

Hand Adzes in the Palaeolithic Culture of India

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IN THE nomenclature of Lower Palaeolithic tool typology, the term "hand adze" was probably introduced by Movius (1943: 351). This type has actually been included within the general broad family of chopper and chopping tools. (Choppers and chopping tools are not actually two tool families. Rather they belong to one broad family, *Chopper*, which has two subfamilies: unifacial and bifacial. The main differences between them are the arrangement of flake scars and the type of working edge formed thereby.) Nevertheless, the name suggests that the hand adze is neither a chopper nor a chopping tool, but a distinct type. A major part of my paper will be devoted to examining this anomaly of terminology.

In describing the Anyathian culture of Burma, Movius has given special attention to the hand adze as a type, which in this context is absolutely appropriate. This is mainly due to the fact that this specific type was primarily being introduced into the inventory of Lower Palaeolithic tool typology. However, in later or secondary prehistory, the type *adze* has its own identity. Neolithic adzes have been differentiated from *axes* of the contemporary period basically on the two characteristic features, while other features of the two allied types are similar. Technomorphologically the neolithic axes are attributed to a group of celts of varied shapes, though elongated forms are generally prevalent, and the lateral margins are semi-parallel. At the cutting edge, one surface, mostly dorsal, is beveled while the opposite surface is more or less flattened. The sectional view along the long axis represents an acute angle which is formed by the intersection of a vertical straight line along the flat surface and a sloping oblique line along the opposite surface. The sloped surface was intentionally prepared by chipping and subsequent grinding and/or polishing. The adjoining surface was also worked in such a way as to flatten it. Functionally (mainly on the basis of assumption), the adze is different from the axe. The former serves the purpose of scooping while the latter is used for hacking and cutting. For better manipulation, the adze is hafted in such a way that the shaft line and the line

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along the cutting edge are perpendicular to each other. On the axe both lines are in the same plane.

The terms "hand adze" and "adze" indicate a chronology; that is, they belong to the palaeolithic and mesolithic-neolithic periods respectively. In the present discussion, which is concerned mainly with the palaeolithic period, the neolithic adze is considered not only for better understanding or for drawing analogies, but also because it reveals a continuity of certain functional types. Movius (1943: 350) suggests:

. . . nearly all the implements in fossil wood, from earliest times through the Neolithic, are of the same fundamental type. But, although heavy forms are found associated with the Late Anyathian and Neolithic cultures, there is a decided tendency, in spite of the difficulties imposed by the fossil wood, to develop smaller tools.

I feel that the basic types were invented to meet primary functional needs and those types continued through different periods of time. During this process of continuation, necessary changes in form took place to increase convenience of use. Traditional elements, which were sometimes conservative, gave rise to related forms that maintained a continuity with the earlier ones. Size differentiation from larger and heavier to smaller and lighter appears to be an intrinsic pattern of development in the typological concept of prehistoric implements. Probable explanations in its favor may be refinement, use advantages, economy of raw material, etc.

THE TERM "HAND ADZE"

In describing the terminology of archaeological materials from eastern Asia and northwestern India, Movius (1948: 349) based his argument "*entirely on the form and technique of manufacture of the tools themselves*" (italics mine). He adds, "These, rather than any hypothetical functions, are considered to be primary criteria." Even in a subsequent study Movius (1949: 35) expressed, verbatim, the same point of view.

In defining hand adzes, Movius (1943: 351) states that "they are worked only on the upper surface of either one or, in some cases, of both ends. . . ." He advocates the following definition for the hand adze:

. . . a hand-adze is a type of chopping implement of roughly tabular form. It is made on a core and has a straight, slightly rounded or even a pointed cutting edge, which forms a right angle with the long axis of the implement. Hand-adzes may be regarded as a special class of chopper, but of square or rectangular rather than of round or oval form. The secondary working along the edge is restricted to the upper surface. (1943: 351)

Movius (1948: 349-350; 1949: 36) found the hand adze to be a new class of implement. He admits that this is completely an artificial category, of least significance from the functional point of view, and that the main emphasis is given to shape and flaking technique. He did not elaborate much on the characteristic features of the hand adze: "Preparation of this type produces the characteristic single-beveled, adze-type of cutting edge, in contrast to the double-beveled, or

bifacial (V-sectioned), axe-type of cutting edge. Hand-adzes are usually made on cores . . . (1948: 350)."

