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The concept of ethno-archaeology

Why ethnoarchaeology?

Archaeological interpretation is founded and ultimately depends upon analogy – a form of inference that holds that if something is like something else in some respects it is likely to be similar in others. We use it to recognize a flint flake as an artifact or, built into a long chain of reasoning, to impute a tributary mode of production to early civilizations (Trigger 1993: 45–6). Archaeologists draw upon their lives and upon everything they have read, heard about or seen in the search for possible analogies to the fragmentary remains they seek to interpret.

By the mid-1950s attention was turning to a new range of questions about the past, to approaches to understanding the patterning in artifact assemblages that would lead beyond cultural chronologies and time-space systematics, the organization of cultural variety into convenient temporally and spatially limited packages such as phases and cultures (Willey and Phillips 1958).

But as archaeologists turned to study cultural evolution and to the reconstruction of human behavior and past environments, they realized that common-sense reflection on their own experiences and on the wealth of historical and ethnographic information on the world's peoples could no longer be held to constitute an adequate basis for analogical inference. Why? Because the cultural range of Us was too limited for plausible analogical extrapolation to peoples living in distant times, places and contexts, and because descriptions of Others either paid little attention to their material culture or emphasized the typical, whereas archaeological remains constantly confront us with variation in space and time that provides clues to past sociocultural behavior.

The inadequacy of ethnographies to provide the information needed by archaeologists can readily be tested by means of an exercise suggested by Karl Heider (1961: 62) in which one first reduces "a documented living culture into archaeological remains," and then asks someone else to "develop a reconstructed culture from these remains." Such experiments, while useful in rendering apparent the analyst's assumptions, lead always to a reconstruction of the original so patchy and impoverished as to be unrecognizable.

Recognition of the need for ethnographic material on which to base analogies gave rise to a new subdiscipline: ethnoarchaeology, the ethnographic study of living cultures from archaeological perspectives. Ethnoarchaeology is neither a theory nor a method, but a research strategy embodying a range of approaches to understanding the relationships of material culture to culture as a whole, both in the living context and as it enters the archaeological record, and to exploiting

such understandings in order to inform archaeological concepts and to improve interpretation. This is but one of many definitions. A sociocultural anthropologist might focus on a rather different aspect: ethnoarchaeology as a form of anthropological inquiry that gives a privileged position to the evidence of material culture and behavior relating to it.

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The birth and definition of ethnoarchaeology

The term "ethno-archaeologist" was coined by **Jesse Fewkes** (1900: 579) in a paper on Native American migration traditions. He used it to mean an archaeologist "who can bring as preparation for his work an intensive knowledge of the present life" of the people whose prehistory is under investigation.

Donald Thomson's (1939) paper on "The seasonal factor in human culture" is the fist that, retrospectively, can be classified as ethnoarchaeology in the modern sense of the term. Thomson showed that tools, settlement patterns, and other cultural characteristics associated with the contrasting wet and dry season adaptations of the Wik Monkan tribe of Australian Aborigines differed so greatly that archaeologists would be likely to interpret their material remains as representing separate cultures.

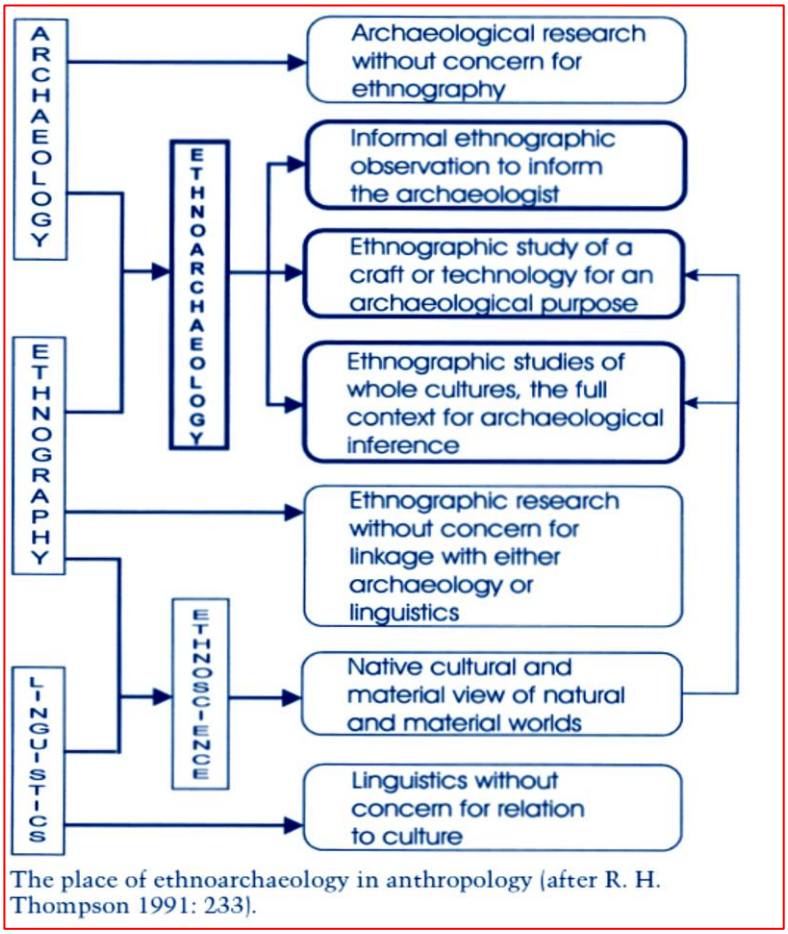
The formal emergence of ethnoarchaeology as a subdiscipline of anthropology is best dated to the appearance in 1956 of a paper by Maxine Kleindienst and Patty Jo Watson entitled "Action archaeology: the archaeological inventory of a living community". This called on "the archaeologist to take to the field of living communities with his own theoretical orientation and gather the necessary information. This would include data on artifact function and typological variation, butchering techniques, subsistence, social structure, and an "attempt to define where and in what degree the total non-material culture of the community could be inferred from the information gathered."

Although their idea caught on, the name and nature of the subdiscipline was for a while disputed. In 1957 **Joseph Bauxar** had been the first to use, but in Fewkes's sense, the term ethnoarchaeology in the title of a paper (1957a and b), whereas Richard Gould (1974: 29) used "living archaeology" to refer to "the actual effort made by an archaeologist or ethnographer to do fieldwork in living human societies, with special reference to the' archaeological' patterning of the behavior in those societies." For him and others (e.g., Janes 1983: 4) ethnoarchaeology was "a much broader framework for comparing ethnographic and archaeological patterning."

Oswalt (1974: 6) proposed the term "archaeoethnography" for the eliciting of ethnographic information relevant to the interpretation of archaeological finds, while Pastron (1974) referred to "recording the types of data regarding living peoples that can be used as comparative material by archaeologists" as "ethnographic archaeology."
Despite the unfortunate asymmetry between ethnoscience - study of the science of people who are not part of a world civilization- and ethnoarchaeology- which all agree is *not* the study of native archaeologies- the term ethnoarchaeology prevailed though with continuing disagreement as to its scope.
Ethnoarchaeology's relationships, as seen from a typically American anthropological perspective, to archaeology, ethnography, linguistics, and ethnoscience are represented in Figure below borrowed with modifications from **Raymond Thompson** (1991: 233).

Ethnoarchaeology is seen here as a combination of archaeological and ethnographic approaches. It

may be undertaken informally, involve systematic study of a single domain of material culture, or involve "the study in depth of significant parts of a living culture or even of an entire culture." Ethnoscience, partaking of ethnography and linguistics, contributes to ethnoarchaeological research by taking account of native categories and concepts.



The place of ethnoarchaeology in anthropology (after R. H. Thompson 1991: 233).

Thompson did not include physical anthropology in his diagram, perhaps because ethnographic studies that involve research into human biological characteristics are better characterized as human or evolutionary ecology even if they are highly relevant to archaeologists at a theoretical level (e.g., Hurtado *et al.* 1985).

Susan Kent (1987: 33-43), an ethnoarchaeologist who has specialized in activity area research first in the American Southwest and later in the Kalahari , distinguishes between:

1 anthropological archaeology - "a holistic approach that utilizes the various fields of anthropology in order to obtain a description of an archaeological group that is as complete as possible ... Its goals tend to be culture historical in nature . . "

2 archaeological ethnography (cf. Watson 1979a) - the provision of "potentially useful ethnographic material for analogy as aids in the identification of archaeological descriptions ... especially valuable as a source of non-ethnocentric analogies and identifications," and

3 ethnoarchaeology- the formulation and testing of "archaeologically oriented and/or derived methods, hypotheses, models, and theories with ethnographic data. Ideally, one starts with archaeological research interests, goes to ethnographic data for formulation and/or testing of hypotheses, models, and/or theories about these interests, and then returns to the archaeological record to implement the understanding gained from the ethnographic data."

She also defines

4 ethnographic analogy as "observations of historic groups used to identify the archaeological record," whether based upon archaeological, ethnographic or other accounts.

first three definitions as too restrictive (and the last as misleadingly phrased in that analogy is a form of inference). Anthropological archaeology is better defined more broadly as archaeology that allies itself with the social sciences rather than with science or the humanities. Kent's archaeological ethnography and ethnoarchaeology can be seen as aspects of a single research orientation, and ones that are in practice difficult to keep separate. After all we use" archaeology"

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to include both work in the field and subsequent analysis.

While her distinction is analytically valid, when archaeological ethnography provides material for ethnoarchaeology, it makes little sense to insist on the use of both terms if, in the course of a single day, field or analytical work has to be conceptualized as switching back and forth between the two modes. Rather than legislate terminology, we prefer to follow current usage, and in this book, conflating Kent's two categories, use ethnoarchaeology to mean what Robert Ascher (1962) called "ethnography for archaeology," research that includes an ethnographic component and is carried out with the analogical needs of the archaeologist in mind. Such a reading conforms with the usage of the majority.

Different definitions of ethnoarchaeology

Michael Stanislawski (1977: 379): the direct observation or participant observation study of the form, manufacture, distribution, meaning, and use of artifacts and their institutional setting and social unit correlates among living (generally nonindustrial) peoples.

Richard Gould (1978c: vii): ethnographic research for an archaeological purpose, linking material remains to the human behavior from which they resulted.

Michael Schiffer (1978: 230): the study of material in systemic context for the purpose of acquiring information, both specific and general, that will be useful in archaeological investigation.

Christopher Hanks (1983: 351): the application of archaeological methods to ethnographic data

Alain Gallay and Eric Huysecom (1989: 49, our translation): archaeology's science of reference. While archaeology allows one to reconstruct historical scenarios and tries from them to deduce typological regularities, ethnoarchaeology tries to discover through observations made in the present the cause of the observed regularities by studying the mechanisms that lie at their origin.

Edward Staski and Livingston Sutro (1991: 2): the study of ethnographic or historical situations, either tluough firsthand observation or documentary research, to extract information useful for understanding the relationships between patterns of human behavior and material culture in all times and places.

William Longacre (I99lb: 1): the study *by archaeologists* of variability in material culture and its relation to human behavior and organization among extant societies, for use in archaeological interpretation.

Rudiger Vossen (1992: 4, 5, our translation): the connecting link between the cultural sciences of ethnology and archaeology ... From a methodological perspective, ethnoarchaeology embraces two different research approaches: "living archaeology" and "experimental archaeology."

Farid Khan (1994: 83): study of modern (contemporary) and traditional processes which result in specific phenomena which might also be observable archaeologically.
Scott MacEachern (1994: 245): the intersection of living people and archaeological constructions .

Victor Fernandez Martinez (1994: 137, our translation): There presently exist two definitions of ethnoarchaeology: one in a broad and the other in a restricted sense. The first includes all the

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connections between anthropology and archaeology . The second definition refers exclusively to ethnographic *fieldwork* carried out by archaeologists (or by anthropologists with archaeological training) with the same purpose as the former, that is to say to assist in archaeological interpretation ... in practice both approaches intermingle.

Carol Kramer (1996]: ethnographic fieldwork carried out with the express purpose of enhancing archaeological research by documenting aspects of sociocultural behavior likely to leave identifiable residues in the archaeological record.

History of ethnoarchaeology

The bibliography of ethnoarchaeology and related studies (**David *et al.* 1999**) has for some years been divisible into three main periods:

1. An Initial period running from 1956, the year of Kleindienst and Watson's" Action archaeology," to 1967

2. A New Ethnoarchaeology period starting in 1968 and ending in 1981

3. A Recent period starting in 1982 and conveniently subdivided into two sub-periods: Recent
a) from 1982 to 1989, and
Recent
b) from 1990 to present

The Initial period, 1956-67

If the following discussion emphasizes ethnoarchaeology's relations to archaeology rather than to ethnography and anthropology, this reflects the concerns of its practitioners. Developments in anthropology during the sixties, for example structuralism and the symbolic anthropologies of Clifford Geertz and Victor Turner (see Ortner 1984), went unnoticed in the early years. The first decade saw discussion of the role of "analogy in archaeological interpretation," the title of an important paper by Robert Ascher (1961), and, on a broader canvas, of the interrelationships of archaeological, ethnological, ethnographic, and historical approaches to the past. Karl Heider's (1961) "Archaeological assumptions and ethnographic fact: a cautionary tale from New Guinea" made a considerable stir because it brought home to archaeologists how poorly we were prepared to conceptualize the rich variety of life lived in very different cultures. Because "common sense"- an understanding of the world based upon ethnocentric premises- far too often misleads would-be ethnographers of the past, it is worth considering Heider's work in some detail.

