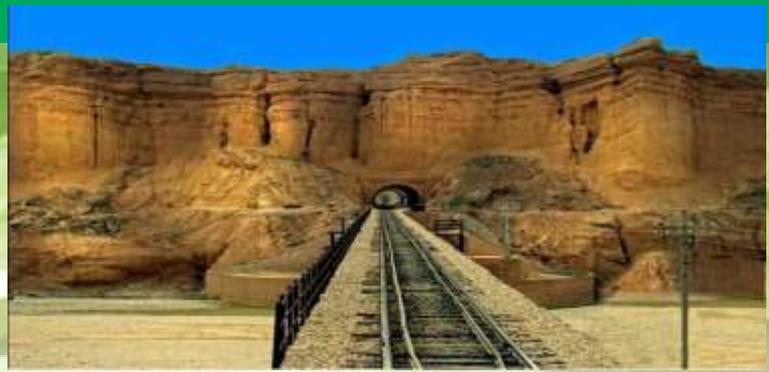


Level: B.S

ARCHAEOLOGY OF PAKISTAN

Course Code
9357



Department of Pakistan Studies
Faculty of Social Sciences & Humanities

ALLAMA IQBAL OPEN UNIVERSITY ISLAMABAD

ARCHAEOLOGY OF PAKISTAN

(BS Pakistan Studies)

Course Code: 9357

Unit: 1-9

Prof. Dr. Badshah Sardar
Course Development Coordinator



Faculty of Social Sciences & Humanities
ALLAMA IQBAL OPEN UNIVERSITY ISLAMABAD

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Course Development Coordinator: Prof. Dr. Badshah Sardar

Editor :.....Fazal Karim

Layout :.....Naeem Akhtar

COURSE TEAM

Deab: Dr. Syed Hassan Raza

Chairman: Prof. Dr. Badshah Sardar

Course Development Coordinator: Prof. Dr. Badshah Sardar

Witters:

1. Prof. Dr. Badshah Sardar
2. Dr. Tahir Saeed

Reviewers:

1. Prof. Dr. Muhammad Ashraf Khan
2. Prof. Dr. Ghani-ur-Rehman
3. Prof. Dr. Saeed Arif
4. Prof. Dr. Wiqar Ali Shah
5. Prof. Dr. Riffat Dar
6. Prof. Dr. Zakir Ullah Jan
7. Prof. Dr. Shakir Ullah

Course Coordinator: Prof. Dr. Badshah Sardar

Editor: Fazal Karim

Layout: Naeem Akhtar

External Members:

- Prof. Dr. Anwar Shaheen,
Director, Pakistan Study Centre, University of Karachi
- Prof. Dr. Abdul Rauf,
Chairman, Department of Political Science, University of Peshawer
- Prof. Dr. Tanveer Anjum,
Chairperson, Department of History, Quaid-i-Azam University Islamabad
- Prof. Dr. Yousaf Khushk,
Director, Academy of Letter, Islamabad

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Perface

Pakistan is one of the few fortunate countries of world which has a rich cultural heritage. However, despite the best efforts of the scholars to document the rich ancient heritage of the country surviving in the form of archeological sites and historical monuments are still awaiting our proper attention of the Archaeologists. This country which despite being very rich in pre-historic, proto-historic and historic period sites. It has a lot of Hindu, Buddhist, Muslims and British period monuments, shrines and memorials which have not received the desired attention in the past.

Cultural relics of a contry are the virtual foundations for advancement in corporate life. As achievements acquired after prolonged struggle with nature and environment, they manifest the store of creative intelligence, initiative, perseverance and integrity that have gone into the making of a particular national character. Pakistan has been very fortunate in this respect. Admittedly, this land has been an important primeval stage for the grand and grim drama of man's first endeavour, his integral rise, his phenomenal fall and the great resilience which kept the stream of human life in action in spite of all obstructions and intermittent lapses.

A rich cultural heritage sites; like ancient rock shelter, rock carvings, Hindu temples, Buddhist stupas, Mughal's period *Boali*, *Sarais*, Mosques and Forts are particular interest and their scientific investigation is likely to shed new light on some key questions of prehistory and historic periods of this region. This book will also highlight the origin and spread of agriculture evolution of the society, the nature and the origin of the early communities and their cultural relations with Central Asia and Persian world in the ancient times.

I am honored that a new course book '*Archaeology of Pakistan*'(code 9357), for the students of BS Pakistan Studies is now available. In this book ancient history and especially cultural heritage of Pakistan has been highlighted. This book will be beneficial for archaeologist, historians, anthropologists, students and social scientists as well.

Prof. Dr. Badshah Sardar
Chairman/Course Coordinator

Acknowledgement

Allama Iqbal Open University (AIOU) has been offering quality education to the students of all over the world in numerous disciplines and programs. These programs are ranging from Matric to Ph. D. AIOU provides education facility at doorstep of the students through out the country. The Faculty of Social Sciences & Humanities has started several new academic programmes, while BS Pakistan Studies is one of them.

Its my great pleasure to put on record the cooperation and academic support of the Committee of Courses (CoC) Department of Pakistan Studies, and members of all the Statutory Bodies of AIOU. It is my pleasant duty to record my gratitude to all the unit writers/authors, whose expertise and insight in subject has encouraged and enable me to undertake this publication. I am also thankful to all reviewers/resource persons of the units for their valuable suggestions and input.

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Prof. Dr Badshah Sardar
Chairman/Course Coordinator

Introduction

During the last four decades, there has been a progressive increase of archaeological field researches in Pakistan. These researches have been undertaken by many agencies; Federal Department of Archeology and Museums, Pakistani Universities and Foreign Archaeological Missions working in close collaboration with Pakistani archaeologists. Scholars of various disciplines have joined hands with archaeologists to unravel and interpret new information on early cultural and civilization of the world.

The book entitled '**Archaeology of Pakistan**' (code 9357), covers diverse subjects, ranging from Stone Age to historic period of the Sub-continent. As we all know that Pakistan has been a cradle of several ancient civilizations; it was here that one of the greatest riverine civilization the ancient world—the 'Indus Valley Civilization' flourished from 2500 BC to 1900 BC. To trace the origin and development of human culture and civilization of the Pakistan from earliest agricultural communities in Baluchistan to a complex urban culture of the Indus Valley Civilization. Since then, various peoples with their varied cultural traits came to this land and left a rich cultural wealth in the form of art and architecture which ultimately became the proud heritage of Pakistan.

The antiquity of the cultural heritage of Pakistan is as old as humanity itself. It is in this primeval stage of civilization that the grand and grim drama of man's struggle for existence was enacted in the hunting stage of human history. Since then, various peoples with their varied cultural traits came to this land of ours and have left the legacy of a rich cultural wealth in the form of art and architecture which ultimately became the proud heritage of Pakistan. Cultural relics of a country are the best manifestations of a nation's corporate life and Pakistan is exceptionally fortunate in this respect.

Before the advent of Islam, in the beginning of the 8th century CE., Pakistan had been the meeting place of the Aryans, Achaemenians, Greeks, Shakas, Parthians and the Kushans each with their distinctive cultural outlook. Thus, it became a centre of varied cultural diffusions. It is, indeed, in Pakistan that the West met the East. Striking its roots deep into pre-Islamic traditions, the rich cultural possessions of Pakistan can easily be compared with those of the ancient Middle East. The stream of cultural life, which started flowing on the river banks of Soan in the hoary past of about two and half million years back, has been kept in motion even down to the present age in spite of occasional obstructions and intermittent lapses.

In the beginning of the 8th century Muhammad bin Qasim arrival at Debul in Sindh and in the 11th century, the Turkish rulers of Afghanistan began the Islamic conquest of the Sub-continent from the northwest. Khyber Pakhtunkhwa, Punjab, Sindh and Baluchistan became integral parts of the Ghaznavid Empire. In 12th century Muhammad of Ghor defeated the Rajput confederacy and captured Delhi in the following years. This marked the beginning of the Sultanat Period, which lasted for over 300 years, with five dynasties of Muslim Sultans succeeding one another in Delhi.

Mughal's domination on the Sub-continent marks the beginning of a new era of great intellectual and artistic traditions. They brought perfection in every aspect of arts and crafts. The main factor behind it was the imperial patronage and the aesthetic nature of the emperors. The Mughals built varieties of buildings such as; Royal Forts, Palaces, Grand Mosques, Tombs, Mausoleums, Gardens and Caravan Sarais in the Sub-continent.

Social, religious, political and economic effects of Islam on Hindu culture and society of the Sub-continent can be detected from the presence of Islamic art and architecture scattered in length and breadth of the Sub-continent. Similarly, the Islamic architecture reflects the Iranian influence prominently, the architectural features like *Minars*, Mosques, Gardens, Tombs and Mausoleums reflects the Muslims influence on Indian architecture.

This volume contains the following units.

1. Introduction to Archaeology
2. Physical and Cultural Anthropology
3. World Civilizations
4. Early Urbanization in Pakistan
5. Ancient Art and Architecture in South Asia
6. Numismatics
7. Muslim Art and Architecture in Sub-Continent
8. Cultural Heritage & Museums in Pakistan
9. Tourism in Pakistan

All the above-mentioned units have designed and written on Open Distance Learning (ODL) mode and according to the level of the students. The offering of this book will hopefully facilitate all the academic faculty of the AIOU.

Course Development Coordinator

UNIT. 1

INTRODUCTION TO ARCHAEOLOGY

Written by: Dr. Tahir Saeed
Reviewed by: Prof. Dr. Badshah Sardar

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Introduction

Archaeology has come of age, while it began as a method of identifying places and objects already known from the historical record, it has become a powerful means of discovering new facts not only about the historical period but also about ages beyond the reach of written evidence. It is at last beginning to provide answers to some of the most fundamental questions about human origins and the development of human society. Dealing with the whole story of man's existence on Earth, it brings a fresh perspective to the study of past and present conditions.

Its evidence is the material imprint of man's activities on the landscape: the remains of his shelters, his tools and the facilities that he has created in order to exploit the natural environment. The methods of the archaeologist range from the microscopic examination of traces of wear on ancient tools to the reconstruction of whole landscapes through the use of aerial photography and field survey. Such methods are as valuable in investigating the recent past as they are in reconstructing the more remote periods of prehistory.

One effect of archaeological research has been to direct attention to the basic material conditions of life in early societies—the means of production and livelihood and the distribution of durable goods. Archaeology is both a set of methods for the reconstruction of past states of society and a realm of inquiry dealing with the long-term development of human culture and its explanation.

The state of archaeological research in different parts of the world is still very uneven. Nevertheless, the progress of the last decades has produced striking advances in our understanding of global developments over the archaeological time-scale. This unit is an attempt to summarize the present state of knowledge over the whole field of archaeological inquiry. It reflects a growing awareness of the contribution that archaeology can make in revealing the common history of mankind.

This book archaeology of Pakistan and its unit-1, endeavored to trace the origin and development of human cultures and civilizations of the world in general and

the Sub-continent in particular from its earliest roots in Stone Age to urbanism, but the students still need to study this phenomenon in its continuity.

Objectives: After studying this unit, the student will be able.

- to arouse student's interest in the ancient history, antiquities and monuments in this region.
- to create a public consciousness that they may respect and seek to preserve these remains of our cultural heritage.
- to trace the growth and development of ancient culture and civilization in Sub-continent
- to examine analytically the sources of ancient history of Pakistan
- to understand human past and evolutionary process that mankind underwent through ages
- to give insight to the student an in-depth understanding of the development of different cultures within the areas constituted Pakistan.

1. Introduction

1.1 Archaeology

The word Archaeology comes from two Greek words; *archaia* which means ancient things and *logos* as theory, or science, study. Literarily it means “the study of ancient history through the material culture”. The material culture is the aspect of social reality grounded in the objects and architecture that surround people. It includes the usage, consumption, creation, and trade of objects as well as the behaviors, norms, and rituals that the objects create or take part in. The material culture can also be described as any object that humans use to survive, define social relationships, represent facets of identity, or benefit peoples' state of mind, social, or economic standing. The scholarly analysis of material culture, which can include both human made and natural or altered objects, is called material culture studies.

Archaeology is scientific study of the material remains of the past human life and activities. The material remain includes the human made artifacts from the earliest stone tool implements to the man-made objects of interest that are buried with the passage of time and un-earthed by the archaeologists. It is particularly important for learning about prehistoric societies, for whom there may be no written records to study. The prehistoric period includes the human past from Paleolithic period or Old Stone Age to the advent of writing (literacy) in societies across the world. The subject of Archaeology is concerned with the full range of past human experience- as how people organized themselves into social groups and exploited their surroundings; what they ate, made, and believed; how they communicated and why their societies changed. The terms "Paleolithic" and "Neolithic" were introduced by John Lubbock in his work *Pre-historic Times* in 1865. The additional "Mesolithic" category was added as an intermediate category by Hodder Westropp in 1866.

The discipline of archaeology involves; archaeological surveying, explorations, excavations and ultimately analysis of data collected to learn more about the past. Archaeology is study of humanity through the analysis of material culture to ultimately gain an understanding of the daily lives of past cultures and the overarching trend of human history. However, in wider scope archaeology relies on cross-disciplinary research work. In its broadest sense, the archaeological record can be conceived as the total body of objects made by, used by, or associated with, humanity. This definition encompasses both artifacts (objects made or modified by humans) and 'ecofacts' (natural objects associated with human activity). In this sense, it is equivalent to material culture, and includes not just 'ancient' remains but the physical things associated with contemporary societies. Archaeology, which studies human activity through investigation of physical evidence, is considered a branch of anthropology in the United States and Canada, while in Europe it is viewed as a discipline in its own right or grouped under other related disciplines, such as history.

The main objectives of archaeology includes; to document and analyze the origins and development of human culture, comprehend the cultural history, find out chronicle cultural evolution as well as study the human behavior and ecology for both prehistoric and historic societies. The archaeological investigations are a principal source of scientific knowledge about the prehistoric period including the ancient and extinct cultures. The archaeological records consist of mainly artifacts, architectural elements and cultural landscapes. A professional and trained archaeologist is supposed to describe, classify and analyze the artifacts he studies to understand the past history of mankind. The foremost aim of an archaeologist is however, to place the material remains in historical contexts to supplement what may be known from written sources and thus to increase understanding of the past. He writes the blank chapters of a nation's history with the

help and interpretation of cultural material discovered through the course of archaeological excavations.

Archaeology is an approach to understand the human culture of the past through the material remains which discovered with the help of the spade of an archaeologist. The traditional archaeology is viewed as the study of pre-historical human cultures. It provides the only means to learn of the existence and about the behaviors of people in the past. In this context, the word 'Culture' is a wide term which encompasses the social behavior and norms found in human societies, as well as the knowledge, beliefs, arts, laws, customs, capabilities, and habits of the individuals in these groups.

Human beings acquire culture through the learning processes of socialization, which is shown by the diversity of cultures across societies. 'Culture' is also defined as a social domain that emphasizes the practices, discourses and material expressions, which, over time, express the continuities and discontinuities of social meaning of a life held in common. In the words of E. B Tylor, it is "that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society." *The Cambridge English Dictionary* mentions that culture is "the way of life, especially the general customs and beliefs, of a particular group of people at a particular time." However, a broad definition of 'Culture' was adopted in a meeting of MONDIACULT held in Mexico during 1982 which describes it as "Culture...is ... the whole complex of distinctive spiritual, material, intellectual and emotional features that characterize a society or social group. It includes not only arts and letters, but also modes of life, the fundamental rights of the human being, value systems, traditions and beliefs." The word 'culture' constitute two forms; tangible and intangible. The tangible culture means built cultural heritage (such as

monuments, group of historical buildings, architectural elements); archaeological heritage (such as archaeological sites/ remains, rock art); cultural landscapes (natural environments); and cultural objects or artifacts; (such as movable cultural heritage in the different collections). The intangible cultural heritage means traditional crafts and occupations (such as techniques and skills in the creation of objects); traditional knowledge (such as skills transmitted from generation to generation); cultural expressions (such as dance, music, language, visual arts); domestic, religious and social practices (such as cultural activities that take place within a community). The 'heritage' means any attribute or immaterial possession that is inherited from ancestors or the practices that are handed down from the past by traditions.

In fact the study of Archaeology is partially the discovery of the treasures of the past, partially the meticulous work of the scientific analyst, partially the exercise of the creative imagination. But it is also the painstaking task of interpretation so that we come to understand what these things mean for the human story. Archaeology has various goals, which range from understanding culture history to reconstructing past life ways to documenting and explaining changes in human societies through time period.

Archaeology is both physical activity in the field or at an archaeological sites and an intellectual pursuit in the study of laboratory work. The traditional approaches tended to regard the objective of archaeology mainly as reconstruction by piecing together the missing parts, but today it is not enough simply to re-create the material culture of remote past to complete the picture. A further objective has been now termed as "the reconstruction of the life ways of the people responsible for the archaeological remains of the past." Therefore in order to fill the gaps in the story of the evolution of human society and to provide meaning and substance to the

bones of history, an archaeologist carry out scientific excavations and explorations as it constitute an essential source of knowledge about the past history.

The people of today more are interested in having a clear picture of understanding as how people lived and how they exploited their environment. There are many big questions that preoccupy us today. For instance we want to understand the circumstances in which our human ancestors first emerged. Was this in Africa and only in Africa, as currently seems the case? Were these early humans' proper hunters or merely scavengers? What were the circumstances in which our own subspecies *Homo sapiens* evolved? How do we explain the emergence of Paleolithic art? How do we explain the rise of cities, apparently quite independently in different parts of the world? After these general questions there are more specific one; we wish to know why a particular culture took the form it did? How its particularities emerged and how they influenced developments? This interest in the processes of cultural change has come to define what is known as "*Processual Archaeology*". The "*Processual Archaeology*" moves forward by asking a series of questions, just as any scientific study proceeds by defining aims of study, formulating questions and then proceeding to answer with them. The main aims and goals of subject of Archaeology are; to document and explain the origins and development of human cultures, understand cultural history, cultural evolution and study of human behavior and ecology for pre and historic societies. As such the subject of Archaeology provides the only means to learn the existence and behavior of people in the past. Archaeology is an exciting pursuit for knowledge about us and our human past. The archaeological investigation usually involves several distinct phases; by employing it own variety of methods and techniques. However, before the commencement of any field work, a clear objective as to what the archaeologists intends to achieve should be recognized. Then a site is surveyed to find out as much as possible about it and the

surrounding area. The archaeological excavations may take place to uncover any archaeological features buried under the ground by applying scientific methods.

When the artifacts and structures have been excavated or collected from surface surveys it is necessary to properly study them which is called as post-excavation analysis. At a basic level of analysis, artifacts found are cleaned, catalogued and compared to published collections. This comparison process often involves classifying them typologically and identifying other sites with similar artifact assemblages. For instance, bones, plants and pollen collected from a site can all be analyzed, using the methods of zoo-archaeology, paleoethnobotany. These techniques provide important information that would not otherwise be known. After identification, collection and proper documentation of different kinds of cultural heritage, it is important to record all the relevant information about these resources for translating into GIS (Geographical Information Systems) and maps. The computer assisted programme like computer graphics are now used to build virtual 3D models of sites, and excavated objects. The 3D modeling integrates spatial knowledge with elevation data in order to produce three dimensional stands-alone relief models. The map is built up out to represent the elevations on a topographic map and creates the physical landscape in three dimensions. Photogrammetry is also used as an analytical tool and digital topographical models have been combined with astronomical calculations to verify whether or not certain structure like pillars were aligned with astronomical events such the sun's position at a solstice. The 3D photogrammetry is the technique for creating images, measurements and 3D models by obtaining the three-dimensional information about physical objects through digital photographs. By requiring only simple devices, this technique has been used as a documentation method in the fields of archaeology and architecture and has many possibilities for sharing knowledge among professionals and public as well.

The use of drones has proven useful in archaeology. The archaeologists use drones to speed up survey work and protect sites from destructions. The information in this process, collected is studied and evaluated in an attempt to achieve the original research objects of the work. After when these methods are applied, it is considered good practice for the information to be published so that the results of the work are available to other archaeologists, researchers, scholars and students.

Archaeology is thus a field of scientific research, which strives to reconstruct the human past cultures and civilization. It begins with the dawn of humanity on earth crust and will end up only with the final extinction of man in this world. Today archaeology is a serious discipline elucidating what is quite contrary to the speculative treasure hunting archaeology of past. Archaeology is a sensitive discipline which requires special attention and careful observation, scientific and systematic methods, and a logical interpretation. There encompasses the whole world, time as well space is no obstacle to it. It is an ever-developing subject, which assimilates, analyzes, and at the same time critically evaluates the existing methods and theories, which were in vogue in recent past. It is a living discipline related with people and their cultures, and not only an assemblage of accumulated data recovered from the archaeological sites.

1.1.1 Archaeology and Anthropology: Anthropology is the study of humanity; our physical characteristics as animals, and our unique non-biological characteristics that we call culture. Culture in this general sense includes what the early anthropologist Edward Tylor summarized in 1871 as “knowledge, belief, art, morals, law custom and any other capabilities and habits acquired by man as a member of society”.

Anthropology is a broad discipline divided into three smaller disciplines: physical anthropology, cultural or social anthropology, and archaeology. Physical anthropology, also called biological anthropology, concerns the study of human biological or physical characteristics and how they evolved. Cultural anthropology – or social anthropology as it is called in Europe and elsewhere – analyzes human culture and society. Two important branches of cultural anthropology are ethnography (the study at first hand of individual living cultures), and ethnology which attempts to compare cultures using ethnographic evidence with a view to deriving general principles about human society. Archaeology is the “past tense of cultural anthropology”. Whereas cultural anthropologists will often base their conclusions on the experience of actually living within contemporary communities, Archaeologists study past societies primarily through their material remains; the buildings, tools, and other artifacts that constitute what is known as the material culture left over from former societies.

Nevertheless, one of the most challenging tasks for the archaeologist today is to know how to interpret material culture in human terms. How were those pots used? Why is some dwellings round and others square? Here the methods of archaeology and ethnography overlap. Archaeologists in recent decades have developed ethno archaeology, whereas like ethnographers they live among contemporary communities, but with the specific purpose of understanding how such societies use material culture; how they make their tools and weapons, why they build their settlements where they do, and so on.

1.1.2 Archaeology and History: The conventional historical sources begin only with the introduction of written records around 3000 BC in western Asia, and considerably later in other parts of the world. A commonly drawn distinction, therefore, is that between prehistory –the period before written records

—and history in the narrow sense, meaning the study of the past using written evidence. Archaeology can contribute a great deal to the understanding even of those periods and places where documents, inscriptions, and other literary evidence exist.

1.1.3 Archaeology and Science: The aim of archaeology is the understanding of humankind. It deals with the human past as it differs from the study of written history— although it uses written history — in a fundamental way. The material the archaeologist finds does not tell us directly what to think. Historical records make statements, offer opinions, and pass judgments. The objects that archaeologists discover, on the other hand, tell us nothing directly in themselves. In this respect the practice of archaeology is rather like that of the scientist. The scientist collects data (evidence), conducts experiments, formulates a hypothesis against more data, and then in conclusion devises a model. The archaeologist has to develop a picture of the past, just as the scientist has to develop a coherent view of the natural world.

Archaeology thus is a science as well as humanity. That is one of its fascinations as a discipline. The technical methods of archaeological science are the most obvious, from radiocarbon dating to studies of food residues in pots. Equally important are scientific methods of analysis, of inference. Some writers have spoken of the need to define a separate “Middle Range Theory,” referring to distinct ideas to bridge the gap between raw archaeological evidence and the general observations and conclusions to be derived from it. But we see no need to make a sharp distinction between theory and method. Its aim is to describe clearly methods and techniques used by Archaeologists in investigating the past. The analytical concepts of the archaeologist are as much a part of that battery of approaches as are the instruments in the laboratory. One of the major developments of the last two or three decades has been the realization that

archaeology has much to contribute not just to an understanding of prehistory and ancient history, but the more recent historic periods as well.

1.1.4 The Sub-disciplines of Archaeology: There are a number of archaeological sub-disciplines which are characterized by a specific method or type of material analysis, the most common mentioned are:

i. Ethno Archaeology: Its study living people, designed to aid in our interpretation of the archaeological record, the early ethno archaeological research focused on hunter-gatherer or foraging societies, today ethno archaeological research encompasses a much wider range of human behaviour. It is study of living people, designed to aid in our interpretation of the archaeological record. Presently, the ethno-archaeological research includes a much wider range of human behavior.

ii. Historical Archaeology: Historical archaeology is the study of cultures with some form of writing. The excavations carried out for instance at Moenjodaro revealed the history of ancient culture prevailed in the area during third millennium BCE.

iii. Environmental Archaeology: The environment archaeology is an important field where archaeologists and specialist from other sciences study the human use of plants and animals and as how past societies adapted to the ever-changing environment. It views the human animal as part of the natural world interacting with other species in the ecological system or ecosystem. The environment governs human life, latitude and altitude, landforms and climate determine the vegetation, which in turn determines animal life. All these things taken together determine how and where humans have lived or at least they did until very recently. The environment is seen now as variable not as something which is constant or homogenous through space and time. The artifacts

discovered from excavations can provide following information about the environmental archaeology:

- a. Information relating to paleo-environment: This can inform us about the general climate, environment and ecology of sites and its surrounding area.
- b. Information relating to economic activities: This can help us to understand the economy of the site and its period. It involves identifying and listing animal and plant remains in order to determine what was used for food at the site. This information can be used to reconstruct the agricultural economy of that period and to compare society, religion etc.
- c. Information relating to human behavior: Through recent research it has become clear that biological artifacts contained in cultural layers, in pits and other features or distributed right across the site are related in various ways to the activities of the people of the time.

iv. Experimental Archaeology: represents the application of the experimental method to develop more highly controlled observations of processes that create and impact the archaeological record. The archaeometry deals to systematize archaeological measurement. It emphasizes the application of analytical techniques from physics, chemistry, and engineering. It is a field of research that frequently focuses on the definition of the chemical composition of archaeological remains for source analysis.

v. Zoo-archaeology also known as **faunal analysis**, is a branch of archaeology that studies remains of animals from archaeological sites. Faunal remains are the items left behind when an animal dies. These include bones, shells, hair, scales, etc. of these items, bones and shells are the ones that occur most frequently at archaeological sites where faunal remains can be found.

vi. Palaeoethnobotany or Archaeobotany: Archaeobotany is the actual sub-field of environmental archaeology that studies plant remains from

archaeological sites. Basing on the recovery and identification of plant remains and the ecological and cultural information available for modern plants, the major research themes are the use of wild plants, the origins of agriculture and domestication, and the co-evolution of human-plant interactions. Archaeobotany is arguably now a mature discipline, but one that is facing challenges relating to data and communication.

vii. Archaeometry: The aim of Archaeometry is to systematize archaeological measurement. It provides aid with the application of analytical techniques from physics, chemistry and engineering. This is a field of research that frequently focuses on the definition of the chemical composition of archaeological remains for source analysis. It investigates different spatial characteristics of features, employing methods such as computer based tools like geographic information system technology.

viii. Geoarchaeology: It is a multi-disciplinary approach which uses the techniques and subject matter of geography, geology, geophysics and other earth sciences to examine topics which inform archaeological knowledge and thought. Geoarchaeologists study the natural physical processes that affect archaeological sites such as geomorphology, the formation of sites through geological processes and the effects on buried sites and artifacts post-deposition. Geoarchaeologists work frequently involves studying soil and sediments as well as other geographical concepts to contribute an archaeological study. Geoarchaeology is considered a sub-field of environmental archaeology because soil can be altered by human behavior, which archaeologists are then able to study and reconstruct past landscapes and conditions.

ix. Marine or Under-Water Archaeology: Underwater archaeology is another important field demanding great courage as well as skill. During the last three decades it has become a highly scientific exercise yielding time capsule

from the past in the form of shipwrecks that shed new light on ancient life on land as well as at sea. Geophysical methods are as useful for finding sites underwater as they are for locating land sites. The excavation underwater is complex and expensive work. Once underway the excavation may involve shifting of vast quantities of sediment and recording and removing bulky objects as diverse as storage jars, metal ingots and cannons etc. It involves same techniques of observation, discovery and recording that are the basis of field archaeology on land but adapted to the special conditions of working underwater. There are three methods used in geophysical underwater survey;

- i) The proton magnetometer is towed well behind the survey boat, detecting iron and steel objects that distort the earth's magnetic field.
- ii) The side scan sonar transmits sound waves in a fan-shaped beam to produce a graphic image of surface feature on the seafloor.
- iii) The sub-bottom profiler emits sound pulses that bounce back from features and objects buried beneath the seafloor.

x. Public Archaeology: Public archaeology is motivated by a desire to control on looting, illegal work or curb on pseudo archaeology and to help in preservation of archaeological sites through education and public awareness campaigns. The pseudo archaeology is a term for falsely claimed to be as archaeological but in fact it violate commonly accepted and scientific archaeological practices.

1.1.5 Stratigraphy in Archaeology: The first, and in some ways the most important, step in much archaeological research involves ordering things into sequence, the things to be put into sequence can be archaeological deposits in a stratigraphic excavation, or they can be artifacts as in a typological sequence. Stratigraphy is the study of stratification the laying down or depositing of strata or layers (also called deposits) one above the other. From the point of view of

relative dating, the important principle is that the under laying layer was deposited first and therefore earlier than the overlaying layer.

Thus a succession of layers should provide a relative chronological sequence, from earliest (bottom) to latest (top). Good stratigraphic excavation at an archaeological site is designed to obtain such a sequence. Part of this work involves detecting whether there has been any human or natural disturbance of the layers since they were originally deposited. But of course what we mostly want to date are not so much the layers or deposited themselves as the humanly generated materials within them- artifacts, structures, organic remains- which ultimately reveal past human activities at the site.

Therefore, in association within the same archaeological deposit it means that they became buried at the same time. Hence provided that deposit is a sealed one, without stratigraphic intrusions from another deposit, the associated objects can be said to be no later than the deposit itself. A sequence of sealed deposits thus give a sequence and relative chronology for the time of burial of the objects found associated in those deposits.

Because of one of those objects can later be given an absolute date, say a piece of charcoal that can be dated by radiocarbon in the laboratory, then it is possible to assign that absolute date not only to the charcoal but to the sealed deposit and the other objects associated with it as well. A series of such dated from different deposits will give an absolute chronology for the whole sequence. It is this interconnecting of stratigraphic sequence with absolute dating methods that provides the most reliable bases for dating archaeological sites and their contents. But there is another important point to consider, if one of those deposits is a rubbish pit with pottery in it, the deposit itself is of interest as an example of

human activity, and the date for it will be the date of human use of the pit. This will also be the date of final burial of the pottery- but it will not be the date of human use of that pottery, which could have been in circulation tens or hundreds of years earlier, before being discarded, perhaps buried in another deposit and then dug up inadvertently with other rubbish to be thrown into the pit. In this context, the archaeological relationship is the position in space and by implication, in time, of an object or context with respect to another. This is determined, not by linear measurement but by determining the sequence of their depositions which arrived before the other, and the key to this is “Stratigraphy”.

1.1.6 Dating Methods and Chronology in Archaeology: In order to study the past it is essential to know precisely how long ago in years a particular period or event occurred. Archaeologist could use the sequence to study for instance changes in tool technology from one stage of the sequence to the next. This idea that something is older or younger relative to something else is the basis of relative dating. The initial steps in most archaeological research today still depend crucially on relative dating, on the ordering of artifacts, deposits, societies, and events into sequences, earlier before later.

However, we want to know the full or absolute age in years before the present of the different parts of the sequence we need methods of absolute dating sometimes called chronometric dating. Absolute dates help us to find how quickly changes such as the introduction of agriculture occurred, and whether they occurred simultaneously or at different times in different regions of the world. Before World War II for much of archeology virtually the only reliable absolute dates were historical one, but only in the last 40 years have independent means of absolute dating become available, transforming archeology in the process. The relative methods allow us to determine that something is relatively older of

younger than something else. The absolute methods make it possible to give a date in years.

Whatever the dating method, we need an agreed measure of time in order to construct a chronology. Most human measuring systems reckon on the basis of years. Thus even age measurements such as radioactive clocks that are independent of annual cycle need for our purpose to be converted into years. Often when there are dating errors it is the conversion into years rather than the dating method itself that is at fault. In fact, our timescale in years must date from or to a fixed point in time. In the Christian world, this is by convention taken as the birth of Christ, supposedly in the year AD 1, with years counted back before Christ (BCE) and forwards after Christ (AD or Anno Domini, Latin for “in the year of our Lord”). In the Greek world, the national starting point was the holding of the first Olympic Games (reckoned at 776 BCE in the Christian calendar), whereas for Muslims the basis fixed point is the date of the Holy Prophet Muhammad (PBUH)’s departure from Mecca, the Hegira (reckoned at CE 622 in the Christian calendar). The starting point in the Māra calendar is equivalent to 3114 BCE in the Christian calendar.

The scientists, who derive dates from radioactive methods, wanting a neutral international system without allegiance to any of the above calendars, have chosen to count years back from the present (BP). But since scientists too require a firm fixed point, they take BP to mean “before 1950” (the approximate year of Libby’s establishment of the first radioactive method, radiocarbon). This may be convenient for scientists but can be confusing for everyone else (a date of 400 BP is not 400 years ago but CE 1550, currently about 440 years ago). It is therefore clearest to convert any BP date for the last few thousand years into the BCE/CE system. For the Paleolithic period, however (stretching back two or three million years before 10,000 BCE), archeologists use the terms “BP” and “years ago”.

- i. Pollen Dating:** All flowering plants produce the almost indestructible grains called pollen and their preservation in bogs and lake sediments has allowed pollen experts to construct detailed sequence of past vegetation and climate. The pollen grains can yield environmental evidence even as far back as three million years ago for sites in East Africa. The pollen evidence at an individual site in the area can sometimes be matched to a particular interglacial, which is a useful dating mechanism given that radiocarbon does not operate at these early time periods.
- ii. Faunal Dating:** It relies on the fact that many mammal species have evolved considerably over the last few million years. The changes in each species have been charted to create a rough sequence. Faunal dating has proved partially important in the correlation of the early human sites that have been discovered in East and South Africa.
- iii. Tree-Ring Dating:** The modern technique of tree-ring dating was developed by an American astronomer A.E. Douglass in 1930s. Douglass was able to assign absolute dates to many of the major sites. But it was not until the end of the 1930s that the technique was introduced to Europe and only in the 1960s that the use of statistical procedures and computer laid the foundations for the establishment of the long tree ring chronologies.
- iv. Radio-carbon Dating:** The radio carbon is the single most useful method of dating for the archaeologists. The American chemist Willard Libby in 1949 worked on radio-carbon and described that when a plant or animal dies does the uptake of C14 cease and the steady concentration of C14 begin to decline through radioactive decay. Thus knowing the decay rate or half-life of C14 the age of dead plant or animal tissue could be calculated by measuring the amount of radiocarbon left in a sample. The radio-carbon laboratories provide an estimate of age based on their measurement of the amount of radiocarbon activity in a

sample. The level of activity is converted to an age expressed in number of years between the death of an organism and the present. The year 1950 is adopted as the “present” by the laboratories.

v. Thermoluminescence Dating: Thermoluminescence can date pottery. Material with crystalline structure such ceramics contain small amounts of radioactive elements, notably uranium, thorium and radioactive potassium. These decay at a known and steady rate, emitting alpha beta and gamma radiation that bombard the crystalline structure and displace electrons which then become trapped at point so imperfection in the crystal lattice. More and more electrons are trapped as time elapses. Only when the material is heated rapidly to 500 c or above can the trapped electrons escape, resetting clock to zero and as they do so they emit light known as “Thermoluminescence”.

vi. Electron Spin Resonance: This method enables the trapped electrons within bone or shell to be measured without the heating that the Thermoluminescence technique requires. In this method, the object to be dated is placed within a strong magnetic field. The energy absorbed by the object as the strength of the field is varied provides a spectrum from which the trapped electron population can be measured.

vii. Potassium-Argon Dating: It is based on the principle of radioactive decay the steady but very slow decay of the radioactive isotope potassium to the inert gas argon in volcanic rock. Knowing the decay rate of K40 its half life is around 1.3 billion years. This method is used by geologists to date rocks hundreds or even thousands of millions of years old. It is also one of the most appropriate techniques for dating early human sites in Africa which can be up to 5 million years old.

viii. Uranium-series Dating: This is another dating method based on the radioactive decay of isotopes of uranium. It has proved particularly useful for the

period 50,000-50,000 years ago, which lies outside the time range of radiocarbon dating.

ix. Fission-Track Dating: It is based on the operation of a radioactive clock. This is useful for early Paleolithic sites, especially where the potassium argon method cannot be applied, even where it can be fission track provides independent confirmation of dating results.

x. Amino-Acid Racemization: This method which was first applied in the early 1970s and still at an experimental stage is used to date bone, whether human or animal. Its special significance is that it can be applied to material up to about 100,000 years old beyond the time range of radio carbon dating.

xi. Cation-Ratio Dating: In recent years a new technique has been developed which for the first time allows the direct dating of rock carvings and engravings. It is also potentially applicable to Paleolithic artifacts that have a strong patina which will have been caused by exposure to desert dust.

xii. X-ray Fluorescence (XRF): X-ray fluorescence is widely used for the identification of chemical elements for analysis, such as; Fe, Cu, Pb, Sn, particularly in the investigation of metal, glass, ceramics and building materials, and for research in geochemistry, forensic science, and archaeology as well as art objects such as paintings.

xiii. X-ray Diffraction Spectroscopy (XRD): X-ray diffraction spectroscopy technique is applied to the identification of different types of minerals or crystalline material including rust, pigments, etc found as chemical compound.

xiv. X-ray analysis: X-ray was discovered by W.K Roentgen in 1895. The rays have the characteristic of passing through solid objects but leave traces on photographic film in the same way as visible light rays. The rays with short wave length can pass through the solid objects. After the discovery of x-ray experimental radiographic photos of paintings were taken. In Japan radiographic

x-ray photos were first used in the field of cultural assets in 1935. A lacquered coffin excavated from Abuyama Mound, Takatsuki, Osaka was investigated by using x-ray technique. This was the first example of application of x-ray to cultural assets in Japan. However, the use of this technique became more common in the field of cultural assets only after 1970's. X-ray analysis technique is useful for the examination of inorganic materials such as; gold, silver, copper alloys, lead, iron, stone, ceramic, glass etc.

1.2 Foundations, origin & Relationships

1.2.1 The earlier Archaeological Expeditions: In the history of mankind, human beings have always remained specific about their past. The majority of cultures have their own foundation myths to explain why society is, how it is. For instance, the Greek writer Hesiod who lived around 800 BCE in his epic poem "*Works and Days*" mention the human past as falling into five stages: the Age of Gold and Immortals, who "dwelt in ease and peace upon their lands with many good things"; the Age of Silver, when humans were less noble; the Age of Bronze; the Age of Epic Heroes; and lastly his own time, the Age of Iron and Dread Sorrow, when "men never rest from labor and sorrow by day and from perishing by night". A rather more detached curiosity about the relics of past ages developed in several early civilizations, where scholars and even rulers collected and studied objects from the past. The last native king of Babylon, Nabonidus (555-539 BCE) took a keen interest in antiquities. He dug one of important temple and discovered the foundation stone which had been laid some 2200 years ago. He housed many of his finds in a kind of a museum at Babylon.

During the revival of learning in Europe known as "Renaissance" during 14th to 17th century CE, the royals began to form "cabinets of curiosities" in which curios and ancient artifacts were displayed. During this period, scholars began to study

and collect the relics of Classical antiquity. At that time sites made of stone immediately attracted attention, such as the great stone tombs of northwestern Europe, and some impressive sites as Stonehenge. During this early period of origin or foundations of archaeology, William Stukeley (1687-1765) made systematic studies of some of these monuments with accurate plans which are still useful today.

Archaeology as a discipline has its earliest origins in 15th-16th century CE, when in Europe during the Renaissance period Humanists looked back upon the glories of Greece and Rome. The religious Popes, cardinals and noblemen in Italy in the 16th century CE began to collect antiquities and to sponsor excavations to find more works of ancient art. It was not archaeology in strict sense rather it was like what we call today as art collection. However, Archaeology proper began with an interest in the Greeks and Romans and first developed in 18th century CE, with the excavations of the Roman cities of Pompeii and Herculaneum, Italy.

Later on classical archaeology was established on a more scientific basis by the work of Heinrich Schliemann, who investigated the origins of Greek Civilization at Troy and Mycenae in the 1870's; the work of M.A Biliotti at Rhodes in the same period; work of German Archaeological Institute under Ernst Curtius at Olympia from 1875 to 1881; and of Alexander Conze at Samothrace in 1873 and 1875. Earlier, the Egyptian archaeology began with Napoleon's invasion of Egypt in 1798. He brought with him scholars who set to work recording the archaeological remains of the country. As a result of discoveries made by this expedition, Jean-Francois Champollion was able to decipher ancient Egyptian writing for the first time in 1822. The British archaeologist Flinders Petrie, who began work in Egypt in 1880 made great discoveries in Egypt and in Palestine. Flinders Petrie developed a systematic method of excavation, the principles of which he summarized in "*Methods and Aims in Archaeology*,(1904). The

Mesopotamian archaeology also began with digging into mounds to find treasures and works of art but gradually gave way in the 1840's to planned digs. In 1846 Henry Creswicke Rawlinson became the first man to decipher the Mesopotamian cuneiform writing. Towards the end of 19th century, systematic excavation revealed a previously un-known people, the Sumerians, who had lived in Mesopotamian before the Babylonians and Assyrians. The most impressive Sumerian excavation was however, that of the Royal Tombs at Ur by Leonard Woolley in 1926.

Charles Darwin's work entitled as "*On the Origin of Species*" (1859) implied a long past for man and the acceptance of the idea of human evolution in the last four decades of the 19th century created a climate of thought in which archaeology flourished and that led to great advances in the unfolding of the full story of man's development. Similarly, in his "*Pre-historic Times*" Lubbock expanded the three-age system of C. J Thomsen and Worsaae, to a four-age system, dividing the Stone Age into Old and New periods (Paleolithic and Neolithic). In the last quarter of the 19th century remarkable Paleolithic discoveries were made in France and Spain which included the discovery and authentication of actual works of sculpture and cave paintings from the Upper (Later) Paleolithic Period (Ca. 30,000- 10,000 BC). Later on similar finds were continued in the 20th century of the most famous of these was at Lascaux, France in 1940.

However, the credit for conducting what has been called "the first scientific excavation in the history of archaeology" goes to Thomas Jefferson (1743-1826) who in 1784 dug a trench or section across a burial mound on his property in Virginia. His work marks the beginning of the end of the speculative phase. In Jefferson's time people were speculating the hundreds of un-explained mounds known east of the Mississippi river had been built not by the indigenous American Indians, but by a mythical and vanished race of mound builders.

Jefferson adopted what today we call a scientific approach. His methods were careful enough to allow him to recognize different layers in his trench and to see that the many human bones present were less well preserved in the lower layers. From this deduced that the mounds had been reused as a place of burial on many separate occasions. Although Jefferson admitted, rightly, that more evidence was needed to resolve the Moundbuilders question, he saw no reason why ancestor of the Indian themselves could not have raised the mounds. His sound approach logical deduction from carefully excavated evidence, in many ways the basis of modern archaeology was not taken up by any of his immediate successors in North America. In Europe, meanwhile extensive excavations were being conducted, For instance by the Englishman Richard Colt Hoare (1758-1838), who dug into hundreds of burial mounds in southern Britain during the first decade of the 19th century. None of these excavations, however, did much to advance the cause of knowledge about the distant past, since their interpretation was still within the Biblical framework of ideas, which insisted on a short time span for human existence.

1.2.2 The start of Modern Archeology: It was not until the middle of the 19th century that the discipline of archaeology became truly established. Already in the background there were the significant achievement of the newly developed science go Geology. The Scottish geologist James Hutton (1726-1797) in his theory of Earth (1785), had studied the Stratification of rocks (their arrangements in super- imposed layers or strata), establishing principles which were to be the basis of Archaeological Excavation, as foreshadowed by Jefferson. Hutton showed that the stratification of rocks was due to processes which were still going on in seas, rivers, and lakes. This was the principle of “uniformitarians”. It was argued again by Charles Lyell (1797-1875) in his Principles of Geology (1833): those geologicallyancient conditions were in essence similar to, or “uniform

with”, those of our own time. This idea could be applied to the human past also, and it marks one of the fundamental notions of modern Archaeology: that in many ways the past was much like the present. These ideas did much to lay the groundwork for what was one of the significant events on the intellectual history of the 19th century. A French customs inspector, Jacques Boucher de Perthes (1788-1868), working in the gravel quarries of the Somme river, who in 1841 published convincing evidence for the association there of human artifacts (of chipped stone, what we would today call “hand-axes”) and the bones of extinct animals. The possibility of a prehistory of humankind, indeed to need for one, was established (the term “prehistory” itself came into general use after the publication of John Lubbock’s book *Prehistoric Times* in 1865).

In 1836 the Danish scholar C.J. Thomsen (1788-1865) published his guidebook to the National Museum of Copenhagen which appeared in English in 1848 with the title, *A Guide to Northern Antiquities*. In it he proposed that the collections could be divided into those coming from a Stone Age, a Bronze Age, and an Iron Age, and this classification was soon found useful by scholars throughout Europe. Later a division in the Stone Age was established between the Paleolithic or Old Stone Age and the Neolithic or new Stone Age. These terms were less applicable to Africa, where bronze was not used south of the Sahara, or to the Americas. It established the principle that by studying and classifying prehistoric artifacts one could produce a chronological ordering, and say something of the periods in question. Archaeology was moving beyond mere speculation about the past, and becoming instead a discipline involving careful excavation and the systematic study of the artifacts unearthed.

These great conceptual advances, the antiquity of humankind, Darwin’s principle of evolution and the three age system, at last offered a framework for studying the past. Darwin’s ideas were influential also in another way. They suggested that

human cultures might have evolved in a manner analogous to plant and animal species. Soon after 1859, British scholars such as General Pitt-Rivers and John Evans were devising schemes for the evolution of artifact forms which gave rise to the whole method of “typology” – the arrangement of artifacts in chronological or developmental sequence – later greatly elaborated by Swedish scholar Oscar Montelius (1843-1921).

However, it was only during the 19th century that the systematic study of the past through its physical remains began to start. An early development in the study of archaeology was mainly due to the establishment of “Institute for Archaeological Correspondence” in Rome in 1829 by Eduard Gerhard. The rapid progress in the development of archaeology continued in the 20th century. Great Britain was one of the earliest countries of the world which developed a systematic approach to archaeology and to recognize it as a discipline. An important contribution towards the development of archaeological studies was made by Augustus P. Rivers. He developed a “typology” for dating purpose. Another major figure in the development of archaeology in the UK was Sir Mortimer Wheeler whose highly disciplined approach to systematic archaeological excavations of his time brought archaeology as a science. Another important strand in the thought of the time was the realization that the study by ethnographers of living communities in different parts of the world could be useful starting points for archaeology seeking to understand something of the lifestyles of their own early native inhabitants who clearly had comparably simple tools and crafts. The scholars such as Daniel Wilson and John Lubbock made systematic use of such an ethnographic approach.

At the same time ethnographers and anthropologists were themselves producing schemes of human progress. Strongly influenced by Darwin’s ideas about evolution, the British anthropologist Edward Tylor (1832-1917), and his American counterpart Lewis Henry Morgan (1818-1881), both published

important works in the 1870s arguing that human societies had evolved from a state of savagery (primitive hunting) through barbarism (simple farming) to civilization (the highest form of society). Morgan's book, *Ancient society* (1877) was partly based on his great knowledge of living North American Indians. His ideas particularly the notion that people had once lived in a state of primitive communism, sharing resources equally – strongly influenced Karl Marx and Friedrich Engels, who drew on them in their writings about precapitalist societies, thus influencing many later Marxist archaeologists. By the 1880s, then, many of the ideas underlying modern Archaeology had been developed. But these ideas themselves took shape against a background of major 19th –century discoveries of ancient civilizations in the old world and the new.

The splendors of ancient Egyptian civilization had already been brought to the attention of an avid public after Napoleon's military expedition there of 1798-1800. It was the discovery by one of his soldiers of the Rosetta Stone that eventually provided the key to understanding Egyptian hieroglyphic writing. Inscribed on the stone were identical texts written in both Egyptian and Greek scripts. The Frenchman Jean Francois Champollion (1790-1832) used these bilingual inscriptions finally to decipher the hieroglyphs in 1822, after 14 years' work. A similar piece of brilliant scholarly detection helped unlock the secrets of cuneiform writing, the script used for many languages in ancient Mesopotamia. In the 1840s the French and British, under Paul Emile Botta (1802-1870) and hieroglyphic inscriptions at the different sites, which led him to argue for Maya cultural unity but no Champollion or Rawlinson was to emerge to decipher the glyphs until the 1960s.

Thus, well before the end of the 19th century, many of the principal features of modern archaeology had been established and many of the early civilizations had been discovered. There now ensued a period, which lasted until about 1960,

which Gordon Willey and Jeremy Sabloff in their *A History of American Archaeology* have described as the “classificatory ‘historical period’”. Its central concern, as they rightly characterize it, was chronology. Much effort went into the establishment of regional chronological systems, and the description of the development of culture in each area.

In regions where the early civilizations had flourished new research and discoveries filled out the chronological sequences. Alfred Maudslay (1850-1931) laid the real scientific foundations of Maya archaeology, while the German scholar Max Uhle (1856-1944) began to establish a sound chronology for Peruvian civilization with his excavation in the 1890s at the coastal site of Pachacamac, Peru. The meticulous work of Flinders Petrie (1853-1942) in Egypt was followed up by the spectacular discovery in the 1920s of Tutankhamen’s tomb by Howard Carter (1873-1939). In the Aegean area, Arthur Evans (1880-1960) revealed a previously unknown civilization that he called Minoan on the island of Crete; the Minoans proved to be even earlier than Schliemann’s Mycenaean’s. In Mesopotamia Leonard Woolley (1880-1960) excavated at Ur, the biblical city of Abraham’s birth, and put the Sumerians on the map of the ancient world.

The greatest breakthrough in Archaeology however, came in the field of dating. In 1949 the American chemist Willard Libby (1908-1980) announced his invention of radiocarbon (C14) dating. It was not until well over a decade later that the full impact of this momentous technical achievement began to be felt, but the implications were clear here at last archaeologists might have a means of directly determining the age of undated sites and finds anywhere in the world without recourse to complicated cross-cultural comparisons with areas already dated by historical methods. Thus, traditionally, prehistoric Europe had been dated by virtue of supposed contacts early Greece and hence with ancient Egypt, which

could itself be dated historically. The radiocarbon method held the prospect of providing a completely independent chronology for ancient Europe.

The growth in Archaeological applications for scientific techniques was such that by 1963 a volume entitled science in archaeology, edited by Don Broth-well and Eric Higgs, was published, not merely on dating techniques and plant and animal studies, but methods for analyzing human remains and artifacts. As with many of the new methods, research stretched back to the 1930s when the Austrian archeologist Ricard Pittioni had begun to apply trace-element analysis to early copper and bronze artifacts. In 1958, Godon Willey and Philip in their Method and Theory in American Archeology had argued for a great emphasis on the social aspect, for a broader “processual interpretation” or study of the general processes at work in culture history. They also spoke of “an eventual synthesis in a common search for socio-cultural causality and law.”

When archaeology developed in the late 19th century, the first approach to archaeological theory to be practiced was that of cultural-history archaeology, which held the goal of explaining why cultures changed and adapted rather than just highlighting the fact that they did. In the early 20th century, many archaeologists who studied past societies with direct continuing links to existing ones followed the direct historical approach, compared the continuity between the past and contemporary ethnic and cultural groups. In the 1960s, an archaeological movement largely led by American archaeologists like Lewis Binford and Kent Flannery arose that rebelled against the established cultural-history archaeology. They proposed a "New Archaeology", which would be more "scientific" and "anthropological", with hypothesis testing and the scientific method very important parts of what became known as processual archaeology.

In the 1980s, a new postmodern movement arose led by the British archaeologists Michael Shank, Christopher Tilley, Daniel Miller and Ian Hodder which has become known as post-processual archaeology. It emphasized the importance of a more self-critical theoretical reflexivity. However, this approach has been criticized by processualists as lacking scientific rigor, and the validity of both processualism and post-processualism is still under debate. Meanwhile, another theory, known as historical processualism has emerged seeking to incorporate a focus on process and post-processual archaeology's emphasis of reflexivity and history.

1.3. Techniques and Methods of Fields:

An archaeological investigation usually involves several distinct phases, each of which employs its own variety of methods. Before any practical work can begin, however, a clear objective as to what the archaeologists are looking to achieve must be decided and determined. A site is surveyed to find out as much as possible about it and the surrounding area. Further, an excavation may take place to uncover any archaeological features buried under the ground. Then the information collected during the excavation is studied and evaluated in an attempt to achieve the original research objectives of the archaeologists. The archaeological Surveys usually involve walking with the instrument along closely spaced parallel traverses, taking readings at regular intervals. In most cases, the area to be surveyed is staked into a series of square or rectangular survey "grids" (terminology can vary). With the corners of the grids as known reference points, the instrument operator uses tapes or marked ropes as a guide when collecting data. In this way, positioning error can be kept to within a few centimeters for high-resolution mapping. Early surveys recorded readings by hand, but computer controlled data logging and storage is now commonly used.

The archaeological project then continues (or alternatively, begins) with a field survey. A regional survey is the attempt to systematically locate previously unknown sites in a region. The site survey is the attempt to systematically locate features of interest, such as houses, within a site. Each of these two goals may be accomplished with largely the same methods. The archaeological survey was not widely practiced in the early days of archaeology. However, Gordon Willey introduced first the technique of regional settlement pattern survey in 1949 and later on the survey of all levels became prominent with the rise of processual archaeology.

The archaeological survey work has many benefits, if performed as a preliminary exercise to, or even in place of archaeological excavation. It requires relatively little time and expense, because it does not require processing large volumes of soil to search out artifacts. As with other forms of non-destructive archaeology, survey avoids ethical issues associated with destroying a site through excavation. It is the only way to gather some forms of information, such as settlement patterns and settlement structure. Survey data are commonly assembled into maps, which may show surface features and/or artifact distribution. The simplest survey technique is surface survey. It involves combing an area, usually on foot but sometimes with the use of mechanized transport, to search for features or artifacts visible on the surface. Surface survey cannot detect sites or features that are completely buried under earth, or overgrown with vegetation.

The serial survey is conducted using cameras attached to airplanes, balloons, or even Kites. A bird's-eye view is useful for quick mapping of large or complex sites. Aerial photographs are used to document the status of the archaeological dig. Aerial imaging can also detect many things not visible from the surface. Geophysical survey can be the most effective way to see beneath the ground. Magnetometers detect minute deviations in the Earth's magnetic field caused by

iron artifacts, kilns, some types of stone structures. Archaeological features whose electrical resistivity contrasts with that of surrounding soils can be detected and mapped. Some archaeological features (such as those composed of stone or brick) have higher resistivity than typical soils, while others (such as organic deposits or unfired clay) tend to have lower resistivity. The regional survey in underwater archaeology uses geophysical or remote sensing devices such as marine magnetometer, side-scan sonar, or sub-bottom sonar.

In archaeology the survey produces a set of data that is more un-differentiated in chronological and evaluative terms. For instance, it is possible to overestimate one site owing to its better state of conservation and on the contrary underestimate the size of another owing to the poor surface conditions. In chronological terms there is a risk of constructing data associations that will not be confirmed later. On the other hand, the excavation is able to produce a more reliable chronological sequence which however, owing to the smaller area involved can give rise to other errors of assessment. Of course the diagnostic reliability is greater when the two approaches (horizontal and vertical) are carried out together or in sequence; the greater reliability (100%) will be achieved in the physical point in which the two processes intersect and will gradually decline the further apart they move. In any case, the two processes, if carried out together, grant a three dimensional reconstruction of the historical reality of the area. The survey can be carried out in many ways depending on the objectives pursued and the forces available in the field.

1.3.1 Types of Archaeological Survey: The archaeologists conduct surveys to search for particular archaeological sites or kinds of sites, to detect patterns in the distribution of material culture over regions, to make generalizations or test hypotheses about past cultures, and to assess the risks that development projects will have adverse impacts on archaeological heritage. The surveys may be:

(a) *Intrusive* or *non-intrusive*, depending on the needs of the survey team (and the risk of destroying archaeological evidence if intrusive methods are used). In a non-intrusive survey, nothing is touched, just recorded. An accurate survey of the earthworks and other features can enable them to be interpreted without the need for excavation. An intrusive survey can mean different things. In some cases, all artifacts of archaeological value are collected. This is often the case if it is a rescue survey, but less common in a regular survey.

(b) *Extensive* or *intensive*, depending on the types of research questions being asked of the landscape in question. Surveys can be a practical way to decide whether or not to carry out an excavation (as a way of recording the basic details of a possible site), but may also be ends in themselves, as they produce important information about past human activities in a regional context. The intensive survey is characterized by the complete or near-complete coverage of the survey area at a high resolution, most often by having teams of survey archaeologists walk in a systematic way over parcels of the landscape in question, documenting archaeological data such as lithics, ceramics and/or building remains. An extensive survey, on the other hand, is characterized by a low-resolution approach over targets within a study area. Extensive surveys may be designed to target the identification of archaeological sites across a large area, whereas intensive surveys are designed to provide a more comprehensive picture of the location of sites and the nature of off-site data e.g. field systems, isolated finds, etc.

1.3.2 Tools Required in Survey: The archaeologists use a variety of tools when carrying out surveys, exploration or excavations such as; GIS, GPS, remote sensing, geophysical survey and aerial photography.

i. GIS (Geographic Information Systems) :GIS deal with the storage of information about the Earth for automatic retrieval by a computer, in an accurate manner appropriate to the information's purpose. GIS has revolutionized the field

of cartography: nearly all mapmaking is now done with the assistance of some form of GIS software. GIS also refers to the science of using GIS software and GIS techniques to represent, analyze, and predict the spatial relationships. It is a method to visualize, manipulate, analyze and display spatial data. It is a system of computer software, hardware and data and the personnel to help manipulate, analyze and present information that is tied to a spatial location. The data required for preparing the GIS applications consists on:

- i) Digitized and scanned maps.
- ii) Data Bases (tables of data)
- iii) GPS (Global Positioning system)
- iv) Field sampling of attributes.
- v) Remote sensing and aerial photography.

There are many ways to use the GIS such as; emergency services (fire and police), environmental (monitoring and modeling), Business (site location, delivery systems), Industry (transportation, communication, mining, pipelines, health care), Government (local, state, federal, military), Education (Research, teaching tool, administration and wherever the spatial data analysis is needed.

ii. GPS (Global Positioning System): GPS (originally NAVSTAR) is a satellite-based radio navigation system. It is one of the global navigation satellite systems (GNSS) that provides geological location and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The GPS does not require the user to transmit any data, and it operates independently of any telephonic or internet reception, though these technologies can enhance the usefulness of the GPS positioning information. The GPS provides critical positioning capabilities to military, civil, and commercial users around the world. It is a network of satellites that continuously transmit coded information which makes it possible to precisely identify locations on earth by measuring distance from the satellites. With the help of GPS current location can be viewed in the form of coordinates. Since

different maps and charts use different position formats, GPS units gives coordinates system for the particular use. The most common format is latitude and longitude. The maps and charts are essentially grids created from a starting reference point called a datum. Many maps still being used today were originally created decades ago. However with the new technology of GPS the surveying skills have improved considerably.

iii. Remote sensing technique: It is used in numerous fields including archaeology, geography, and most earth science disciplines like hydrology, ecology, oceanography, glaciology and geology. It also has military intelligence commercial, economic, planning and humanitarian applications. It is the science of obtaining information about Earth features from measurements made at a distance. Remotely sensed data comes in many forms, such as satellite imagery, aerial photography, and data obtained from hand-held sensors. The photographs taken from satellites have a limited application to archaeology since their scale is often huge but images from the LANDSAT (Earth Resources Technology) Satellites have proved useful.

The scanners record the intensity of reflected light and the infrared radiation from the earth's surface and convert these electronically into photographic images. LANDSAT images are used to trace large scale archaeological features. Another remote sensing technique is known as sideways looking airborne radar (SLAR). The technique involves recording in radar images the return of pulses of electromagnetic radiation sent out from flying aircraft. Basically remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object and thus in contrast to on site observation.

Before actually starting to dig in a location, remote sensing technique can be used to look where sites are located within a large area or provide more information about sites or regions. There are two types of remote sensing instruments—

passive and active. Passive instruments detect natural energy that is reflected or emitted from the observed scene. Passive instruments sense only radiation emitted by the object being viewed or reflected by the object from a source other than the instrument. Active instruments emit energy and record what is reflected. Satellite imagery is an example of passive remote sensing. Here are two active remote sensing instruments: Lidar and Laser Altimeter. A Lidar (Light Detection and Ranging) uses a laser (light amplification by stimulated emission of radiation) to transmit a light pulse and a receiver with sensitive detectors to measure the backscattered or reflected light. Distance to the object is determined by recording the time between the transmitted and backscattered pulses and using the speed of light to calculate the distance travelled. Lidar can determine atmospheric profiles of aerosols, clouds, and other constituents of the atmosphere. Laser altimeter uses a Lidar to measure the height of the instrument platform above the surface. By independently knowing the height of the platform with respect to the mean Earth's surface, the topography of the underlying surface can be determined.

iv. Proton Magnetometer: The main instruments for tracing buried features using magnetic methods are magnetometers and metal detectors. A proton Magnetometer consists of a sensor encircled by an electrical coil, mounted on a staff and connected by a cable to a small portable box of electronics. The device can detect small but sharp differences in magnetic field intensity caused by buried objects and features. A proton Magnetometer uses the principle of Earth's field nuclear magnetic resonance to measure very small variations in the Earth's magnetic field, allowing ferrous objects on land and at sea to be detected. It is used in land-based archaeology to map the positions of demolished walls and buildings.

v. Aerial photography: This technique was used first in 1913 by Sir Henry Wellcome when he took vertical pictures of his excavations in Sudan by means of a box kite. The World War-I, gave the technique a great impetus when

archaeologists such as O.G.S Crawford in England realized that air photographs taken from aircraft and balloons could provide a plan view of prehistoric monuments. Aerial photographs are of two types; the oblique and the vertical. The oblique photographs taken at an angle reveal contours are best for discovering sites while vertical photographs are useful for mapping. The accurate plans and maps of the layout of sites can be made quite easily from vertical photographs. The oblique photographs are harder to transform into maps because of the way they distort perspective. However, features in these pictures can now be mapped quite accurately and rapidly using relatively simple computer program, provide at least four points in a given picture have known positions on the ground. The individual plans can be made from oblique photographs at selected scales, which can be compared used as a source of measurements, and combined into maps of an area.

vi. Recording with pictures and AUTOCAD application: In many excavations, archaeologists and surveyors nowadays take a set of top or graphical points by the means of a total station. Then they take vertical digital pictures from cameras held above the trench, join the pictures with commercial PC applications, and draw their maps on scale on the photo planes so obtained in AUTOCAD or Adobe graphic environments. Although this procedure is doubtless inexpensive, fast and relatively precise, nothing can substitute the detailed observation that comes together the long observation required by traditional hand-mapping. The problems are 1) to decide which layers and features must appear together in a phase map, 2) to accumulate photo planes that are not interpreted, thus losing the memory and evidence of important details; 3) In the photo planes, the colors of the layers are not so evident, and many small finds and inclusions are not always visible; 4) color and limits with the other excavators. The same problems are encountered when vertical sections are recorded with the same technology. The best solution is to construct the recording base with these new techniques, but

keep the partial maps on the field and constantly update them by adding manually limits and details.

vii) Plane Table: A plane table is a device used in surveying and related disciplines to provide a solid and level surface on which to make field drawings, charts and maps/plans. The plane table became a popular instrument for surveying. It is an instrument compared to other devices such as the theodolite, since it was relatively easy to use. By allowing the use of graphical methods rather than mathematical calculations, it could be used by those with less education than other instruments. A plane table consists of a smooth table surface mounted on a sturdy base. The connection between the table top and the base permits one to level the table precisely, using bubble levels, in a horizontal plane. The base, a tripod, is designed to support the table over a specific point on land. By adjusting the length of the legs, one can bring the table level regardless of the roughness of the terrain.

It is set over a point and brought to precise horizontal level. A drawing sheet is attached to the surface and an alidade is used to sight objects of interest. The alidade, in modern examples of the instrument a rule with a telescopic sight, can then be used to construct a line on the drawing that is in the direction of the object of interest. By using the alidade as a surveying level, information on the topography of the site can be directly recorded on the drawing as elevations. The distances to the objects can be measured directly or by the use of stadia marks in the telescope of the alidade.

viii) Total Station: Total stations are mainly used by land surveyors and civil engineers, either to record features as in topographic surveying or to set out features (such as roads, houses or boundaries). They are also used by archaeologists to record archaeological excavations. The total station measure

angles by means of electro-optical scanning of extremely precise digital bar-codes etched on rotating glass cylinders or discs within the instrument. The best quality total stations are capable of measuring angles to 0.5 arc-second. Inexpensive "construction grade" total stations can generally measure angles to 5 or 10 arc-seconds. The measurement of distance is accomplished with a modulated infrared carrier signal, generated by a small solid-state emitter within the instrument's optical path, and reflected by a prism reflector or the object under survey. The modulation pattern in the returning signal is read and interpreted by the computer in the total station. The distance is determined by emitting and receiving multiple frequencies, and determining the integer number of wavelengths to the target for each frequency. The total stations use purpose-built glass prism (surveying) reflectors for the EDM signal. A typical total station can measure distances up to 1,500 meters (4,900 ft) with an accuracy of about 1.5 millimeters (0.059 in) \pm 2 parts per million. The Reflectorless total stations can measure distances to any object that is reasonably light in color, up to a few hundred meters.

The coordinates of an unknown point relative to a known coordinate can be determined using the total station as long as a direct line of sight can be established between the two points. The Angles and distances are measured from the total station to points under survey, and the coordinates (X, Y, and Z; and elevation) of surveyed points relative to the total station position are calculated using trigonometry and triangulation. In order to determine an absolute location, a total station requires line of sight observations and can be set up over a known point or with line of sight to 2 or more points with known location, called free stationing.

However, some total stations also have a Global Navigation Satellite System receiver and do not require a direct line of sight to determine coordinates. Some models include internal electronic data storage to record distance, horizontal

angle, and vertical angle measured, while other models are equipped to write these measurements to an external data collector, such as a computer. When data is downloaded from a total station onto a computer, application software can be used to compute results and generate a map of the surveyed area. The newest generation of total stations can also show the map on the touch-screen of the instrument immediately after measuring the points.

The Robotic or motorized total stations allow the operator to control the instrument from a distance via remote control. This eliminates the need for an assistant staff member as the operator holds the retroreflector and controls the total station from the observed point. These motorized total stations can also be used in automated setups known as Automated Motorized Total Station (AMTS).

ix) 3D Scanning technique: 3D scanning is the process of analyzing a real-world object or environment to collect data on its shape and possibly its appearance. The collected data can then be used to construct digital 3D models. A 3D scanner can be based on many different technologies, each with its own limitations, advantages and costs. Many limitations in the kind of objects that can be digitised are still present. For example, optical technology may encounter many difficulties with shiny, reflective or transparent objects. For example, industrial computed tomography scanning and structured-light 3D scanners can be used to construct digital 3D models, without destructive testing.

The collected 3D data is useful for a wide variety of applications. These devices are used extensively by the entertainment industry in the production of movies and video games, including virtual reality. The other common applications of this technology include augmented reality, motion capture, gesture recognition, robotic mapping, industrial design, orthotics and prosthetics, reverse engineering

and prototyping, quality control/inspection and the digitization of cultural artifacts.

The purpose of a 3D scanner is usually to create a 3D model. This 3D model consists of a point cloud of geometric samples on the surface of the subject. These points can then be used to extrapolate the shape of the subject (a process called reconstruction). If colour information is collected at each point, then the colours on the surface of the subject can also be determined.

The 3D scanners share several traits with cameras. Like most cameras, they have a cone-like field of view, and like cameras, they can only collect information about surfaces that are not obscured. While a camera collects colour information about surfaces within its field of view, a 3D scanner collects distance information about surfaces within its field of view. The "picture" produced by a 3D scanner describes the distance to a surface at each point in the picture. This allows the three-dimensional position of each point in the picture to be identified. For most situations, a single scan will not produce a complete model of the subject. The multiple scans, even hundreds, from many different directions are usually required to obtain information about all sides of the subject. These scans have to be brought into a common reference system, a process that is usually called alignment or registration, and then merged to create a complete 3D model. This whole process, going from the single range map to the whole model, is usually known as the 3D scanning.

1.3.3 Methods in Field Surveys:-

i. Intensive transect survey

This method intensifies the conventional surveying technique in which one or more persons move over a part of the ground counting and defining the presence

of archaeological material on surface. The space is divided up into parallel strips about two meters wide and of the same length as the surface to be surveyed. This is certainly the most systematic method and the one providing the greatest quantity of information as a function also of the intensity and repetitively of the operation. The drawback is that it demands a heavy investment in time and labor as well as an accurate assessment of the areas surveyed. Visibility is decisive for a correct sampling as vegetation or crops cause a progressive reduction and thus also a reduction in the possibility of detecting archaeological remains, until a threshold is reached beyond which it is impossible to identify even monumental remains. This technique is used on all land free of vegetation or crops and with natural flat surfaces, either slightly sloping or with artificial terracing. This is because of the difficulty involved in performing transect survey on steeper slopes and also because in such circumstances the archaeological record tends to be concentrated downhill under the effect of rainfall and earth are explored thoroughly using the transect survey so as to gather as much information as possible on the discovery of monumental remains.

ii. **Contour technique survey:** To solve the problem of taking sample along steeper hillsides a contour exploratory technique is preferred: the method consists of in travelling over hillsides maintaining a constant level and continuing horizontally at the prescribed level. Of course, the presence of natural obstacles sometimes means that the same level cannot be maintained. A zig-zag trajectory is followed inside a strip laying between two relatively closely space levels which could vary be up to a few dozen meters. Also in this case two or more team member make possible to subdivide the space into survey bands on several different levels and to simultaneously explore several parallel areas. This technique is effective only in the case of archaeological evidence of the

monumental nature but is combined with the transect technique on any section of land that allows it, such as stepped or terraced areas.

On very steep slopes the remains of fragmentary material usually tends to roll downhill until stopped by less inclined areas or against irremovable obstacles encountered on the way. A substantial cluster of artifacts on surface point to a site, but the location of the cluster could be entirely secondary. In this case it is important to define the actual line of fall of the material.

The advantages of the contour technique consist of its systematic nature and reliability vis-a-vis the monumental remains present over the whole surface. Its limits consist of excessive steepness of the hillsides or heavy vegetation making some of the areas impossible and also monumental archaeological remains invisible.

iii. Pathway technique survey: By following the traditional lines of communication - crossing the hillside along the valleys it is possible to identify archaeological sites, roads, paths passes and dry stream beds or river banks represent lines of communication that may have remained unchanged for centuries. Nowadays they allow the local inhabitants to reach their homes, small villages, mountain tops and clean water sources just as they were used for similar purposes in the past. This survey technique allows the work to be speeded up. In the space of a single day it is possible to cross the whole valleys, encountering without too much effort (except perhaps physical) a succession of archaeological remains. Also in this case, however, the technique is effective only in indication monumental evidence. It is possible to combine it with the transect technique in relatively flat areas free of heavy vegetation so as to detect the presence of ascertain the absence of non-monumental sites.

iv. **Local guided survey:** A fundamental help is given by the local inhabitants who, after lengthy conversations, often accompanied by tea and food prepared on the spot, may take us to explore completely unknown sites or areas not lacking historical evidence, but which until only a few years before bore obvious traces of archaeological remains in such cases, it endeavored to exploit the information by carefully inspection the areas searching for diagnostic elements of use in confirming the datum. In some cases the inhabitants may lead us to areas in which important terracing work left only a few traces of former archaeological sites. The draw backs of this technique are they lack a systematic approach and control. Also the information or the informers may turn out to be unreliable. However, this technique is quite effective in identifying rock-art and rock – artifact sites.

v. **Probabilistic technique survey:** This is a type of nonsystematic survey aimed at exploring points on the landscape considered to be promising. This technique can be used only rarely and specifically in areas considered as marginal or inaccessible to the survey techniques and inaccessible to normal human traffic which may conserve sacred symbols such as rock reliefs or paintings along rugged and difficult terrains. Though this technique lacks planning and systematic implementation, it allows some light to be shed on areas that would otherwise remain concealed.

vi. **Electrical resistance surveys:** Electrical resistance survey (also called earth resistance or resistivity survey) are one of a number of methods used in archaeological geophysics, as well as in engineering geological investigations. In this type of survey electrical resistance meters are used to detect and map subsurface archaeological features and patterns.

vii. Geophysical survey: There are many methods and types of instruments used in geophysical surveys, for instance seismic methods such as reflection seismology, seismic refraction, and seismic tomography. This type of survey is carried out to discover the detailed structure of the rock formations beneath the surface of the Earth in archaeology, geophysical survey is ground-based physical sensing techniques used for archaeological imaging or mapping. Remote sensing and marine surveys are also used in archaeology, but are generally considered separate disciplines. Geophysical survey is used to create maps of subsurface archaeological features. Features are the non-portable part of the archaeological record, whether standing structures or traces of human activities left in the soil. Geophysical instruments can detect buried features when their physical properties contrast measurably with their surroundings. In some cases individual artifacts, especially metal, may be detected as well. Readings taken in a systematic pattern become a data sheet that can be rendered as image maps. Survey results can be used to guide excavations and to give archaeologists insight into the patterning of non-excavated parts of the site. Unlike other archaeological methods, geophysical survey is neither invasive nor destructive. For this reason, it is often used where preservation (rather than excavation) is the goal. The most commonly applied equipment in the field of archaeology includes; magnetometers, electrical resistance meters, ground penetrating radar (GPR) and electromagnetic (EM) conductivity meters. These methods can resolve many types of archaeological features, are capable of high sample density surveys of very large areas, and of operating under a wide range of conditions. While common metal detectors are geophysical sensors, they are not capable of generating high-resolution imagery. Other established and emerging technologies are also finding use in archaeological applications.

1.3.4 Archaeological Excavations: In order to fill the gaps in the story of the evolution of human society and to provide meaning and substance to the dry bones of history, the field archaeological explorations and excavations constitute an essential source. By piecing together the evidence from the scientific excavations, the archaeologists write the blank chapters of nations' history. However, the archaeological survey and explorations of all ancient sites and monuments takes precedence over all the measures. In fact, the archaeological excavation is a process of digging the buried landscape which is carried out with all the skilled craftsmanship that has been built up in the last hundred years. The first stratigraphic excavation to reach wide popularity with public was that of Hissarlik, on the site of ancient Troy, carried out by Heinrich Schliemann, Frank Calvert and Wilhelm Dorpfeld in 1870's.

1.3.5 Renowned Persons in Field Archaeology: During the late 19th century a sound methodology of scientific archaeological excavation was started to develop. From that time till the recent past, major figures stand out who in their various ways have helped to develop and create the modern field methods which we use today in archaeology. The most prominent and pioneer figures who contributed remarkably in the field techniques of archaeology are mentioned below:-

i. William Cunnington (1754-1819): William Cunnington is considered father of archaeological excavations who undertook excavations in Wiltshire from around 1798 funded by Sir Richard Colt Hoare. William Cunnington made particular recording of Neolithic and Bronze Age barrows and the terms he used to categorize and describe them are still used by the archaeologists even today.

ii. General Augustus Lane-Fox Pitt-Rivers (1827-1900) : He brought long experience of military methods, survey and precision to impeccably organized excavations on his estates in southern England. He prepared plans, sections and

even models and exact position of every object was recorded by him. He was pioneer in his insistence on total recording and his four volumes publication describes excavations on Cranborne Chase from 1887 to 1898.

ii. **Sir William Flinders Petrie (1853-1942):** His work is noted for meticulous excavations and insistence on the collection and description of everything found not just the fine objects. He devised his own techniques of seriation or “sequence dating” which he used to bring chronological order during excavations in Egypt and later in Palestine.

iv. **Sir Mortimer Wheeler (1890-1976):** He brought military precision to his excavations, through the techniques such as the grid-square method. He excavated sites of Harappa and Taxila in Pakistan. He introduced the stratification technique of excavation which was in vogue during that time and improved the system of reporting and publishing.

v. **Max Uhle (1856-1944):** The scientific archaeology in South America owes much to the work of Uhle, a German scholar. His excavations in 1890's became the first important step in establishing an area-wide chronology for Peru. His concentration on graves and the careful recording of grave-good associations recall Petrie early work in Egypt.

vi. **Alfred Kidder (1885-1963):** He was one of the first archaeologists to use a team of specialist to help analyze artifacts and human remains. He is famous for important works such as; reconnaissance, selection of criteria for ranking the remains of sites chronologically, seriation into a probable sequence stratigraphic excavation to elucidate specific problems and more detailed regional survey and dating.

vii. **Sir Alexander Cunningham (1814– 1893) :** Major General Sir Alexander Cunningham was appointed as the first Archaeological Surveyor in 1861 after establishment of Archaeological Survey of India in 1860 by the British in the

Sub-Continent. He was basically a civil engineer and instead of unmaking conservation of monuments he excelled in recording and documenting archaeological, historical and archaeological data including survey of archaeological sites and monuments. He focused on the ancient geography due to the published records of Fa-Hien and Hiuen Tsang, two famous Chinese pilgrims. He carried out excavations at many places including Taxila and prepared a map of the territory which was surveyed by him. He produced his researches of almost a quarter of a century in the form of 23 volumes of the Archaeological Survey of India Reports. The methodology introduced by him in editing the Inscriptions is still followed by the Epigraphists of the South Asian countries.

viii. Sir John Marshall (1876-1958): Sir John Marshall was the real architect of Archaeology in the sub-continent whose discoveries added now and most important chapters of history. He put the archaeological survey of India on a most sound footing. His two books “Conservation Manual”, 1923 and “Archaeological Works Code”, 1938, covers all important aspects of the conservation work other solutions to practical problems. He opposed hypothetical reconstructions and restoration and insisted on preservation of original components of monuments and decorative designs. The rules framed by Sir John Marshall have been followed during the British colonial period and even later times in south Asia.

1.3.6 Organization of Excavation Plan at an Archaeological Site; Following important steps are required to complete before the commencement of archeological excavation:-

- i) Proposed Project / Field Programe of the Excavations (aims and objectives, selection of area/site, schedule of all work activities at the site area and established camp)
- ii) Composition of Team (name of team members)
- iii) Work context and Legal aspects (license, permissions)

- iv) Establishment of Field Camp at site/field (arrangements for physical work plan)
- v) Provision of equipments/tools/scientific methods applied by concerned technical staff at the site
- vi) Provision of facilities for storage of excavated material (Pottery yard) at camp
- vii) Registration/documentation/cataloguing/inventories and recording
- viii) Collection of data and analysis / laboratory tests
- ix) Interpretation of data and results achieved
- x) Preliminary reports/notes/daily diaries and publication of technical final reports

1.3.7 The Base of Field Archaeology: In Archaeology, any excavation activity that does not comply with existing legislation and according to prevailing Laws/Rules or fails to follow the rules of application is deemed as illegal. An illegal dig is a hole in the ground or a series of holes and tunnels. The aim of this work is to find an object for which there is a demand on the antiquarian market or from a collector at the same time by destroying the contextual details of an object as well the site. Therefore, legal framework is an essential and important part of all kind of surveys, archaeological explorations and excavations. The concept of excavation license for legal excavation was introduced in British India in the early 1930s and it evolved through several amendments to the Ancient Monuments Preservation Act 1904 which remained in force after independence of Pakistan for many years until it was replaced by a new legislation in 1968. It was amended and ultimately replaced by the present prevailing Act called as “Antiquities Act, 1975”. A number of Rules have also been framed and notified by the Government of Pakistan relating to the management, protection, preservation and maintenance of movable and immovable antiquities including the “Archaeological Excavation and Exploration Rules, 1978” which regulate the activities of the archaeological excavations in our country. The State has the ownership of all the archaeological items whether excavated or not.

The development of archaeological excavation techniques have moved over the last many decades from treasure hunting process (curios) to one which seek to fully understand the sequence of human activity on a particular site. However, all forms of archaeological excavations require great skills and careful preparation. A number of years are required for training in the field work. There are many different types of archeological sites and there is no one set of precepts and rules that will apply to excavations as a whole. For instance some sites such as monuments, temples, forts, ancient cities, palaces and remains are easily visible on the surface of the ground. However, among the most obvious archaeological sites that have yielded spectacular results by archaeological excavations are the huge human made mounds. These mounds are result from the accumulation of remains caused by centuries of human habitation on one site. The archeological site of Taxila, for instance is one of this example. In some cases there are no surface traces and outline of suspected structures is revealed only by aerial or geophysical techniques. Then there are some other sites located in cliffs and gravel beds as well. Therefore, a wide range of techniques are employed by the archaeologists in their applications according to different kinds of sites.

The excavation however, produces three things; descriptive data, photographic data and the material unearthed during the excavation. The results are summarized in the preliminary report of the excavation. The excavated finds are progressively documented as they are found together with the stratigraphic meta-data (sector, number of stratigraphic unit and date of find). After careful cleaning of all the objects, the objects to be inventories are selected. The selection is made keeping in view their exceptionality, state of conservation and importance. For instance all coins found are inventoried, but among the potsherds only those with inscriptions or which are painted are however, necessary to be inventoried. The preparation of an Inventory List is the most delicate segment of all excavation

procedure. It is a list containing the important information such as; serial number, stratigraphic information, short description, principal measurement and the material of an object/find.

1.3.8 Methods of Excavations: Basically there are two types of archaeological excavations; first a research excavations when time and resources are available to excavate the site fully, second the development-led excavations when the site is being threatened by urban development. However, sometimes, if there is a need to determine the extent and characteristics of archaeological potential in an area or at a site before extensive excavation is undertaken, then trial excavation is carried out. The salvage excavation is also carried out at a time when it is necessary to obtain quick results. Whatever excavations is planned, the purpose of excavations is to obtain answer the two questions; first that what were the human activities at a particular period in the past and second that what changes in those activities from period to period were taken place. Generally, we can say that contemporary activities take place horizontally in space whereas changes in those activities occur vertically through time. This is called as horizontal excavations and vertical excavations respectively. In the horizontal dimension archaeologists demonstrate contemporary activities occurred at the same time, but in the vertical dimension archaeologists analyze changes through time by the study of “Stratigraphy”. In archaeology, stratigraphymean study and validating of stratification - the analysis in the vertical, time dimensions of a series of layers in the horizontal. It is the process when the layers or strata are laid down, one on top of the other as *law of superposition*.

i. **The Wheeler box-grid:** Most excavations employ a combination of both strategies (horizontal and vertical) but there are different ways of achieving the targets and results. Once the general extend and layout of the site has been ascertained, some of the baulks can be removed and the squares joined unto an

open excavation to expose any features that are of specific interest. However, on contrary the open-area excavation method argues that the baulks are invariably in the wrong place or wrongly oriented to illustrate the relationships required from sections and that they prevent the distinguishing of spatial patterning over large areas. The open area method is particularly effective where single period deposits lie near the surface. However, no single method is ever going to be universally applicable. The box-grid has rarely been employed to excavate very deep sites. The solutions is commonly adopted as step trenching, with a large area opened at the top which gradually narrows as the dig descends in a series of large steps.

ii. **The Harris Matrix:** The Matrix method was developed in 1973 in England, by Dr. Edward C. Harris. It is a tool used to depict the temporal succession of archaeological contexts and thus the sequence of depositions and surfaces on an archaeological site. The matrix reflects the relative position and stratigraphic contacts of observable stratigraphic units, or contexts. In his *Principles of archaeological stratigraphy* Harris first proposed the need for each unit of stratification to have its own graphic representation, usually in the form of a measured plan. The Harris matrix is a tool that aids the accurate and consistent excavation of a site and articulates complex sequences in a clear and understandable way.

When there are hundreds of relationships, a formal method of keeping track of them is required. An effective method is to prepare a Harris Matrix. Their position in the matrix places the contexts in their sequence in time, provided that the archaeologist has maintained a record of the context in which each artifact was found, the tracing of the contexts by the matrix does equally well for the artefacts.

iii. **Harris Laws of Archeological Stratigraphy:**

a) Law of superposition

In a series of layers and interfacial features, as originally created, the upper units of stratification are younger and the lower are older, for each must have been deposited on, or created by the removal of, a pre-existing mass of archaeological stratification.

b) Law of original horizontal

Any archaeological layer deposited in an unconsolidated form will tend towards a horizontal disposition.

c) Law of original continuity

Any archaeological deposit, as originally laid down, will be bounded by the edge of the basin of deposition, or will thin down to a feather edge.

d) Law of stratigraphic succession

Any given unit of archaeological stratification takes its place in the stratigraphic sequence of a site from its position between the undermost of all units which lie above it and the uppermost of all those units which lie below it and with which it has a physical contact, all other superposition relationships being regarded as redundant.

1.3.9 Composition of Excavation Team

- i) Team Leader / Director
- ii) Co-Leader/Co-Director
- iii) Team Members; at least two from amongst archaeologists, anthropologists, geologists, zoologists, palaeo-botanists, paleontologists and geomorphologist, architect , conservationists, archaeologicalchemists
- iv) Field / Camp Supervisor
- v) Draftsman
- vi) Photographer
- vii) Skilled Workers
- viii) Trained Labors

- ix) Pottery Recorder
- x) Technical staff (pottery restorer)
- xi) Store keeper

List of equipments/tools required for excavation

a. General type:

- i) Picks
- ii) Long handled shovels
- iii) Wheel-barrows
- iv) Small picks
- v) Large trowels
- vi) Small travels
- vii) Baskets
- viii) Brushes of different sizes
- ix) Ladders
- x) Plastic bags
- xi) Labels

b. Scientific type:

- i) Optical level and stadia
- ii) Site ranging rods
- iii) Measurement tapes
- iv) Folding rulers
- v) Plumb line
- vi) Black board
- vii) Metric scale and north pointer
- viii) Compass
- ix) Bubble levels
- x) Drawing material

1.3.10 The Archaeological Excavations: The term “archaeological section” is used to refer to two different things. The physical section is the inner wall of the excavation which runs around the trench or along unexcavated baulks. On the other hand, the main cross section of a trench is the graphic representation of its stratigraphical sequence crossing crucial parts of the site, usually those that link the architecture to separate stratigraphic contexts. This graphic section and its geometry are selected by the archaeologist at a certain point of the dig to interpret, summarize and explain the history of the whole site.

When Mortimer wheeler introduced the concept and the practice of stratigraphic recording first in India and then in Pakistan the use of reading the stratigraphy on the vertical (balk or wall) sections was strongly recommended and emphasized. The steps of this procedure were: laying down the grid, excavating by squares within baulks, then, once reached the virgin soil, carving on the baulks the limits among the layers, thus dividing the sites sequence in “Periods”. The modern archaeology, wherever possible, tends to excavate extensively and produces sections reconstructed from the planes of the layers surveyed using the optical level vis-à-vis a datum point. These sections, often called “cumulative”, can be reconstructed in any part of the excavation, wherever they can enhance the illustration of the general stratigraphy.

As a rule, difference in colors, texture and inclusions among layers are more precisely appreciated when these latter are superimposed and cut vertically, rather than when they are exposed side by side on horizontal surface. Vertical sections may reveal details of stratigraphical formation processes and biological transformation not visible in other ways. Sometimes for example within graves it will be useful to leave small, partial sections limited to one or two layers, then document and remove them as soon as the exploration of a given surface or filling

will be completed in short, there is not a single method of excavation to be recommended in every case. If the excavated area is on a steep slope, after removing the topsoil we can find some parallel strips of soil distinguished by different colors or lines of stones. In this case, it is important to start the excavation from the uppermost layer, exposing its inclusions and possible architectural features on its inclined surfaces. In these cases, to excavate by the means of geometric horizontal cuts will mix materials of different periods beyond hope of recovery.

During excavations, sometimes on the dig we find the remnants of complex and delicate objects in perishable materials, or fragile parts of burials that deserve a greater attention and a particularly careful documentation. Often similar finds cannot be left on the field, where they can be damaged by exposure to air and rains. Depending on the type of surrounding sediments and their compactness, these finds can be isolated within blocks of earth, fixed with bandages, gypsum, wax or wooden frames tied up with iron wire, and under excavated, while gradually supporting their bottom. Then, such blocks can be lifted and removed, to be brought to a lab to be micro-excavated with the due security and care. The collection of samples like soil, pollen, charcoal, bones etc. is very important which need much care by observing operational and practical guidelines or instructions. As these samples are used for different types and kinds of laboratory tests therefore utmost care should be carried out while collecting the samples for scientific laboratory test purposes.

In fact excavation is a basic method of archaeology with its own body of data and set of techniques. The objects unearthed during an archaeological excavation provide the illustration, which imitate the environmental, physical and culture subsistence of man in antiquity. The excavation procedures may seem perplexing to a novice, but it is an intelligible means of unearthing facts. The archaeological

sites are spread all over the world; in different environs, geological and culture contexts, and at different altitudes. For instance the Egyptian and Mesopotamian civilizations, the Harappan and Iranian glories, the Central Asian cultures, and Mayan Epic, are a few examples. Every archaeological site has its environmental and presents its own set of questions. No standard principles could be postulated which are applied everywhere. It is only through careful observation and keen insight of the excavator to discern the true nature of the situation, which helps him/her to formulate the specific principles in accord with the particular case.

Excavation is destruction is a common saying, which refers to the fact that archaeological sites are records of wealth of information, buried underneath for thousand to years. They provide a quantity of details and accuracy, which is a basic requirement of the scientific research and modern quest. Once excavated, and the objects are removed from their physical and archaeological contexts, they will never attain their natural position again. Excavation is thus a very sensitive responsibility, which the excavators undertake on themselves. It involves very high cost in terms of labour, time and money. It is the main duty of an excavator to try to understand the meaning of an archaeological context as minutely as possible bringing forth even minor aspects of the critical analysis, so that the past life is reconstructed accurately to the maximum extent, for the benefit of humanity in consonance with present day scientific pursuit. The following are some procedures and principles, which are considered as the backbone of a scientific excavation:-

Non-destructive sampling techniques: The Soil Auger (Drill) and the Proton Magnetometer are non-destructive techniques, which could be applied on an archaeological site before conducting research excavation. These are reliable method, which are also very cheap.

The Soil Auger (Drill) Method: The Soil Auger consists of a drill bit, intervening lengths of a rod and a handle. The bit is placed in a damped area and

the handle is twisted. When the head of the bit is completely conversed by the soil, it is removed. A plug of soil held in the head is removed and placed on a plastic sheet. The sheet is marked in graduations of 20 cm. the plug is cut open and the soil Munsell color is noticed. This method is employed to reconstruct the stratigraphic sequence of part of a site by hanging out a grid and testing cores at intervals (up to a depth of 10 m). The site can also be dated from fragments of pottery within the soil plug or from carbon samples recovered.

The Proton Magnetometer Method: The Magnetometer contains a proton rich liquid in a canister surrounded by a metal coil. A current is passed through the coil, causing protons to align parallel to the axis. The current is switched off and the coil becomes a detector attached to a sensor so that the protons align to the new magnetic field (of the earth's magnetic field and anomalies), while re-aligning they generate a small voltage in the coil and the frequency of this voltage is proportioned to the strength of the field measured. The Proton Magnetometer measures the intensity of the earth's magnetic field in a single area. The archaeologists to identify anomalies or differences caused by man's activities in antiquity use it.

The Proton Magnetometer is often used to locate kilns or metal working areas. These areas often involve the heating of clay. If clay is fired it is first demagnetized and then re-magnetized in a single coherent pattern presenting an anomaly. The Proton Magnetometer can also be used to identify ditches on an archaeological site (within a range of 2 m of the surface). Topsoil is normally more magnetic than subsoil, thus ditches give a positive signal. However, some ditches which are filled with slit only highly magnetic subsoil will produce a negative signal.

Field excavation techniques: A scientific excavation is completely different from just digging. It is the responsibility of an excavator to instruct the labour the proficiency in observing and feeling differences in the soil colour, architectural

features and artifact. The local labour employed on a site is generally very sharp and quick in detecting such differences, if trained properly. However, even when trained and experienced labour is concerned, only employ them to assist you in your work; do not rely completely on them for the excavation of an archaeological site. What an archaeologist can observe and feel, a labour can't. There is a high possibility of losing important evidence, if labour is mainly responsible for the excavation of a site. Archaeology is just like a puzzle where an archaeologist has to put together countless tiny pieces of evidence to present a nearest accurate glimpse of the life in antiquity. Even if a minor piece of evidence is lost it may deform the picture and destroy its authenticity, while the same piece of evidence, if observed and interpreted correctly, may prove to be of prim importance in long run.

- Never hurry while excavating. Try to observe the artifacts in – situ to a maximum possible extent. Once an important object is noticed, the excavator should unearth the object/architectural feature etc, personally, delicate excavation tools such as soft brushes, small trowels, wooden sticks etc, may be used whenever required. Horizontal excavation should be carried out in order to observe and unearth the archaeological remains with relation to their archaeological context. An important artifact should not be removed until the nature of its contextual information is fully comprehended. Moreover, a delicate artifact may not be removed by a labourer, it is an excavator's job.
- Always keep a daily note book while in the field. Never rely on your memory. Daily diary should contain every decision the excavator makes in the field and its reasoning i.e. why did that particular decision was taken; the hypothesis made and tested in the field; the findings (minor and major), with their three-dimensional measurements, and description of their contextual information. If such daily diary is prepared during an excavation it will be a useful reference

not only for the excavator, but it will also provide important details to other archaeologist. A published report cannot contain that much detailed description and drawings, which a daily diary may contain.

- