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PREHISTORIC INDIA



PREHISTORIC INDIA

ITS PLACE IN THE WORLD'S CULTURES

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BY

PANCHANAN MITRA, M.A.,

FREEMAN'S BOYCHAND RESEARCH STUDENT, LECTURER IN ANTHROPOLOGY
AND ANCIENT INDIAN HISTORY AND CULTURE, CALCUTTA
UNIVERSITY, SOMETIME LECTURER IN ENGLISH
LITERATURE, BANARAS UNIVERSITY.



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To

The memory of my father

UDAYENDRALĀLA MITRA,

Born September, 27, 1858,

Died February, 20, 1915,

a late fulfilled task



PREFACE

Since the last Great War, West European civilisation is being tried in the balance and repeatedly found wanting, and 'Culturology' (as I might say) is coming more and more to the forefront. There is a systematic endeavour to dive deep into the question of origin and decay of civilisation which, to quote a Sanskrit simile, like the goddess of Fortune comes mysteriously like the milk in the cocoanut high up in the tree and disappears like the rind inside the nut (which comes out whole when swallowed by the elephant). It is being more and more felt that India and China alone in the old world with complex communal life and primitive institutions somehow possess the vital elixir which made them survive the diseases to which, to quote Edward Carpenter, has succumbed Egypt and Persia, Greece and Rome and will still make them escape the factors that are ruining modern Europe.

Thus Maeterlinck has pointed out in his Prologue to the Great Secret that "Thanks to the labours of a science which is comparatively

recent, it is very much easier than it was not so long ago, to discover the source, to ascend the course and unravel the underground network of that great mysterious river which since the beginning of history, has been flowing beneath all the religions, all the faiths and all the philosophies; in a word beneath all the visible and everyday manifestations of human thought. It is now hardly to be contested that this source is to be found in ancient India."

Now it is well-known that prehistoric archaeology is as vital to a proper understanding of the steps and processes of human progress as ontogeny is to philogeny. And the place of India in human culture being once completely comprehended, prehistoric archaeology of India becomes fraught with the utmost interest. "A glance at the map shows India as the heart of the old world; in fact, the ideas that emanated from India, the elements of culture that matured there, had been derived from outside, had been recast and transformed over and over again by an indescribably fertile imagination, sometimes indeed worked up even to extravagance, and in all these stages given out again broadcast to the world. In the rise of Indian studies, India was looked on as 'the cradle of mankind,' 'the seat of primæval wisdom.' This was a mistake. Still in one's zeal to reduce everything to proper proportions we must not go so far as either to



The Bactria Cranium
(By courtesy of Rai Bahadur G. A. Gupta, F.Z.S.)

ignore or to minimise the immense importance of Indian life in the history of human culture." (Grünwädel, *Buddhist Art*, 1901, p. 6.)

Thus as in historic times, so possibly in prehistoric times India was in touch with phase after phase of the dominant cultures of the world. What is more, with the motto of "live and let live" India is still dragging on primitive elements from the remotest prehistoric times even in the most cultured households which live and move in latest thoughts whether spiritually evolved within herself or materially imported from the West. The cultured Hindu still perpetuates in his society the totemistic exogamic basis of Australoid times (c. 9000 B. C.), believes in the 'Yak' guardians of treasures like the Nae Yaku of Veddas (c. 7000 B. C.), revels in Mother-goddess worship in forms redolent of Indo-African or Proto-Mediterranean phases (c. 5500 B. C.), worships idols of cow-dung or pays homage to the cow with the scrupulousness of a Toda (c. 4000 B. C.) and utters *mantras* during marriage and *śrad̥d̥ha* (funeral) ceremonies set in vogue by Rig Vedic longheaded peoples (c. 2500 B. C.). And yet sometimes teacher, sometimes taught, India learning new analytical methods and revealing new synthetic truths has a firm faith in her future and proclaims with one of her greatest modern sons, Swami Vivekananda,

that :—“ Whenever there has been a great conquering race, bringing the nations of the world together, making roads and transit possible, immediately India arose and gave her quota of spiritual power to the sumtotal of the progress of the world. This happened ages before Buddha was born and remnants of it are still left in China, in Asia Minor and in the heart of the Malayan Archipelago. This was the case when the great Greek conqueror united the four corners of the then known world; then rushed out Indian spirituality and the boasted civilisation of the West is but the remnant of that deluge. Now the same opportunity has again come; the power of England has linked the world as was never done before.” (Address in Works, Vol. III, p. 222.)

Then again, as Stoddard has pointed out, the importance of racial problems for the future of mankind far transcends all other questions (Rising Tide of Colour, 1920, p. vii). “ But in India where East and West meet as nowhere else, Britain has lighted a beacon which if she keep it burning, will show to both the way of escape from a more disastrous conflict than that from which the West has just emerged battered and bleeding, a conflict not between nations but between races ” (Sir Valentine Chirol, India Old and New, 1921, p. 310). It is from pre-historic India alone that is to be discovered the secrets of a process which could weld up in one

homogeneous group life, be it social or religious, the races which are akin to the Nordics, the Alpines and the Mediterraneans who have yet failed to come to any agreement except that of aggressive plunder in Europe. The Nordic Hindu of North-Western India or the Mediterranean Dravidian of the South or the Alpine Bengali or Mahratta would be found offering *pūjā* at the same shrine perhaps at the same time when they belong to the same religious group, *e.g.*, a Vaishnava, a Saiva, or a Śakta or participating in the same group life of a Brahman, a Kshatriya, a Vaisya, or a Sudra even in these degenerate days of castedom. It is the spiritual harmonising impetus from her prehistoric times that makes Modern India put new wine in old bottles and has given rise to sects which preach divine love from a scientific realisation of the unity of life in all its diversity, and to a religion which holds that all true religion and all true science are but one, the difference lying only in creeds and dogmas, which already like Conklin's 'evolved religion of the future' (*The Direction of Human Evolution*, p. 247) has built up a camaraderie of "all men of good-will" 'making love of God and love of fellow men the one requirement for mutual fellowship and service.'

While acknowledging my personal gratefulness to my great benefactor and patron Sir

Asutosh Mookerjee, Kt., C.S.I., M.A., D.L., Ph.D., D.Sc., Vice-Chancellor, Calcutta University, I think I would fail in my duty if I do not point out what anthropological studies in India owe to him. What to Sir Herbert Risley was but a pious wish, to Sir Richard Temple a long cherished object, what was but a paper resolution in the Museums Conference of the Government of India more than a decade ago, *viz.*, systematisation of anthropological teaching and research in India, is going to become a reality under him in the Calcutta University in spite of his being seriously handicapped for want of funds.

My thanks are due to Professor Ramaprasad Chanda, Dr. D. R. Bhandarkar, Rai Bahadur B. A. Gupte and Mr. Anathnath Chatterjee M.B., B.S. for encouragement and guidance. Mr. Percy Brown is mainly responsible for the fine plates and the valuable note that grace this book and I cannot be sufficiently grateful to him. I have to thank Mr. Tarakchandra Das, M.A., who helped me with the bibliography. I have also to thank my young friends Sj. Sisirkumar Har, M.A., who also helped me with indexing and Sj. Rajendrakumar Bhattacharyya, M.A., for giving me the two notes. My best thanks are due to Mr. A. C. Ghatak and his staff as well as Sj. Pulin Krishna Mitra, M.A., Sj. Anilkrishna Mitra and Sj. Radhashyam Ghosh for help in seeing my

work through the press. Last but not least I take this opportunity to acknowledge gratefully the deep debt I owe to the correspondence with various European scholars specially the late lamented Prof. Giuffrida Ruggeri and Prof. Elliot Smith.

SENATE HOUSE,
CALCUTTA.

The 19th February, 1923.

} P. M.



PREHISTORIC INDIA

CHAPTER I.

THE NEEDS, METHODS AND SOURCES OF PREHISTORIC STUDIES IN INDIA.

It is rather fortunate that now-a-days in the words of Prof. Teggart there has been 'an attempt to do for history what biologists are engaged in doing for the history of forms of life.' Time was when history meant but a catalogue of kings and battles and we know how a Heine could chuckle with satisfaction at his labours to get by heart the list of Roman kings in order to appreciate better the later researches that they had no existence at all ! History has indeed been made at times to moralise over the turns of the wheel of fortune or to emphasise the fleeting character of things. It is the kings and states or at best the mighty religions on account of the potent power they wielded that have been made the subject of classical studies in the 18th

century. But it is in the latter part of 19th century or rather in the 20th century that the science of man, probably brought into being by the democratic and individualising tendencies of the day, has set us a-hunting for the records of man, the creature's heir claiming the whole world as his kin. In other words we have been led to "the study of the creature man, considered as a material object and great group of individuals possessing many qualities. First, this being has to be described (ethnography) and subdivided into different races (ethnology) and then special attention has to be given to his physical constitution (somatology) and also to what he produces (technology). Closely associated with this last and indeed an important part of it, is the search for the record he has left, consisting exclusively of such products belonging to past periods and preserved from destruction. This is Archæology. But many of his productions are not material and consist of institutions of various kinds. Using this term in a broad sense institutions embrace language, customs, governments, religions, industries and ultimately art and literature. The study of these constitutes real history as distinguished from the mere *histoire bataille*."

Now the outlook about the beginnings of history and the origins of civilisations has been

* Ward, *Outlines of Sociology*, p. 182.

completely revolutionised during the last thirty years. Reinach has shown Early Philological researches. beautifully that the now decried "Aryan" researches did yeoman's service in giving the death-blow to the orthodox idea of Hebrew being the oldest and the source of all languages. But these researches brought in their train what the French savant has so nicely expressed 'the mirage oriental.' "Towards the close of the 18th century, Sir William Jones drew attention to the striking similarities between Sanskrit, Greek, Latin, German and Keltic, similarities that could only be explained by a common parentage. Bopp's *Comparative Grammar* (1833-5), established the science of comparative philology, and all the European languages except Basque, Finnic, Magyar and Turkish were comprised in what was called the Indogermanic group. The title is misleading but the more usual term Aryan, invented by the late Professor Max Müller, is also open to many objections. *Arya* is a Sanskrit adjective meaning noble, and in the Vedic hymns it appears to be a name assumed by the conquerors who introduced the language of the Vedas into India. In the Zendavesta, the most ancient Persian Text, the country of the Aryans is mentioned, and it was long said that *Ariana*, the district round Herat, was the cradle of the Aryan languages. Professor

Max Müller in 1861 spoke not only of an Aryan language, but an Aryan race or family.¹ Then a long controversy was started as to the home of the primitive Aryans but no doubts were raised about the correctness of the central position.

Thus Reinach has drawn our attention to the excesses committed by the early Philologues. He says :—“The profound impression which was produced by the discovery of Sanskrit at the end of the last century (18th) amongst the savants of Europe is well known. As this language happened to possess a grammatical mechanism more complicated than others it was believed for a long time that it was the mother or at least the eldest sister of the Aryan languages. A fabulous antiquity was ascribed to its literary monuments; it was supposed for a long time though not explicitly stated that the ‘Aryaque’ or Sanskrit had been the language of the first men. India, Asiatic plateaus, the pure Aryas became the *Alpha* and *Omega* of erudition.”²

And meanwhile comparative mythology had also come into being to ‘make confusion worse confounded.’ A typical case would be that of Ancient Greece which as much as India was subjected wholesale to the “Aryan” theories. In the domain of Greek researches no name

¹ British Museum, *Guide to the Antiquities of the Bronze Age*, 1873, p. 11.

² *Le Mirage Oriental (L'Anthrop.*, 1893, pp. 535-40).

stands higher than that of Professor Ridgeway and the fittest prologue to the memorial volume presented to him by all antiquarians who had revealed the glories of Crete, Mycenæ and Hisarlic (Troy) in 1913 has been found to be a verse beginning with an indictment of Max Müller and his theories by Dr. A. D. Godley thus:—

"E'en when Max Müller, celebrated man,
 Conceived the past upon a different plan,
 Divulged the fact and pleased the world therewith
 That Agamemnon was a solar myth :
 And first presented to our mental view
 The glorious certainty that naught was true !
 E'en then each legend howsoever designed
 Was still a figment of the Græcian mind !
 No part of dim antiquity, but it
 Was made or fancied by Hellenic wit."

And thus Hall has truly pointed out how 'if we look to the Greek histories of thirty years ago we find their writers, when dealing with the beginnings of Greek culture, talking under the influence of philological theories of Max Müller and how Archaeology had to rescue history from the morass into which philology had dragged her.'¹

True it is excesses have sometimes been made here also in swinging the pendulum too much on

¹ *English Archaeology*, p. 11.

the other side. But European Archæologists have been alive to it. Since the days of Sergi every bit of advanced culture is being ascribed to the "Mediterranean Race." But says Reinach (though we should leave aside his ethnology)¹ "should one speak of the Mediterranean race? After having attributed all the virtues to the Aryan, mythic creature, we are afraid of inaugurating a new cult and not less arbitrary, that of Mediterranean. We should not forget that the men are above all fashioned by mixture and that the word 'race' more and more discredited will come to appear perhaps a little devoid of sense."¹

Now if Prehistoric Archæology has become the *sine quâ non* of the histories of ancient Greece and Rome, if it has been definitely recognised that any historical attempt to deal with the ancient cultures of those two lands without a proper and thorough enquiry into their fore-runners in civilisation the Creto-Ægeans or Etruscans is bound to end in failure, is not the case the same as regards India?

Of course though no Schliemannic excavations have come in India, so far, the accepted basis of things is solely the result of inferences drawn largely from the comparatively recent discoveries which throw little light on the ancient traditions, literary or otherwise, of

¹ *La question d' Orient en Anthropologie (L'Anthrop., 1896, p. 687).*

the Hindus, Buddhists and Jainas. Now that the value of traditions cannot be minimised do we not get as yet but a study of the history of India from the wrong end? Should not the light of more ancient discoveries be turned over ancient India as it has been done with so marvellous success in the case of Egypt and Western Asia? And now that prehistoric Egypt and prehistoric Chaldaea have been laid bare no one doubts the datings in thousands of years of the cultures of these two lands and thus only their histories have been placed on a sound footing. But the traces of prehistoric man and his culture are being unearthed in India for over fifty years and yet no systematic historical treatment has been offered of them. It is our business here to accumulate that scrapheap of respectable size about the prehistoric antiquities of India and with the aid of Ethnology to arrange them on the basis of European methods and to point out their historical bearings on the earliest page of Indian history. Now it might be that here the old philological theories would be confirmed and the word "Aryan," would be re-established being more concerned with the culture of India and its neighbouring countries, (the 'Ariane,' of the ancient Western writers), from which one branch at least moved eastwards

¹ Strabo (McClellan's *Ancient India*, p. 60).

who became the Hindus, *i. e.*, Sindhu-Bank dwellers in the Vedic age and spread over the rest of India later on. Still though much has been written about the invading race from the North-West and even their career of conquest has been mapped out from their ancient literature, about what they found in India, and the cultures that were handed over to them Indian history is yet very vague. But we are all know to-day that Homer is but a closing chapter of human existence and brilliant culture in Greece and the antiquity of Indian civilisation does not all lie Vedwards. Scholars like Sir John Marshall or Dr. Coomarswamy have come to recognise in Indian art a distinct Southern maritime Indo-African or Pre-Mycenean element, which I think is best expressed by the word Erythrean. The bulk of Indian historical culture is 'Aryo-Erythrean,' which in its Erythrean aspect is at least as old as Bronze Age I or the Pre-Mycenean Epoch or the chalcolithic stage in Egypt, Sumer, Elam and Anau, *i. e.*, 3500-1500 B.C. at the latest. But we do not stop even there. As the story of man in Sussex does not end with the coming of the Saxons or the Roman occupation but is carried back to the earliest quaternary epoch when modern man (*Homo Dawsoni* without the tooth of *Pan vetus*) hunted the meridional elephants with rude stone implements of a distinctly recognisable artistic

type (pre-chellean or rostrocarinate) so also there are unerring proofs of the existence of man in India from late Tertiary and quaternary times. Nevertheless it is rather a travesty of science to attempt to read the Bible in Pleistocene Palæontology like Rev. Dr. James Wright (*The Antiquity of Man*, 1914) or to ascribe a Miocene antiquity to the Rig-Vedic culture (*vide* Dr. Abinashchandra Das—*Rig-Vedic India*, Calcutta, 1920) which its own tradition pins it down to the *Ayaa* (Bronze or Early Iron) stage.

So it is that Dussaud opens his masterly treatise on '*Les Civilisations préhelleniques*,' thus:—

Prehistory.

"It is the glorious achievement of the nineteenth century to have pierced beyond the limits of history and to have found vestiges of human activity anterior to all written record, in a word, to have constituted 'Prehistory.' It has brought into being new methods, which nobody denies at the present day, and utilises the data furnished by geology, ethnography and archæology." In the words of Dechelette, the greatest prehistoric archæologist:—(1) with the geologists the prehistorian has to study the ancient human remains and determine their age and order of succession by the stratigraphic method. (2) Palæontology procures for him the fossils indicating the relative age. (3) Ethnography aids

The method of Prehistoric archæology.

the prehistorian in his study of the industrial vestiges and conditions of existence of primitive man : and lastly (4) Typological method allows him, in the absence of all others (stratigraphic, paleontological, ethnographic) to arrange the order and evolution of things.¹ This science, in the words of a President of the Royal Anthropological Institute, 'has enormous value in reproducing for us in an absolutely accurate form the history of prehistoric times. In critical literature we are confronted with varying accounts of historians set side by side whereas the advantage here is that the evidence is truly set before us.'² But a word of caution is needed. It is often forgotten that there can be no hard and fast distinction between history and prehistory. This is brought about very luminously by the great Americanist Holmes thus :— "Prehistory signifies merely pre-written history. Since history must be regarded as embracing the entire record of the race, whatsoever form it may take, there can in reality be no such thing as 'Prehistoric period' or 'Prehistoric Archaeology.' The beginning of written record is not the end of unwritten record either for the race as a whole or for any of the groups. The unwritten phase in no case ceases with the beginning of the written phase of the history of any people :

¹ *Archéologie préhistorique* (Manuel d'Archéologie, Part 1), p. 23.

² *Journal, R. Anthropol. Inst.* 1901, p. 94.

a large part of the current history, in all cases, being unwritten, passes, unless temporarily conserved by tradition or by some nonpurposeful method, directly into the vast body of the subject-matter of archaeological science or otherwise into the great blank of oblivion."¹

So the value of ethnography to prehistoric Archaeology is very great; the two branches of science are in fact complementary to each other and Ethnography can throw a most useful light upon archaeological problems. For instance, the similarity in winter houses of Arctic peoples, with their covering of earth, to the chambered barrows suggested the reasonable explanation that these barrows were really survivals of actual houses. It is a common practice among primitive peoples to bury a man in his own house, or by a development of this idea, in a tomb resembling a house, and it is therefore natural to infer that the chambered barrows are tombs of this description. In the same way the existing pile-villages of New-Guinea and other Asiatic Islands provide a most life-like illustration of the vanished lake dwellings of Switzerland. Again from existing ethnographical specimens made of perishable materials, such as wood, skin, basket-work or matting, we may form some idea of the costumes and

Prehistory and
Ethnographic illustrations

Archaeology is very great; the two branches of science are in fact complementary to each

¹ Handbook of American Archaeology, 1919, Part I, p. 3.

household utensils of primitive man in Europe which have so completely disappeared. In all probability, therefore, the resemblance between the perishable productions of the modern savage and those of prehistoric man, which are now lost, was proportionately as great as that which undoubtedly exists in the case of implements of stone and bone which have remained.¹¹¹

It is rather lately that attempts are being made especially by continental scholars to study the facts as a whole and to systematise them into chronological, cultural and racial groupings. The method is, as Montanadon has happily put it, this :—“ For obtaining some light on the parentage and succession of races and civilisations, history based on the written records and rising up to main-springs chalks out an ascending path. Quite contrarily prehistory tries to attack this problem at the very origins and thus follows, so to speak a reverse ascending track. Linguistics, Ethnology and modern Anthropology attaching themselves to forms persistent from the past to the present, march to the common meeting ground by a course which we might speak of as horizontal. These diverse enquiries if incorporated into each other would form a bundle of definitive certitudes.”¹¹² It is by the

¹¹¹ British Museum, *Guide to the Stone Age*, pp. 74-79.

¹¹² *Arch. suisse d'Anthrop. generale*, 1919, pp. 94-5.

help of this synthetic method developed from Graebner and Pater Schmidt that during the last few years Prof. Elliot Smith, Dr. Rivers and their brilliant following have made the 40th to 20th century B.C. (and not the 8th century B.C. as I hope to show) as significant in Egypt, the Erythrean sea and later on in Indonesia and the Pacific as the Mediterranean, the Atlantic and the United States are in the world-wide culture movements of to-day.

It is a pretty long time since various stray notices began to appear in Geological, Palaeontological, Anthropological and Asiatic Journals about the stone implements of Ancient India. Fergusson treated the megalithic part of this subject with his usual thoroughness in his "Rude Stone Monuments in all Countries." But no connected account of oldest India has yet been compiled if we except Logan's rapid and short survey of the "Old Chipped Stones of India." Though in the words of a reviewer "A prehistoric survey on scientific lines of Southern India is still a desideratum"¹ and though even in Hyderabad Archaeological Society's Journal for the last year² we read how 'there are now still in H. E. H. Nizam's dominions alone a thousand unexplored megalithic remains,' it cannot be denied that we

¹ Somerset Playns, F.R.G.S.—Scribner, India (1914-15), p. 22.

² P. 63.

have already got a large amount of material ready to hand to deal with. The published catalogues alone of the prehistoric collections in the Museums of India are already five in number :—(1) The Catalogue of the Prehistoric Antiquities, Madras Museum (1901), (2) the *Catalogue raisonné* of the Foote Collection of Indian Prehistoric and Protobhistoric Antiquities by R. B. Foote (1914), (3) Note on the Ages and Distribution of the Foote Collection (1916), (4) the Catalogue of the Prehistoric Antiquities from Adichanallur and Perumbair, by A. Rea (1915) and (5) the *Catalogue raisonné* of the Prehistoric Antiquities in Indian Museum at Calcutta by Coggin Brown edited by Sir John Marshall (1917). Besides this, in the numerous provincial museums there lie uncatalogued hundreds of palæoliths, neoliths Copper and Iron Age artifacts in which little interest has been aroused mainly owing to the lack of synthetic interpreters.

It may indeed be argued that all labours in this direction would be mere Facilities and accuracy. misdirected energy so long as all the possible data are not at hand and it would be prudent to wait till all the prehistoric sites and megalithic monuments are laid bare by excavations. But it must be definitely noted that until proper spade-work is done with the actual materials

already available there is no earthly use of accumulating facts *quæ* facts and little chance of definite steps being taken towards their identification, classification and grouping. The Madras Museum collection had so long been in the show-cases but it is only lately that they were examined afresh that definite marks in the prehistoric pottery were found out. But at the present stage we should come to conclusions always with reservations and try to keep an open mind being prepared for any issue. The vestiges of culture, the stone implements, the ceramic and other arts should all be taken and carefully examined and compared with similar other cultures and results should be deduced therefrom. Thus there would be a descriptive portion based on scientific inference which would be little liable to doubt. And then there would be an attempt to grapple with the various interesting problems arising out of them, which would be of a more or less controversial kind, and as it is best not to have a preconceived theory, all the possible aspects of the case would be laid bare. It is well-known how an intensive study of the technology of the stone implements aided though by geological and palæontological observations has settled once for all the various stages of culture in the Palæolithic age and it has been found worth while to classify the Indian finds

according to the accepted methods of the West. The light of later research may lead us to modify our groupings and probably the very basis might be changed. It would probably be more profitable to speak of an upper Siwalik (Pliocene) Post-Siwalik or Pre-Narbada (quaternary Glacial I) Narbada (quaternary Interglacial I) Karnul (quaternary Glacial II) Upper Ganges-Goalpara (quaternary Interglacial III) and Banda-Vindhya (Post-Glacial). But this is venturing too much and my typological and technological conjectures should wait till the Indian Geologist and Palaeontologist is humoured to take to Quaternary and Recent times in right earnest. That a treat awaits him there has been even recently (on the occasion of the Rhodesia find) pointed out the other day by the eminent anthropologist Sir Arthur Keith, M.B., F.R.S., who had already observed in 1916¹ :—

“It (India) is part of the world from which the students of early man has expected so much and so far has obtained so little.”

It is but idle speculation to think whether
 Fossil remains future excavations (which unfortunately has scarcely begun) would bring to light, anent the Sivapithecus and Dryopithecus, a great early man like *Homo Dawsoni* or shed new light on the existing races by unearthing the great Neanderthal race as at

¹ *The Antiquity of Man* (1916), p. 256.

Broken. Hill side by side with a more polished Cromagnon type or reveal a Proto-Negro Pre-Dravidian type as from Mentone, or show a Veddaic type persistent here through dim ages of Antiquity as at Boskop or Talgai and in North America. As it is, the tale of human shape and form and build in India is carried a pretty long way into the past by the skulls discovered at Gorakhpur, Bayana and Sialkot as well as at Adichannallur though these dim into insignificance besides the previously mentioned types in point of antiquity or interest.

But though as yet human bones in India have allowed us little facility to track his brain capacity far into the distant ages, there are sufficient remains of undoubted human origin associated with animal bones or found *in situ* by competent geologists to allow us to build up a considerable portion of the structure of the civilisation in which man flourished in India. Here, as at every step, the works of the great savants on European culture not only offer us the safe methods of work but afford the only corner-stones of research. One has got to forget now that most of the subdivisions of Palaeolithic culture, Azilian or Acheullean, are but names of particular localities of France, for to the prehistoric technologist they become definite landmarks and synonyms of distinct phases of

culture. Of course time may show that the particular order of development of Palæolithic cultures indicated by the terms, Reutelian, Mafflian, Mesvinian, Strepian, Chellean, Acheulean, Mousterian, Aurignacian, Solutrian, Magdalenian and Azilian hold good of France or Europe alone rather than of this country. But when it is remembered that Europe by its geographical situation and favourable climate was possibly the Cradle of Pleistocene and Prehistoric Eurasiatic culture, its claims for being the standard of comparative culture become obvious. The division of the Stone Age into Palæolithic and Neolithic is of course as old as Avebury's classic work but the modern tendency is strong to bring in a third forerunner, the "Eolithic" age. As there might be some objection to the term "Eolith," I have avoided the difficulty by applying the word Pre-Chellean to specimens very early and yet beyond the range of controversy and considering technologically the 'Eoliths' partly as 'Rostro-carinates.' The other succeeding stages of culture have come in also for their due share, though it has been impossible to recognise all the stages and some intermediate ones had to be left aside. Passing now to the special conditions applicable to India alone we have got to refer to the two laudable attempts at dealing with the oldest strata of Indian civilisations in some systematic shape by

Logan in his *Old Chipped Stones of India* and Bruce Foote in his *Notes on the Ages and Distribution of the Prehistoric and Protohistoric Antiquities of the Foote Collection of the Madras Museum*. The former was published in 1906 and though the latter has been brought out in 1916 by Mr. Henderson, as his preface shows, it was long on the anvil and, in fact, the composition was most likely finished by the late eminent Indian Geologist at least 12 years before its publication as is quite patent from its internal evidence. But Anthropology has undergone a great revolution within the last two decades. Duckworth's last sentence in his *Prehistoric Man* (1912) is that 'the extraordinarily fruitful results of excavation during the last 10 years may challenge comparison with those of any other period of similar duration,' and even this work has become antiquated by the discovery of the Piltdown skull. If we just turn over the pages of Sollas's *Ancient Hunters*, Osborn's *Men of the Old Stone Age*, Keith's *Antiquity of Man* and last but not least the two superb works of 1921, *Les Hommes fossiles* by the great human palaeontologist Boule and *Su l'origine dell'uomo* by the great Palethnologist Giuffrida-Ruggeri, we can realise the advantage in equipment of the present day anthropologist. Even for him the science is moving too fast when we remember the Broken Hill Skull which does not find a

place in any of the above. So with a word of high praise to Logan's summarisation of the geological aspect of the localities in which the worked stones of India occur we have to take note of the natural narrowness of his outlook by just quoting a few of his sentences. "We may therefore picture our precursors as short brown apes, no bigger than the African pygmies and probably not very brutal in face, living in companies as large as their means of subsistence would allow and endowed with the primary virtues of courage, co-operation and obedience to leader but not necessarily anything else that we should call virtue,"—"the race that invented the river-drift paleoliths I take to have been exclusively the long-headed race which inhabited Europe in the earliest times known to us and which was destined to become the ancestors of the white races in its three main divisions of Aryans, Semites and Berber," are sentences which neither Prehistoric Archaeology nor Ethnology nor even Comparative Philology would think of at the present day. Then again, I doubt whether only a strong prejudice to tertiary man alone does not lead him to increase in large figures the duration of the pleistocene age in India and bring down the earliest vestiges of human existence there to middle or late quaternary age. The last charge can be brought against Bruce Foote even.

Bruce Foote's last work is more a geographical study as Logan's is a geological one, and both of them suffer from doing little justice to the cultural and evolutionary aspects of the things. He has indeed recognised the value of Ethnography for a solution of the problems of culture of the older people but he has missed one important point that in this, the range of comparison for enquiry and study should at first be limited to the Indian or neighbouring savage tribes most of whom are very possibly survivals, 'vestigial organs,' as it were, of the tale of past human life and its culture in this country. That is why in the course of Indian researches care has always to be taken to trace out the existence of archaic implements and their methods of use amongst the existing primitive tribes of India on the one hand and also to take note of the changes in them during the later higher civilisations in this country.

Thus an explanation of use of ringstone is possible by the study, for instance of the *chakra* (discus) on the hand of Vishnu meant to be hurled at an enemy or the shoulder-headed celt may be studied in its multiform shapes as the thunderweapon in the hands of Buddhist, Hindu and Jaina icons. When we remember the place of India figuring the Eurasiatic continent as a *cul de sac* to the world-wide culture movements of the past, its study becomes as interesting as of

the extreme west European countries. Thus the distribution of rostro-carinates 'in Kent and Cuddapah', of palaeolithic and neolithic art designs identical in India and Australia, of pygmy flints over maritime tracts and fluvial parts accessible by sea, of neolithic and chalcolithic forms in India and Egypt, of banded and grooved hammers and shoulder-headed celts in N. E. India and Asia and possibly America, of identical linear designs on pottery from Central Asia, Beluchistan and the Deccan, and occurrence of linear alphabetiforms of the Proto-Egyptian, Sumerian and Minoan type in megalithic pottery from the Deccan can no longer be lightly passed over.

A study of these parallels has become of vital importance in these days owing to the gradual change of attitude of anthropologists in explaining these remarkably similar phenomena.

The explanations of similarities.

Three sharply distinguished schools stand out, *e.g.*, the British, dominated by the evolutionary idea, the French, working out the factor of sociological environments and the Germans, bringing to prominence the parts played by cultural and racial movements in prehistoric times. It is the triumph of the last and its practical acceptance by a recent body of brilliant British anthropologists that has not only bound up intimately prehistoric and primitive studies but

has well nigh made anthropology the sole if not most fruitful source for recovering the first few pages of the history of mankind in general or of any particular tribe. It is well to understand clearly what we mean and we can do no better than turn to the lucid exposition of the mastermind of Dr. Rivers¹:—“The efforts of British anthropologists are devoted to tracing out the evolution of custom and institution. Where similarities are found in different parts of the world, it is assumed, almost as an axiom, that they are due to independent origin and development, and this in its turn is ascribed to the fundamental similarity of the workings of the human mind all over the world, so that given similar conditions, similar customs and institutions will come into existence and develop on the same lines.

“In France, it is held that the psychology of the individual cannot be used as a guide to the collective actions of men in early stages of social evolution, still less the psychology of the individual whose social ideas have been moulded by the long ages of evolution which have made our own society what it is. It is urged that the study of sociology required the application of principles and methods of investigation peculiar to itself.

¹ Presidential Address, Section II, British Association's Report, 1911, pp. 490-2.

"In Germany, we find the most fundamental difference in standpoint and method. The movement formed part of the general revolt not merely against Darwinism which is so prominent in Germany but it seems against the whole idea of evolution, either in the forms of material objects or in social and religious institutions, the modern German school sees only the evidence of mixture of cultures, either with or without an accompanying mixture of the races to which these cultures belonged."

So we see as Graebner¹ pointed out 'that any good work about even a geographically restricted small tract of land should form, so to say, the rallying point of far-reaching researches. No data, not the slightest relations between island and island and people and people are negligible in constructing human history. For even while dealing with strange and foreign interconnections we deal but with our own things and seek to dive into the beginnings of our own history, as in prehistoric times humanity was linked together in well-connected groups.' These various groups had become sharply differentiated from each other be it owing to earlier separation from the common cradle-land or modification due to

The contact of peoples
and its psychological
effects.

¹ Die Malanesische Eigenkultur. Anthropos, IV, p. 1032.

difference of habitat that is to say in boreal or equatorial regions. Thus they were in different levels of culture without which culture-contact would not have been possible or at least the influence would have been but *nil*. But we must not allow ourselves to forget which unfortunately the German school is often led to do, that not a mechanical process alone but well-defined psychological processes were at work. Thus Dr. Rivers has clearly formulated them: "High organisation of social structure, a refined and exalted religion, high aesthetic ideals finding their accomplishment in works of art, a language capable of expressing the finest shades of meaning all these are important when we have to do with settlements among those already civilised. To the uncivilised they are of small importance beside the purely material aspects of culture. It is the knife and the match, the steamship, the house and its furniture, but above all and beyond all the fire-arms of the European which impress the man of rude culture and lead him to regard their possessors as beings of higher order than himself. It is the recognition of the superiority of the material objects and arts which precedes and makes possible the acceptance of other elements of an introduced culture." This is not all. We understand the circumstances which lead to

* Ridgeway Commemorative Volume, 1911, pp. 477-78.

commingling of cultures. But the results are something like a chemical compound, with quite a new set of properties. Dr. Marrett clearly explains it thus:—"For methodological purposes we have to group the influences at work in culture-contact under various heads, one set relating to environment, another to material culture, a third to social organisation and a fourth to language and lore. Most important of all, however, is to grasp the nature of the synthesis whereby each diverse influences unite so as to bring a new form of culture into being. This is not a mechanical process; the law of which would seem to be that, just as in the mental development of the individual a conflict of impressions invites selective attention, so in the spiritual development of society it awakes latent energies of a constructive kind. Explanation along these lines will be at once historical in as much as it has reference to movements of peoples whereby the culture-contact was brought about and evolutionary because the creative effort of which such contact is the bare occasion must be accounted for in terms of a self-active, self-unfolding soul." How such an angle of vision is needed in properly understanding the culture of India would be brought home to us when we clearly realise the true significance of such words as the

Graeco-Buddhist art of Gandhara. And Brahmanism itself with a catholicity far more than that of the Roman Church beside an insular individualistic stamp like the Anglican would continue to be a standing riddle unless the various culture-complexes of which it is composed are stratigraphically studied in this light.

In fact Hinduism or rather 'Indianism' carries with it the stamp of a continuous process of modification and adaptation to the various phases of invading cultures with which it came into contact. So in spite of a clear-cut individuality of its own, it has nevertheless dragged various inconsistent elements which had been finding place in it ever since prehistoric times. Now that 'the lesson of Comparative Anatomy is that the persistence of primitive traits is a sign of strength rather than weakness,' and whether to this is due its remarkable vitality or not it is a remarkable fact that certain cultural elements which saw the inception of proto-Egyptian civilisation and passed away with the mighty civilisation of the Nile still survive in the Deccan. Elliot Smith thus has been drawing attention to 'these remarkable identities of customs and beliefs found in Dravidian India and East Africa showing the fundamental unity and community of origin of the earliest cultures of

The different strands
in 'Indianism.'

¹ British Association Report, 1912, p. 530.

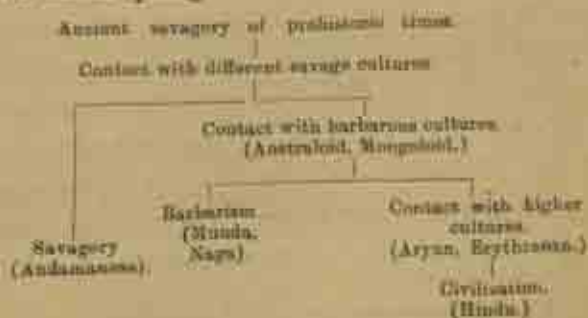
Southern Asiatic and North East African littorals.¹ So Bishop Whitehead in the course of his study of some crude strata of religion in the Deccan truly points out²:—"What we now call Hinduism, therefore, is a strange medley of the most diverse forces of religion, ranging from the most subtle and abstruse systems of philosophy to primitive forms of animism. At the same time, the primitive forms of Dravidian religion have been in their turn greatly modified by Brāhman influence. For the most part, the same people in town and village worship the village deities and the Brāhman gods. There are a few aboriginal tribes in some of the hill tracts who are still unaffected by Brāhman ideas or customs, but in the vast majority of the districts the worship of the village deities and the worship of Shiva and Vishnu go on side by side; just as in China Confucianism and Taoism are not rival religions but complementary creeds. To the student of comparative religion this study is interesting because it reveals many points of contact with primitive forms of religion in other lands and also it enables the student to see these primitive religious ideas in very different stages of development." The facilities for comparison in India are even greater for there are now still primitive tribes, *e.g.*, the Andamanese and the

¹ Man, 1918, p. 12.

² The Village Gods of South India, 1910, p. 13.

Vaeldas or barbarous stocks, *e.g.*, the Mundas and Nagas who have been crystallised as it were in different phases at different epochs in the march from prehistoric times to the present day. But before carrying out any comparison or arriving inductively at the exact pre-historic and primitive stage imbedded in the modern civilisation we must always remember as Sir Lawrence Gomme points out, 'that civilised people do not consciously borrow from savages and barbaric peoples nor constantly revert to a savage original type of mental and social condition. So we cannot take back the custom or belief of the modern peasant to a date when a people of savage or barbaric culture occupied the country now occupied by their descendants the peasant in question now to equate the custom or belief of modern savage or barbaric culture.'

Thus we can illustrate the development of Indian cultures diagrammatically after the eminent anthropologist:—



* Vide Folklore as an Historical Science, pp. 178-198

I am not quite sure if 'Pre-history is content with merely giving us the pre-civilization stages of a land and if Pre-Hellenic Crete now forms the subject of Proto-history I think it is best to equate Pre-history like Holmes with 'Pre-written history' and to consider the period subsequent to that, up to what is known as the historical period, as Proto-History. Thus as Greek history begins with the Homeric period, in India a definite landmark is set by the periods of the written records, i.e., Vedic literature and culture, whose Chronology is unfortunately shifting in the page of every savant. According to Oldenburg, the Vedic Indians lived at the time of the composition of the oldest sources of their history the Vedas, at about 1500 and 1000 B.C. in the Indus and the Punjab.¹ This is the furthest limit of those who do not believe with Jacobi and Tilak in the higher antiquity of Vedic culture placing it between 2500 and 5000 B.C. So pre-history in the North-Western India deals with times anterior to that, though in Southern India where the 'Aryan' colonisation was completed sometime in the 5th century B.C.,² it dragged on for a thousand years more. Then again, thanks to the Archaeological excavations of recent years,

¹ *Die Religion des Veda*, p. 1.

² Bhandarkar, *Carmichael Lectures, First Series*, 1918, p. 7.

the range of accurate Indian history based on corroborative evidence has been extended from mediæval to ancient, Muhammadan to Buddhist times. There archaeology seems to have cried pause and the times from the inception of Vedic culture to the rise of the Mauryan, where there is always a vast body of literature to fall back upon for corroborative evidence are to be reckoned as the nebulous region of Indian *Proto-history*. As tradition is still rife and still continued in Indian almanacs of a Kali Yuga beginning sometime in 3102 B.C. marking the era of the activities of the epic heroes of the Mahabharata of a Saptarshi era used in Kashmir beginning in 3076 B.C.,¹ or the age of the Tamil academical conferences or sangams beginning according to some, as early as 8000 B.C.,² it is possible that the sharp axes of some future Indian Evans or Petrie may still further extend the proto-historic period. It is safer however to reckon all as province of Hindu history and proto-history which deals essentially with Aryan rule and Vedic culture and its amalgam with the earlier elements leaving to pre-history the pre-Vedic and to proto-history the pre-Mauryan era, not forgetting that here as in post-Columbian America, pre-history continues as survivals, *e.g.*, in the

¹ Vide Duff Indian Chronology.