In the early 1960s, Heider, then a Ph.D. candidate in anthropology at Harvard, worked for 26 months among the Dugum Dani of the highlands of Irian Jaya (or West Papua, Indonesia). When he first arrived, they were "not under the influence of government or missionaries," and "[except that they lacked pottery, fit the description of a typical neolithic culture" (p. 54). They traded for the ground stone blades that they hafted either as axes or adzes. Their typological distinctions tended to refer rather to the whole tool than to its parts; variations in raw materials and sizes were reflected in their classificatory system only to a limited extent and in sometimes unexpected ways. The introduction of iron tools, which occurred while Heider was in the field, had no revolutionary effect, or at least none that he was able to detect.

In a section on settlements, Heider noted that as a result of the reuse of materials and the digging of old house sites to make sweet potato gardens, little would remain of individual compounds. Neither do middens form; and because people move frequently from one compound to another, "there are at least twice as many houses and compounds as are being used at any one time" (p. 58). Sturdy wooden fences and ditches around compounds have to do not with defense- though the Dani raid and fight battles- but rather with drainage and the enclosure of pigs. Again, on the subject of inter-area relations, Heider shows how, while archaeologists could quite correctly infer the existence of an extensive trade network on the basis of the distributions of shell and stone, specific trade relations could not be reconstructed since much of the traffic is indirect and consists of perishable items. Despite such trade and other contacts, many items of material culture well known to the Dani and their neighbours fail to diffuse from one group to another.

Heider's paper reflects the archaeological assumptions of its day. How these have changed! While we have by no means resolved all the interpretive problems posed by the Dani case, ethnoarchaeological work on lithics and classification (e.g., White and Thomas 1972), on the abandonment of households and settlements (e.g., Cameron and Tomka 1993), on the social construction of technology (e.g., Dietler and Herbich 1998; Gosselain 1998), and on inter-group relations (e.g., Hodder 1979), has endowed archaeologists with a far larger and better-controlled analogical fund for applying to the past. On trade and exchange, another topic discussed by Heider, we used to have rather less to offer, largely because most ethnoarchaeologists work at a sub-regional scale, but this is now changing (e.g., Mohr Chavez 1991; Stark and Longacre 1993; Kramer 1997).

Heider had subtitled his paper "a cautionary tale," and the term was subsequently applied by archaeologists, sometimes dismissively, to other ethnoarchaeological case studies. Perhaps they were frustrated by the continuous challenging of the assumptions on which they based their reconstructions; perhaps they were hoping for universally applicable laws or regular correlations between material and total culture. If so they remained disappointed.

Cautionary tales, like other ethnoarchaeological case studies, alert archaeologists to the existence of a variety of models, and invite them to sharpen their analytical tools and develop new ones. Ethnoarchaeology got off to a slow start in this first decade with only 1.4 publications per annum (Table 1.2). The geographical range was restricted; while Mesoamerica, with its glamorous archaeology and highly visible Indian populations at America's back door, attracted researchers, it may be that a comparatively rich early ethnographic record led North Americans to believe that ethnoarchaeological research was unnecessary. In any case that area produced no publications that meet our definition of ethnoarchaeology. The majority of papers are exploratory in nature, several discussing a range of artifact types. Raymond Thompson's (1958) monograph *Modern Yucatecan Maya* pottery *making* differs by juxtaposing ethnographic description and a simulated archaeological collection in an extended study of the nature of archaeological inference.

Helene Balfet's (1965) contribution to Frederick Matson's volume *Ceramics and man*, a valuable collection (despite its inappropriately sexist title), broke new ground in showing how the quality, forms, and decoration of pottery in Maghrebin North Africa varied with the mode of production. In the same volume George Foster (1965), one of whose earlier papers (1960a) on the archaeological implications of ceramic production in Mexico had initiated a long-running debate on the significance for archaeology of the differential life spans of utilitarian pottery types (see chapter 4), reflected on his research, suggesting that psychological conservatism of potters helps to account for continuity in pottery styles. Although this conclusion was later to be disputed (David and Hennig 1972), it raised, as had Balfet, interesting questions about the factors that structure material culture and the archaeological record.

The New Ethnoarchaeology period, 1968-81

In 1962 Lewis Binford's "Archaeology as anthropology" ushered in the epoch of what came to be called the "New Archeology," with its insistence that culture, conceived of as humans' extrasomatic means of adaptation, consisted of material remains that could be studied without reference to the ideas that had once existed in the heads of the makers of the artifacts. At about the same time the cultural ecological approach associated with Julian Steward, Marshall Sahlins, Elman Service, and others was exerting an important influence on archaeology.

An overly enthusiastic adherence to Hempelian logico-deductive positivism and to systems theory (Salmon 1976, 1978) came to underlie what was claimed by some to be an explicitly scientific approach to archaeological interpretation and explanation (Watson *et al.* 1971). As deduction is a form of reasoning that extracts information from premises, it might seem to be antithetical to analogical inference, which goes beyond them - though always at some risk of being wrong.

But the New Archaeologists realized that they required models of human behavior from which to generate hypotheses that could be tested against the archaeological record. It is assumed that some behavioral elements of sociocultural systems have material correlates; if they are incorporated in the archaeological record, such residues may be used to develop inferences about the behaviors with which they were associated. Observations of contemporary behavior can facilitate the development and refinement of ms1ghts into past behaviors, particularly when strong similarities can be shown to exist between the environments of the past and contemporary sociocultural systems being compared.

Thus ethnoarchaeology was rather encouraged than discouraged by a change in paradigm in some ways more apparent than real. Besides the two canonical texts of the New Archaeology, *Analytical archaeology* by David Clarke and *New perspectives* in *archaeology,* edited by Sally and Lewis Binford, Richard Lee and DeVore's edited volume, *Man the hunter,* also appeared in 1968. The combination, which expressed the New Archaeology's emphasis on adaptive systems and long-term processual change, complemented an international movement in palaeoanthropology that had found its voice in a collection edited by Sherwood Washburn (1961), *Social life of early man.* Together these stimulated the research on foragers that is one of the hallmarks of the New Ethnoarchaeology period. While only 4 percent of a much larger total number of ethnoarchaeological publications were actually about foraging as a subsistence technique, initially mainly in Australia where Gould e.g., 1967, 1969) was an early and productive exponent, research into other topics, including lithics (e.g., White 1968), was also frequently conducted among hunter-gatherers.

There is in this period a near tenfold increase in the rate of publication to 13.4 per annum, and ethnoarchaeology expands almost to its current geographical range- only East Asia and Central Asia are missing, and in both it has still scarcely begun. While state societies are poorly represented, the range of societies amongst which ethnoarchaeological work is carried out becomes much wider, to include village agriculturalists and pastoralists in a variety of environments. The modem range of topics, less only ideology, here used in the general sense to include symbolism and systems of thought, is attained. Africa, and particularly Sub Saharan Africa, becomes the most popular area in which to carry out ethnoarchaeological research. Decolonization of the continent had led to a demand for archaeological resarch on later periods, and the political interests of the United States of America led to the support of much Africanist research. Work in Mesoamerica and Southwest Asia including Iran, but among the Arab countries

only isolated studies in Syria and fordan) was similarly favored by the Americans who at this time formed the bulk of those who practiced ethnoarchaeology.

In the area of material culture, ceramics, the testing ground for so many archaeological ideas, is the most popular single topical area, with 15 percent of total publications, including the first truly ethnoarchaeological study by a non-Westerner, "Traditional pottery technology at Krobo Takyiman ... "by the Ghanaian Effah Gyamfi(1980), who sadly died shortly thereafter. Ceramics are followed by lithics with, a long way behind, other artifacts (the keyword "arti" also includes considerations of typology and classification). Artifact classes that are unlikely to preserve in the archaeological record have been undeservedly shunned by ethnoarchaeologists. On the positive side, more intensive interrogation of archaeological sites as the loci of human activities, and in Southwest Asia the increasingly sophisticated excavation of *tells* (settlement mounds), was leading to a demand for models for interpreting domestic space and architecture, and thus to the first publications based on ethnoarchaeological fieldwork by authors such as Patty Jo Watson (1979a, 1979b), whose monograph *Archaeological ethnography in Westen Iran* appeared in 1979, andCK(1979a), and in Africa byND (1971), Roderick Mcintosh (1974), and, in the first year of the next period, E. Kofi Agorsah's (1982) "Spatial expression of traditional behavior .".

Another popular area, stimulated in part by the work of Michael Schiffer (1976), and more generally by the demands of a processual archaeology for understanding the nature of archaeological components, is the study of site formation processes, of which John Yellen's (l977a) work among the !Kung San of the Kalahari is the most sustained example. Gould (l978b) was indeed arguing that ethnoarchaeology was the "anthropology of human residues." There were at this time no researchers who categorized themselves as ethnoarchaeologists but only archaeologists and occasional others who did ethnoarchaeology, mostly occasionally, and mostly for short periods on delimited topics. There are only four ethnoarchaeological monographs, Watson's (1979a) on village life in Iran, and the remaining three all on foragers: Yellen (1977a) on the !Kung San, Binford (1978a) on the Nunamiut caribou hunters of Alaska, and Gould (1980) on the Ngatatjara Aborigines of the Australian Westem Desert. Theoretical discussion during this period tended to focus on specific topics rather than on broader questions (e.g., Gould 1978c). However, retrodiction of the past through deduction from laws of culture was a major preoccupation.

The Recent period : Recent 1, 1982-9

"Recent" is used by analogy to the Holocene or Recent Period in which we live, and because the term "modern" now carries with it considerable baggage, only period to the publication of Ian Hodder's (1982a) *Symbols in action,* a book that, in a series of ethnoarchaeological essays, explores the relations between associations of material culture items in living contexts and archaeological concepts of culture. Whereas the prevailing archaeological view of the time was that "Material culture patterning is a distorted but predictable reflection of human behaviour" (p. 11), Hodder concluded that material culture does not merely *reflect* culture, but serves actively to *constitute* it. It is in this sense that artifacts are symbols in action.9 Although we have reservations about the field methods of Hodder and his team (see chapter 3), this was a new and tremendously exciting view of material culture- and of the role of ethnoarchaeology.

Symbols in action questioned and found wanting some of the fundamentals of interpretation, the existing archaeological concept of culture and the interaction theory of style, which held that the degree of stylistic similarity between two components or assemblages was a measure of the intensity of social interaction between them. Moreover, in treating material culture as an active

element in communication - as had Martin Wobst (1977) though from a systems theory perspective- Hodder also challenged a fundamental tenet of the New Archaeology: that for heuristic purposes the human mind can be adequately conceptualized as a rational, economizing processor of information, and can therefore be ignored in the relationship between environmental stimulus and human behavioral response. The opposing view, that mental processes intervene in a more complex, transformational, manner between input and output, changes the nature of explanation by reinstating human agency as a factor in culture. Hodder was developing a new theoretical position, influenced by the ideas of a very dilierent set of scholars from those who had inspired the processualists, most notably by Giddens's theory of structuration and Bourdieu's theory of practice, and he could and did cite ethnographic chapter and verse in its support. Two decades later, the last paragraph of *Symbols in action* makes fascinating reading:

there is a need for archaeologists to integrate theories and ideas from a wide range of studies concerned With structure, meaning and social action. The prospect is for a debate in archaeology concerning structuralism (Piaget 1971; Levi-Strauss 1963) and its various critiques (Bourdieu 1977; Pettit 1975), post structuralism (Aidener 1978; Harstrup 1978), structural Marxism (Godelier 1977; Friedman and Rowlands 1977) and contemporary social theory (Giddens 1979; Marsh, Rossn and Harre 1978). What is meant by such concepts as ideology, legitimation, power, symbol and social structure must be argued within the archaeological literature and the concepts must be incorporated into interpretations of the past. (p. 229)

There are some names and concepts missing- most notably Michel Foucault and reflexivity- but the paragraph presages the proliferation of postprocessual and, in some cases, postmodern, theoretical positions that characterize "hot theory" in the eighties and early nineties.

