1,47$.

Relative Shoulder Breadth

Frequencies are distributed as follows:

These figures show that in the Rumbur Katis shoulders tend to be broad in relation to stature.

min. = 20,0; max. = 24,3; mean = 22,4;
$$\sigma = 1,19$$
.

Relative Bi-iliac Breadth

The values obtained are divided according to the usual distribution:

The same percentage of medium and narrow pelves occurs, in relation to stature.

min. = 15,3; max. = 22,8; mean = 17,0;
$$\sigma = 2,27$$
.

Acromial-cristal Index

For this index we have the following figures:

A prevalence of pelvis over shoulders is evident.

min. =
$$67.6$$
; max. = 94.1 ; mean = 76.7 ; $\sigma = 7.89$.

Relative Chest Circumference

The values obtained for this index are distributed as follows:

No clearly prevailing tendency appears, but high values occur more frequently.

min. = 49,2; max. = 57,2; mean = 52,8;
$$\sigma = 3,84$$
.

THE VAULT OF THE HEAD

Maximum Head Length

	n	%
170-177	I	8,3
178–185	_	
186–193	4	33,3
194-x	7	58,4
	12	100,0

A majority of long and very long crania is shown.

Maximum Head Breadth

Values are distributed thus:

	n	%
x-139	I	8,3
140-147	7	58,4
148-155	4	33,3
		
	12	100,0

Narrow heads prevail, with an incidence of medium values in one-third of the cases studied.

Horizontal Cephalic Index

The individual values for the Kati series are divided as follows:

Dolichocephaly is clearly prevalent, although one-third of the cases falls into mesocephaly.

min. =
$$71,2$$
; max. = $79,1$; mean = $74,7$; $\sigma = 2,48$.

Cephalic Length-Height Index

The distribution of this index reveals the following results:

One half of the group is chamaecephalic, one quarter orthocephalic, with a few cases of hypsicephaly.

min. =
$$55.6$$
; max. = 64.6 ; mean = 58.8 ; $\sigma = 2.6$.

Cephalic Breadth Height Index

Values are divided as follows:

Kati heads are not high, related to breadth. Acrocephaly is absent.

min. =
$$72.7$$
; max. = 83.3 ; mean = 78.4 ; $\sigma = 3.21$.

Horizontal Head Circumference

Frequencies are as follows, according to the quinary table in use:

	n	%
506-510	I	8,3
511-515		_
516-520		
521-525		
526-530		
531-535		
536-540	3	25,0
541-545		_
546-550	2	16,7
551-555	_	_
556-56o	4	33,3
561-565	_	
566-570	2	16,7
	12	100,0

Although not homogeneous, distribution shows a greater frequency for higher values. The mean falls in 550,8.

Considering the three dimensions according to Giardina's index and Sera's base-lines, we obtain the following results:

	n	%
Dolicho-orthoplatycephalic	2	16,7
Dolicho-platycephalic	8	66,7
Dolicho-orthohypsicephalic	1	8,3
Dolicho-hypsicephalic	_	
Brachy-platycephalic		_
Brachy-orthoplatycephalic		
Brachy-orthohypsicephalic	I	8,3
Brachy-hypsicephalic		_
		
	12	100,0

THE KATIS

According to the triangular coordinates, frequencies are distributed thus:

	n	%
Short, broad and high heads		_
Short, narrow and high heads	I	8,3
Long, narrow and high heads	_	_
Long, narrow and low heads	7	58,4
Long, broad and low heads	3	25,0
Short, broad and low heads	I	8,3
	I 2	100,0

Both graphic distributions confirm the dolicho-platycephalic tendency of this group.

THE FACE

Morphological Facial Index

	n	%
x-78,9	2	16,6
79,0-83,9	I	8,4
84,0-87,9	4	33,3
88,0-92,9	4	33,3
93,o-x	I	8,4
	12	100,0

This series is prevalently mesoleptoprosopic, with a slight incidence of chamaeprosopy.

min. =
$$76,06$$
; max. = $95,2$; mean = $85,8$; $\sigma = 5,63$.

Cephalo-facial Index

As there are no conventional divisions for this index, we report the frequencies of the single values:

	n	%
89	I	8,3
90	I	8,3
91	—	
92		_
93	3	25,I
94		
95	I	8,3
96	4	33,4
97	I	8,3
98		
99		
100	_	_
101	I	8,3
	12	100,0

Values for this index are quite high in the Rumbur Katis, owing to the low cephalic length-breadth figures and the considerable facial breadth.

min. = 89,4; max. = 100,7; mean = 94,6;
$$\sigma = 3,22$$
.

Nasal Index

Values are divided as follows:

	n	%
x-54,9	2	16,7
55,0-69,9	7	58,3
70,0-84,9	3	25,0
	12	100,0

The series is mainly leptorrhine, but narrower forms are present, as well as broader forms.

min. =
$$50,1$$
; max. = $73,1$; mean = $61,5$; $\sigma = 7,5$.

Labial Index

The following distribution occurs:

Lips are prevalently thin, with an incidence of medium lips (25%). min. = 9,3; max. = 38,6; mean = 28,7; $\sigma = 9,7$.

DESCRIPTIVE FEATURES

Shape of Body

The form of the 12 Rumbur Katis' bodies does not fall into extreme categories:

	n	%
Robust	4	33,3
Slim	8	66,7
	12	100,0

Pilosity of Body

This is divided as follows:

	n	%
Abundant	I	8,4
Thin	5	41,6
Deficient	6	50,0
	12	100,0

These figures show the low development of the Katis' pilous system.

Beard and Moustache

	n	%
Thick	2	16,7
Thin	6	50,0
Deficient	4	33,3
	12	100.0

Likewise, beard and moustache have low values.

Hair of Form

	n	%
Straight	10	83,3
Wavy	2	16,7
	I 2	100,0

Curly hair is absent, straight hair prevails.

Eye Aperture

	n	%
Small	5	41,7
Medium	2	16,6
Large	5	41,7
	12	100.0

Eye aperture is mainly small.

Inclination of Palpebral Fissure is horizontal in 100% of subjects examined.

Nose Base

	n	%
Upturned	I	8,4
Horizontal	4	33,3
Downturned	7	58,3
	I 2	100,0

The downturned form of the nose base clearly prevails.

Nose Bridge

	n	%
Concave	I	8,3
Straight	6	50,0
Convex	5	41,7
	12	100,0

Straight noses are most frequent, but cases of convex noses occur.

Depression of Nasal Root

	n	%
Deep	I	8,3
Medium	I	8,3
Slight	10	83,4
	12	100.0

In the main, noses are slightly depressed. Nasal bones are upturned in $100^{\circ}/_{\circ}$ of cases studied.

Form of Lips

	n	%
Thin	3	25,0
Medium	9	75,0
	12	100.0

Lip form is prevalently medium.

Shape of Forehead

	n	%
Receding	6	50,0
Straight	6	50,0
		
	12	100,0

Equal frequency is found in the two classes of forehead forms.

PIGMENTATION

Colour of Hair

	n	%
U	I	8,4
\mathbf{V}	2	16,6
X	I	8,4
Y	8	66,6
	12	100.0

In the Katis of Rumbur the colour of hair is prevalently very dark. No case of white hair or baldness appears.

Colour of Skin on Forehead

	n	%
12	3	25,0
13	2	16,7
14	3	25,0
15	I	8,3
16		_
17	I	8,3
18	2	16,7
		
	12	100,0

The skin on the forehead is shown as rather light in the Katis from Rumbur. A few cases of a darker shade are present (No. 17, No. 18 of Fischer's scale).

Colour of Iris

	n	%
2	2	16,7
3	3	25,0
4	6	50,0
5 6		
6	I	8,3
	12	100,0

On the whole the iris is rather dark. Only in one case does it appear less pigmented (No. 6 of Martin's scale).

THE CHITRALS

By the term Chitrals I wish to designate the groups I measured not only in the valley of the Chitral itself — to be exact, in the capital of the State which takes its name from it — but also the inhabitants of the lower part of the valley of the river Mastuj, which, as is known, joins up with the Lutkenor and forms the Chitral or Kunar about five miles north of the capital. The stretch of the Mastuj valley considered here is about twenty miles long, and the measurements were taken in the villages of Kuzhu, Koghozi and Barenis (or Barins).

The capital of the Mastuj district is at a considerable distance from Barins, the last place in which I worked.

Though the group of individuals measured in Chitral and those measured in the other places actually belong to two geographically different regions (the first to the valley of the Kunar, the rest to the valley of the Mastuj), yet these two regions politically form part of the State of Chitral, and for this reason I have used the single denomination Chitrals to indicate the various groups taken as a whole. Furthermore, a comparative examination of the results of the anthropological investigation does not show sufficient variation between the individuals measured at Chitral and those measured in the Mastuj Valley to justify separation of the two groups. If any difference exists, it appears more marked, for example, between the individuals from Chitral and those from Khusu, the nearest village to Chitral, rather than between the former and those from Barenis who are much farther away. Hence it is difficult to attach a racial significance to such differences; they can be considered as normal group variations.

Again, in a comparison of the group of individuals measured in the Mastuj valley and those measured in Chitral, the differences between the averages of

five features (stature, relative sitting height, horizontal cephalic index and nasal index) are not statistically significant. Both groups can therefore be considered as belonging to one and the same people.

The observations on physical features available prior to the Italian Expedition to these regions were those of Sir Aurel Stein made in 1903, which were later elaborated by Joyce (1912) and Morant (1936). They relate to 22 Chitrals and 28 Mastuj.

The Chitrals, 44 in number, were measured by me at Barenis (12), Khogozi (10), Khuju (14) and Chitral (8). All had Chitral parents; their language was Chitral and their religion Mohammedan. All were peasants except one (from Chitral), who was a member of the local police force.

The age distribution of the sample now considered is:

	n	%
20-39	42	95,5
40-x	2	4,5
	44	0,001

There was no one very young and few of over 40 (only 4,5%); so they were on the whole of medium age and all were in good health.

Ability to taste P.T.C. was recorded in 43 out of the 44, with the following results:

	n	%
Positive	33	76,7
None	10	23,3
		
	43	100,0

Over three-quarters of the series, therefore, show ability to taste P.T.C.

METRICAL FEATURES

Stature

Figures for stature of the 44 Chitrals studied are divided as follows:

	n	%
x-157	4	9,1
158-162	11	25,0
163-167	20	45,5
168–172	7	15,9
173-х	2	4,5
	44	100,0

The Chitrals can thus be taken as a group which tends towards tallness of stature. The highest frequency in the series is in the medium tall statures; there is also a good frequency in tall statures, though the short and medium short subjects have percentages which are not negligible. The average falls within medium tall category of stature (163,9).

min. =
$$153,2$$
; max. = $176,0$; mean = $163,9$; $\sigma = 4,74$.

Relative Span Arms

Values for this character are as follows:

	n	%
x-99,9	13	29,5
100,0-104,9	26	59,0
105,0-109,9	5	11,5
	44	100,0

Arms are of medium length, with tendency towards shortness; there are few long ones.

min. =
$$96.3$$
; max. = 107.4 ; mean = 101.5 ; $\sigma = 2.71$.

Upper extremity Index

The divisions in use allow us to take into consideration the following percentages:

Upper extremity in relation to stature appears to be very little developed in the 44 Chitrals; the mean is rather low (39,6); variability is also not at all high ($\sigma = 1,34$).

Cormic Index (Relative Sitting Height)

Figures are as follows:

	n	%
x-48,0	I	2,3
48,1-51,0	9	20,4
51,1-53,0	26	59,1
53,1-55,0	8	18,2
		
	44	100,0

The Chitrals are mesoskelic, with almost equal percentages of macroskely and brachyskely. The extremes of hypermacroskely and hyperbrachyskely are almost completely absent.

min. = 47,9; max. = 5,6; mean = 51,8;
$$\sigma$$
 = 1,39.

Trochanteric Index

Figures are divided as follows:

Hence the lower extremity is short in relation to stature.

min. = 47,5; max. = 52,6; mean = 50,3;
$$\sigma = 1,10$$
.

Intermembral Index

This provides a measure of the relationship between the two extremities, or the intermembral index to the trochanter. The mean is very low (79,5). The variability is also slight ($\sigma = 2,87$).

Values according to the divisions in use are:

Relative Shoulder Breadth

Values are divided as follows:

Shoulders are rather broad (over 56%) and narrow shoulders are also well represented.

min. =
$$18,7$$
; max. = $24,7$; mean = $21,6$; $\sigma = 1,30$.

Relative Bi-iliac Breadth

Values are divided as follows:

	n	%
x-14,5	I	2,3
14,6–16,5	25	56,8
16,6-x	18	40,9
	44	100,0

The pelvis appears to be medium with a tendency to wideness; there is no case of a narrow pelvis. On the whole the transverse measurements of the Chitrals are rather large.

min. = 12,8; max. = 17,7; mean = 16,3;
$$\sigma = 0.76$$
.

Acromio-cristal Index

This was calculated for all the Chitrals measured and shows the following distribution:

The iliac-acromial index for the Chitrals is decidedly medium; only a little more than a third of the series is among the higher figures.

min. =
$$56,5$$
; max. = $89,5$; mean = $75,6$; $\sigma = 5,28$.

Relative Chest Circumference

Values according to the divisions in use are as follows:

	n	%
x-51	34	77,3
51-56	9	20,5
56-x	I	2,2
	44	100,0

From the above it can be concluded that the Chitral chest is small in relation to stature; cases of medium-sized chests are few.

THE VAULT OF THE HEAD

Maximum Head Length

	n	%
170-177	5	11,4
178–185	18	40,9
186–193	16	36,3
194-x	5	11,4
		
	44	100,0

The heads examined are not excessively long, although the highest frequencies occur in medium and long classes.

Maximum Head Breadth

The division is as follows and does not require comment at this stage.

	n	%
x-139	5	11,4
140-147	29	65,9
148–155	10	22,7
	44	100,0
Horizontal Cephalic Index		
	n	%
71,0-75,9	13	29,6

76,o-8o,9	20	45,4
81,0-84,9	11	25,0
	44	100,0

The horizontal cephalic index tends towards mesocephaly; examples of brachycephalic heads are present in about 1/4 of the sample, but no values are extreme in this respect.

min. =
$$71,5$$
; max. = $84,1$; mean = $78,3$; $\sigma = 3,33$.

Cephalic Lenght-Height Index

Values according to the divisions in use are:

Hypsicephaly prevails in the series, but the incidence of orthocephaly is not negligible.

min. = 57,7; max. = 70,5; mean = 64,1;
$$\sigma = 3,35$$
.

Cephalic Breadth-Height Index

Figures are as follows:

Metriocephaly is dominant in the series. However, there are also considerable percentages of tapeinocephalic and acrocephalic heads.

Horizontal Head Circumference

	n	%
486–490	I	2,3
491-495	_	_
496-500	I	2,3
501-505	3	6,8
506-510	I	2,3
511-515	4	9,1
516-520	5	11,3
521-525	4	9,1
526-530	8	18,2

531-535 536-540	7 4	15,9 9,1
541-545	6	13,6
	44	100,0

The horizontal head circumference of the Chitrals appears to be rather low. This means that, in conjunction with other data, it can be inferred that the Chitral head is of a not excessive absolute or relative length.

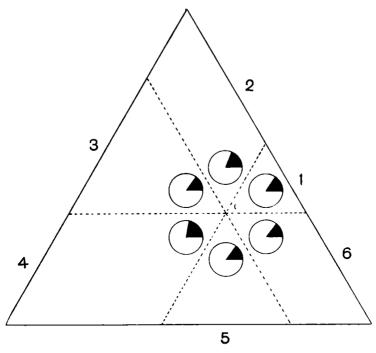
The Chitrals heads though mesocephalic have a tendency towards broadness in relation to length, and this is confirmed by the distribution of Giardina's index according to the base-lines of Sera. This provides the following percentages:

	n	%
Dolicho-platycephalic	3	6,9
Dolicho-ortho-platycephalic	9	20,4
Dolicho-ortho-hypsicephalic	10	22,7
Dolicho-hypsicephalic	3	6,9
Brachy-platycephalic	4	9,1
Brachy-ortho-platycephalic	6	13,6
Brachy-ortho-hypsicephalic	7	15,9
Brachy-hypsicephalic	2	4,5
	44	100,0

The average is dolicho-ortho-platycephalic (78,64).

According to the triangular co-ordinates, the figures for the three cephalic indexes are divided as follows:

	n	%
Short, broad and high heads	7	15,9
Short, narrow and high heads	8	18,3
Long, narrow and high heads	6	13,6
Long, narrow and low heads	10	22,7
Long, broad and low heads	6	13,6
Short, broad and low heads	7	15,9
	44	100,0



Division of head data of 44 Chitralis according to triangular co-ordinates.

1. short, broad, high head
2. short, narrow, high head
3. long, narrow, high head
6. short, broad low head
6. short, broad low head

- c. average human measurement

THE FACE

Morphological Facial Index

Values for this index according to the divisions in use are as follows:

	n	%
84,0-87,9	4	9,1
88,0-92,9	22	50,0
93,o-x	18	40,9
	44	100,0

The Chitral face is definitely long; the number of medium faces is quite negligible.

min. = 86,9; max. = 99,3; mean = 92,8;
$$\sigma = 3,15$$
.

Cephalo-Facial Index

Most of the series is distributed between the values of 79 and 98; the low figure of 70 occurring in one case is quite exceptional.

The modal values are 85 and 92, with high frequencies at 84, 88, 89, 93 and 95. On the whole the series appears to tend to rather high figures for this index, which can possibly be attributed to the narrowness of the Chitral head in comparison with the bizygomatic breadth. A remarkable fact about the Chitrals is, in fact, the narrowness of the head as has been seen from the analysis of the various cephalic indices taken separately and together. Their mesocephaly is due more to this than to head length.

The same cause influences the figures for the cephalo-facial index. These are high not because the bizygomatic breadth is considerable (and this is clearly shown from the distribution of the morphological facial index) but because that of the head is comparatively narrow.

LIIC	ncau	19	comparatively	marrow.	
				n	%
70)			I	2,3
79)			2	4,5
80)			I	2,3
81				2	4,5
82				I	2,3
83	}			2	4,5
84				3	6,9
85				4	9,1
86)			2	4,5
87	,			I	2,3
88	}			3	6,9
89)			3	6,9
90)			2	4,5
91				2	4,5
92	;			4	9,1
93	;			3	6,9
94	•			I	2,3
95	·			3	6,9
96	•			2	4,5
97	,			I	2,3
98	}			I	2,3
			_	44	100,0

Nasal Index

The available values are divided as follows:

	n	%
x-54,9	5	11,4
55,0-69,9	32	72,7
70,0-84,9	6	13,6
85,0-99,9	1	2,3
	44	100,1

The series is clearly leptorrhine, but side by side with some cases of hyperleptorrhiny there are a few cases of mesorrhiny and also of platyrrhiny.

min. =
$$49.2$$
; max. = 93.2 ; mean = 62.7 ; $\sigma = 6.08$.

Labial Index

This is divided into the following categories:

	n	%
x-35,5	34	77,3
35,6-49,5	10	22,7
		-
	44	100,0

For the most part the Chitral lips are thin with a certain percentage of thick.

min. = 10,0; max. 42,2; mean = 28,6;
$$\sigma = 7,67$$
.

DESCRIPTIVE FEATURES

Shape of Body

In the individuals examined divisions are as follows:

	n	%
Delicate	10	22,7
Robust	2	4,6
Slim	32	72,7
	44	100.0

About three quarters of the series have a slim build, almost a quarter are delicate, and only 4.6% robust.

Pilosity of Body

This is divided as follows:

	n	%
Abundant	5	11,4
Medium	3	6,8
Thin	4	9,1
Deficient	32	72,7
	44	100,0

The greater part of the subjects examined are deficient in body hair; there is a small percentage of those with abundant pilosity. Medium and thin quantities of body hair are negligible.

Beard and Moustache

Division is as follows:

	n	%
Thick	5	11,4
Thin	26	59,1
Deficient	13	29,5
		
	44	100,0

ANTHROPOLOGY

Thin beard and moustaches are in a majority; thick ones are associated with individuals having abundant body hair. A fair percentage are deficient in facial hair.

Hair form

The custom among the Chitrals of cutting the hair very short has lead to some difficulty in determining the incidence of this feature.

	n	%
Straight	16	43,2
Wavy	16	43,2
Curly	5	13,6
	37	100,0

Both straight and wavy hair are well represented. The existence of a small percentage of subjects with curly hair is a fact of interest.

Eye Aperture

The three divisions adopted have the following frequencies:

	n	%
Small	6	13,6
Medium	10	22,7
Large	28	63,7
		
	44	100,0

The eye aperture is large; the number of medium and small apertures is low.

Inclination of Palpebral Fissure

The two divisions have the following frequencies:

	n	%
Horizontal	34	77,3
Oblique	10	22,7
	44	100,0

More than three-quarters of the individuals have a horizontal eye aperture. The oblique line represents less than 25% of the sample. Two individuals have almond-shaped eyes, one with horizontal (16), the other with oblique aperture (35).

Nose Base

The divisions for this feature have the following frequencies:

	n	%
Upturned	I	2,3
Horizontal	31	70,4
Downturned	12	27,3
	44	100,0

In the main, the base of the nose is horizontal; there is a fair percentage of downturned noses, and only a single case of an upturned one (31).

