
UNIT 2 RELATIONSHIP OF ARCHAEOLOGICAL ANTHROPOLOGY WITH OTHER DISCIPLINES*

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Learning Objectives

This unit will help you to understand:

- The aim and scope of archaeological anthropology;
- The relationship of archaeological anthropology with other disciplines;
- How different disciplines contribute to the study of archaeological anthropology;
- The role of anthropology in the study of archaeological anthropology; and
- How other disciplines in conjunction with anthropology provide answer to the many questions of archaeological anthropology, namely, biology and its stages, culture, bio-cultural relationship, environment, space and time.

2.0 INTRODUCTION

Archaeological Anthropology is a part of Anthropology. It was known at first as Prehistoric Archaeology because it did not provide any written record and it is a time period of human beings when script was not discovered. This term was coined by Lord Avebury, also known as Sir John Lubbock in 1865 (Lubbock, 1865:2). Archaeology can only be defined in terms of Anthropology (Deetz, 1967). According to Penniman, (1965:16) archaeology is that part of anthropology, “which deals with the antiquity of man as ascertained by the earliest remains of his handiwork and is called Archaeology”.

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Anthropology in its broadest sense is the study of human beings. Archaeology studies humans of the past. In other words archaeological anthropology is the anthropology of extinct people. Prehistoric and Archaeological Anthropology are synonymous in the realm of Anthropology.

2.1 ANTHROPOLOGY AND ARCHAEOLOGICAL ANTHROPOLOGY

Anthropology is defined as holistic study of human being. The discipline covers diverse areas on the study of humans. It studies the origin and evolution of humans in space and time. The change and development of human beings, not only in its physical characters but in the area of socio-cultural element as well forms the study area of anthropology. Diversity of humans and their culture are also studied through time and space. Anthropology has got practical value too. Anthropological knowledge is applied for the well being of human kind.

Anthropology is divided into several branches. The most important of them are Biological/physical anthropology, Socio-cultural anthropology, Linguistic anthropology and Archaeological anthropology. Physical anthropology studies biology of human being, variation of biological aspects and human evolution. Primatology is an important part of biological anthropology. It deals with the study of primates. Biology and behaviour of primates are important for the reconstruction of evolution of biology and culture of man. Socio-cultural anthropology refers to customary ways of thinking and behaving of a particular population or society. It covers languages, religious beliefs, food preferences, music, work habits, gender roles, how they rear their children, construct their houses, and many other behavioural aspects that are shared customarily by a group of people (Ember, *et al.* 2002). Linguistic anthropology at present has found an important position in anthropology. It is study of people through their language and of relation between language, biology and culture.

Archaeological anthropology is a part of socio-cultural anthropology but the main difference is that it is study of the past culture. The study is based on reconstruction of the day to day life of people who lived in the past. It also studies the change and development of culture. At the same time it seeks explanation for such change. This branch not only includes prehistory but also studies the makers of the prehistoric culture. Sometimes this part is separately known as Palaeoanthropology, meaning anthropology of past. Conventionally the fossil remains of early man are studied under this heading.

Human beings are taxonomically defined as an animal having erect posture, enlarged and complex neural system, manual dexterity, visual acuity, articulated speech and other related biological characters. Culture is the behavioural aspect of man. Tylor (1871) defined culture as “a complex set of behaviour, which includes beliefs, art, morals, law, customs and any other habits and capabilities acquired by human being as a member of the society”. Kroeber defined it as extrasomatic behaviour of mankind. Culture is a unique feature of Human being. Culture has got a biological base. Human being could make culture because it attained some specific biological features. Human kind is distinguished from other animals by culture, by the ability to make tools and communicate ideas. To sum up Archaeological anthropology is anthropology of the past. Both biology and culture are equally important in archaeological anthropology. This branch of anthropology too is holistic study of man but the main difference is of time dimension.

Check Your Progress

1) “Archaeological anthropology is the anthropology of the past”. State if the statement is true or false.

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2.2 ARCHAEOLOGICAL ANTHROPOLOGY

In the middle of the nineteenth century several events such as formation of *Société ethnologique de Paris*, discovery of stone tools by Boucher de Perthes, Charles Lyell’s finding of the principles of geological layers, publication of Darwin’s *The Origin of Species* and such other events laid the foundation for the development of the discipline of anthropology. Various branches of science had contributed to the development of the subject. According to Ember, Ember and Peregrine (2002) the discipline is indebted to a number of other disciplines for its growth but it remains as a distinct and special subject on its own right.

Similar to anthropology the scope of archaeological anthropology can be divided into a number of broad categories centering around humans, such as, biology, culture, environment, space and time. For proper study of this branch of anthropology multidisciplinary approach is necessary.

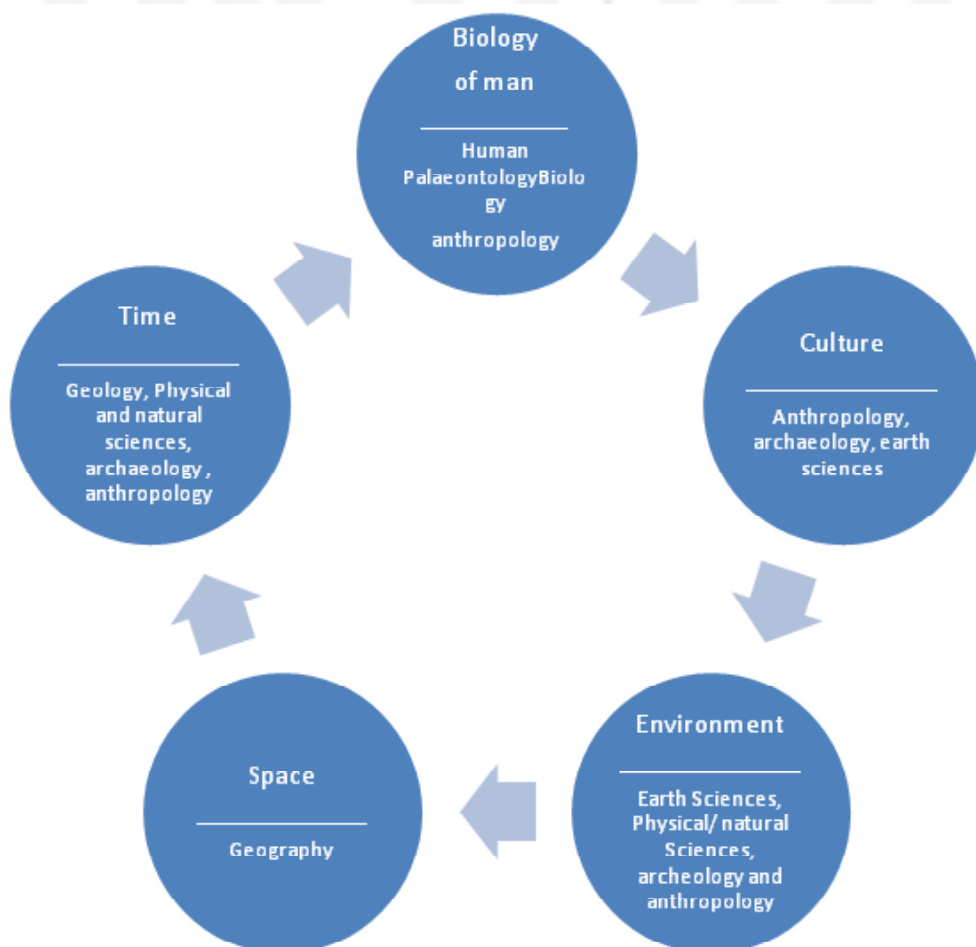


Fig.1: Scope of Prehistoric/Archaeological Anthropology and the Relationship with other Sciences to Reach the Goal of Reconstructing Anthropology of the Past

2.3 RELATIONSHIP OF ARCHAEOLOGICAL ANTHROPOLOGY WITH OTHER DISCIPLINES

Anthropology is considered as a master Science, which has collected data with the help of various specialised departments of already existing sciences. These are applied to the study of man, biologically, culturally, and in relation to the environment through time and space. None of the existing science alone can reveal the complete story of human being.

Man and culture in archaeological anthropology is reconstructed from bits and pieces of early man himself and his material remains found scattered over different spaces over the surface of the earth and below the surface as well. Method of reconstruction of anthropology of early man is considered as a conjunctive one. It is done with the help of a number of sciences.

A large number of sciences are involved in the methodology. Most important of the disciplines are as follows; Geography, Geology, Archaeology, History, Botany, Zoology, Chemistry, Physics, Mathematics and many other natural sciences. Anthropology of course is a very important part of the study of archaeological anthropology because it is the mother discipline and has evolved its own methodology.

2.3.1 History

Any subject for its study of its origin and development owes to its history of origin. The reason for the slow growth and development of the sub-discipline can only be understood in the study of its history of coming into being (Penniman, 1965). History says that prehistoric/archaeological anthropology is more than a hundred and fifty years old. History also points out the nature, time and sequence of finding of different artifacts and fossil remains. On the basis of history of discoveries the theory of evolution and understanding of development, change and diffusion mechanism can be studied. Reconstruction of cultural history is related to this discipline. Often archaeological data combined with historical records produce complete picture of man and culture than either would have given separately.

2.3.2 Earth Sciences

Earth Sciences cover both geography and geology. The common element between the two subjects is the prefix 'Geo' meaning earth. In many respects Geology and Geography are common as both of them deals with the study of the Earth. But they are not synonymous. Geology is concerned with time and Geography is involved with space. The former studies earth below the surface and the latter studies the surface of the earth. Earth which is under the study of geologists was at one time exposed but over time due to erosion and depositional activities caused by elements of nature, such as, water, wind and temperature was covered up by other deposits or removed to other places. When both geology and geography are taken together they give impression of diachronic study. The geological aspect presents vertical dimension mainly of time and the geographical science provides horizontal concept of space. Both time and space information are very important for archaeological anthropology. Relations of the two sciences with archaeological anthropology are discussed separately.

2.3.2.1 Geology

Geology provides chronology. It answers the question "when" man and culture originated and evolved. Main constituents of geology, which are essential for the present study are; stratigraphy, lithology, palaeontology and petrology. Each of the branches of geology mentioned has equal importance in relation to archaeological anthropology.

Stratigraphy

This is based on geological law of superimposition. It was first put forward by Charles Lyell in 1830. The principle is that layers of earth or strata are superimposed one on top of the other; lower the strata earlier the age. This is true for undisturbed deposits. Time dimension found in this way is relative, mainly in terms of earlier or later and in terms of the geological layer within which an artifact or fossil remains are found. Since the formation of the earth all the evidences are stored in geological stratigraphy.

Stratigraphy is observed either through excavation or at a naturally exposed surface, such as cliff sections along river beds, gorges, gullies etc. Biological characters of human being and its culture are divided into several stages on the basis of certain fundamental issues of geology. Even when we talk of archaeological or cultural stratigraphy, the underlying idea is borrowed from geology. Study of change and development in archaeological anthropology is meaningless without time dimension. Stratigraphy provides time dimension, which helps to understand the process of continuity of biology and culture through time, encompassing change, and development. The concept of time is an essential factor for determining diffusion mechanism.



Image 1: Example of Stratigraphy Showing Different Strata from Which Human Remains may be Found

Source: Prof. Ranjana Ray (authors) private collection

Check Your Progress

2) Define Stratigraphy.

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Lithology

This branch of geology is closely linked with stratigraphy. It gives information about the composition of each stratum. Example may be given of a stratum which is composed of materials which could only be brought down and deposited under a glacial condition. If any archaeological material is found from that stratum we can say that the people who made them lived under a cold climate. Many more inferences can be drawn about men and their culture from lithology, specially about climatic changes and environment.

Quality of stratum is studied through analysis of sediments. This involves three elements; i) components of the layer; ii) degree of humus present; and iii) physical properties of the layer. Various methods are involved in it which themselves are related to other disciplines, such as, soil science, chemistry, microbiology, botany, zoology etc. The composition of the stratum is not only indicative of materials with which the stratum is composed of but it involves issues related to the formation of the stratum. In pointing out and explaining the composition and formation of stratum, understanding of contemporary environment is done. Lithology points out changes in the climate that had taken place through time. In this way ecology and process of adjustment by human being under specific environment and under changed condition is reconstructed. It also gives an idea about patterns of culture, its growth and development with cause and effect in the given environmental background.

Palaeontology

This approach, though a part of geological method but can be taken up separately. Major relation of palaeontology with archaeological anthropology is dating, possible reconstruction of past environment and recovery of remains of early man.

Main objective of Palaeontology is study of fossils. Fossilisation takes place under fossiliferous environment. Bones of living creatures are made up of organic and inorganic materials. The organic material is bony protein, called ossein. The inorganic materials are minerals in different compositions. Ossein is replaced by silica particles present in the soil in which the bone is buried. The replacement is molecule by molecule. In this process the forms are perfectly preserved, whereas chemical composition changes. Fossils provide data about the morphology of the animals and even about human being, in case a human fossil is found. Skull not only provides information about its shape and form but the endocranial casts give estimation of cranial capacity. At present DNA are being extracted from fossil bones and important data on evolution and other biological aspects are coming out.

Two kinds of animal fossil remains have importance for archaeological anthropologists. They are as follows: i) some fossil remains continued from one geological period to another and II) some fossils are restricted to one particular period of time. The former are considered as 'index fossil' for a particular time period. When any form of human remains either biological or cultural or both are found to be associated, directly or indirectly, in a proper geological (stratigraphical) context, the human remains may be dated in terms of the associated palaeontological materials. Example may be given of *villafranchian* fauna, which is index fossil for Pleistocene period. This group of fauna consists of the genus of *equus* (horse), *bos* (cattle), *elephas* (elephant) and *camelus* (camel). Human remains found from any geological stratum bearing any one of the fauna will be considered as Pleistocene in date.

Animals of the contemporary period indicate generalized environmental condition of the time. From the environment cultural ecology can be reconstructed. Even ecological niche of early man can be understood. Presence of woolly rhinoceros and mammoth

indicates very cold climate. Butzer (1964:143) has given a chart of animal assemblages found at present in- different environmental zones of the world. Human beings possess greater and better capacity to adjust themselves to the changed condition of environment than the animals. Such adjustment is done with cultural innovations, such as, lighting fire and /or covering the body with fur or materials taken and fashioned from the natural resources.

Man and animal relationship can be established with the help of palaeontology. Types of animals early men hunted or the types they domesticated at a later date.

Human palaeontology is part and parcel of palaeoanthropology/ archaeological anthropology. Different stages of evolution are reconstructed on the basis of comparative anatomy of the modern man with those of fossil findings of early man. Human palaeontologists reconstruct the whole history of human evolution together with development of culture.

Petrology

This branch of geology studies rock types. Larger portion of human history belongs to Stone Age. Rock types played a major role in fashioning of stone tools. Petrologists make thin sections of different types of rocks and identify them into different categories. The analysis is important because it produces data on quality of the rocks and gives an idea about stone tools, their manufacturing techniques and about the skill and knowledge of the makers of stone tools. Petrologists provide information about suitability of rock types for preparation of stone tools. For a stone tool maker there could be bad or good rocks. Through this kind of study it was found that early man was capable of selecting ideal rock types for preparation of tools. The selection of rock types were very much connected with relevant technique of manufacture and of course availability in the locality. Quartz and quartzite were favoured in India and Africa for making lower palaeolithic tools like handaxe etc but with the development of prepared core technique (Levalloisian) they preferred finer grained raw material like cherty quartzite, chert etc. The heavy woodcutting implements like axe and adze of Neolithic times were made on hard grained rocks, for example, epidiorite, diorite or altered basalt. Technique of tool making and functions of the tools had changed with agriculture during Neolithic times. This necessitated for the change in raw materials. Petrology speaks about man's capacity for resource utilisation, its exploitation as well as migration in search of raw materials and new resources. Finally petrology throws a lot of light on understanding of stone tool making techniques, also known as reduction technology. Petrology is very important for archaeological anthropologists who are working on experimental reduction technology.

Check Your Progress

3) What is reduction technology?

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2.3.2.2 Geography

Any study on space is related to geography. Archaeological anthropologists begins

with the site of a finding of human remain, may be biological or cultural or both. The location of the site is marked in relation to its geographical situation. The site is described in terms of its latitudinal, longitudinal and altitudinal positions. Environment is very much part and parcel of geography. Contemporary geography provides clue to the past environment.

Geography points out man- region relationship. On the basis of geographical element an area may be considered as favourable or unfavourable for human habitation. Archeological anthropologist begins to look for remains of early human being on the basis of the areal suitability for human occupation. Arid zones both cold and hot desert are not favourable for human habitation. Early man preferred to live along the foot hill region of Himalayas but not on higher altitude where permanent frosting is present. Similarly the plains of river Ganga did not yield any evidence of human occupation of Pleistocene period because geographical evidence tells that the area was under mangrove swamp condition until the end of the Pleistocene period and was not suitable for human habitation. The deserts of western part of India had better climatic condition and palaeolithic men lived in the area from a very early time.

Man region relationship is further focused in geographically unsuitable areas. There are three aspects in case of change in the environment. They are: i) Early man may change his mode of adaptation, ii) it may bring in change in the environment by artificial means, such as, bringing in water in the dry areas by digging canals or clearing forest for grazing animals or for cultivation; iii) if nothing could be done they may abandon the area. Example may be given of towns and cities of Indus Valley Civilization, which were abandoned when the River Saraswati lost its navigability and the desert encroached upon the area (Danino, 2010). Physiographic information is largely related to this kind of understanding in archaeological anthropology, especially if the geographical information is substantiated by palaeo-geography of the region.

The concept of territory, culture area, and nuclear area of culture and area of its distribution is related to the discipline of geography. Any work in cultural perspective seeks to identify the centre from which the streams of culture originated and spread. The culture centre covers certain areas and usually possesses some special geographical elements. The extension of culture from the centre to the periphery is known as diffusion of culture and it depends on several geographical factors. Some amount of variation is found from centre to periphery, which increases with geographical situation. Important and interesting results are found in the transition areas, where culture areas merge into one another.

2.3.3 Archaeology

Archaeologists are anthropologists who excavate the material remains of past culture (Deetz, 1967). To begin with archaeology is largely concerned with material remains of man, both of past and recent past. Archaeological anthropology is restricted to very early times, before the discovery of writing. Archaeology too is dependent on other disciplines for its study.

Archaeology relates to search for material objects left by man. There are two kinds of search, namely, exploration and excavation. Exploration provides data from the surface and excavation brings out data from beneath the surface. Archeologists have developed methods and techniques for the recovery of materials both from exploration and excavation. After the materials are recovered they are put into order in relation to space, time and form (Deetz, 1967). Childe (1956) in his book "*Piecing Together the Past*" has pointed out how inferences can be drawn beginning with drawing and describing a single artifact and then going on to making a catalogue of all the related

objects in space and time. This he called assemblage. From assemblage archaeologists go on to make inference on culture and finally interpret the total cultural regime.

2.3.4 Physical Science/Natural Sciences

A number of other sciences are closely related to reconstruction, mainly in connection with dating. These range from chemistry, physics, astronomy, mathematics, statistics, botany, zoology and a few other subjects.

There are two kinds of dating; relative and absolute. The former establishes date of a human remain in relation to already dated event. The latter is chronometry where date of an object is established in absolute numerical order of the calendar. An account of the relationship of these sciences with the archaeological anthropology is given below.

Physics and Chemistry

Radiometric dating is based on physical and chemical sciences. Most important and most known is radio carbon method which is done on radioactive carbon (c14). Other radiometric methods are Potassium Argon method, Thorium Uranium method, Thermoluminescence, Obsidian Hydration, Fission Track, Archaeomagnetism, etc.

Flourine test, amino acid racemization, nitrogen analysis are a few examples of importance of chemistry in archaeological anthropology. Moreover these subjects also provide mechanism for preservation of perishable objects.

Electronics are providing means for detecting objects below the surface of the earth. With the help of electromagnetic resonance, buried objects, like, metal objects, burials, walls, foundations, kilns, furnaces, hearths and even pits and ditches filled up with topsoil or rubbish can be located. The satellite images help not only to identify unusual features of archaeological interest on the surface but it also point to buried objects. Remote sensing has become an important tool for the archaeological anthropologists.

Biological Sciences

Botany and zoology are important disciplines. Flora and fauna are valuable markers for environment. Human element both of biology and culture can be understood in the background of contemporary environment. In fact taxonomic identification of man in the animal kingdom is in the domain of zoology. Understanding of man animal relationship is largely dependent upon zoology. Man is a part of the animal kingdom. His relation with animals may either be positive or negative. Human beings may be prey of a carnivore or it may prey upon other animals. Some animals are domesticated by mankind to its own advantage. With the help of zoologist man - animal relationship and its cultural implications are properly understood. Past faunal remains are identified by the zoologists. This has been discussed above in relation to palaeontology.

Botany also plays a major role in archaeological anthropology. Pollen analysis provides with important data not only on chronology but it also throws light on the vegetation pattern of an area. Vegetation pattern points out the relevant environmental background for human activities. Example may be given of Clark's (Clark, 1980) work on Mesolithic culture of Europe. He had shown the dynamicity of adaptation by Mesolithic people to the changing environment during post Pleistocene period in Europe. This he had done with the help of data provided by the botanists and earth scientists regarding the development of forest and change in the environment and geography in Western Europe. He had superimposed archaeological data on them and established ecological niche formation by Mesolithic people who lived at that time in Europe.

Dendrochronology is one method of dating which the botanists provide. Botany also helps to analyse man - plant relationship. Plants resources are used by human beings for its livelihood, namely as food, fibre, medicine, container etc. Human beings not only used the plants in its natural habitat but also had domesticated them. These are turning points of human history and origin of cultivation and domestication mechanism can be researched with the help of plant science.

Finally there are a number of shell fish, mollusks, micro plants, animals and virus, which are sensitive to any kind of change in the environment. They also are important marker for dating and reconstruction of environment and culture.

<p>Check Your Progress</p> <p>4) What is dendrochronology?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

Mathematics and Statistics

Both the subjects are closely related to archeological anthropology. These are used for quantitative and qualitative analysis of data and for proper interpretation.

Astronomy

There is evidence that from a very early time mankind was attracted to the grandeur of the astral bodies. It has been reflected upon rock art, reliefs on potteries etc. Greatest contribution of astronomy is found in dating of the *Rigveda*, which coincides with the peak period of Indus Valley Civilization. This was done on the basis of location of constellation Pleiades, the *krittika nakshatra* (Tilak, 1893). Astronomy also helped to prepare calendars in prehistoric times.

These are some of the important relations of archaeological anthropology with other disciplines. There are other sciences as well which contributes to the knowledge of archaeological anthropology.

2.3.5 Anthropology

Main connection between anthropology and its branch archaeological anthropology is through human being. The focal point for both anthropology and archaeological anthropology is human kind. As discussed earlier scope of anthropology and archaeological anthropology are same. Identification of fossil men is done by human paleontology and biological anthropology. Biological anthropology relates the different stages of human evolution. There are at least three four stages of genus Homo or Hominoid. These stages are established with the help of data provided by paleontologist and dates estimated on the basis of natural sciences.

Socio-cultural anthropology helps in establishing relationship between biology and culture. Social manifestation of early man is reconstructed by anthropological method of analysis. Cause and factors responsible for culture, biological base for culture are part of anthropological study. Process of adjustment to the environment, any change or reasons for change are estimated with the help of common anthropological methodology.

Though there is no direct evidence for linguistic anthropology for archaeological anthropology but the biological factors responsible for development of articulated speech may be derived from biological and cultural evidences. For example the development of larynx, palate etc in the buccal area, concomitantly with brocas area in the brain postulates man's capability for language. Further to this the standard and uniform pattern of tool types, similar processes of artifact manufacture, use of similar raw material for preparing tools also indicate presence of some kind of linguistic media for communication.

Recent contribution of biological anthropology in the field of mitochondrial study of both modern and fossil men point out centre for origin of humans and their dispersal over the globe in a systematic manner. The study had been superimposed on the early cultures of the world and a clear picture of early diaspora and peopling of world from its cradle in Africa has emerged.

Ethno-archaeology is a special technique of archaeological anthropology. With the help of ethno graphic data cultural reconstruction can be done. This method is very much dependant on anthropology. Ethnographic data is collected by prescribed anthropological methods. Superimposition of present socio-cultural meaning on the past materials is to be done with extreme caution because socio-cultural elements are processes, which are dynamic that is constantly changing due to various reasons. Use of ethnographic data for reconstruction of past ways of life depends on the anthropological expertise.

It may be said that when the focus of study is man, anthropology has to play a bigger role. Anthropology synthesizes the data on man and culture and helps to reconstruct the past ways of life of man, together with the bio-cultural process which took place in the last two million years until we reached the present day status both biologically and culturally.

2.4 SUMMARY

Prehistoric/ archaeological anthropologists are anthropologists who study day to day life of people who lived in the past. They reconstruct the socio-cultural pattern, beliefs and customs of early man as well as they study their biological make up and the relationship between biology and culture. Growth and development of anthropology took place with the contribution of a number of other disciplines, namely biology, earth sciences, history, physical and natural sciences. Similarly archaeological anthropology also is related to all those disciplines. Scope of archaeological anthropology is same as anthropology with aim at holistic study of man. Main difference is the time factor. Archaeological anthropology is concerned with man and culture of past. Scope can be divided into biology of human being, socio-cultural element, environment in which it lived, space on the globe, which gave rise to diversity in the environment, leading to change in culture from one place to the other. Time is a very important part in the scope of archaeological anthropology. A number of disciplines are related for the study of this branch of anthropology. Basic theme of archaeological anthropology is reconstruction. Fragmentary evidences of human remains, both of biology and culture are available for reconstruction. Numbers of other disciplines such as history, earth sciences (Geology and geography), archaeology and physical and natural sciences are contributing to the reconstruction of man and his culture through time. Anthropology together with its branches, biological, socio-cultural and even linguistic anthropology are related for the study of early man and his culture. No single discipline on its own can answer all the questions related to man. Each discipline contributes in one way or other for the study. Biology of early man is understood through zoological classification. Different stages of

Homo or Hominoid are identified with the help of biological anthropology and human palaeontology. For the reconstruction of early culture archaeology and anthropology play major role. Knowledge about past environment is an important part in reconstruction of mode of adaptation of man through its biology and culture. Earth sciences like geology and geography have their important contributions. Natural and physical sciences are also equally important in this respect. Without the contribution of geography understanding of environmental condition, variation in space could not have been done. Time has an important role to play in the study of evolution, origin, and dispersal and diffusion mechanism. Prime importance in this respect is of geology, physical and natural sciences. Archaeology, history and anthropology are other disciplines contributing to the knowledge. In brief it may be said that a number of disciplines are related to the study of archaeological anthropology but the binding factor is anthropology. Anthropology synthesises the data available through other disciplines and reaches the ultimate goal of archaeological anthropology that is the study of early human being, its biology, socio-cultural milieu through time and space.

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2.6 ANSWERS TO CHECK YOUR PROGRESS

- 1) Yes, Archaeological anthropology is the anthropology of the past.
- 2) Stratigraphy is based on the geological law of superposition. The principle of

stratigraphy states that the layer at the top is the recent layer while the later at the bottom is of the earliest period provided there has been no disturbance to the layers like earthquake, tectonic movement, landslide etc.

- 3) Petrology is the study of rocks and it has a significant role in archaeological anthropology. The study of the rocks throws a lot of light on understanding of stone tool making techniques, also known as reduction technology.
- 4) Dendrochronology is a method of dating widely used by botanists.