² M. Srinivas Aiyangar—Tamil Studies (1915), p. 265.

hill and jungle tribes of pre-Dravidian times who still await a thoroughly scientific study.

Now Anthro-Geo-graphy points out that India has been subject to most Cultural contact and origin. of cultural cycles originating in boreal or equatorial regions being a peninsular extreme of Euasiatic zone or the calling place of African or Australasian maritime adventurers. Yet Indian history has been not to a small extent handicapped by an insistence on its so-called isolation caused by barriers leaving a few passes on the North-East and the North-West as the only gates of India through which have poured in successive waves, conquering bands of adventurers from the steppes to hold in easy sway the weaklings of the fertile plains. It was naturally argued that in each and every case (an exception, however being made in favour of the civilised Aryans of Max Müller) the conquerors were but barbarian hordes led in chains by the higher culture of the conquered in less than no time. A natural corollary to this had been to argue the essentially pure and indigenous character of Indian civilisation on the one hand or to dogmatise on a late historical influence which, as it were, like the mango plant of Indian magicians caused her culture at once to spring forth and bear delicious fruits in Mauryan times. But while Indology like the one-eyed deer of Esop's Fables did not reckon

with the possibilities of inroads by the sea in ancient times, Egyptological, Assyriological and Anthropological studies has been moving too fast. Thus Jastrow¹ remarked :—"There are good reasons for believing that a *direct cultural influence* came to China at a period even earlier than the introduction of Buddhism, while the evidence, though not yet complete, is increasing which indicates that both the Chinese and Hindu civilisations lie within the sphere of influences emanating from such far older cultural centres as the valley of the Euphrates and the valley of the Nile." During the last few years Elliot Smith and a formidable band of students of comparative culture are bringing forth thesis after thesis showing 'that the essential elements of the ancient civilisation of India, Further Asia, the Malay Archipelago, Oceania and America were brought in succession to each of these places by mariners, whose oriental migrations (on an extensive scale) began as trading intercourse between the Eastern Mediterranean and India sometime about 800 B.C.(?) and continued for several centuries, that the highly complex and artificial culture which they spread abroad was derived mainly from Egypt (not earlier than the XX1st dynasty), but also included many important accretions and modifications from the Phœnician world around the Eastern Mediterranean, from

¹ The Civilization of Babylonia (1915), p. 2.

East Africa (and the Soudan), Arabia and Babylonia; that, in addition to providing the leaven which stimulated the development of the pre-Aryan civilisation of India, the cultural streams to Burma, Indonesia, the Eastern littoral of Asia and Oceania was in turn modified with many additions from Indonesia, Melanesia and Polynesia as well as from China and Japan, continued for many centuries to play upon the Pacific littoral of America when it was responsible for planting the germs of the remarkable pre-Columbian civilisation.¹ But points out Evans "A new and far more broader vista has been opened out in recent years, and it is not too much to say that a wholly new standpoint has been gained from which to survey the early history of the human race. The investigations of a brilliant band of prehistoric archaeologists with the aid of representatives of the sister sciences of geology and palæontology, have brought together such a mass of striking materials as to place the evolution of human art and appliances in the last Quaternary period on a far higher level than had been suspected previously: Its successive phases, the Aurignacian, the Solutrean and the Magdalenian with its Azilian offshoot—the order of which may now be regarded as stratigraphically established—represent, on the whole, a continuous story. Now it is a commonplace of

¹ Report of the British Association, Manchester, 1915, p. 668.

Archæology that the culture of the Neolithic peoples throughout a large part of Central, Northern and Western Europe—like the newly domesticated species possessed by them—is Eurasiatic in type. So too, in Southern Greece and the Ægean world we meet with a form of Neolithic culture which must be essentially regarded as a prolongation of that of Asia Minor. It is clear that it is on this Neolithic foundation that our later civilisation immediately stands. But in the constant chain of actions and reactions by which the history of mankind is bound together—short of the extinction of all concerned, an hypothesis in this case excluded—it is equally certain that no great human achievement is without its continuous effect. The more we realise the substantial amount of the progress of the man of the Quaternary age in arts and crafts and ideas the more difficult it is to avoid the conclusion that somewhere "at the back of behind"—it may be by more than one route and on more than one continent in Asia as well as Africa—actual links of connection may eventually come to light." ¹—The expeditions of Morgan and Pumpelly have laid before us new links in the East and as we have already indicated the culture zone has been extended still eastwards. So we hold with Dr. Wilke

¹ Evans: *New Archæological lights on the Origins of the Civilisation in Europe.* (British Association Report, 1916.)

that 'there is a great probability that indeed in early Neolithic times a strong overflowing culture stream spread from South-West Europe to the Eastern shores of the Mediterranean up to India and its eastern currents even spread up to the shores of the Pacific Ocean and that this was brought about by the migrations of peoples.'

Thus in order to understand fully India's place in the scheme of prehistoric culture of the old world we have got to enquire into ^{Chronological out-look} chronological fixations of other lands. India as an intermediary between two areas of cultures with which its cultural relations have been established can very soon afford us an insight into two limits. If India had been in cultural and ethnic contact with the western nations, *e.g.*, Egypt, when could it possibly happen? If it did happen at all, archaeological vestiges must be forthcoming. The prehistoric finds of India are not inconsiderable though practically the border crops alone have been reaped. If these, comparatively studied, do provide us with affinities in style, the contact is proved and as the date has been fixed for its western neighbour, we get the earliest date when this happened. This is what we would attempt. But if for instance no affinities or identities or analogies could be established

* Witke: Kulturbeziehungen zwischen Indien, Orient und Europa (1911, p. 18-19.)

between the archaeological finds of India and of the Western nations, the probability of such contact would have been reduced and it would have shrunk into mere wild speculation. Then there is the other element. It has been held by a consensus of learned opinion that such migrations, for instance that of the Polynesians, did proceed from India. If so, India with its crystallisation of primitive cultures at every stage in its hill and forest tribes would very probably afford us the clue as to what people left its shore and at what stage of culture. The migration might have been due to overflowing of population or pushing forward by a later migration which is more probable. In the former case we arrive at a time when a culture from the west reached its acme or perhaps were brought to a close by a successive wave at a certain sociological cyclical stage. For the chronological dating of this cycle Petrie's tentative calculation in his brilliant *Revolutions in Civilisation* would give us quite a workable date. In this manner we want to arrive at historical truth about pre-Vedic times which later finds may corroborate or modify but would not possibly disprove. In any case we would have a definite idea about what things to look up to for affinities and the human and the historical significance of these finds would then alone be realised.

Similarly also India, has got beyond its boundaries several socio-religious standards wherewith to measure and find out its great culture-complexes. Whichever way the Aryan question be decided the Indo-Aryan stamp of Indian society and religion cannot be denied. And whenever we have got to seek the original foundations of some elements in Vedic culture-complex we can stamp it as Indo-Aryan really when its counterparts can be warranted a pre-Indian existence in other places of Nordic 'Aryandom.' Similarly the studies of the outer Aryan, the Homo Alpinus have become simplified by numerous masterly works on the Celts. We have already seen that the South Indian elements in Hinduism which possibly got the upper hand of philosophical naturistic 'Aryanism,' through Tantric revivals in post-Buddhistic times has probably its counterpart in the theriomorphic or goddess cults on the other shores of the Erythrean sea. But Pater Schmidt has opened the window of the other side what with his great linguistic researches but still greater socio-religious treatment of the Austronesian peoples, *e.g.*, in his "Grundlinien einer Vergleichung der Religionen und Mythologien der austronesischen Völker." Specially when one remembers the settled assignment of certain strata in the Indian population belonging to the Austric

stem, these would stand in clear contrast to the other body of studies, the Indo-European while midway we would get such highly complex phenomena as the so-called Dravidian culture. I do not know where to look for the totemistic ezogamic features of Hindu society in the quest for origins and primitive types if not in the Australoid tribes in and beyond India. Similarly we should not ignore the synthetic studies of the bow, betel, shell, and megalithic cultures in Melanesia, Polynesia and Indonesia providing us with the different stages and effects of culture contact.

Now it is not very long since that Risley offered us his study of India from anthropometric data. But his book opens with the emphasising of 'ethnic isolation' of India though in most of the types he mentions foreign names. But his classifications do not carry us far. The types given by him are well-known:—

(1) The Turko-Iranian, (2) the Indo-Aryan, (3) the Aryo-Dravidian, (4) the Seytho-Dravidian, (5) the Dravidian, (6) the Mongolo-Dravidian and (7) Mongoloid. The stumbling block in his way was the broad-headed element for which he went to the Turks, Seythians, Mongolians, etc., but this has been recognised to be possibly Alpine thanks to the labours of Grierson and Ramaprasad Chanda. But the recent work of

Ethnic stratification
and chronological cor-
relation.

the greatest Palethnologist as we should speak of the late lamented Prof. Giuffrida Ruggeri, has thrown a great light on Indian racial problem. He gives the following *ethnic stratification* commencing with the more ancient strata:

- (1) Negritos,
- (2) Pre-Dravidians (Australoid-Veddaici),
- (3) Dravidians (having affinity with H. Indo-africanus Æthiopicus),
- (4) Tall dolichocephalic (Mesopotamic ?) elements,
- (5) Dolichocephalic Aryans (H. Indo-Europeanus dolichomorphus),
- (6) Brachycephalic Leuco derms (H. Indo-Europeanus brachymorphus).¹¹¹

It is obvious that all these racial movements took place in prehistoric times. The last, that of the brachycephalic leucoderms is a migration which took place probably in Bronze Age times of Western Europe. At least their migration in India may be connected with the few bronze articles in India of a somewhat Halstattian type. The copper implements of India are connected, it seems, with the cult of the sacred horn, the axe and the sun and solar symbols and these form the link perhaps as in Europe with the earlier cycle of Dolichocephalic Aryan culture. The problem of the Todas is yet a mystery but the pottery

¹¹¹ Vide G. U. Journal of Department of Letters, Vol. V, pp. 219-220.

figurines of the Nilgiris, if they are connected with Toda origins betray Armenoid features and the terracotta figurines mostly riding on horseback with prominent noses and full beards make us think of Asia Minor. In the Dravidians I am led to think of the same movements of peoples that led to the starting of Egyptian and Sumerian cultures, having their counterpart in India in eneolithic times. This combined with a previous Veddalic neolithic stratum gave rise possibly to the Dravidian or as I think it better to say the Indo-Erythraean culture-complex. With the Australoids we pass on to late Palaeolithic times preceded by the Negroid in upper Palaeolithic times. We cannot say from the cultural standpoint alone how much, if at all, we had to do with Cro-magnonoid or Neanderthaloid culture not to speak of still earlier ones. Summing up, at present we may tentatively arrive at the following chronology:—

(using Petrie's extremely convenient cycle
of 1500 years)

Indo-Aryans	{	1000 B.C. ¹ —	Iron and Iron—Broadheaded	Indo-European
		2500 B.C. ² ..	Early copper—Longheaded	
Indo-Erythraean	{	4000 B.C. ³ —	Eneolithic—Central Asiatic (Toda ?)	Indo-European
		5500 B.C. ⁴ —	Neolithic—Indo-African (Dravidian)	

¹ Oldenberg's date for Rig-Vedic culture

² Jacobi's date for Rig-Vedic beginnings.

³ Semitic movements in Asia Minor.

⁴ Petrie and Haxtho's date for the coming of dynastic peoples to

Indo-Australian	{	7000 B.C.*	—	Early Neolithic—Veddai.
	{	5000 B.C.*	—	Late Palaeolithic—Australoid.
—				Upper Palaeolithic—Cromagnonid, Negroid.
—				Mid Palaeolithic—Neanderthaloid, Kartouf.
—				Early Palaeolithic—Narvada.

* Neolithic Egypt and Elamite culture.

* Sollas's date for the Azilian phase.

CHAPTER II.

GEOLOGY AND PREHISTORIC ARCHAEOLOGY

Man, being a mammal could not appear before the Tertiary era because the secondary mammals were very small and primitive.¹ The appearance of man went hand in hand with great geographical and orographical changes all over the globe. Besides the formation of great mountain chains, the end of the Tertiary was marked by a gradual depression of temperature. We know that "in Europe great geographical changes took place at the close of the Cretaceous period."² No less remarkable were the changes in India. "For it was during these ages that the most important surface-features of India were acquired and the present configuration of the country was outlined. The vast pile of marine sediments that was accumulating on the border of the Himalayas and in Tibet underneath the waters of the Central Asiatic Tethys, since the Permian period, began to be upheaved by a slow secular rise of the ocean-bottom. During the long intervals of

¹ Beale, *les Hummes fossiles*, 1921, p. 30.

² Geikie, *Class-book of Geology*, 1921, p. 361.

ages from mid-Eocene to the end of the Tertiary this upheaval continued, in several intermittent phases, each separated by long periods of time, till on the site of the Mesozoic sea was reared the greatest and loftiest chain of the mountains of the earth. The last sign of the Tethys after its evacuation of the Tibetan area, remained in the form of a few straggling basins..... There were three great phases of the upheaval of the Himalayas as we now see them and the last was of Pliocene age.¹ Whatever that be, this uplift and depression of land was fraught perhaps with the greatest importance for ushering man into existence. According to Lull and others, the uplifting of the Himalayas had a direct bearing on the emergence of humanity from the anthropoids.² "Thus the late Joseph Barret ingeniously suggested that it may have been during the uplift of the Himalayas at the end of the Miocene and beginning of the Pliocene that primitive man originated. As the land rose, the temperature would be lowered, and some of the apes which had hitherto lived in the warm forest would be trapped to the north of the raised area. As comparatively dry plains would there take the place of forests, and as the apes could no longer migrate southwards,

¹ Wadia, *Geology of India*, 1919, pp. 203-4.

² Dr. A. Smith Woodward, *The Antiquity of Man*

(*Nature*, Nov. 6, 1919, p. 213).

those that survived must have become adapted for living on the ground, and acquired carnivorous instead of frugivorous habits. By continued development of the brain and increase in bodily size, such ground-apes would tend to become man."

So the question of the great Ice Age or glacial period which began in upper Pliocene or Quaternary times becomes very important. It seems at first very hard to hazard any opinion on the Glacial phase in India. Wadia rightly remarks:—

"Whether India, that is, parts lying to the south of the Himalayas, passed through a Glacial Age, is an interesting though unsettled problem." Some geologists like Bruce Foote while denying the existence of an Ice Age would like to bring a substitute—a Pluvial period. Thus he says, "It does not appear hard to understand that a period of great cold in central and northern Asia, was in the south represented by a very wet period, a really pluvial epoch which was characterised by the formation of the great lateritic deposits of the east and west coasts of the peninsula."² Though it is rather hard to say how far the temperature was lowered, whether there was ground ice as in Northern Europe or in Permian times in

¹ Wadia, *Geology of India*, 1919, p. 242.

² *N. A.*, p. 196.

India it is no longer possible to deny that there was a great lowering of temperature in recent times. We know that in Europe 'when the sea was higher (or the land lower), beaches and terraces were formed which remain permanent now high upon land; when the sea was lower, valleys were formed, which became flooded as estuaries when the sea rose or are found by soundings some way out of the shore.' In the Records of the Geological Survey of India we read a report by S. E. Ormiston, Resident Engineer, Bombay Port Trust, of a submerged forest in Bombay which shows the land to have subsided at least 30 feet.¹ This probably occurred in the closing phase of pleistocene times. Still later also slighter movements continued. We read of modern raised sea beaches in a paper by Theobald² "Note on the value of the evidence afforded by raised oyster banks in estimating the amount of elevation thereby." 'An elevating movement of at least two feet and probably more occurred in 1856.' So also the littoral concrete formation on the coasts of the Persian gulf has afforded evidence of a recent elevation of land. Then again, in a preliminary survey of certain glaciers in the North-West

¹ Patric, *Some Sources of Human History*, 1919, p. 8.

² H. G. S. I. XI, 1879, p. 302.

³ H. G. S. I., 1912 p. 111.

⁴ H. G. S. II. 1872 p. 44.

Himalaya¹ it was observed that the glaciers were more extensive before generally. "The second point most prominently displayed is the evidence of general retreat shown by the occurrence in nearly all cases of old moraines (sometimes grass covered) at lower levels in the valleys."

Thus Kropotkin had already pointed out "There is reason to believe that the Pamirs were ice-bound and the great extensions of formidable glaciers in the Himalayas is fully proved in my opinion."² I think, the case as it stands, is soberly stated by Vredenburg thus: "Indications of the glacial period in the mountains of India have not been clearly recorded, the question having scarcely received any attention. The Himalayan glaciers were far more extensive during the glacial period than at the present day, though they still include some of the largest glaciers of the globe. According to R. D. Oldham's investigations, there are indications of three great oscillations of the extension of the glaciers coinciding with some of the glacial and interglacial of the great Ice Age in Europe."³

Blandford also was led to premise glacial conditions in Pleistocene India, on Palaeontological grounds. He says:—"There is the

¹ R. G. S. I. 1907, p. 126.

² Report of the British Association, 1893, p. 273.

³ Vredenburg's Summary of Indian Geology, p. 108.

occurrence of certain Himalayan species on the mountains of Southern India and Burma and even further south but not in the intervening area. There is also the predominance of the Western or what I have proposed to call the Aryan element in the Pleistocene Fauna of the Nerbudda valley and of Karnul in the north of the Carnatic tract. Lastly, we have to account for the apparently recent immigration of Indo-Malay types into the Himalayas. It is evident all these peculiarities of the Indian Fauna may have been due to the glacial epoch.....It was probably during this cold period that the ossiferous Nerbudda beds and the deposits in the Karnul caves were accumulated. The tropical damp living Dravidian fauna if it inhabited Northern India must have been driven out of the country. Unless the temperature of India and Burma generally underwent a considerable diminution it is not easy to understand how plants and animals of temperate Himalayan types succeeded in reaching the hills of Southern India and Ceylon as well as the forests of Burma and the Malay Peninsula. When the whole country became warmer again after the cold epoch had passed away, the oriental fauna appear to have poured into the Himalaya from Eastward. Thus this theory will add to the evidence now considerable in favour

of the glacial epoch having affected the whole world."¹

It is now very interesting also to turn to the Records of the Geological Survey which are valuable mines of information. So far as Europe is concerned the lucid statements of Sollas describes it as follows:—"The great ebb and flow of temperature was at least four times repeated; four times have the glaciers enlarged their bounds, and four times have they been driven back in their mountain home."² After studying the river terraces he says "The four terraces are ruled, as it were, across the last page of terrestrial history; they are datum lines, which enable us to divide the Pleistocene or Quaternary epoch into seven ages, the first, second, third and fourth glacial ages, with their three intervening genial ages."³ In Central Asia, too, Messrs. Davis, Huntington and R. W. Pumpelly established independently positive proofs of at least three distinct glacial and interglacial epochs of the great Ice Age.⁴ We know that as early as 1867 Dr. Verchere recorded the presence of erratic blocks in the Potwar at less than 2,000 feet altitude⁵ and Mr.

¹ The distribution of vertebrate animals in India, Burma and Ceylon, Phil. Trans. Royal Society of London, Vol. 194, 1901, pp. 435-6.

² Ancient Hunters, 2nd edition, p. 23.

³ *Ibid.*, p. 29.

⁴ Pumpelly Expedition, 1904, Vol. 1, p. XXXVI.

⁵ Journ. Asiatic Society of Bengal, Vol. XXXVI, p. 112.

Wynne's dissertations on 'Indus-borne crystalline fragments' as he then, spoke of boulder deposits scattered about on the ranges of Bagh and Choi at heights of 2,500 to 3,000 feet, too numerous to be carried by humans, have become one of the curiosities of Indian geological literature. Mr. Lydekker¹ comes to the conclusion that in Kashmir 6,500 feet is about the lowest level at which undivided evidence of former glacier-action exists and Mr. Wynne in the same volume divides the Pleistocene deposits of the Punjab into an upper, middle and lower subdivision characterising them as "Northern detrital drift," "Alluvium and river drift" and "Post tertiary valley or lake deposit." It is quite evident that this division tries to explain the sequence of three different groups of boulder beds in its own way of which the first possibly represents the latest and the last the earliest Pleistocene epoch while the intervening one, a middle period. Theobald's masterly paper² established once for all that these boulder-beds were to be ascribed to glacial action and had it not been so early as 1880 we would have probably got as interesting a study of the Indian glacial stages from him as we have got of the six English stages from Prof. James Geikie. However his personal observations are of the

¹ *Records of the Geological Survey*, Vol. XIII, p. 221-242.

² *Ibid.*

highest value and he tries to establish 'that there was an extension of an isothermal line compatible with the existence of glaciers to so low a level as 2,000 and 3,000 feet in the Northern Punjab. The sections of the Kunhar river given in the plate accompanying the paper are very interesting as they show two glacial stages in the early fluvial deposit period of Mr. Wynne and thus gives us practically all the phases in India. However the question is of great intricacy as even now there is a tendency to attribute some of the boulder conglomerates spread over a large part of Northern India to the fluvial action of a great Siwalik river in Tertiary times. La Touche in a remarkable paper on the Relics of the Great Ice Age in the Plains of Northern India was disposed to see, what perhaps Huntington corroborates from another quarter, in the river-terraces the direct impress of the glacial age. "It is possible," he says, "indeed quite certain, that during the glacial period exceptionally immense quantities of debris were precipitated into the rivers, more indeed than they were able to carry away comfortably, as the terraces in the upper valleys show. Is it not, then, reasonable to suppose that it was then that the lower valleys of the same rivers were choked with a superabundance of silt and that to this same period it is that we must attribute the formation of the 'older alluvium':

that, in fact, these deposits are as truly relics of the passage of the glacial period as the ancient moraines among the hills."

The river-terraces enable us to divide the Pleistocene or Quaternary epoch into several ages. As this is almost synchronous with 'Palaeolithic' culture we get the respective stages of the prehistoric archaeologists. We

The significance of 'river terraces.'

all know how rivers cut through their channels and their banks are worn off by rain or stream action which are technically known as 'erosion' and 'denudation.' "There is, however, a limit below which the erosion cannot be carried, depending upon the size and swiftness of the river and its relation to the level of the sea. This limit is known as the *base-level*. When the river reaches its base-level, it begins to deposit the detritus, carried down from the upper reaches, on the bed of the lower stages. If there be a depression of the region containing the river-base the accumulation of the detritus will greatly be increased. If the land should rise, the base-level would be correspondingly lowered. The process of erosion will begin again." Now if anybody visit rivers showing such process he would be struck by seeing various step-like

¹ Geological Magazine, May, 1910, p. 109.

² Macallister, A Textbook of European Archaeology, 1921, p. 44.

ridges in the banks which are known as 'terraces.' In these would be found partly the alluvial or rocky soil of which the surrounding land is composed and partly gravel-beds. Now the latter are the most important things for us. "The gravel beds found in terraces up the side of river-valleys were deposited at different periods by the river to which must be attributed often a greater carrying power than it now possesses. And it will be evident that the higher terraces were formed before the lower, and consequently the higher the position of the terrace gravel the greater must be the antiquity of the implements contained in them, supposing no disturbing agencies to have been at work."¹ Besides the terraces are now shown to be indelible records of climatic conditions. For as Ellsworth Huntington says, "It seems probable, as Park has suggested in regard to those of Asia, that the oldest terrace may represent the last glacial epoch, and that others represent the post-glacial stages, or minor epochs of glacial retreat. In as much as man is known to have existed prior to the last glacial epoch, the terraces preserve the record of a series of climatic changes which have played a part in shaping human destiny. If the oldest terrace dates back no more than 30,000 years more or

¹ British Museum, *Guide to the Antiquities of the Stone Age*, 1911, p. 2.

less, to the last glacial epoch, the youngest cannot be more than 2,000 or 3,000 years old at most and may be much less."¹

But still now river-terraces especially bearing human artifacts in India have scarcely been begun to be studied and we are constrained to notice on a sure basis

Bhangar, Karnul
and Khadir Plains—
some deposits.

only three Palaeolithic periods—a lower, a middle and an upper. The lower coincides with the older alluvium (Bhangar) of the Ganges, Narbudda, Tapti, where the rich Siwalik fauna are still continued to a certain extent and fossils of extinct species of *Elephas antiquus*, Rhinoceros, are found and in the lower alluvium (Khadar), we can distinguish some fauna still racially distinct from modern ones, while midway stand such fauna as show a transition from older to later forms as is witnessed in the fossiliferous stalagmite caves like Karnul, containing some living as well as extinct species. In India the two types of river-beds and alluvium are sharply distinguished. The one which is the more recent is spoken of as the Newer Alluvium and still in process of formation. The other, the Older Alluvium is the most important for us though they await systematic study by the prehistoric archaeologists still, for there alone genuine palaeoliths would be found if it

¹ E. Huntington's, *The Climatic Factor*, Washington, 1914, p. 36.

happened to be a human settlement in those far remote days. As their geological features become very important for us, I give below an excerpt from Vredenburg's excellent summary: "The great depth of the Ganges alluvium, as revealed by borings, indicates that in its case also subsidence must have preceded simultaneously with deposition. Except in the neighbourhood of the delta, the greater portion of the alluvium plain is above the level of the highest floods of the Ganges and its tributaries, indicating that this area has been upheaved, or that the delta region has been depressed within relatively recent times. The presence of a mass of ancient alluvium, known as the Madhupur jungle north of Dacca in the midst of the delta region, further indicates that a certain amount of disturbance must have occurred. The existence of the ancient alluvial areas enclosed within rock basins along the course of some of the Peninsular rivers, such as the Nerbudda, Tapti, etc., points to the same conclusion, and it is evident that a certain amount of irregular warping has affected India in Pleistocene times. In consequence of these physical changes, the ancient alluvium and the one still in process of formation can be readily distinguished from one another. They are known in the vernacular as "bhangar." In geological age, they correspond with the two main divisions of the Quaternary

era, the Pleistocene and Recent. The Pleistocene age of the Bhangar or older alluvium is clearly shown by the remains of numerous extinct animals amongst which may be mentioned *Elephas antiquus*, a characteristic species of the Pleistocene of Europe, and various extinct species of horse, ox, rhinoceros, hippopotamus. Contemporaneous with these are the earliest remains of prehistoric man in the shape of stone implements" (pp. 109-110).

Besides these amongst the Pleistocene and Recent deposits may be reckoned among others the high-level river terraces of the Upper Sutlej and other Himalayan rivers, the lacustrine deposits of the Upper Jhelum Valley, the Poravander stone of the Kathiawar coasts, the molian deposits of the Godavari, Kistna and Cavery, the loess deposits of Potwar-plateau, the cotton-soil or Regur of Gujrat and the Deccan and last but not least the perplexingly wide distribution of high-level laterites all of which are too important for prehistoric archaeology, some having already yielded palæoliths in abundance.¹

Laterite is also of great importance to us as it is found often in India especially in the south and often yields human implements. It has now been accepted that this is formed by

¹ The peculiar case of 'Laterites' and raised sea-beaches.

¹ Wadia, *Geology of India*, p. 252.

action of water dissolving rich ferruginous masses and forming reddish concretionary masses consisting of hydrates of iron, aluminium or manganese. This has been found often in high levels and high level laterites are now being established as of great antiquity indicating fluvial or lacustrine deposits of the Pleistocene age and sometimes earlier. There is also a low-level laterite which is rather recent and in some places it is still in process of formation. As implements of antique amygdaloid types have been found in high-level laterite, their antiquity is unquestioned and so also lateritic accretion in places where water action is absent now is also fairly indicative of the great length of time which must have elapsed before the physical changes of upheaval could have accomplished this. So also raised beaches have been observed all round India which are now ascribed to Pleistocene times. It would be interesting indeed to study the upper strata of these, as now the question of migrating races is no longer looked upon as a heresy and the sea-craft of some of the earliest people of late Pleistocene and later times.

So also submerged forests which have done so much for throwing light on late prehistoric times in Britain have been discovered in the Ganges delta, Pondicherry, and the Eastern Coast of the Island of Bombay as we have already pointed out and

it may be hoped some future Reid or Munro would elicit much tellurine and human secrets from them.

Before taking leave of this chapter, it is highly profitable to study the excellent chart given by Boule (*Les Hommes fossiles*, pp. 48-49). The tentative Indian correlations are added in italics by me in the chart overleaf. In the column of human types, the suggestions of Ruggieri (*Su l'origine dell' uomo*, p. 115) are given with R. in brackets.

Tertiary and quaternary sub-divisions.

CHAPTER III.

THE HUMAN ANCESTRY—THE CRADLE LAND, FIRST MIGRATIONS AND INDIAN FOSSIL SKULLS.

Though not beginning with the stars and recognising that the proper study of mankind is man we cannot expect to study man as Dendy has reminded us with any prospect of success unless we study the animal kingdom to which he belongs and of which he is the latest product. Thus for having some rough idea about his ancestral line and age we can with good profit recapitulate some part of the Presidential address of Dr. H. H. Hayden, F.R.S., delivered to the Asiatic Society of Bengal in 1910¹:—"The trilobites appeared first between 550 and 700 million years ago, the first fish between 300 and 400 million years ago, and the birds about 150 million years ago. The first unmistakable mammals appeared at about the same time as the birds, or possibly earlier, but the *Mammalia* as a class reached their maximum development in the Tertiary epoch.

¹ J. A. S. B., Vol. XV, pp. xvii-xviii.

and especially in the Miocene and Pliocene periods, say, between five and ten millions years ago. The remains of large mammals are extremely abundant in the Siwalik rocks of the Himalaya and the Panjaub. The last stage, so far achieved in the history of mammalian development was ushered in by the appearance of man."

It was not very long ago when talking of the nearest ancestors of man almost
The human ancestry. the whole known truth would have been taken to be stated in Dr. Smith concluding words:¹ "It is possible that the earliest men were very varied, some inheriting one set of traits and tendencies from the lower animals, others another set. Some might thus progress directly towards the existing form of man, while others might revert in different ways to a condition which prevented survival in the struggle for life. Hence, although the facts are still very scanty, it is evident that the further human remains are traced back in geological time, the more marks they retain of an ape-like ancestry. They suggest a gradual approach to a primitive forest animal with an overgrown brain, which was destined to begin a fundamentally new departure in organic evolution."²

¹ *Guide to the Fossil Remains of Man (British Museum)*, 1918, p. 21.

But difficulties have arisen in accepting 'the origin of Man from the Anthropoid apes *via* the monkeys.' These have been lucidly brought out in Prof. Wood Jones's "Lecture on the Origin of Man." It has been seriously questioned whether 'the origin of the human race is to be sought at the base and not the apex of the Primate series and that in a very remote past ancestral Man became a more or less distinct creature which might be termed zoologically a "ground-ape." An overwhelming mass of evidence has been brought forward to show that "Man retains so many traces of mammalian simplicity, his body is so compounded of the most primitive mammalian features, that it is difficult to picture him as anything more than an extremely primitive mammal committed to a line of evolution which consisted almost entirely in the general and overwhelming development of the brain. So many of the primitive features which astonish us in Man are not possessed by the anthropoid apes that it is difficult to believe that Man could have arisen from any type at all similar to those living to-day; and so for the old World monkeys, they are so definitely specialised in their own direction that they can in no wise be regarded as the ancestral forms of Homo." Thus Prof. Elliot Smith¹

¹ Simian vs. primate descent.

¹ British Association Report, 1912, p. 580.

'is inclined to look upon the Orang, the Chimpanzee and the Gorilla not as ancestral forms of Man, but as the more unenterprising members of Man's family, who were not able to maintain the high level of cerebral development of the feeble-bodied human, but saved themselves from extinction by the acquisition of great strength and a certain degree of specialisation of structure. The feebler man was able to overcome his enemies and maintain himself in the struggle for existence by his nimbleness of wit and superior adaptability to varying circumstances.'

But whatever be the ethical outlook of the conception that 'Man is no new-begot child of the ape, bred for existence upon brutish lines but regarding himself as an extremely ancient type, distinguished chiefly by the qualities of his mind and looking upon the existing Primates as the failures of his line, as his misguided and brutish collaterals rather than his ancestors' this view is also, according to some, open to serious objections. Mr. G. S. Miller (jr.)¹ of the United States National Museum has summarized them in a recent article showing that the facts cited in favour of a pre-Simian origin from a Tarsius-like lemur are capable of other interpretations. Mr. Miller brings forward practically the old Simian hypothesis under a new face, his contention being that 'the distinctively human

¹ American Journal of Physical Anthropology, Vol. III, pp. 243-44.

line branched off from the generalized primate stock at a point near that at which the line leading to the Gorilla and the Chimpanzee originated and at a time when the great toe had not lost its simply divergent characters and that the inception of this line was not due to a profound and relatively abrupt alteration of habits and functions forced on the animals by environmental change, but to a process the evidence of which may be seen everywhere among mammals living under uniform condition, *e. g.*, the process known as "local adaptive radiation."

Side by side with these new issues raised mainly by the new discoveries and studies of fossil remains during the last two decades, the question of the specific or generic unity or diversity of man has been brought to a head. One can read in the additional matter of 50 pages (pp. 323-74) in Prof. Frassetto's masterly compendium, *Lezioni di Antropologia*, all these put together conveniently, and I take some cognate extracts from it. The Polygenists holding firm the distinctions between fossil groups of man perceive that the chasm separating groups related to each other is so great that it is no longer possible to attribute all humanity to the same genus but it must have originated independently at least from two different branches.

Polygenism and
Monogenism.

This theory has been enunciated in different forms notably by Klaatsch in Germany and Sergi in Italy. According to Klaatsch, Neanderthal man would have had an origin distinct from that of modern types of man and both would have been derived from the same anthropogenic centre which the author finds in the centre of Asia. Sergi's classification is more elaborate. He admits diverse human genera, two for the group of human fossils and four for living men. All these genera have developed independently from different anthropogenic centres, of which one or two was in the Old World and one in the New. These six branches would be—the Neandertheloid (*Paleoanthropus*) which according to the author is already extinct; the two branches of modern form (the fossil and the living), of African origin; the branch which includes all the pygmies, the Asiatic branch, (*Hecoanthropus*), the branch of American fossil (*Archeoanthropus*) and finally the branch of modern form that has given the varieties of the living in America (*Hesperanthropus*). Whatever be the ultimate value of these classifications the somatic differences between the races of mankind have been so much emphasised that Giuffrida Ruggieri has found out a new *via media*, spoken of with authoritative approval by Boule, by making 'actual man—a collective species' and dividing it into *smaller species of*

subspecies. All living men are classed collectively as *Homo sapiens* and so far as fossil men are concerned they have been placed in another systematic species belonging to genus *Homo* and found only in prehistoric times. Another parallel line to Hominidae has been admitted also as representing at its apex the ape-man of Java—*Pithecanthropus erectus*. But as Boule remarks 'the filiation cannot be followed with any certitude but slightly. The solution of the problem of our origins and above all the precise determination of the diverse elements of our line demand the discoveries of new fossil and numberless fossils.'¹

If polygenism be accepted, it is not possible to deny perhaps that humanity may have evolved at different times in different places under almost identical circumstances² and then the old controversy about the cradle of humanity would lose much of its savour; but still Dr. Wright's theological zeal gives us late in 1913 a laudable book on the Origin and the Antiquity of Man which is pledged to prove the orthodox canon that man appeared suddenly probably by the intervention of God in Central Asia not more than fifteen thousand years ago. How and where man was evolved was surmised long ago by Lord Avebury with his characteristic insight and

¹ Les Hommes fossiles, p. 452.

² About the discovery of what is termed *Hesperopithecus Harold Cookii* in Nebraska.

lucidity. "Without expressing any opinion as to the mental condition of our ancestors in the Miocene period, it seems to me evident that the argument derived from the absence of human remains, whatever may be its value, is as applicable to Pliocene as to Miocene times. Judging from the analogy of other species I am disposed to think that in the Miocene period man was probably represented by anthropoid apes, more nearly resembling us than do any of the existing quadrumana. We need not, however expect necessarily to find the proofs in Europe: our nearest relations in the animal kingdom are confined to hot ~~spots~~ to tropical climates; and though we know that during parts of the Miocene period the climate of Europe was warmer than at present, so that monkeys lived north of their present limits, still it is in the warmer regions of the earth that we may reasonably find the earliest traces of the human race." It is exactly this which is impressed on us when we read the recent article of Dr. Pilgrim on "New Siwalik Primates and their bearing on the question of the Evolution of Man and the Anthropoidae" in the Records of the Geological Survey (1915). He makes out a strong case for a Sarmatian (Miocene) ancestor of man from the Siwaliks thus: "The remarkable characters possessed by the mandible of Sivapithecus ally it in many respects rather

to man than to any of the Simiidae." After pointing out that a short symphysis is a primitive characteristic as seen in the *Propliothecus* of Fayum and that its extreme shortening is a special development in man he points out that this characteristic combined with other peculiarities leads him to place it on the line of man's ascent. The outward curvature of the premolar region, in his opinion, involves the co-existence of the breadth of jaw and a degree of separation of the mandibular rami which is essentially peculiar to man. The inner cusp of p.m. 3 as in the cebidae, the large canines with primitive features, the hinder heel of the lower canine as in the gibbons, etc., forces him to the conclusion that *Eoanthropus* represents a marginal species which did not lead to man, being one of nature's experiments at producing the higher human type and that *Sivapithecus* diverging long before the appearance of that genus represents a marginal species of the human ancestor.

Mr. W. K. Gregory, a firm believer in anthropoid ancestry holds that the ancestral Chimpanzee-Gorilla-man stock appears to be represented by the Upper Miocene genera *Sivapithecus* and *Dryopithecus* and that the former is more closely allied or directly ancestral to the Homiidae, the latter to the Chimpanzee and Gorilla and that many of the differences that separate

man from the anthropoids of the *Sivapithecus* type are retrogressive changes following a profound change in food-habits. He further thinks that there is no good evidence for believing that the separation of the Hominidae from the Simiidae took place any earlier than the Miocene and probably the Upper Miocene and that the change in structure during this vast interval (two or more million years) is much greater in the Hominidae than in the conservative anthropoids.¹ But in any case Dr. Pilgrim's paper has the greatest importance for us as Boule pointed out in *L'Anthropologie*, 1915, p. 410: "Un autre fait de première importance est que, pendant la Miocene, l'Asie était habitée par des très nombreux Singes anthropoïdes aux caractères divergents dans toutes sortes des directions et même, comme *Sivapithecus* dans une direction humaine. Il y a là un mouvement de vie chez les Primates, tout à fait, extraordinaire et l'on a pour la première fois, la sensation que l'Asie était, à ce moment, le laboratoire où devait s'élaborer la différenciation des ancêtres des Hominiens." "There can be little doubt that man evolved somewhere in southern Asia, possibly during Pliocene or Miocene times"—this is the verdict of Dr. Haddon (*The Wanderings of Peoples*, p. 15) and we know it was with this

¹ *Bulletin of the American Museum of Natural History*, Vol. XXXV, 1916, p. 341.

conviction that Dubois launched his expedition to Java and discovered the famous *Pithecanthropus*. It is of supreme interest for us as Java was at that time connected with the mainland and Osborn in his *Men of Old Stone Age* (1918) surmises that the Trinil race, as he calls it, was also most probably living in India at that time.