Nose Bridge

Division is as follows:

	n	%
Concave	2	4,5
Straight	27	61,4
Convex	15	34,1
•	44	100,0

The straight nose bridge is strongly prevalent; the convex bridge is also well represented, and the concave hardly present.

Depression of Nasal Root

The following divisions occur:

	n	%
Deep	4	9,1
Medium	6	13,6
Small	24	54,6
Absent	10	22,7
	44	100,0

The depression of the nasal root is small; the next figure is that of absent; while the percentages of medium and deep depressions are low.

Nasal Bones

These are prominent in 100% of cases.

Form of the Lips

The three divisions furnish the following percentages:

	n	%
Thin	12	27,3
Medium	20	45,4
Thick	12	27,3
	44	100,0

The lips are mostly medium, but there are also a fair percentage of thin and thick lips, the last class being the smallest.

Development of supraorbital Ridges

	n	%
Medium	I	2,3
Light	8	18,1
Absent	35	79,6
	44	100.0

Supraorbital development is hardly accentuated at all in the series examined.

Shape of Forehead

Divisions are as follows:

	n	%
Receding	11	25,0
Medium	I	2,3
Straight	32	72,7
		
	44	100,0

The forehead is straight in about 75,0 per cent of individuals examined; in the remainder it is receding except in one case where it is medium.

PIGMENTATION

Colour of Hair

	n	%
V	2	4,5
W	4	9,1
X	13	29,6
Y	25	56,8
	44	100,0

The class Y shows the highest frequency, but X is well represented while W and V are negligible.

ANTHROPOLOGY

Colour of the Skin on the Inner Side of the Upper Arm

According to the divisions of the Von Luschan scale, we have the following figures:

	n	%
10	6	13,6
II	13	29,6
12	15	34,1
13	4	9,1
14	3	6,8
15	I	2,3
16	2	4,5
	44	100,0

The modal values are Nos. 11 and 12. The lighter No. 10 also occurs with a fair frequency but darker shades are rare.

Colour of Skin on Forehead

This is shown according to the following scheme:

	n	%
12	13	29,6
13	13	29,6
14	13	29,6
15	4	9,0
16	_	_
17		
18	I	2,2
		
	44	100,0

The greatest frequencies are found in the lower and lighter categories of the Von Luschan scale. Darker skins are infrequent.

Colour of Iris

The divisions follow the order of the Martin scale. As can be noted, the highest frequencies are at Nos. 3, 4 and 5, with a strong prevalence, however, at No. 4. The numbers corresponding to darker and lighter colours are not well represented.

	n	%
2	I	2,3
3	8	18,2
4	20	45,4
5	8	18,2
5 6	2	4,5
7	4	9,1
8	1	2,3
	44	100,0

Relative Span Arms	x — 99,9 Short arms	100,0 — 104,9 Medium arms	105,0—109,9 Long arms	TOTAL	6'66-x	% 100,0—104,9	%	TOTAL
Stature			} [[
x-157 Short	2	I	I	4	15,4	3,8	20,0	9,1
158-162 Medium inferior	3	8		11	21,5	30,7		25,0
163-167 Medium superior	7	11	2	20	53,8	42,4	40,0	45,5
168-172 Tall		5	2	7	_	19,3	40,0	15,9
173-x Very tall	1	I	<u></u>	2	7,7	3,8	_	4,5
Total	13	26	5	44	100,0	100,0	100,0	100,0

TABLE II.

Relative Sitting Height	Hypermacro.	191	8	<u>\$</u>	Тотаг	%	%	%	%	Total
	Нуре	Macr 48,1	Mes 51,1	Bracl 53,1	T	x-48,0	48,1-51,0	51,1-53,0	53,1-55,0	
Stature		!								
x-157 Short	I	I	I	I	4	100,0	11,2	3,8	12,5	9,1
158-162 Medium inferior	_	2	6	3	11	_	22,2	23,1	37,5	25,0
163-167 Medium superior		4	13	3	20	_	44,4	50,0	37,5	45,5
168-172 Tall	-	2	5	_	7		22,2	19,2	_	15,9
173-x Very tali	_	_	I	I	2			3,8	12,5	4,5
Total	1	9	26	8	44	100,0	100,0	100,0	100,0	100,0

Relative Sitting Height	Hypermacro.	Macroskelic 48,1 — 51,0	Mesoskelic 51,1 — 53,0	Brachyskelic 53,1 — 55,0	Тотаг	% x-48,0	% 48,1-51,0	51,1+53,0	% 53,1-55,0	Тотаі.
Relative Span Arms									· •	
x-99,9 Short arms	-	3	5	5	13	_	33,3	19,2	62,5	29,6
100,0-104,9 Medium arms	1	5	17	3	26	100,0	55.5	65,4	37,5	59,1
105,0-109,9 Long arms	_	I	4	_	5	_	11,2	15,4	_	11,3
Total	1	9	26	8	44	100,0	100,0	100,0	100,0	100,0

TABLE IV.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	% x-51,9	% 5 2,0– 54,9	TOTAL
Stature		:				· !
x-157 Short	3	! : I	4	7.9	16,7	9,1
158-162 Medium inferior	10	I	11	26,3	16,7	25,0
163-167 Medium superior	18	2	20	47,4	33,3	45,5
168-172 Tall	5	2	7	13,1	33,3	15,9
173-x Very tall	2		2	5,3		4,5
TOTAL	38	6	44	100,0	100,0	100,0

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	% x-51,9	5 2,0 –54,9	TOTAL
Relative Span Arms			· !			
x-99,9 Short arms	13	_	13	34,3	_	29,5
100,0-104,9 Medium arms	22	4	26	57,8	66,7	59,0
105,0-109,9 Long arms	3	2	5	7,9	33,3	11,5
Total	38	6	44	100,0	100,0	100,0

TABLE VI.

Trocantheric Index	x — 51,9 Short legs	52,0 — 54,9 Medium legs	TOTAL	% x-51,9	% 5 2,0 –54,9	TOTAL
Relative Sitting Height						
x-48,0 Hypermacroskelic	I	<u> </u>	1	2,6	_	2,3
48,1-51,0 Macroskelic	8	I	9	21,0	16,7	20,4
51,1-53,0 Mesoskelic	21	5	26	55,4	83,3	59,1
53,1-55,0 Brachyskelic	8		8	21,0		18,2
Total	38	6	44	100,0	100,0	100,0

	Z. Y	× δ				
Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	% x-21,5	% 21,6-x	TOTAL
Stature		:				
x-157 Short	I	3	4	5,2	12,0	9,1
158-162 Medium inferior	7	4	11	36,8	16,0	25,0
163-167 Medium superior	5	15	20	26,4	60,0	45,5
168-172 Tall	5	2	7	26,4	8,0	15,9
173-x Very tall	I	I	2	5,2	4,0	4,5
Total	19	25	44	100,0	100,0	100,0

TABLE VIII.						Chitrals
Acromial Index	x — 21,5 Narrow shoulders 21,6 — x Large shoulders		TOTAL	% x-21,5	% 21,6-x	TOTAL
Relative Span Arms					:	
x-99,9 Short arms	6	7	13	31,6	28,0	29,6
100,0-104,9 Medium arms	11	15	26	57,9	60,0	59,1
105,0-109,9 Long arms	2	3	5	10,5	12,0	11,3
Total	19	25	44	100,0	100,0	100,0

Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	% X-21,5	% 21,6–x	TOTAL
Relative Sitting Height						
x-48,0 Hypermacroskelic		1	1		4,0	2,3
48,1-51,0 Macroskelic	4	5	9	21,0	20,0	20,4
51,1-53,0 Mesoskelic	13	13	26	68,5	52,0	59,1
53,1-55,0 Brachyskelic	2	6	8	10,5	24,0	18,2
Total	19	25	44	100,0	100,0	100,0

TABLE	X.
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Acromial Index	x — 21,5 Narrow shoulders	21,6 — x Large shoulders	TOTAL	% x-21,5	% 21,6-x	TOTAL
Trocantheric Index						
x-51,9 Short legs	17	21	38	89,5	84,0	86,4
52,0-54,9 Medium legs	2	4	6	10,5	16,0	13,6
Total	19	25	44	100,0	100,0	100,0

Bi-iliac Index	x — 14,5 Narrow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	TOTAL	% x-14,5	% 14,6–16,5	%	TOTAL
Stature								
x-157 Short	_	3	ı	4		12,0	5,6	9,1
158-162 Medium inferior	_	6	5	11	_ _	24,0	27,8	25,0
163-167 Medium superior	I	13	6	20	100,0	52,0	33,2	45,5
168-172 Tall	_	2	5	7	_	8,0	27,8	15,9
173-x Very tall	_	I	I	2		4,0	5,6	4,5
Total	1	25	18	44	100,0	100,0	100,0	100,0

TABLE XII.

Bi-iliac Index	x — 14,5 Narrow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	Total	% x-14,5	% 14,6–16,5	% 16,6–x	TOTAL
Relative span arms								
x-99,9 Short arms	I	12 	:	13	100,0	48,0	-	29,6
100,0-104,9 Medium arms	_	11	15	26		44,0	83,3	59,1
105,0-109,9 Long arms	—	2	3	5	-	8,0	16,7	11,3
Total	1	25	18	44	100,0	100,0	100,0	100,0

Bi-iliac Index	x — 14,5 Nartow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	TOTAL	% x-14,5	% 14,6–16,5	% 16,6-x	TOTAL
Relative Sitting Height								
x-48,0 Hypermacroskelic	_	I	 	1		4,0	_	2,3
48,1-51,0 Macroskelic	_	5	4	9		20,0	22,2	20,4
51,1-53,0 Mesoskelic	I	12	13	26	100,0	48,0	72,2	59,1
53,1-55,0 Brachyskelic	_	7	I	8		28,0	5,6	18,2
Total	1	25	18	44	100,0	100,0	100,0	100,0

TABLE XIV.

Bi-iliac Index	x — 14,5 Narrow pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	Total	% x-14,5	% 14,6–16,5	% 16,6-ж	TOTAL
Trocantheric Index					!			
x-51,9 Short legs	I	24	13	38	100,0	96,0	72,2	86,4
52,0-54,9 Medium legs		I	5	6		4,0	27,8	13,6
Total	1	25	18	44	100,0	100,0	100,0	100,0

								Cintrai
Bi-iliac Index	x — 14,5 Nаттоw pelvis	14,6 — 16,5 Medium pelvis	16,6 — x Large pelvis	Total	% ¥-14,5	% 14,6–16,5	% 16,6–x	TOTAL
Acromial Index					i i			
x-21,5 Narrow shoulders	_	11	8	19	_	44,0	44,4	43,2
21,6-x Large shoulders	I	14	10	25	100,0	56,0	55,6	56,8
TOTAL	1	25	18	44	100,0	100,0	100,0	100,0

TABLE XVI.

Cephalic Index	71,0 — 75,9 Dolicho- cephalic	76,0 — 80,9 Mesocephalic	81,0 — 85,4 Brachy- cephalic	TOTAL	% 71, 0- 75,9	% 76,0–80,9	% 81,0–85,4	TOTAL
Stature								
x-157 Short	2	1	I	4	15,4	5,0	9,1	9,1
158-162 Medium inferior	3	5	3	11	23,1	25,0	27,3	25,0
163-167 Medium superior	5	8	7	20	38,5	40,0	63,6	45,5
168-172 Tall	2	5	_	7	15,4	25,0	_	15,9
173-x Very tall	I	I	_	2	7,6	5,0		4,5
Total	13	20	11	44	100,0	100,0	100,0	100,0

Total Facial Index	84,0 — 87,9 Meso- prosopic	88,0 — 92,9 Lepto- prosopic	93,0 — x Hyper- leptoprosopic	Total	% 84,0–87,9	% 88,0-92,9	% 93, 0 –x	TOTAL
Stature								
x-157 Short	ı	2	I	4	25,0	9,1	5,5	9,1
158-162 Medium inferior	_	4	7	11		18,2	38,9	25,0
163-167 Medium superior	3	11	6	20	75,0	50,0	33,4	45,5
168-172 Tall	_	4	3	7		18,2	16,7	15,9
173-x Very tall		1	I	2		4,5	5,5	4,5
Total	4	22	18	44	100,0	100,0	100,0	100,0

TABLE XVIII.

									_	
Nasal Index	Hyperleptor. x — 54,9	Leptorrhine 55,0 — 69,9	🖺	Chamaerrhine 85,0 — 99,9	Тотаг	% x-54,9	% 55,0—69,9	% 70,0–84,9	% 85,0-99,9	Total
Stature										
x-157 Short	-	3	1	-	4	_	9,3	16,7	-	9,1
158-162 Medium inferior	-	10	ī	_	11		31,2	16,7	_	25,0
163-167 Medium superior	4	13	2	1	20	80,0	40,8	33,3	100,0	45,5
168-172 Tall	I	4	2	_	7	20,0	12,5	33,3	_	15,9
173-x Very tall	-	2	_	_	2	<u> </u>	6,2	_		4,5
Total	5	32	6	1	44	100,0	100,0	100,0	100,0	100,0

Total Facial Index	84,0 — 87,9 Meso- prosopic	88,0 — 92,9 Lepto- prosopic	93,0 — 99,9 Hyper- leptoprosopic	Total	% 84,0–87,9	% 88,0–92,9	% 93,0-99,9	TOTAL
Cephalic Index		:				i		
71,0-75,9 Dolichocephalic	I	3	9	13	25,0	13,5	50,0	29,6
76,0-80,9 Mesocephalic	I	12	7	20	25,0	54,6	38,9	45,4
81,0-85,4 Brachycephalic	2	7	2	11	50,0	31,9	11,1	25,0
Total	4	22	18	44	100,0	100,0	100,0	100,0

TABLE XX.

Nasal Index	Hyperleptor.	Leptorrhine 55,0 — 69,9	탕	ae	Total	% x-54,9	% 55,0-69,9	% 70,0-84,9	% 85,0-99,9	Total
Cephalic Index		<u> </u>								
71,0-75,9 Dolichocephalic	I	11	I		13	20,0	34,4	16,7	_	29,6
76,0-80.9 Mesocephalic	4	13	3	. —	20	80,0	40,6	50,0	_	45,4
81,0-85,4 Brachycephalic	ļ —	8	2	I	11	_	25,0	33,3	100,0	25,0
Total	5	32	6	1	44	100,0	100,0	100,0	100,0	100,0

Total Facial Index	83,0 — 87,9 Meso- prosopic	88,0 — 92,9 Lepto- prosopic	93,0 — x Hyper- leptoprosopic	Total	% 83,0-87,9	% 88,0–92,9	% 93, 0 –x	TOTAL
Nasal Index								
x-54,9 Hyperleptorrhine	I	2	2	5	25,0	9,1	11,1	11,4
55,0-69,9 Leptorrhine	I	17	14	32	25,0	77,3	77,8	72,7
70,0-84,9 Mesorthine	I	3	2	6	25,0	13,6	11,1	13,6
85,0-99,9 Chamaerrhine	I			1	25,0		<u> </u>	2,3
Total	4	22	18	44	100,0	100,0	100,0	100,0

Chitrals	Тотаг		9,1	25,0	45,5	15,9	4,5	100,0
	% wo		1	100,0	ı	1	ı	100,0
	% ^		25,0	25,0	25,0	25,0	1	100,0
	% 9		ı	50,0	ı	50,0		100,0
	% %		I	37,5	62,5		1	100,0
	% 4		10,0	20,0	55,0	5,0	10,0	100,0
	% €		12,5	12,5	37.5	37.5	1	100,0
	% "		1	I	I	100,0	1	100,0
	латоТ		4	11	20	7	7	44
	œ		ĺ	Ħ	1	ı	1	=
	7		H	н	н	H	ī	4
	9			H	1	Н	1	7
	Ŋ		1	8	N	l	1	x
	4		7	4	11	н	7	20
			н	H	6	т.		x 0
	- 70				 	H		-
TABLE XXII.	Color Iris	Stature	x-157 Short	158-162 Medium inferior	163-167 Medium superior	168-172 Tall	173-x Very tall	Тотаг

I

TOTAL 9,62 45,4 25,0 1 | 44 || 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 100,0 Ì % 75,0 25,0 ١ % 100,0 1 -% 25,0 50,0 25,0 % 40,0 20,0 40,0 % 12,5 % 100,0 1 % латоТ 13 20 1 00 3 7 ~ 9 4 4 œ 7 Ŋ ∞ 00 20 7 œ ~ -] 17 Cephalic Index 71,0-75,9 Dolichocephalic 81,0-85,4 Brachycephalic 76,0-80,9 Mesocephalic Color Iris

Chitrals

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TABLE XXIII.

I_	-	_	_		-					Chitrals
4 5 6		∞ латоТ	% 4	% r	% 4	% s	% •	% ^	% ∞	Тотаг
I - 3		4		12,5	15,0		[ļ		9,1
- 5 10 5 1	H			62,5	50,0	72,5	50,0	25,0		50,0
1 2 7 3 1	8	1 18	100,0	25,0	35,0	27,5	50,0	75,0	100,0	40,9
1 8 20 8 2	4	1 44	100,0	100,0 100,0 100,0 100,0 100,0 100,0	0,001	100,0	100,0	100,0	100,0	100,0

TOTAL 11,4 72,7 13,6 2,3 1 | 44 || 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 100,0 1 % **%** 50,0 25,0 25,0 ١ % 75,0 100,0 ١ Ì ۱ % 25,0 1 1 % 80,0 5,0 0,01 5,0 % 62,5 25,0 12,5 1 % 100,0 1 -% 4 9 'n 32 латоТ l 1 00 4 ļ ~ | 13 9 1 9 œ S 91 8 20 4 S 7 00 6 I ļ TOTAL x-54,9 Hyperleptorrhine 85,0-99,9 Chamaerrhine Nasal Index 55,0-69,9 Leptorrhine 70,0-84,9 Mesorrhine Color Iris TABLE XXV.

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CHIEF FEATURE ASSOCIATIONS

- Table 1 Stature compared with relative arm span shows medium short arms to be associated with tall statures; long arms correspond to medium tall and tall statures.
- Table 2 Relative sitting height compared with stature shows a general tendency for all statures to be associated with mesoskely, while brachyskely is found together with small and medium stature.
- Table 3 A comparison of relative arm span and relative sitting height shows that a medium relative sitting height is associated with all classes of arms, but a high relative sitting height accompanies short and medium arms.
- Table 4 The trochanteric index considered in relation to stature shows that low figures for it correspond to all degrees of stature. A few cases of slightly higher trochanteric indices are found in association with medium tall and tall statures.
- Table 5 Comparison of the trochanteric index and relative arm span shows nothing noteworthy; low figures for the trochanteric index are associated with all arms. A few higher figures are found among medium arms.
- Table 6 Comparison of the trochanteric index with relative sitting height shows, as for the stature, that a low trochanteric index is associated with all classes of relative sitting height. Instances of a high trochanteric index are found to be related to pure mesoskely.
- Table 7 Comparison of stature and relative shoulder breadth shows that the tallest statures are those of subjects with narrow shoulders, while medium and small statures are found associated with broad shoulders.
- Table 8 A comparison of relative span and relative shoulder breadth shows that low values for relative span are related to narrow shoulders.
- Table 9 Comparison of relative sitting height and relative shoulder breadth shows a concentration of wide shoulders in relation to taller relative sitting height.
- Table 10 Division of the trochanteric index in comparison with relative shoulder breadth shows that the few high figures for the trochanteric index correspond to wide shoulders.
- Table II Comparison of relative bi-iliac breadth and stature shows agreement between low figures for bi-iliac breadth and both very small and medium

small statures. Medium tall, tall and very tall statures are associated with higher figures for relative bi-iliac breadth.

- Table 12 Relative span compared with relative bi-iliac breadth shows that the higher figures for relative bi-iliac breadth correspond with high figures for span.
- Table 13 Relative bi-iliac breadth compared with relative sitting height shows that the higher figures for the first correspond with the figures for meso- and brachyskely.
- Table 14 As regards the trochanteric index and bi-iliac breadth, there is an association between less low bi-iliac breadths and higher trochanteric indices.
- Table 15 Comparison of relative shoulder breadth and trochanteric index shows nothing worthy of note.
- Table 16 Stature considered in relation to cephalic index shows an association between tall and very tall statures and rather narrow head forms (dolichocephaly). Broader heads go with medium (taller and lower) and small statures.
- Table 17 From this table can be noted the agreement between the few medium facial indices and small and medium tall statures. In the rest of the series the facial index is distributed without any special association with stature.
- Table 18 Narrower nose shapes (hyperleptorrhiny) correspond to medium tall and tall statures. True leptorrhiny is found without distinction in all classes of stature. Mesorrhiny, however, is found with both medium and small statures. The single case of chamaerrhiny is among the medium tall statures.
- Table 19 True dolichocephaly is associated with long faces. Less high facial indices go with rather higher cephalic indices.
- Table 20 The distribution of true leptorrhiny shows that it is associated with all forms of head; hyperleptorrhiny goes more with medium and narrow head forms; mesorrhiny and the single case of chamaerrhiny go with broader head forms.
- Table 21 Comparison of the nasal and facial indices affords no useful information. However, it can be observed that both narrow medium forms of face occur in conjunction with all shapes of nose. The case of single chamaerrhiny is associated with a mesoprosopic face.
- Table 22 Stature considered in relation to the colour of the iris shows a good correspondence between dark colours of the iris and medium low and small statures. In the case of tall and medium tall statures the iris is light.