Hodder's ideas had not been without precursors in archaeology generally and ethnoarchaeology in particular (e.g., Gould l978d), and indeed the years 1977 through 1990 saw an ongoing debate over the definition, uses and nature of style in archaeology involving James Sackett, Lewis Binford, and on the ethnoarchaeological side notably Polly Wiessner, who was active in the Kalahari during the 1970s (chapter *7).* In 1986 the publication in the *Journal of Anthropological Archaeology* of a paper by Pierre Lemonnier that featured his work on the material culture of the Anga of Papua New Guinea introduced the French "anthropology of techniques" school to Anglophone readers. *Symbols in action* advanced ethnoarchaeology but scarcely resulted in an immediate transformation of the field. Processualism remains a strong forceand some "pre-processualist" papers continue to appear. An intense argument early in the Recent period between Gould and Watson (1982) and the philosopher Alison Wylie (1982) on the concept and use of analogy was effectively terminated by Wylie's magisterial "The reaction against analogy" of 1985. Otherwise theoretical debate tended to become less separate and more an intrinsic feature of papers right across the range of topics and classes of material culture treated.

The number of publications nearly triples to 35.5 per annum and for the first time includes a substantial number of items in French. Sub-Saharan Africa, with 29 percent of all publications, is increasingly the most popular geographic area, in large part because that continent is perceived as having the most peoples practicing "traditional" life styles, i.e., lives less obviously affected by industrialization and globalization, though Ann Stahl (1993) and Scott MacEachern (1996)- and the "Kalahari Bushmen Debate" (Smith 1996)- have warned us against accepting such views and of the dangers of essentializing the African in a mistaken search for the pure and pristine. The most popular topical area, with 18 percent of publications, concerns domestic and community space and architecture, relating directly to interpretation of activity areas and site layouts (sometimes including their demographic implications). While Southwest Asia still dominates here

(e.g., Kramer 1982a), Africa is well represented. Susan Kent begins publishing African materials in this period. Her processualist monograph *Analyzing activity areas* (Kent 1984), although set *in* North America rather than Africa, contrasts vividly and in a manner typical of the period with Henrietta Moore's (1986) postprocessualist *Space, text and gender: an anthropological study of the Marakwet of Kenya,* the latter being the first ethno(archaeo)logical entry in the bibliography with "gender" in its title.

Mention of iron working reminds us also that, in large part because bloomery techniques of smelting iron continued to be practiced very late in Sub-Saharan Africa, the subcontinent holds a virtual monopoly of ethnoarchaeological works on metallurgy (chapter 11). These begin in the New Ethnoarchaeology period (Schmidt 1980), becoming more common through time, although we should not forget the many earlier studies that are better characterized as technological or ethnological. In the 1990s interest in smelting extended, though much less than might be expected, to smithing (e.g., Robertson 1992; Childs and Dewey 1996).

It is in the Recent 1 period that, as noted above, we can begin to appreciate some broader topical trends within ethnoarchaeology. One other is worth mentioning here; categories concerned with subsistence (Fauna/Foraging/Other subsistence techniques) increase from 13.3 percent in the New Ethnoarchaeology period to 16.9 percent in this period and to 18.6 percent in Recent in good part because of the work done from the University of Utah by Kristin Hawkes, James O'Connell, and their associates. Their fine-grained research among the Ache of Paraguay (e.g., Hawkes, Hill, and O'Connell1982) and the Hadza of Tanzania (e.g., Hawkes, O'Connell, and Blurton Jones 1991) adds they would certainly label most of their work human ecology or optimal foraging research rather than ethnoarchaeology. Pastoralists become more of a focus of attention in the succeeding period.

Recent 2, 1990-present

The Recent 2 period is to be celebrated for the increasing productivity of non-Western ethnoarchaeologists. They include Kofi Agorsah (e.g., 1993) and Kodzo Gavua (1990) of Ghana, Nigerians Kolawole Aiyedun (1995), C. A. Folorunso and S. 0. Ogundele !1993), the Franco-Cameroonian Augustin Holl (1993), Chapurukha Kusimba (1996) from Kenya, Sokhna Gueye (1998) from Senegal, the Franco-Algerian Hassan Sidi Maamar (Chaix and Sidi Maamar 1992), Turkey's Fiisun Ertug (1996), **India's Seetha Reddy (**1991, 1997), Japan's Masashi Kobayashi (19941, and, from Szichuan in the People's Republic of China, Enzheng Tong (1990). It is curious that with rare exceptions (e.g., Eduardo Williams 1994, 1995) Latin-Americans have not been attracted to ethnoarchaeology.

Almost all those named above were trained in the Western anthropological tradition and, especially as several have worked amongst peoples other than their own, most of their contributions are as yet little differentiated from those of their Western colleagues. Thus the ethnoarchaeological potential of the combination in a single individual of native and Western perspectives remains to be fully realized. However, a Master's thesis by Rowland (Caesar) Apentiik (1997), "Bulsa technologies and systems of thought," achieves precisely this synthesis.

Other developments in archaeological thought are detectable in the emergence or rapid expansion of topics. A flurry of ethnoarchaeological publications on various aspects of fauna, including several in Jean Hudson's (1993a) edited volume From *bones to behavior,* are evidence of, among other things, a desire to identify incontrovertible archaeological signatures of hominid activities and particularly hunting. Such collections of papers on special topics, for example on ceramic ethnoarchaeology (Longacre 1991a) (Fig. 1.8), abandonment (Cameron and Tomka 1993), or approaches to mobile campsites and the ethnoarchaeology of pastoralism (Gamble and Boismier

1991) have replaced the broadly based compilations of earlier years. There are also more comparative studies seeking, but not necessarily finding, underlying uniformities, for example Ben Nelson's (1991) study of ceramic frequency and uselife in crosscultural perspective.

A newly flourishing category, that of ideology, though remaining for the moment largely African in its geographic scope, deserves special notice. While specific artifact classes and topics range from iron to calabashes, and from of metaphor- "forging symbolic meaning," "pots as people" that underlies material culture. This is a world that, while it may seem unscientific and even fanciful to some, is in fact critical to understanding how technologies are controlled and transmitted within and between generations. When such questions are related to the division of labor and modes of production, it is apparent that they are fundamental to archaeology's explication and explanation of cultural continuities, change and development.

There can be no doubt that during the Recent period there have been significant improvements in the doing and writing of ethnoarchaeology; the quickie watch-a-native-fell-a-tree kind of study is no longer acceptable. Scholars who, like the authors of this book, identify themselves more as ethnoarchaeologists than as archaeologists may remain few and far between, but the movement of individuals back and forth between subject areas is no bad thing. It would be unrealistic to claim that ethnoarchaeology has achieved maturity as a subdiscipline of anthropology- unless, as the recent history of archaeology suggests, maturity may be characterized by progressive incorporation into the discipline of a variety of viewpoints within a broadly agreed philosophical framework, a range of lively approaches to diverse subject matter, and the appearance of second-generation studies that group and synthesize individual case studies. All these developments augur well for the future.

Ethnoarchaeological Approaches

Ethnoarchaeology developed in order to provide better ethnographic analogies to assist in the interpretation of archaeological data Analogy is the principal theoretical apparatus by which an archaeologist gains ethnological knowledge. Interpretation made through analogy evaluates any belief about non-observed behaviour in reference to observed behaviour which is thought to be relevant. There are two kinds of analogies commonly employed by the archaeologist:

1) The Direct Historical Analogy: This type of analogy is applied when there is a temporal continuity between the archaeological culture and the ethnographic culture. It is generally considered to provide the highest probability of being correct. Such continuity is based either from historical records and· description known as "area historical" or, based on field work in the area under consideration known as "area ethnographic model".

(2) General Comparative Analogy: This analogy is based mainly on the similarities between contemporary cultures and the cultural materials from an archaeological context. In such analogy, correlation between the two sets of cultures can be made on a cross- cultural level without any special restriction.

General principles regarding analogical arguments in ethnoarchaeology

1. The subject and source cultures should be similar in regard to variables likely to have affected or influenced the materials, behaviors, states, or processes being compared. Substantiating the principles of connection between variables and the establishment of relevant similarities and

differences is vitally important. It is here that the analyst enters a critical area of debate regarding comparison and causality in anthropology and other relevant disciplines (geoarchaeology for example).
2. Since cultures are generally conservative, if the source culture is the historic descendant of the subject culture, there is, *always subject to the conditions of (1) above*, a greater intrinsic likelihood that similarities between the two will exist than if there is no such antecedent–descendant relationship. Unfortunately, the expansion of Europe has over much of the world resulted in major cultural disjunctions with the result that cultural descent must itself be regarded as a problematic concept.
3. The range of potential source models for comparison with the subject data should be expanded by ethnoarchaeological and other means in order to obtain as representative a range as is practically possible.
4. Not merely one but several possible analogs for the subject data should be sought among the sources.
5. Hypotheses developed from these analog models should be tested by various means that may well include archaeological excavation. However, owing to the inevitable elements of inductive reasoning and subjectivity involved in testing, deductive certainty can never be achieved.
6.Wylie (1985: 83, 100–1) emphasizes how "assessments of the relative credibility of the analogical arguments . . . can be significantly refined by upgrading the methodology and the background knowledge on which they are based." This involves "source- and subject-side strategies for establishing relevance" by "expanding the bases of interpretation and elaborating the fit between source and subject."

Objections to analogy

Both Martin Wobst's (1978) and Gould's (1980: 29–47) objections to analogy require discussion here, Wobst's argument in "The archaeo-ethnography of hunter-gatherers or the tyranny of the ethnographic record in archaeology" is that the nature of ethnographic fieldwork results in a failure to develop constructs of time, space, and human behavior that adequately model what hunter-gatherers actually do and why. Wobst is especially concerned that the local or parochial scale of ethnographic fieldwork cannot cope with the regional or greater scale of forager adaptations. Thus "if archaeologists consume ethnographically derived theory without prior testing, there is a great danger that they merely reproduce the form and structure of ethnographically perceived reality in the archaeological record." Therefore, "we have to liberate our theories from the biases imposed upon them by the ethnographic record" (p. 303).

Wobst's criticisms are well taken – archaeologists are better equipped than ethnographers to study phenomena of long duration – though we may note that the ethnographic record is in fact sufficiently rich and detailed to enable Wobst to found his criticism on more than mere supposition. Perhaps this is because, rather as most archaeology is site-based and yet concerned with distributions at various larger (and smaller) scales, ethnographers also engage in regional and areal comparative studies.
If the historical/ethnographic record did not provide us with many of the building blocks, our ability to construct the cultural past would be much diminished. The trick is learning when and how to use them, and when and how to use other materials.

Gould's (1980: 29) objection is : "the use of ethnoarchaeology to discover analogies to the prehistoric past is downright misleading." He fears that analogy, even when multiple analogies are employed, "cannot by itself provide a way for us to know more about the past than we already do about the present, since *we are still bound by the present as the source of these alternatives"* (p.

32, our emphasis).

Whereas Wobst was suggesting that ethnographic research distorts the present, Gould (like O'Connell after him) is arguing that ethnographic research, even if it provides a conceptually appropriate and observationally accurate record, will, when used for analogical purposes, still limit the range of descriptive models.

Gould is here misrepresenting argument by analogy, for, as we have seen, the analyst should be concerned not merely with the positive but also with negative and neutral components of the analogy. If all we did was to apply modern patterns to past behavior, this would constitute a quite unacceptable limitation on interpretation. There is every reason to suppose that many behaviors engaged in by humans in the past are no longer practiced (far less recorded) today. It is true that the application of analogies to hominids whose psychology was very different from our own poses special problems.

What Gould is in fact objecting to is the application of analogical waffle irons to the stuff of prehistory in order to imprint a limited range of rigid patterns. In this he is right, as in his suggestion that analogy be used "as a basis for comparison with prehistoric patterning" (p. 35). This is precisely what Richard Potts (1984) did in a fascinating paper in which he investigates associations of lithic and faunal remains in Bed I at Olduvai Gorge.

After evaluating and discarding a variety of interpretive models using many different sorts of analogies, he concludes that the sites are places where protohumans cached stones. The time and energy spent in handling and transporting portions of meat could be minimized by taking the [scavenged] meat bones to the nearest cache, where there remained stone tools and bones from previous visits. Time spent at the cache was then minimized by processing the new material quickly to obtain whatever meat or other resources (e.g., sinew or hide) were needed. By abandoning the site immediately, hominids could probably often avoid direct confrontation with carnivores attracted to the remains. (p. 345) Thus Potts calls up a variety of ethnographic and other analogies, tests them against the data, and infers a cultural pattern that has not existed for thousands, if not millions, of years.

In conclusion, we must accept that the value of ethnoarchaeological analogy to the study of long-term processes is limited, but that ethnoarchaeological and otherwise derived demonstrations of the workings of mechanisms can and should lead to the development of models of process involving changing material outputs over time that can be tested against the archaeological record. Second, by bearing in mind the warnings of Wobst and Gould regarding the use of analogies, analogical distortion of the past and its masking by the present can both be minimized.

Ethnoarchaeology in India

In case of India, ethno-archaeology, as an academic discipline, has been introduced very late. Although there are number of tribes and other communities living in India with their traditional lifestyle they did not properly attract the archaeologists. Although importance of ethnographic work was known to the archaeologists since the early part of the 20th century, it was actually used in a wider way after the mid of 20th century. At the time of analyzing the emergence of New or Processual Archaeologr in India,

Basa (2OO7:116) has mentioned that; "In India, although in the early part of the 20th century the importance of ethnographic work for archaeology has been emphasized by scholars like John Marshall, E. Mackay, Ananda Coomarswamy, P. Mitra and Furer Haimendorf, etc. it was felt more during 1960s. Within this background, it was G.S. Ray who in his presidential address to the Anthropology and Archaeology Section of the Indian Science Congress Association in 1966 called for effective collaboration between anthropologists and archaeologists in India.

Prior to him, Subbarao (1962:127) had pointed out the dependence of archaeologists on ethnology" (Basa 2OO7: I 16). Prior to two decades, except few institutes like Deccan College, Pune; ethno-archaeology was not accepted as a separate and an, important branch of archaeology and therefore the ethnographic data was very rarely used for explaining archaeological evidences (Dhavalikar 1983 49).

Malik felt that "Indian archaeology should seek the help of such social sciences as anthropology and sociology because archaeology is now taken up to mean the 'whole anthropology of extinct culture'" (1968: f 4). The role of anthropology in Indian archaeology is effective. At the time of analyzing the impact of anthropology in Indian archaeology, Basa {2OO7:113) mentioned that "... while the British archaeology is basically an inheritance from a historical tradition and American archaeology from an anthropological tradition, the tradition of Indian archaeology is a combination of both".
Basa (2OO7) has argued that anthropology is playing a major role for interpreting archaeological data. According to him the archaeology is invariably associated with anthropology in general and social anthropology in particular has contributed significantly for interpreting and explaining the archaeological data.
He has argued that, "It has been rightly said that if anthropology is the study of humankind, archaeology is the study of what humans have left behind. Besides, the need for an anthropological perspective for archaeology becomes evident when one considers the very nature of archaeology as a discipline. Because archaeology is a means of reconstructing the past on the basis of material remains, which are often partial.

Hence, the challenge in archaeology is how to reconstruct the whole on the basis of partial remains. This makes archaeology an interdisciplinary subject in which an archaeologist has to depend on other disciplines to obtain optimum information for the use in the process of reconstruction of the whole. In this, anthropology as a discipline helps in various ways. While biological anthropologists could determine the age, sex, palaeoanthropology and DNA from skeletal remains, models and theories of social anthropology are used in archaeology to add flesh and blood to the dry bones of archaeological data (as in ethno-archaeology), to study the

emergence of complex stratified society from an egalitarian band level organization, and to explain and interpret theories of culture change" (Basa 2OO7 :1 13- I 14).

South Asian ethnoarchaeological studies can be broadly divided into four main categories, covering

(1) traditional subsistence and settlement strategies among various populations;
(2) traditional technologies and the organization of craft production;
(3) social organization and belief systems; and
(4) the formation of archaeological sites.

Subsistence and Settlement Strategies

Primary among research on traditional subsistence and settlement patterns in South Asia have been studies of surviving hunter-gatherer populations. Recent work on this topic includes research by Murty (1978-1979, 1981, 1985a, 1985b; Murty and Sontheimer 1980) and Raju (1985, 1988) in Andhra Pradesh; Nagar in Madhya Pradesh (1975, 1977, 1983, 1985); Nagaraja Rao in Karnataka (1965); and Cooper in Madhya Pradesh (1983a, 1983b, 1986) and the Andamans (1985, 1988, in press a, in press b). Paddayya's work in Karnataka (1982) is a further example of the use of ethnographic data in the archaeological interpretation of prehistoric hunter-gatherers.

Ethnoarchaeological studies of contemporary hunter-gatherer or tribal populations have focused on subsistence resources (Vishnu-Mittre 1985), patterns of seasonal movement, and technology (Misra 1974). Typically, the goal of such studies has been to apply the information derived from contemporary societies to the interpretation of prehistoric archaeological remains from the same region. As has been often noted, paleolithic studies in India are frustrated by the paucity of stratified and well-dated primary context sites, the near absence of preserved faunal or botanical remains, and limited reconstructions of Pleistocene environments.

The development of sophisticated models based on a broad knowledge of hunter-gatherer adaptations may well provide the best means for interpreting these enigmatic paleolithic remains. On the other hand, the ethnoarchaeological studies of tribal groups on the Indian subcontinent have also stressed the degraded nature of the contemporary environment and the loss of many wild plant and animal resources as a result of agricultural expansion and modernization (Raju 1988: 5).
They have noted that the natural world inhabited by contemporary tribal populations is not at all the same as the one that was inhabited by the paleolithic populations of the same region. The wild plant and animal species exploited today may coincide to some extent with those collected in the past, but all the researchers writing on this topic have pointed out that the prehistoric hunter-gatherers could have chosen from a much wider array of species, particularly of large game animals, than can contemporary populations. Modern subsistence and settlement practices may, therefore, have only slight parallels to ancient ones in the same region.

There is, of course, as Paddayya (1982) has demonstrated, no necessary reason why models for the South Asian Paleolithic need be derived exclusively or even primarily from South Asian hunter-gatherers. It is a very tenuous link indeed to argue for direct historic continuity between present-day hunter-gatherers and those of the Paleolithic. The demonstration of such a link is not theoretically necessary nor, is it justified.

Ethnoarchaeological studies of South Asian tribal populations have focused on general patterns of subsistence and settlement. Scholars have noted the broad knowledge that members of these

groups have of their natural environments (Murty 1981), and that most groups traditionally exploited a very wide range of plant and animal resources (Murty 1981, Nagar 1985, Raju 1988). It has also been observed that the extant groups were traditionally mobile (though many are now sedentary), with a settlement system responsive to the seasonal availability of food and water (Paddayya 1982). At this broad level of generalization, it should be noted that these are patterns that hold for most small-scale tropical or subtropical hunter gatherers, although, of course, the particular resources exploited vary considerably from case to case.

Contemporary tribal populations also inhabit a very different cultural world than did the hunter-gatherers of the Paleolithic. Murty (1978-1979,1981, 1985a), in particular, has stressed the ongoing symbiotic relations between tribal populations and sedentary agriculturalists in Andhra Pradesh. These relations appear to have considerable antiquity in the region, as attested by inscriptional evidence (see also Possehl and Kennedy 1979, for a suggestion that such a pattern may have existed in Gujarat as early as the third millennium B.C.). The tribal populations provide forest products, including honey, sap, fiber, wood, and game, as well as labor, to the agriculturalists, in exchange for agricultural products and craft goods (Nagar and Misra 1989). Nagar and Misra have also noted that in Uttar Pradesh, many of the traditional hunting groups have accepted caste ideology and incorporated attributes of Hinduism and Islam into their belief systems.

While this complex pattern of interaction makes it virtually impossible to detect the "pure" hunter-gatherer in contemporary tribal populations, the long-term continuity of symbiotic economic and social relationships between foragers and farmers is of considerable theoretical import. Over the past decade, a number of archaeologists have suggested the existence of similar interactions in regions as disparate as neolithic Europe (Gregg 1988), the late prehistoric Southwestern United States (Spielmann 1983, 1986), as well as in South and Southeast Asia. The continued existence of such patterns in contemporary South Asia provides an important opportunity for ethnoarchaeological work on the material and archaeological correlates of forager-farmer interaction. Such work will have relevance for archaeological studies oflate prehistoric and historic South Asia, as well as for archaeologists working in many other regions of the world.
Ethnoarchaeological studies of subsistence and settlement practices among agriculturalists in South Asia include the work of Roy (1981) and Pratap (1987) on shifting cultivators in Assam and Bihar, respectively, and work by Roux and Sinha (1986) on agricultural technology in Northwest Rajasthan. Roy's work in Assam has focused on technological and social aspects of swidden agriculture in the subtropical zone of the Garo Hills. He sought to document the impact of environmental constraints on labor investment and coordination and seasonal variations in agricultural activities. Roy also examined the technology of swidden agriculture, in particular, the tools used and patterns of use wear. The axes and hoes used by modern agriculturalists are of metal, but Roy's work has demonstrated that the wear patterns they develop as a result of use in particular activities are quite similar to those found on prehistoric stone tools in the same region, and may result from similar kinds of use.

Roy has also recorded indigenous folk tales on the origins of these modern agriculturalists, and their beliefs concerning how cereal crops were introduced into their traditional system of root crop cultivation. Another provocative ethnoarchaeological study that examined local beliefs about origins of particular subsistence and settlement systems was conducted by Murty and Sontheimer (1980) in South India. They documented the ancient Birappa legends of the Kuruva pastoralists of Andhra Pradesh and Karnataka, and considered their relevance for understanding the origins of pastoralism in the third millennium B. c.

Ethnoarchaeological studies of South Asian villages have focused primarily on documenting

specific material-culture parallels between ancient and contemporary villages, such as in house forms (Dhavalikar 1983; Nagar 1969, 1975; Rao 1965), often in the context of arguing for historic continuity between prehistoric and modern populations. These studies have not, for the most part, focused on the broader structure of subsistence or settlement.

Technologies and Craft Production

Although automation and large factories have replaced smaller scale technologies in many regions of the world, in South Asia many goods continue to be produced in small-scale workshops using ancient techniques. The continued existence of traditional potters, stoneworkers, metal casters, weavers, and other craftspeople (Pal 1978) provides archaeologists with a tremendous opportunity to document both the technology and the organization of specialized craft production. We are also able to consider social relations between producers and consumers, as well as distribution and exchange systems-all questions of considerable importance to archaeological interpretation.

Documentation of traditional technologies in South Asia comes from many sources. From the nineteenth and early twentieth centuries, we have accounts in colonial gazetteers and early ethnographies (Baden-Powell 1972, Dobbs 1895, Halifax 1892, Mackay 1930, 1933). These accounts, though not necessarily explicitly concerned with the archaeological implications of various manufacturing techniques, nonetheless incorporate much information of interest to archaeologists on materials and techniques employed by traditional caste- and kin-based producers.

More recently, members of the ASI and the Census of India have carried out largescale documentation projects on traditional craft production (Behura 1965, 1967 a, 1967b, 1978; Biswas 1966; Bose 1982; Das Gupta 1967a, 1967b; Das Gupta and Syamchauduri 1966; Ghose 1981; Mitra 1964; Mukherjee 1978; Saraswati 1967, 1978; Saraswati and Behura 1966; Sinha, Dasgupta, and Banerjee 1961; Syamchauduri 1966; Syamchauduri and Biswas 1967). Their work has provided important information on regional traditions of craft production, as well as on the social and cultural patterns within craft-producing communities, and on the broader position of craftspeople in the contexts of caste and Indian society.

In many cases, these scholars have broadened their focus to discuss the implications of their work for interpretations of South Asian prehistory. Saraswati (1978: 102-109), for example, in his discussion of Indian pottery manufacture, proposes that there exists long-term continuity in traditions of pottery manufacture in Northern India from Harappan times until the present. He further concludes that this continuity in techniques and ceramic forms derived from long-term genetic continuity within potting communities. That is, Saraswati proposes that the existence of localized endogamous communities of potters extends well back into the South Asian past, and that modern potters are the direct descendants of pre- or protohistoric potting communities.

Some archaeologists have recently begun to examine systems of traditional craft production in South Asian rural and urban contexts from an explicitly ethnoarchaeological perspective. Such work has focused on three main areas of production:

- **Ceramic vessels and fired clay figurines,**
- **Bead manufacture, and**
- **Metallurgy.**

CERAMICS

The production of earthenware ceramics is the South Asian craft most studied by ethnographers

and archaeologists alike. Studies have focused on:

- ceramic manufacturing techniques and the organization of ceramic production
- ceramic vessel forms and ceramic use (Birmingham 1975; Junker 1985; Miller 1982, 1985);
- figurine production (Blurton 1987; Jayakar 1953, 1980; Jayaswal 1984, 1986; Jayaswal and Krishna 1986);
- distribution systems (Kramer 1990, 1991; Miller 1981);
- and kin and social relations among potting communities (Kramer 1990, 1991).

Contributions of two recent studies of South Asian ceramics that are explicitly ethnoarchaeological:

the first by Jayaswal, and the second by Roux.

Jayaswal's (1984, 1986; Jayaswal and Krishna 1986) research on figurine production in the Gangetic plain focused on:
(1) production techniques,
(2) the ritual and nonritual contexts of figurine use, and
(3) regional distribution patterns.
Coupled with her study of more than 800 modern potters, she examined archaeological figurines from several early urban sites in the region.

Jayaswal used her knowledge of contemporary patterns of figurine production, distribution, and use to interpret the archaeological remains. Although some of her conclusions can be questioned for example, that the widespread distribution of figurine types across a broad region necessarily implies a market system-she nonetheless provides much important and interesting information with considerable archaeological relevance beyond the South Asian context. She observed, for example, a correlation between settlement size and productive technique, with mold-made figurines produced primarily in urban contexts or for urban consumption.
Jayaswal also had the opportunity to observe first hand the impact of centralized sponsorship of craft production among a subset of producers. These were a family of potters who produced ornamental figurines, in high demand among affluent urban consumers in Delhi and throughout India. A government grant was awarded to these potters to aid them in developing their craft and marketing structure.
In documenting this success story, Jayaswal provided important information for considering such issues as technological innovation, and technological conservatism as a response to state sponsorship or consumer demands. Among the potters she studied, government sponsorship resulted in improved social and economic status and increased rates of production compared to other figurine makers in the region. Although the mechanisms of state support and figurine distribution are operating in modern market contexts, Jayaswal's data provide a useful framework for considering the relations among state institutions, technological change, and productive organization in premodern contexts. Her work also contradicts the oft-made claim that potters are inherently conservative.
Jayaswal's research, along with the studies by Birmingham (1975) and Miller (1982, 1985) provide evidence that both innovation and conservatism must be viewed in their broader social and economic contexts. Valentine Roux conducted her ethnoarchaeological study of ceramic production in the 1980s (1985-1986, 1989a).