Moreover in it would be seen that from the Tertiary of Burma and the older ossiferous gravel beds of Nerbada and Godavari Archæological Observations have been discovered in the fifties of the last century genuine human artifacts which on account of their antiquity have been widely noticed. But on examining them afresh in the Indian Museum I was struck by the fact that though on paleontological grounds they cannot be later than the pre-chellean phase in Europe their technique was of the sort of much greater finish of later paleolithic phases as in Europe. The Hackett Nerbada find inevitably recalls a Levallois artifact and the Godavari agate chip is more the prototype of a Chellean II 'knife' than anything that I know. I could not find the Burma specimens in the Archæological collection but from the plate in the Records of the Geological Survey it appeared to me that some of them, specially the rectangular and irregular forms, belonged to the Chellean II type. Thus we find Haddon is probably being upheld by archæological evidence when

he states the likelihood of interglacial man in Europe being represented by pre-glacial man in Asia. (*The Wanderings of Peoples*, p. 15.) Whatever may be said in respect of other centres as starting points of humanity, one has ultimately to give up the cases of South England or Southern France or even Egypt or the blessed land between the two rivers and formulate with Dr. Mathew a South Central Asiatic Home for the earliest man. In other words we can state with Sir H. H. Johnston as follows: "From such meagre facts as have already been collected by scientific investigation we are led to form the opinion that the human genus was evolved from an ape-like ancestor somewhere in Asia, most probably in India, but quite possibly in Syria on the one hand, or in the Malay Peninsula or Java on the other. So far, the nearest approach to a missing link between the family of the anthropoid apes and the family of perfected man has been found in the Island of Java (*Pithecanthropus erectus*), but there are slight indications pointing to Burma or the southern part of the Indian Continent having been the birthplace of humanity" (*The Opening-up of Africa*, p. 10).

Leaving the question of a Central Asiatic home to be finally solved by the Andrews expedition, we turn afresh to the refreshing studies of Ruggeri trying to sketch the first

The first human migration.

human migrations from the neighbouring highlands of northernmost India.¹ Ruggeri believes that the first migratory movements being directed to the south of the Himalayas is a matter of doubt for there was plenty of much easier territorial openings both to the East and the West. Now, a study of the geographical distribution of typical objects of use and characteristic costumes especially in Germany have led to interesting theoretical reconstruction of the course of migrations and cycles of culture. Recently Dr. Montanadon has given us a study of these from musical instruments making the starting point of various cultural cycles in Central Asia and taking the most distant to be the most ancient and the more recent to be by degrees less remote.

The first cycle or the primitive according to Montanadon, is found only in Tasmania and is characterised mainly by the rudest Palaeolithic culture, *e.g.*, rudely chipped stones, implements of wood and stone, a lance-like staff, primitive rafts and simple leaf shelters. I think *the Andamanese are their nearest prototypes if not actually falling within this class.*

The second class is called the cycle of the boomerang characterised by curious throwing

¹ *Fels Le. Prime Migrazioni Umane* (Scientia, 1920, March, pp. 201-200).

sticks which come back, a sort of rude neolithic culture, and shelters of which roof and walls are inseparable. The presence of *valaitadi* or *boomerangs* in the forests of Deccan shows that perhaps trace of such a cycle may be met with amongst some Pre-Dravidian (or Negroid) tribes in the Deccan.

The third class or the cycle of the totem characterised by elaborate sociological divisions conical huts, propulsuers recalling the *Todas* and *pre-Dravidians* of *Chota Nagpur* whose totemism has found a place in the 2nd volume of Frazer's great work.

The fourth cycle called the cycle of Masks or of the systems of two classes characterised by rudiments of agriculture, use of masks, etc., also reminds us of such peoples as the *Singhalese* in *India*.

Similarly the fifth cycle is the cycle of the bow of *scarfave* an instrument found in many varieties amongst the *Feddas* of *Ceylon* and *Nagas* of *Assam*.

Thus we find India is intimately associated with every phase of early human culture. We cannot indeed be very positive in asserting that all the earlier ethnic and cultural waves passed *via* India but we see how many of them have left their impress on the motley population of this varied and vast continent.

We now pass on to the scanty human remains which have some claim to antiquity in India. Meagre as they are, their value is decreased on account of the paucity of well-ascertained details or authentic associated finds. The first of these, the Bayana cranium is very interesting on account of the evidence it affords along with the Buskop or Talgai skull of the persistence of types. It is of a Veddaic type as would be seen from Keith's report. But the Veddas are at present restricted to Ceylon. Ray Bahadur B. A. Gupte, F.Z.S., F.R.S.A., through whose kindness I got the report and photograph, is disposed to identify it with the 'Bharatas' of Indian tradition. As we cannot be sure of the physical type of the 'Bharatas' we should think the Bayana cranium supports Ruggeri's contention that "the Dravidians should be restricted to the mesorrhine type and the Pre-Dravidians of a Veddaic type are the most important in the ethnic stratification of India" (The First outlines of a Systematic Anthropology of Asia by Ruggeri, Chakladar 1921 p. 58).

We would give verbatim the important report on the two human crania of considerable, but uncertain antiquity, by Arthur Keith, M.D., F.R.S. (Read on 30th April 1919).

Bayana and Siakot
Crania.

There is no Anthropological problem more in need of investigation than that of the prehistoric inhabitants of India. We all wish to see applied to India the methods which have brought to light the ancient races of Europe. Nor is there any reason to doubt that there are hidden away in more recent deposits of river valleys and of caves, in prehistoric isolated interments and communal cemeteries, records of the ancient races of India. They have not been seen nor found because they have not been patiently and systematically looked for. It was because of the importance of this great blank in our knowledge of India that I welcomed the opportunity, given to me some three years ago, by Dr. Jivanji Jamshedji Modi, at that time Honorary Secretary of the Anthropological Society of Bombay, of examining two imperfect human crania which, from the circumstances of their discovery, might possess a considerable antiquity.

The details relating to the discovery of these two crania were the following: In the table appended to these are labelled "C" and "D," but I shall speak of "C" as the "Bayana" Cranium and of "D" as the "Sialkot" Cranium—these cities being near the sites of discovery. The Bayana cranium was presented to the Anthropological Society of Bombay through the Bombay Natural History Society by Mr. Wolff in 1903, when an excavation for a bridge on the Bayana

—Agra Railway—was being sunk on one bank of the Gumbhir River near Bayana. It lay in the alluvial deposit 35 ft. below the level of the bed of the river. Nothing was observed in the deposit (at least there is no record of any observation) that would give a clue to the approximate date at which the skull was embedded—no record of animal bones nor of human artifacts of any kind. Nor have I any facts to guide me as to rate at which such valley deposits are laid down or of the frequency to which they are liable to be disturbed. All we may take as certain is that the imperfect crania lay at the considerable depth of 35 feet. As regards its condition of preservation—it agrees in colour, consistency and mineralization with crania recovered from the river Thames near London. Most of the skulls dredged from the gravel bed of the Thames range in date from Neolithic to early Christian times. Although the antiquity of this skull is uncertain, it is possible that future operations may bring to light such evidence as may be given as a reasonable basis for assigning to it a date. Cranium "C" thus comes from the southern limits of the N. W. Provinces and lies within the watershed of the Ganges.

The second or "Sialkot" cranium was found in the Punjab,—within the watershed of the Indus. It was discovered by Lieut. R. W. G. Hingston, I.M.S. (21st Cavalry) in 1912 on

the side of a deep nullah six feet below the level of the adjoining cultivated land. The discoverer did not think he had to deal with an interment, but feeling that a complete skeleton was represented, which was noted to be resting on its right side, we may reasonably presume we are dealing with a deliberate burial, but the date of that burial we cannot judge, having no evidence of any implement or artifact which could give a clue to the period to which this grave belongs. The bones are of a dirty chalky grey colour inclined to crumble and very similar in constancy to human remains recovered from burials of a Bronze-age or later date in England. In this case, too, it is well to place all the facts relating to this discovery on record, for it may happen that future enquiry may establish the approximate date of such graves. We should make a beginning now even if the material at our disposal is of an imperfect nature.

The dimensions, shape and amount recovered of the Bayana (C) and Sialkot (D) crania can best be realized by examining the table of measurements which are appended to this paper. In both cases the facial parts and a great part of the base of the skulls are missing; fortunately in the Bayana specimen the nasal bones are preserved; unfortunately in the case of Sialkot specimen the nasal and supra-orbital regions have been broken away.

In both cases I infer they are male skulls, both of them belonging to men in advanced middle life—probably 45-55 years of age. In the Bayana cranium the sagittal suture is almost closed and the coronal suture is closing. A peculiar anomaly is present; the mastoid region of the temporal bone has fused with the neighbouring part of the parietal bone on the left side. The bones of the Bayana specimen are stained a light brown and are dense and hard; the crevices and recesses are filled with a fine sandy loam. In the Sialkot cranium the closing of the sutures has reached a less advanced stage. As may be seen from the table of measurements they are crania of small size; in "C" the maximum length is 173 mm., in "D," 180 mm.; maximum width of "C," is 127 mm.; of "D," 180 mm.; the height of the vault above the ear passages in "C," 108 mm.; in "D," 119 mm. As may be seen they are narrow in comparison to their height. As regards the thickness of the walls there are no features marking them off from modern crania along the vault. The thickness of the bones varies from 3, 5 to 7 mm.

We have thus to deal with crania of men who had small heads which were narrow in comparison to their length and height. We have to see if amongst the modern inhabitants of India we can find crania identical in shape and dimensions

and ascertain to what race such cranial types are to be assigned. It is a pity we have to depend almost entirely on the cranial form because, in the determination of racial types the shape and dimensions of the face are of the greatest assistance. In the Museum of the Royal College of Surgeons of England there are the skulls of some 500 natives of various parts of the Indian Empire, the largest and most valuable part of the collection the College owes to Sir Havelock Charles. It was easy to pick from the series, especially from the sections representing India proper and Ceylon, crania of the form and dimensions possessed by the Bayana and Sialkot specimens. Such types were particularly abundant among skulls from natives of the Punjab and North West Provinces—the areas from which the crania under the investigation had been derived. I therefore took two skulls with which to compare them—that of a typical male Veddah (No. 678 5 R. C. S. Museum). And the skull of a Punjabi male, alt. 55 (No. 631 21 R. C. S. Museum), and figured as "B" in the accompanying table. It will be seen that on a framework of lines on which the drawing of these four skulls A.B.C.D. can be set, the frameworks representing the average dimensions of this small type of Indian skull, the maximum length represents 178 mm., whereas in the conventional framework

used for British skulls, I employ a length of 190 mm. It will be noted that if the profile drawings of the skull are orientated on a base line that passes through the frontomalar and parieto-mastoid sutures—these points being those usually available in ancient crania—the vault of a typical British skull rises 100 mm. above this base line, but in this small type of Hindustani skull, the vault rises only about 95 mm., hence the upper horizontal of the conventional framework is pitched at 95 mm., instead of 100 mm. as used for British skulls. The width of the framework used for British skulls is 140 mm., but in the case of the small type of Hindustani skull has to be reduced to 122 mm.

When we compare the Bayana cranium (C) with that of the selected Punjabi, I do not think there can be any doubt we are dealing with the same kind of man—the same race—or racial type—to which Rislely applied the term Aryo-Dravidian. Fortunately in the Bayana skull part of the nasal region is preserved: the nose is of the narrow prominent Aryan type; the interorbital width—between the internal angular processes is 22 mm.; between the inner border of the right and left lachrymal grooves—only 16 mm.

The nasal bones are compressed and prominent, very different from the short, flat, depressed nasal bones of typical Veddah and Dravidian

skulls. There cannot be any doubt that the race which lived on the banks of the Gumbhir river, when the Bayana skull became embedded in the silt of its bed, was the same race as that which is still represented amongst the modern inhabitants. It will also be seen that in the Bayana skull the zygomatic arches and cheek bones projected well beyond the width of the skull.

As regards the Sialkot cranium we have no evidence of the nasal or facial form; we have to base our inference on the cranial form and dimensions. It will be seen that it is distinctly higher in vault, and somewhat more capacious than the small type of cranium I have selected as a standard for comparison. Its characters may be due to a somewhat greater predominance of the Aryan characters. In any case it would be easy, amongst the modern inhabitants of the Punjab to find many crania of the same dimensions and shape. We have thus in these two crania—whatever their antiquity may be—no unknown human type. They belong to a type abundantly represented in the districts in which they were found. Their value lies in the fact that they may yet serve as evidence of the persistence of type. Although the four crania belong to a small narrow type it will be evident, if the details of their outlines are studied, that the Veddah form is peculiar. We have already mentioned the width and flatness of the nose.

but it will also be noted, that although the Veddah type agrees in dimensions with the Aryo-Dravidian type, yet the configurations of the skull is different—a difference which is to be noted in nearly all Veddah crania. In all collections of Veddah crania there are a few skulls of great strength and size, and possessing certain peculiarities of form which I cannot help thinking, represent an admixture. The skull shows the usual peculiarities of Veddah crania. The main growth of the brain is in an upward and backward direction so that the ear-passages appear to lie farther forwards more centrally to the rest of the skull than in crania of the Aryo-Dravidian type.

In the adjoining table are given the chief measurements of the various skulls depicted in Figs. I, II, and III; from these tables and the drawings the reader or student will be able to infer such facts or measurements as may be needed for further comparison. In place of giving the exact measurements of the Veddah skulls I have given under A, in the annexed table, the mean dimensions obtained by measurement of the Veddah skulls.

TABLE OF CRANIAL MEASUREMENT.

A. Means of ten skulls of male Veddahs in the R. C. S. Museum.

B. Skull of a Punjab male alt. 55. No. 631·21 R. C. S. Museum.

C. Bayana Cranium.

D. Sialkot Cranium.

	A	B	C	D
Max. Length	170·6 mm.	174 mm.	178 mm.	180 mm.
Max. Width	122 "	126 "	127 "	128 "
Cephalic Index	99	72·4	71·3	71·1
Auricular height	113 mm.	114 mm.	108 mm.	119 mm.
Basibregmatic	130 "	134 "	131 "	140 "
Min. Front Width	90·4 "	91 "	90 "	98 "
Supraorbital Width	105 "	104 "	101 "	108 "
Max. Width at Coronoid Suture.	109·4 "	108 "	107 "	108 "
Bi-asterismic Width	100·7 "	97 "	95 "	103 "
Bi-mastoid Width max.	115·5 "	122 "	120 "	112 "
Bi-zygomatic Width	122·1 "	122 "	130 "	"

In the Indian Museum is now exhibited several fragments which are described at length in Catalogue and Handbook of the Archaeological Collection by Dr. Anderson (1883), Part II, pp. 398-403. Dr. Anderson is disposed to identify these fragments with those described by Mr. H. F. Blandford in 1864 as follows:—"The skull consisted of the occipital and parietal bones and a portion of the frontal with portions of upper and lower jaws and was filled with a mass of shells of the genus *Unio*. Mr. Theobald stated that the matrix of the specimen resembled that of certain Nerhudda bone deposits" (J. A. S. B., Vol. XXXIII, p. 575). Dr. Anderson traced these finds to a

The Goshpur Cranium fragments.

gift by Mr. Car Tucker from Gorakhpur to the Asiatic Society of Bengal in 1847 as recorded in J. A. S. B., Vol. XVI, Part I, p. 376. It appears that these were found at a place called Umbut, on the Koana Nuddi which joins the Gogra at Gopalpore. While building a bridge the labourers came upon what would appear to be a pit filled with shells, deer's horn and all sorts of bones. What makes the fragments very interesting are two pieces of deer-horn which have been probably sharpened like implements. If the beveling is not due to the fragments becoming imbedded in the bed of stream as Mr. Medlicott suggested, the pieces would appear like heavy bone implements occasionally found in late Mousterain caves. One fragment about 7.50" long and 1.5" in diameter is bevelled off at both ends, whilst the other is also bevelled at one end. The species would appear to be *Cervus duvaucelli*. There are 26 fragments. Of these no less than 13 are human.

No. 1.—The upper portion of a human skull, comprising part of the frontal, the greater part of the parietals and part of the occipital bone.

No. 2.—A mass consisting of the upper and lower jaws of the right side of a human skull.

No. 3.—The anterior portion of the superior maxilla of the right side of another human skull.

No. 4.—The horizontal ramus of the right lower jaw of a human skull.

No. 5.—The external auditory meatus of the right side of a skull with mastoid process.

No. 6.—A fragment of a left human temporal bone.

No. 7.—The hinder portion of an upper human jaw containing 2 molar teeth.

No. 8.—The middle of the shaft of a right human femur.

Nos. 9, 11, 12, 13, 14. } —Broken bones.

No. 10.—A right human ilium.

These are too fragmentary to be reconstructed. Whether they belong to two skulls or one, the state of fossilization is the same in both the cases. They are completely fossilized and absolutely white and not brownish as the Bayana cranium appeared to me, still less reddish than the semi-fossilised Maheswar Cranium in the Indian Museum or the Ghatsila skull picked up from the banks of the Subarnarekha river. The thickness of the skulls, the formidable character of the teeth, and the possible implemental shape of the fragments of bone accompanying them make it likely that the skulls are of palæolithic age. The frontal portion of one skull is in tact enough to show it to be of a dolichocephalic nature. There is nothing of a neanderthaloid and little of negroid features in these. The skulls do not appear to

be so small as the Bayana or the modern pre-dravidian tribes. If these are really of palaeolithic antiquity, they testify to the presence of some type of non-negroid upper Pleistocene *Homo* recond possibly of a protocaucasian type.

These fragments were lost once in the heap but in the course of re-arrangements found out and are now exhibited in the archaeological collections. They are very important on account of the bone implements (?) that were found with them.

The fragments have been examined by my young friend and M.A. Student Mr. Sisirkumar Har, B.A., who has specialised in Physical Anthropology who reported as follows:—

The following portions of the cranium have been found:—

- (1) Occipital—two portions.
 - (a) One attached to the right parietal bone.
Lateral breadth = 4 c.m.
Antero-posterior length = 2.9 c.m.
Max. thickness = 0.7 c.m.
 - (b) One broken; detached piece possibly from near about theinion (?) = 3.2 × 3.5 c.m.
Maximum thickness = 0.6.
- (2) Parietals—two portions.

- (a) Greater portions of the right and left parietals attached to a portion of the frontal, with the position of the Bregma intact.

Length from the Bregma along the Sagittal Suture = 7.7 c.m.

Highest breadth along the parietal bosses (one parietal boss perfectly recognisable) = 12.4 c.m.

Maximum thickness = 0.7 c.m.

- (b) A portion of the right parietal attached to a portion of the occipital.

Maximum available breadth from Lambda (well recognisable) over the superior temporal line = 8.3 c.m.

Antero-posterior length = 4.6 c.m.

Maximum thickness = 0.7 c.m.

- (3) Frontal—two portions.

- (a) The bigger portion, attached to the parietals.

Maximum breadth along the coronal sutures = 10.6 c.m.

Maximum available antero-posterior length = 3.8 c.m.

Maximum thickness = 0.7 c.m.

- (b) A very small portion, the greater part of it lying about 1.7 c.m.

right of Bregma just below the right coronal suture.

Maximum antero-posterior length
= 2.4 c.m.

Maximum breadth = 4.6 c.m.

Maximum thickness = 0.8 c.m.

(4) A portion of the left temporal bone with the mastoid process (3.3 × 3.2).

(5) A portion of the right temporal bone with the external auditory meatus

Maximum length = 6.7 c.m.

Maximum breadth from above the external auditory meatus

= 2.9 c.m.

From these fragmentary measurements it would appear that the Skull was extremely dolichocephalic; and the thickness of the calvarium is rather pronounced. Of course, the thickness has been to some extent due to the overcoating of conglomerate and matrix.

Maxilla and mandible—

(1) A portion of the right mandible (the body only) with the second incisor tooth intact and a broken molar (first?) broken just at the symphysis.

Maximum available length from the broken edge of the symphysis = 5.3 c.m.

Maximum thickness along the inferior border 1.1 c.m.

Maximum height from the inferior border up to the root of the first lower incisor = 3.0 c.m.

Length from the root of the 1st incisor to that of the 1st molar = 4.2 c.m.

(2) Hinder portion of the right maxilla with two molar teeth. The cusps much worn out, indistinguishable and plain.

The breadth of the anterior molar = 1.4 c.m.

Right Ilium—

Maximum length = 13.3.

Maximum breadth = 12.2.

The ridges are feebly marked and the pelvis is shallow thus betraying female characteristics.

There are several skulls from early megalithic remains in the Madras Museum excavated by Mr. A. Rea from Aditannallur in the Tinnevelley

district. Mr. Thurston thus writes of them:—

“Two of these skulls, preserved at the Madras Museum, are conspicuously prognathous. Concerning this burial site M. L. Lapique writes as follows: “J’ai rapporté un spécimen des urnes funéraires, and une collection assez complète du bon état, et parfaitement déterminable. Il est hyperdolichocéphale, et s’accorde avec la série que le service d’archéologie de Madras a déjà réuni. Je pense que la race d’Adichannallur appartient aux Proto-Dravidiens.” The measurements of six of the most perfect skulls from Aditanallur

The Aditannallur
crania and megalithic
fragments.

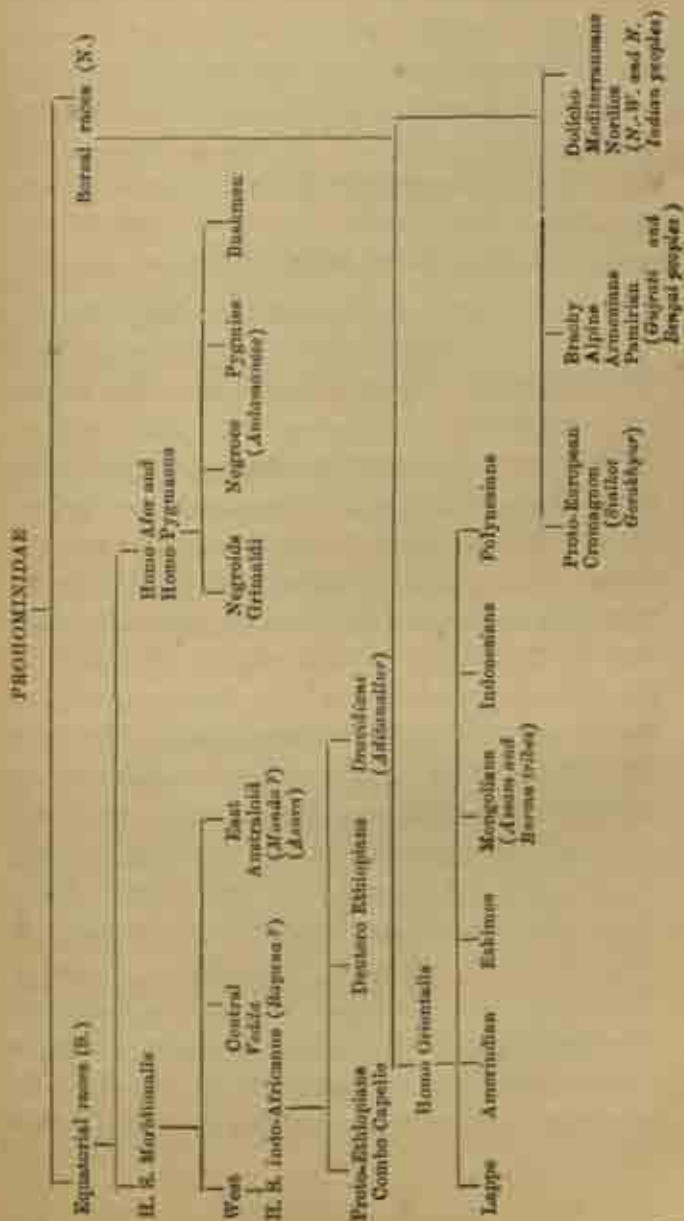
in the Madras Museum collection give the following results—

Cephalic length c m.	Cephalic breadth c m.	Cephalic Index.
18·8	12·4	66
19·1	12·7	66·5
18·3	12·4	67·8
18	12·2	67·8
18	12·8	77·1
16·8	13·1	78"

The hyperdolichocephalic type still persists in some inhabitants of the Tamil country, *e.g.*, Palli, Paraiyan and Vellala, as Thurston observes. They survive also partly in the north. But this, by itself, unaccompanied by other considerations such as nasal index, facial angle, circumference of the skull, leads to nothing. These megalithic skulls range in India from neolithic (*c.* 4000 B.C.) to late metallic times (*c.* 500 B.C.). There are some from Hyderabad cairns, one complete skull, I hear, being with Dr. Hunt of Hyderabad. Rai Bahadur S. C. Roy, M.A., collected some fragments from a megalithic remains, the so-called Asura sites in Chhota Nagpur. Some of these were examined by Dr. Amalkumar Roy Choudhury M.D., who published a note on them in the *Journal of Behar and Orissa Research Society* (1920, pp. 407-8). It ran as follows:—"The bones found are those of an adult, probably a

female, as the bones are very small and the muscular prominences not well marked. The stature was between 4 feet 10 inches and 5 feet. The musculature of the lower extremities was well developed as can be seen from the prominence of the ridge on the bones of the lower extremities. The skull capacity was much smaller than that of the ordinary modern man, and the face also was much smaller. The cheek bones were prominent. The jaws are small and there was a very slight prognathism. The teeth also were small and rather sharp. The muscles of the jaws were well developed as can be seen from the prominence of the zygoma."

Before finishing this chapter we would again attempt to show a tentative place of our Indian fragments by placing them in a chart made out from the unrivalled synthetic studies of Ruggeri as put forth in his last work (*Su l'origine dell'uomo*, specially p. 131). My suggestions have been, as before, put in brackets.



CHAPTER IV,

PRE-CHELLEAN CULTURES.

It is a matter of common knowledge that in the year 1847 Boucher de Perthes of Abbeville began to discover rude stone things which he claimed to have been shaped by man in the long bygone ages before the deluge. In those days the orthodox biblical dogma had caught so much hold of the geologists that no one would believe that the frail human body could withstand the rigours of a diluvial age, which it was held, had swayed the world in geologically recent times. In 1855 Dr. Rogillot of Amiens also published an account of the discovery of flint implements enclosing the remains of extinct animals. It is a source of satisfaction to us that Dr. Hugh Falconer, whose name would, as one would find later, figure prominently in the controversy regarding one of India's oldest artefacts, and Prestwich, turned the scale in favour of accepting the antiquity and 'humanity' of these finds in question. Since then nobody dares to deny when

The early history of river-drift finds and their subdivisions.

chipped stones are found in river-drifts that they bring forth evidence of the existence of man at the age calculated by studying the conditions of the bed in question. And of late years the balance has seemed to sway to the other side. For in ancient days the classification roughly was Riverdrift period and Cave-period which was called Palæolithic (and formerly Archæolithic, *i. e.*, of Old Stone) and the surface period distinguished by the term

Classification. Neolithic (or New Stone) which have passed into general currency since Avebury's use of the terms. Since 1892 when J. Allen Brown brought forward a new term for forms considered earlier than Palæolithic, the term Eolithic (Dawn-Stone), the word has been a great bone of contention among prehistoric archaeologists: most of whom reject and some hold to that term. The Twentieth Century has seen a great study of Palæolithic forms, often to the neglect of Neolithic and Metallic ages, and has brought forth these names for successive phases of old stone culture, *e. g.*, Chellean, Acheullean, Mousterian, Aurignacian, Solutrian, Magdalenian and Azilian. Some forms from Strepv, Mesvin and Maille have now been established mostly by the efforts of Mr. Rutot of Belgium, a great champion of 'Eoliths' and are now spoken of as 'Pre-Chellean' by the French savants who are reckoned the highest

authorities in this matter. Mr. Rutot's proposed term 'Reutelian' is far from being accepted and we should do well to use the term 'Pre-Chellean' not only of shapes of the horizon of these early Belgium finds but to extend it to earlier forms still where the human hand in the chipping is not doubted.

Though Eolithic types in general have not been accepted, we should know what a 'rostro-carinate,' the supposed earliest stone implement used by man, is, for round it the controversy raged very strong. In the words of its great champion Mr. Reid Moir "A rostro-carinate is an implement with broad posterior region, narrowed anteriorly to a quasi-vertical cutting edge. This anterior narrow edge is strongly curved and gives the implement the form of the beak of an acipitrine bird. The form of the region of the implement may also be compared to that of the prow of a boat (the boat being turned keel upwards)."

Now I had pointed out already that one of the Burma finds of Dr. Noetling of rectangular shape bore a remarkable resemblance to a similar Eolithic type from Dorset figured in 'Man,' 1908. As for the Burma finds by Dr. Noetling in 1789, though much ink has been spilt to show that they belong to

Indian rostro-carinate.

The very early shape of the Burma specimens.

Miocene and then later to Pliocene, the modern opinion seems strong to accept them as of the earliest Pleistocene times if not earlier. Not having the good fortune to study them first-hand, all that could be made out from the plates is that there is not much of design there, though little doubt exists as to their being chipped, as was the opinion expressed by Professor T. Rupert Jones in "Natural Science," 1894, p. 345. The presence of nodules gives us reason to compare them with Chelles forms and absence of design to a little earlier stage.

The next authenticated implement described in detail in Coggin Brown's Catalogue, p. 57, is Hackett's Bhutra Boucher found associated with bones of extinct animals. It was found in a gravel bed about 6 ft. above the low water level of the Nerbudda and that indicates the vast age that must have elapsed before the Nerbudda could find its present course allowing for the various changes of level by subsidence and elevation, denudation and deposition in the meanwhile. The ossiferous gravel in which it has been found has been assigned by competent paleontologists to a horizon just succeeding the last of the Siwaliks and it is immaterial whether it is called the latest Pliocene or the earliest Pleistocene. Dr. Hugh Falconer was disposed to consider it as Pliocene. What is

The Pre-Chellean
Nerbudda Boucher.

very remarkable about this is that it undoubtedly was of a time which can be called 'Pre-glacial' and yet its forms betray a finish of the Chellean type. A large portion of original mass of unworked Vindhyan sandstone still remains and the specimen appears to be a little too heavy for its high finish.

The next in order though scarcely less important in antiquity and authenticity comes an Agate chip $2\frac{1}{2}$ inches long and $\frac{1}{16}$ inch in width, described in some detail in C.R.I.M., p. 61. It was found at Mungi near Python. It is also a riddle, for by its Palæontological associations it has been found to be of a horizon identical with that of the Nerbudda find (the Nerbudda boucher was found at a level about 8 or 10 feet above the present water level; this was extracted from a bed about 20 ft. from the present water surface). But though of hoary antiquity, the shape inevitably suggests the fine form of a Levallois flake of Mid-Palæolithic times of Europe. It had evidently been used, and being found *in situ* and having been considerably written upon, there is little doubt about its genuineness at present. The question is, whether it may be of Pre-chellean times or of Mid-Palæolithic age. Palæontological arguments leave no doubt as to deciding its place in the earlier phase for a considerable section was

The Pre-Challean
Godavari-chips.

for holding that both this and the Hackett Boucher belonged to the Upper "Pliocene."

Bergson has beautifully remarked that 'if we could rid ourselves of all pride, if to define our species,

The Harma find.

we kept strictly to what the historic and pre-historic periods show us to be the constant characteristic of man and of intelligence, we should say perhaps not *Homo sapiens* but *Homo faber* (not man the intelligent but man the manufacturer). In short, intelligence considered in what seems to be its original feature, is the faculty of manufacturing artificial objects, especially tools to make tools and of indefinitely varying the manufacture."

We are on a safer ground here as we have not to do with doubtful 'Eolithic' workmanship but unorganised instruments definitely shaped and used by men. But it is now very amusing indeed to turn over old records where facts were given the go-by simply because the notions of the day rebelled against a very high antiquity of man. We would here meet with specific instances in which the evidence of palaeontology and the opinion of such a very eminent authority as Falconer in that department was being called into question. The three cases that we have got to deal with are so interesting that we cannot miss the controversies, the more so as

¹ *Creative Evolution*, p. 144.

they would bring out the problems of earliest Pleistocene humanity in India. Let us take up the cases one by one. Turning over the pages of the Records of the Geological Survey¹ we find Dr. Noetling of Tasmania in the course of his duties in India noticing the occurrence of chipped flints in the Upper Miocene of Burma. He describes it as follows:—"While engaged in mapping out a part of the Yenangyoung oil fields my attention was particularly directed to the collecting of vertebrate remains. One of the most conspicuous beds palæontologically as well as petrographically is a ferruginous conglomerate upwards of ten feet in thickness. This bed may be distinguished a long distance off² as a dull red band running in a continuous line across ravines and hills. Besides numerous other vertebrate remains such as, *Rhinoceros perimense*, etc., one of the commonest species is *Hippotherium antelopium* of which numerous isolated teeth can be found. Three types of implements may be distinguished: (a) irregularly shaped flat flakes, (b) more or less triangularly shaped flakes, and (c) a rectangular flake." Dr. Keith telling us how 'as in all cases where chipped flints of an eolithie type have been discovered the humanity of these implements has been called in question,' mentions these flints as showing distinct traces of having been worked

¹ Vol. XXVII, pp. 101-2.

by man though found in a conglomerate deposit which contained the remains of animals belonging to the earliest part of the Pliocene period. Geological and stratigraphical proofs about the high antiquity of the Burma flint has also been discussed by the finder. His statement is as follows:—“Three distinct groups can be distinguished in the Yenangyoung tertiaries, namely, in descending order:—

(1) Group A.—Consisting of a series of blue clays. Thickness not less than 1,000 ft.

(2) Group B.—Consisting of brown and red sandstone and light brown clays consisting of numerous crystals of Selenite and countless numbers of *Balissa Crawfordi* terminating in a bed of ferruginous conglomerate with remains of terrestrial animals, *e.g.*, *Hippotherium antelopium*, and *Rhinoceros perimense*; chipped flints locally not rare. Measured thickness 1,105 ft.

(3) Group C.—Consisting chiefly of light coloured yellow sandstones. Thickness not less than 4,620 ft.

Group C must be upper Miocene.” The finder concludes thus: “But whatsoever their particular age may be it is certain considerable amount of time must have elapsed since the deposit of a series of strata of more than 4,620 ft. thickness. Moreover the writer draws our

* Records of the Geological Survey, Vol. XXXVII, p. 102.

attention to the fact that ' the shape of this specimen reminds us very much of the chipped flint described in Vol. I of the Records and discovered in the Pleistocene (?) of the Nerbudda river, the artificial origin of which nobody seems to have doubted."

The second undoubted vestige of very old culture in India which was unearthed from the banks of the Godavari more than fifty years ago by Mr. Wynne in the upper Godavari associated with some extinct mammalia. In the Quarterly Journal, Geological Society, London,¹ the eminent Palæontologist Dr. Falconer proved the deposit to be Pliocene and stated, " In designating the formation as Pliocene which I have during many years, I have been guided by the indications of the mammalian fauna, as intermediate between the Miocene of the Irrawaddi, Perim Island and the Siwalik hills and that of the existing period." We must call back to mind the acute phase the question of the antiquity of man was then passing through, in Europe. Though in 1833 the human cranium now known as the Engis Skull had been discovered by Dr. Schmerling² it was not till 1863 that even the open mind of Sir

¹ XXI, p. 283.

² Recherches sur les Ossements fossiles decouvertes dans les cavernes de la province de Liège, 1833.

Charles Lyell, convinced of the great antiquity of man published his classical work¹ and full five years were yet to come when Aurignacian culture and the Cromagnon men were to be discovered.² So in October 1866 Mr. Blandford expressed his doubts in the Proceedings, Asiatic Society of Bengal, thus:³ "I was first very sceptical as to the genuineness of this flake, but a recent examination and comparison of it with some of the Jubbulpore specimens have strongly inclined me to believe that it is really of human manufacture." Dr. Oldham of the Geological Survey who has doubted the age of the implement just marking with a query the word "Pliocene" thus describes it in his paper in the Record of the Geological Survey of India:⁴ "The flake was discovered just below the village of Moongee near Pyton. The river cliff here has a height of about 50ft. It was found about 23ft. above the base of the cliff. It is formed from a compact, light-coloured agate chip, which near the surface has become blackened and in two parts the original smooth ferruginous surface of the agate mass remains. The flake is rudely triangular in section, one side being flat while between the two edges, although not centrally, it rises on the other side into a ridge. The whole is slightly curved, and at an end the

¹ The Geological Evidences of the Antiquity of Man, 1863.

² Vide Keith—The Antiquity of Man, pp. 53 and 55.

³ Vide p. 230.

⁴ Vol. I, p. 66.

sharp edges are curved so as to form a slight reflexion of the whole flake, giving the end very much the form of the curved end of a carving knife for game. The other end of the flake has a lateral extension which may have served as a means of attachment to a handle. The sharp cutting edges are much blunted and hacked, obviously by use. The total length of the flake is $2\frac{1}{2}$ inches; the breadth which is tolerably constant for its entire length is $\frac{1}{18}$ inch."

In the address to the Asiatic Society, Bengal, in December, 1865, ¹ Mr. Old-

Extinction of mammals.

ham referred to the locality thus: "Many of the members

of the Society are perhaps not aware that spreading over a large area in the country drained by the upper waters of the Godavari and its affluents, there is a widely spread deposit of clays and gravels containing remains of large mammalia which are probably of the same kind as those which occur in the similar gravels and clays of the Nerbudda valley and of which the Society possesses many specimens." Further in September, 1867 when several chipped stones were being exhibited, Mr. H. F. Blandford reverting to this interesting find of Mr. Wynne said: ² "I am much disposed to believe that we have

¹ Proceedings, Asiatic Society of Bengal, 1865, p. 207.

² *Ibid.*, 1867, pp. 144-146.

evidence in India of the existence of man at a much earlier period than Europe. We have here evidence of the co-existence of man with the animals the bones of which occur in Godavari gravels and which are identical with those found in the Nerbudda gravels. The fauna thus indicated differ much more widely from the existing Indian fauna than the pleistocene animals of Europe do from those now existing in that country." Thus we find that though doubts have from time to time been raised as to the authenticity of Dr. Noetling's find *in situ* and thus as to the vestiges of Tertiary man in India nothing can be said against the very high antiquity of this Godavari find. Its case is quite similar to the Nerbudda find, as we have got to describe presently, whose association also with extinct fauna leaves little chance of post-dating it. Whether these two belong to the Tertiary age or not would depend only upon the time granted to the Pleistocene age. We have here more concern with culture than geological time-scales ever shifting in the pages of every new great scientist. "Pre-Chellean" which stands for the earliest culture is, I think, the best term to satisfy all demands. And our point consists in recognising the Burma find of Dr. Noetling, the agate chip from the Godavari and the boucher from the Nerbudda as belonging to types of culture and to times which cannot be brought

down later than the earliest Pleistocene stage even in the opinion of the doubters. Before coming to a general consideration and bearing on the history of culture of these, we have got to enter into the details of the Nerbudda celt. "The celt,"¹ we read, "is formed of Vindhyan quartzite such as might be procured at any point along the northern edge of the valley; it is of pointed oval shape, 5' 3 $\frac{1}{2}$ " of very symmetrical outline. Mr. Hackett dug it out himself from where he found it lying flat and two-thirds buried, in a steep face of the stiff, reddish, mottled unstratified clay about 6 ft. above low-water level and about 3 ft. below the upper surface of the clay, upon which there rested about 20 ft. of the gravel with bones. From the edge of the cliff of gravel there is a steep slope passing up through the ground to the plains at 90 to 100 ft. above the level of the Nerbudda. The locality is on the left bank of Nerbudda near the village of Bhutra, 8 miles due north of Godarwara." Now the antiquity of this piece can be gauged by the fact that it was found in gravels associated with bones of animals long since extinct. Besides that, the passing away of these animals for ever from India forms part of a general movement and change for which a great lapse of time must be allowed. What

¹ *Results of the Geological Survey of India*, 1878, p. 49.

that is, Mr. Blandford brings out clearly¹: "The change which has taken place in the Indian fauna since the period of the Nerbudda gravels consists in a substitution of animals with Malay affinities for animals with European or African affinities. The great bovine of the Nerbudda gravels, an animal, the remains of which are peculiarly abundant was a true Taurine, so closely allied to the *Bos primigenius* of Europe that the differences are scarcely more than sufficient to constitute geographical races. But as it is well-known, the only indigenous race of wild bovines (exclusive of the Buffalo) in the Indian peninsula, the Gaur is a flat-horned Taurine, widely different in structure from the true round-horned Taurines. A more complete case of the substitution of one animal by another with distinct affinities can scarcely be imagined. Then again the species *Hexaprotodont* and *Tetraprotodont hippopotami* of the Nerbudda have become extinct." Dr. Falconer, as has been mentioned before invariably spoke of these fauna as Pliocene as being a development of the Siwalik fauna in many respects, and intermediate between them and our times. Though his opinion in questions relating to the determination of vertebrate fossils specially of India, is unassailable, his word "Pliocene" has been the cause of much contention. Some would

¹ Proceedings, Asiatic Society of Bengal, 1865, p. 217.

allow even 400,000 years or more when these bits were manufactured. But a few thousand years are of little account in the earliest palæolithic age where we have got to do more with geological time of hundred thousand years than any lesser period. But the fact is important since much depends upon the lease of time granted for the first appearance of man and we have seen the systematic efforts in Europe have settled beyond doubt the question of the possibility of such human handicraft existing at such an early age.