THE CHITRALS

Table 23 – This table shows that all but dark irises are associated with every class of cephalic index; a few light colours can be observed in relation to narrow head forms.

Table 24 - Narrow forms of face are associated with all colours of iris. However, there are some dark shades with medium faces indices and the lightest are associated with hyperleptoprosopic subjects.

Table 25 – Leptorrhiny goes indifferently with all colours of iris. It can be noted, however, that the darker shades go with mesorrhiny. The cases of hyperleptorrhiny accompany rather lighter shades of iris.

CONCLUSIONS

We shall now proceed to sum up the basic characteristics of each of the groups studied in the Chitral, and bring into evidence any eventual differences between the results obtained in 1955 and 1960, in order to make a short comparison between the previously mentioned groups.

THE KALASH. The Kalash whom I measured in 1955 and 1960 in the Bomberet, Rumbur and Birir valleys, (this region covers the whole territory inhabited by the Kalash), are for the majority of average stature (50%) with emphasis on above average stature of 30%. There is also a high percentage (31,7%) of tall stature (from 168 cms to 176 cms) and a low percentage (18,3%) of short stature below 158 cms. If we compare these data with those published by Guha in respect of the research he made on the subject in 1929, it may be seen that an evident difference exists between our data and his, as has already been mentioned on page 68. According to Guha "the majority of the people vary from a short to medium stature, only 8% have a stature of over 170 cms i.e. tall" (1). This difference cannot be attributed to errors in the taking of measurements, which should be excluded for obvious reasons, neither is it due to immigration — during the last thirty years — of foreign elements from bordering territories who are exclusively Moslems as the Kalash are a small community, completely isolated from a religious point of view and form a small ethnical polytheistic island. The most convincing explanation is that attributed to a natural process of increase in stature which is also apparent in the new generations of many other races and peoples of the world.

The Kalash are for the greater part (45%) macroskelic with a good number (33,3%) of meso-macroskelics. The measurements taken in 1960 have

⁽¹⁾ Guha, 1938, p. 250.

brought about an increase in our series of machroskelics, in respect of the data obtained in 1955 (37,5% macro and 40% meso). Only 11,7% are at the limit of brachyschelics (maximum 53,7%).

They have a greater percentage of average arms; however long arms are present in 36,7%. Also in this case the measurements taken in 1960 have shown an increase in the percentage of the average length since measurements were taken in 1955. The shoulders are large in the majority of individuals (87,5%) and the average pelvis is large, whilst the chest is not greatly developed. On the whole the majority of Kalash are of slender build (51,7%); delicate build in 15% of the cases referred to and sturdy build in a further 15%. 18,3% were stockily built.

We shall now make a short examination of the principal metric characteristics of the head; it may be noted that the highest percentage (83,3%) are dolichocephalic, 13,3% are hyper-dolichocephalic; 16,7% mesocephalic, complete absence of brachycephals. These data agree with those of Guha who recorded a cephalic index for the majority of 71 and 75 (1).

The great majority of Kalash (63,4%) are leptoprosopic but 20% are medium index and a smaller percentage (16,6%) are chamaeprosopic. These data appear to be in agreement with those obtained by Guha, who does not quote the index value but states as follows, "in the majority (of Kalash) the facial form is longish and persons with a round face are very small" (2).

The nose is always well marked. However the highest percentage is leptorrhine (83,4%) but 6,7% of the former percentage are hyperleptorrhine; only 15% are mesorrhine. There was only one case of a chamaerrhine nose.

Our observations conform with those of Guha who considers dominant, in all the tribes of the Chitral, the leptorrhine nose (3). However a certain difference exists between our data and those of Guha regarding the percentage of straight noses; Guha quotes the following ratio: 70% straight and 30% curved (4). The individuals that I examined had straight noses for 51,7%, curved noses 43,3% and 5% had concave noses.

The Kalash have medium shaped lips (70%) and thin lips (23,3%), only 6,7% of the individuals I examined had thick lips. The supraorbital conformation is slight in 57,5% of the cases examined and absent in 42,5%. The eye aperture is large in 50% and medium in 35%: the percentage of palpebral

⁽¹⁾ Guha, 1938, p. 251.

⁽²⁾ Guha, 1938, p. 252. (3) Guha, 1938, p. 252. (4) Guha, 1938, p. 254.

aperture is 15% which conforms with Guha's observations (1). I was unable to find the epicanthic fold which Guha found in 6% of the males examined. I remember having seen only one Kalash woman whom I was unable to photograph, with obvious mongoloid eyes.

All the Kalash whom I examined were fair skinned, the highest percentage (61,6%) of group II, Von Luschan (nos. 12-14), 31,7% were Group III and 6,7% Group I (nos. 10, 11), very fair skinned. These annotations more or less correspond to those of Guha, who grouped the Kalash as follows: 84% in the groups "rosy white" and "sallow white" (2). The colour of the eyes for the greater majority are brown or dark brown (nos. 3 and 4 Martin) (58,3%), but there are also lighter coloured eyes from hazel (nos. 5 and 6) (18,3%) to green (nos. 7 and 8) (15%) and dark grey (no. 9) (1,7%). Also Guha's data, which are very brief (3), conform more or less with ours.

To conclude this brief synthesis of chromatic characteristics it should be stated that all the Kalash I examined had brown-black hair, W — Y of the Martin – Saller scale with a maximum frequency of Y (78,4%). Also Guha notes only black and dark brown hair with a small percentage (12%) of light brown hair.

THE KATIS. The Katis whom I measured in 1955 and 1960 in the three villages which they inhabit in Chitral, namely: Brumbutul and Shekandè in the Bomberet Valley and Kunisht in the Rumbur Valley, are generally of average height (51,5%) but there is a large percentage (48,5%) of tall statures (from 168 to 170 cms). I did not encounter any individuals of small stature. In comparing these data with those of Guha, it may be noted that Guha's measurements indicate a small percentage (11%) of short statures amongst the Katis. It may be established that there is an increase in the stature of the Katis I measured in comparison with the generation of Katis which Guha measured thirty years before.

The Katis are for the greater majority mesoskelic (45,5%) with a good percentage of macroskelia (39,3%). There are also 15,2% of brachyskelics. The measurements taken in 1960 have brought about an increase in the series, of brachyskelics, and a diminuition of mesoskelics, in comparison with the measurements taken in 1955.

⁽¹⁾ Guha, 1938, p. 254.

⁽²⁾ Guha, 1938, p. 257.

⁽³⁾ Guha, 1938, p. 257.

Most of the Katis have arms of average length (54,5%) but there is a large percentage of long arms (30,4%). Also in this case the measurements taken in 1960 show an increase in the percentage of average arm length in comparison with the measurements taken in 1955.

The bodily structure of the Katis is as follows: 58,1% of slender build; 25,8% of sturdy build and 16,1% thin or weakly built.

The principal metric characteristics of the head form show that the greater majority (60,6%) are dolichocephalics and 36,3% are mesocephalics. I noted only one brachycephalic (3,1%). Guha's measurements show a majority of indices between 72 and 76 (1). The majority of Katis have orthocephalic heads (48,5%) but there is a fair percentage of hypsicephalics (27,2%) and chamaecephalics (24,3%). The majority are leptoprosopics (42,4%) but there is also a good percentage of mesoprosopics (27,2%) and chamaeprosopics (30,4%).

The Katis have a tendency to rounder faces in comparison with the Kalash. This fact was noted by Guha who observed "on the whole perhaps the Kalash and Pathan possess a slightly longer face" (2).

The nose is for the highest percentage (about the same as the Kalash) leptorrhine (84,3%) with a prominent bone structure and, as in the Kalash, the highest percentage have straight noses (54,6%) whilst 36,4 have curved noses and 9% have concave noses. Also in this case our data correspond with those of Guha regarding the index but not for the profile, as this author states that he found 72% with straight noses and 28% with curved noses (3). I do not know if this slight difference is due to a different manner of evaluating the shape of the nose based on an individual point of view of the observer.

The Katis have average lips for 63,7%; thin lips (27,3%); thick lips are rare (9%). The supraorbital formation is for the majority slight (44,4%) but there is a good percentage of strong accentuation (38,9%). In 16,7% of the individuals measured the supraorbital formation is absent. The Kalash did not show the supraorbital formation to any marked degree. The palpebral aperture is large (46,2%) or average (33,3%); less frequently small (20,5%) and rectilinear in the majority of individuals (84,4%); slanting eyes are few (15,6%). Guha also found that the majority of the Katis had horizontal eyes (96%) and very few slanting eyes (4%) (4). However, as amongst the Kalash,

⁽¹⁾ Guha B. S., 1938, p. 251. (2) Guha B. S., 1938, p. 252. (3) Guha B. S., 1938, p. 254. (4) Guha B. S., 1938, p. 257.

Guha found amongst the Katis a small percentage of epicanthic folds (3%) which were not present amongst the individuals that I measured.

The Katis whom I examined were fairskinned (94%), with a greater majority (75,8%) of Group II Von Luschan (nos. 12-14) and a small percentage (6%) group IV (no. 18). There is therefore a tendency to darker skin than the Kalash. This is borne out by Guha's observations of the Katis: 68% are rosy white or sallow white whilst 11% are light brown; 19% brown and 2% dark brown.

It should be noted that Guha found amongst the Kalash only 2% brown and no dark brown skins.

The greatest majority of Katis 33,5% have dark brown eyes (nos. 2, 3 Martin) 30,4% have brown eyes (no. 4); 17,9% have hazel eyes (nos. 5, 6). Greenish eyes (nos. 7, 8) and dark grey eyes (nos. 9, 10) are found in 9,1%. Also in both cases there is a certain tendency towards dark eyes amongst the Katis and this is borne out by Guha.

As for the Kalash the colour of the Katis'hair whom I examined is in the brown-black group (x-y of the Martin-Saller scale) with a maximum frequency in "y" (50%). None of the 32 individuals whom I examined had blonde hair, nor do I remember having seen any fair haired individuals during my stay amongst the Katis. This fact may seem very strange if one bears in mind that Guha found 18% of blondes and 1% of redheads amongst this same group. On the other hand the existence of fair haired individuals amongst the Kafirs has been commented on by observers both before and after Guha. Stein (1) mentions that he found 28% of blondes amongst the Kafirs and Biddulph mentions the existence of blondes amongst the Red Kafirs of the Hindu-Kush (2). Robertson also states (3) that 1% of the Red Kafirs have fair hair. Voigt mentions 31% of the Eastern Kafirs are fair haired whilst 68% of the Western Kafirs and 52% of the Central Kafirs are also fair haired (4). These percentages leave one slightly in doubt.

I am unable to explain the complete absence of fair haired individuals amongst the Katis whom I examined; maybe this fact could be related to an effective diminuition of fair haired individuals during the last thirty years amongst these tribes.

THE CHITRALS. I report herewith the metric data and basic description of the 44 Chitrals whom I measured in 1955 in Chitral and Mastuj. The majority (70,5%)

⁽¹⁾ Stein A., 1921, pp. 138-88.

⁽²⁾ Biddulph J., 1880, p. 128.

⁽³⁾ Robertson G. S., 1900, p. 170.

⁽⁴⁾ Voigt M., 1933, p. 60.

were of average height, with an accentuation of above average height (45,5%); a relevant percentage of tall stature (20,4%) and only 9,1% of short stature (less than 158 cms). The majority are mesoskelic (59,1%), with a good percentage of macroskelics (22,7%) and a fair percentage of brachyskelics (18,2%). The average arm length is noted in 59,1%; however there is a good percentage of short arms (29,6%) and a small percentage of long arms (11,3%). The majority are of slender build (72,7%) although 22,7% are thin.

The Chitrals are for the greater part mesocephalic (45,4%) but there is a relevant percentage of dolichocephaly (29,6%) and 25% of brachycephaly. There is a great difference between the Chitrals and the Kalash and Katis as brachycephaly is almost absent amongst the latter (I found one case amongst the Katis I examined). Dolichocephaly was present amongst the majority of Kalash (86,7%) and (60,6%) amongst the Katis. The Chitrals are for the great majority (68,2%) hypsicephalic; 29,6% orthocephalic and 2,2% chamaecephalic. Leptoprosopic faces are found in 90,9% and mesoprosopic in 9,1%. The Chitrals are leptorrhine in 84,1% of the individuals, this percentage is almost identical with that of the Kalash and Katis. Chamaerrhiny is absent and mesorrhiny is present in 13,6% of the individuals measured. Straight noses are found in 61,4% and curved noses in 34,1%. Medium lips are found in 45,4%, thick lips in 27,3% and thin lips in 27,3%. Supraorbital formation is present in the great majority of individuals (79,6%) and absent or slight in 20,4%. The palpebral aperture is large in the majority of individuals (63,7%) and the axis of the eye horizontal (77,3%); however a fair percentage have slanting eyes (22,7%) which are not found amongst the Kalash and Katis.

The colour of the skin for 88,8% falls clearly into II Group (12, 13, 14) of Von Luschan. The colour of the eyes are brown (45,4%) (no. 4 Martin Scale); 20,5% dark brown; 22,7% hazel (nos. 5, 6) and 11,4% greenish.

The colour of the hair is brown-black with a greater percentage (56,8%) "y" on the Martin-Saller scale. I did not find any blonde individuals amongst the 44 Chitrals whom I examined, whilst Guha mentions that he found 2% of blondes and 1% red-heads amongst the Kho he examined (1) and Stein notes fair and medium hair amongst the Kho of Chitral and Mastuj (5 doubtful and 4) (2). With regard to the difference between the observations of these authors and my own I can only refer to what has already been said with reference to the Katis. (pag. 211).

⁽¹⁾ Guha B. S., 1938, p. 257.

⁽²⁾ Stein A., 1921, vol. III, p. 1387.

4

			KALASH	н		- 11	KATIS	KATIS		O O		CH	CHITRAL	L S	
	.c	Min.	Max.	Mean	ь	.i.	Min.	Max.	Mean	ь	n.	Min.	Max.	Mean	ь
Stature	99	149.1	0.921	163.8	6.30	33	159.3	6.771	167.7	5.01	‡	153.2	176.0	163.9	4.74
Relative span arms	99	95.3	108.0	103.8	2.65	33	8.16	109.3	103.9	2.67	‡	6.96	107.4	101.5	2.71
Upper extremity index	6	37.3	46.9	40.7	1.59	56	38.3	4.0	40.9	1.45	4	37.3	43.7	39.6	1.34
Cormic index	9	47.2	53.7	50.7	1.72	33	48.6	55.4	51.4	1.35	‡	47.9	54.6	51.8	1.39
Relative shoulder breadth	- 40	17.8	24.9	22.4	1.20	23	18.7	24.3	22.6	1.36	4	18.7	24.7	21.6	1.30
Relative bi-iliac breadth	9	14.4	20.8	16.3	0.97	33	13.9	22.8	16.7	1.54	4	12.8	17.7	16.3	92.0
Acromio-cristal index	40	62.3	81.2	71.0	4.14	23	63.4	94.1	77.2	7.24	‡	56.5	89.5	75.6	5.28
Relative chest circumference	99	45.6	57.9	51.8	2.67	32	46.6	57.2	52.0	2.38	‡	46.4	56.0	49.6	2.04
Horizontal cephalic index	9	69.5	78.9	73.8	2.60	33	71.2	83.4	75.3	2.50	‡	71.5	84.1	78.3	3.33
Cephalic length- height index	9	55.4	8.69	6.19	3.11	33	55.6	70.5	60.7	3.81	‡	57.7	70.5	64.1	3.35
Cephalic breadth- height index	8	74.5	95.6	83.7	4.70	33	72.7	1.06	80.6	4.05	‡	72.5	60.7	81.9	4.51
Morphological facial index	9	77.4	104.0	89.5	5.71	33	1.92	0.001	87.7	6.65	‡	86.9	99.3	92.8	3.15
Cephalo-facial index	9	8.98	104.9	94.8	3.32	33	82.0	100.7	92.9	3.87	4	70.0	2.76	88.4	5.53

6.08

62.7

93.2

49.2

9.29

62.5

83.7

30.0

33 33

8.38

63.2

28.6 7.67

10.0 42.2

4 **‡**

33.6 8.09

41.2

9.3

27.7 7.83

47.8 92.2

9.8 51.7

9

Labial index

9

Nasal index

As the numbers of Kafirs and Chitrals of Pakistan (60 Kalash, 33 Katis and 44 Chitrals) who were studied anthropologically during the course of the Missions of 1955 and 1960, permit the correct use of biometric methods in order to ascertain correlations (amongst the components of each group) between certain important metric characteristics, we have calculated the coefficient r (Bravais-Pearson), proving it's significance.

The characteristics which are correlated are:

Stature — Horizontal cephalic index Stature — Morphological facial index

Stature — Nasal index

Horizontal cephalic index — Morphological facial index

Horizontal cephalic index — Nasal index Morphological facial index — Nasal index

The results obtained are reported in the table which follows (page 215).

The Kalash and Katis show a significant correlation which is positive, between stature and nasal index. This permits us to recognize, on both groups, individuals of not very tall stature with a rather low nasal index, as well as individuals with higher stature with a higher nasal index, which however does not superate the lower limit of mesorrhiny. The Katis present a significant correlation (negative) between the facial morphological index and the nasal index. This bears out that in the group of Katis there are still individuals with a high facial index (leptoprosopic) and a low facial index as well as short faced individuals with a higher nasal index; which are not however above the lower limit of mesorrhiny (see Martin-Saller).

This greater possibility of dividing the Katis into different somatic nuclei, is justified as this group of individuals had not been subject to a rigorous ethnical isolation such as the Kalash.

No correlation is evident regarding the characteristics previously mentioned found in the Kalash and Katis and those of the Chitrals who were also studied: however it is well known that the latter have felt the repeated contacts with other very different human types, which mingle together in the regions of Central-Western Asia.

Correlations	60 K	alash	33 I	Katis	44 C	hitrals
	σ	s. or n. s.	σ	s. or n. s.	σ	s. or n. s.
Stature - horizontal cephalic index	— o,o7o5	n. s.	— o,1975	n. s.	0,0296	n. s.
Stature - morphological facial index	+ 0,0943	n. s.	— 0 ,32 69	n. s.	+ 0,0182	n. s.
Stature - nasal index	+ 0,260s	s.	+ 0,4637	S.	0,2100	n. s.
Horizontal cephalic index - morphological facial index	0,0760	n. s.	+ 0,0640	n. s.	— 0,16 <u>9</u> 0	n. s.
Horizontal cephalic index - nasal index	+ 0,0089	n. s.	o,2488	n. s.	0,0067	n. s.
Morphological facial index – nasal index	0,1930	n. s.	+ 0,4882	s.	+ 0,0315	n. s.

ANTHROPOLOGY

We also present a table showing the significance of the differences regarding the principal metric characters between Kalash, Katis and Chitrals.

60 Kalash — 33 Katis

Stature	Relative span arms	Upper extremity index	Cormic index	Relative shoulder breadth	Relative bi-iliac breadth	Acromio-cristal index	Relative chest	Horizontal cephalic index	Cephalic length- height index	Cephalic breadth- height index	Morphological facial index	Cephalo-facial index	Nasal index	Labial index
s.	n.s.	n.s.	n.s.	s.	n.s.	s.	n.s.	s.	n.s.	s.	n.s.	s.	n.s.	s.

60 Kalash — 44 Chitrals

Stature	Relative span arms	Upper extremity index	Cormic index	Relative shoulder breadth	Relative bi-iliac breadth	Acromio-cristal index	Relative chest circumference	Horizontal cephalic index	Cephalic length- height index	Cephalic breadth- height index	Morphological facial index	Cephalo-facial index	Nasal index	Labial index
n.s.	s.	s.	s.	s.	n.s.	s.	s.	s.	s.	n.s.	s.	s.	n.s.	n.s.

33 Katis - 44 Chitrals

Stature	Relative span arms	Upper extremity index	Cormic index	Relative shoulder breadth	Relative bi-iliac breadth	Acromio-cristal index	Relative chest circumference	Horizontal cephalic index	Cephalic length- height index	Cephalic breadth- height index	Morphological facial index	Cephalo-facial index	Nasal index	Labial index
s.	s.	s.	n.s.	n.s.	n.s.	s.	s.	s.	s.	n.s.	s.	s.	n.s	s.

The difference between the Kalash and Katis concerning: stature, relative shoulder breadth, acromio — cristal, horizontal — cephalic, cephalic height, cephalic — facial and labial indices, would therefore appear significative. Amongst the Kalash — Katis and the Chitrals the significant differences appear more numerous.

However, I am of the opinion that in general it is not wise to attribute an excessive value to such purely mathematical results. These results must therefore not influence excessively our appraisal of the evaluation of the connections between the various ethnical groups.

Notwithstanding the significant differences existing between some of the metric characteristics of the Kalash and Katis, reported in the accluded tables, there appears to be a generic affinity between the two groups as far as their facial characters are concerned (the same variability appears in both groups).

The tables show the same aspects in both groups, for example, the nose is either straight or curved and in some cases the individuals measured had more aquiline noses: the chin, in both groups (Pls. 104 below, 138) may vary from a very pronounced form, which is rarer (Pls. 96, above, 104 below, 138) to a regular form and in some cases is receding (Pls. 103 middle, 105 below, 110). Generally, the face has regular features and tends to be comparatively long, however in some cases courser features may be encountered, even amongst the women. (Pl. 120 below).

I do not intend to proceed with a further physiognomic examination of the groups which I studied in the Chitral as it is my intention to go into further detail in a future publication. However it is my opinion that there appears to be a physiognomic affinity, under certain aspects, notwithstanding individual variations, between the Kati-Kalash group and the Chitral group, although the latter mentioned shows certain influences of a different origin (e.g. a slight mongoloid tendency; Pls. 145 below, 151 below) which I did not encounter amongst the two previous groups. This is quite understandable if one considers the greater isolation of the Katis and Kalash in respect of the Chitrals.

On the whole, the facial characters of all the three groups I examined appear to be, in the majority of cases, of the Dardo type indicated by Biasutti, which he noted amongst the populations of the Upper Indus amongst the Brokpa, Machnopa and to a lesser extent amongst the Baltí (1).

⁽¹⁾ BIASUTTI R., 1925, pages 244-252.

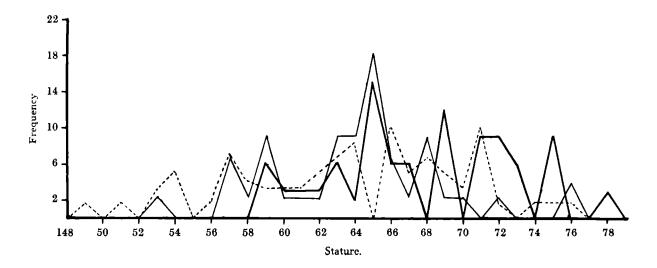
I also found amongst the groups I examined a small minority of individuals with the facial characters generally indicated as Iranian type and characterized amongst other things by a well marked nose curving inwards at the tip. This type of nose is more frequently found amongst the neighbouring Kafirs of the Afghan Hindu-Kush, which were studied by Herrlich and classified by him in Type B. (1).

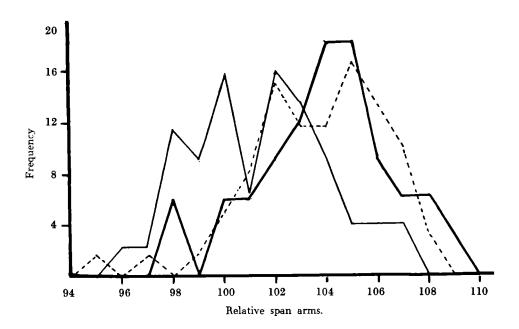
It is my intention to postpone until a future publication, as previously mentioned, not only a more complete study of the physiognomic data of the Kalash, Katis and Chitrals, but also a tentative attempt to group these populations in the general anthropological systemization of Western and Central Asia, in addition to the study of the problem of their origin. The scope of this publication has been a simple presentation and elaboration of statistical data which I gathered during my two Expeditions in 1955 and 1960.

I wish to add, in conclusion, that the populations of the State of Chitral, although demonstrating a notable homogeneity also show certain morphophysiognomical variations which bear out the existence, in their general makeup, of certain elements due to different origins. These elements are however Europoid in characteristic with particular reference emphasis to the Mediterranean and Alpine races. Moreover, one has the impression that these groups have been subject to particular conditions which have favoured the conservation of their ancient original characteristics, which originated, without doubt, from the environmental isolation of these peoples.

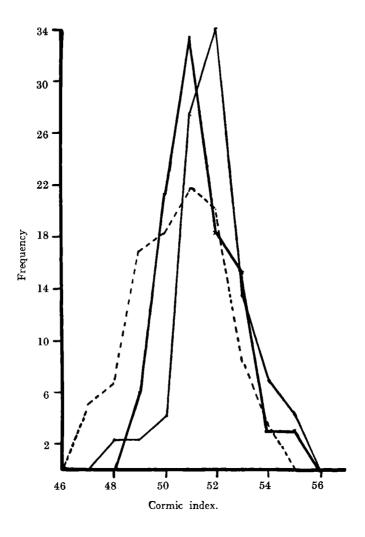
⁽¹⁾ HERRLICH A., 1937, plates 97, 98, 99, 100. Herrlich grouped the Kafirs of Nuristan that he measured into three principal types: Type A (attributable to the primordial populations of small stature having dark eyes and hairs. Type B: demonstrating characteristics of the "Caucasian race", of medium height, with a very prominent nose, curved inwards at the tip: the majority have dark hair and eyes. Type C: tall stature, straight nosed often with light coloured eyes and hair showing characteristics of the Nordic and Dinaric races. In addition to these three basic groups, to which a not very numerous number of individuals appertain, Herrlich has added four other mixed groups which are a result of the mingling of the three basic types previously mentioned.

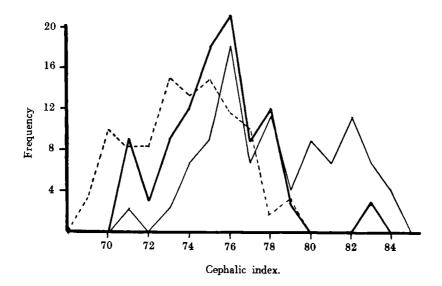
With reference to the Kalash, Herrlich groups them almost without exception in Type A primitive (Page 218), an attribution which we do not feel like accepting.

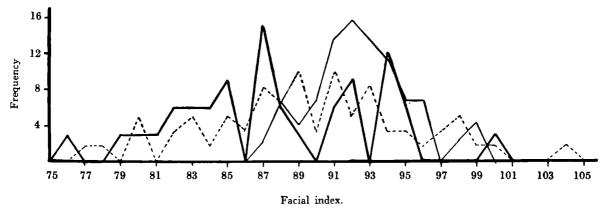


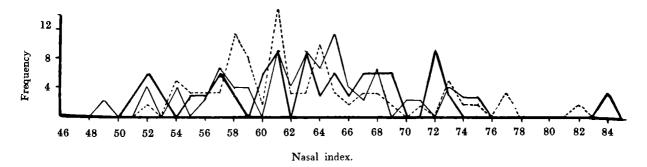


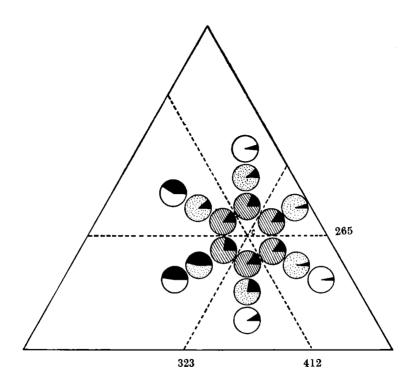
Stature and relative span arms of 60 Kalash -----, 33 Katis ----, 44 Chitrals ----- according to measurements taken in 1955 and 1960.



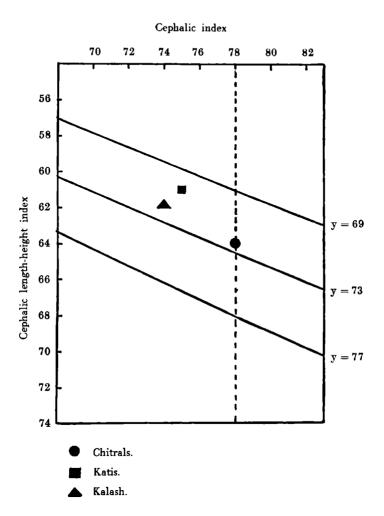








Division of head data of 60 Kalash O, 33 Katis , 44 Chitrals according to triangular coordinates.
(Measurements taken in 1955 and 1960).



Distribution of the average of the head indices according to the base-lines of Sera (Giardina's index).

COMPARATIVE TABLES OF DESCRIPTIVE AND METRICAL FEATURES DESCRIPTIVE FEATURES

Ability to taste P. T. C.:	60	Kalash	33	Katis	43	Chitrals
Positive	45	75,0	22	66,7	33	76,7
None	15	25,0	II	33,3	10	23,3
	60	100,0	33	100,0	43	100,0
Shape of body:	60	Kalash	31	Katis	44	Chitrals
Sturdy	5	18,3		_		-
Robust	15	15,0	8	25,8	2	4,6
Slim	31	51,7	18	58,1	32	72,7
Delicate		15,0	_5_	<u> 16,1</u>		22,7
	60	100,0	31	100,0	44	100,0
Pilosity of body:	60	Kalash	31	Katis	44	Chitrals
Deficient	23	38,3	14	45,2	32	72,7
Scanty	2I	35,0	12	38,7	4	9,1
Medium	3	5,0			3	6,8
Abundant	13	21,7	5	16,1	5	11,4
	60	100,0	31	100,0	44	100,0
Beard and moustache:	60	Kalash	30	Katis	44	Chitrals
Thick	16	26,6	7	23,3	5	11,4
Medium	3	5,0			_	
Scanty	34	56,7	19	63,4	26	59,1
Deficient	7	11,7			13	29,5
	60	100,0	30	100,0	44	100,0
Hair form:	41	Kalash	17	Katis	37	Chitrals
Straight	12	29,3	11	64,8	16	43,2
Wavy	27	65,8	6	35,2	16	43,2
Curly	2	4,9		 _	5	13,6
	41	100,0	17	100,0	37	100,0

Eye aperture:	60	Kalash	39	Katis	44	Chitrals
Small	9	15,0	8	20,5	6	13,6
Medium	2 I	35,0	13	33,3	10	22,7
Large	30	50,0	18	46,2	28	63,7
	60	100,0	39	100,0	44	100,0
Inclination of palpebral aperture:	60	Kalash	32	Katis	44	Chitrals
Horizontal		05.0	27	84,4	24	77.3
Oblique	57	95,0	27	15,6	34 10	77.3
Oblique	3	5,0	5			22,7
	60	100,0	32	100,00	44	100,0
Nose base:	60	Kalash	32	Katis	44	Chitrals
Upturned	~	11,6	I	2.2	I	2,3
Horizontal	7 28	46,7	12	3,2	31	_
Downturned	25	40,7 41,7		37.5 50.3	12	70,4 27,3
Downtained		41,/	19	59.3		
	60	100,0	32	100,0	44	100,0
Nose bridge:	6o	Kalash	33	Katis	44	Chitrals
8						
Concave	3	5,0	3 18	9,0	2	4,5
Straight	31	51,7	18	54,6	27	61,4
Convex	26	43,3	12	36,4	15	34,1
	60	100,0	33	100,0	44	100,0
Depression of nasal root:	60	Kalash	33	Katis	44	Chitrals
Deep	28	46,7	5	15,2	4	9,1
Medium	5	8,3	ĭ	3,0	6	13,6
Small	25	41,7	27	81,8	24	54,6
Absent	2	3,3			10	22,7
	60	100,0	33	100,0	44	100,0

Form of lips:	60	Kalash	33	Katis	44	Chitrals
Thin	14	23,3	9	27,3	12	27,3
Medium	42	70,0	21	63,7	20	45,4
Thick	4	6,7	3	9,0	12	27,3
	60	100,0	33	100,0	44	100,0
Development of supraorbital ridges:	4	o Kalash		18 Katis	44	Chitrals
Marked				39,9		
Slight		57,5		44,4	9	20,4
Absent		42,5		16,7	35	79,6
		100,0		100,0	44	100,0
Shape of forehead:	60	Kalash	32	Katis	44	Chitrals
Straight	21	65,0	13	40,6	32	7 2 ,7
Medium	_	<u> </u>	_		1	2,3
Receding	39	35,0	19	59,4	11	25,0
	60	100,0	32	100,0	44	100,0

PIGMENTATION

Colour of skin on inner side of the upper arm (Von Luschan scale):	40 Kalash	21 Katis	44	Chitrals
3		4,8		
4		<u> </u>	_	
5			_	
6			_	
7			_	
8	2,5	14,2		
9		4,8		
10	2,5	23,8	6	13,6
11	2,5	23,8	13	29,6
I 2	32,5	19,0	15	34,I
13	12,5	4,8	4	9,1
14	22,5		3	6,8
15 16	15,0	4,8	1	2,3
16	2,5		2	4,5
17 18	5,0		_	
18	2,5		_	
	100,0	100,0	44	100,0

Colour of skin of forehead:	60	Kalash	33	Katis	44	Chitrals
5 6			I	3,1	_	
	_		_		_	
7 8			_		_	
	_		_		_	
9			_		_	
10	1	1,7	_		_	
11	3	5,0	I	3,1		
12	14	23,3	6	18,2	13	29,6
13	6	10,0	5	15,1	13	29,6
14	17 8	28,3	14	42,5	13	29,6
15		13,3	2	6,0	4	9,0
16	4	6,7	_		_	
17 18	7	11,7	2	6,0	_	
18				6,o ———	I	2,2
	60	100,0	33	100,0	44	100,0
Color of iris:	60	Kalash	33	Katis	44	Chitrals
2	•	5.0	2	6,1	I	2,3
	3 16	5,0 26,6	9	27,4	8	18,2
3	19	31,7	10	30,4	20	45,4
4 5 6	19	8,3	1	30,4	8	18,2
6	5 6	10,0	5	14,9	2	4,5
	6	10,0	2	6,1	4	9,1
7 8	3	5,0	ī	3,0	I	2,3
9		1,7	ī	3,0	_	-,5
10	_	-,,	2	6,1		
II	_		_			
12	_		_		_	
13			_		_	
14	_		_			
	_				_	
15 16	I	1,7			_	
	6 0	100,0	83	100,0	44	100,0
Colour of hair:	60	Kalash	32	Katis	44	Chitrals
U	•	۲.۵	т	2 1	_	
Ÿ	_3	<u>5,0</u>	1 5	3,1 15,6	2	4,5
$\overset{\mathbf{v}}{\mathbf{x}}$	8	13,3	3 9	28,2	13	29,6
Ÿ	47	78,4	16	50,0	25	56,8
$\mathbf{\dot{w}}$	47	3,3	1	3,1	4	9,1
	60	100,0	32	100,0	44	100,0

METRICAL FEATURES

Stature:	60	Kalash	33	Katis	44	Chitrals
X-157	11	18,3	_		4	9,1
158–162	12	20,0	5	15,2	11	25,0
163-167	18	30,0	12	36,3	20	45,5
168–172	16	26,7	10	30,3	7	
173-X	3	5,0	6	18,2	2	15,9
-73						4.5
	60	100,0	33	100,0	44	100,0
Relative span arms:	60	Kalash	33	Katis	44	Chitrals
x-99,9	5	8,3	2	6, 1	13	29,5
100,0-104,9	33	55,0	18	54.5	26	59,1
105,0–109,9	22	36,7	13	39.4	5	11,3
110,0-X	_				_	
	60	100,0	33	100,0	44	100,0
Upper extremity index:	40	Kalash	26	Katis	44	Chitrals
x-42,9	39	97,5	24	92,3	42	95,6
43,0-44,9		7773	2	7,7	2	4,4
45,0-X	I	2,5	_		_	
	40	100,0	26	100,0	44	100,0
Cormic index:	60	Kalash	33	Katis	44	Chitrals
x-48,0	6	10,0			I	2,3
48,1-51,0	27	45,0	13	39,3	9	20,4
51,1-53,0	20	33,3	15	45,5	26	59,1
53,1-55,0	7	11,7	4	12,1	8	18,2
55,1-X	<u>'</u>		i	3,1	_	
	60	100,0	33	100,0	44	100,0
Trochanteric index:	2	o Kalash		20 Katis	44	Chitrals
Y-ri o		76,5		80,0	38	86,4
X-51,9					6	13,6
52,0-54,9 55,0-x		23,5		20,0 —	_	
		100,0		100,0	44	100,0

Intermembral index:	2	o Kalash		14 Katis	44	Chitrals
x-80,5		65,0		21,4	27	61,4
80,6–86,5		30,0		71,5	17	38,6
86,6-x		5,0		7,1	_	
		100,0		100,0	44	100,0
Relative shoulder breadth:		Kalash		Katis		Chitrals
Retative snoutaer treatin:	40	Varazu	23	Katis	44	Chitrais
X-21,5	5	12,5	11	47,8	19	43,2
21,6-x	35	87,5	12	52,2	25	56,8
	40	100,0	23	100,0	44	100,0
Relative bi-iliac breadth:	60	Kalash	33	Katis	44	Chitrals
X-14,5	2	3,3	I	3,1	I	2,3
14,6–16,5	3 4	56,7	18	54,5	25	56,8
16,6–x	24	40,0	14	42,4	18	40,9
	60	100,0	33	100,0	44	100,0
Acromio-cristal index:	40	Kalash	23	Katis	44	Chitrals
x-64,5	2	5,0	1	4,4	I	2,2
64,6-77,5	33	82,5	11	47,8	28	63,6
77,6-x	5	12,5	11	47,8	15	34,2
	40	100,0	23	100,0	44	100,0
Relative chest circumference:	60	Kalash	32	Katis	44	Chitrals
x –51	24	40,0	12	37,5	34	77,3
51-56	31	51,7	16	50,0	9	20,5
56-x	5	8,3	4	12,5	Í	2,2
	60	100,0	32	100,0	44	100,0

THE VAULT OF THE HEAD

Horizontal cephalic index:	60	Kalash	33	Katis	44	Chitrals
x-70,9	8	13,3			_	
71,0-75,9	42	70,0	20	60,6	13	29,6
76,0-80,9	io	16,7	12	36,3	20	45,4
81,0-85,4	_		I	3,1	II	25,0
85,5-90,9	_				_	-3,0
91,o-x	_		_		-	
	60	100,0	33	100,0	44	100,0
Cephalic length-height index:	60	Kalash	33	Katis	44	Chitrals
x-57,9	10	16,7	8	24,3	I	2,2
58,0–62,9	27	45,0	16	48,5	13	29,6
63,0-x	23	38,3	9	27,2	30	68,2
53,5						
	60	100,0	33	100,0	44	100,0
Cephalic breadth-height index:	60	Kalash	33	Katis	44	Chitrals
x-78,9	9	15,0	14	42,5	10	22,7
79,0-84,9	27	45,0	13	39,3	24	54,6
85,0-x	24	40,0	6	18,2	10	22,7
	60	100,0	33	100,0	44	100,0
Distribution of head data accord- ing to the triangular coordinates						
graph:	60	Kalash	33	Katis	44	Chitrals
I			1	3,1	7	15,9
2	3	5,0		12,1	8	18,3
3	3 23	38,3	4 4	12,1	6	13,6
3 4 5 6	28	46,7	15	45,5	10	22,7
5	5	8,3	15 8	24,1	6	13,6
f 6	I	1,7	1	3,1	7	15,9
	60	100,0	33	100,0	44	100,0

Distribution of the head indices according to the base-lines of Sera (Giardina's index)	60	Kalash	33	Katis	44	Chitrals
Dolicho-platycephalic	14	23,3	16	48,4	3	6,9
Dolicho-ortho-platycephalic	17	28,3	7	21,2	3 9	20,4
Dolicho-ortho-hypsicephalic	21	35,0	7	21,2	10	22,7
Dolicho-hypsicephalic	6	10,0	I	3,0	3	6,9
Brachy-platycephalic	_		_		4	9,1
Brachy-ortho-platycephalic	I	1,7	_		6	13,6
Brachy-ortho-hypsicephalic	1	1,7	2	6,2	7	15,9
Brachy-hypsicephalic	_		_	<u> </u>	2	4,5
	60	100,0	33	100,0	44	100,0
Morphological facial index:	60	Kalash	33	Katis	44	Chitrals
x-78,9	2	3,4	2	6,2	_	
79,0–83,9	$\tilde{8}$	13,2	$\tilde{\tilde{8}}$	24,2	_	
84,0-87,9	12	20,0	9	27,2	4	9,1
88,0-92,9	22	36,7	7	21,2	22	50,0
93,o-x	16	26,7	7	21,2	18	40,9
	60	100,0	33	100,0	44	100,0
Nasal index:	60	Kalash	33	Katis	44	Chitrals
Y-54 O	4	6,7	4	12,5	5	11,4
x-54,9 55,0-69,9	4 46	76,7	23	71,8	32	72,7
70,0-84,9	9	15,0	-3 5	15,7	6	13,6
85,0-99,9	I	1,6		-377	I	2,3
	60	100,0	32	100,0	44	100,0
Labial index:	60	Kalash	33	Katis	44	Chitrals
x-35,5	51	85,0	2 6	78,8	34	77,3
35,6–49,5 49,6–x	9	15,0	7	21,2	10	22,7
49,0-4						

60

100,0

100,0

100,0

33



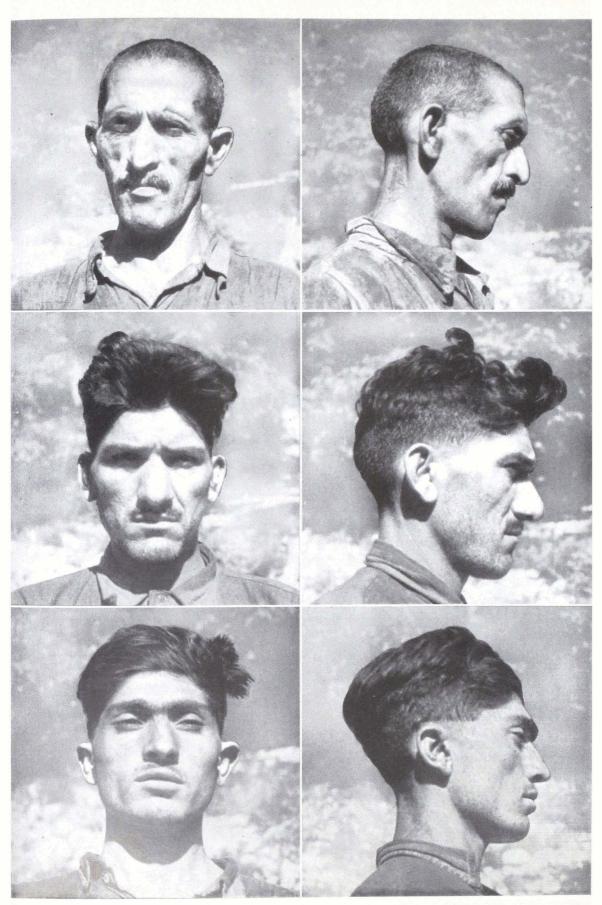
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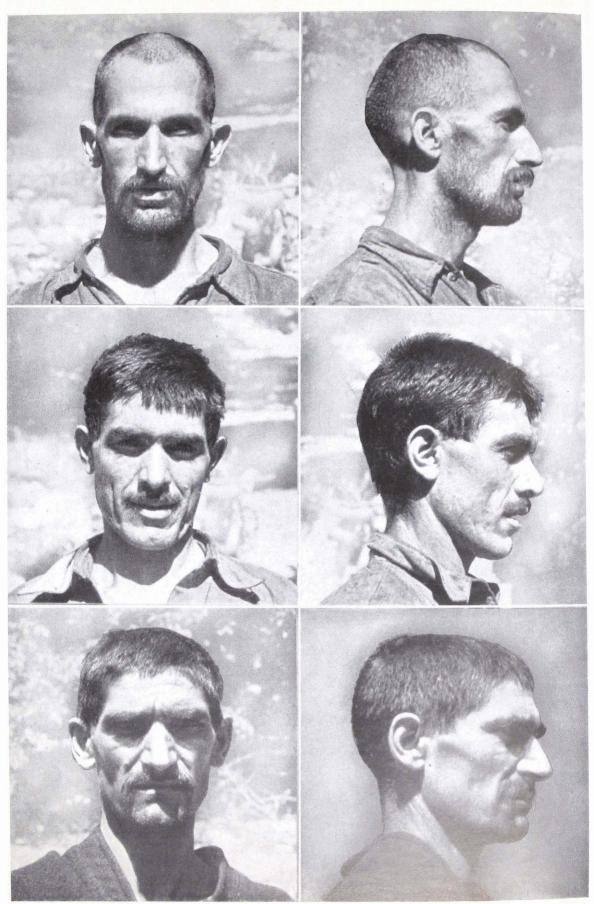
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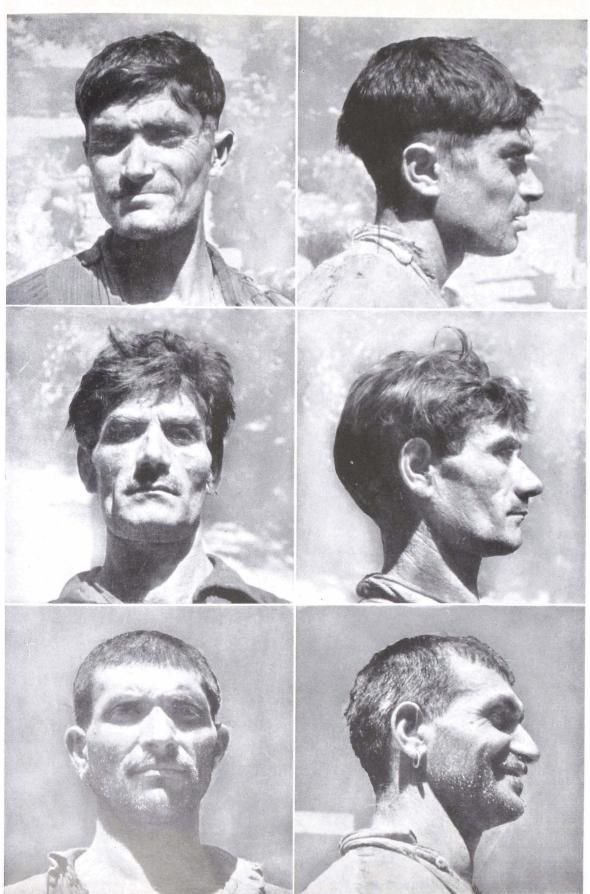




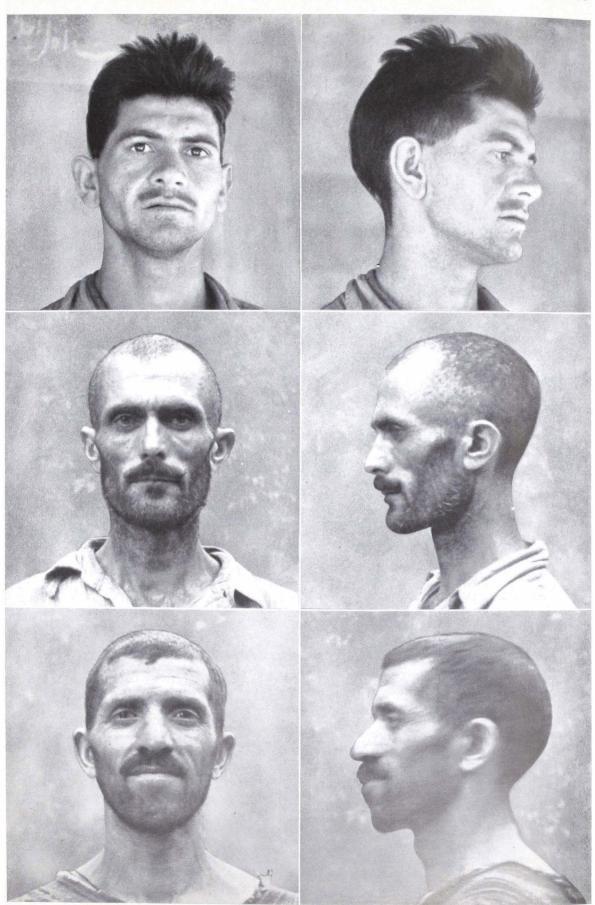
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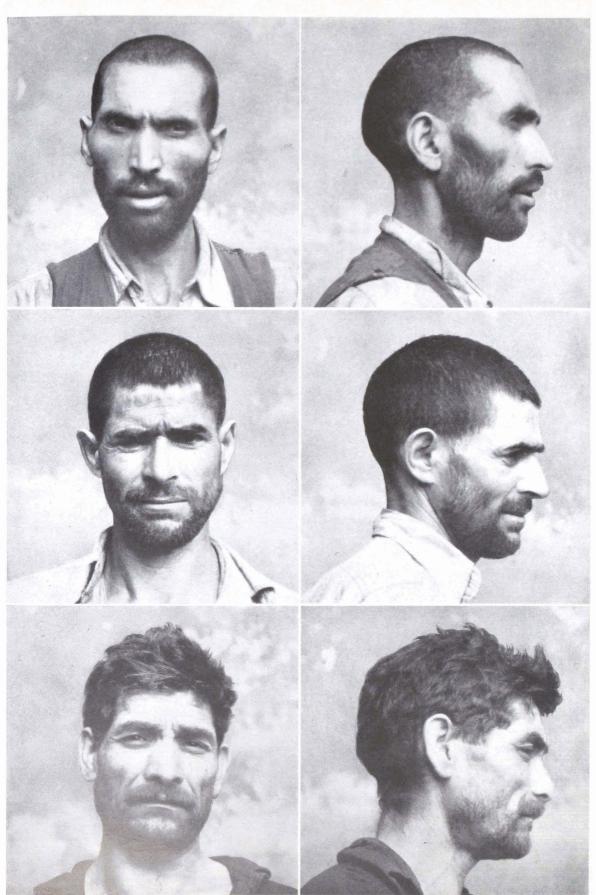
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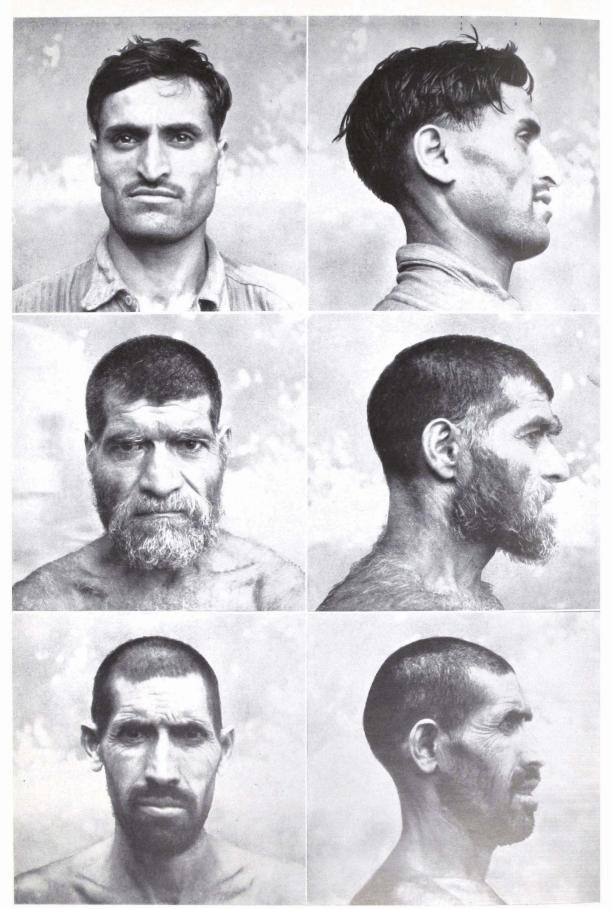
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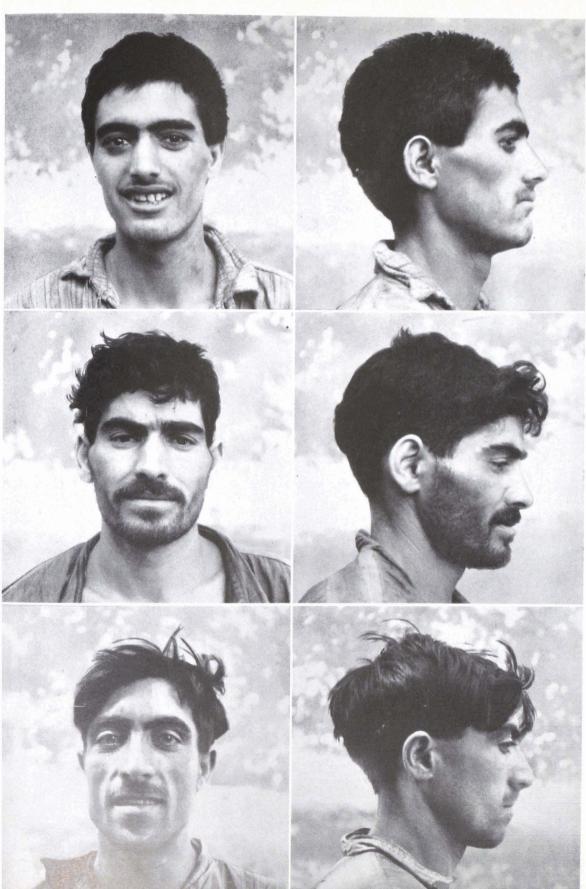


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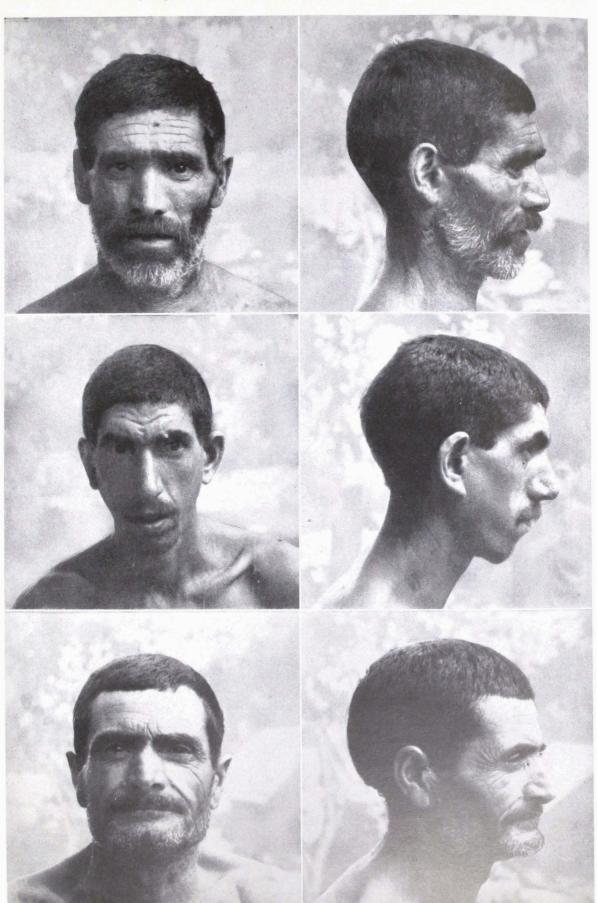


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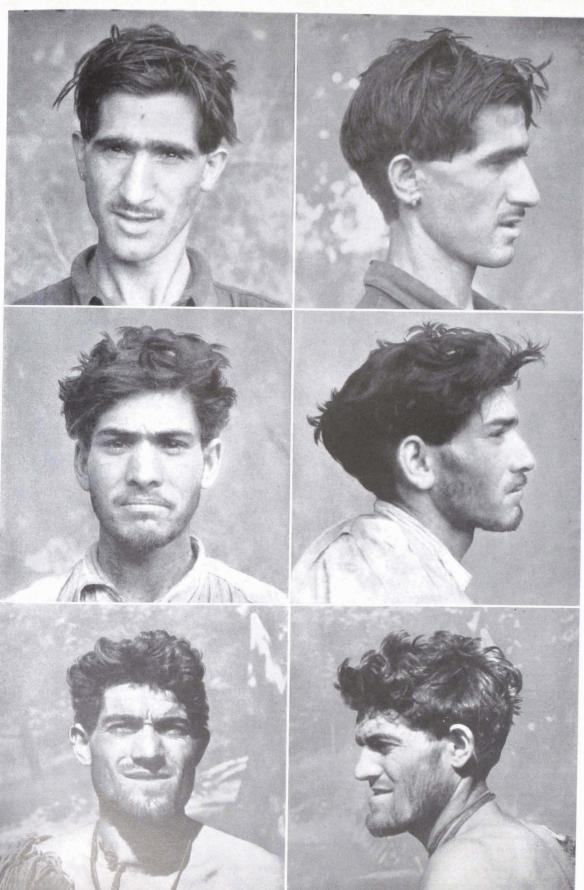




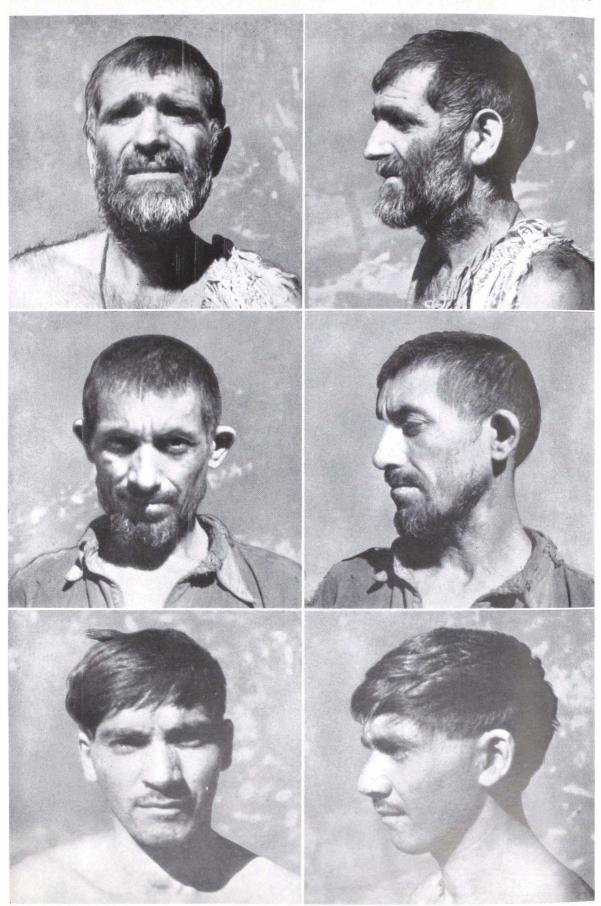
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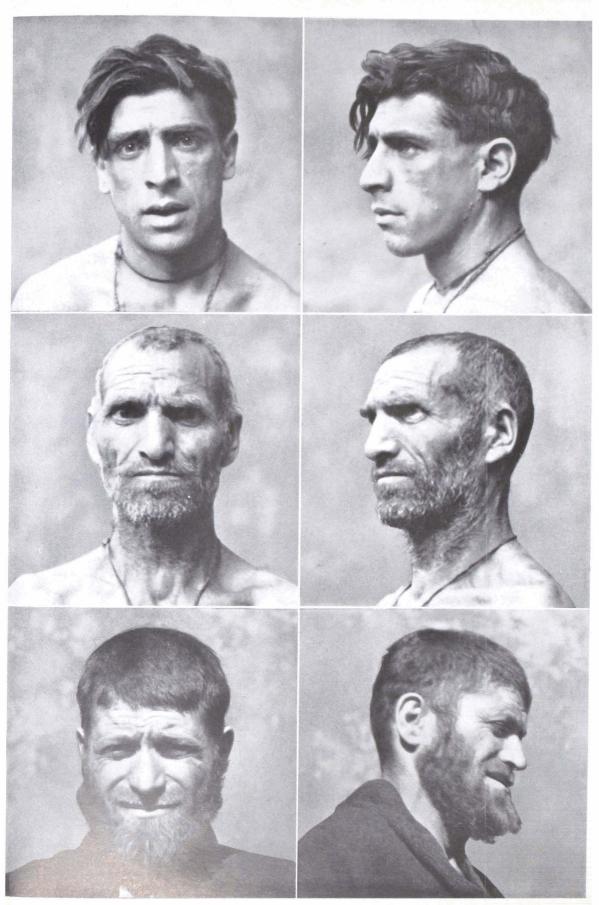
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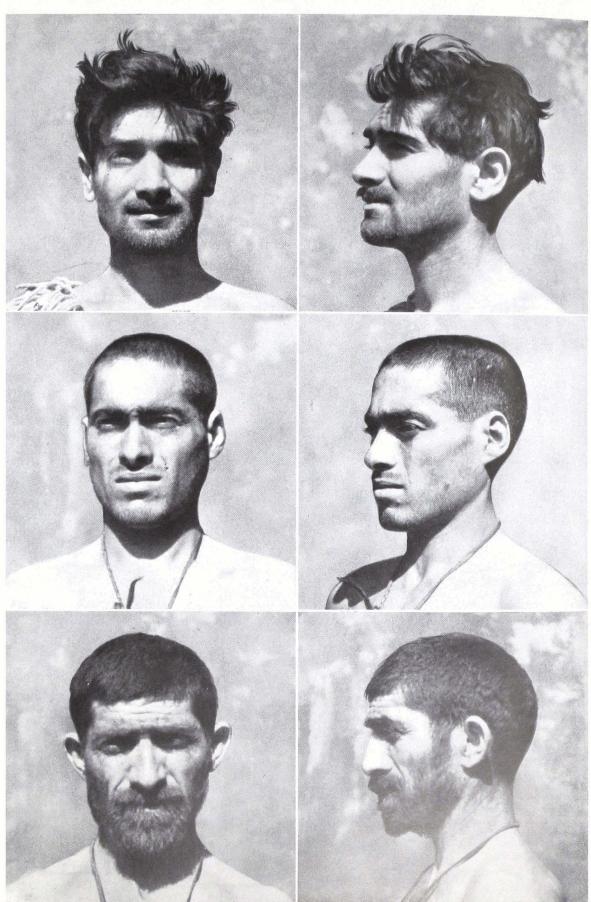
Ton. two Kalash of Bomberet and, bottom, one of Birir.



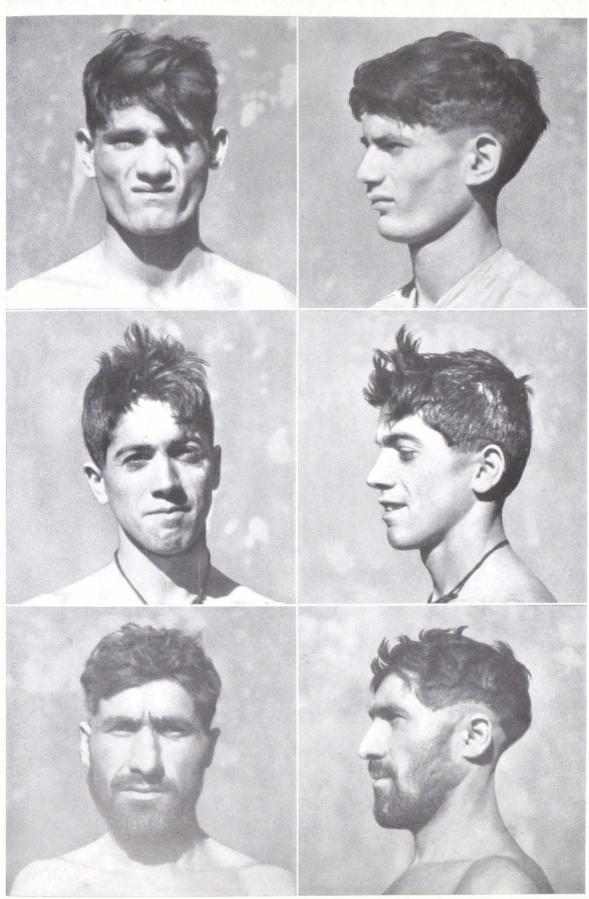
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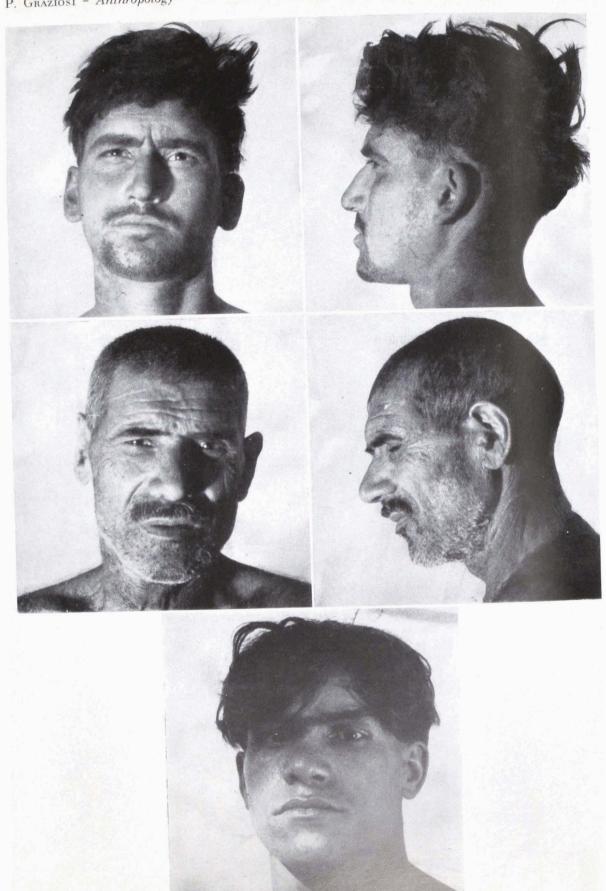
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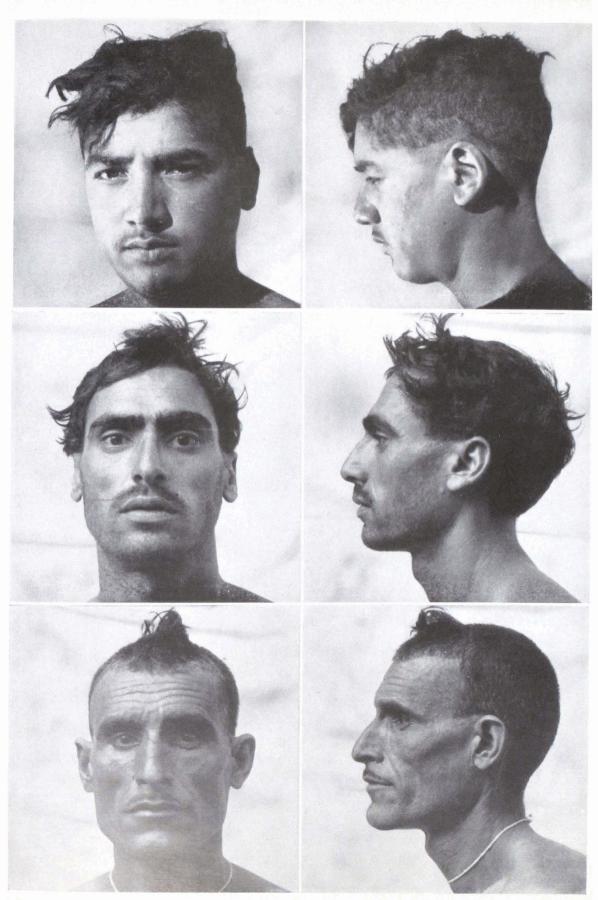
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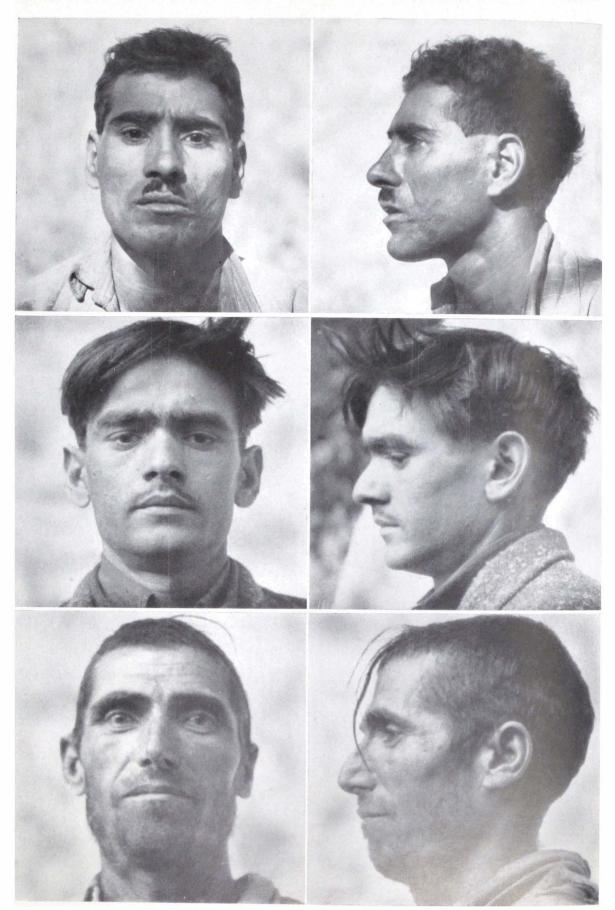
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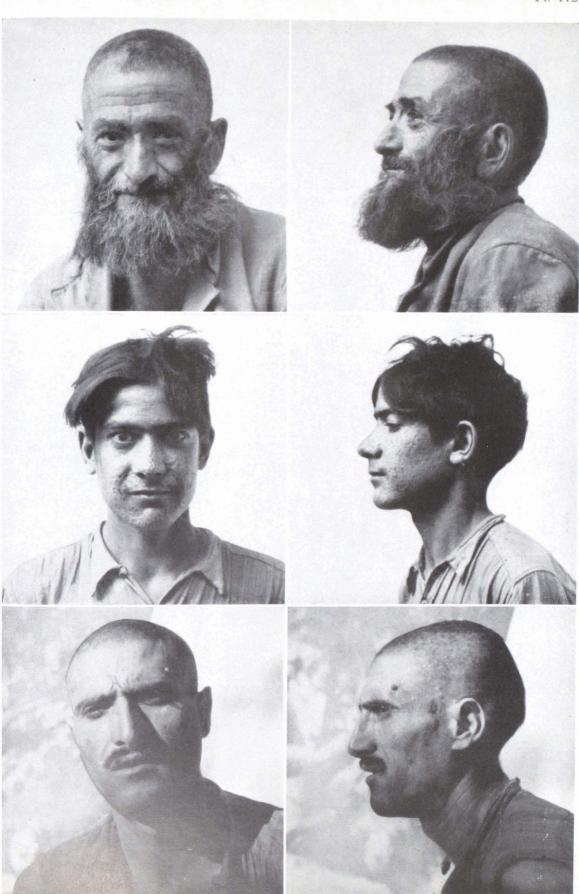


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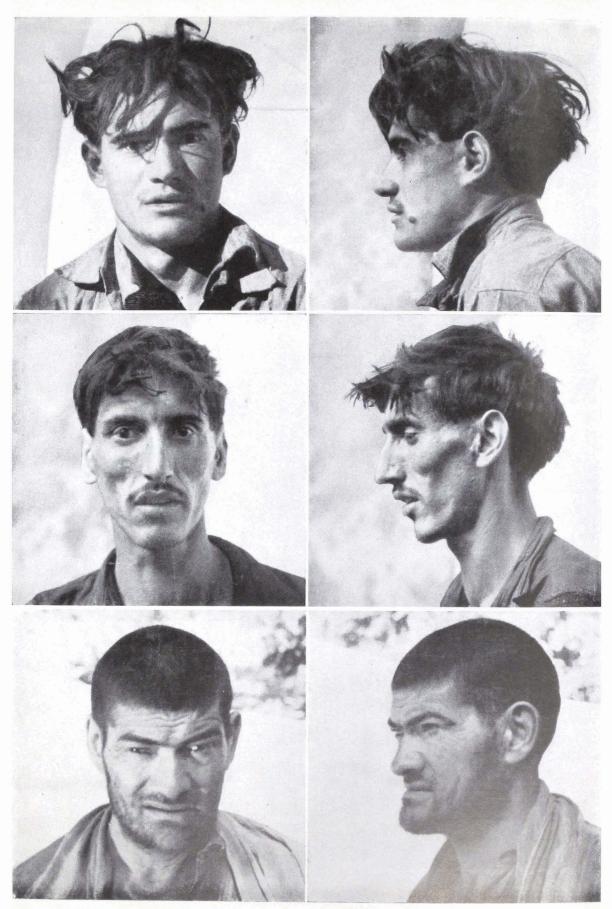


Kalash of Rumbur.

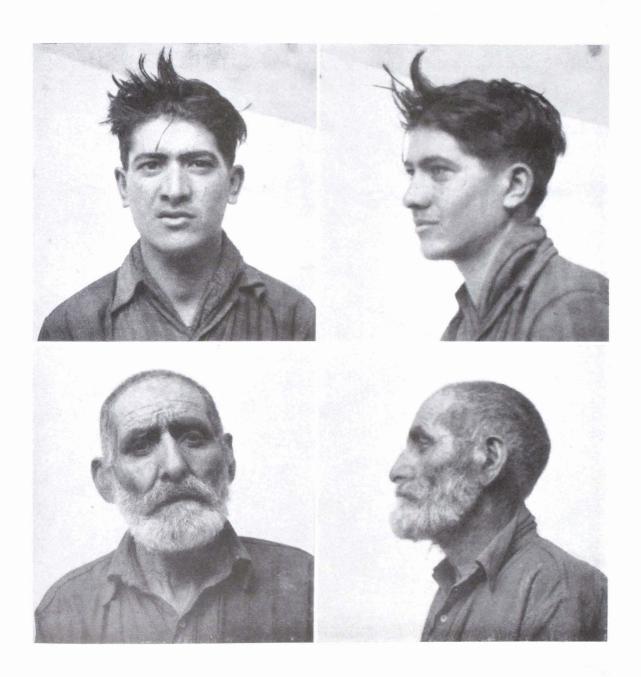




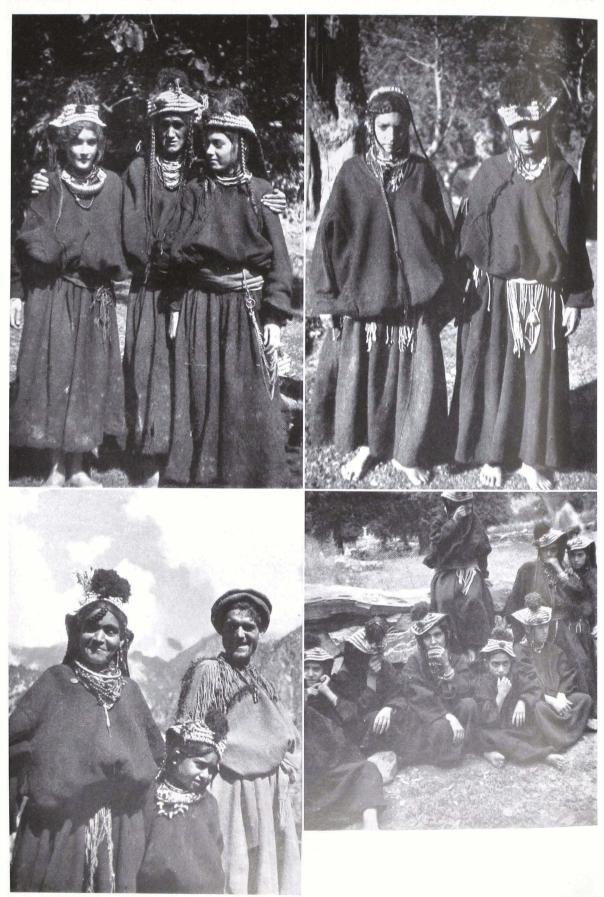
Kalash of Rumbur.



Kalash of Rumbur.



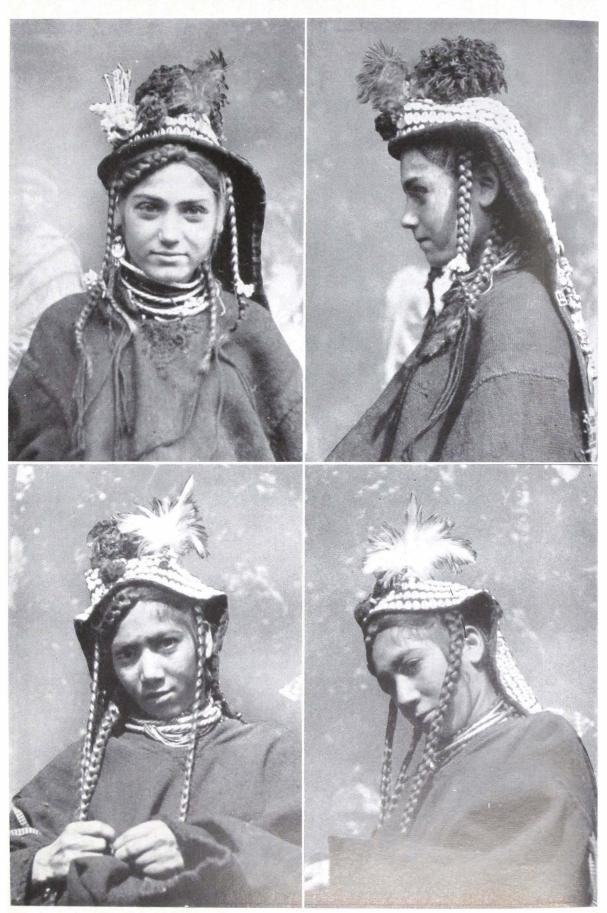
Kalash of Rumbur.



Kalash women of Bomberet (1, 4) and Birir (2). Kalash women and a man of Birir (3).



Kalash women of Bomberet.



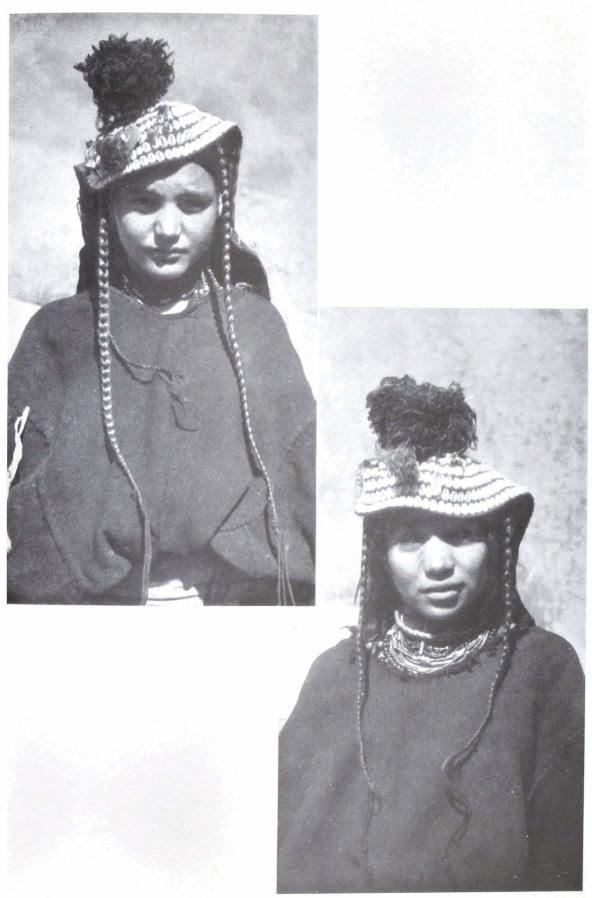
Kalash women of Bomberet.



Kalash women of Bomberet.



Kalash women of Bomberet.



Kalash women of Rumbur.



Kalash women of Birir.



Kalash women of Birir.



Kalash women of Birir.



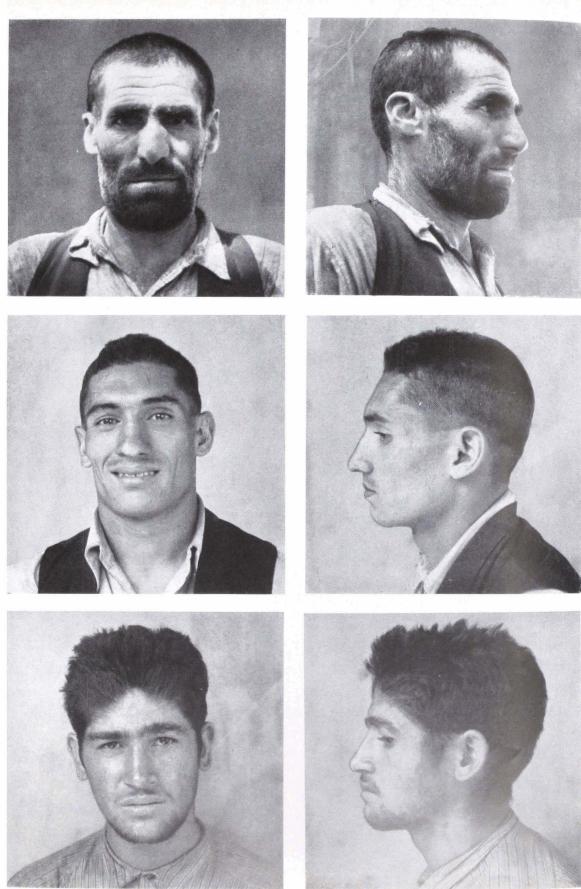
Kalash women of Birir.



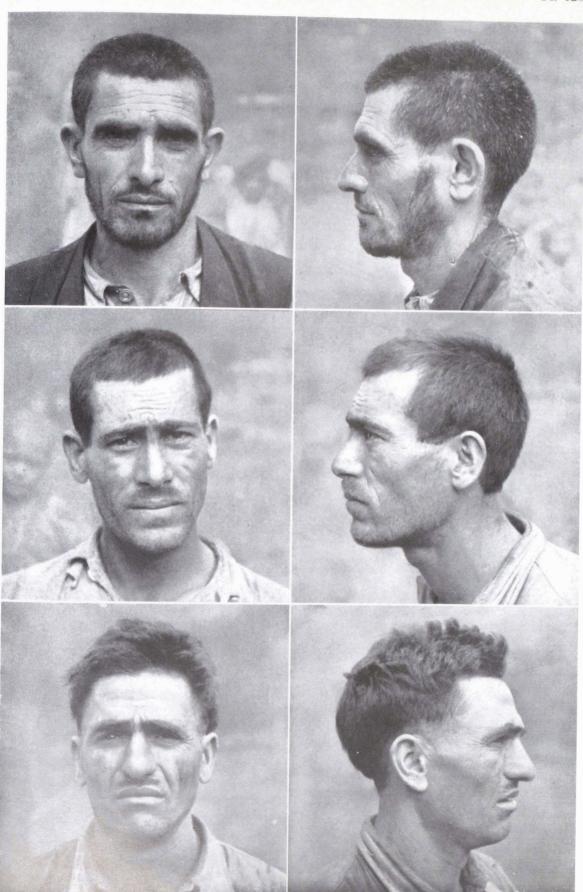
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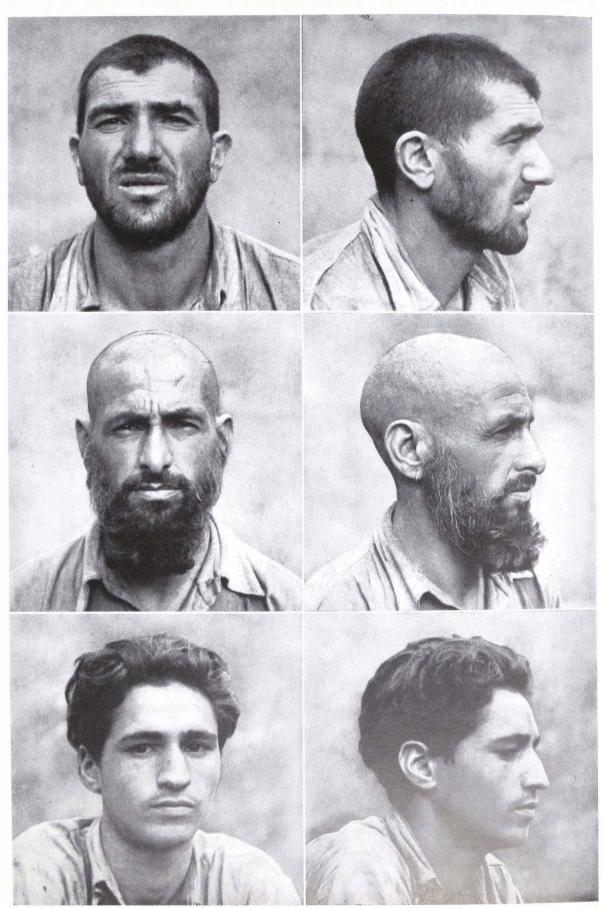
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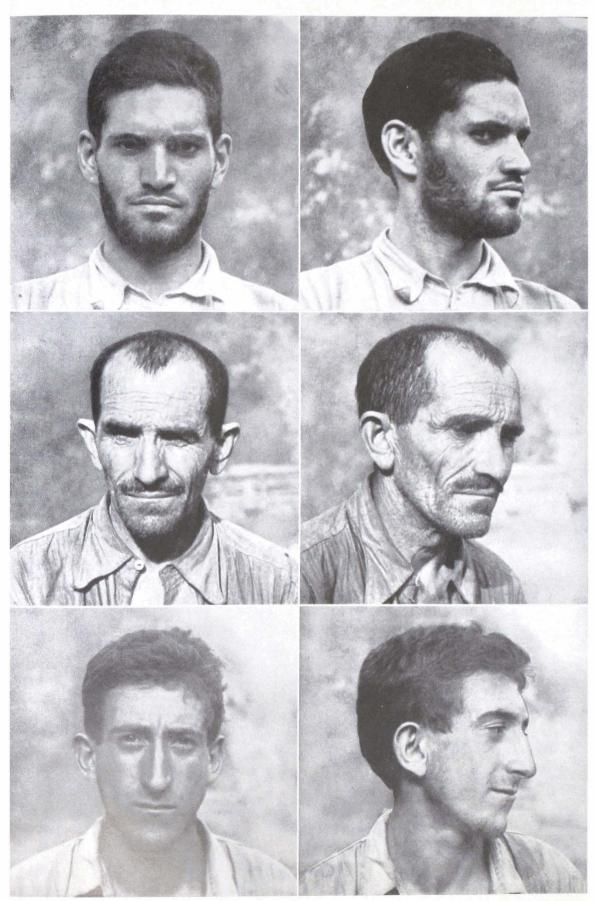
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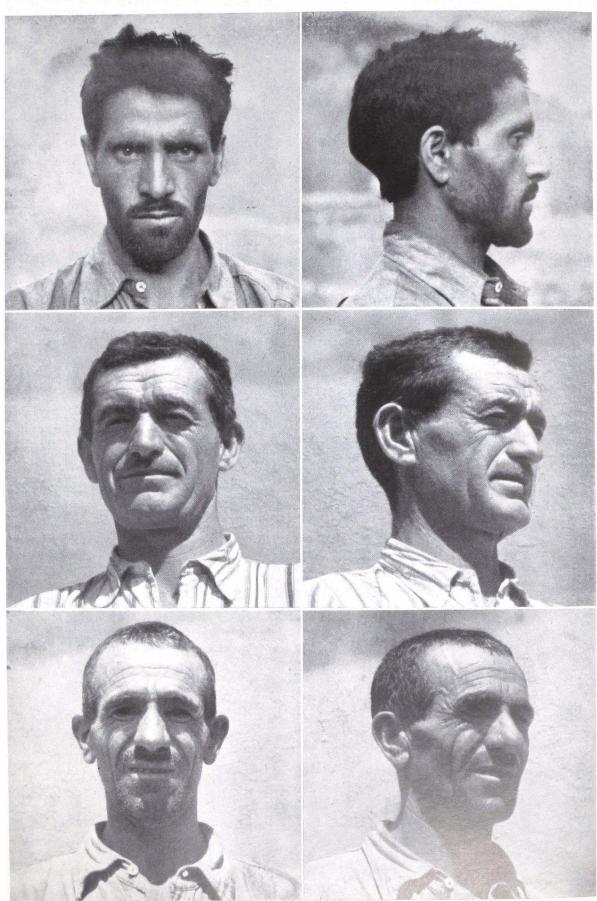
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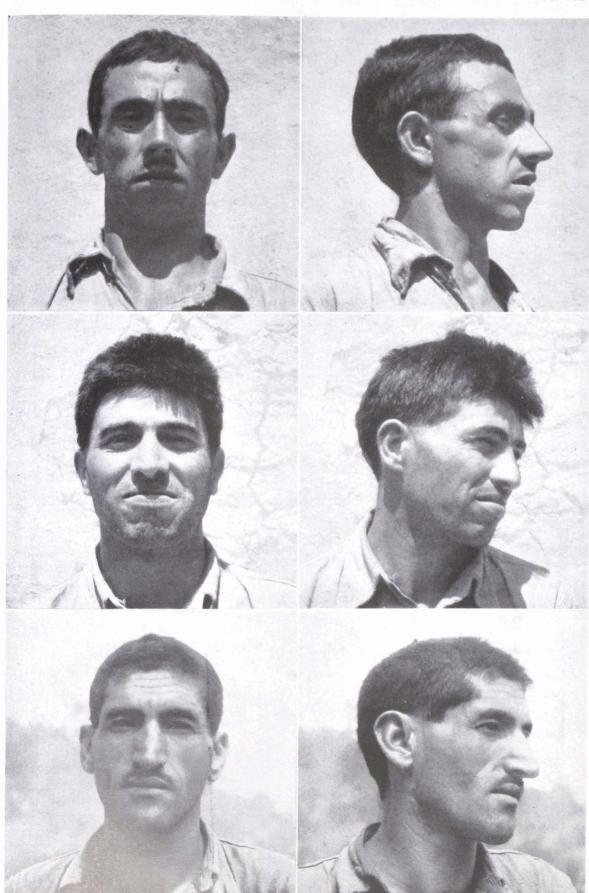


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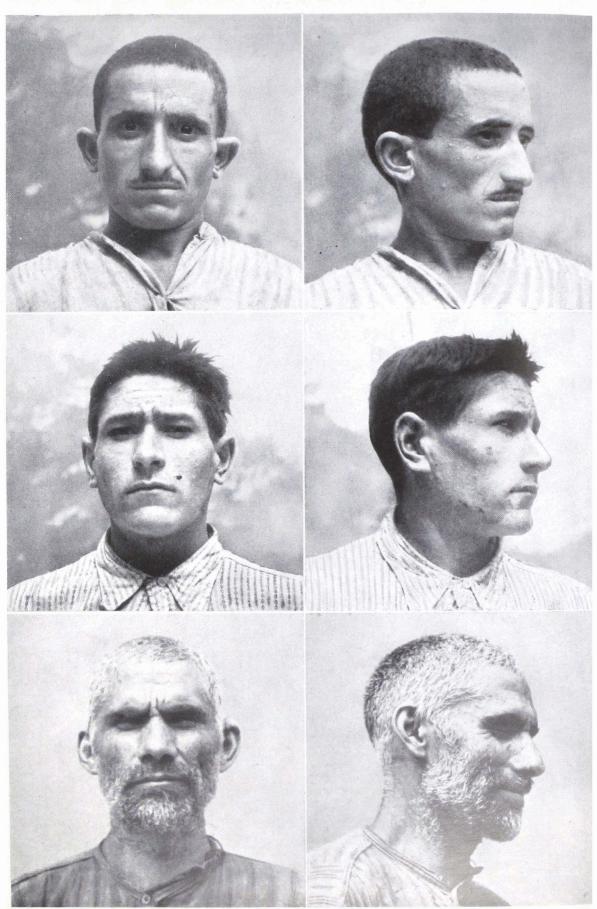


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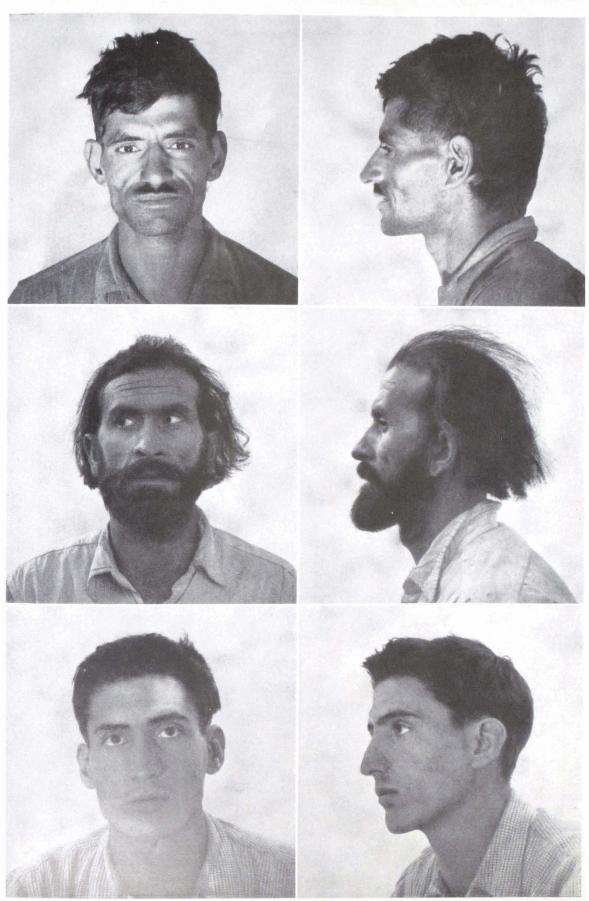




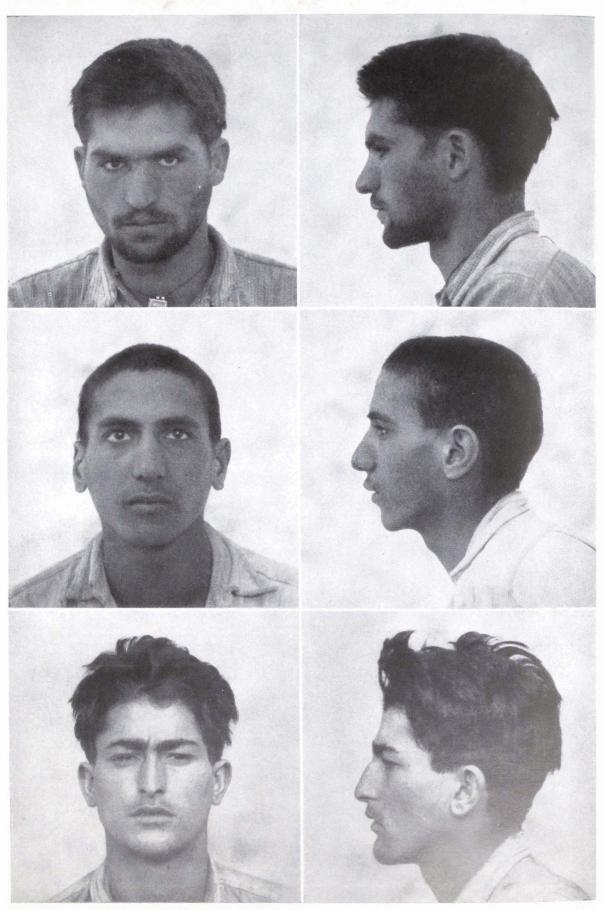
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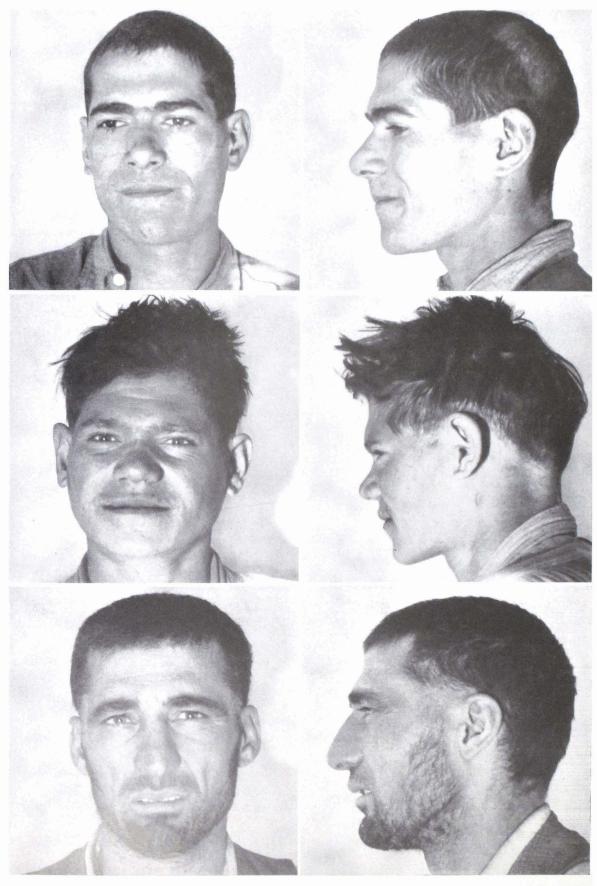
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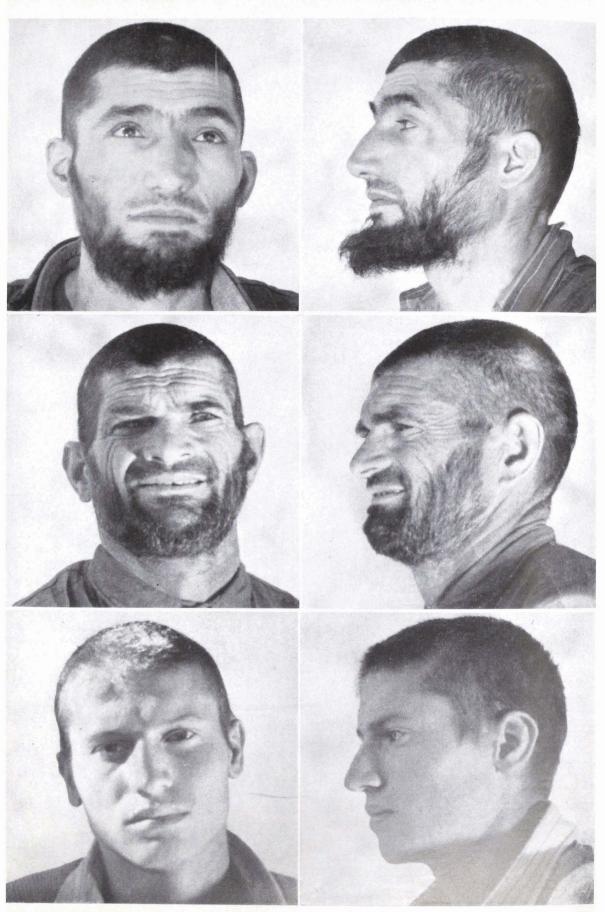
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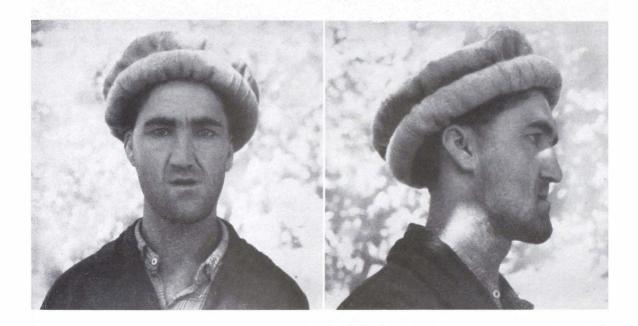
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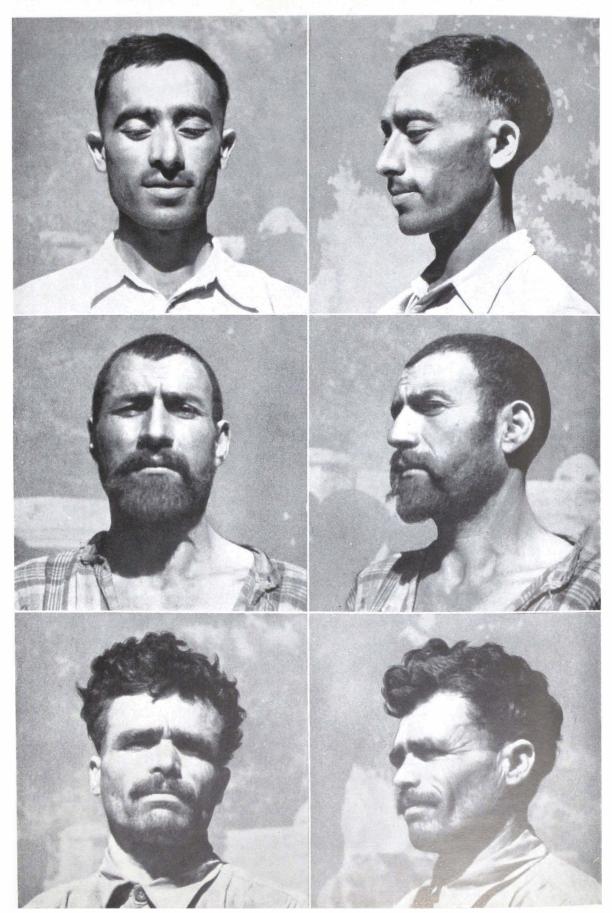
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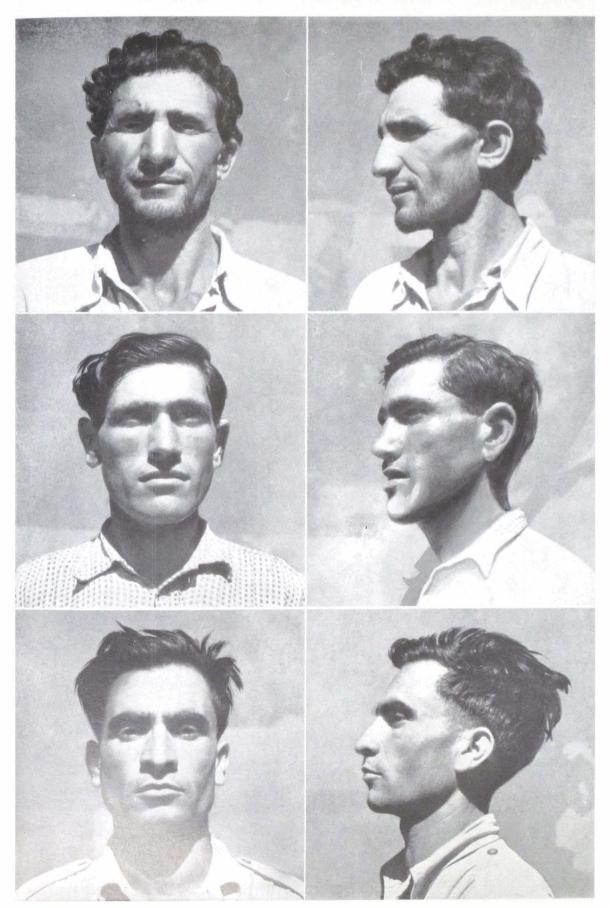


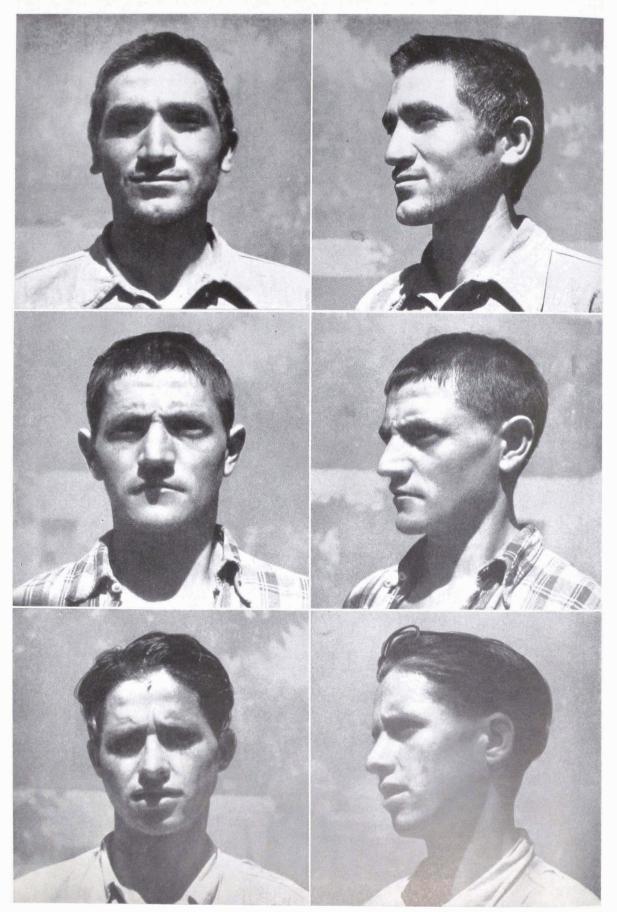
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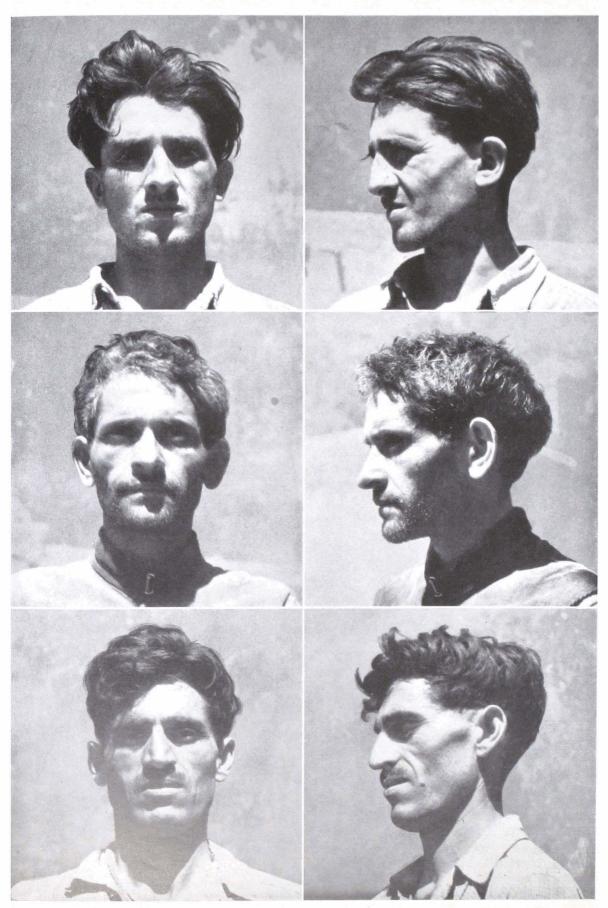


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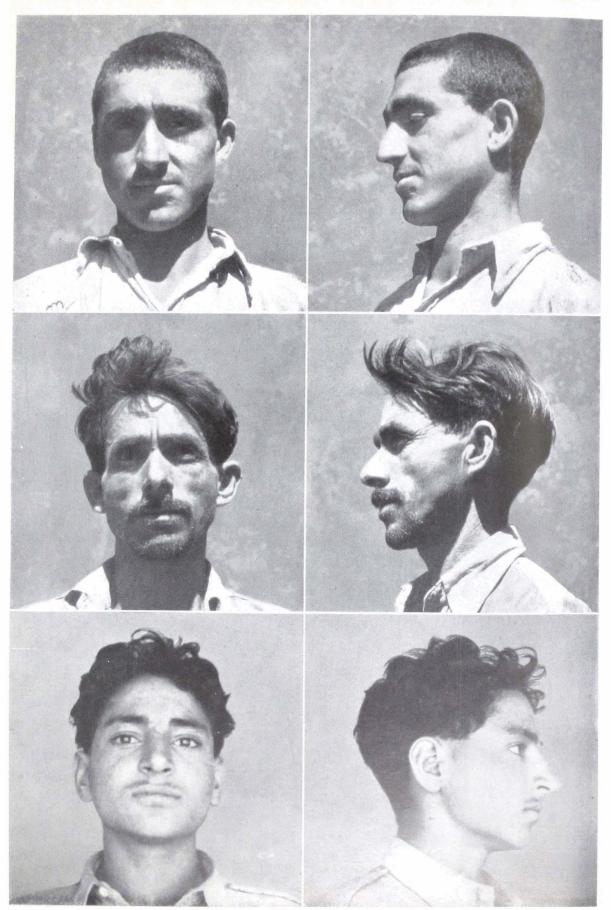


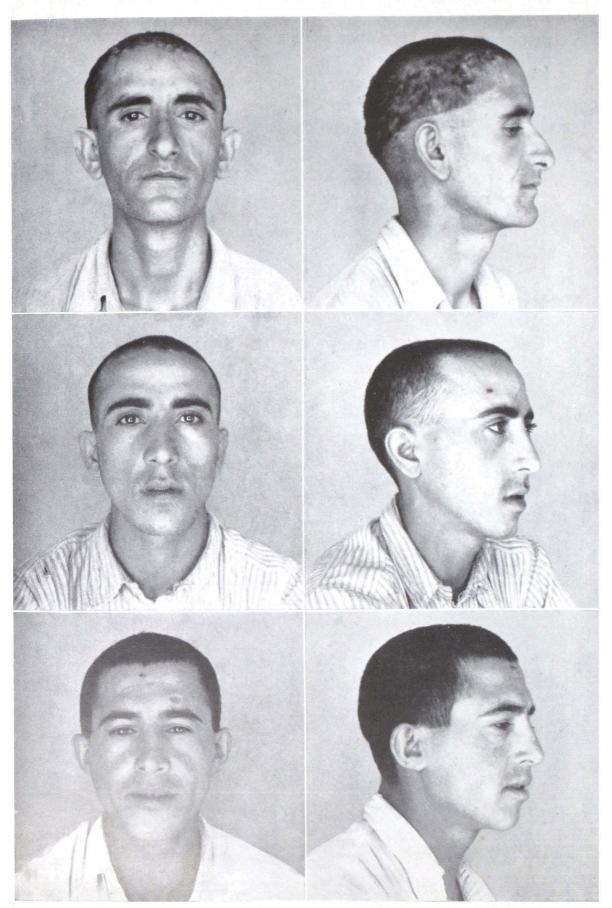




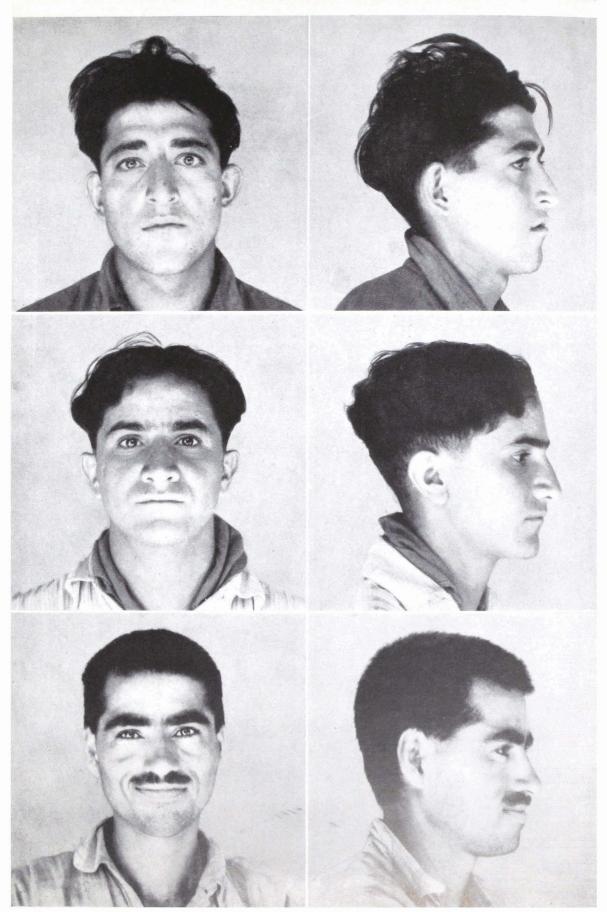


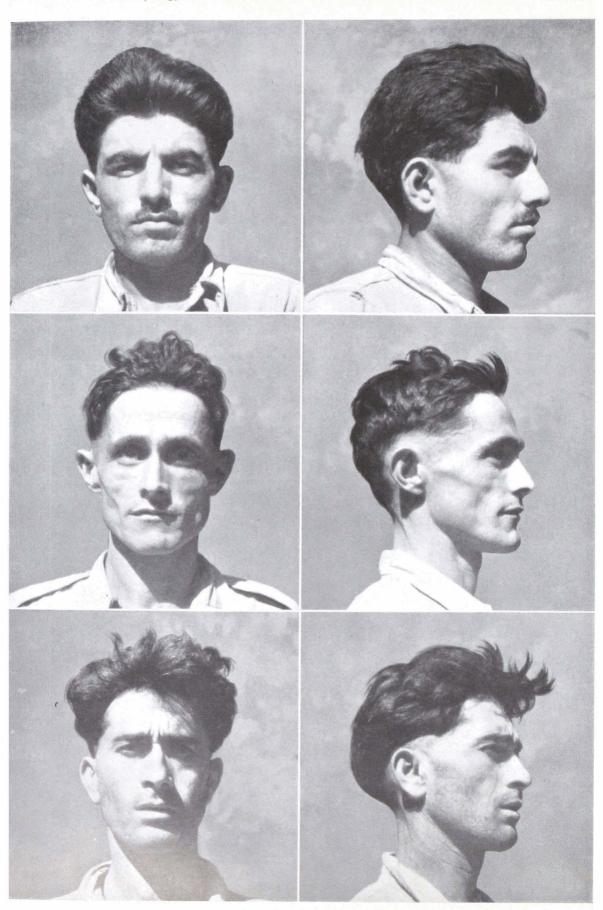
Top, two Chitralis of Barenis and, bottom, one of Koghozi.



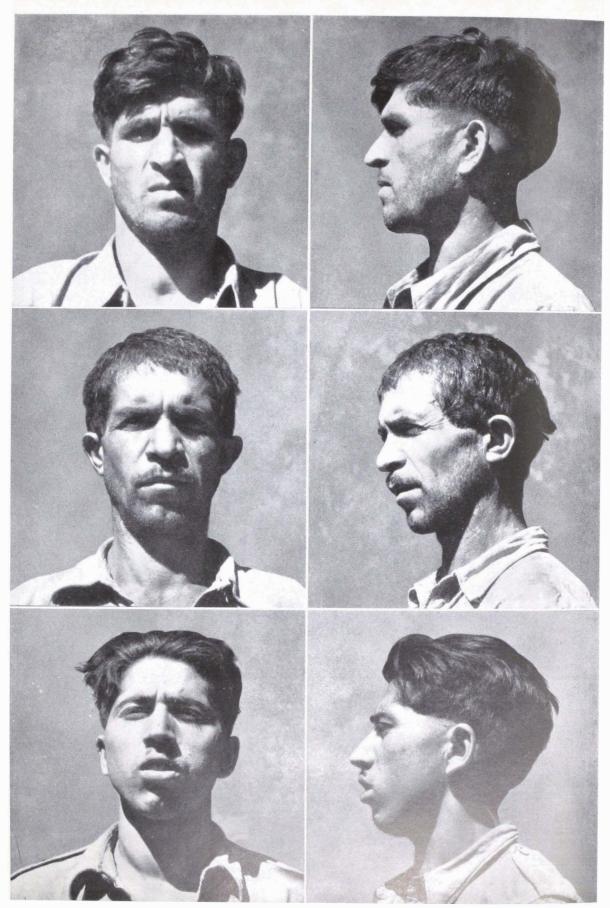


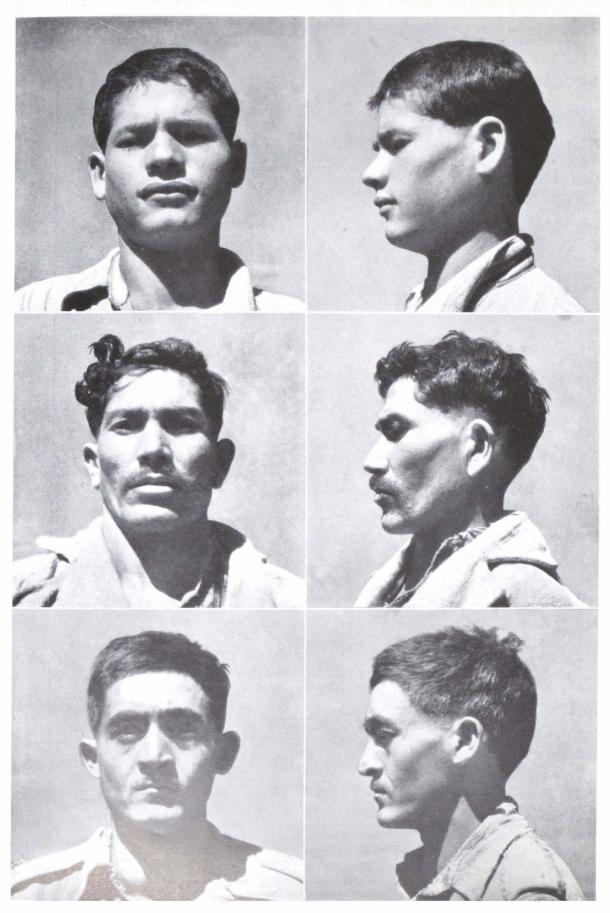
Chitralis of Koghozi.

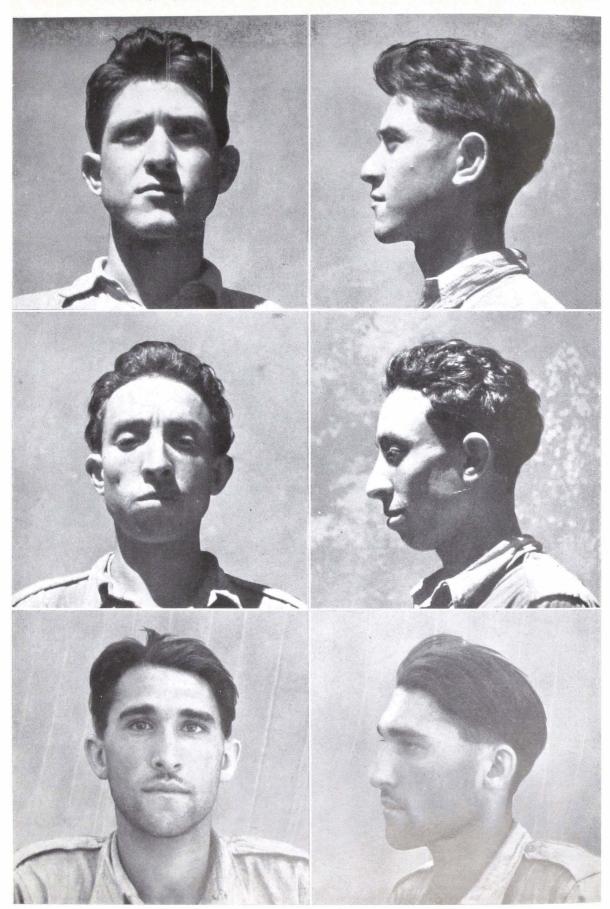


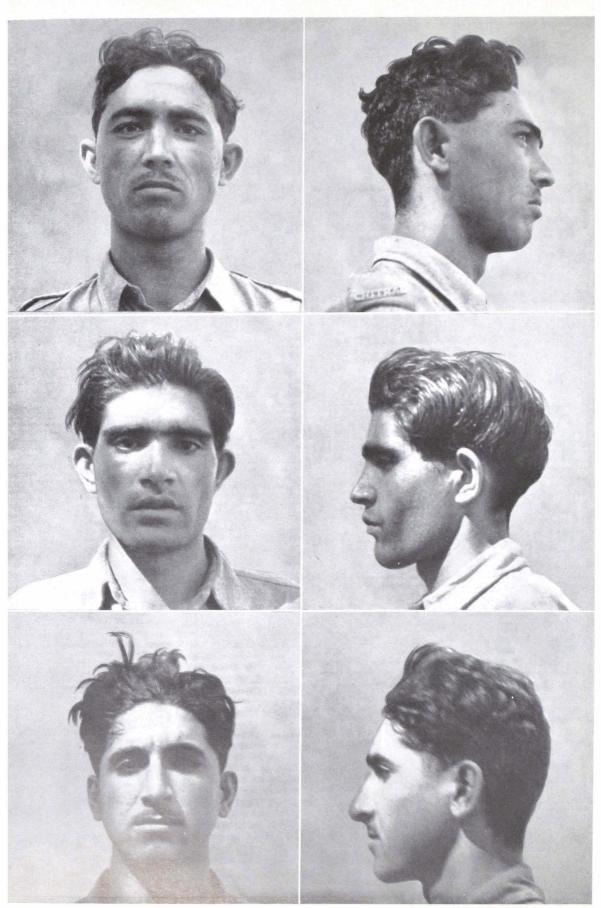


Chitralis of Kauhu.

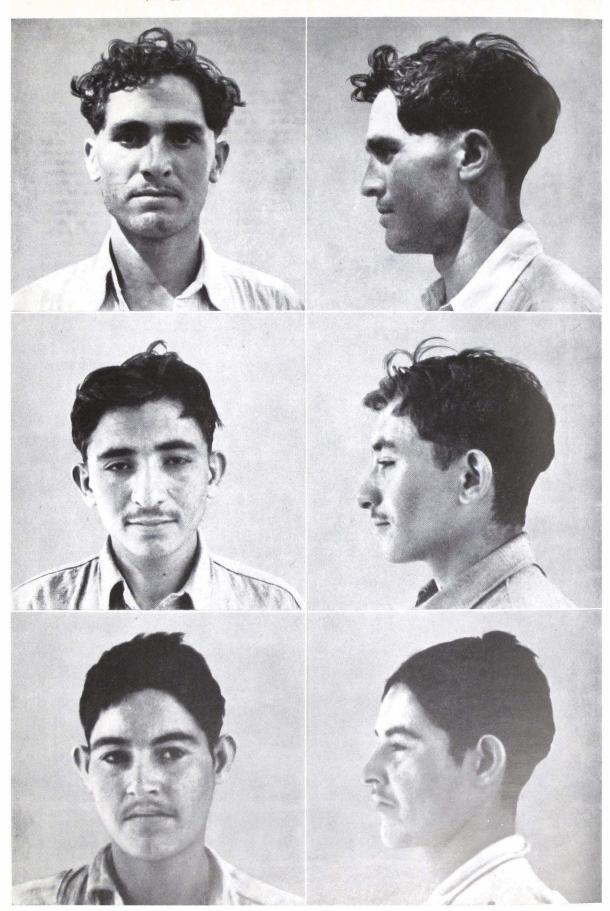


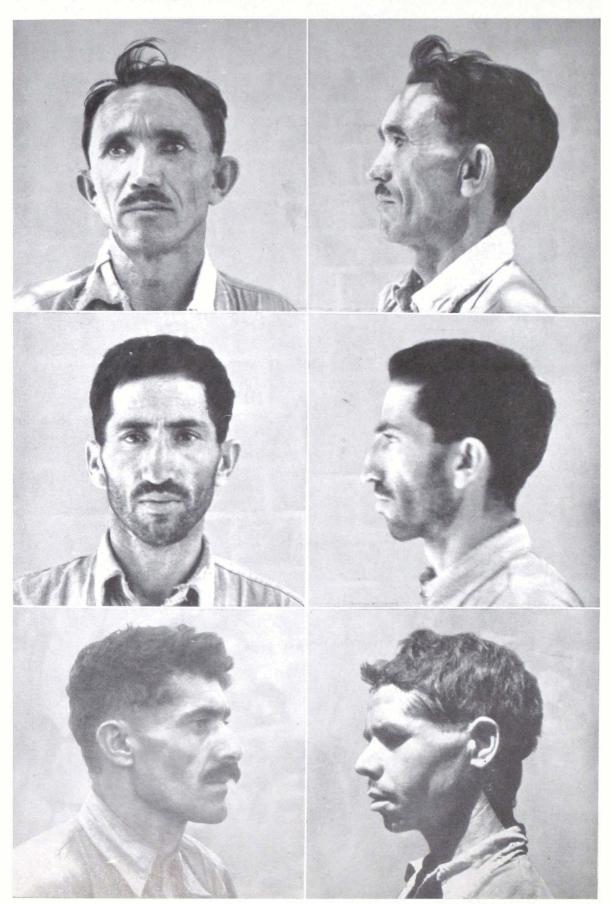




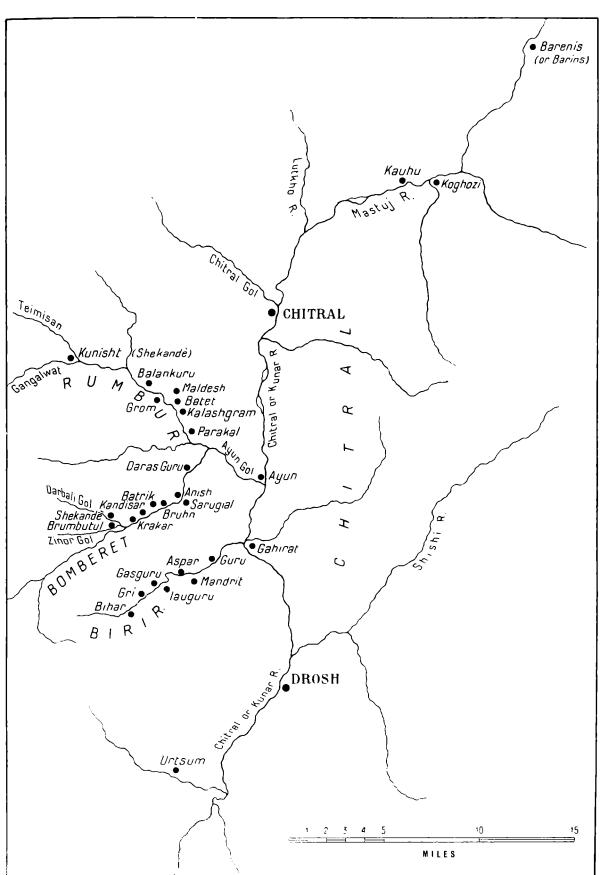


Chitralis of Chitral.





Top, two Chitralis of Chitral and, bottom, two of Kauhu.



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