Movius' later type description showed no major change on the basis of technomorphological studies:

A core implement of tabular form with a cutting edge that forms a right angle with the long axis of the tool. The flaking is restricted to the *upper surface* of one end. This results in the production of a single-beveled, adze type of cutting edge, in contrast to the double-beveled, or bifacial (V-sectioned) axe type. (1954: 261)

THE HAND ADZE IN INDIA

Without at the moment modifying Movius' hypothetical definition of the hand adze, I present Indian data on the same implement type. From the reports it appears that hand adzes are very rare in India. However, from a general observation and examination of Indian palaeolithic finds, it seems that hand adzes are few but not extremely rare as appears from the literature on Indian palaeolithic archaeology.

In India the occurrence of the hand adze was first reported by Sankalia (1946: 8-9). He collected a single hand adze from the Sabarmati valley. It was "found *in situ* among the huge gravel conglomerate blocks lying on the narrow talus," near Aglod. This gravel bed, which yielded the hand adze in association with other implements of Abbevillio-Acheulian type, is situated between lower lateritic bedrock and upper reddish silt.

Most of the features found on the hand adze unearthed from Aglod are comparable with those given in Movius' definition. The tool is made on a quartzite pebble core which is flat and tabular. On the dorsal surface there is a large central flake scar. The butt end is also covered by a sloping flake scar which intersects with the irregularly flat ventral surface. A concave working edge is formed by the intersection of the steeply flaked dorsal surface with the flat or slightly concave (from side to side and antero-posteriorly) ventral surface covered by the large flake scar.

A number of hand adzes have been found among the collection stored in the Prehistory Museum of the Department of Anthropology, Calcutta University. They were collected from different parts of India, both north (e.g., Rawalpindi, belonging to the Soan culture area) and south (e.g., Madras). None of these finds has been reported so far. This reveals that, despite its presence, the hand adze has gone unnoticed in the Indian context. During my work in different parts of eastern India I discovered a few hand adzes. The present work on Indian data is based mainly on my own collection and a few sporadic remains which I have identified.

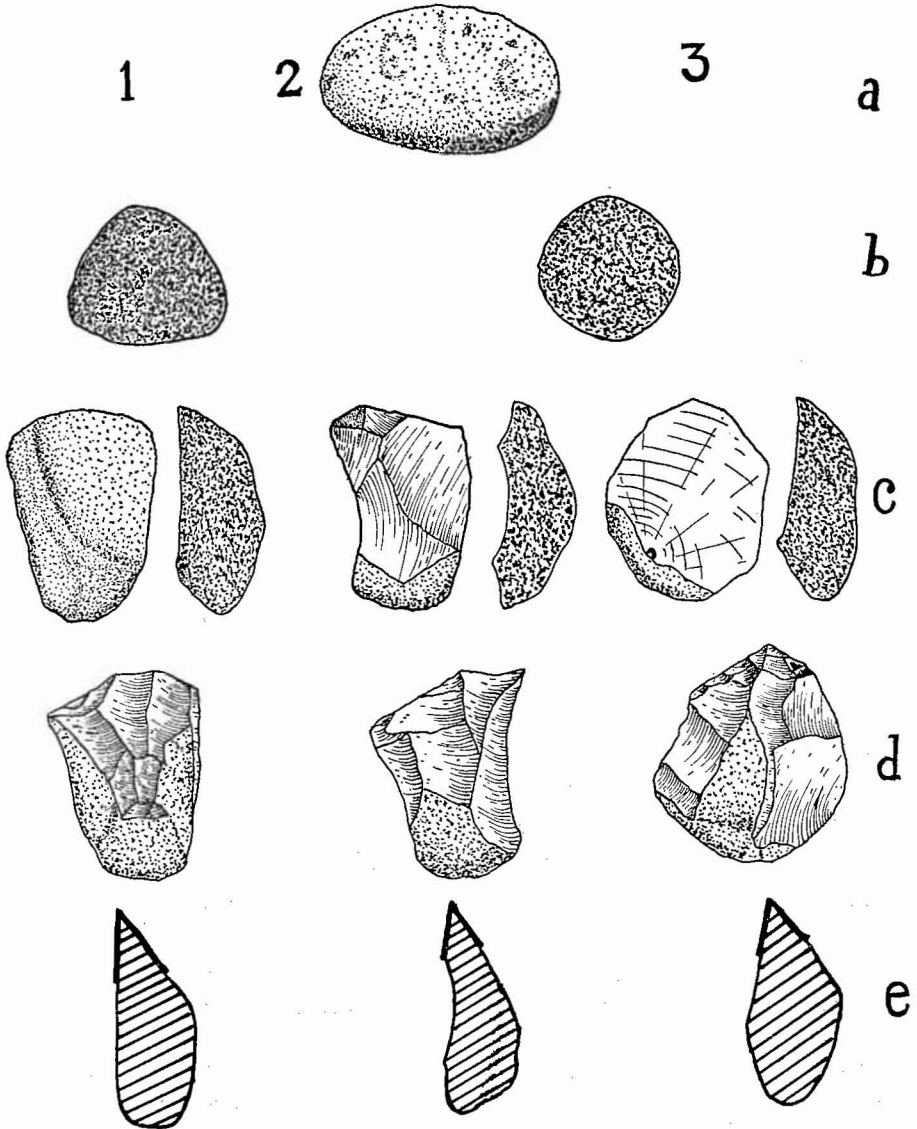
The hand adze as a type may be divided into three subgroups, mainly on the basis of the kind of raw material used.