Roux was interested in examining the transmission of pottery-making skills through learning, and particularly through the practice of apprenticeship, as a means for understanding the emergence of

craft specialization. She argued that there is a broad and universal link between the degree of technological sophistication in ceramic production and the degree of specialization. She focused particularly on the association of wheel-made pottery with fully developed craft specialization, and conversely the association of non-wheel-made pottery with the absence of specialization or the existence of less developed systems of ceramic specialization.

In her work, Roux examined the transmission of pottery-making skills in a New Delhi suburb that is home to more than 100 pottery-making families. She noted that the learning sequence is both formal and prolonged, beginning in childhood and proceeding through six stages into early adulthood. Roux conducted a morphological analysis of vessel forms produced at each stage of the learning process, in order to consider the material correlates of apprenticeship. Her study thus provides archaeologists with valuable information on the social context of ceramic transmission, and on the technological and physical constraints within which potters must work.

Roux next applied her ethnographic results to a consideration of the development of ceramic specialization throughout the Early and Mature Harappan periods. She suggested that "the stages of technological development of wheel-thrown pottery during the 4th and 3rd millennia seem comparable to the stages for apprenticeship in wheel-thrown pottery today" (Roux 1989a: 7). That is, she argued that the process of ceramic development in the Indus region during the fourth and third millennia B. c. duplicates the process by which a contemporary potter masters his craft over 15 to 20 years, through a progression from small to large vessels and simple to more complex ceramic forms. Since wheel-made pottery, for Roux, is equivalent to specialized production, the identification of the increasing frequency and improved quality of wheel-made forms in the archaeological record throughout the Early and Mature Harappan provides evidence for the emergence and elaboration of craft specialization during that time.

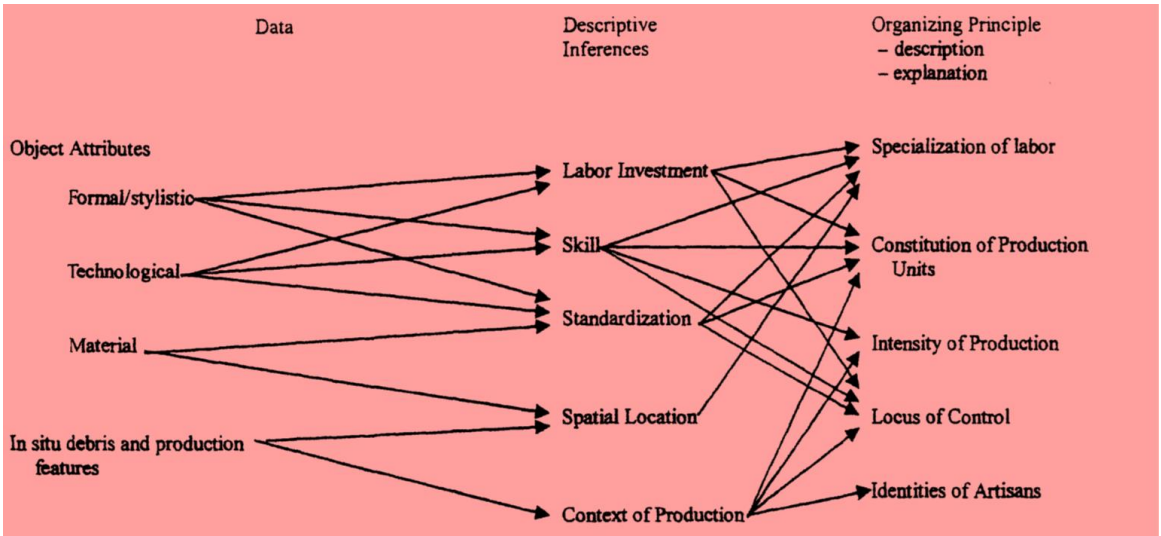

Fig. 1. Chart illustrating the flow of inference in reconstructing ancient production systems, from data to organizing principles.

This latter aspect of Roux's work can be criticized on several grounds. It is incorrect to argue, as Roux does, that since wheel-made pottery equals specialization, non-wheel-made pottery equals nonspecialization. This claim can easily be refuted by considering such cases as the elite ceramics of the Inka empire (Earle et al. 1986) or the bevel-rim bowls of Uruk Mesopotamia (Beale 1978). Further, I would question whether the rather simple and coarsely made vessels produced by hand today are at all comparable in labor or skill requirements to the finely made and decorated hand-made vessels of the Early Harappan period.

A final and more important critique of Roux's model concerns its logical structure. It is a logical fallacy to argue that societal change can be viewed as individual change writ large. There is no inherent reason why the process by which an individual learns a craft from a master should be the same as the process by which pottery-making techniques emerged in the first place. Nor is it clear why, if such links could be demonstrated, the time scales at which they operate are so radically different. Roux is conflating two very different issues in her interpretation, by comparing the development of individual skills with the emergence of systems of specialized production in complex societies.

Significance of ceramics and Ceramic Ethnoarchaeology

Ceramics are very important material remains, which are abundantly found in archaeological investigations. These artifacts are formed from clay and made durable by firing. Mostly containers (commonly called pottery) are included in this type of artifacts, but a verity of other items, such as figurines, tablets, tiles and pipes can also be placed in this category. Among all other ceramic artifacts pottery is the most significant source of information to produce a reconstruction of human behavior in archaeological studies. Pottery commonly recovered in the form of sherds in archaeological excavations and explorations. Potsherd is not just an archaeological object but it is the end product of the interactions of raw material, culture, and technology. It is most useful material remain for archaeologists to identify the resident culture and determine the chronology of the stratum. Style and decoration are also important for the knowledge of social and economic systems. It plays critical role in many economic, social, ritual and artistic contexts.

Different types of ceramics reflect specific time period and place zones. It is assumed that minute study of potsherd offers considerable promise in achieving an understanding of site chronology, culture and trade patterns (Sutton and Yohe 2003, p.151). Thus, in archaeological studies pottery generally used to build chronologies, identify style zones, explain migration of communities and interaction between regional levels. With the help of ceramic artifacts household size, economic differentiation, craft specialization and social structure can also be reconstructed (Kramer1985 p.78). Pot sherds are not only useful to know about shape, size, raw material and production techniques but they also reflect potters taste and idea towards beauty and significance (Glassie, 2000, p.17). It is always a hard task for an archaeologist to reconstruct the realistic model of past cultures and ceramic functions. But reliable model of the past culture can be made by the application of ethnoarchaeological approach, because until recently, with the exception of some most industrialized nations the ceramic ware are produced and used all over the globe.

Reconstruction of manufacturing techniques and use behavior associated with them can also be traced by this approach (Ashmore and sharer 2000, p.170). The application of ethnoarcheological approach on ceramics yield fruitful insight into the pottery manufacturing, patterned human behavior and material culture. It has opened an exiting field for exploring the pre and

protohistoric potential in the present communities. It normally describes manufacturing techniques, vessel functions, aspects of division of labour, social organization of production, scalar and spatial aspects of production and distribution (Kramer1985, p.77). In a broader perspective it involves social, ecological, economical and functional factors (Stark, p. 202). Hence, ceramic ethnoarchaeology has emerged as an important sub-field of ethnoarchaeology.

Major works done in the field

An attempt to explain prehistoric stone tools with the help of ethnographic analogy was made by De Jussieu in the early eighteenth century. Afterwards Solla, Cushing, Fewkes and Hodge made some efforts to coordinate ethnography and archaeology (see Stiles1977, p.89). Jesse Walter Fewkes was the first person who used the term 'ethno-archaeologist' in his study of Tusayan migration of traditions (Fewkes 1900, pp.578-79).

Some description of pottery manufacture can be found in research of the American southwest in early nineteenth century (London 2000, p.1). Morgan, Tylor, Spencer and others used ethnographic data to explain archaeological antiquities in the later part of nineteenth century. In the early twentieth century several researches were conducted within the living communities in order to explain prehistoric societies. But these studies have tended to focus on hunting and gathering peoples and their activities rather than pottery and potters. Bade (1931), Grace Crowfoot (1932, 1940, 1957) and Hankey (1968) has described local potters in their respective studies. Tufnell has pointed out her observations of traditional potters from Saudi Arabia and the Levent in her studies of Lachish pottery (London 2000, p.1). Nevertheless, few attempts were made with direct historical approach to describe the relationship or connection between past and present ceramics (see Deniel Stiles 1977,pp.88-90 ; Gloria London2000,pp.2-6; Nicholas David and Carol Kramer2001,chapter 1 and 2; Miriam T. Stark2003, pp.193-196 for the development in ethnoarcheology and ceramic ethnoarchaeology).

Carol Kramer has carried out ethnoarchaeological researches with the explicit purpose of understanding ancient artifacts. Her edited book (1979) 'Ethnoarchaeology: Implications of Ethnoarchaeology for archaeology' illustrates various aspects of direct historical approach of ethnoarchaeology for reconstructing the past. Her review, which was published in 1985, is a mile stone in the field of ceramic ethnoarchaeological research. She concentrated her study on the questions often posed by archaeologists and described ceramic production, social organization, ceramic use and disposal, ceramic change and style in detail.

In the 1980s she conducted her studies on the pottery and potters of Rajasthan (India) and publish it in the form of a book entitled 'Pottery in Rajasthan: Ethnoarchaeology in Two Indian Cities'(1997).Her book 'Ethnoarchaeology in action' co-authored with Nicholas David (2001) also provides an extensive array of ethnoarchaeological research. During last 20 years several studies (see Sinopoli 1991a,b; Rice 1999; Krishnan 1997; Arnold 2000; Costin 2000; Hegmon 2000; London 2000; David and Kramer 2001; Stark 2003) have been done to explain technological as well as social and ritual issues through ceramic ethnoarchaeology. Although considerable ceramic ethnoarchaeological research has been conducted throughout the world rather less attention has been paid to Indian pottery and potters.

Scope of ceramic ethnoarchaeological research in India

India has an unbroken tradition of ceramic manufacture; therefore, ceramic ethnoarchaeological approach has much potential to enhance the various aspects of pre and protohistoric pottery in this region. Still people are engaged in traditional techniques relevant in some way to ancient pottery manufacturing process. Rich cultural diversity and huge demographic and geographic size of India make this region an ideal locus for ceramic ethnoarchaeological research. In spite of much industrialization and development, pottery is still an essential utensil in Indian houses. Enormous

time depth can be found in India that trace back to Harappan time (Krishnan and Rao 1994).

In India earthenware are also associated with some religious and ritualistic practices and considered as a pure and sacred ware. Huyler (1994, pp.323-324) pointed out that in eastern India earthenware is essential to contain basil plant, which is regarded by Hindus embodiment of their goddess Tulasi. This type of practices reveals the importance of earthenware in society rather than metallic ware and could be helpful for archaeologists to understand past religious customs. Some ethnoarchaeological researches have been undertaken in some parts of India by archaeologists and anthropologists to describe and explain the construction and development of ceramic production (e.g. Behura 1964,1978; Gupta 1969; Saraswati and Behura 1966; Bose 1982;Ghosh and Bhattacharya 1997; Sinopoly 1988,1991a; Kramer 1992,1994,1997; Bala1997). Renu Bala (1997) has done valuable work with ceramic ethnoarchaeological approach in middle Ganga plains. She has illustrated correlation of ethnography and archaeology to explain earthenwares. Ghosh and Bhattacharya (1997) have made an attempt to explain pottery of tribles in their ceramic research.