Let us pass on to the actual men who used these chipped stones, their environments and their possible lines of development. In all probability there are some other palæoliths still gracing the show-cases of the Indian Museum or the Madras Museum which belong to the period of the remotest human antiquity in India. Though the Pithecanthropus has been found associated with bones of animals many of which flourished in Pre-chellean India we cannot speak of the existence here of possible Pithecanthropoids still less Dryopithecoids or Sivapithecoids (not to mention the far-off Eoanthropoids or Hesperanthropoids?) without actual remains to go by.

Note.—Evidence is now forthcoming that Pre-chellean cultures probably extended from Burma to Ceylon (*vide*

Spolia Zeylanica, October, 1919) which was then connected with the Indian mainland. I have personally come across some Pre-chellean coup-de-poings from Chakradharpur in Chota Nagpur. Cuddapah finds are of a rostrocarinate type (*vide* Appendix). The Andamanese have been found to perpetuate the earliest type of Palaeolithic (according to Sollas, Eolithic) industry. The Pithecanthropus spread into Java with late Siwalik and Early Nerbudda (Pleistocene) fauna by land. So we might speak of the earliest Pre-chellean culture cycle here as comprising of the Burma—Deccan—Ceylon—Andaman—Java area.

CHAPTER V.

THE CHELLEAN, ACHEULLEAN AND MOUSTERIAN CULTURES.

The Chellean and Acheullean cultures preceded the Mousterian stage in Europe. Many Paleoliths have been recovered from older alluvium beds or laterite which Mr. Bruce Foote speaks of as Chelleo-Mousterian from their shape and Mr. Coggin Brown as Chelleo-Acheullean. Though little record has come down to us about the exact level from which most of the artifacts were unearthed and thus considerable doubts have been thrown on the age of the most of them, the technique and shape of the things roughly lead them to be classified as Chellean, Acheullean, and Mousterian and when there is no paleontological evidence to the contrary there is little to demur as many were discovered *in situ* from the older alluvia of early Pleistocene beds by geologists.

A few words must be said about the movements of this period before coming to their chipped stones. At the outset it must be pointed out that though, no doubt, the occurrence of suitable

Tentative classification.

Paleolithic movements.

rocks played a considerable part in the selection of habitation sites by Palaeolithic men, it seems that there were thicker settlements towards the South than in the North and so likewise towards the East than in the West of India. And a distinct progress is discernible from the Burma find to the Godavari chip and the more southern the find the better the finish. And all indications of the palaeolithic movements of the people are from the North to the South. However that may be, we find the Early and Middle Palaeolithic Indians mustered strong in the Cuddapah Guntur and Nellore districts and the neighbouring tracts of Madras. Now many of the implements have been extracted from undisturbed laterite beds which prove their great antiquity for these have been formed immediately after Pliocene times. Most of the specimens obtained are formed of quartzite. And so Logan is disposed quite rightly to take the quartzite-users as the most ancient prehistoric men of India and speaks thus :¹ "The men of the quartzite and most ancient period appear to have inhabited the coast from Orissa to South Arcot and inland as far as Karnul. From Arcot a colony detached itself to Tanjore and Madura where quartzose was used in place of quartzite and from Karnul another branch passed across Tungabhadra perhaps leaving out Bellary and colonised the

¹ *Old Chipped Stones of India*, p. 65.

Southern Maratha country" (*vide* Appendix). Anyway, it is in the great river districts of southern India that the Palæolithic man is traced most often exhibiting various stages of culture. The Southern and evidently late ones belonging no doubt to the Early and Middle Palæolithic period show a progress from rougher careless forms to variegated attractive artifacts and from offhand conchoidal to careful stepped retouchings on which evidently much labour had been bestowed. Some rare specimens from Bundelkhand and Jaipur betray a Chellean phase of culture. The dirty white quartzite from Indargarh, the quartzite from Bundelkhand (Nos. 167 and 145 of the Indian Museum) and several specimens from Cuddapah can be called the handiwork of the Indian "Proto-Chelleans." There are about 220 specimens of old artifacts from Cuddapah and of them no less than 72 are of such rude make yet unquestionably worked up by man, that there would be little hesitation in calling some of them Proto-Chellean and some Proto-Mousterian types. These are almost identical in shape and size to those figured by Prof. Breuil as found from Taivilla and Tapatuilla in Cadiz (Figure 9, *Institute Francis d'anthropologie, Séance du mai 20, 1914, pp. 69-74*). They are, as we shall see of the typical 'rostro-carinate' forms of archæologists. (*Vide* Appendix.) The Early

Paleolithic man in India made Cuddapah the centre of his culture as this district is practically the home of the quartzite formation and thus had the best attractions for the primitive settlers. Any rough and handy form suitable for throwing and cutting a wound if possible was sufficient for these peoples. Sharpness of the edges is met with in some artifacts which made them quite effective and rude efforts at selections of pieces affording grooves as facilities for holding these tight are discernible. Some sort of chipping, however rude, can always be traced and bespeak probably the work of rude, thick and stout fingers. Cutting woods and piercing animals were also occasionally done with these same artifacts which were not yet developed into distinct types but it is to be doubted whether any digging could be carried on with them.

But undoubtedly, just as in the later age, the settled life or at least for some time the ceasing of large migration told slowly but effectively

Some South Indian sites.

on the culture of the Paleolithic dwellers of Peninsular India. In the districts now known as Chingleput and Arcot in the neighbouring tracts of Madras and the Southern Mahratta country the early Indians soon developed aesthetic instincts in the choice of colours and progressed in craftsmanship and passed, in

one word to the Acheullean stage. From Attrampakkam, Caradepootoor, Manajakaramsi Hire and Chik Mulungi, Puttrur, Amarambeda, to mention only a few of the names, a good number and variety of old chipped stones have come to tell us how humanity was flourishing in those portions of Southern India under conditions highly favourable to primitive life. The proximity of rivers to the rocks highly suitable for the old weapons and implements no doubt was helping man much to be the dreaded hunter of animal life. Probably also in some places lake-dwellings were found highly suitable and Palæolithic lacustrine (?) settlements sprang up. At Heera and Chik Mulungi about 20 miles above Kaira a large variety of weapons have been found in a lateritic soil which does not belong to the river alluvium but is evidently of old lacustrine origin.

Some Indian palæontologists are seen hesitating at times whether to constitute the uppermost Siwaliks as uppermost Pliocene or Lowest Pleistocene and probably the line is as hard to draw everywhere. In any case Dr. Pilgrim in his classic paper on "The Correlation of the Siwaliks with the Mammal horizons of Europe"¹ gives us a very useful list of late Pliocene fauna which belonging to post-Sivapithecus times are of the

¹ Records, Geological Survey of India, Vol. XLIII, 1912, pp. 264-322.

utmost importance to the investigators of human palæontology in India as proto-human remains should some day be unearthed associated with the remains of these. The mammalian fauna of the period are *Stegodon gonesa*, *Elephas hysudricus*, *Dicerorhinus platyrhinus*, *Equus*, *Sus falconeri*, *Camelus*, *Bos*, *Buffelus* and little earlier we find *Stegodon*, *Elephas planifrons*, *Hipparion*, *Leptobos*, *Hemibos*, and still more earlier we find *Stegodon Clifti* and *boeifrons*, *Mastodon sivalensis*, *Hipparion*, *Merycopotamus*, *Hippohyus*, *Hippopotamus* (abundant), *Hemibos* and *Leptobos*. One very essential thing to remember is that the tale of the human animal very probably continued in one unbroken order from these times along with that of other fauna, the only change being the suppression of some forms probably by the rigours of glacial times and slight modifications of some others. *We may indeed take the Sivaliks as Pre-glacial and the Nerbudda as one Interglacial, the Karnul as another subsequent glacial, and the Pleistocene Jamuna and Gangetic fauna as a still later interglacial, for this alone may conveniently explain the extinction and modification of fauna as met with in these stages which constitute for us some convenient milestones.*

Dr. Oldham rightly remarked¹ "In India the present physical order of things modified

¹ Records, Geological Survey of India, Vol. I, 1868, p. 67.

only by alterations of level, by upheavement and depressions could be traced back, in an unbroken chain, to the ossiferous strata of the valley of the Nerbudda and of the Siwalik hills. Results in harmony with these indications were yielded by a retrospect cast upon the system of organized life. The Mastodon, Stegodon, Loxodon elephants were extinct as were also the Sivatherium, the Chalicotherium, the three-toed Hipparion-horse, the Hexaprotodon, the Merycopotamus and other peculiar forms. But they were found associated in the same Siwalik deposits with species of true Equus, of camel and of Giraffa, the two last being characteristic contemporaries of man at the present time. The Pliocene fauna of the Nerbudda valley produced along with the Miocene *Stegodon insignis* of the Siwalik hills, an extinct elephant (*E. namadicus*) the dental system of which is closely allied to that of existing Indian species; a true *Hippopotamus*, and, not to mention others, a true Taurine Ox, *Bos namadicus*, and a huge buffalo, *E. (Bubalus) (Palaindecus)* which is nearly approached by the living 'Arnee' of the forests of Assam, being the stock from which the domestic buffalo of oriental countries is supposed to have sprung. That the actual order of the present system of life had begun during the Siwalik period was indicated by the living glacial crocodile and — *Emys tecta* being

found associated with the extinct mammalian forms."

The step towards progress seems to have been taken by the decided tendency towards a uniform shape often of rough geometrical form and the development of an eye for colour. Chipping, pecking and sharpening are done for the artifacts and the range of use is also extended. In the Indian Museum are shown 34 specimens unearthed from Bennihallah nullah, 3 miles south of its junction with the Malprabha river; of these ten are of decent elongated oval sharp edge,—a few of these are well truncated and one has a curious projection on one side. The colours are oftener reddish or pinkish than grey. They formed the chellean hand-axes (*coup-de-poings*) held often with both hands and driven straight into the body of the enemy. The rest though superficially of the same thick coarse build can be differentiated into various kinds. The ridges are always sharp, crescentic or oblique or wedge-shaped, the sides are sometimes parallel or constricted, often thick and flat. They are mostly pebble-butted and are made of striking striped red or mottled grey or white banded coloured specimens of quartzite.

But the Indian Acheulleans and Mousterians mustered stronger and went another step forward in their settlements by the Attrampakkam

stream in the Trivellore taluk, Chingleput district.¹ More than 90 speci-

Flint shapes.

mens (Nos. 572-670) from that place are now in the Indian Museum. Wedges, axes, cleavers, knives, scrapers, digging, casting and piercing implements mostly of variegated hues and well chipped and flaked surfaces yet on the whole maintain the rude build of the early palæolithic phase and justify the designation of Acheulean when applied to them. The shapes show an agreeable variety. Mousterian discoids with convex faces, ovoids, beautifully triangular pieces, rectangular 'gespal-tener keiltypus' as in North Spain, roundish ones and triangular ones with stepped ridges, meet our eyes not infrequently.

¹ A late Palæolithic phase is also discernible in the finds from the recent alluvia of the places.

CHAPTER VI.

THE KARNUL CAVE-DWELLERS.

It is well known that the Billa Surgam caves of Karnul afford us sure proof of very early Palaeolithic cave-dwellers in India and though eminent authorities would characterise some of their artifacts as Magdalenian, still there is no reason why the cave can be told to have begun to have been inhabited from earlier times. Though these were discovered and partly explored in 1844 by Captain Newbold they were forgotten till more than forty years afterwards their systematic exploration was undertaken, at the suggestion of Huxley, by the Madras Government. There can be now little doubt that Karnul was one of the most ancient settlements of the cave-dwellers and many caves were found near Billa Surgam or within a few miles of it containing distinct traces of human habitation. The bones of many animals were found in the Billa Surgam caves, which have been extinct in India long since. While Billa Surgam is in the neighbourhood of Benganapalli, a few miles N.N.W. of it is the Yerrazari cave and S.W. by

The only excavated
Pleistocene cave.

South of that very place is another, while there are no less than 3 caves at the Yegunta pagoda immediately north of Yerrazari and another cave near the South of Billa Surgam.¹ Of these details are forthcoming about the Billa Surgam cave alone. There also though 2,000 bones were found, the exact place and depth in which each was found has not been recorded. Though no continuous trace of human habitation could be found little doubt exists as to the fact that even up to Neolithic times the cave was resorted to by men, for at a low depth of 2 to 3 ft. broken pottery of very antique pattern was found.² But the floor of the cave which was found level for a distance of 160 ft. could be reached only after an excavation of 27 ft. at one place or even of 33 ft. at another showing the old age of the caves. At the depth of 11 to 12 ft. was found an old fireplace with many fragments of charcoal and some of which looked like cowdung ashballs. This clearly brings out that men acquainted with fire and what more with the art of keeping it ablaze by some animal products or otherwise lived in very early age in the cave. Many bone implements have been found in these caves which have been called Magdalenian. But a consideration of the extinct fauna would lead to its dating to Mid-Palaeolithic times when

¹ See *Remains of the Geological Survey of India*, Vol. XVII, p. 33.

² *Ibid.*

cave-dwelling began in Europe. It is well-known that India also suffered from the rigours of a glacial period and also of pluvial periods. These drove the people no doubt into the caves. A mysterious change of climatic conditions or some upheaval was affecting the conditions of life at that time in India. Though the human bones that were found have been lost sight of, the testimony of the other animals will throw much light on the times. Thus Lydekker after enumerating carefully all the mammalia found in the Karnul caves goes on to point out,¹—

“The most remarkable feature in the list is the occurrence among a number of existing Indian species, of a *Cynocephalus*, of *Hyæna Crocuta*, of a small *Equus* indistinguishable from *Equus asiaticus* and of a *Manis* apparently identical with the existing West African *Manis gigantea*; while scarcely also less noteworthy is the occurrence of a peculiar species of *Rhinoceros* and of a *Hystrix* and a *Viverra* specifically distinct from the species now living in India as well as of the non-Indian genus *Atherura*. The occurrence of the genus *Cynocephalus* and of forms identical with African species of *Hyæna*, *Equus* and *Manis* is extremely important in supplementing the evidence afforded by the Siwalik fauna as to the probable derivation of many of the existing Ethiopian mammals from those of later tertiary

¹ *Paleontologica Indica*, Series A, Vol. IV, Part II, 1896, pp. 20-2.

of India; and it is interesting to trace the gradual dying out in the latter country of genera and species which are now dominant forms in Africa. There is at present no satisfactory explanation of this total extinction of genera and species which appear equally as well suited to exist there at the present day as those which remain." It has already been seen that these changes were taking place in times just succeeding the Pliocene epoch. Though it continued for a long time after it, it cannot be brought down to later than middle Pleistocene times. Of course this epoch in India may or may not synchronise with the same age in Europe but it must be admitted that the same hard climatic conditions were driving the men of Europe as well as of India to the caves. Unfortunately no stone-implements except perhaps one were discovered in the Billa Surgam cave which could have afforded us more chance of identifying this culture with the European phase. The bone-implements which have been dug out occur only at the depth of 15 or 16 ft. while the floor is reached after 26 or 30 ft. On the other hand definite proofs exist of the use of stone. Thus in the Cathedral cave of Billa Surgam 'two or three bones were found showing distinct traces of having been scraped with a hard and sharp implement the marks being such as would be made by sharp stone flake.'

“The comparatively large number of species
 either totally extinct or which
 are not now found living in

The fauna.

India, renders it probable that the age of a considerable part of the Karnul cave deposits is not newer than the Pleistocene; and the fauna, as being almost certainly more recent than that of the Nerbudda beds may be provisionally assigned to the later part of that period.”¹ After this Lydekker gives an exhaustive list of the fauna, which is the most correct and sole record of mid-Pleistocene India. Of the primates *Semnopithecus entellus* appears to have existed during the whole period of the Karnul cave deposits when probably the range of the existing was a little more southern.² A species of *Cynocephalus* appears to be indistinguishable from the African species on the one hand and the Siwalik species on the other. Of the cat family we get the *Felis tigris* or *leo*, the leopard (*Felis pardus*), *Felis Chaus*, which last having a very long range at the present day as well as the small cat still found in Madras and Ceylon, *Felis Rubiginosis*. The existence of *Hyena Crocuta* also allows it to be linked with the Siwalik species and to lead to the supposition that the species originated in India and spread westwards at the commencement of the Pleistocene or the end of the Pliocene. The very old genus *Ficiera*, found from the upper Eocene of England is also

¹ Pal. Ind., Ser. X., Vol. IV, p. 28.

represented by a species here which may be traced to the earlier Siwalik species. An extinct species of *Prionodon* also occurs in the deposits. *Herpestes griseus*, *Ursus labiatus*, *Sorex*, Chiroptera and *Sciurus*, *Nesokia bandicoota*, *Mus Mettada*, *Mus platythrix*, *Gollunda Ellioti*, *Hystrix Crassides* the last being different from all existing species also occur. The peculiar case of the Karnul species *Atherura Karnuliensis* has also been referred to. The two species of *Equus* are very interesting for 'the existing wild races of *E. asiaticus* being confined to North Africa it is extremely interesting to find evidence in the Pleistocene of a form which there is every reason to regard as specifically the same and which not improbably indicates that African races originally came from India.' The other fragments of an *Equus* not specifically distinguishable 'indicate a species superior in size to *E. asiaticus* which is certainly distinct both from the larger *E. namadicus* of the earlier Pleistocene and *E. sivalensis* of the Pliocene of India and about equal in dimensions to the existing Indian *E. onager* and some of the South African species.' A *Rhinoceros Karnuliensis* also occurs specifically different from existing *R. Unicornis* or *R. deccanensis* but

¹ This reminds us of the European Pleistocene low-statured horse as the *Nestorula* species recalls the high-headed type. This species (A) is like Ridgway's hypothetical *Equus caballus Hoopii* (*The origin, etc. of Thoroughbred Horse*, 1905, pp. 425-433) 'which passed into Africa from Asia or Europe or both.'

coming nearest to *R. atruscus*. The other remains are of *Bos* or *Bubalus* sp., *Bozophilus tragocamelus*, *Gazella Bennettii*, *Antelope cervicapra*, *Tetraceros quadricornis*, *Cervus aristotelis*, *Cervus axis*, *Cervulus Muntjac*, *Tragulus meninna*, *Sus Cristatus*, *Sus karnuliensis*, *Manis gigantea*. Besides these 7 species of birds, 5 of reptiles, 1 of amphibia and 4 of mollusca appear among the remains. In the chapter of prehistoric art it would be found that the Vindhya are interspersed with caves with paintings some of which may stretch forth to prehistoric antiquity. But no Lydekker or Bruce Foote has come to study them and it is left for the future explorer to see how far the accurate Karnul record is borne out in Northern India.

The Billa Surgam caves are situated on the

Yerrakonda hills and are three

The cave-finds and life there.

in number and known as the Cathedral, Charnel house and

Purgatory caves. A passage to which the name of the 'Corridor' was given, was found to lead at a distance of 55 ft. to another passage running East and West which formed a domed chamber which was so beautiful at its Eastern extremity that it was called the 'Fairy Chamber.' "All have the appearance of considerable antiquity being above the present drainage levels and full of stalagmite in enormous masses." It has already been pointed out that man did not

inhabit the cave continuously. But the existence of the deep floor and extinct fauna, the bone implements at a great depth as well as of pottery at a smaller depth shows that the cave was resorted to by men from very early times to Neolithic days. Now a curious fact is that the cave was associated with religious rites or it was resorted to by a race who were hunters of scalps not only of men but of all animals as well, for it is remarkable how not a single skull was discovered in the midst of the heap of bones. With the exception of two or three tolerably perfect skulls of bats which lived in the cave, no entire crania or large fragments of crania were found. The dwellers of these prehistoric caves were mighty hunters. At least 200 bone weapons or implements were found there. They include all manner of primitive weapons required to destroy the wild denizens of the forest and to cut them up for food. Awls, many kinds of arrowheads, small daggers, scrapers, chisels, gouge, wedges, axe-heads, etc., form part of the various kinds of things which bear definite traces of being worked up by man. The flesh probably was selected from any animal that came ready to hand and might have been smoked before being taken as the presence of the cinder plainly brings out the existence of fire. There can be little doubt that the majority of the animals whose bones have been found formed the diet of these primitive inhabitants. The horses,

gazelle, the antelope, the bovine species, the rhinoceros, and the manis supplied quite a heavy meal though it must have been but few and far between. The lion, the leopard, the tiger, the hyena, the bear, the big monkeys were creatures with whom they had to deal in the course of their forest excursions and they went to bulge their game bag. These primitive dwellers did not lack any muscular strength at all as some of their bone weapons clearly show. We read how 'the dagger (as found in the cave) is made of the calcaneum proper of some large animals. The calcaneum proper is the handle and the narrow head of the implement is cut out of the united fibula and tibia. It would be a formidable weapon in the hand of a strong man.' The presence of the cinder and a clear evidence about the spasmodic nature of the habitation of the cave-dwellers raise interesting problems. Was the Billa Surgam cave connected with some religious rite, and some of the antique cults were enshrined in a cave temple which played such a prominent part in later India? Then the long list of scalpless animals and possibly the smashed human bone possibly carry the tale of the numerous victims to some pristine cave deity. When we remember some form of magic or religion always existing among the lowest savages, the perpetuation of grim mother-goddess cults

¹ Records, Geological Survey of India, Vol. XVII, Part IV, p. 201.

in caves of India to the present day and human sacrifices still carried on by the primitive wild tribes, we may surmise that in Karnul we are in presence of a cult akin to that of a Brassempouy Venus or a Gondh sacrificing Meriah pole. What is more probable is that the cave was used as an occasional retreat and deserted after the death of somebody there. Now we know how the Veddas represent one of the most primitive stocks of mankind near India of probably Neolithic cave-dwellers. Allowing for the lapse of such a vast time and also some essential modification which climatic changes and intercourse with higher cultures have brought about in the lives of the modern 'Forest Veddas' we might imagine from their mode of living very well the condition of life in the Palaeolithic caves. Mr. and Mrs. Seligman thus writes of them :—“The forest-Vedda forms a home two or three times a year, as the season demands. Thus in the dry hot months when brooks and ponds dry up, the game collects in the low forests around the half dried river-beds, he then settles with his family in a place close to water. The rain sets in, however, and the iguanas, deer, pigs, etc., are scattered over the country : the elks then seek rocky hills and are followed by the Vedda. Here if possible, a

¹ The Veddas, pp. 81-82.

cave is chosen for the term."¹ Now here don't we get a very plausible explanation of the mode in which the caves like Billa Surgam were resorted to by the primitive cave-dwellers of India as Duckworth surmises the same of Europe. In Europe the rigours of the climate compelled the cave-dwellers probably to spend most of the year indoors but the conditions in India were much milder. Then again it is from these Veddas that we can suggest a cause of the desertion of the caves for a long time. "Amongst the Veddas² when a man or woman dies from sickness the body is left in the cave or rock-shelter in which death took place. The body is not washed or purified but covered with leaves and left as it is. This was formerly the universal custom. And as soon as these matters are attended to, the small community leaves the place or cave in which the death has occurred and avoids it for a very long time." Now we find how very likely it was that these cave-dwellers of the Palæolithic age had similar notions and the fear of being pelted by demons (or Yakkus as in the case of the modern Veddas) drove them to other contiguous caves whence they returned again after they had forgotten the incident which led to their desertion or hard necessity compelled them again to seek their previous shelter.

¹ Records, Geological Survey of India, Vol. XVIII, p. 224.

² The Veddas, pp. 818-2.

CHAPTER VII.

THE CLOSE OF THE PLEISTOCENE AND THE LOST PALEOLITHIC PHASES.

Before coming to the archaeological remains I cannot but refer to Lydekker's Catalogue of the Remains of Pleistocene and Prehistoric Vertebrata in the Indian Museum which though old is indispensable to the prehistoric investigator of India. For there we not only meet with the well-known specimens from Nerbudda and Karnul but also some later specimens from Banda and Jumna beds and still later specimens from Madras and Goalpara. The Pleistocene of Penganga offered some remains of times not far removed from Nerbudda while those of Kistna and Kathiawar came probably of a post-Karnul epoch along with Banda remains. So once we get at a rough idea of the chronological place of these deposits, the finds from those places may conveniently be assigned to those epochs, though the want of associated remains in most cases of paleolithic finds always leaves a great element of doubt. The first to meet us among mammalian remains is the common Bengal monkey

(*Macacus rhesus*) of which a left ramus has been found from Mudras and the left maxillæ from Goalpara (Assam). It also occurs in the Pliocene of the Punjab, France and Italy and also in the Pleistocene of Essex showing the presence of these apes in Europe at that late period (vide Flower and Lydekker, *Mammals Living and Extinct*, p. 722). Remains of the tiger well-known in India have also been found from the Jumna beds at Banda and are interesting on account of its present long range in Southern Asia, though Blandford thinks that it has only recently migrated to Southern India since it is absent from Ceylon. From the Nerbudda has come a damaged canine of *Ursus namadicus* which according to Flower and Lydekker may have been allied to the Malay Sun Bear with short and broad head (*Ursus Malayanus*). The present common Indian bear is the Sloth bear or *Melursus Ursinus*. Rats and mice are well-known in India as elsewhere, the common varieties being the rat (*Mus rattus*) the ordinary house mouse (*Mus musculus*) and the common field mouse (*Mus buduga*). The Pleistocene remains give us specifically undetermined and somewhat different kinds. Coming to the hollow-horned ruminants we find that apparently an allied form of the Siwalik species (*Bos planifrons*) and somewhat removed from the living varieties, the domestic ox (*Bos taurus*) and the

humped ox (*Bos indicus*) was the extinct *Bos namadicus* with an inclination to a flattening of the horns which had a wide distribution in Pleistocene India, remains having been found from the Nerbudda beds, Pengunga, Gokak, Kistna valley, Belgaum district, Kathiawar and Jumna beds at Banda. Almost similar is the case with the buffaloes, the remains of the larger species of which came from the Siwaliks while those intermediate between Pliocene and Recent occur abundantly (*Bubalus paleiudicus*) in the Nerbudda and Jumna beds. Of the antelopes there are at present four species in India—the Indian Antelope or Black Buck, the Gazelle or Chinkara, the Blue Bull or Nilgai and the four-horned antelope. Of these remains of two, thought by some to be a little specifically different have been as yet found in Pleistocene India, viz., *Boselaphus namadicus* and *Antelope Cervicapra*. Of the animals bearing two solid bony antlers we find the Sambar (*Cervus unicolor*) and the Barasingha (*Cervus duvaucali*) occurring in Pleistocene India. Of the pigs *Sus cristatus* has been found from Madras. The Hippopotamus, so abundant in the Siwaliks, and occurring also in the Nerbudda period had, as we have seen, disappeared before Karnul times.

The question of the derivation of the domesticated horse has always been very interesting and we can note two species of *hippotherium* and

one of *Equus* occur in the Siwaliks while the remains of *quus namadicus* have been found in Nerbudda as well as the Jumna beds. But surely the test animals for Pleistocene India would be besides the occurrence of *Hippopotamus* (up to the Nerbudda period) the determination and differentiation of the *Rhinocerotidae* and the *Proboscidae*. Of the former, however much difference of opinion exists but the antelope variety widely spread in Tertiary India and Pleistocene Europe has given us two species in Pleistocene India, viz., *Rhinoceros deccanensis* and *Rhinoceros karnuliensis*. No better study of Pleistocene fauna of India in order to bring it in a line with Europe is possible than that of Lydekker of course always paying homage to the earlier masterly studies of Dr. Hugh Falconer, F.R.S. Thus Lydekker writes:— (*Paleontologica Indica*, sec. X, Vol. I, 1880). "We find that in the Siwalik period there lived in India three species of *Tinotherium*, five of *Mastodon*, four of *Stegodon*, one of *Loxodon*, and one of *Euelephas*. In the succeeding Nerbudda period, the proboscidean fauna which is richest in the world was greatly reduced in number and was only represented by possibly two species of *Stegodon* and one of *Euelephas* the two former being Siwalik species and the latter new. It is, however, possible that *Mastodon pandionis* lived in the same period as its

teeth are said to have been found in the Deccan. In modern India this fauna has dwindled down to one species of *Euelephas*—a species which is not known before the period of the recent alluvium.

We find that most of the species of Proboscidae (unless we accept Leith Adam's identification of *E. namadicus* with *E. antiquus*) are peculiar to India but that many of them are represented in the Tertiaries and post-Tertiaries of Europe.

<i>Indian.</i>		<i>European.</i>
<i>Dinotherium</i>	}	No very closely allied species.
(3 species) Mio-Pliocene.		
<i>Mastodon pandionis</i>	}	M. <i>Angustidens</i> .
Mio-pliocene, Pleistocene (?)		
<i>Mastodon falconeri</i>	}	No closely allied species though approaching the last.
Mio-Pliocene		
<i>Mastodon latidens</i>	}	No allied species.
Mio-Pliocene		
<i>Mastodon perimensis</i>	}	<i>Mastodon diavimilis</i> .
Mio-Pliocene		<i>Mastodon longirostris</i> .
<i>Mastodon sivalensis</i>	}	<i>Mastodon arvernensis</i> . Upper Pliocene
Mio-Pliocene		
<i>Stegodon</i>		No European representative of this subgenus.
Mio-Pliocene and Pleistocene.		
<i>Loxodonta planifrons</i> . Mio-Pliocene.		No closely allied European species (sub-genus Pliocene to Recent).

* Is the species *Gomphus* with long curved tusks allied to *Elephas meridionalis*?

<i>Indian.</i>	<i>European.</i>
<i>Elephas hysudricus</i> , Mio- Pliocene.	No closely allied European species. (Subgenus <i>Pliocene</i> to Recent.)
<i>Elephas namadicus</i> , Pleisto- cene	<i>Elephas antiquus</i> , Plio- cene.
<i>Elephas indicus</i> , Recent	<i>Elephas primigenius</i> , Ple- istocene."

Lydekker in a note in *Pal. Ind.*, ser. X, Vol. II, p. 66, points out that 'the Siwalik and Nerbada elephants ranged over great part of India, Burma, China and Japan in Pleistocene times.' Lydekker's notes are highly important for us when we remember that it has yet to be settled how much ascribed to late Pliocene in those days come within early Pleistocene now.

Though Bruce Foote strongly asserts that there was a hiatus between the
 No hiatus. Palaeolithic and Neolithic ages, the student of the progress of culture and technological evolution would be very loth to concede it, since a steady approximation to Neolithic types is discernible in the artifacts, already unearthed. He says that the hiatus theory has met with the approval of many of the most experienced and leading prehistoric archaeologists of Europe. "It appears to me that the real existence of a similar gap is strongly supported by the geological features seen in

the right bank of the Sabarmati." It might be that the banks of the Sabarmati had been deserted for long ages after paleolithic dwellers settled there and then a Neolithic colony sprang up at the same place much later but that does not argue a general hiatus all over India between the two ages. In fact we find in the case of the Narnaveram river finds of the Chingleput district that Paleolithic implements of quartzite were chiselled out of laterite and on the very same bed stood many "Kurumbar rings" or circular enclosures of large rough blocks of laterite. This is a clear proof that in India as in Europe in many places the Neolithic age overlapped the earlier one. In fact, some of the Paleolithic types resemble Neoliths so much that even the guide to the Stone Age issued by the British Museum was led into the error of classing them with "Neoliths."

As a rule, it might be stated that the uniformly slender types of small delicate flakes of trap or Vindhyan sandstone belong to later ages than those we have already spoken of. Besides the oblique-edged and the pointed oval axe-types now appear the square-edged regular-shaped forms. The trap flakes, chipped and pecked, beautiful crescentic scrapers,

¹ The flakes and the pygmies.

¹ Vide p. 15. The Foote Collection of Prehistoric and Protchhistoric Antiquities (1916)

the pointed tapering pieces reveal that men are gradually coming to learn the art of rough grinding which when added to smoothening and polishing would usher in the next age. Besides, quartzite has now given place to trap and chert, as in the case of the Central Indian specimens and two yellow Palæoliths from Trichinopoly, and these are more artistically workable. Upper Indian tracts along the Northern and Eastern outskirts of the Vindhya have yielded Aurignacian and Magdalenian types of implements while Banda, the Vindhyan regions and the places in India yielding pygmies, have now been recognised by Sollas and others to be the centres of Azilo-Tardenoisian industries (*vide* Appendix).

It is at this stage that the rise of the two shapes peculiar to India can be noticed—they are the oblong choppers and those of triangular shapes. We would find later on, how these types persisted to later historic times in India and they themselves were evolved from ruder earlier forms. It is rather curious how all these later transitional forms occur mostly across the Nerbudda in the Northern parts of India or in the upper portion of Central India while they shade off into earlier types the more South we proceed. All the artifacts are losing in weight and gaining in shape, size and colour. In the earlier

period the artifacts clearly reveal in India a total lack of the grasp of principles of fastening to a handle, while in the later Palæolithic and Neolithic period the majority of the weapons and implements are seen to be meant for effective use by hafting. This idea was being comprehended in India through the long lapse of ages after the middle Palæolithic period of the cave-dwellers.

I had already insisted on a systematic regular gradation of culture discernible between the Burma and the Godavari types while the Nerbudda type came in as an intervening step. Fortunately in an excursion to Chakradharpur under instruction from Sir Asutosh Mookerjee and Dr. Bhandarkar I found a site where Late Palæolithic and Azilo-Tarden-son forms abound in lower terraces while from the uppermost terrace came, some coupes poings of Pre-Chellean type. The Sinjai-Binjai Valley seems to have been inhabited by prehistoric peoples from almost the earliest times to the dawn of the Neolithic age and several stages could be easily detected. The paper in the Journal of Bihar and Orissa Research Society in 1917 by Mr. Anderson published an account of some remarkable Palæolithic forms found associated with gravels at a height of about 18 ft. from the present river bed where the fossil

The Chakradharpur site.

tooth of a wild horse of Karnul (mid-Pleistocene) type was found. The palæolith that we picked up had evidently been washed off from the highest existing gravel bed which is about only 2 or 3 ft. from the top of plateau whose total present height is about 50 ft. Below it was another gravel bed after which we came to the third in which was found the teeth of *Equus* of Karnul type. While the heavy *coup-de-poing* betrayed traces of high level 'laterite' sticking to it, thus carrying it to the earliest prehistoric times. That such heavy forms were not uncommon in Palæolithic India are evidenced by the presence of at least 6 such specimens (in a collection of over 2,000 palæoliths) in the Indian Museum. They came from Chanda and Sripur areas of the Godavari district¹ and various sites in the Chingleput and Arcot districts.² In the course of a recent excursion to Ghatsila, I extracted such a heavy *coup-de-poing* of very early shape and chipping design sticking *in situ* in a denuded earlier terrace of the river Kharsuti (in Singbhum district) 3' 4" above the present high-water level and 8' 10" above the low-water level.

Though it is not desirable to rely on archaeological tests alone for chronological subdivision of Palæolithic artifacts yet the

The later subdivisions of palæolithic artifacts in Europe.

'retouch'-test of R. R. Schmidt which may

¹ Cat. No. 43 and 52, C. R. I. M.

² Cat. Nos. 416, 442, 479, 602, C. R. I. M.

not hold good for other parts is very important especially in sharply marking out the later palæolithic subdivisions. So Sollas has done well to quote from Mannus, 1910, p. 98, Schmidt's nice differentiations that Chellean retouches are coarse, broad, conchoidal, leaving strongly marked concavities which in Acheullean times though conchoidal are narrower, longer and fewer and persist up to Lower Mousterian times. In Upper Mousterian we get 'stepped' in Aurignacian 'channelled' or 'fan-like' in Solutrian 'scaly' and in Magdalenian 'nibbling' retouches.¹ In this light a classification of the late Palæoliths in the Indian Museum all huddled together by Coggin Brown under the heading of Neolithic cherts and flakes would have been possible, and would have given us an insight into the gradation and distribution of cultural activities in late palæolithic times. At the outset it has been noticed that bone implements are very rare, that may be due to termites or other peculiarly destructive Indian conditions as suggested by Bruce-Foote, and earlier forms apparently abound, with Chelleo-Mousterian according to Bruce Foote or Chelleo-Acheullean facies according to Coggin Brown. But this roughness of forms might have been due to the Indian 'Palæolithians' using the less tractable but easily accessible quartzite and

¹ *Ancient Hunters*, 1915, Footnote, pp. 437-48.

not flint. Still I could discern Aurignacian retouches in C.R.I.M. Nos. 594 and 597¹ or Solutrian forms in C.R.I.M. Nos. 528 and 584² bearing in mind that these come from the districts of Chingleput and Arcot which have also yielded the earliest forms in abundance. The 'inferior chert flakes' already described at length in the J.B.O.R.S. 1917 present marked Mousterian

characteristics and the finely worked specimens in Mr. Anderson's collection from Chakradharpur including some

very nice arrow-heads and burins come from the just lower gravel bed. Nobody who has just had a look over the fine collection of arrowheads of pointed and leafshaped flakes would be disposed to doubt their existence and subscribe to the sweeping generalisation of Bruce Foote that these were unknown to the Stone Age in India. It is rather interesting to turn to Evan's work³ where we find an arrow-head from India, acutely pointed 2½ inches long and tanged and barbed described, and also to notice that the specimens which raised doubts even in Bruce Foote's mind were those collected from Chota Nagpur by Mr. Wood Mason.

Besides the arrow-heads, beaked burins, keeled scrapers, 'gravette' points, chatelperron

¹ C.R.I.M., p. 40.

² C.R.I.M., pp. 37 and 40.

³ First edition, p. 361.

points, elongated laurel-leaf points and the wonderful variety of the stone artifacts, of middle palæolithic shape in Mr. Anderson's collection all pointed to a great development of Late Aurignacian and Early Solutrian cultures in the Chakradharpur locality. But what we missed was bone implements which had either disappeared owing to the destructive nature of the soil in which they were buried or by the quick action of the termites when exposed. What was still more striking that the locality was still strong with its populace, one of the most primitive (Pre-Dravidian) inhabitants of India whose well-shaped huts were painted in rectangular patterns with inlaid figures of sometimes isolated figures of animals like the elephants which, inevitably (what with the gaudy colour what with the crude shape) suggest Bushman-like activities. So here we are face to face with palæoliths and colouring materials suggestive of palæolithic art and also an aboriginal tribe still carrying on rude artistic designs.

Our previous classifications are but from one aspect. Holmes has in his *Quaternary of India* 'thorough' manner pointed out that the following methods of classification are possible: (1) by geographical areas, natural and political, (2) by culture characterisation areas, (3) by peoples, as tribes, stocks and nations, (4) by successive geological

periods as Tertiary, glacial, post-glacial, (5) by classes of artifacts as implements, utensils, weapons, (6) by the materials employed, as mineral, animal, vegetable, as bone, stone, metal, wood, bone, shell, (7) by arts and industries as hunting, war, agriculture, quarrying, mining, building, (8) by successive steps in culture-development as savage, barbarous, civilized, (9) by function groups as practical, ornamental, sacerdotal, diversional.¹ However, Bruce Foote's studies have presented us with 14 different palæolithic forms, *e.g.*, 4 kinds of axe, 2 forms of spears, digging tools, circular implements, choppers, knives, scrapers, cases, hammerstones, and strike-a-lights.² So far as the distribution is concerned he remarks "the localization of all the races has also been influenced in some measure by the distribution of the rocks yielding materials suitable for their respective implements. Thus there are far more numerous traces of the Palæolithic race (*sic*) around the great quartzite-yielding groups of the hills forming the Cud-dapah series of Indian Geologists and the great quartzite shingle conglomerates of the Upper Gondwana system in the Chingleput, North Arcot and Nellore districts than in other regions. In diminishing quantities traces of Palæolithic

¹ Handbook of Aboriginal American Antiquities, 1919, Part 1, p. 148.

² N.A., p. 9.

man are found to the northward of the Kistna valley as also to the south of the Palar valley."¹ But we have already cited instances of early quartzite from Chota Nagpur and Dr. Noetling's Burma finds as well as Wayland's Ceylon finds which have been ascribed to Palæolithic Indians walking on terra firma to the island connected with the mainland in Pleistocene times shows that the whole of the Indian Continent had been traversed by early Palæolithic culture in Pleistocene times though it is noteworthy that the route possibly lay through the older rocks and by the older river-beds which in contrast with the other parts of India had been very little subject to orographical changes on a huge scale. This cultural and racial movement continued till late Palæolithic times as the Azilotardenoisian Pygmies (Sollas recognises those from Banda and the Vindhyan area as Azilian) are obtainable from Central India to Ceylon not to speak of the other parts of the world. To whatever psychological or ethnological causes the widespread distribution of the 'pygmies' may be ascribed, the occurrence of the quartzite industries in flint-using countries such as Somaliland and Assuan (Egypt),² Morocco, and France,³ as well as Rhineland,⁴ require more investigation.

¹ N.A., p. 36. * *Zeitschrift f. Ethnologie*, 1909, pp. 737-741.

² *L'Anthropologie*, 1908, pp. 168, 425; 1914, pp. 43 & 47.

³ *Zeitschrift f. Ethnologie*, 1910, pp. 586, 591.

CHAPTER VIII.

PREHISTORIC ART.

Bruce Foote while pointing out by the presence of chert burin at Jubalpur the possibility of prehistoric paintings in India had bluntly stated that none had as yet been reported. Though this is true very largely, as any cave scientifically explored seems to have been the Billa Surgam Caves which contained no traces of any etching or primitive figures, we find reported in *Indian Antiquary*, 1901¹ a remarkable paper on the Rock Carvings in the Edakal Cave, Wynaad, in the *Journal of the Royal Society* a no less interesting paper on the Cave Drawings in the Kaimur Range, North-West Provinces by John Cockburn and in the *Journal of the Asiatic Society of Bengal* for 1880, a paper by the same author on an archaic rock painting from Mirzapore. Besides these, etchings have been reported from Bellary which have been noticed by Bruce Foote and caves have been reported in Kalat, and another

¹ Pl. 402-421.

paper, from Mr. Carlleyle seem to have reported notable discoveries of paintings from Bughelkhend, Bundelkand and other places. From Ceylon and Tibet have also come informations of rock carvings. Similarly cave paintings have also been reported from Banda (U.P.) but the last and the most important of all in fulness of details is the paper of Mr. Anderson, in the *Journal of Bihar and Orissa Research Society* for September, 1918. The paper has attracted world-wide attention and describes a rock-painting near Singanpur in the Raigarh district. Under in-

The Singanpur paintings and our visit there

struction from Sir Asutosh Mookerjee and on behalf of the Post-Graduate Council of Teaching of the Calcutta University I visited the place in the company of Mr. Ghosh, Curator of Patna Museum. We had before this met Mr. Anderson and learnt from him how when he discovered these paintings long ago he had invited the Indian Museum authorities to study them and Mr. Percy Brown Principal of the Art School and head of the Art section Indian Museum had also been taken by him to the spot and the latter had reported to the Asiatic Society of some paintings in the Raigarh which had already been noticed in *L'Anthropologie* in 1915, p. 304, thus:—
 "The Asiatic Society of Bengal in a sitting of the 7th April last has heard a communication of Mr. Brown in the walls of a cavern

situated near Raigarh in the Central Provinces of British India. This cavern represents nothing but the ruins of a site once much used. The anterior portion has gone to give way to an ancient epoch and the debris in obstructing the openings has preserved the designs. They represent the scene of chase and resemble occasionally in an extraordinary manner the paintings of Cogul in Spain. From the point of view of technique there we have the approaches to the cross-lined 'pottery of prehistoric Egypt.' The paintings are of great interest and cannot be estimated by less than thousands of years—they are much older than all that have been hitherto discovered. Some agate flakes have been found in conditions which enable us to arrive at interesting geological conclusions." The Singanpur hill is well-known to the villagers on account of the caves it contains. They told us there were three 'Mandirs' (temples or sacred places?) where the hermits used to reside and from one cave often appeared a white rider on horseback which disappeared mysteriously in the grotto. As is common with such places the tradition connected it with fairies and mysterious creatures. The caves are all well-suited to human habitations there being a pool of water inside. It seemed to lie on the high road of people passing from the North of India to the South. It is however not in the caves but on a part of rock surface now

thoroughly exposed to the sun by some apparent projections having fallen away, that numerous figures in red pigment occur. Unfortunately the majority have been washed off and there is no possibility of rescuing them. It is evident that all these scenes depicted were connected with some sort of magic or totemistic rites. Just getting up the surface on the left hand are remains of a scene very interesting prehistorically for we have got the clear outlines of a Kangaroo and just beneath apparently the faded outlines of a still bigger one. This fact is very important as these marsupials, now restricted only to Australia, must have been known to the painters who have given quite a life-like reproduction in palaeolithic times. The other figures have been given in some detail in Mr. Anderson's paper who has however failed to catch the import of the Kangaroo scenes. The only perfectly preserved scene which is still to be seen is the bull or sambar-hunting scene where the people conventionally or probably dressed in masks, which according to Mr. Captain was an widespread custom in quaternary times.¹ Another piece missed by Mr. Anderson is a spirited though a little conventionalised human figure with arms akimbo near the hunting scene. The right ankle is bent in such a way as to suggest a dancing posture.

¹ *Vide L'Anthropologie*, 1914, pp. 106-112.

In one place appeared the traces of a mammoth-like figure which is now too fragmentary to allow of any sure assumption. Almost all the paintings were in red pigment except the semicircular figure of a sun (?) with divergent ray-like lines near the mouth of the grotto. All the paintings are highly interesting and have been figured by Mr. Anderson in his article in the J.B.O.R.S.

From the Kappallu in the Bellary district have been reported more than 20 groups of figures of birds and beasts of various degrees of artistic execution. Some of them are described by Bruce Foote in N.A., pp. 88 and 89. In one group there are obscure human figures with a well drawn figure of a bustard. In another are figures of two elephants of a very lean type standing tail to tail to each other. A third group contains a bird with a big tail and a thin body with a high-humped bull near by. The most interesting of them all is a hunting scene depicting two men with upraised right arms as if for hurling javelins, having something like shields on their left arms proceeding towards a bull. There is also delineated in another part a six-rayed star. All the figures are interesting and occurring in a Neolithic site being more of conventional shapes and mystic outlines, they cannot be referred to the best art period of Palaeolithic times to which the Singanpur paintings most

The Bellary "graffiti."

probably belong but to later artistically decadent neolithic times.

Probably to the same decadent culture horizon belongs the series of carvings occurring in the Edakal cave, Wynaad and situated about 56 miles from Calicut, about the same distance from Ootacamund and four miles South-West from Sultan's battery. Mr. Fawcett, a Superintendent of Police, has introduced the subject with some detail and several plates to readers of the *Indian Antiquary* in October, 1901. One part of the cave contained inscriptions of ancient and mediæval historical times which were deciphered by Dr. Hulizsch. But of much earlier date are the carvings which had been partly covered up by a mould which was completely cleared up only after an excavation of 7 ft. which had accumulated under the roof rock during a long stretch of years "after the rock carvings had been completed and indeed after the place had been abandoned." "The carvings clearly represent human beings and animals and objects for human use and symbols, but they so run into each other and are placed so closely together that it takes a protracted and close study to make anything of them. The most interesting features of the sculptures are the frequent human figures with peculiar head-dress. There are several rather

indistinct figures of animals. The usual Indian symbols are of frequent occurrence, *e.g.*, the swastika and specimens of the familiar circular 'sun-symbols.' There is evidence also of magic squares."¹ It appears that all the figures are but rude outlines conventionally drawn and probably associated with some magic or totemistic rites. Many appear to be men dancing in masks or masked head-dresses. The elongation of the figures are noticeable here as in the Singanpur figures. That they belonged to Neolithic times is proved by the find of a fragment of a wellshaped and polished celt from the place.

To the same culture horizon, at least so far as the style was concerned belonged a group of rock-carvings discovered by me in a village called Maubhandar accessible from Ghatsila, a town in the Singbhum district. Tradition goes that the five Pandava brothers spent their year of secluded life there and the marks of their habitat had been left in the incised human figures on the black stone (see Plate). What was remarkable in the style was that the figures agreed extraordinarily with the rockcarvings of Australians as figured by Matthews in *J.R.A.I.*, Vol. XXV, p. 16.

Rock-carvings in
Ghatsila.

¹ *Ind. Art.*, 1901, p. 413.

As I could pick up fortunately a neolithic axe of campignian facies sticking in the matrix on a level with the carvings I am inclined to ascribe a neolithic date to these. *This group as well as the Kangaroo scene of Singanpur might go in support of an Indo-Australian culture-contact from late Palæolithic up to Neolithic times, which the Philological studies of P. W. Schmidt have just begun to hint at. (Vide Die Gliederung der Australischen Sprachen Wien, 1919, p. 22.)*

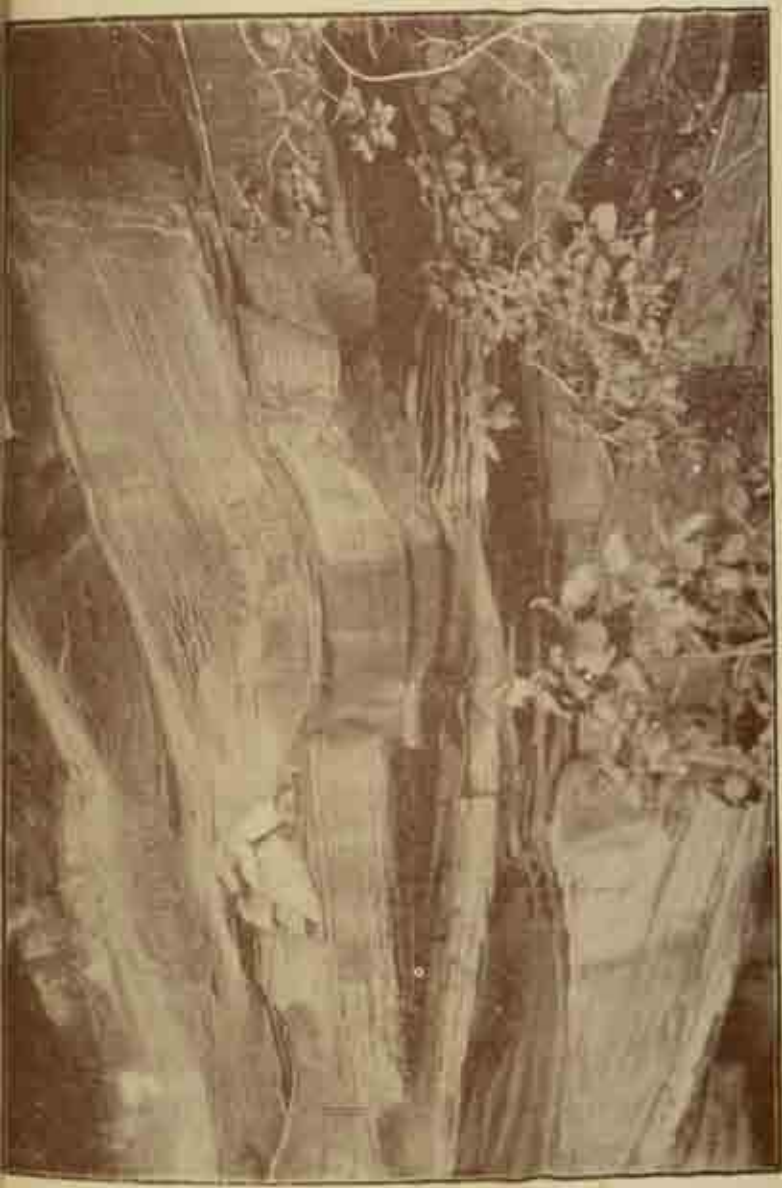
Of unique interest are Cockburn's researches¹

John Cockburn's discoveries of cave paintings in the Kaimar ranges of late Palæolithic times.

which would have been invaluable if recorded fully with coloured plates but whose fragmentary descriptions are but

preserved to us in two interesting papers in J.A.S.B., 1883, and J.R.A.S., 1899. It is evident that thanks to the liberality of Rivett Carnac, Mr. Cockburn long pursued his work in this direction and came across paintings in Ghormangar cave, Chunadry cave, Louri cave, Likhunia rock shelter and other places, fraught with

¹ Mr. Dikshit, Offg. Supt. of Archaeology, kindly showed me several photos from various places of Mirzapore district, of rock-paintings in red hematite depicting hunting scenes. He was led to explore the sites following the clues given by Cockburn and though he came across quite different scenes, e.g., huntings of elephants and horses it seems the Vinilhyas when thoroughly explored would prove to be a classic ground of primitive if not prehistoric art, like the Tyrens.



Rock-drawings by Belan river (Mirzapur)
(By courtesy of the Curator, Lucknow Museum)

great prehistoric interest, in the Kaimur ranges. From what can be gathered from the descriptions in the papers we can come to the conclusion that they belong to late Palæolithic times and not mediæval historical times as the writer was led to grope into. These are bound to shed much light on the late Magdalenian and later Azilian and Capsian cultures in India for the Vindhyan hills and Banda (which is near these caves) are recognised Azilian stations. It should be noted that Mr. Anderson showed to me a nice collection of white-keeled scrapers collected from the Reva which less finely finished belonged probably to Azilian times when they were revived than to early Aurignacian times. The three very rude and unsatisfactory outlines in J.R.A.S. facing page 89 are of the highest value to us as they represent hunting scenes with weapons which are unmistakable. The first shows the hunting of a stag with prominent horns which played so great a part in providing the Azilian hunter with his characteristic harpoons with a spear tipped with what may be considered the late Palæolithic modification of a Chatel-perron point. The second represents a man besides a leopard and curiously what the man holds in his hands has been suggested by Vincent Smith who communicated this paper to be a torch (!) though it and the weapon in the

the Likunia rock-shelter.' "The last evidence we can have in support of the idea that the drawings above alluded to represent stone weapons is the fact that stone implements occur in abundance mingled with the identical material with which the drawings were executed." The descriptions are all the more disappointing for though the author notes that the rhinoceros does not now range in the locality or any place near the painting sites, the sketches given in the plates do not afford us any clue as to whether they represent the atalodine variety, especially the *Rhinoceros deccanensis* or *R. Karnuliensis* which though now extinct had a wide distribution in Pleistocene and Prehistoric India. (*Vide* Lydekker, Catalogue of the Pleistocene and Prehistoric Vertebrata of the Indian Museum.) Of a similar nature, though somewhat cruder, appear the drawing reported from the Banda district (which is noted for Azilian and early Neolithic finds) in J. A. S. B., 1907, p. 467 fl.

Before taking leave of this chapter, it is well to take note of the latest views as to the motives which led these men of so very early times to take to art. Was it for the satisfaction of some æsthetic tastes as in later times? Modern opinion seems to hold that these elaborate carving and paintings executed in places under exceptionally difficult circumstances such

The motives of
palæolithic art.



Rock painting at Lalibabun Pass (Mongolia)
(By courtesy of the Central Asiatic Museum, Museum)



as in a kneeling posture or with the aid of light must have been connected with some form of crude faith. Recently Mr. Wennert of Spain has brought forth a brochure which is quoted with approval in 'L' Anthropologie, 1916, pp. 117-120, by Breuil, the greatest living authority on Palæolithic art that probably ancestors were represented either realistically or conventionally for some cult of ancestor-worship. The conditions of Palæolithic discoveries in several caves of Europe oblige one to admit the existence of animistic and magic beliefs even at that early period. "So in the Upper Palæolithic times we have but magic represented by art thus:—the human hands mutilated of fingers (rites) the animals pierced by dart (magic of hunting), the females in gestation (magic of reproduction), the masked dances (magic of chase), the generative organs (magic of reproduction), the animals struck with darts (magic of arms), etc. To the same ideas belong the employment of ochre, the cups cut in the skulls and the corpses in crouched positions. Considering the primitive ideas and taking note of the racial movements at that early epoch one ought to admit that there existed at that period certainly a great variety of religious manifestations founded on the veneration of ancestors (manes) of animals and totemic ideas." Mr. Capitan has also shown that the quaternary designs especially in France

naturally lead one to assume that masks or ceremonial accoutrements were worn in those times.¹ As for the sociological and psychological needs that produced the stylised and schematic figures, Durkheim states: "It is in the Australian societies that we must seek the origins of these representations. Although the Australian may show himself sufficiently capable of imitating the forms of things in a rudimentary way, sacred representations generally seem to show no ambitions in this line: they consist essentially in geometrical designs drawn upon the churinga, the nurtunja, rocks, the ground, or the human body. They are either straight or curved lines, painted in different ways and the whole having only a conventional meaning. The connection between the figure and the thing represented is so remote and indirect that it cannot be seen, except when it is pointed out. Only the members of the clan can say what meaning is attached to such and such combinations of lines. Men and women are generally represented by semicircles and animals by whole circles or spirals, the tracks of men or animals by lines of points."²

¹ *Vote L'Anthropologie*, 1914, pp. 106-113. The use of masks has been conclusively established by the discovery of the masked human figure in *Trais Femmes* (*Vide Man* Dec. 1921 p. 183 and Jan. 1922 p. 3).

² Durkheim, *Elementary Forms of Religious Life*, tr. Swain, pp. 126-127.

CHAPTER IX.

THE NEOLITHIC TYPES IN INDIA.

The most common of Neolithic forms are polished celts. This name has
Celts. been given to hatchets, adzes and chisels of stone. It has got no reference to Keltic people but is merely the English form of the *Lat.* *Celtis* or *Celtes*—a chisel. It has been suggested that there may originally have been some connection between the *Lat.* *Celtis* and the Welsh *Celt*, a flint, but this is merely accidental. The Welsh proverb says that there are three hard things in the world—*maen-celt* (a flint stone), steel and miser's heart. The general form of stone celts is well known, being usually that of more or less flat blades approaching an oval in section with the sides more or less straight and one end broader and also sharper than the other. They have been divided into three classes by Evans, *viz.* (1) those merely chipped out in a more or less careful manner and not ground or polished; (2) those which after being fashioned by chipping have been ground or polished at the edge only; (3)

those which are more or less ground or polished not only at the edge but over the whole surface. There is a curious wide-spread belief all over the world amongst savage (uneducated) people that the celts were thunder weapons. In the West of England people still hold that the thunder axes they find, once fell from the sky. In J. A. S. B., 1909, there is an article by Coggin Brown showing how these celts are sold in Yunnan (Western China) for medicinal purposes. In most parts of Europe, Asia, Africa and America these celts are looked upon with a great deal of awe and regarded as lightning weapons.

These were used hafted in various manners. The earliest handles seemed to have been made of horn into which the narrower end was inserted. But more commonly wood was used in the early neolithic site of Bobenhausen. We find blades often inclined towards the handle. Often we find an intermediate socket of staghorn used with the celt when inserted into the handle. Sometimes also similar tools were used in the hand without intervention of any haft. The forms of polished celts are many. Sometimes as in the earliest forms they show facet at the edge but more often they are thin and highly finished with flat sides and oblique edge. They are generally triangular in section but rectangular and oval sections are also not unknown.

Some forms are sharp at both ends. They were used chiefly for cutting down timber and for scooping canoes out of the trunks of forest trees; for dressing posts, for huts, for grubbing up roots and killing animals for foods, for preparing fire-wood for scraping the flesh from bone when eating and for various other purposes in the domestic arts. But they were also employed as weapons of offence and defence and sometimes for mining in chalk in pursuit of stones and probably also for religious purposes. (*Vide* Evans, *Ancient Stone Implements of Great Britain and Ireland.*)

The stone selected for the celts in India is in the case of polished ones, diorite, of varying degrees of fineness in some cases nearly approaching porphyry. A perfectly distinct type roughly chipped is of a hard black basalt. As a rule while those of the one class are thick and show an ovate section, the basalt celts are comparatively flat. The basalt weathers differently from the diorite. In rare instances celts of polished sandstone have occurred.

Rough hewn celts of basalt may be divided into three types: (*a*) heart-shaped or cordate, rather an uncommon type, the edge alone highly polished and so much rounded as to be almost semi-circular. In many cases inequalities of the chipping have been partly removed, but in no case has the implement itself been entirely

polished, (b) Lanceolate, long and comparatively narrow and coming to a point at the end, resembling the arrow-heads termed leaf-shaped in European collection. The side edges have the appearance of being serrated owing to flakes having been taken off, on alternate sides. (c) Very flat and almost triangular in shape.¹

“Grooved hammer and axes are perhaps the rarest of numerous neolithic stone implements recorded from Eastern Asia. Only one specimen of this type appears to have been described from India. It was found by J. A. Cockburn together with a number of other stones under a sacred tree, 37 miles south-west of Allahabad at Alwara. In form it somewhat resembles a modern hammer, being flat at the ends, and slightly carved on the upper surface. A groove of 50 inches in width and 5 inches in depth has been carefully carried round the centre. The base has been hollowed out in equal care in a gouge-like form to the depth of about of an inch. The whole arrangement suggests that the hammer was attached by ligature to a wooden or withy handle, the ligature being kept in its place by the upper groove, while the lower groove held the hammer in position on the rounded haft.² Mr. Cockburn

¹ J. A. S. B., pp. 228-29.

² J. Coggin Brown, Grooved Stone Hammers from Assam, etc.—J. A. S. B., 1914, p. 107.

has pointed out certain minute marks especially on the lower groove, which suggest the possibility of metal implement having been used in the fashioning of the hammer and it may be that this implement belongs to the transition stage from stone to metal. These implements may be counted among the best known relics of the aborigines and specially in the rural districts of the older states of America they are very frequent. Amerindian stone tomahawks are familiar objects. In general they can be defined as wedges encircled by a groove usually nearer the butt than the edge. The grooves served for the reception of a withe of proper length which was bent round the stone-head till both ends met when they were firmly bound together by ligatures of hide or someother materials.

Another kind of hammer stone from India was also collected from Allahabad. It is a cubical mass of basalt measuring 2.50 inches each way. On each of its six sides is a hole of depression about one inch in diameter and .25 in depth. The implements fit conveniently into the hand, the depression affording a hole for the fingers and suggesting its use as a many-sided hammer, the faces of which were changed from time to time when the pit became inconveniently deep for use.

Another kind is seen in a flat red quartzite pebble, measuring 4.25 inches by 3 inches by 1.75

inches. The two ends are slightly flattened and the upper and lower sides exhibit a double groove or notch for the purpose of securing it to a wooden handle. On the upper and lower surface double cup marks or depressions which are not easily accounted for but may have been meant for hammering, appear.

Another kind of curious implement is a wrought piece of basalt 3.50 inches by 3 inches. It bears the appearance of having been split into two either by accident or by design. A deep but narrow groove runs through the centre. Mr. Cockburn considers it a type of implement resembling the single Bolas or modern slung shot, and supposes the groove to have been intended for the reception of a thong. Mr. Cockburn found a third figure at Kalinjar bearing in his hand an implement which he considers resembles that now described. At the back of the stone is a small but curious depression hardly large enough to have been produced by hammering.

Another type very well known in Europe is a mace-end or ring-stone. It is sometimes made of quartzite and has got a central hole. On either surface towards the centre it narrows in the manner characteristic of the working of the implement of this description found both in India and in Europe. Many examples of this type are to be found figured by Evans and others in their works on 'Stone Implements.' Perfect

specimens in some numbers have been found by Mr. Cockburn and Rivett Carnac, beside a large number of fragments. The perfect specimens are generally found under trees, deposited there together with celts, but numerous fragments have been picked up at the base of hills on the Kaimur plateau or in ravines together with fragments of celts and flint chips and other indications which usually mark the sites of ancient encampments. Large round pebbles with the drilling of the central hole in a more or less imperfect state have also been found in considerable numbers indicating that the process was troublesome and lengthy. Some exhibit a deep cup mark or depression on either side, others on one side only. They closely resemble the hammer stones found in Europe and America and figured in the various works on the subject. In many of these cases it seems doubtful whether it was intended to perforate the stone, which fitted conveniently enough into the hand as a hammer.

Four-sided blocks of diorite ground to a rough point at the end bear all the appearance of having been used as picks or holes and are well adapted for grubbling out roots or digging out holes. According to Rivett Carnac this implement may have been used in a rude state of culture. The fact of the point being unsymmetrical and the right side exhibiting a greater

amount of the wear than the left favours this idea.

Long, tapering, well rounded pieces of diorite measuring $9\frac{1}{2}$ inches in length are sometimes met with. It bears from top to base the marks of the chipping by which it has been worked into its present state. The implement has all the appearance of having been used as a pestle for pounding grain or other substances. It may possibly have been used as a stone club like those of the Merai of New Zealanders but is rather short for such a purpose.

CHAPTER X.

THE NEOLITHIC SETTLEMENTS.

Neolithic India shows us three phases: (1) from Banda and Murpā come the earliest Campignian and Robenhausian stages of India; (2) the Bellary is an instance of a long-enduring mid-Neolithic phase passing straight off into the Early Iron Age; (3) Chota Nagpur and Assam with their highly polished and shouldered celts bespeak of chalcolithic times when copper, bronze or iron was being used side by side with neoliths which were becoming symbolic objects of veneration.

The men of the Old Stone Age have been seen to evince a preference for the tract of India from the Kistna to the Palar river but

A Neolithic factory site.

the Neolithic cultures spread far into the north. Neoliths are reported in large numbers from the Salem, Madura and Bellary districts and this was undoubtedly the centre of Neolithic as Cuddapah was of the Early and Mid-Palæolithic culture. In 1872 the discovery of the north and the Kappallu Neolithic remains by Fraser brought out the existence of the most extensive polished stone culture in that part of the Bellary district. All sorts of Neolithic weapons and implements were found in abundance. Only from Kappallu alone 180 celts were recovered. The north-east slope of the hill was apparently a

Neolithic factory-site and the largest manufacturing industry of polished stones in India flourished there. The diorite trap dykes which traverse the hill furnished the workers with an inexhaustible supply of excellent material of two sorts, the coarse black diorite and a fine-grained pale greenish grey to a drab type which occurred in lenticular masses. In a rock-surface just on the edge of the south-east terrace was found five or six well-polished grooves. They were 7 to 8 inches long and 1 to 1½ inches deep, apparently worn by grinding the celts to a sharp edge. All these grooves lay parallel to each other within an area of less than 20 inches square.

No less than 77 prehistoric sites were discovered near that place and in the outlying tracts and there is no doubt that a large and extensive civilisation flourished there. The people, though they still adhered to the primitive forms of life offered stubborn resistance to invading races from the North with higher cultures. The cinder mounds in the contiguous districts retain unmistakable traces of big encampments and huge conflagrations and there was most probably a tussle between some bringer of Northern culture with the equatorial tribes flourishing with their older type of civilisation. Thus on the road from Bellary to Dharwar rocks a remarkable mound consisting of slaggy cinders full 50 ft.

Bellary in the Rāmā-
yana.

high and 400 ft. in circumference is met with and local tradition assigns it to the cremation of a Rākshasa Hirimba by name who was killed by Bhīma, one of the five Pāndavas of the Mahābhārata epic. From the Rāmāyana we find that Rāma had a tussle here with the "monkey"-king (?) Bāli and allied himself with his brother Sugriva and the description plainly indicates the existence of an organised state of a primitive neolithic tribe dwelling in rocks and forests in Kiskindhyā (the modern Bellary district). Vālmiki indeed, writing in much later times, could not quite seize the import of the old legends that he was utilising and also could not distinctly differentiate between the different stages of culture. As it is, a cursory glance over the particular part of the Rāmāyana would convince one that a numerous band of forest-dwelling tribes abiding in arboreal and rocky recesses and yet hunting the wild deer and tigers and possessing rock-fortresses are but meant (*vide* Rāmāyana, Kishkindhyā Kānda, Canto II, Slokas 10-11). The caves covered at the mouth by trees and plants and by turf (?) served as forts (*ibid*, Sloka 19) and possibly they were of the Neolithic type. The better weapons like bows and arrows excited wonder in them (*ibid*, Canto XII, Sloka 5). The fight between Bāli and Sugriva is carried on by blows, fisticuffs, wooden weapons as well as by stone weapons (*ibid*, Canto XII, Sloka 18). In the

Mahābhārata, Vanaparva, Chapter 281, we read of the fight being carried on by weapons of Śal and Tāl wood as well as of stone. And it has been often pointed out by many that the so-called monkeys were not actual tailed arboreal animals.¹ "The monkeys in Rāmāyana might have been a very low class primitive southern tribe. The tail probably referred to a peculiarity in the mode of dressing of the lower class people in Southern India (which can still be seen occasionally) which appeared like tails. The panels on the Sanchī tope representing the primitive tribes bring it fully home to us." Bruce Foote forgetting that Valmiki writing in historic times was liable to make errors of anachronism states that the tussle occurred in later times. But as the tail-wearing habit recalls predynastic Egyptians, the earlier form of Rāma legend making Sitā—his sister—wife recalls the royal custom of dynastic Egypt. Dasaratha the father of Rāma is a name familiar in Western Asia and 'Ra-amu' has a Hamitic ring. Are the Bellary neolithic and Rāma legends witness to Hamitic invaders in India.

Leaving aside these doubtful but highly interesting speculations and only pointing out how prehistory can come to the rescue of Indian history by bringing, as in this case,

¹ The stages of 'cell' manufacture.

¹ Vide Somerset Playne, Southern India, p. 58.

independent evidence as to the date of Rāma's expedition (not Vālmiki's composition) we pass on to considerations more proper to our review. These old Neolithic peoples of the Bellary district can be traced at their work of celt-making. The successive series of celts in various stages of preparation tell an eloquent tale. A piece of dioritic trap was first selected and chipped into form roughly. Then it was pecked, *i.e.*, the different angularities due to chippings were broken down. Then came the third stage in which the implement was ground and all roughness was smoothed down. Lastly the things were polished and made fit for hafting. Celts of various types were used, some were of basalt with narrow shape and straight sides, some were pecked and the ridges between the chipping faces were broken down, some were of thick battle-axe type, some were adze-like in shape, but all were in different stages of polishing and thoroughly effective.

No longer mere hunters but partly agriculturists the Neolithic peoples show abundant varieties of mealing stones, corncrushers, pounding stones. In fact, the people were more vegetarians than carnivorous like the preceding men of the Old Stone Age as the peaceful implements far outweigh in number the weapons for war. The fascination for colour is more than evident

especially in the articles for domestic use. The small tools were made of beautiful chert, agate, chalcedony, bloodstone, Indian stone and rock-crystal. Knives, saws, drills, and lancets were made from the flakes struck off for them and went to make up the comforts of their economic household. The numerous fine rock-shelters have already been commented upon. Thatched primitive houses were also not infrequent as the presence of the straw in the cinder-mounds clearly prove. But the inhabited parts of the old settlement were mostly the citadel on the hills and on the little shallow sloping valleys.

That this Neolithic settlement was acquainted with iron-making industry need not be doubted as some small pottery (tuyere) suitable for protection against direct flame action of the nozzle of a small bellows was found in the Neolithic strata.

Before passing on to the next section, some mention should be made of the cinder-camps which form the standing puzzle of this place and which as we have already suggested might but mark the invasion by peoples of higher culture from the north of these tracts of Neolithic culture. Bruce Foote has once for all established the connection of these cinder-heaps with the Neolithic Age and differentiated them into cinder-camps and cinder-mounds. To the former class belong the

Iron-smelting.

The Cinder-camps.

two camps at Kuggal, one at Halakandi (S. W. of Bellary), one at Gadigunurer (23 miles west by North of Bellary), the fifth at Soudaspur (16 miles North of Bellary) and the last at Lingadhalli (129 miles N.-E. of Bellary). Of the latter class are those at Budiknama, Nimbapur, Kanchangar, Belagulla, at Sugura, at Kurikoppe and at Suridamna Konda.

It would be an injustice to Neolithic India if the other parts from which the polished stones are abundantly forthcoming, are not brought in for due considerations. To Burma specially some remarks are due as a few new types come from that part alone. It has already been remarked that the Neolithic settlements are more abundant in Northern India or rather the parts immediately North of the Deccan namely the Central Provinces, and still higher up, the United Provinces. Of course Bengal and Assam on the one side and the Indus valley on the other also yield their Neolithic celts, chisels, etc. The involuntary suggestion cannot be kept back that as it were the Palæolithic passed into the Neolithic stage in Southern India which became in time the emanating centre of the some Neolithic culture over other parts of India, and, who knows, probably over a large tract of the Old World. The question of this distribution of some Late Stone Age

Possible cultural routes.

culture from some central point has been the bone of contention of prehistoric archaeologists for a long time and as, so to speak, a particular phase of this has received ampler treatment in a later chapter we pass by it for the present.

Theobald's paper in the Memoir of the Geological Survey of India¹ can still be read with interest and as it deals with the Burma Neoliths and their speciality it is given here, "Were there however, any objector so hardy as to argue that such similarity of monuments both industrial, funeral and religious, was merely the result of fortuitous similarity of condition it would seem as though a conclusive answer to such a supposition was provided in anticipation in British Burma. It seems difficult to imagine what differing conditions could have obtained during the savage infancy of our race in Burma, greater than what existed between India and Europe; yet directly we cross from India, properly so called, to the countries lying to the eastward of the Bay of Bengal, we find stone implements not less abundant than elsewhere, but of an entirely different type. We no longer find the Indo-European type either Palæolithic or Neolithic, but one seemingly autochthonous to the Malayan countries, and both in size,

¹ Vol. X, p. 160.

shape, and design displaying considerable divergence from any of the ordinary types of weapons found elsewhere." The main points of divergence are, 1st, the frequency of forms possessing "shoulders" a peculiarity quite confined to articles from the Burmese or Malayan area; 2nd, the cutting edge being usually formed by grinding down on one side, as chisel, and not an axe; 3rd, the general small size and seeming inefficiency for any rough purpose, though it must be remarked that very small and well fashioned weapons are also found in India."

Shouldered or spade-celts have since been discovered in the highlands of Bengal and Assam. These with some grooved hammers and axes have been found in Assam and rarely occur in Eastern Asia. Mr. H. C. Das Gupta who wrote in the *Journal, Asiatic Society, Bengal*,¹ connected them with the Khasia hill tribes who are still in the practice of raising megalithic monuments:—

"The occurrence of these two implements of the Burmese type, in areas through which the wave of Khasia immigration very likely passed, before the race found its present hilly home, is of extreme interest and is quite in conformity with the view so long held regarding a relationship between the Khasias of Assam

¹ Vol. IX (1913), p. 292.

Shouldered celts and
ethnic associates.

and some of the older tribes of Burma, which has been based chiefly on linguistic grounds."

Whether these had anything to do with the
 Khasias or whether the Mon-
 Khmer languages are the

only surviving remnants of the Neolithic race passing out of India and evolving a high stone culture, is more than can be answered at the present juncture. But what is highly interesting is that if a progress is admitted in a Northerly route from the Deccan, distinct advancement is discernible in the North-East as well as the North-West of India. Perhaps the most finished specimen of Neolithic celts and cores come from the Indus valley which with their flawlessness remind us of the great height the New Stone Age culture of the Toltec, Maya, Nahua and Aztecs of America attained to. Mr. Blandford in the course of his long notice of them in the *Journal of the Asiatic Society of Bengal*¹ while calling attention to the high finish, the ground bottom and the late age of these was led to suppose the existence of a new race with a higher civilisation. The cores especially from Rohri, Sind, are strikingly similar to those found from Anau by Pampelly, from Egypt, from the Swiss Lake Dwellings and from Denmark.

¹ 1875, pp. 125-30.

In North-Western India the cores are more common than other types. They

Wooden types.

are most often of agate or chert and with their translucent pinkish, white and orange, milkish white, banded and other variegated hues form very pleasing objects to the eye. These with flakes often of very small size, hammerstone, smoothed sandstone, polishing stone and ringstone were much in request amongst the Northern Neolithic dwellers. An article of which primitive Indians from late Palaeolithic times seemed to have been very fond, was "Reddle." It was no doubt used for pigmentation and stones for its preparation as well as pieces of red earthy hematite have been discovered in Neolithic sites. Wood was undoubtedly very largely used along with stones but being less durable has not come down to us. Fortunately a piece of fossil wood beautifully polished and flattened on one side has been recovered from the Sitakoond range in Chittagong. But the most interesting wooden find, though perhaps of a later prehistoric age, is the wooden tooth-comb perfectly preserved and found at Guntakul Junction by Mr. Cardew.

CHAPTER XI.

PREHISTORIC METALLURGY.

The 'wealth of Ind' and its 'barbarous pearl and gold' had always been before the eyes of the civilised world and the modern views are that prehistoric peoples were not blind to the beauties of the yellow metal. The early knowledge of metals in India. Savants led by Elliot Smith are trying to map out the trend of prehistoric migrations by the location of mines and attractive materials. The articles that come in for our consideration are Copper, Iron, Gold and Gem Stones. In all these cases we find not only that they are widely distributed throughout India but they had been worked almost from time immemorial. The difficulties for prehistoric study are increased for it is very difficult in India to associate the working of a particular metal with a particular set of people or fix its beginnings at a particular point of time. This much is known that the beginnings of metal for general use as distinguished from articles of ornamentation came into vogue gradually after the people had known the art of perfecting stone

implements, taken to a settled life, learnt the art of weaving garments, began to use pottery and gradually inventing the use of the wheel for making it quicker in the end of the Neolithic age. But though it is true that copper (and much less bronze) and iron were totally unknown in the Neolithic age and were used for some time side by side with polished stones, the same can scarcely be said of the precious metals and shining beads for which as for coloured stones, a fascination was never wanting from almost the earliest dawn of humanity probably in India.

For "Gold is very widely distributed throughout India, more so perhaps than any other useful mineral with the exception of iron ore. There is, in fact, hardly a province in which the washing of alluvial gold from the sands of the rivers is or has not been practised by the native inhabitants." (La Touche, Art. Gold). Gold is obtained also directly from quartz veins or schists of Southern India. It is well-known that the Deccan Palaeolithic peoples used quartzite and were very fond of milkwhite quartz. "Many old workings have been met with along the out-crops of the veins in the Chota Nagpur with large number of grooved stones which had been used for crushing and grinding the quartz" (*ibid*). Gold has been obtained at great depths from various

Gold and gem stones.

prehistoric sites of Tinnevely in South India. "India, at all times, has been regarded as a land of gold, yet the gold-bearing districts are almost exclusively confined to comparatively small areas in the South, so that the question naturally suggests itself, whether the gold was chiefly obtained by mining or by external intercourse. Gold certainly occurs in small quantities in the sands and gravels of many rivers and streams but the chief remains of ancient workings are found in the Wynaad district of Malabar and Nilgiri and in Mysore and Hyderabad. In the former, the country is covered with detritus left by ancient miners, who here were not content to treat only the alluvial deposits but sank shafts in the quartz veins" (Gowland, *Metals in Antiquity*, Journ. R. Anthropol. Inst., Vol. XVII, p. 260). Its yellow colour was the cause why it was found in sporadic use in such early times. A like case is of several finely coloured gem-stones which were in demand for beads which were used for ornamental as well as ritual purposes. Agates and Carnelians were great favourites and it may be said that diamond exercised like attraction as it occurs in districts of Anantpur, Bellary, Cuddapah, Kurnool, Kistna and Godavari which we know were great centres of human habitations even in early Palaeolithic times.

Copper is also of wide occurrence throughout India though not in native sheets but as ores.

What is of great interest to us is that copper ores have often been found associated with iron in India, so here the invention of the extraction of copper probably had gone hand in hand with that of iron at least in Northern India. Ancient mine workings have been found in many places which are still the seats of peoples who are accepted as the descendants of Pre-Aryans in India. Thus in Singbhum heaps of slags still bear witness to the fact that copper deposits had long been known and exploited by primitive tribes living there. Mr. S. C. Ray has discovered copper slags from 'Asura' sites in Chhota Nagpur. Their treatment (which may be considered to be substantially unchanged through ages) consists in four processes: (1) the ore is thoroughly pounded and washed; (2) it is smelted with charcoal in a primitive furnace, so as to form a regulus, the slag being removed by cooling the surface of the molten mass with a wisp of wet straw; (3) the regulus is pounded and mixed with cowdung, made into balls, and roasted with free access of air, (4) the roasted powder is resmelted in the original furnace, (La Touche, Bibliography, II, p. 115). Old copper workings have been reported from the Shan States, Indore, Nellore, Kistna district, Rupavati in Kathiawar, Nepal and Kangra, Singbhum, Sikkim and Kumaon.

In the Indian Antiquary, October, 1905, Vincent Smith had emphatically held that India

(in spite of there being reports of bronzes at various places) had no Bronze Age. All the bronzes that occur here were used as adornments or mere exotics. "That the Iron Age in peninsular India was not preceded by a Bronze Age, as in Crete, Greece and so many other Western countries, was very probably due to the land-loving character of the Neolithic people, for had they possessed any sea-faring inclinations, they would certainly have sailed across the Bay of Bengal, reached the Tenasserim coast and there become acquainted with the tinstone of that region. As copper is found plentifully in India, the art of making an alloy must soon have followed. As it fell out however, the discovery of the alloy was not made in India till after the art of iron-smelting had been acquired and iron weapons and tools had come largely into use" (N. A., pp. 24-25)—such is the opinion of Bruce Foote. Mr. Read in his Presidential address to the Royal Anthropological Institute in 1900 also harped on the probable precedence of Iron to Bronze specially referring to Mr. Gowland's paper on Early Metallurgy of Copper, Tin and Iron in Europe thus:—"One point of great interest that in his judgment is still undecided, is whether iron or bronze was first used by man though it is probable that many archaeologists have made up their minds on the subject: but he dispels altogether the idea that

there is any greater difficulty, by the most primitive process, in producing an implement of iron than in making one of copper or bronze and endorses Dr. Percy's opinion that metallurgically the Age of Iron should precede the Bronze Age." Six bronze weapons of which three are harpoons, one a celt, one a spearhead and the last a sword have been noticed by Vincent Smith and no less than 123 bronze objects are recorded by Mr. Rea and I found not quite a small number in the Patna Museum.

If the predominance of any article is to give the name to any country, India
Iron. should have been called 'the

land of iron' so widely distributed is the ore here and so many workings have been reported from various places. The question of the antiquity of iron in India has always been studied from the wrong side in as much as evidence was always sought from the literatures of the 'Bronze and Copper-using Aryans' whereas 'Pre-Aryan' India gives quite a different tale. Go to any part of primitive India, Iron industry, the high quality of steel produced and the low state of civilization of people producing them (*e.g.*, the Khasis, the Kols) would present a great riddle. It does not matter whether in the Vedas, the shining metal often mentioned Ayas would be 'steel' or 'copper' though as in the case of Homeric literature the case for Bronze

or Copper seems to be more weighty than that of iron. But there is also no denying that when sometime had elapsed after the settlement of the Vedic peoples in this country they came in contact with the aborigines who prepared 'wootz' and the word might have soon artificially modified the meaning of Aryan 'Ayas.' This alone can explain why Iron according to Vincent Smith is not mentioned in the Rig Veda but is evidently known by the time of Atharva Veda and Satapatha Brahmana on the one hand as well as the very important fact adduced by Bruce Foote that traces of Iron smelting have been noticed in many neolithic settlements in the Deccan, *e.g.*, the Bellary. Bruce Foote has also rightly observed that iron industry is one of great antiquity in India, far more ancient indeed than in Europe, *e.g.*, at Hallstatt and La Tene Primitive furnaces have been reported from various parts of India.

"The furnace is built of clay by the smelter and his family, and is of no great capacity, the maximum yield reported for single furnace being about 30 tons per annum; while the blast is usually supplied by a pair of leather bellows. Only the softer varieties of ore such as can be easily reduced to powder, and if necessary concentrated by winnowing, are made use of. These are gathered from the surface or dug out from

Its ancient smelting processes

the shallow pits and trenches; or when available are collected in the form of iron sand from the beds of streams. The ore is reduced in direct contact with charcoal, and without the addition of a flux to a pasty mass or 'bloom' from which a slag is expressed by repeated hammering and reheating; since the temperature at command is seldom high of the charge." (La Touche, Bibliography, Vol. II, p. 133.) Another special feature was the manufacture of wootz or crucible steel by the carbonisation of wrought iron as practised in the Trichinopoly district and other places of Southern India from time immemorial. The iron is placed in crucibles made of ferruginous clay and charred rice husk, with wood of the Avaram tree (*Cassia auriculata*) and leaves of *Calotropis gigantea* or *Convolvulus laurifolius*, and sealed with clay. The crucibles are arranged in the furnace in batches of 25, forming a flat arch, and are subjected to a continuous blast for about two hours. The steel is produced in the form of small conical ingots, each weighing from 8 to 11 ounces."

Dr. Panchanan Neogi, Professor of Chemistry, Rajshahi College, has shown in his admirable monograph on "Iron in Ancient India" (1914) that the crucible process of making cast-steel is an Indian discovery. He says "It is evident that the traditional Indian method of making steel

was the crucible process of making cast-steel in a fused condition by cementation, which process should really be regarded as Indian discovery. The chemical action that takes place is that during the application of heat to the closed crucible the dry wood and green leaves would yield charcoal as well as an abundant supply of hydrocarbons. This joint action of carbon and hydrocarbons greatly facilitates the formation of steel as the European method of cementation by means of charcoal alone used to take six or seven days, and even fourteen to twenty days, while the Indian process takes only four to six hours."

It is curious how "wootz" is often spoken of in very ancient Greek literature as well as Egyptian dynastic literature as one of the metals imported from the East

The antiquity of the Early Iron Age in India.

and has been generally interpreted as Electrum, but much more likely refers to Indian steel where we get the very name. Von Luschan in dealing with "Eisentechnik in Africa" (*Zeitschr. f. Ethn.* 1909) had described the Egyptian "Schalengeblase" the handled blowing instruments which were worked by standing on leather and maintained that these were the most primitive and the Egyptians had derived the knowledge of these from Negroïd neighbours and from Egypt this had spread all over the old

world. Now amongst the Kols of India exactly identical processes prevailed till a late day. Thus we read in the District Gazetteer on Santal Parganas (1910, p. 201)—“In the ground on each side of the furnace a planted stake 8 or 9 feet in length had been driven. These were now bent over towards the bellows, and to the stake on the left-hand side was fastened a string which was attached to the goat-skin of the left-hand bellows, so that the stake, trying to spring back into place, pulled up the skin on the bellows. The stake on the right-hand side was similarly attached to the right-hand bellows. The skins each had a perforation. Then a man standing on the bellows, with one foot on each, depressed the right-hand stake, and at the same time closed the perforation in the skin of the right-hand bellows with his foot, and by means of his weight drove the air from the bellows into the furnace. He then leant over to the left and repeating the operations on the left-hand hand bellows sent a blast from the left-hand pipe into the furnace and thus alternately he threw his weight from right to left in a series of operations resembling a man in the tread-mill, and gave a fairly steady blast into the furnace.” It seems as if we were reading a description of Egyptian treadle-blasts depicted in Fig. 7 of Luschan’s article, so strikingly similar are methods adopted by these Pre-Dravidians to that of the Egyptians.

There are some facts and data which go to show that the civilisations of earlier Sumer and Egypt might be due to some Neolithic Indo-Erythraeans whose home was likeliest to be round the shores of the Erythraean sea. The opinions of several Egyptologists are well known to be the same, though India specifically was not mentioned by them. Now it is a curious fact that iron though not in common use in Egypt till in the middle dynastic period, occurs as sporadic specimens undoubtedly in the earliest dynastic times. *If the mysterious ethnic and cultural connection between India and Egypt based on the identity of cephalic indices of Veddaic and predynastic skulls, identity of the shape of some funeral urns as well as Neolithic pottery-marks from Egypt and early Indian megaliths and the possible affinity of agglutinative tongues is conceded, it must be also said that in predynastic times even the knowledge of iron was probably common to both countries.* And as the one is possessed by India at large, we think steel, especially wootz was imported from India in Egypt as objects of high value in those early times about 3 to 4 thousand years before Christ. It seems that a great equatorial neolithic race of India, of East African affinities, whom I called the Indo-Erythraeans, probably evolved in the Deccan the process of smelting iron and that is why we find iron beads in Egypt in Pre-Dynastic times

occurring sporadically long before the times when they became more frequent when possibly trade-relations were re-established with the Decan after a long lapse following the ethnic separation of the peoples on the African and Indian littorals. It would not indeed be impossible to think of the piece of iron of the Great Pyramid at Gizeh in the IVth dynasty as results of trade relations with India as was the case with the piece of Indian teak found in Mugir in a strata of about 4000 B.C. That the knowledge of iron did not spread from Asia Minor eastwards is proved by the iron age in China (about 2357 B.C.) being much anterior to that in the West, say in Hissarlik (about 2000 B.C.).

CHAPTER XIII.

PREHISTORIC COPPER, BRONZE AND IRON FINDS.

An Indian Bronze Age is still a thing to be proved, for bronze occurs but rarely in pre-historic sites and figures there more often as costly ornaments than articles of daily use. In the case of Europe, in Homeric and pre-Homeric Greece and all through the North, Bronze has been found at a certain stage to be an article in common use and swords and celts were mostly made of bronze. The great Minoan culture was essentially a Bronze Age culture and pottery of the highest artistic kind, palaces of great ingenuity have gone hand in hand with it. It is rather curious that the South of India where thousands of megalithic structures of late Neolithic days and early Iron Age are still standing, yield pottery and iron implements of the type of pre-historic Bronzes yet give out but some occasional Bronze articles meant to be gaudy furnitures or costly ornaments.

This leads us to think that the bronzes of India are exotic. As such they would be the corner-stones of Indian protohistoric chronology by supplying definite landmark's whenever their foreign affinities may be established.

But this is not the case with the copper objects. Dechelette in his admirable way thus sums up that case. "The existence of an age of copper in India is attested by several discoveries. The most important is that of Gungeria (1870), about 10 English miles from Boorha in Central India. It comprises mostly of 400 flat axes, of various lengths, all in copper, and 102 objects in silver, notably several plaquettes figuring schematically the head of a bull. No consideration permits us to assign the Gungeria craft to an original phase of metallurgy. The diverse varieties of axes do not correspond to a primitive type. At least it may be allowed to connect the horned amulettes to old bull cult so much spread in the West in the premycenaean epoch." (Dechelette, *Manuel D'archeologie, Age du Bronze*, p. 66).

Thus the use of copper itself in primitive form has been demonstrated to exist in India from the various discoveries from several places of Northern India. Southern India is now held to have passed through no Copper Age even and the Iron Age succeeded there to the polished Stone Age. Copper Age antiquities have been forthcoming from Rajpur, Mathura, Mainpuri, Niarai, Bithur, Allahabad, Behar, Hazaribagh, Karachi and Beluchistan, while the most important discovery of instruments of copper in the old world has come from Gungeria

in the Balaghat district of the Central Provinces.

A remarkable feature of the copper finds is that most of them are weapons and of heavier build though perhaps not with sharper edges than the Iron Age artifacts of Southern India. Nothing more can be said of the people who used them on account of the absence of other associated articles. The manner in which most of them had been found, at least the Gungeria articles, would seem to indicate that they had been been often as Europe, votive offerings consecrated to divinities. And the low depths from which most of had been recovered combined with the primitive shape clearly point out that these had been found out and collected at a later age and cherished as a treasure with superstitious veneration. The Neoliths from Bhita recovered from the house of Nagadeva of Kushana date might have been used for religious purpose or due to invading tribes as Sir John Marshall suggested or merely collected by later peoples and looked upon with veneration by them as the Yunnanese Chinese regard still Neolithic stone implements as of celestial origin. Many objects of Hindu worship and veneration are still but Neoliths which are gathered under some tree and receive homage as rude phallus. In the case of metallic finds, popular Bengali superstition attributes them to

Yak and speaks of them as Yaker dhan, the treasure of Yaka, which may be a variant of the Veddah Yakku often standing for spirits departed souls (as the Nae Yakku). The men think that some calamity would visit them if they reveal the secret places or utilise the treasure and this clearly explains why Hazaribagh finder did not point out the place of discovery of the copper celts and metal plates.

Coming now to the artifacts themselves we find the celt to be conspicuous by its variety. First of all the celts are generally of broad, flat battle-axe type.¹ A much larger type and more expanded across the cutting edge which is highly convex but blunt has also been found from Gungeria and resembles strongly some Irish Bronze celts. A distinctly 'shouldered' celt in the form of a battle axe with a rounded cutting edge has also been recovered from the Midnapur districts.² Swords of various types but betraying Indian individuality have been found

¹ These flat axes are found throughout the Mediterranean basin, notably in Egypt, Cyprus, in the island of the Egean sea, in Palestine, in the second city of Hissarlik in Italy, in Sardinia, in Spain and Portugal. They have been found also in India the caucasia and places in France. They are met with in the North of Europe in the Britanic Isles, the Balkans and the Baltic coast, Switzerland, Scandinavia and in several parts of Germany' (Dechelette *Âge du Bronze*, p. 244).

² Axes have been classified into five principle types as follows:—

1. Flat axe (1st period).
2. Axe with straight edges.
 - (a) raised slightly (Period II).
 - (b) raised sides (Period III).

from the district of Ferruckabad. Leaf-shaped swords not contracted towards the hilt but having two projections on two sides a little below the top, formed picturesque but effective weapons of the day. Some swords had long tapering blades one side of which was rounded off into the handle. Some others were dagger-shaped and some were meant for piercing and cutting. Spear-heads of copper were also not unknown.

Vincent Smith draws attention to the remarkable copper harpoons peculiar to India, which recall the very widespread Magdalenian and Azilian bone harpoons on the one hand and the mirzapora cave paintings on the other.

Some sort of money like the ring money of the Northern antiquaries were evidently used as the six rings, of which three were linked together, found from Mainipuri had been thought to be such by Dr. Oldham. They also recall the mycenean spiral rings which are however smaller.

The Gungeria silver discs embossed with several concentric circles like the solar discs of Ireland and peculiar threeconed pieces

3. Axe with humilla (Period III).

4. Axe with wings (Period III).

middle wings (Period III).

terminal wings (Period IV).

5. Axe with pocket (Period III) of those only the first two types have been found up to now in India. (Duchélotto, *Age de bronze* p. 242.

have given rise to much discussion and their connection with cults of the sun, the circle (*chakra*) and the sacred horn is obvious. I would like to refer to a figure in "The Cave Temples of India" by Fergusson and Burgess and to plates VII and XI of Vincent Smith's "The Jaina Stupa and Other Antiquities of Mathura" and point out that both the forms occur conspicuously as prominent Jaina emblems. They also are found in Buddhist symbols and thus with the Svastika has passed from prehistoric times to the historical cults of India.

Iron¹ was known to the Vedic Hindus from the very earliest times. In the Rigveda there are numerous references to weapons made of iron (*vide* R. V. I. 326; II. 156; IV. 250, etc.). And the people whose monuments have been discovered in Southern India where abundant traces of the uses of iron are forthcoming were surely not Hindus and most probably the pre-Hindus of the Deccan as their funeral rites plainly prove. Some prehistoric chronology may be attempted by tracing the use of iron and of another important element of the so-called,

¹ The question on the interpretation of 'Ayas' which has been taken to mean copper in consideration to Latin 'aes,' Gothic 'Ais.' But black 'Ayas' is also found described in late Vedic literature. I suggest that this was the semantological change consequent on the Aryans coming in contact with "woots" steel manufactured by pre-Aryans from time immemorial.

Aryan civilization, the horse.¹ For the latter also was well-known to the early Iron-age people of the Deccan as the rider figures of bearded people amongst the pre-historic pottery are very frequent. It may indeed be argued that the use of the horse by these pre-Hindus of the South was subsequent to their being influenced by the Northern "Aryans." If so why then should they have continued in their peculiar funeral rites and went on building the megalithic structures as before? It is well-known that megaliths have long since ceased to be reared up in Hindu India as in mediæval and modern Europe. The important exception of the Khasis in Assam who still continue this curious practice, proves our contention as they are still beyond the pale of Hindu influence. Besides it is well-known that in Babylon the horse was known as the "Ass of the East" and the dwarfish horses of the pottery figurines of Southern India, which, by the by, were probably descended from the *Equus asinus* of the extinct Narbada fauna, suit that description more than the spirited horses described in the Rigveda (II. 220; IV. 154, etc.). Nothing can be definitely stated but the strong likelihood is that the Iron Age in Southern

¹ The ideogram of the horse in Babylon signifies 'the ass of the mountain in the east' and its name is "Shar." The Babylonians could not have learnt its use from the Aryans who were not inhabiting mountain-tracts but living in steppes or plains at this stage.

India was in full swing at least in 1500 to 1600 B. C. and that the knowledge of iron in Mesopotamia valley spread from the plateaus of the Deccan and not possibly *vice versa*.

The main objects of iron found are from the Deccan megaliths. From Adichanallur along with iron finds has come forth a cup of bronze with geometric patterns of the earliest Hallstatt type. The iron swords are long, ribbed, with lateral projections at times recalling early Hallstatt forms. The sickles also like the swords seem to be copied from bronze specimens. A bronze cup from the Nilgiris found with iron is incised with a pattern akin to cypriote palmettes. The gold objects found in the iron-bearing graves of Adichanallur resemble the long oblong dotted ornaments from Mochlos (*vide* Dussaud, *les Civilisations préhelleniques*, fig. 21). Thus iron in India is synchronous with the times of extension of Ægean influence in the East up to the end of Hallstatt epoch in Europe (*i.e.* C. 2000 to 600 B.C.) and may be thus coeval with Vedic culture.

CHAPTER XIV.

THE INDIAN MEGALITHS.

Their Builders and Origins.

When Walhouse wrote his famous paper on non-sepulchral monuments in the Deccan about fifty years ago scholars were led to search for Sanskritic texts to prove their antiquity. For then the vast antiquity of the orthodox Aryan literary records on the one hand as well as the just revealed Buddhist monuments on the other were leading people to ascribe the Deccan megaliths to post-Asokan times—the more so as definite allusions in Hindu literature to them could not be found. Prof. Chanda has however already drawn attention to the tumuli mentioned in the Satapatha Brahmana. The passage is remarkable as we have reference not only to the custom as prevalent among non-Aryan peoples but also to at least two different kinds of sepulchral mounds rectangular and round. Thus we find in the 8th Adhyāya, 1st Brahmana¹:—“They now do what is auspicious for him (to serve him) either as a house or a monument.” It is interesting

¹ Satapatha Brahmana—Sacred Books of the East—translated by Eggeling, p. 42.

to note here that the Sanskrit word *Smasāna* is derived as meaning a couch for the body (*aman sayana*) by Yaska and also meaning a stone (*asman sayan*) by Prof. Weber. Then again we read¹ "four-cornered (is the sepulchral mound). Now the gods and the Asuras both of them sprung from Prajapati were contending in the (four) regions (quarters). The gods drove out the Asuras, their rivals and enemies, from the regions, and, being regionless, they were overcome, wherefore the people who are godly make their burial-places four cornered, while those who are of the Asura nature the Eastern and others (make them) round for they the gods drove them out from the regions. He arranges it so as to lie between the two regions, the eastern and the southern, for in that region assuredly is the door to the world of the Fathers: through the above he thus causes him to enter the world of the Fathers, and by means of the (four) corners he (the deceased) establishes himself in the region and by means of the other body (of the tomb) in the intermediate regions: he thus establishes him in all the regions."

It is essential here to remember the methods of the disposal of the dead amongst the Vedic peoples. Macdonell² describes it thus:—"Burial and cremation were concurrent one hymn of the Rīg Veda (10, 16) describes a funeral by burning

¹ *Ibid.*, pp. 423-424.

² *Vedic Mythology*, p. 105.

and another (10-18) one by burial. The 'house of the clay' is also spoken of (7, 8, 9). Fathers burnt with fire and those not burnt with fire (i.e., burial) are referred to (10, 15, 14; A. V. 18, 2, 34). But cremation was the usual way for the dead to reach the next world." The conditions we have been hitherto describing belong to times estimated to be not later than 800 B. C. at least so far as the Satapatha Brahman goes and they have reference to North Indian conditions. In the South there is another highly ancient literature, the Tamil, and though its classics have not been held to earlier than 1st century A. D. they record for us many pre-Aryan cultural traditions just as the Niebulungen Lied or Chanson de Roland or Beowulf contain, though a little mixed up, a vivid picture of the pre-Christian pre-classical spirit in Europe at large. To such a class belongs the Manimekhalai where it is recorded that the means of disposal of the dead were five in number: (1) by cremation, (2) exposure in an open place to be eaten by jackals and vultures, (3) burial, (4) stuffing the corpse in natural pits, and (5) covering it with big earthen jars."¹

Coming back to Asuras of the Vedas we have got to record two interesting facts. According to Sir R. G. Bhandarkar and Prof. D. R. Bhandarkar who have traced the 'shibboleth' of

¹ Aiyangar, Tamil Studies, p. 39.

these people in Vedic literature, they came of a stock akin to or identical with the Assyro-Babylonians. There has also been found in the forests of Ranchi an early Pre-Dravidian tribe calling themselves still "Asuras" and it is for Indologists to decide what connection they have with the Eastern Asuras of the Vedas. Anyway the significant fact remains that the earliest archaeological vestiges yet unearthed in India are some of these mounds excavated from the neighbouring province of Behar. Sir John Marshall speaks of them as but one group of monuments now existing to which there is any warrant for assigning a Vedic origin. These are the well-known mounds at Lauriya-Nandan-garh in Behar, which were opened by Dr. Bloch and identified by him with the burial mounds (*smaśāna*) described in Vedic ritual.¹ The tentative date assigned to these has been the 7th or 8th century B. C. We read in the Report² "Four of the mounds in all were opened by Dr. Bloch and two of them presented almost identical features. The material of which they are constructed is a yellow clay, which appears to have been taken from the bed of the Gandak river, at present about 10 miles distant. This clay was found to be laid in horizontal layers a few inches thick and intending apparently, right

¹ Sketch of Indian Antiquities (Calcutta), 1914, pp. 6 and 7.

² Archaeological Survey of India, Annual Report, 1904-5, p. 32.

through the mound, with straw and leaves between them. Time had rendered it for the most part very hard and rough, but it varied in this respect in the several and varied also in colour according to its depth below the surface. At a few feet below the top and in the centre of each mound was a deposit of human bones and charcoal and a small gold leaf with the figure of a woman stamped upon it, then further down comes a long hollow shaft in the clay, showing where a wooden post had once existed but had since been eaten away by white ants; and then still further down, at the dividing line between the yellow clay and the grey virgin soil was found the stump of the post itself *in situ*. Prof. Jouveau-Dubreil in a recent monograph has tried to connect many of the Deccan megaliths with sacrificial houses mentioned in later Vedic literature.

Somewhat akin to these we have come to know a good deal recently are the so-called Asura sites in the Ranchi district from the great ethnographer Rai Bahadur Sarat Chandra Roy, M.A., B.L., only, one wishes that the excavations had been more scientifically carried out and there should have been a thorough investigation whether these sites are locally spoken of as 'Asura' just as most archæological remains, no matter whether they are mediæval or ancient or pre-historic, are locally spoken of by

peasants as those of Rākshasas, (demons) Asuras, Pandavas etc. or whether, as it is tacitly taken for granted, these are actually associated with and still owned or looked upon with reverence by the neighbouring Pre-Dravidian Asura peoples. Still one cannot but be sufficiently cognisant of the high worth of the articles unearthed from these places all of which bear remarkable prehistoric facies and when comparative archaeology has settled their places, there is no doubt that a definite step would be taken towards the scientific ascertaining of the chronology and ethnology of the N. E. Indian megalithic peoples. Coming now to the graveyards of these 'Asuras' we read ' "The Asura burial place is a large tract of land, measuring several acres, which slopes down on the south and the east into a *dhora* or water-channel. Huge stone-slabs mark the burial sites and under each of these slabs are found from one to three or even four cinerary urns in the shape of large earthen jars. Over fifty large stone-slabs were visible above ground. These slabs are not supported, as in Mundari graves, on small pieces of stones at the four corners, but they lie flat on the ground with the urns lying from one foot to over two feet under ground. A big earthen jar (Gharā) with a bowl-shaped earthen cover fixed

¹ E. C. Roy—Journal Bihar and Orissa Research Society, Decr. 1915, p. 7.

over its mouth with a paste of clay, contained the mortal remains of the dead Asuras. Unlike the Mundaris, who only bury on a small *chuke* or jug with a very narrow mouth a bit of bone from the forehead, a bit from the chest and sometimes also a bit from the arms and a bit from the legs, the Asuras appear to have buried all the bones of their deceased. Later on he describes them thus :¹ The largest of the stone slabs measured 13 feet in length, 7 feet 6 inches in breadth and 6 inches in thickness. The size of the slab probably varies according to the importance of the family whose remains are buried underneath. The contents of the different burial urns do not however give any indication of the difference in the wealth or the importance of their owners. In fact, some of the urns under the smaller stones contained the largest number of beads and other ornaments. The Mundas call the shelter formed by such a stone slab on the top with the stones at the four corners underneath the "houses of the dead." Besides some building sites were found associated with these megaliths. About their chronology, though probably mixed up, we find Mr. Roy bringing out a significant fact. "In the gullies or channels formed by rain water I have on several occasions, particularly after heavy showers of

¹ S. C. Roy—*Ibid* September, 1920, p. 395.

rain, picked up stone crystal beads, stone arrow-heads and axe heads and stone cores and flakes at a depth of from seven or eight to about fifteen feet below the top level of the brick foundations of Asura buildings. And close to more than one Asura site I have found genuine palaeoliths, although but very few in number. This would appear to indicate that the sites extend over a wide range of time, having been occupied successively in the Stone Age, the Copper Age and the early Iron Age.¹⁾ The above though perhaps not proving the Asuras to be descendants of palaeolithic peoples in India at least shows that they were successors to that culture, occupying as they did the Palaeolithic sites which had perhaps been not still entirely abandoned or forgotten and that they were probably flourishing peoples from early Neolithic to early Iron Age time and some of the stone grave yards may be of that date. The existing Asura tribes appear in Munda traditions as earlier than these pre-Dravidian peoples in those parts as they are invariably associated in Munda as well as Oraon traditions with the early knowledge of smelting iron. Bruce Foote also speaks definitely of Neolithic megaliths from the Deccan²⁾ and there should be little doubt *that the megalithic cult apart from the architecture, existed in*

¹⁾ S. C. Roy—*Ibid* p. 400.

²⁾ Vide Hoffman, *Mundari Grammar*, Appendix p. vi and S. C. Roy—*The Oraons II*, part 2, p. 471.

India from the earliest times traces of them being found amongst the earliest ethnic stocks the precursors of pre-Dravidians as well as Neolithic remains. We cannot say whether the furthest eastern cults had originated in some migrations from this early Neolithic epoch, but the fact of American culture being mainly neolithic and at the same time being possibly due to Asiatic sources and Pater Schmidt's definite tracings of the Austronesian influences in South America make it likely. Where Prof. Elliot Smith's theories also render it very likely that different cultural waves did reach these places as well as India from higher civilisations in the West, but if a very crude megalithic cult was brought along with ethnic migration it probably happened through neolithic peoples. Mr. Perry¹ in his book on the 'Megalithic Cultures of Indonesia' which he ascribes to migration of culture folks from India and further West, works with this basic idea,—'evidence points to the possibility of a connection between India and Java as 700 B.C.' and thence of course the cultural wave spread further eastwards. (Whatever that be, we find in San Cristoval islands in the eastern Pacific mounds being erected which remind us strongly of Asura grave-yards and Lauriya Nandangarh mounds and also possibly might explain some features in them.) Thus we

¹ Perry—Introduction, pp. 2-4.

read of the 'Heo's and 'Masitawa's how a hollow is made about thirty or forty feet long and twenty feet broad and in this a house is built like a sago-palm tent. An opening is left so that the jaw bone may be taken out when the body on the platform within the house decays. The whole is then covered over with earth and large stones are placed along the side. After a time the whole falls in making a broad low mound only a few inches high, flanked by stones. Probably of still ruder types are the neat huts erected over the graves as in the South Australia where 'upon the mounds or tumuli over the graves, huts of bark or boughs are generally erected over the graves to shelter the dead from the rain, they are also frequently wound round with netting.' Similar customs are also known in Western Australia and New Guiana.¹

We have here some motives akin to or identical with the cult that led to the rearing of megaliths, but from the architectural point of view we are yet far off from the finished brick-graves of the predynastic period, the Mastaba or the Dolmen or the circle. Now if the megalithic *cult* spread from a single source, the first wave Eastwards then evidently passed before the stone-monumental forms, so common in the Deccan and

¹ *Vide* Frazer—Belief in Immortality and Worship of the Dead, Vol. I, pp. 150-151 and 203-4.

the west, were elaborated. The finding of a gold-leaf in Lauriya-Nandangarh mounds and its identification with the goddess Prithivi (Earth)¹ of the Vedas as well as the direction of building of mounds over *cremated* remains therein connect oddly enough this cult with the Aryan rather the roundheaded peoples with mediterranean rites. From Minns² we come to learn of funery mounds in Siberia and from Pumpelly³ we hear apparently of menhirs from Central Asia. Is it possible that the reverence for the dead and the mound cult existed amongst the Indo-European section of the Boreal folk in Central Asia to which was added a vast mass of a complex cult of Erythrean section of Equatorial people, and resulted in elaborate ramification which we can follow in such illuminating details in Egypt and which we can only guess at from the varied innumerable rude stone structures in the Deccan. If Prof. Elliot Smith is right it seems the nature folk could not have elaborated such a complex megalithic cult with its array of cognates⁴ unless they had received it from the hand of culture

¹ While the small size and gold representation reminds us of Mycenaean icons, we are sure in finding here the neolithic idol, 'Dochelette's *Idole tutélaire des tombes*' whose appearance is synchronous with dolmenic chambers and other megalithic structures in Europe (Archéologie préhistorique p. 428-429 and p. 603).

² Scythians and Greeks, 1913, pp. 145-148.

³ Explorations in Turkestan.

⁴ Vide Supra, Chap. I, p.

folks. But is it that two distinct strains of the Naturistic North and Totemistic South-East are discernable therein and were responsible for the various differences amongst them that perplexed even now such a life-long student as Lewis? But synthetic cult studies in order to be thoroughly scientific have yet to wait till Central Asia, savage, barbarous or civilised is as stratigraphically studied as Melanesia or Polynesia.

When we come to architectural considerations we are on safer grounds as the element of speculation and interpretation becomes much less. Mr. A. L. Lewis who has life-long emphasised the difference in structure between the various rude stone-monuments has reiterated his views as follows:—

“From a consideration of the subject as a whole it would seem then that the building of dolmens was not confined to one race and the building of circles to another, nor that there was any one race which originated and diffused both, but rather that megalithic construction was a phase of culture through which many races have passed, and which was developed in a different way not only by separate races but also, in very restricted localities by different tribes, without regard to any racial differences or connection between them.” In contrast with these is the view held by more technically skilled archaeologists

¹ *Journal Royal Anthropological Institute*, 1910, p. 342.

like Fergusson who as early as 1871 was impressed by the unity of the basic structure of the Rude Stone Monuments in all countries and T. Eric Peet points out clearly that the megalithic building could not have evolved among several races independently. "On the whole, this idea has not found favour among archaeologists. The use of stone for building might have arisen in many places independently, but megalithic architecture is something much more than this. It is the use of great stones in certain definite and particular ways. In each case we see a type of construction based on the use of large orthostatic slabs, sometimes surmounted by courses of horizontal masonry, with either a roof of horizontal slabs or a corbelled vault. Associated with this we frequently find the hewing of underground chambers in the rock. In almost all countries where megalithic structures occur certain fixed types prevail, the dolmen is the most general of these, and it is clear that many of the other forms are simply developments of this. The occurrence of the structures with a hole in one of the walls and of blocks with 'cup-markings' is usual over the whole of the megalithic area. These parallels are due to something more than coincidence, in fact, it is clear that megalithic building is a widespread and homogeneous system, which, despite local differences, always preserves certain common

features pointing to a single origin."⁶) Similarly Warren, after his masterly study of the various basic measures, comes to the conclusion that the various cubits used all belong to one series, and are closely allied in simple proportion, that there was a curious connection of prehistoric measures all over the world and that the unit or base was the fathom of 72 Imperial inches divided into 4 cubits of 18 inches and further into 80 and 100 digits."⁷

But where did this system originate? Prof. Elliot Smith in his essay on the Evolution of the Rock-cut Tomb and the Dolmen comes to the following conclusions⁸ :—

(1) "It is quite certain that the Egyptians of the second and third dynasties invented the rock-cut tombs.

(2) The other Mediterranean peoples both in the Aegean area, as well as in the middle and west adopted the use of such tombs from Egypt.

(3) From the simple type of trench grave the Egyptians developed a great variety of tombs and funerary monuments and crude imitations of which were made by all their neighbours eventually by more distant nations.

(4) The dolmen represents the crude and overgrown copy of that part of the Egyptian

⁶ *Boagh Stone Monuments*—1912, pp. 45-46.

⁷ "The early weights and measures of mankind" by Sir Charles Warren, G.C.M.G., F.R.S., &c., 1913, pp. 99-100.

⁸ *Essays presented to William Ridgeway*—1913, p. 544.

mastaba, the Serdab which was supposed to be the dwelling of the spirit of the deceased."

So it has always been recognised that the "European megaliths in spite of the rudeness of their architecture are in evident relations with the ancient funeral monuments of the East" as Dechelette points out. He goes on to observe "The chamber with cupolas in Spain, the *Britannic* isles and those of *Asia Minor* and of *Greece* have had incontestably a common ascendant which we hardly know of, but which ought to be placed at the East of the *Mediterranean*.... With *Montelius* we admit a continuous influence exercised by the East on the West since a period in the remote past of prehistoric times. Without doubt one should not conform to the doctrines of *Sophus Muller* and to derive from Egyptian art the quaternary art of the hunters but one may recognise that beginning from Neolithic times commercial relations extended gradually and united Western and Northern Europe with the *Mediterranean* regions..... We are not concerned with the ancient theories relative to the supposed existence of a dolmen race, who were navigators who had travelled over the vast zone occupied by the dolmens, in masses or in small groups and left on their route these imperishable testimonies of their passage. Anthropological observations have fortunately, done away with all this adventurous hypothesis. One should

admit amongst the peoples who raised these megalithic monuments a certain community of culture but not a community of races." (*Archeologie prehistorique*, pp. 425 and 427).

So also we find this same view upheld by Elliot Smith in the following manner at Dundee:

"If one considers the details of the history of Egypt and the evolution of her arts and crafts and her custom and beliefs during the beginning of the third millennium B.C. and bears in mind either the chronological order of appearance and the geographical distribution of megalithic monuments in various countries on the one hand or the general plan, the structural details and the ideas exemplified in the evolution of tomb construction in Egypt and the other places where megaliths occur, it seems to me inconceivable that any other conclusion can be reached but that the idea of tomb building, which was slowly evolved in Egypt during the fourth and third millennia B.C. was handed on from people to people, not only along the whole Asiatic littoral, from that of the Red Sea to Southern Arabia and Persia, and thence to India, Ceylon and Burma to Indo-Malaysia, Korea, Japan and the Pacific islands if not to American."

And the megalithic culture which was evolved in Egypt as one of the results of the discovery of metals, made its appearance in other lands

first before the dawn of the age of metals. This theory essentially differing from that of Lewis in that a common origin is insisted upon also differs from that of Peet for though ascribing the invention to a single race, the Egyptian, the building in different parts of the world are propounded to be due to culture contact. This is best understood from the lucid statements of the great psycho-sociologist (if we might say so) Dr. Rivers:¹ "May there not be a relation between the passage of the megalithic culture by sea and its association with use of metals. May it not have been the use of metals which first made possible the building of craft fit to carry men to such distant parts of the globe? We know that vessels capable of long ocean voyages can be constructed without the use of metal, but if the megalithic idea had its birth in the knowledge of metals and was fostered by their use, a great impetus must have been given to the manufacture of vessels which would make possible the dissemination of the idea throughout the world.

"I believe that it will become far easier to accept the ethnological unity of the megalithic culture if we assume that it was carried by small bodies of migrating people peacefully received. The peculiar feature of the distribution of the

¹ *The Contact of Peoples* (Essays presented to Ridgeway, 1918), p. 401.

monuments, the transport of their culture by sea, the slowness with which it travelled, all become natural if those who carried the culture so high that they became the chiefs, perhaps even in some cases the god, of those among whom they settled."

As a faint protest and a possible alternative to Prof. Elliot Smith's theory may be read an interesting article in *Man*, 1916, No. 68. There Harold Peake incidently brings out that 'the conditions postulated by Prof. Elliot Smith as necessary for the evolution of the domes may be met with everywhere, except on barren rocks, where there existed members of the Mediterranean race or of any other race which connected the idea of future existence with the preservation of the body.'¹ So also 'that Prof. Elliot Smith has made the Phoenicians the transmitters of the megalithic culture in the West sometime about 800 B.C. whereas Siret had placed the date of earliest Phoenician trade in the West at 2000 B.C. but both these dates are but imaginative and hypothetical.'² He suggests that³ prior to 2200 B.C. some traders from the north-east of the Aegean, familiar with the use of copper and probably possessing the secret of bronze, set out from their home, which may have been Lemnos, in search of copper and tin. Their voyages to Sicily led them to Sicily, Spain and in all probability to Sardinia and Balearic

¹ *Man*, 1916, p. 117.

² *Ibid.*, p. 118.

³ *Ibid.*, p. 121.

Islands. They were also in touch with Morbihan, though possibly through mediation of western traders, who may have been engaged from some time past in commerce along the Atlantic sea board. At home they had relations with Crete, the Cyclades and the Hissarlik and through the last named possibly with Cyprus. They were accustomed to erect Cyclopean walls, and learnt the use of cists from the people of the Cyclades, they spread the knowledge of these two arts away the people with whom they traded, and the result was evolution of the dolmen. "What is of great interest and not a little importance for us in the article is that the figures of the four axes from Brittany especially the copper axes from Spain matching with those from Hissarlik II, Cyprus and the Aegean are almost in shape and size identical with those long copper axes found from Gungeria and other places in Northern India and that the graves of megalithic character which have been fairly excavated in India *e.g.*, those of the Nilgiris by Brecks, of Adichannallur by Rea, (of Asura sites in Ranchi by S.C. Roy have yielded copper and bronze articles in abundance, the latter being invariably cult objects¹ and especially reminding us of Mediterranean types, *e.g.*, the big bronze cup from the Nilgiris in Bruce Foote Catalogue 1901 or the various Bronze spirals from Asura sites in Ranchi.

¹ Connected with the cults of the sun or of the circle or of the axe or of the sacred horn.

Coming now to the actual people in megalithic India we can build up a tolerable picture of their culture for the purposes of ethnic comparison. Mr. C. Hayavadan Rao, the well known contributor to *Anthropos* on Deccan ethnography has beautifully summarised the evidence from Brecks and Bruce Foote thus:—"Prehistoric burial graves such as stone-circles cairns, cromlechs, barrows and cistvaens have been found in the Nilgiris, Travancore, Malabar, Cochin, Tinnevelly, Madras, Palni hills, Coimbatore, Salem, North Arcot, South Arcot, Chingleput, Bangalore, Coorg, Anantapur, Bellary and Kurnool. Among the most striking objects of the pottery series are tall jars, many storied cylinders of varying diameters, with round or conical vases fashioned to rest upon pottery ringstands or to be struck into soft soil. These jars were surmounted by domed lids, sometimes in fitting but mostly projecting over the edges of the jars they covered. On these lids stand figures of men or animals and much more rarely of inanimate objects fashioned in grotesque style. Among the arms borne by these people were short-handed axes, swords, daggers, maces but of spears there is no positive evidence. Men and women appear to have worn head dresses of various shapes, mostly peaked caps, with the peaked summit hanging more or less in a forward position. The men wore their beards clipped rather short, but

they were apparently of thick growth. In the true prehistoric grave the funeral urns are now found low down in the grave. These are usually low flattish vessels with or without covers and they have been known to contain a few burnt bones with five black or brown mould in which are found small gold ornaments, bronze and iron rings and beads of glass or agate or small sowries with perforated backs.

The tradition extensively prevails in Southern India that the cromlechs and dolmens mark the burial sites of a race of pygmies who at one time formed the general population of the land. They are variously termed *Moriar Mane*, *Pandu Kuzhi* and *mandu or mandowar Kuzhi*. The monkeys in Rāmāyana might have been this tribe. The tail probably referred to a peculiarity in the mode of dressing of the lower class people in Southern India."

Now it is very interesting to find that the culture of the pre-dynastic Egyptians with their ornamental iron beads and "Karnata" wearing was little dissimilar to it. Thus we learn from Budge:—"Predynastic (Egyptian) women wore necklaces of beads made of carnelian, agate, flint, limestone, etc. Bracelets made of ivory, flint and mother of pearl have been found. Some garments were worn. In daytime most of them wore no clothing of any kind, some wore the undressed skin of animals in such a manner that

the tail was seen hanging behind the men's back. The hair of both sides was short and the beards of the men were long and pointed but turned up at the points. The faces were regular and oval." Mr. Longhurst, Superintendent of Archæology, Madras Circle, the last systematic explorer of some Deccan megaliths after Breeks, and Mr. Rea, quite curiously got a similar impression of Indo-Egyptian similarity after excavating some of the megaliths in the Anantpur district. Most of these were provided with a circular ring of stones all round like the cairns and there is little doubt that coins were actually built over most of these stone-box like cells. In plan they are of the usual rectangular shape, with four stone sides and a heavy cap-stone. Some had a little passage about 1 ft. 6 in. in width in front, while others had smaller circular openings but cut in one of the side-slabs possibly intended as passages for the soul on its return to earth. From the nature of the construction and the contents found in these Indian cell-tombs it would appear that the religious belief of the primitive peoples who constructed them must have been much the same as that held by the Ancient Egyptians regarding man's life after death. (The Egyptian belief in the transmigration of the soul fostered the religious duty of preserving the body after death. The soul was thought to return

to earth and re-enter its former body after a long cycle of years and again live the life of a human being. The natural outcome of this belief was this process of embalming and a construction of tombs which might be relied upon to safeguard the remains of the dead by taking them in earthen jars or urns, carefully sealed with clay, while the almost cyclopean nature of the construction of some of the tombs rival those of the Egyptian in point of durability. The presence too of a circular hole laboriously cut through one of the solid stone side-slabs, seems to show that the soul was expected to return at length to the tomb and probably to re-enter its former body. It is a curious fact that tombs of this kind are found in Southern India which seem to point to Western influence. It is noteworthy that the two other savants who had personal knowledge of some of these South Indian megaliths put emphasis upon this similarity. Thus Mr. Fergusson in comparing Eastern with Western dolmens sums up the evidence¹: "These two—the holed stone and the simulated cist—are perhaps the most direct evidence of similarity between the East and the West, but the whole system affords innumerable points of contact, not sufficiently distinct perhaps to quote as evidence individually,

¹ *Iside Stone Monuments*, p. 498.

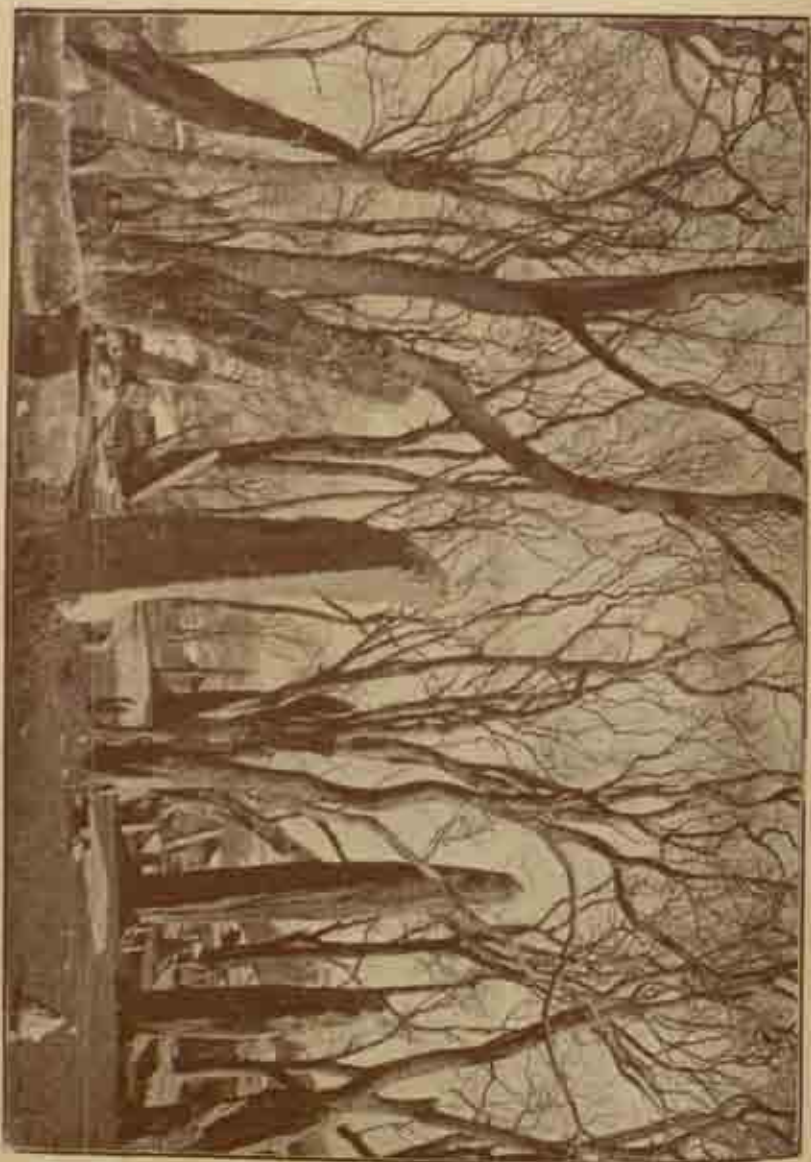
but collectively making up such a case that it seems very difficult to refuse to believe that both styles were the product of one kindred race of men and who at the time they erected them must have been more or less directly in communication with one another." And it is interesting to read along with it Mr. Walhouse's explanation of the holed dolmens as early as 1874 of Egyptian analogies :

“(The idea immediately arises whether the mysterious holes so carefully pierced in the massive slabs of prehistoric dolmens may not have had a similar use of blowing incense to the spirits of the deceased and pupose.) The ancient Egyptians were of the tomb-building Turanian race and these lately explored countries, which are at least 4000 years old, may contain traces of the survival amongst them of still more primeval and prehistoric customs. Evidence for the enormous antiquity of communication between Egypt and Southern India continually grows stronger and (the forests of the latter country abound with fragrant gums, notably the ancient *olibanum* which to-day are principally gathered up by wild jungle tribes, who are looked upon with much probability as the descendants of the prehistoric cairn-building peoples.)” Similarly he speaks of the ‘identity’ of the megaliths in Etruria with many a group with

¹ *Indian Antiquary*, Vol. LIII, p. 278.

which he was familiar in the jungles of Koimbatur, Maisur frontier, in Salem and elsewhere." ¹ So also Coggin Brown summarising the latest evidence speaks as follows :—"There is a very remarkable resemblance between the oblong terracotta coffins discovered near Bagdad, and also between the latter and more highly developed and ornamented Etruscan terracotta coffin-tombs. This similarity of interment in earthenware coffins, identical in shape, size and material, has given rise to interesting speculations connecting archaic Indian civilization with that of Babylonia and Assyria. The hut-urns, which were apparently used for funeral purposes in Neolithic times are the prototype of the later hut-urns now met with, in various parts of the country. Two forms of the earliest Etruscan hut-urns figured in Birch's "History of Ancient Pottery" very strongly resemble modern forms, such as those occurring at Harsani in Baroda and a large group of very fine ones discovered by Foote near the great ford over the Tapti some miles east of Mandu in the Surat district." Mr. Richards has dwelt on some interesting points of contact possible between Dravidian culture and Etruscan and Mr. Yazadani has also referred while bringing out his remarkable list of signs occurring on the megalithic potteries found in Deccan, which as would be seen later on, are

¹ Indian Antiquary, Vol. III P. 276-7.



Manoillee at (Wahuzet, Stirling
(By courtesy of S. Phillips in the Bay, M.A.)

remarkably similar to the ownership-marks found on the pre-dynastic and proto-dynastic potteries of Egypt. A detailed study of the various finds in the megaliths has also called forth this remarkable question of affinities elsewhere.

Some light as to the origin of Indian megaliths was sought with a good deal of justice from a study of those tribes amongst whom the cult still survives in some form or other. Truly as Fergusson remarks: 'In India there is a curious but persistent juxtaposition that everywhere prevails of the highest form of progressive civilisation beside the lowest types of changeless barbarism. Everywhere in India the past is the present and the present is the past, not as is usually assumed that the Hindu is immutable—quite the contrary. (When contemporary history first dawned on us, India was Buddhist and for eight or nine centuries that was the prevalent religion of the state. There is not now a single Buddhist establishment in the length and breadth of the land.... Even within the last six centuries one-fifth of the population have adopted the Muhammadan religion and are quite prepared to follow any new form of faith that may be the fashion of the day. But beside all these never-ceasing change there are tribes and races which remain immutable... The Bhil, the Kol, the Gond, the Toda, and other tribes remain as

* *Early Stone Monuments*, pp. 428-430.

they were and practise their own rites and follow the customs of their forefathers as if the stranger had never come among them." Fergusson then mentions the Khasis, the Kurumbars and the Mala Ariyans as peoples still practising the megalithic cult. If we turn to the other great student of these monuments, Walhouse, we find the list almost complete.¹ "That these dwindled miserable tribes of Kurumbars are the representatives of the race that once covered the plains with megalithic monuments is proved, as far as proof is ever likely to be obtained, by the curious fact of their maintaining at the present day the same practice in miniature show. The *malei Ariyans* of the Travancore mountains who still number from 15,000 to 20,000 on a death amongst them make as imitation *Kistvaen* of small slabs of stone, lay in it a long pebble to represent the body and place a flat stone over with ceremonies and offerings the spirit of the deceased is suffered to dwell in the pebble. The Kurumbars and Irulars of the Nilgiri Hills do the same. The Gond tribes of the Godavary and Orissa make miniature cromlechs. The Kols are reported by Major Macpherson to place the ashes in a chatty, bury it in the ground and lay a large stone over it." Ethnology being regarded as one of the prime factors in the study of prehistoric archæology, the importance of the study

¹ Journal, Royal Asiatic Society, 1875, p. 27.

of these tribes who still carry on the megalithic cults cannot be over-emphasised. From Thurston who quotes the Rev. S. Mateer we learn "The Aryans bury their dead, consequently there are many ancient tumuli in these hills.... These tumuli are often surrounded with long splintered pieces of granite from eight to twelve or fifteen feet in length, set up on the edge, with sacrificial altars and other remains, evidently centuries old. Numerous vaults, too, called Pandi Kuri are seen in all their hills." Prof. R. P. Chanda¹ has shown the similarity in physical features between the Todas and the Mala Aryans and are disposed to look upon them as Proto-Dravidians. Thanks to Lapieque, Thurston, Ruggieri and Haddon the Irulas and Kurumbars are recognised as Pre-Dravidian tribes. The Kadirs, possibly another Pre-Dravidian tribe, have the custom of simple mat-burial. Next to these come the Irulas of whom we read that "the dead are buried lying flat on the face with the head to the north, and the face turned towards the east. When the grave has been half filled they throw in it a prickly pear shrub, and make a mound over it. Around this they place a row or two of prickly pear stems to keep off jackal. No monumental stone is placed over the grave."² When we pass on to the Kurumbars

¹ Castes and Tribes of Southern India, 1909, Vol. IV, p. 360.

² Vide Anantakrishna Iyer, Cochin Tribes and Castes.

we notice one interesting fact that at present these like the Veddas are sharply distinguished into a ruder forest tribe (Kurumbar) and a more advanced barbarous tribe (Kuruba) who are undoubtedly ethnically the same,¹ and it is amongst the latter that megalithic cult still survives showing that it was espoused as a fashionable form by the advanced section of these whenever it did happen in the dim past.² "The temples of this caste are usually rather extensive, but rude low structures, resembling an enclosed matapam supported upon rough stone pillars, with a small inner shrine, where the idols are placed during the festival time. A wall of stone encloses a considerable space round the temple and this is covered with small structures formed of four flat stones, three being the walls, and the fourth the roof. The stone facing the open side has a figure sculptured upon it, representing the deceased Gandu or Pujari to whom it is dedicated. For each person of rank one of these monuments is constructed, and periodically, and always during the annual feasts, puja is offered not only to the spirits of the deceased chief but also to all those who have died in the clan. It seems impossible not to connect with those strange structures called by the natives Pandava's temples. They are numerous where the

¹ Thurston: Tribes and Castes, 1909, Vol. II, p. 386.

² *Ibid.*, Vol. IV, pp. 158-159.

Kurumbas, are now found, and are known to have been raised over the dead. Though the Kurumbas bury, they do not now raise their monuments over the resting-place of the corpse. Nor can they build them upon anything approaching to the gigantic scale of the ancient kistvaen or dolmen." Though it is a far way off to Fiji, which, by the way, falls within the sphere of the culture stream from the west we are strongly reminded of the *Nanga* or open air temples formed by flat stones set upright and embedded endwise in the earth the more so, as these "sacred enclosures of stone have been compared to the alignments of stones at Carnac in Brittany and Mobihan on Dartmoor and it has been suggested that in the olden time these ancient European monuments may have witnessed religious rites like those which were till lately performed in the rude open-air temples of Fiji. If there is any truth in the suggestion, it would furnish another argument in favour of the view that our European cromlechs and other megalithic monuments were erected specially for the worship of the dead." We have almost exhausted the hill tribes of the Deccan and Southern India who still indulge in this practice classed as Pre-Dravidian or Proto-Dravidian. Passing now to Central India we find the Gonds, who

¹ Frazer, *The Belief in Immortality*, pp. 437-38.

are spoken of as Proto-Dravidians, raise memorial stones to the dead. "At some convenient time after death, a stone is set up in memory of any dead person, who was an adult, usually by the road-side. Families who have emigrated to other localities often return to their parent village for setting up these stones. The stones vary according to the importance of the deceased, those for prominent men being 8 feet high. After being placed in position the stone is anointed with turmeric, curds, ghi and oil, and a cow or pig is offered to it. Elsewhere a long heap of stones is made in honour of dead men, sometimes with a flat-topped post at the head." Still further North-East we come to the Oraons, who strangely enough speak a tongue akin to the Dravidian but are culturally and physically nearer to the Mundas whose neighbours they are. Dr. Haddon in his introduction to the Oraons by S. C. Roy¹ refers to several stone cults of the Oraons, which he is inclined to ascribe to a culture contact with the Mundas. In fact the ceremony of the 'marriage of the dead' points to higher organisation and cultural status.² "From the autumn until the harvest is over, the Oraons may not cremate their dead, and thus until then the corpses of all the Oraons dying during this period remain buried at the village burial place (*masan*). After

¹ S. C. Roy, *The Oraons*, 1915, p. xvi.

² *Ibid.*, p. 277.

the winter paddy has been harvested and garnered by all the villagers, the corpses of all the buried dead are disinterred and cremated on a day appointed beforehand, and the bones are then ceremonially gathered by the women, anointed with oil and turmeric, and with music carried in procession to the stone *Knudi* by the side of some pool or water course where the bones of the dead Oraons of the village family are always deposited. Coming now to the Mundas, who linguistically if not in many other respects belong to a different stratum, the familiar 'Austrie' group of Pater Schmidt and have a similar custom of *jang-topa* or bone-burial ceremony:—"after the winter rice is harvested when the bones of the deceased are deposited underneath old stone-slab of the family cinerarium. Otherwise a new stone slab is placed in the '*sasān*' for the deceased. A grave is dug at a selected spot in the '*sasān*' and in it the earthen vessel containing the bones of the deceased is interred. Along with the bones a little rice, oil mixed with turmeric and a few copper coins (*piec*) are put into the vessel. After the excavation is filled up, the large stone slab is placed over it, supported on four small pieces of stone at the four corners." We pass now to the extreme North-East of India to a group of tribes, who are decidedly mongoloid in features though some of them speak languages which have been

¹ E. C. Roy, *The Mundas*, 1912, pp. 303-400.

ascribed to the Austro-Asiatic group. Now the best authorities have practically been superseded by Perry's manual where we read:¹ "The Khasis cremate their dead and have an elaborate system of stone structures chiefly alignments and menhirs dolmens being comparatively raised. The Garo erect menhirs. The Nagas inter their dead and have several megalithic structures. Several of the tribes of the old Kuki of Manipur erect megalithic monuments and so also to the Lushie. The Chin tribes erect either menhirs or dolmens and inter their dead in graves lined with stone. The Mikirs erect menhirs, alignments and dolmens."

We have taken a rapid detailed survey of the tribes among whom the megalithic cult is still prevalent and who are looked upon as survivals of the times when the culture was a predominant and fashionable one. We would notice one important fact that in India the more numerous, ancient and gorgeous structures occur in the South. In North-West and Central India these are entirely absent. And so also in the Gangetic plains but (they are common in the Chota Nagpur and Assam hill tracts where however it is difficult to separate the modern ones from the ancient all being mostly of degenerate imitative class some being spoken of by Mr. Perry as 'dissoliths.')

The same degenerate forms are noticeable in the

¹ The Megalithic Cultures of Indonesia, 1918, pp. 23 and 14.

modern ones erected in the South. (We have further seen that the culture exists still in India among such varied stocks Pre-Dravidian, Proto-Dravidian, Austrie (Australoid-veddaici) and Tibeto-Burman that ethnic unity is out of the question.) Then evidently it was a phase of culture which we find has been traced with the greatest amount of likelihood to the influence of Egypt. But when did it come? Evidently not in 'Aryan' India. The orthodox Aryan Sanskrit literature of India has no place for these in spite of their high antiquity and only one mention (the enemy tribes Eastern Asura mound-builders. Prof. Chanda pointed out to me that in Pali literature especially in the Buddhist scriptures we find references to a cult of the worship of *chaityas* or funeral mounds and dolmenic structures. This cult prevailed over a tract inhabited by men with *chhatrākārasirah* (round heads) and *tunganāsāh* (prominent noses) in pre-Buddhistic times. Peet has also pointed out that in spite of Montelius, 'the megalithic structures are to be associated with cultures and races decidedly not Aryan.') Was it Dravidian? Fergusson long ago answered it once for all: 'The first inference one is inclined to draw from this is that they must be Dravidian as contradistinguished from Aryan, and it may be so. But against this view we have the fact that all the races at

present dominant in the South repudiate them: (none use similar stones of burial now, nor do any of them object to our digging them up and destroying them.) Now Ruggieri has called our attention to the importance of Pre-Dravidians thus¹:—“Everything induces us to hold that the Dravidians have really been a *small number of invaders who have introduced their languages* and even that not everywhere, since in the Munda-Kol zone, languages more ancient, have been preserved. It is logical, that if the languages have remained in spite of the Dravidian influence, those who speak them should also have been little contaminated. There is therefore no reason to consider them as platyrrhine Dravidians but certainly as Veddaic or Australoid, and from the fact that between the Munda Kols of the North and the Veddias of the South there intervene other Platyrrhines (Paniyans, etc.) these latter also represent the same ancient Pre-Dravidian formation which at one time extended over the whole of India and has always been much less affected by the newcomers (Dravidians, Aryans, etc.).”²

(It is evident then that India was being influenced by the megalithic culture, if at all, only in Pre-Dravidian times considering that all the megalithic tribes are either classed physically as such or are proved linguistically like the Khasis

¹ *Principles d'un Anthropologie systematica dell' Asia*—1919, p. 46.

to have been strongly influenced by a Pre-Dravidian (Mon-Khmer) cultural wave.) We know that 500 B.C. the Aryan culture have superseded the Dravidian in Southern India. Allowing some time (say 300 to 500 years) for Dravidian domination considering the extent of the languages there we might roughly arrive at 1000 or 800 B.C. as the approximate limit of the Pre-Dravidian domination in the South when we might naturally expect their *megalithic cults to have dominated*. Prof. Flinders Petrie has beautifully shown that the association of a cycle of nature with an ethnic stock may be taken as 1500 to 1800 years. (So the beginning of the megalithic cult in India may be taken as roughly 2500 B. C.) That this was so is proved by the identity of numerous ownership marks on the megalithic pottery of the Deccan with those from Predynastic and Protodynastic Egypt. The only objection that can be urged against this date is that Prof. Elliot Smith assigns 800 B. C. as the likely date of the spreading of the megalithic idea from Egypt eastwards. But it is evident that not having at hand any other proof of earlier foreign connection of India than Rhys Davids' Phœnician theory on the origin of the alphabets, he had to fall back upon that. But he himself has got to go in for earlier dates on grounds of technology. Thus he says in his *essay on Ancient Mariners*¹

¹ Proc. Belfast. Lit. and Nat. History Society, 1918, pp. 62-65.

"The preservation until the present time in Burma and further east, of the earliest known type of Egyptian sea-going ship which in Egypt itself was superseded by new developments in the art of shipbuilding before 2000 B. C. indicates that before that date these distinctively Egyptian models must have reached the Indian ocean. The recent researches in Elam have revealed the fact that the painted pottery which was being made there before 2000 B. C. was copied in Turkestan and Baluchistan¹ not very long afterwards. The derivation of this art of painted pottery in Elam is probably to be referred to Predynastic Egypt, and it may have been carried to the shores of the Persian Gulf along with the knowledge of copper working, by means of the early maritime intercourse between the Red Sea and the Persian Gulf." But there is a rift in the lute as Elam pottery is derived from Predynastic Egypt and not *vice versa* as by general concensus of opinion. It is very possible that there was a mound cult in central Asia as is established by Pumpelly and Mians and that a migration from Central Asia which brought about the civilisation of dynastic Egypt had some counterpart in India and that out of the conflicting and converging elements

¹ The Baluchistan pottery with Anu Hueser designs in Indian Museum has been found only with copper objects and flint knives and with no trace of iron.

of the cultures of the existing equatorial and invading boreal races there arose an Indo-Erythrean culture-complex which saw the rise of the huge countless funerary monuments in the Deccan as well as Egypt. The variety and number of the megaliths near the Southern seaboard of India in contrast to their absence in North-Western India and feeble miniature copies in the North-East show that a strong culture-stream came by the sea-board and passed out of India possibly late by the North-East. Warren also metrologically proves the influence of the megalithic peoples in N. E. India and thence over Indonesia. These were the times when India was in intimate cultural contact with Egypt and possibly Central Asia and may be set down roughly as ranging between 2500 and 800 B. C.

CHAPTER XV.

CULTURAL SEQUENCE, AFFINITIES AND SURVIVALS.

Simcox in his *Primitive Civilisations* in the long section on Malabar has given us an interesting study of some customs of the Deccan and those of Egypt and Babylon which goes to show in his own words 'that in Malabar, a number of usages linger akin to the most archaic customs of Egypt and Babylonia.'¹ Avebury in "*The Origin of Civilisation and the Primitive Condition of Man*" in pages 153 and 175-79 has also drawn attention to several particular Dravidian customs closely similar to some of the customs of the Red Indian tribes. But of more interest to us from the point of view of prehistoric archaeology are Dr. Wilke's two remarkable books "*Sudwest Europäische Megalithkultur und ihre Beziehungen zum Orient*" and "*Kultur-Beziehungen zwischen Indien, Orient und Europa*" which in spite of their radical defect by being ridden by the mistaken theory that the megaliths are due to a Aryan race who poured from N. E. Europe into Asia are useful as

¹ Vol. I, p. 354.

having collected many facts together. The connection between the East and West have taxed brains from the learned pages of Heeren's *Historical Researches into the Politics, Intercourse and Trade of the Primæval Nations of Antiquity* (1820) to the speculative flourishes in the lecture of Hermann and Keyserling (*Ueber die innere Beziehung zwischen den Kulturproblem des Orients und des Okzidents*). Bissing's study of *Prähistorische Topfen aus Indien und aus Aegypten* (1911) brings out clearly besides other things how Egyptian "glazing" was done by means of some plant juice like the Indian process.

But all this is but an array of wilderness unless we can arrange things and see them in the proper perspective. India lying so near Central Asia, which, as we have seen, was the likeliest place where mankind was evolved was also possibly subject to the various culture-waves emanating from the Central home. So a study of prehistoric India would be incomplete and mutilated unless it can be brought in relation to the other early cultures at least of Asia if not elsewhere. We all know that prehistoric Europe has been more illuminated than later times therein simply because the greatest savants like Montelius early recognised that 'without chronology one cannot write any history' and 'build up a fortified castle of interrelated culture

systems by which alone the whole culture of Europe could stand on the firmest basis.'¹ One cannot hope for such things in Asia at such an early stage but if this is not prominent in the minds of oriental archaeologists, even the most startling finds would cease to excite any human interest and would be taken as the mere whims of curio-hunters. Specially in this synthetic 20th century when Karl Pearson himself in his presidential address to the Anthropological section of the British Association was advocating the cause of useful science as opposed to science for its own sake, the prehistoric archaeologist would but fail in his task if he makes no endeavour in his humble way to indicate the place of the chipped stones, be they old, in the foundations of the human structures of our times.

Starting now from the central home, if any, we find a plausible explanation of past events is supplied by Pumpelly in the beautifully sketched tale of 'early regional isolation, the segregation into separate groups brought about by the regional progress of desiccation in Central Asia.' It may indeed be supposed that in prehistoric as well as in historic times the world was overrun by the surfeit of population in Central Asia. So we may take Pumpelly to be likely correct when trying to describe

¹ *Zeitschrift für Ethnologie*, 1910, pp. 955-62.

past conditions as follows:—"The great continental unrest which variably affected different parts of the West, being caused by the decreasing capacity of the pasturage to support nomadic shepherd life, could not have begun until all of Central Asia has become peopled up to the limit of that capacity. We may imagine the great area to have been by this time portioned out among peoples of varied racial origin and having different degrees of culture, varying from nomads in the arid regions to more or less settled pastoral peoples with elementary agriculture in the more favoured lands north of the Black Sea. The waves of movement beginning in the drier eastern region, should seem to have progressed outward, and so on till the climatically favoured peripheral regions including Europe, were successively submerged by one migration after another, ending with the purely Turanian inroads of our era."

Pumpelly could come across no Palæolithic

cultures in the Turkestan which began with a neolithic culture. From Eastern Turkestan however Stein gives us information

Asiatic Palæolithic and Neolithic sites and Indian Correlations.

of a palæolithic settlement 30 miles from the nearest traceable bed of Yarkand river,¹ a neolithic settlement from the Lop-Nor region²

¹ Stein—A Third Journey of Exploration in Central Asia, 1913-16, p. 18. ² *Ibid.*, p. 25.

and another neolithic and later settlement from near the Helmund.¹ Of these the first two are of supreme interest when we remember the Pithecanthropus find in Java and also the earliest Indian Palæolithic carving from Burma. Though the majority of Indian palæoliths come from Southern India and extend up to Ceylon, a stray Palæolith has also been heard of from the Punjab² picked up by the geologist Theobald near Attock. Near Asia Minor we find many stone-age sites mostly palæolithic and early neolithic as at Narh-kelb, Adloum, Damas hillocks, at a place between the Demovend and the Caspian Sea, Tapeh Gulam, etc.³ We should remember that the ancient historic civilisations of Chaldæa and Egypt began with the Neolithic culture. Minns has collected from Niederle and others all about Stone Age remains of South Russia and Czaplicka from Adrianoff about such remains in Siberia, but the record of the Stone Age in Russia is, as we find, yet a blank. The notable exceptions are Indo-China and possibly China. About the former we learn from Man Suy "up to the present day there has not been discovered in Eastern Asia any instrument comparable to the quaternary artifacts of Europe. On the other hand certain polished stones, knives with chipped

¹ *Ibid.*, p. 63.

² Records of the Geological Survey of India, Vol. XIII, p. 176.

³ Morgan, Notes sur les ages de la pierre dans l'Asie antérieure (Bull. de Soc. d'Anthropologie de Paris, 1902, pp. 709-10).

ends offer remarkable similarities to European neoliths.¹ Similarly Guiseppe Perocci tries to fix a chronology of about 3000 B.C. from Chinese literature about the usual reverence of thunder-weapons (shoulder-headed celts?) which we know are characteristic of late neolithic North-Eastern India. It is idle and premature to attempt to build up any theories from such scrappy information and some more possibly that have escaped my reach, for Asia is still to a great extent archæologically *terra incognita*. But one cannot help pondering over the comparative fullness of the palæolithic and neolithic records of India in contrast to other parts of Asia and also that the historical civilisations of Chaldæa, Egypt and possibly China start with neolithic times. But evidence is forthcoming that palæolithic centres are not wanting in Central Asia to make it a convenient first home of men of the Old Stone Age though W. Europe teems with authentic finds some of which are being resolutely attempted to be pushed even into tertiary times!

But the correlation of the ancient springs of culture with the seats of early civilisation in Asia, Southern Europe and Africa, though attended with controversies has not been very fruitful. Their importance for us also cannot be minimised for India also would

Central Asia and the ancient civilisations.

¹ L'Anthrop., Vol. XXX, 1920, pp. 172-74.

come in for its share in comparison and though it would be somewhat spasmodic in character there is no doubt we would arrive at some mile posts on our long road. Besides the swinging of the pendulum of migrations in other lands would also bring us clear indications of the periods of oscillation in the prehistoric cultures in India. In the beginning of 1920 R. Campbell Thompson delivered an interesting lecture in Royal Institution where he made out three distinct migrations as causing three different cultures :

(1) A proto-Hamitic Mediterranean migration with the Arab and predynastic Egyptians as their contemporaries (*vide* my Indo-Erythrean culture complex) forming a nest for future Semitic migrations from Arabia.

(2) An Armenoid migration *via* Syria about 4000 B.C. starting the dynastic cultures in Egypt and replacing peaked beards by bushy beards.

(3) A sumerian migration with potteries quite different from the geometric potteries of the second.

Now from the archaeological standpoint Elliot Smith has brought forth along others 'evidence of an intimate cultural connection that must have linked proto-dynastic Egypt to Elam and Sumer and these in turn with the Iranian and Turanian domains.' Petrie

* Journal, Manchester Egyptian and Oriental Society, 1918-19, p. 15.

simultaneously holds that 'Elam (Susa) was a whole cycle ahead of Egypt in its development.'¹ In a very learned and interesting paper Prof. M. Rostovzieff has come to some definite conclusions after an exhaustive enquiry into the origin besides giving us an useful summary: "The potteries of Anau and Elam are contemporary and related but each followed its own independent line of development of more elaborate style in Elam but of a simpler kind in Anau. At the present time it is impossible to determine the place where this painted pottery actually originated and indeed the time has not yet arrived for conjectures on the subject. We shall have to wait, at the very least, for the publication of data concerning the very interesting neolithic necropolis at Eridu and near Van, where painted pottery was discovered; the published specimens of this painted pottery show a very close relationship with Elam and Turkestan. Practically nothing is known about the painted pottery found in the neighbourhood of Carchemish by Hogarth's expedition. We do not know even, whether any parts of it go back as far as Neolithic period at the Danube and the Dnieper regions many of whose features stand in so strikingly close connection with particular features of the Susa pottery. After that alone may it be possible to say whether the painted pottery was imported

¹ *Eastern Exploration*, 1918, p. 75.

into the river-valleys from far-away Central Asia, or whether it was developed by the local population in a number of different centres, the people having gradually descended into the valleys from the mountains and having communicated their cultural achievements to neighbours either by migration or by exchange."²

We have already pointed out that pottery from prehistoric India dates roughly from neolithic and chalcolithic times. In fact Bruce Foote has given a list of no less than 54 places in Western and Southern India where the pottery finds according to him are distinctly neolithic and 41 sites where they belong to the Early Iron Age.³ Amongst these painted designs remarkably similar to those from Elam and Anau are easily detected and they are all geometrical in design. We know 'there is a close relationship between the geometrical ornament of Susa and of Anau. In both cases a strange preference is shown for triangles partly with concave sides; in both cases there are rows of zig-zag lines, the chess-board pattern is found and the net-work pattern is in common use; in both cases rows of triangles are used and combinations of rhombuses and triangles; a love of

Central Asiatic and
Indian pottery.

² *Journal of Egyptian Archaeology*, Vol. VI, Part I, Jan. 1920, p. 25.

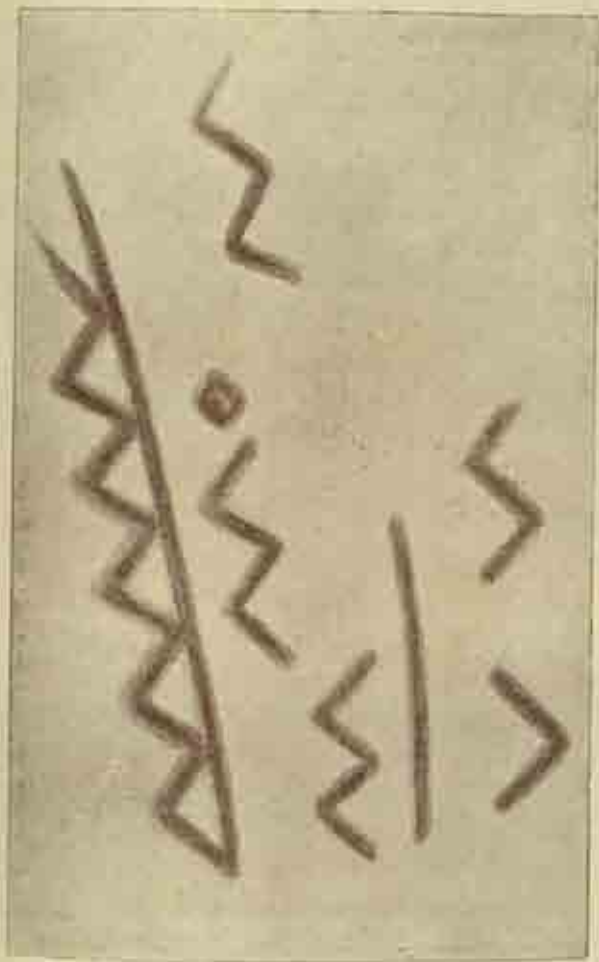
³ *Notes on the Ages and Distribution of Foote Collection*, 1916, pp. 22-33.

mented lines is also traceable and a tendency to choose cross-like ornaments and so forth."¹¹ Now in prehistoric India the only painted designs so far known are dominated by these characteristics. The Kalat state in Baluchistan figures in Bruce Foote in the list of neolithic pottery-bearing sites. In the Archaeological Survey Report of India, 1904-05, Sir John Marshall has brought to notice with coloured plate some potteries from a mound in the Nal village of the Jhalwar district of the Kalat state. He has not failed to observe that 'the main interest of this pottery centres in its decoration *motifs*. The simplest of these are quite elementary geometric forms, like the chevrons in Plate XXXIII, figs. 4, 7, 9, and 11 and the diamond-shaped lozenges in Plate XXXIV, fig. 12. An advance on these is seen in the foliate design of Plate XXXIII, figs. 1 and 2, and Plate XXXIV, figs. 8, 11 and 13 (*op. cit.*, p. 104). It is remarkable that not only the geometrical designs are identical with the like from Central Asia, *e.g.*, the Anau pottery figured in Pampelly, Vol. I, plate XXVIII or in figs. 82, 84 of page 130 but the phyllo-morph designs are the exact counterparts of fig. 85 in p. 130 of figs. 1 and 2 of Plate XXXIV. I may note here that these designs had a wide distinction

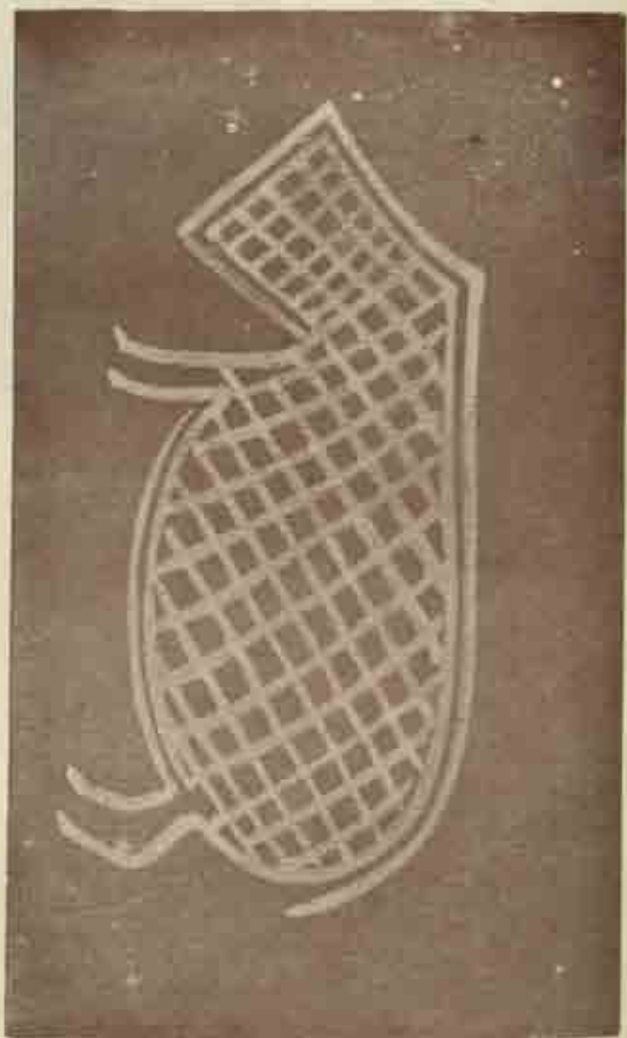
¹¹ Hootenoff, *ibid.*, p. 25.

¹² E. Smith: *Ancient Mariners* (Proc. Belfast Literary and Natural History Society, 1918, pp. 53-4).

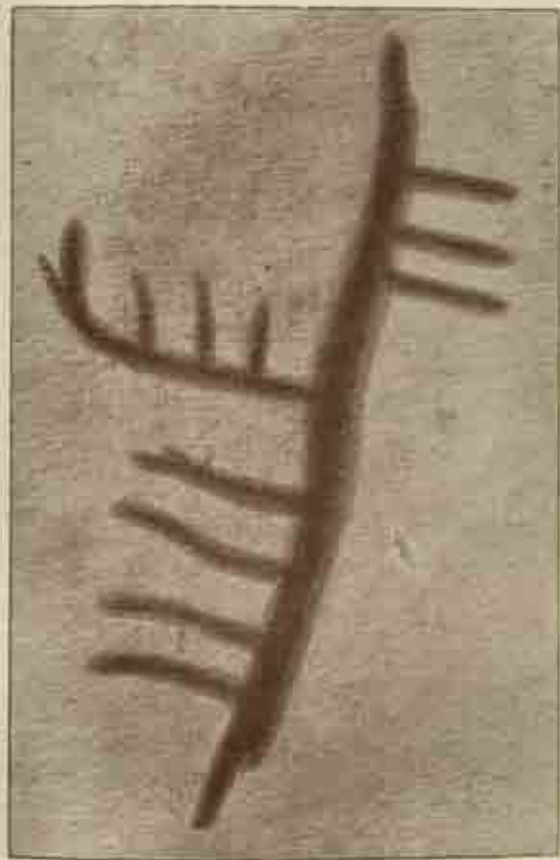
in prehistoric India, though owing to long lapse of time and the moist conditions here, the designs have often disappeared and escaped the eyes of almost all save Bruce Foote who figures in Plate 30 (*cf.* no. 386-7 Notes on the Ages, etc.) a trellis pattern found in Bellary with four other painted bowls. In Plate 53 of Bruce Foote's Notes, etc., and Plate XXIII (no. 1077) of his Catalogue of 1901 we find similar simple trellis patterns and wavy lines occurring respectively in potteries from Tungabhadra in the Hyderabad State and from Coimbatore district. Some Beluchistan potteries in the Indian Museum are given in the plates annexed to this book. These potteries have been found with copper objects alone. These are but mere indications of what has long begun to be hinted at by Elliot Smith thus:—"The recent researches in the Elam have revealed the fact that the painted pottery which was being made there before 2000 B.C. was copied in Turkestan and Baluchistan not very long afterwards...The contact between Elam and India may have been brought about by land in the third millennium B.C."



Singapore cave painting—1



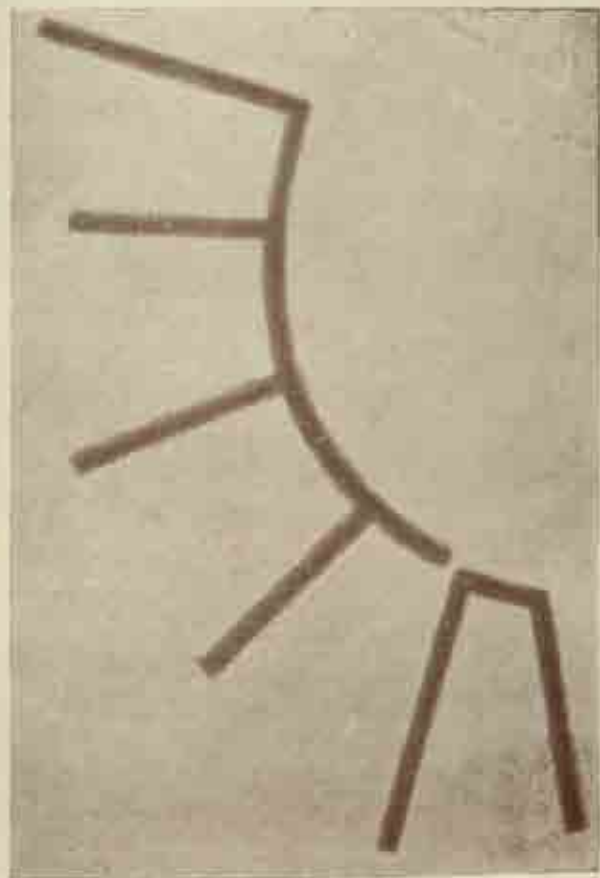
Singanpore cave painting—II



Singapore cave painting—III

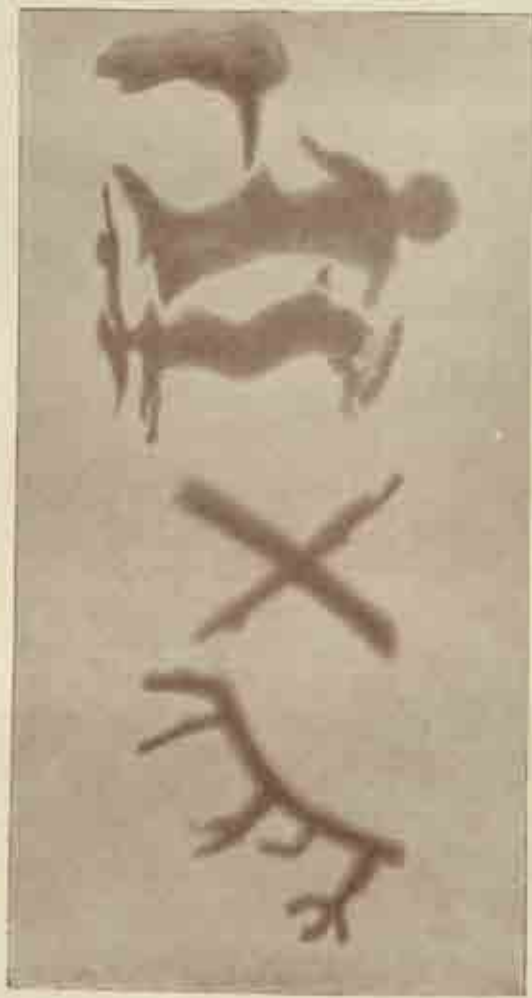


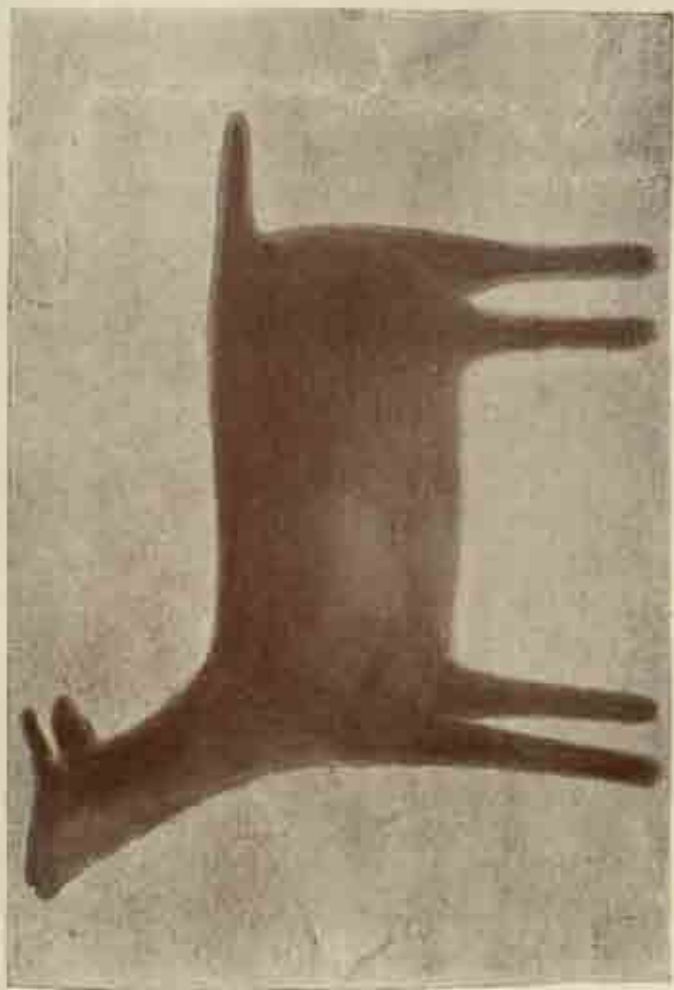
Singapore cave painting—IV



Singapore myve painting—V

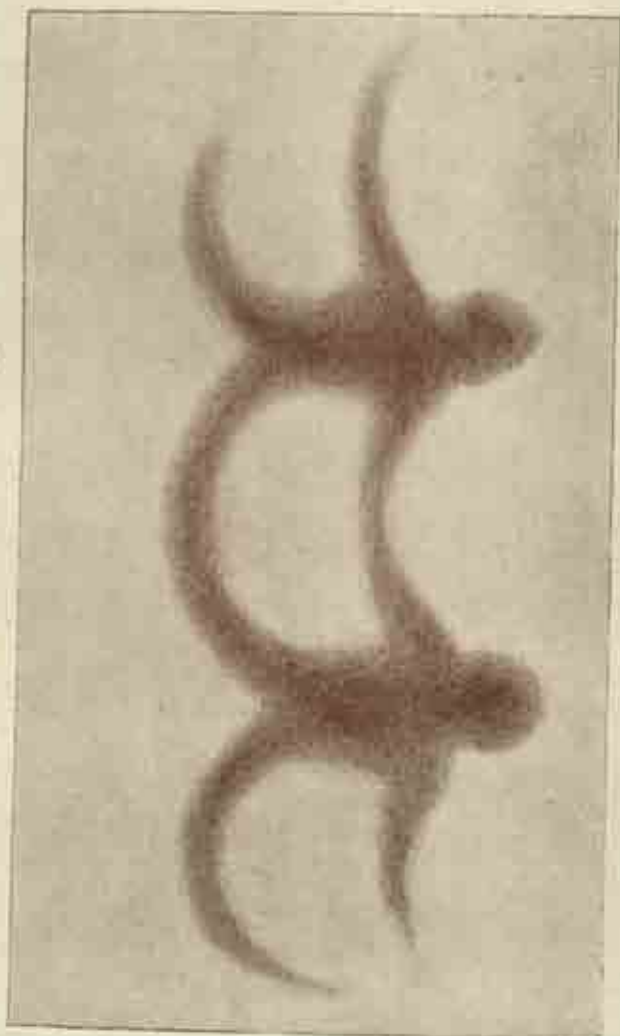
Fig. 1.—Shaping cave paintings.





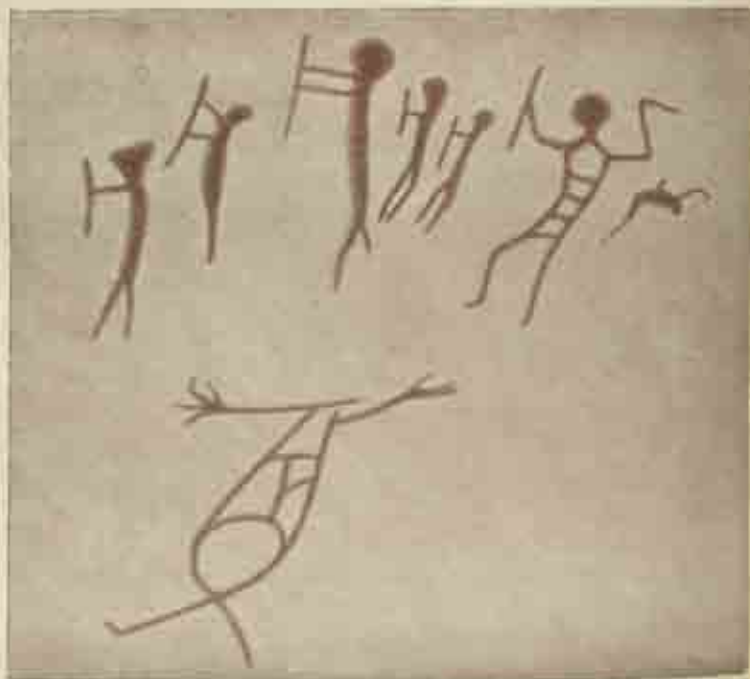
Singapore cave painting—VII

Singapore cave painting—VIII

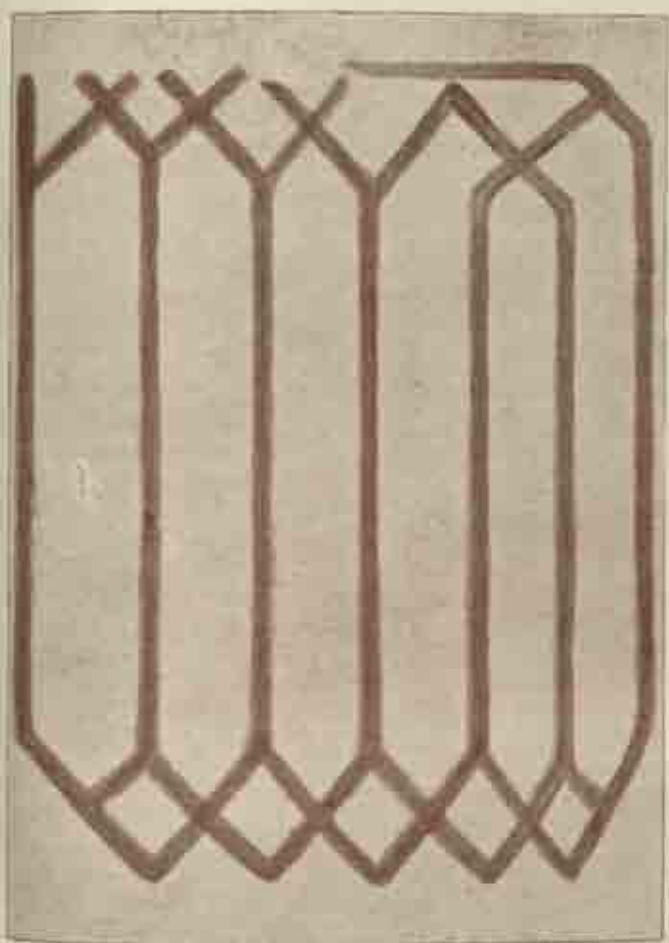




Singapore cave painting—IX.



Singapore cave painting—X



Singapore cave painting—XI

Singanjore cave painting—XII

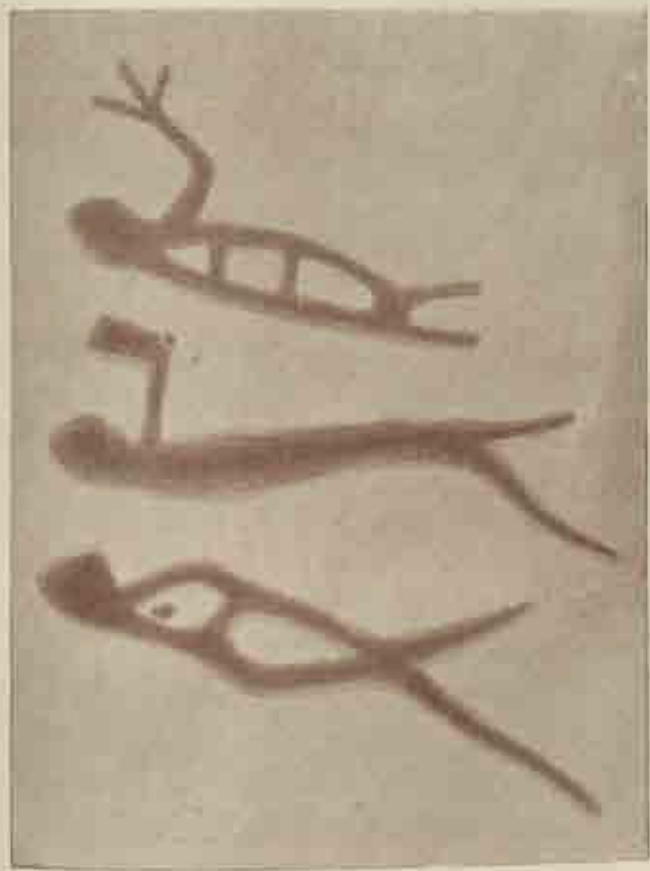




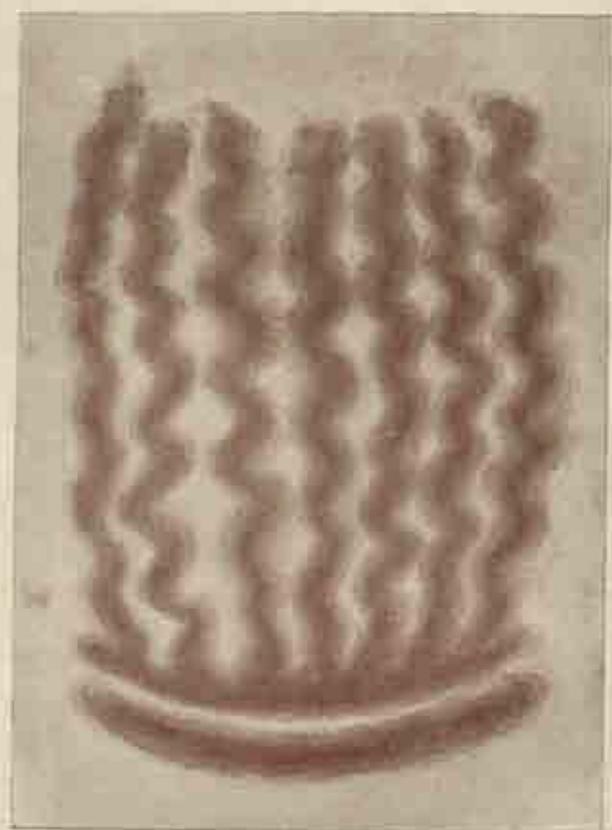
Singampore cave painting—XIII



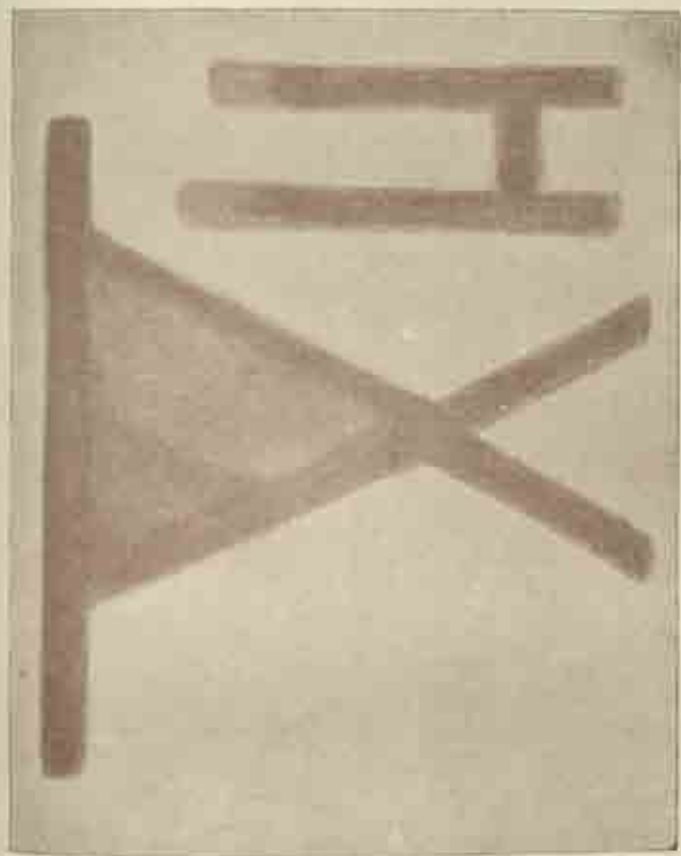
Singapore cave painting—XIV



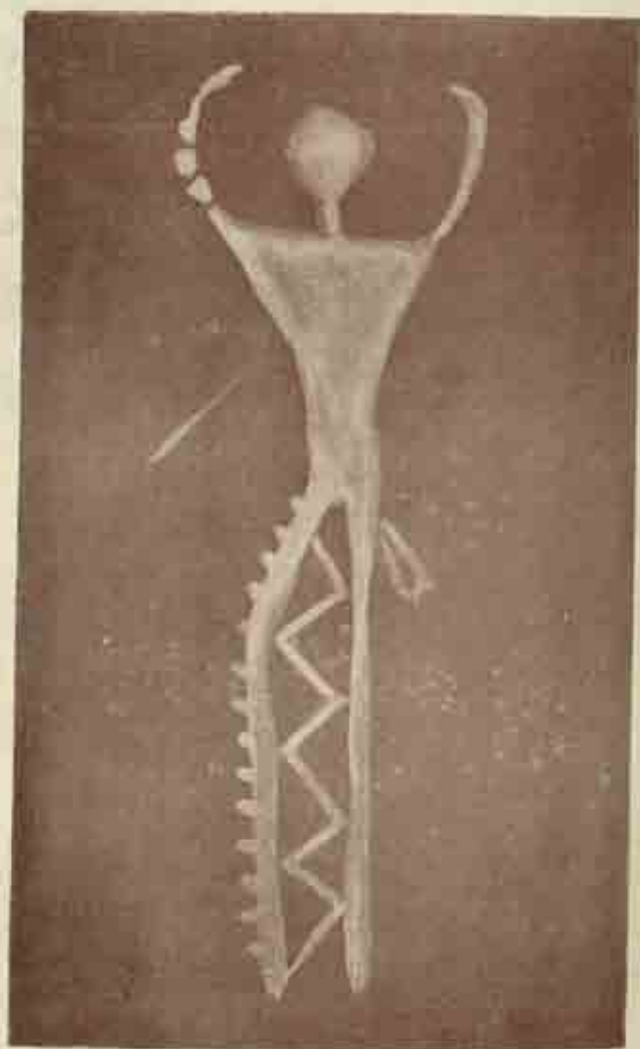
Singapore cave painting—XV



Singapore cave painting—XVI



Singanpore cave painting—XVII



Singapore cave painting—XVIII



Singanpore cave painting—XIX

Fig. 19. Singanpore cave painting.



Singapore cave painting—XX



Singanyoro cave painting—XXI



Singapore cave painting—XXII



Singapore cave painting—XXIII



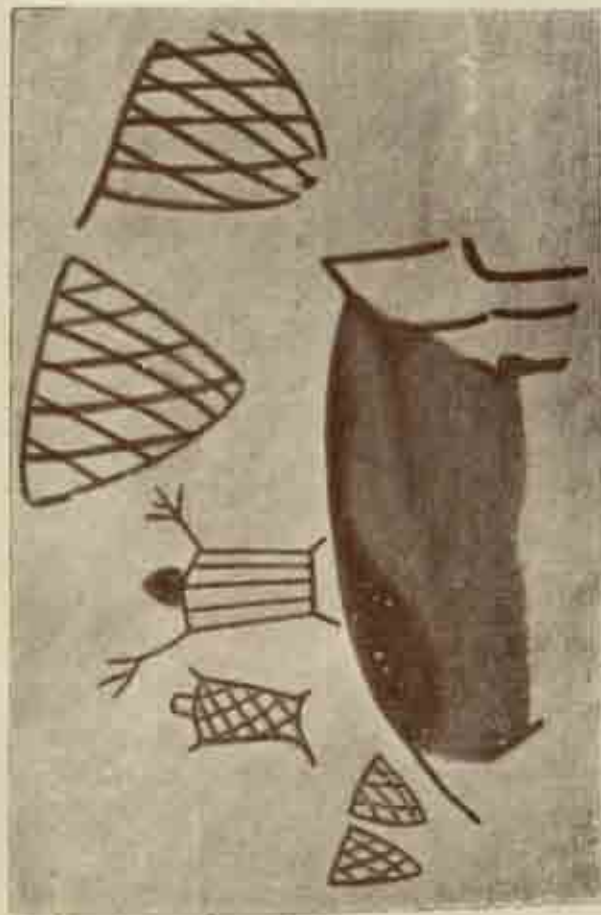
Singapore cave painting—XXIV



Singapore cave painting—XXV



Singapore cave painting—XXVI



Singanpore cave painting—XXVII

Appendix I.

Notes on the Prehistoric Cave Paintings at Raigarh.

BY

PERCEY BROWN ESQR., A.R.C.A.

*Principal, Government School of Art, Calcutta;
officer-in-charge, Art Section, Indian
Museum, Calcutta*

The examples of early painting in India are so rare, that it seems desirable that every site in which they occur should be somewhat carefully investigated and described. Ajanta, Bagh, and Sigiriya in Ceylon have each furnished types of early Buddhist painting which are of great æsthetic value, while at the caves of Raigarh Hill in Sirguja, C. P., certain frescos have been recently copied which are judged to be more than two thousand years old. But the paintings that are the subject of this note will probably prove to belong to an age that lies far outside the historic period of the country, and are believed to be the artistic efforts of primeval man himself. Much evidence remains to be sifted before this can be unconditionally accepted, but even now sufficient testimony is forthcoming to make these paintings of more than ordinary

interest. The particular paintings about to be described are located on a rocky hill in the State of Raigarh in the Central Provinces. At the 375th mile from Calcutta on the Bengal Nagpur main line a range of low hills runs parallel to and within a mile and a half north of the railway. The nearest railway station to this is the very small one of Naharpali. Due north of this, about two miles away, a bold rocky bluff may be seen, and it is in the shallow caves on the south face of this that the paintings were found.

They were first discovered by Mr. C. W. Anderson of the B. N. Railway in 1910, and, here it should be mentioned, that to the energy and scholarship of this gentleman our first introduction to these unique paintings is due. In 1911 Mr. Anderson again visited the caves and was able to make some very careful and comprehensive copies of the paintings, and much of the material obtained on this occasion figures in the illustrations. But to enable the investigation to be quite complete certain geological evidences were considered desirable, and in 1913 efforts were made to secure these. By this time, however, the caves had become the haunt of wild bees, and the party undertaking the expedition was suddenly attacked by swarms of these insects and utterly routed. This expedition was singularly well

fitted out, and it is a source of regret that it met with such an unfortunate end. The story of the precipitous retreat from the caves down the steep hillside has been graphically told by several of those who took part in this ill-fated survey, but this may not be related here. It will, however, suffice to say that the majority of the party never ceased running until they reached the railway station over 2 miles away where most of them, stung from head to foot, lay groaning, and in high fever, on the platform until medical help arrived.

A short time ago however in consultation with Mr. Anderson it was arranged that the effort should again be made to explore thoroughly the site of these paintings. In view of the last unfortunate experience, precautions were taken to fit out most of the party with protection in the way of mosquito net veils and also gloves, etc., for the hands.

Leaving Naharpali station we traversed the two miles of semi-cultivated land until the village of Singanpur was reached, which nestles immediately at the foot of the hill. A rough precipitous climb over huge rocks and through bamboo jungle brought us to the foot of the scarp in which the caves lay. Several of these excavations lie at intervals along this line, but the one containing the paintings has almost entirely collapsed and is approached only by

climbing over the great fallen rocks which originally formed its façade. Above this fallen debris, however, portions of a sort of natural platform still remain and from this the paintings may be comparatively easily studied. This platform, which is in height about 600 feet from the cultivated land below, enables one to obtain a magnificent view of the surrounding country, through which the sandy bed of the adjacent Mand River may be plainly traced.

Leaving the bulk of the party some distance below, we warily approached the cave, as the nests of bees immediately above the paintings were easily visible. Mounting the platform we were soon the object of an attack by a small reconnoitring force of these insects. Being well protected with nets, etc., we remained absolutely still, so they proceeded to attempt to sting us through our clothing. Finding this futile, and eventually realizing that we meant no harm, they finally retired, and after this preliminary skirmish we were subjected to no more annoyance from this source.

The cave in which the paintings occur is obviously only a ruin of a much larger excavation. It is possible that at some remote age the entire front fell in, thus hermetically sealing up the cave and preserving the drawings. Subsequently, at a much more recent date, the debris which had thus closed up the opening,

broke away and slipped another stage down the cliff, exposing the remains of the paintings to view. This mass of rocks and debris forms the stiff little climb which has to be negotiated before the cave platform is reached. Other and more extensive caves are to be found a short distance along the same cliff, but up to the present no inscriptions have been found in these. A complete exploration of this range might produce some interesting results. This particular site must have been eminently suitable to the inhabitants of these caves because a few hundred feet away, a little stream tumbles its way down the rocky hill-side.

Situation of the Paintings.

The paintings themselves, which are now quite exposed to view and on the exterior surfaces of the cave and cliff are all fairly close together but resolve themselves into three groups:—

(a) Those on the wall of the cave proper, (b) those on the side of a deep fissure, and (c) those on a completely exposed rock surface, but which was originally the far end of a shallow cave now entirely fallen away. The paintings seem to be in two distinct styles, being different in treatment and technique (*i.e.* pigment used), and are also possibly of two periods. Those presumed to be the older ones are more direct in their drawing,

of firmer brush forms, and the pigment used seems to have been more carefully prepared. The other paintings are more rudely daubed on, and show less care in drawing, while the paint is raw in colour and apparently not so carefully prepared. In the case of the paintings in the fissure (*b*), these are all high up beginning some 20 feet from the cave platform. Without a ladder they are inaccessible. The paintings in the cave proper (*a*) are on a level with, and also above, the eye. The most interesting series of all, those on the cliff face (*c*), commence above the level of the eye and continue irregularly up the surface of the rock for some 20 feet.

The position of the paintings on the face of the cliff is at present somewhat difficult to understand. So much of the cave has fallen away that its theoretical reconstruction is impossible. It is however likely that the cave ramified into a series of high clefts, on the upper surfaces of which some of the drawings were made. It might not have been difficult to have made the paintings in this position by means of footholds, or even rough rock-cut steps. An apparently awkwardly situated surface for the reception of their efforts is however a noteworthy and at the same time an incomprehensible feature of prehistoric man's art. Much of the painting too was undoubtedly executed in darkness and this has required explanation. Lamps burning

animal oils were probably used, and the soot from these would, after a time, disappear.

Technique.

The rock surface does not seem to have been specially prepared for the reception of the paintings. The subjects seem to have been painted on any of the fairly smooth portions of the cave, according to the fancy of the painter. What I have presumed to be the older painting appears to have sunk into the surface of the rock more than the other, but at the same time it has not penetrated far into the texture of the rock. The surface of the rock is a more or less natural pink, which when chipped indicates a skin, immediately under the pink surface, of what appeared to be a bright metallic green, like verdigris. Below this the rock was white. The pigment is undoubtedly hæmatite (iron oxide), which would be readily available in this locality. No materials or appliances, such as palettes, etc., were forthcoming from the neighbourhood of the cave. The pigment was probably applied by means of bamboo or reed brushes, the implement most likely used being a stiff blunt point, rather than a brush, and the treatment of some of the painted surfaces seems to prove this. For these surfaces are "cross-lined" over, the painter intending to fill in the interstices afterwards, but neglecting to do so. The

drawings are mostly executed in flat washes of one colour, although there are certain traces of shading and modelling, but these are very indistinct and barely discernible. The soft effect of the outline of the paintings may be due to age, or to the porous nature of the rock having absorbed the pigment. It has the appearance of what is termed "squelching" in an inferior lithographic drawing.

Subject.

The subjects are (a) hunting scenes, (b) groups of figures, (c) picturewriting or hieroglyphics and (d) drawings of animals, reptiles, etc.

(a) *Hunting scenes.*—These indicate the chase of what may be bison, and, in one drawing, possibly elephants or mammoths. One scene depicts a spirited encounter, the hunters attacking the bison with spears. The artist has most graphically drawn one individual in the act of being tossed, while others may also be regarded as either injured or dead. A small inset indicates the animal severely wounded with spears, and evidently in the act of "foundering." The tall individual like a ladder, who, by the way is the one of the most distinct and readily recognized figures on the rock surface, is not understood, but this "ladder" treatment may be noticed in several of the people depicted. Some of the men

may be armed with bows. The large elephants or mammoths, except as interesting records have little worth mentioning in their connexion. The crossed triangles on the space near these animals may represent the local "yoke," which the villagers still use for carrying their produce. These are made of crossed cords in the form of a coarse net.

One of the scenes evidently depicts a hunting tragedy, a man being hugged by a bear while another hunter is endeavouring to rescue the victim by attacking the animal in the rear with a club. The district around Raigarh is noted for bears. Tigers are also occasionally seen, and the aborigines of the district when shewn one scene at once said it represented a man being carried off by a tiger. The similarity between this drawing and a prehistoric painting from a rock shelter at Cogul in Spain is most remarkable.

(b) *Groups of figures*.—Most of these appear to be dancing or engaged in some religious ceremony. The cross-legged treatment and the upraised arms occur in almost every case. The large figure of a gesticulating man, about 10 inches in height, is spirited in action. Below is a figure probably holding a trident.

(c) *Picture writing or hieroglyphics*.—Some of these are very intricate in shape, but are largely based on the running zig-zag, generally

identified with the Egyptian hieroglyphic for water. The figure of what may represent the rising or setting sun is painted in a greyer pigment than most of the other subjects. A flaw in the drawing of the semi-circle may be due to a movement of the rock strata, subsequent to the painting having been made. It is not a crack. This may be interesting to the geologist. To my mind the most interesting picture-writing is what I identify as a water-fall. After I had interpreted it in this way, a water-fall, somewhat of this general outline, was located in the same range of hills some 4 miles away.

(d) *Drawing of Animals.*—Most of these are life-like and spirited. The lizards are distinctly good, while what may be a "Sambar" has some natural characteristics.

Artistic Character.—The artistic character of these paintings is not high, it is hardly of the same quality as the prehistoric cave paintings of France and Spain. But as already indicated some of the drawings shew the same method of brush-work as the more primitive paintings at Cogul in Spain. The chief artistic feature of these Raigach paintings lies in their spirited expression and spontaneity of treatment. A strong family likeness may be noticed between these cave paintings and the patterns on what is called the "cross-lined" pottery of prehistoric Egypt. In these the men are represented in the "triangular

style," a method of drawing adopted by many primitive races of ancient and modern times.

Geological Evidences.

At the suggestion of Dr. (now Sir Henry) Hayden a number of geological objects were collected, and are now under investigation. They are (a) samples of the cave wall, (b) pieces of the platform, and (c) a number of small specimens taken from the soil which formed the floor. In his preliminary acknowledgment Dr. Hayden says with regard to the last named (c) that these "flints" are really agates and have certainly been chipped and probably transported from a considerable distance, so that the find is presumably a genuine one.

APPENDIX II.

Indian Rostrocarinates.

At my request, my young friend and student of the senior M.A. Class, Mr. Rajendrakumar Bhattacharyya, B.A., has given me a detailed study of the rostrocarinates in the Indian Museum as follows :—

During the past few years, many researches by the most distinguished scholars have led to the discovery of a good number of flint implements in Europe, proving the existence of skilled workers of flints in Pliocene Age. Mr. J. Reid Moir has discovered more than 39 flints from Ipswich, 10 from the Red Crag of Suffolk, the River Gravels in the Thames Valley and other places. Sir E. Ray Lankester, K.C.B., has written lengthy papers with good photographs of each of them. He has tried to trace the evolution of earliest Palæoliths from these flints and he has given the implements of almond shape, and elongated kite-shape, the name of "Rostrocarinate."

Though some refer to the action upon flint of frost, of territorial water, of glaciers and frost,

of the pressure of beds of sand, yet Sir E. Ray Lankester remarks that this action is due to purposeful blows delivered by human hands in the primitive age. Another account of the flint implements has been published in *Nature*, July, 1921, from which I have gathered some details about quartzite flints of Rostrocarinates discovered by Mr. Reid Moir from Uganda, which have also thrown much light on the existence of Rostrocarinates in a continent other than Europe. Up till now, we had been certain fully that it was in Europe only which had furnished us with Rostrocarinate implements and other Palæolithic flints and stone implements discovered by western scholars and nowhere else. But with the process of time, the flood of light of advanced knowledge and study about these things I was directed to launch upon the investigation of such stone implements in India and I found some 200 stone implements, preserved in the archaeological gallery of the Calcutta Museum, unmistakably of this Rostrocarinate type.

Rostrocarinate as applied really to flints fashioned by human hands, implies an implement having a broad posterior region called "stern" narrowed anteriorly to a quasi-vertical cutting edge which looks like a strongly curved point forming a beak of an accipitrine bird. This form looks like the "prow" of a boat being turned upwards when this stone is held with the beak in front. I

find an upper or dorsal plane, a lower or ventral plane and right and left lateral surfaces narrowed to the beak called "prow" while in the posterior portion we find a nodule called "stern" gradually narrowed down to the beak forming keel or carina of the boat. By blowing off some flakes on two lateral sides and some flakes below the beak in the ventral portion towards the anterior, the dorsal plane looks like the keel of a ship. But Sir E. Ray Lankester remarks that three and only three blows, one to the left, one to the right side and another to ventral plane below the anterior point of prow, are enough to form a "Rostrocarinate." I have also investigated this fact that it is this above method which helps one to shape a Rostrocarinate implement though it looks a very rough one. It is also interesting to know how Sir E. Ray Lankester has described the process of picking up nodules, handling in a particular manner and of detaching flakes therefrom. It is unnecessary to deal with this process at length.

Though it is very difficult to give detailed accounts of each of the 15 stones I have picked out from the archaeological gallery, I will here try to dwell upon the Indian Rostrocarinates arranging the best specimens in an upward evolving series.

The Cudappah Rostrocarinates.

Coggin Brown's Catalogue No. 5697.—This is the earlier, I think, amongst those

implements, as it has been worked very roughly. Ventral plane still remained, worked roughly on the two lateral sides with rough flakes struck off, the keel beginning from the $\frac{3}{4}$ th portion of the stone towards the stern; some flakes also struck off from the stern nodule but towards the beak, it is slightly broken at the point.

Ibid, 5699.—It has plain ventral surface though the lateral sides are little worked out and the keel is indistinctly marked with beak perhaps broken. It has been aberrated by water current slightly, the keel beginning from more than $\frac{1}{4}$ of the dorsal surface.

Ibid, 5687.—It has a long keel. Flakes have been struck off for the first time from both the lateral sides. Ventral plane is very smooth, indicating no work here. It looks like half of a boat broken, not well developed. Work is done very roughly on all sides.

Ibid, 5739.—Its beak has been broken down by some accident, the keel being present on the dorsal plane, lateral left side flaked greatly. In the ventral plane there is no ridge but a flat surface; a great flake struck off from lateral left side and worked towards the beak, the whole dorsal plane looks smooth without any marked rough ridges. Posterior portion is prominent.

Ibid, 5752.—Original form, keel prominent with a great portion of the nodule remaining, a

little portion below the beak struck off, with the beak point broken down perhaps, the lateral sides worked off. Ventral plane has a level surface.

Ibid, 5810.—The carina is prominent beginning from the middle of the dorsal plane, the strong curved point forming the beak of an accipitrine bird. This form looks like the dorsal surface, two or three flakes blown off, the dorsal plane is not well marked, on both the lateral sides some flakes chipped off by the blows delivered thereto. On the ventral plane, the left lateral side has been worked well with its right side unworked and only the beak point slightly worked.

Ibid 5832.—It has its lateral sides worked off. On the ventral surface left lateral side has been slightly worked. The dorsal plane is present with the carina extending from the midway. Towards the posterior point, only two flakes struck off. On both sides, beak is prominent but bent to the right.

Ibid, 5734.—The keel has been marked prominently; from the sides of the keel many flakes have been blown off and also from the posterior portion which is fitted for holding with the hand. Ventral plane is greatly worked, its beak is turned to the right and is prominent and the two lateral sides have been greatly narrowed downwards towards the beak with the beak

bending towards the ventral surface anteriorly, which has not been worked at all, only a part of the ventral portion on the left side has been flaked off. It looks like a typical Rostrocarinate.

Ibid, 5805.—It is a very prominent well-shaped Rostrocarinate with a lengthened keel well marked measuring $\frac{3}{4}$ of the whole stone with a nodule remaining, a big flake struck off from the right lateral side though the ventral plane is little visible as it has been worked well throughout. It has been greatly worked on the right lateral side, the beak being bent to the left.

Ibid, 5721.—The carina reaching up to the $\frac{3}{4}$ ths of the dorsal surface with its lateral right sides worked to form a beak which has been probably broken off by accident; all the sides worked well; more flakes struck from the left lateral surface as well as on the dorsal point without any dorsal platform; a carina-like ridge has been formed on the ventral plane.

Ibid, 5838.—It has a big nodule in the stern, the dorsal remained with beak broken off, keel little marked, many flakes struck off below the beak on the ventral side. Towards the stern, ventral plane is still visible though it has been worked out towards the beak.

Ibid, 5663.—It has the most prominent beak turned to the right, the posterior portion well fitted for handling, the left lateral side gradually turning towards the beak. A true Rostrocarinate is

existing here, both the right and left lateral sides have been worked out well to form a prominent beak. In the posterior end, 4 flakes have been blown off from the dorsal and ventral surface.

Ibid, 5725.—Ventral platform is present in the middle though sides around have been worked out; keel towards the right lateral side, not in the middle, reaching up to half way of the dorsal surface. The ventral surface on both sides is well worked, the dorsal platform is well marked.

Ibid, 5780.—On both the left and right lateral sides, flakes have been blown off to form the required beak, on the ventral and dorsal surfaces, 3 flakes gone off with the carina reaching midway and with a similar ridge formed in the ventral plane a nodule still remains. The ventral surface has not been worked towards the stern.

Ibid, 5775.—One of the flints probably approximating the *Coup-de-poing* with the carina more towards the right lateral side and with the beak turned towards the ventral plane and the beak being prominent, partially bent to the right.

The ventral platform is marked towards the posterior end. On upper and lower surfaces towards the anterior direction, both the sides are worked off, the flat posterior part is well marked as the old portion is still left.

We must here point out that though there are some 4000 to 5000 Palaeoliths in the Indian Museum collected from all parts of India, Rostrocarinate types are forthcoming mainly from Cudappah and scarcely from anywhere else."

NOTICES OF PREHISTORIC FINDS IN INDIA.

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