A. Hand Adzes on Pebble

Hand adzes on pebble are found in talus/scree deposits or from areas near such deposits. Talus pebbles were mostly used for manufacturing the implements. Such pebbles are generally elongated, with a flat ventral surface and a rounded dorsal surface (Fig. 2a). The working is concentrated mostly at one end of the dorsal surface (Fig. 1d). The central portion of the dorsal surface, the butt end, the

posterior half of both lateral sides and the whole ventral surface are covered by pebbly cortex (Fig. 1c).

The major worked area is initially covered by primary flaking. This flaking also serves the purpose of making a working edge. At times secondary flake scars are found; they are concentrated at the proper working edge only. Primary flake scars on the anterior half of the upper surface are fan-shaped and diverge from a central



Figs. 1-3 Technical features of hand adzes made on pebble (1), core (2), and flake (3).

a, pebble; *b*, transverse cross-sections of flat-based and round-based pebbles; *c*, ventral surfaces of hand adzes on pebble (1c), core (2c), and flake (3c), and the respective profiles before working on dorsal surface; *d*, worked dorsal surfaces of hand adzes on pebble (1d), core (2d), and flake (3d); *e*, longitudinal sections of hand adzes on pebble (1e), core (2e), and flake (3e). Approximate scale 1:5.

point. The flake scars are very steep, and the worked dorsal surface with sharp beveling intersects the flat ventral surface to form the sharp cutting edge (Fig. 1e). The shape of the cutting edge is generally convex in outline, though the degree of convexity varies from one implement to another. The convex cutting edge was conveniently prepared for the convex shape of the pebble extremity at the same end. The outline shapes of the original pebble and of the final working edge of the hand adze differ only in smoothness. The former is smoothly convex, while in the latter the convexity is formed by several straight lines of unequal length. Maximum length, breadth, and thickness of this group of hand adzes are from 17.7 to 18.6 cm, 9.9 to 11.0 cm, and 8.7 to 9.8 cm respectively.

B. Hand Adzes on Core

Unlike hand adzes on pebble, these implements are flaked all over—possibly to produce the necessary shaping. From the collected implements it is nearly impossible to recognize whether they were made from pebbles or from tabular cores. Field data reveal that pebbles of different sizes were preferred for making other types of implement during the same period. On the basis of this information, it may be suggested that these too were originally pebbles which were not very suitable for making hand adzes. Primary flaking is the preliminary stage of shaping to make the pebble a suitable blank. The ventral surface was flaked all over to make it flat (Fig. 2c), and the lateral sides were made steep in the same way. Given the presence and purpose of primary flaking, it would not be illogical to say that in the absence of flat pebbles, well-rounded river-borne pebbles were used.

The second stage of working, found only at the cutting edge, resembles flake scars on hand adzes made from talus pebbles. Secondary shaping is more prevalent in this group, and the resultant flake scars are long, narrow, and steep. They range in length from 13.7 to 20.3 cm, from 10.0 to 12.5 cm in width, and from 3.8 to 4.7 cm in thickness. The comparative thinness of tools in this group results from knapping of the cortical surface to make the ventral surface flat.

In summary, hand adzes on pebble have some traits in common with those on core. It is still to be decided whether these comprise one subgroup or are two separate subgroups.

Hand Adze on Flake

The hand adze on flake is a distinct subgroup. Pebbles selected for detaching a large flake are naturally large and provided with a suitable platform. Here the technique is somewhat modified to obtain a blank with a flat ventral surface. Free flaking, especially the anvil technique, probably was used to produce a large and tabular flake (Fig. 3c). Subsequent working on the dorsal surface is similar to that seen on other hand-adze groups. The presence of steep flake scars results from the use of the flat ventral surface as a striking platform. Cross sections are angular, unlike the cortex form found in other subgroups of hand adzes. The length and the thickness of this type of implement are relatively less than the comparable dimensions of hand adzes on core and on pebble. The number of adzes belonging to the flake subgroup is very small.

On the chronological and cultural scale, hand adzes from India appear to belong

to the Acheulian I of the Chopper-Biface element (Ghosh 1966). In eastern India, the bed from which they come is the lower gravel conglomerate or its counterpart, the lower level of secondary laterite deposits. (In some places the lower gravel conglomerate is present, while in other areas it is replaced by secondary laterite.) Both levels may be attributed to the early part of the Middle Pleistocene.

All of the observations stated above agree with those of Sankalia (1946: 8-9). The hand adze from the Sabarmati valley was also found in gravel conglomerate. The same bed yielded an Abbevillio-Acheulian industry. A few hand adzes from other localities in India lack stratigraphic data. Their technological features are suggestive of the Indian Abbevillio-Acheulian technological level.

On the basis of the foregoing facts drawn from Indian data, the hand adze may be defined as a specific and separate class of tool made on a large pebble or core but rarely on a large flake. The kind of raw material used was dependent upon availability. Flat pebbles, mainly on quartzite, were mostly preferred. The shape of the implement varies from subtriangular to rectanguloid. Flaking for functional elaborations is found to be concentrated only at the anterior half of the dorsal surface. These flake scars are elongated and steep. Other flake scars, if present, are simply for shaping, that is, flattening the ventral surface, side trimming lateral margins, etc. The cutting edge is generally convex (though straight or concave forms are not altogether absent), and is formed by the intersection of the flat ventral surface and the highly beveled dorsal surface. Sometimes the cutting edge is made sharper by a few secondary flakings. The longitudinal section at the distal end resembles an inverted half-V, and the angle at the cutting edge is acute. The size, shape, and nature of the cutting edge indicate that possibly it might have been used for scooping and breaking particular parts.

This definition both agrees and disagrees with Movius' definition. Originally Movius (1943: 351) included the hand adze in the broad family of chopper and chopping tools. I do not find any justification for such an inclusion, as the hand adze and chopper/chopping tool differ from each other in form, technique, morphology, etc. In his later work Movius (1948, 1949) considers the hand adze to be a new class of implement. The features of the hand adze pointed out by Movius are appropriately characteristic and may be considered to identify the type.

Technologically, the unifacial chopper (the "chopper" of Movius) and the hand adze have closer affinities; mainly, the longitudinal section at the cutting edge does not differ much between the two. The cutting edge proper and the proportion between the major and minor axes are distinctly different. Because of the shallowness of the flake scars, the cutting edge in the hand adze is never jagged. The greater length of the major axis in the hand adze has an impact on thrust, and possibly serves manipulative and functional needs.

I believe that Movius also considered these details, but still could not be very sure about classification into types. Such tentativeness when new types first appear is not at all unlikely.

In India, the hand adze is found to be an integrated typological trait in the Chopper-Biface element with Pebble-Core tradition. Aside from association, the technological and morphological features of the hand adze are akin to other types of the Chopper-Biface element. So far the occurrence of hand adzes is neither widespread nor frequent. They may be restricted to certain culture areas, and their

number is very low in comparison to other associated types. Possible explanations of the facts of their occurrence are as yet lacking.

HAND ADZES IN SOUTHEAST ASIA

Hand adzes were found for the first time in Burma, where they have different subgroups that come from different successions and their phases in Anyathian culture (Movius 1943). The classification of hand adzes in Anyathian culture is very extensive, though the criteria considered are varied. In Early Anyathian 1, all the hand adzes are steep-ended, but the cutting end may be pointed, round-ended, or square-ended. In Phase 2 the hand adzes are single-ended and occur in four different sizes: massive, large, medium, and small. Others are double-ended, and they are either simply double-ended or inverse double-ended. The cutting edge is sometimes concave in outline, and concave-ended hand adzes form a separate category. Besides those of the double-sided type where the edges are opposite, hand adzes are found that have adjacent sides worked. The latter are also known as choppers, but this nomenclature is not very satisfactory. There are few types of hand adzes in Early Anyathian 3, and these are mostly tabular.

Excepting only two specimens made on flake of silicified tuff, hand adzes are absent from Late Anyathian 1. The two implements are more like choppers than hand adzes. In Phase 2 of the Late Anyathian the hand adzes have a scalloped edge. Small steep-ended adzes, approaching end scrapers, are also present.

In Southeast Asia the hand adze has also been reported from the Tampanian industry of Malaya (Walker and Sieveking 1962). Hand adzes are very few in number in the total assemblage. Of eight specimens (though not all of them are definite), only one agrees with Movius' definition. All of them are made on flake, usually cortex flake. A similar type of hand adze, on pebble flake, is also found in India. Walker and Sieveking feel that because these specimens are made on flakes instead of cores, it is wise not to differentiate them as hand adzes. It should be determined whether or not the flakes were intentionally made to achieve a very flat ventral surface. To prepare such a flake is more convenient, if the technique is known, than to make the ventral surface flat by extensive flaking. The Tampanian tool makers perhaps knew this technique and made hand adzes in this way. In other words, it may be said that they had a similar tradition, but the specific technological tradition for making hand adzes was somewhat different from that of India. The picture that emerges is interesting.

The distribution of hand adzes is quite restricted in both space and time. In general, they are found in South and Southeast Asia. Specifically, they are found only in Burma, Malaya, and the northeastern and western parts of peninsular India. The type forms an important typological trait in Burma, but occurs less commonly in areas of Southeast Asia other than Burma. Whether or not hand adzes have any relation with a particular tradition is still to be verified. Areas with two distinct technotypical traditions during the Palaeolithic period were first pointed out by Movius (1948: 408-411). The first tradition, namely, Chopper-Chopping tool, covers the Southeast Asian countries including northwestern India. The other one, the Biface tradition, is found in the west and in peninsular India. The hand adze does not actually fit into this concept of traditional areas. It occurs in both of these

traditional areas of the palaeolithic culture complex, and as such it cannot be considered an integrated trait complex. From the present state of knowledge it cannot be inferred whether the presence of the hand adze has any relationship with the environment as well as with functional need. Such relationships appear to be unlikely, as, except for a few stray finds, the hand adze has not yet been reported from other places in peninsular India where several common types associated with hand adzes are present. The probability of isolated and local phenomena cannot be ruled out.

CONTINUITY OF THE HAND ADZE

Except in Burma, hand adzes may be dated to the early part of the Lower Palaeolithic in most of the places where they have been found. In the Anyathian culture they are found to have continued into succeeding phases. It appears that hand adzes were transformed into other types through time. I personally think that cleavers, found in the later part of the palaeolithic culture of India, are derivatives of hand adzes, as revealed by general form and function. (In the grading of one class of implement into another technology and functional need play important roles.) It is also true that during the period when cleavers were prepared, the technological level had changed, and the workmanship together with the resultant types had developed to a considerable extent. Movius (1948: 361) has suggested that the hand adze is an intermediate formal type between the chopper and the proto-hand axe. It is to be noted too that the chopping tool also originated in the chopper. In the hand adze the execution is different and resembles that of cleavers. In areas where cleavers are absent this kind of continuity does not appear to be logical, and perhaps further development of the hand adze into other forms became stunted.

Regarding the continuity of the hand adze type, Movius (1943: 374) has not clearly set forth the connection between the hand adze and the end scraper. He has pointed out that the end scraper of Late Anyathian 2 belongs to the hand adze family. In fact, this is not always true—the diminutive forms were made by a different technique and were perhaps used for some other functions. In spite of certain general resemblances, points cannot be considered as belonging to the hand axe family; they are two distinct tool families. Both technotypology and functional morphology are important criteria for the differentiation of tool families.

Hand adzes, cleavers, end scrapers, and mesolithic-neolithic adzes have some common characteristics. It may be suggested that all of these types are related by a continuous lineal order of succession, mainly in the form of industrial traditions. Further work on these tool families, including their variations, may lead to some idea of analogous tradition or function behind their common forms.

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