Carol Kramer's ceramic ethnoarchaeological studies in India are notable here. In 1980s she has conducted her ethnoarchaeological research on Hindu and Muslim traditional earthenware potters of Jodhpur and Udaipur in the state of Rajasthan .She published her work in some research articles (1991,1992,1994) and a book entitled "Pottery in Rajasthan: Ethnoarchaeology in Two Indian Cities"(1997). Her work is significant to understand the ceramic production, distribution, interaction in pottery manufacturing communities and style characteristics of ceramics in Rajasthan. Sinopoly(1991a,b) has done her ceramic ethnoarchaeological research in a traditional rural extended family house hold workshop in Kamampuram, South India and contemporary Malwa in central India. Some remarkable works have been done with ethnoarchaeological approach in the field of bead making (Kenoyer,Vidale and Bhan 1991;Kanungo 2004) and rock art (Nagar 1983) but still less works have been conducted on pottery with explicit ceramic ethnoarchaeological approach. Pottery recovered in excavations and explorations from Madhya Pradesh(Kayatha; Maheshvar Navadatoli; Nagada; Runija; Dangwada;Eran, Mahidpur, Awara, Manoti, Besnagar, Bhim Betaka, Mandsaur, Azadnagar, Piplya loraka, Chichali Adalpur, Pitanagar etc.in Shrotriya 2001, pp.373-394), Rajasthan(Ahar, Balathal and Gilund), Bihar and West Bengal(Kakoria, Magha, Koldihwa, Banimilia-Bahera, Takiapar, Raja Nal Ka Tila, Kausambi, Sringverapura Chirand, Prahladpur , Rajghat, Mahisdal, Pandu Rajar Dhibi etc, in Mishra2001, p.514), Maharashtra (Jorwe, Daimabad; Inamgaon; Nevasa; Chandoli; Prakash; Kaothe; Bahal; Tekwada; Apegaon ;Savalda etc. in Misra2001, p.516) provide data about chalcolithic settlements and shed light on many aspects of the protohistoric culture of India.

Some ceramic ethnoarchaeological research have been undertaken on the Harappan pottery (Kenoyer 1997) but still there is a great need to describe chalcolithic pottery with this approach in above mentioned area.

Applications of Ceramic Ethnoarchaeology

The artifacts gathered in the archaeological investigations reflect human behavior, surrounding environment and ecological situation of the past. But the reconstruction of realistic models of past social and economic conditions with these artifacts is not an easy task; it needs deep imagination and reliable hypothesis. Ethnoarchaeological approach made this exercise simple to gain insight into the artifacts. This approach is much more important for the explanation of pre and protohistoric cultures.

In historical reconstruction, archaeologist often relies on literary sources to identify archaeological remains, but in pre and protohistoric context archaeologist must rely on inferences using analogy (Ashmore and Sharer 2000, p.170). In this approach archaeologist first collects the ethnographic data that is useful to explain ancient material remains and the people associated with them. Early written accounts of ethnographic studies, museum collections of material culture, experimental studies done in controlled form and the explicit ethnographic fieldwork provide useful data for archaeological interpretation. Among all above sources direct observation of existing primitive societies is most useful for appropriate information.

The collected data are generally used by the archaeologist in ethnographic analogy, generation of hypotheses and testing of hypotheses. In ethnographic analogy archaeologist compare the ethnographic data and analogous archaeological data to explore the possibilities of some resemblance between living culture and past culture. This type of analogy is known as 'folk culture' or 'direct historical approach' (stiles 1977, pp.91-94).

The ethnographic data is also used by archaeologists to formulate hypotheses about the past human behavior and then these hypotheses are tested by archaeological data. After the individual or integrated application of above-mentioned methods model of the past cultures can be formed. Pottery has traditionally been seen as a product of the pre and protohistoric cultures. But it is still in use throughout the world by different societies and tribes as their requirements. Thus, it contains a great potential of the application of ethnoarchaeological approach. In the protohistoric civilizations it was used to transport, cook and store a wide range of foods and other supplies. But as societies became increasingly complex, pottery also assumed other specialized functions, including such ritual uses as burial urns and incense burners.

Analysis of ancient pottery remains may reveal clues about manufacturing behavior, but in contrast to a subtractive technology such as the manufacture of stone tools, pottery involves a plastic, additive technology. Manipulation of the clay in the later stages of manufacture often obliterates the diagnostic markings and features left by earlier stages. The only way to overcome this difficulty is to use analogy with documented instances of pottery production today. Observing actual production and matching these with similar features on ancient pottery may recognize clues of protohistoric life (Ashmore and Sharer 2000, p. 121).

Correlation between ancient potsherds and contemporary pottery provides useful insight to build hypotheses about protohistoric human behavior. Shape, size, slip and decorative motifs contain greatest amount of information about a culture. Decorative motifs on the pottery often suggest about individual groups and their emblems (Hegmon 2000, p.132). The ecological information can also be collected from the faunal and floral designs. These pottery characteristics are useful to distinguish ethnolinguistic group and production communities from one to another. The realistic model of pottery technology as well as socio-economic structure of protohistoric societies can be traced by the keen observation of whole pottery production process. Observation of the form, manufacture, distribution, disposal and use of pottery in present world provides a great insight into the protohistoric technologies and usage. The process of collecting and converting ethnoarchaeological data for the interpretation of material remain involves certain needs.

According to Gloria London(2000, p.7) a carefully constructed research design, selection of a appropriate community, an extended time in the field, knowledge of the language, keen skills of observation and experience with ancient material culture is essential to conduct ethnoarchaeological research. Longacre (1991b, p.1) emphasizes that ethnoarchaeological fieldwork should be conducted by archaeologist himself and he should stay in the field for a long duration to observe and record the work minutely. It is also required to give special attention

towards the continuity and discontinuity of the design patterns, vessel size, vessel function, longevity, recycling and disposal, production and manufacturing, stylistic change and firing technology, while comparing ethnographic and archaeological data. Knowledge of continuity and discontinuity in above aspects of present and past ceramic samples may establish development stages in a certain zone.

Conclusions

Ceramic ethnoarchaeological researches provide a valuable insight in ancient pottery for the archaeologists and a broader understanding of living potters for the anthropologists. Besides manufacturing technology; decorative motifs; size; shape; function and distribution of pottery, ceramic ethnoarchaeological research tells about man's past and present. In this sense it fulfills the goal of archaeology as well as anthropology. This approach has thus proved to be of the greatest importance of virtue of its contribution to our understanding of the human. Several studies have been done on the various aspects of ceramic ethnoarchaeology in last 20 years around the globe. But less work yet done in India. There is also a great need for integrated research between archaeology and anthropology. Joint effort of anthropologists and archaeologists to analyze the ceramic data can reveal cultural process and change in this region.

BEAD MAKING

Studies of traditional South Asian bead making include work by Mackay (1933), Trivedi (1964), and Roux and Pelcgrin (1989). The most comprehensive ethnoarchaeological project on traditional bead making in South Asia is the ongoing work directed by Kenoyer, Bhan, and Vidale in Khambat, Gujarat (Kenoyer 1989; Kenoyer et al. n.d.). Khambat (Cambay) has been a center of agate bead making since at least 2500 B. c. Bead-making techniques exhibit considerable continuity from that time to the present. Kenoyer and colleagues have examined material ac quisition and production techniques, as well as marketing strategies and productive organization.
Khambat bead making is organized in two main ways:
large-scale production regulated by centralized workshops, and
smaller scale production in independent workshops.
The dominant centralized workshops are run by powerful merchant families. These merchants control all aspects of production, from raw material acquisition through distribution of the finished products. Regional and interregional kinship ties among merchants play an important role in bead distribution systems.
The manufacturing process is directed from central workshops run by the merchants. Large quantities of raw materials and partially worked beads are stored in these workshops. Much of the actual production, however, takes place in spatially isolated households, as the proprietors farm out raw materials or partially finished products to widely dispersed artisans, each of whom is responsible for only a small stage in the highly standardized production process.
Kenoyer (1989) has noted that such a pattern could be identifiable archaeologically by differential distributions of by products, raw materials, and finished products across a site. Small-scale workshops run by independent entrepreneurs exist alongside the large centralized workshops. In the smaller workshops all stages of production occur in a single locale, though few individuals are involved in production.
The work of Kenoyer and colleagues (n. d.) has provided documentation for multiple systems of production for a single product within a single community, and has broad implications for considering craft production in a variety of early urban contexts.

METALLURGY

Horne's work (1989, 1990) on brass workers in West Bengal has examined the techniques and

social context of production of the traditionally mobile tribal artisan groups. Many of these brass workers now reside in a specialized community of artisans, though some are still mobile for portions of the year. They speak a different language from the dominant sedentary population of Bengal, for whom they produce elaborate rice-measuring bowls, lamps, and figurines of animals and deities. These groups present another example of mobile tribal populations who, until quite recently, have existed in a symbiotic relationship to sedentary communities.

TECHNOLOGIES AND CRAFT PRODUCTION:

Each of the studies of craft production discussed here, have important implications for archaeological interpretation in South Asia and beyond. Documentation of the range of productive systems in South Asia can broaden our perspective of prehistoric productive systems in general. The information that ethnoarchaeological studies can provide about raw materials, the techniques necessary to form craft goods, and the material residues of these techniques has clear relevance for archaeological studies.

Ethnoarchaeological studies can also play an important role in the development and evaluation of models of productive organization and change. We can examine such topics as the scale and management of craft production and distribution, and the impact of social, cultural, and political factors on productive organization.

In South Asia, we also have the opportunity to examine simultaneously a diverse range of technologies and goods in well-defined contexts. By contrasting ceramic production to bead making, iron working, brass casting, weaving, and so on in a single region or community, we are in a position to consider the coexistence of many and diverse strategies for productive organization within a single cultural and political context. Such work can play an important role in refining our models and approaches to the study of economic organization in prehistoric contexts.

We would be on much less secure grounds, though, if we were to use ethnoarchaeological information to ascribe contemporary caste structure or genetic continuity to craft producers of the more distant South Asian past. Kin-based and perhaps endogamous production groups seem to be characteristic of many, if not all, early state societies. The Hindu caste system with its elaborate rules and characteristics is, however, a unique historical manifestation, whose origins at present remain unknown. Archaeological documentation of craft production by specialized social or kin groups does not in and of itself demonstrate the existence of caste in pre- or protohistoric South Asia. Archaeological evidence can potentially prove useful in examining the origins of the South Asian caste system, but at present, we should be very cautious in projecting caste into the past on the basis of productive organization alone.

ETHNOGRAPHIC DATA USED FOR ARCHAEOLOGICAL PURPOSE

The Munda and Their Country is the first ethnographic work published in 1912 by Rai Bahadur Sarat Chandra Roy. After that, there are number of such type of works made both in Orissa and Jharkhand. All these ethnographic works would help the archaeologists in interpreting archaeological data. The following ethnographic data are used for solving archaeological problems.

Settlement patterns

The term 'settlement pattern' has different meaning. In illustrated Dictionary of Anthropology, Lawman (2OO4:148) has mentioned, 'it is the spatial distribution of

cultural activities across a landscape, at a given moment in time'. In his noteworthy reference, Chang (1958) has mentioned that, 'settlement pattern refers both the internal organization of individual settlements and to the distribution and interrelationships of multiple settlements on a landscape'.
In Ethno-archaeology in Action, David and Kramer have characterise several subsistence adaptations- hunting and gathering, pastoralism and agriculture-and their spatial correlations, drawing on selected case studies with a view to identification of their archaeological signatures. Since long back, the archaeologists are interested in documenting patterns of changes in settlement. All these studies demonstrate that while subsistence and settlement are tightly linked, settlement patterns, in addition, are the complex products of social and political relations. Most of the archaeological works made in the late l96os and 1970s are influenced by the concept derived from 'General System Theory' focussed on subsistence and settlement system (David and Kramer 200l:226).

"Archaeologists cannot observe systems, and even patterns are inferences derived from the numbers, associations, and spatial distributions of the surviving residues of the range of activities carried out over the course of time at different places in a landscape. Ethnoarchaeologists can, on the other hand, observe a sample of such activities directly, and more easily infer from them the desire to develop bridging arguments linking patterns and systems were important stimuli in the development of ethno-archaeology in its New Ethno-archaeology (1968) period" (David and Kramer 2OOl:227).

In case of Orissa and Jharkhand, most of the typical tribal villages are situated either on the top of the hill, foothill, at the sloppy land close to the water source. Besides, some tribes are practising settled agriculture in the plains. Except a few, all the tribal huts are very simple and traditional in form. In the hilly region, most of the tribal settlements are found in scattered form while in plains different hamlets of a village are situated in close proximity.

Site structure and activities

Archaeologists are often interested on identifying, analysing the nature and internal organization of the structure of a site as well as its associated activities. On the basis of findings they try to establish the settlement pattern and subsistence system of a particular site (David and Kramer 2OO1:255). They usually emphasize in locating areas in which craft activities were made. In search of identifying and interpreting such areas archaeologists can benefit from the related ethno-archaeological work made on site structure and associated activities. Discussing about the importance of this ethno-archaeological work for archaeologists David and Cramer stated that:

"In seeking to identify and interpret such locations' archaeologists can benefit from ethno-archaeological studies of sites' structures and activities carried out in particular kinds of places' Activity areas relate to economic activities and diversity; they comprise minimal elements of settlement systems' Site structure' as well as site size, may relate to duration of occupation' degree of sedentism, and population size; these and other factors (some related to changes in subsistence economy) are of direct relevance to studies of the so-

called Neolithic revolution, marked in many areas by growing reliance on an extended occupation of built habitats,'(Davidand Kramer 20O1:255).

Since long back archaeologists are trying to distinguish the various kinds of sites on the basis of use, e.g, multipurpose sites, special purpose sites' etc' (Binford and Binford 1966). At the time of disunguishing such kind of sites, usually they give emphasis on the artefact types and diversity in relation to their contexts. Here diverslty' indicates about number of activities performed at that particular site, duration of occupation, number of activities carried out at that particular site, and size of that particular site etc(David and Kramer 2OO1:256).

Where there are buildings and other architectural remains, artefacts and other. waste materials can be deposited directly in and around that structure which help to reconstruct their culture' But, when we discuss about the hunter-gatherer or nomadic people' it will be too difficult to find such type of architectural structure, as they do not produce such type of substantial built structure.

Subsistence systems

Setflement pattern and subsistence system is always interelated. A human habitation or settlement is always established near to a source of food and drink. similarly, the human settlements always leave some substantial tangible remains on the surface from which an archaeologists can able to trace out the nature and types of occupation practiced by the inhabitants. These residual remains help to know what the occupants of the region cultivated, gathered, hunted, bred, and ate. This floral and faunal evidence of a particular region help an archaeologist to establish the subsistence system of a particular area adapted by a group of people in that area in a particular time. The tribal group of Jharkhand and Orissa follow a wide range of subsistence strategies.

According to Basa (1992:85) the chief ingredients of a subsistence economy of Orissa tribe are simple technology, small scale units of production and social units of production, distribution and consumption being limited to family and lineage. Behura has divided the subsistence strategies of Orissan tribe into six types namely, (a) hunting, collecting and gathering (b) catfle herding, (c) simple artisan (d) hill and swidden cultivation (e) settled agriculture (f) urban industrial workers.

Both these classifications are applicable for the tribes of Jharkhand. A brief description of the major subsistence strategies are given below.

(i) Hunting-gathertng and fishing

Although now a days the tribes falling in tJlis group are no more isolated and are in contact with: other wider groups but in some respect, especially in case of settlement and subsistence, they are yet in very backward stage. The important tribes in this category are the Birhor, the Chenchu, the Maller, the Korwa, the Hill Kharia, the Mankadia, etc. They live in small huts and leaf-shelters. The main economy of these tribes is hunting and gathering with the males hunting and female gathering roots and tubers from the nearby forests. The limited resources and the nature of food supply keep them in small bands. Traditional economy of the Birhor is hunting and gathering and they are the best rope makers. They not only work hard for their food, but often go hungry in spite

of their hard labour. They exchange rope as well as the hunted animals and collected forest produces for rice, salt, oil and some other essential materials with their neighbours (Patnaik 2OO5:18).

Due to the denudation of the local resources and constant ecological pressure, some hunting and gathering communities are facing hardship and anxiety. As they are living close to the natural water sources, they collect different varieties of fishes from the ponds and rivers. During the monsoon they collect fishes and dry them in sun and fre and keep in for summer, when the fishes are usually not available to them. In summer, they cook these dried fishes either with the green vegetables or roast them.

(ii) Pastoral

Once upon a time the Koya tribe of southern Orissa was cattle herders but now they have changed their economy and became settled agriculturists.

(iii) Shifting cultivation

There are a number of tribes residing in Jharkhand and Orissawho are practising shifting cultivation. Some of the important tribes of this group are the Dongria, the Kutia Kondh, the Lanjia Saora, the Bonda Paroja, the Juang and the Bhuinya, etc. They use a piece of plot located on the hill slope continuously for fewyears then it is abandoned for recuperate. Earlier, the duration of recuperative was very long (about six to nine years) but, because of the population explosion, increasing necessity, forest laws, etc. they have shortened it up to two to three years. Nowadays they are cultivating a mixed variety of crops like, millets, pulses, and vegetables, etc.

{iv) Settled agriculture

The tribal groups residing in plains have adapted shifting cultivation as their main economy. Some of the important settled agriculturist tribes of Jharkhand and Orissa are the Santhal, the Munda, the Oraon, etc. Paddy is the major crop cultivated in this part of ttre area. Rice is the major food item of these tribes. They usually take one full meal in a day where as some tribes take rice both in the day and night. In the side dish they take different types of fried green leaves, vegetable currlr, chitly, onion, garlic, oil and salt, etc' They also take different types of fishes and meat along with the rice. Rice beer is one of the important drinks of tJle tribes of Eastern India. Irrespective of age and sex everybody consume this rice beer. Besides, the adult males and some females are accustomed to smoke l?cca or bidt.The practice of chewing tobacco is also noticed among the adults.

MATERIAL CULTURE

Material culture comprises any house, building or structure, tools and other artefacts that include any material item that has had cultural meaning ascribed to it, past and present. According to Miller and Tilley (1996:5) study of material culture may be stated as:- "The study of material culture may be most broadly defined as the investigation of the relationship between people and things irrespective of time and space' The perspective may be global on local, concerned with the past or the present, or the mediation between the two.

Defined in this manner, the potential range of contemporary disciplines involved in some way or other in studying material culture is effectively as wide as the human and cultural sciences themselves". Ethno-archaeologists are more concerned to show the relation between the human and things, and in this context, they study human culture as a whole and the material culture as a part. Earlier, when ethnoarchaeology was frequently carried out by archaeologists, they were basically emphasizing only on the production and characteristics of material culture. In the succeeding period the trained anthropologists came forward to study ethnoarchaeology with a mind set up to study the holistic aspects of the culture (David and Kramer 2OO1:64).

The major component of the material culture of Eastern Indian tribes includes the Household

Equipment, Agricultural Implements, Dress and Ornaments, Hunting and Fishing implements, etc. A brief description of the material culture is given below.

(i) Household equipment

The household equipments of the majority of the tribal groups of India are very simple and limited. They use different types of earthen utensils in their kitchen, which include earthen vessels, earthen jar and earthen lid, etc. These earthen pots are used for various, purposes like cooking food, preparing rice-beer, storing grains, etc. The household articles of a traditional Ho house include earthen kitchen utensils, palm leaf mat, wooden cot, bamboo umbrella, leaf raincoat, bamboo hat, broom stick, bamboo basket, winnowing fan, axe, grain bin made of straw and husking lever, etc. Presently they are using various types of metal utensils, cloths, umbrella and bicycle, etc.

(ii) Agricultural implements

The traditional agricultural implements of Eastern Indian tribes are very simple. The settled agriculturalists use different t5pes of wooden as well as iron implements for their agricultural activities which includes wooden plough with iron blade, yoke, moi (a longwooden field levelling implement), shovel, crowbar, knife, sickle and bullock cart, etc.

(iii) Dress and ornaments

The dress and ornaments of eastern Indian tribes var5r from area to area and tribe to tribe. Some of the 'Primitive' tribes residing in the dense forest area use very simple dress to cover their body. Few decades back, the Juangs of Orissa, and some other tribal groups were using leaf to cover their body. But some other tribes like the Ho, Santhal, Munda, Bathudi and Bedia, etc. who are residing along with other communities also use very simple dress to cover their body. Traditionally, the male members were using a hand woven coarse and narrow stripped dhoti around their waist, which rarely reach below to the kneqs. The lower corner of the dhoti tucked at the back. presently the shirt, pant, trouser and lungi are frequently used by the young generation. The female folk use a local made coarse sarz in their village. One end of this san is used as a lower garment to cover the waist to' knee portion where as the rest portion of the sari covers the chest and left shoulder reaching up to the right armpit' The undergarment and blouse are rarely used by the village ladies. But due to the regular contact with other communities and frequent visit to the nearby town and market, their dress pattern is gradually changing' Presently most of the female folk are wearing sarz' and other dresses and material like their neighbouring communities. Besides, some school going girl use frock, shirt and ribbon as their school dress. Generally the female folk of these tribes use different types of ornaments to decorate their body, which include glass bangle, earring, necklace, paiob and hair pin, etc' The use of wrist watch is frequently found among the male members who are working outside their village whereas it is very rare in case of female members.

(iv) Hunting and fishing implements

The long bow and arrow are the major hunting implements of these tribes. The bow is usually made of a broad, pliant splits of bamboo with the ends tied with a thin bamboo strings. They use two types of arrow namely, the sharp arrow and blunt arrow. The sharp end of the arrow is made with an iron tip, if needed; it is tied with a thin thread whereas the blunt end of an arrow is made of a hard wood. Feathers of different types of birds are tied at the butt end of the arrow to enhance its speed. The sharp end arrows are basically used for hunting of big animals where as the blunt

end arrows are used for killing small birds.

For fishing, they use a varieties of traps made of bamboo splits and kasigrass. These fishing implements are fixed in narrow and shallow running water channel or stream in such a manner that the fishes which enter into the basket are unable to return. However, sometimes they also catch small fishes from the stream by hand and net. During monsoon they also collect fishes from their paddy field by using small sized fishing trap.

{e) Art and craft

Art and craft is an important aspect of human culture. Scholars from different field study art and craft as well as the artisan groups from different perspectives. Although the anthropologists, ethnologists, sociologists and other social scientists are studying the art and craft since long, their major emphasis remain on the study of the social and economic organization of the artisan groups, broad patterns of distribution of their products, their articulation with society at large, and on the other aspects of social organisation.
On the other hand the Art historians, ceramicists and metallurgists focus on objects and techniques from their own specialized perspectives. From these, it is clear that, although these scholars from different disciplines are working on various aspects of a craft, none of these provide data on the material correlates of different patterns of craft production and their broader significance, to an archaeologist, what they actually need to interpret a culture.

However, it is only the ethnoarchaeologists, who try to show the pattern of distribution of material items result from the interaction of certain modes of specialist production with particular means of distribution and consumption, and how such patterns relate to socio-cultural entities of various kinds (David and Kramer 2OO1:304). The knowledge of art and craft is, usually, transmitted from generation to generation by the process of socialization. An ethnoarchaeologist studies the route and routes of transmission of this technology from the present ethnic communities and supplies this knowledge to archaeologist to reconstruct the past technology of the region. But, there is some limitations of ethnoarchaeolory. It is unable to provide all the essential data to archaeologists. India in general and eastern India in particular is very rich and well known for its art and craft products. While the tribes like Asur and Kolha are famous for their traditional iron smelting technique, the Mahali is famous for bamboo craft and Birhor is known for rope making. Similarly, the Soura possess expertise knowledge in wall painting.

Apart from these, most of the tribes decorate their houses, grain bins, and different kinds of materials in different ways. Apart from these, there are different types of art and craft objects prepared by these tribal people which have some cultural value. Mention may be made of the traditional door and other wooden carvings, carvings on comb and bamboo materials, tattoo and other body decoration and wall painting of the Juangs of northern Orissa (Ehrin 1948; Patnaik 1989; Dash L992a): art and crafts of the Kondhas (Dash and Pradhan 2006; Patnaik 2OOZ), etc.

(f) Trade and exchange

The general meaning of 'exchange' is the transfer of goods and services between people where as trade involve at least part-time specialists. Study of trade and exchange for ethno-archaeological purpose includes descriptions of markets along with the other mechanisms of distribution including gifting, exchange between friends, allies, kin, and members of different age-sets, and formal exchange partnerships between member of unrelated families over the course of generations, jajmani (patron-client relationships), where and services are exchanged, usually on

specific occasions. A11 these are suggestive of the variety of nonmarket forms of exchange existing in the past (David and Kramer 2O01:361).

At the time of analysing the significance of trade and exchange in ethno-archaeology they have stated that; "Exchange and trade distribute raw materials and artefacts across space through a variety of physical and institutional mechanisms, and, as items move, information and energy, sometimes in the form of armies, move with them. The desire to rationalize trade is frequently implicated in the spread of state forms of policy and the development of empires. The contexts in which objects move from producer to consumer that are most familiar to archaeologist are markets, a type of institution for which there is no evidence in many ancient context" (ibid).

(g) Mortuary practices

The ethnographic study of mortuary practice is very much useful for interpretation of the burial sites of archaeological context. As most of the archaeologists are not aware about the ritual process, they face a lot of problem to analyse the corpse material buried with in a burial site.

Binford (1971a,l97lb,1972) has made a significant work on mortuar5r practice. In this report, he dismissed several propositions regarding the determinants of mortuary practices offered by anthropologists of the culture historic period. At the end of this work, he mentioned that inconsistency in mortuar5r practices is related to changeability in societ5r in general and to the social persona of the deceased and the size and composition of the group to which he or she is socially related in particular.

For better understanding about the role of mortuary practice for interpreting the archaeology of the region a brief analysis of the mortuary practice of the Ho tribe is given here. For the burial of the dead body, the Hos always dig a stepped burial pit which contains two chambers i.e. inner and outer. They place the dead body and associated grave goods inside the inner chamber where as the outer chamber is filled with soil. In earlier times the Hos placed many grave goods inside the burial pit for a deceased's future use and satisfaction. These grave goods basically includes foods, drinks, utensils, coins, ornaments (glass, brass, silver, iron and gold,etc.) and a person's daily used articles, except the hunting implements.

But nowadays because of awareness and the high market price they do not bury the ornaments made of gold and silver. Customarily, the Hos perform the Pathalghori (placing of memorial stone) ceremony on the 10 th day after the death or 9th day after the Jangpokhari (in case of cremation). But as per their convenience a deceased's family can also perform it in advance to the customarlr date or postpone it for a long period. But now a days, a lot of changes are noticed in Ho memorial stones. Due to the non-availability of huge stone, heavy expenditure in transportation and lack of man power, presently the Hos prefer to place a small stone on the grave of their deceased relatives. After placing this small stone some of the Hos (not economically poor) prepare cemented platform on it.

As reported in earlier texts that vertical memorial stones were erected, but now some of them make vertical cemented memorial pillars instead of small stone near the road side, engraving name of the deceased and his/her achievements. It is found that usually two types of memorial stones, namely Dolmen - horizontal stone and Menhir - vertical stone are placed in memory of the deceased. Use of dolmen is widely found which means it is used for the commoners. On the other hand the menhirs are erected only for the persons having some status within the community (e.g. village headmen). For this purpose all the community people within the village bear the expense.

Nowadays, an economically well to do commoner with no notable social status like the village headmen can go for erection of menhir at his own cost which is socially acceptable within the community (Mohanta 2O1O).

IMPLICATION FOR ARCHAEOLOGY

As discussed earlier, the ethnographic data can answer easily many difficult or unsolved questions of archaeologists. Basa (1992: 95) in this context mentioned that "ethnographic, studies could work as flesh and blood for the skeleton of archaeological researches". These following points of the ethnographic work are important for the archaeological study. The shifting cultivation and terrace cultivation practiced by different tribal groups of Orissa and Jharkhand make available evidence to the subsistence strategies of early Neolithic culture of the region. Both Orissa and Jharkhand are very rich in Prehistoric as well as Early Historic Rock Art Heritage.

There are a number of Rock art sites discovered from Sambalpur, Sundargarh, Jharsuguda, Rairangpur and some other parts of southern Orissa as well as from the Hazaribagh region of Jharkhand. Out these, some rock arts bear only paintings and engraving where as some possess both paintings and engravings. The subject matter and s5rmbols of these rock paintings vary from site to site. The art and painting in general and the wall painting and floor design of Eastern Indian tribe may provide clue to analyse the prehistoric rock art.

Ethnography of craft, especially the traditional method of iron-smelting craft of the Asuras and Kolhas, the pottery and terracotta manufacturing technique, dokra craft of Mayurbhanj and Dhenkanal districts of Orissa as well as the other brass ware, bamboo and other wooden craft may show technological continuity from the remote past.

Different tribal group follow various types of methods for disposing up the body of their deceased relatives. They also bury various kinds of material in the grave along with the corpses. The size, shape and type of burial pit also vary from tribe to tribe. The ethnographic study of burial is more relevant for the archaeological study. The ethnographic study about the location of burial place, type of burial pit, direction of the head of the dead body and the arrangement of the grave goods give some important date for the further study. Besides, the size, rock type and direction of memorial stone could help to compare with the mortuary practices of neighbouring tribes as well as with the other archaeological evidences. Therefore, the study of mortuary practice of different tribal communities of eastern India might help in interpreting the eastern Indian burial sites.

Most of the tribes of the region believe in simple exchange system. Goods against goods, goods against services, services against goods, gift, etc. are very common in exchange system of the tribes. The area of their exchange network is also very limited. The intra tribal inter tribal dependence between the hill and plain people able to analyze the trade and exchange system of our ancestors.
The settlement and subsistence system of different tribes residing in different region could help to study the primitive settlement and subsistence system of the region. Besides, it could also provide data about the primitive ecology, environment, climate, flora, fauna, etc. The type and nature of the house and other material remains, daily use materials as well as other materials or artefacts, waste products can be deposited directly or indirectly in and around a structure or activity area would help to reconstruct the past culture.

Case studies

Ethno-archaeological Approach to Study Gujjar Tribe in Jammu and Kashmir, by Tirtharaj Bhoi.

The main objective of this study is to examine how the ethno-archaeological approach can help to document the material culture of past and present history of Gujjar people. The pastoral forms are still practiced by the Gujjar of Jammu and Kashmir region. However, the influence of the Aryans on transhumance and pastoralism remained a dominant characteristic. The intermingling of the Aryans and the native population gave rise to various ethnic identities in this region. Most of these were initially pastoralists but later they took to settled agriculture. Though, some of the communities maintained their tradition and are still practising the migratory livestock rearing. The most important community is Gujjar tribe. Hence, the standard Historical and Archaeological tools and techniques have been applied for collection of primary and secondary data.

A perspective has been forwarded by Abdul Gani Shashi after a detailed study of Arabic and Persian history. According to him, Gujjars share with Baduo tribe of Arab a common lifestyle, way of living and culture. It is believed that Gujjars along with Baduo tribe are associated with Khizir tribe that had left for Koh-ekaf during the era of Christ along with its camels and other domestic animals. Again he described, the word Khizir got changed to Garz to Garzar and with the passage of time this tribe came to be called as Gujjar. There is also a belief based on the history of Gujjars and Hindu manuscripts that Gujjars were one of the communities comprising devotees of lord Krishna. Gujjars took Krishna as their ideal and adopted his lifestyle. For a long time they were known for preservation of cows and it is because of cows that some of the castes of Hindus were known as those owning cows.

Cultural Heritage:
Gujjars are the dominating sect of people living the area of Jammu and Kashmir. They have their own typical cultural identity, speak different language in different dialects and have different occupation, music, different life style and clothing pattern. They are famous for cattle, sheep and goat rearing. But there is a lack of awareness among the people to preserve the history, archaeology and culture of the gujjar tribe.

Settlement Structure:
From the archaeological and historical evidences it is, however, evident that though the Indo-Afgan were the predominant race in the ancient population of Kashmir, there was definite admixture of other races from time to time. The Gujjars who had been a nomadic tribe are extensively becoming sedentary having a settle life in this region. Though, animal rearing is still practiced, the arable agriculture has also attained a prominence in the occupation of the Guijars. The similar type of tribe and practices is found among the people of Afganistan, Baltistan, Gilgit and Punjab area. These people speak the Dardic dialect which was similar to the Pisachas of Sanskrit literature of ancient period.[9]
Pastoral and Agricultural Practices:
If we analyses the description of Sir Walter Lawrence, some of the Gujjar settled down to agriculture and most of them are herdsmen and prefer the pastoral life. They are fine tall race men, with rather stupid faces and large prominent teeth. To understand the above mentioned truth by the British official, we need to use the DNA examination of Gujjars people with use of C14 and Skeletal Biology. The pastoral life was well described in Indian history and tradition. In

Bhagavata Purana it is mentioned that the cowherd Yadava rulers migrated to Saurastra region from Mathura to search for pasture field. Similar kind of theory one can utilize in the study of Gujjars in Jammu and Kashmir also.

Sheep and Goat Pastoralism:

Sheep and goat remains in the early farming in this region were evidence from Gufkral and Burzohan of Neolihtic and Megalithic period. One can take resource to ethno-ecological and the oral tradition of present day sheep and goat pastoralist of this region. Their oral narratives may represent the recapitulating the social memory of their past. The sheep and goat pastoralist communities claim their origin from an ancestral agricultural stock. These communities connect themselves to the ancient community which was mentioned in the Shiva Purana. In Shiva Purana, it is described that Parvati asked Shiva that she wanted sheep. To delight her, he created a ram and awe. In course of time these two multiplied in to big herd and became a nuisance. Then Parvati asked Shiva to take away the sheep and that day onwards a particular group of people who cared the sheep. One can conclude that the origin of this tribe may go back to the ancient period.

Historically and Archaeologically, this region has a high potential that can help to explore and reconstruct the past, which in turn would help to gain information that will help us in understanding the present scenario. From the above discussion one can say that, there is a huge scope for the study of Gujjars community from the Ethno-archaeological perspective. One of the major factors which have contributed to the strengthening of the regional identity of Jammu and Kashmir is the Gujjars culture and their identity. A number of scholars have studied in detail of the Gujjars tribe from the present perspective such as their art, culture, history etc. In the light of the above findings, it is quite clear that, for reconstruction of regional identity of Jammu and Kashmir one has to take into account the pivotal role played by the Gujjars in society and history. Hence, this approach leaves ample scope for the historians, archaeologists and anthropologist to work together and draw from each other's findings and exhibit their scholarship in a manner which would not only enrich their respective disciplines but also would strengthen the Gujjars identity in the State of Jammu and Kashmir.

The concept of 'Thunder Axe' in North East India

In the context of the North East India, ethnoarchaeology has ample scope as its application in the region expands beyond the understanding of material culture alone. The multiplicity and variety of preserved traditions render the region to be a storehouse of preliterate cultures. Thus, if ethnoarchaeology stresses on observing the ways of the pre-literate people, the traditional practices and belief systems which the tribes in this part of the world have carried with them from generations to generations, it can unfold valuable information about the past and act as an aid to archaeological recourse.

The concept of 'thunder Axe' is one of the many distinctive aspects of ancient belief systems which probably dates back to a very remote period. This belief is retained in the form of tradition by almost all the tribes that inhabited the North East region of India. Thus by applying the general comparative analogy for the concept of 'Thunder Axe', great insights could he gained about the cultural and cognitive patterns of prehistoric life.

The Neolithic stone tools, owing to their peculiar nature, have always mystified the common man who cannot diagnose them scientifically. These stone objects are assumed to be material products of thunder and lightning. The notion of a "thunder Axe" became a popular belief which remained unquestioned throughout the world, stretching from Europe, Africa, Asia Minor, India and Far East. Before the introduction of modern archaeology in Korea, prehistoric stone tools were

commonly called thunder axes.
In China, a thunder axe was seen as a heavenly object having medicinal properties. Traditional people believed that these thunder axes can immunize people and property from attack by lightning and thunder . In Scandinavia and Germany, people would hurl the 'thunderbolt (axe)' against the building, the door or the roof imitating the thunder strike in order to increase the chances of immunity from the real thunder strike. There is no reference about the concept of 'thunder axe' from the mainland of India, although, a picture in one of the reports from Tamil Nadu showed a picture of stone implements being placed at a shrine as objects of worship.

As stated earlier, the various tribes of North East India consider the Neolithic stone tools as 'thunder axe' with magical and medicinal properties. In their local dialects, the following terms are used to denote these objects; The Kachari tribe of Assam refer to these stones in their local language as *Sarak, ni-Ongthai (Sarak*= Heaven, *ni=of Ongthai=stone)*. In Santhali dialect these stones which came along with a thunder strike are called *Ceter* or thunder Axe. The traditional Sanatal people believe that the stones also have medicinal properties. They would rub the stone on a rough surface and whatever dust particle that comes out of the grinding process is dissolved in water and served as medicine. The Karbi and Tiwa tribes of Assam call the stones as *Choteracho* meaning thunder stone and they are also said to have magical and religious power with medicinal properties. Among the Adi tribe of Arunachal Pradesh, these stones are called *Lidar* which means a thunder stone. In fact no one is allowed to touch these stones because of superstitions that is associated with it.The Garos of Meghalaya refer to these stones as *Goera gitchi (Goera=god* of lighting; *gitchi=hoe.* The Angami Nagas call them *Methie* meaning thunder axe; in the Chongli and Mongsen dialect of the Ao Nagas it is called *Tsungyipo* and *Tsunglaao* respectively, which mean thunder axe.

According to J.P.Mills, many of the latter stone implements obtained from the Nagas and Kukis have already been scraped and otherwise damaged because they have been used as medicines. It is said that the Kukis would Oath in the name of these stone objects.

The concept of 'thunder axe' is an important ethnographic evidence to help us collect preliminary information on the locations of Neolithic culture or sites in any part of the region. Although the existing traditional idea of thunder axe may not be directly useful for archaeology since much of the information have been clothed in mythical association, a closer examination of the traditional explanation of the Neolithic axes can however, open up new questions to help formulate hypothesis on at least two theoretical conditions;

(i) To establish some form of conjecture about the determining factors which could have probably engendered the rise of such a concept among the traditional people.
(ii) To use the traditional concept in order to achieve some understanding about the dual role of these prehistoric tools, as items of utility and items of symbolic significance.

While dealing with the concept of thunder axe, it appears that much of the subject is closely linked with the evolution of 'religion' itself. But viewed from another perspective, tradition seems to supports a model that the conspicuous role played by these archaeological materials within the socio-economic system (mainly their functional utility) fostered their evolution into mythical objects attaining symbolic significance. Many more speculations can be forwarded to deal with this problem, but for a brief discussion on the topic, the following interconnected hypothetical questions can be made:
(a) Are these stone tools mistaken for other objects that have real association with the sky, such as the meteorites?
(b) Has their functional utility in the past help to elevate their role to a symbolic and mythical

position?
(c) Are the authors of the stone tools culturally separated from those who rendered them into mythical objects?
There is good evidence from Europe that even fossil echinoids *(sea urchins)* were looked upon as thunder bolts. Along with this, the aeroliths or meteoric stones which were also dug up from the soil have added to the theory of the thunder axe. This seems to explain the hypothetical question (a) , And it may be speculated that the peculiarity of the stone tools which do not have a natural shape must have indeed generated the concept of a thunder axe.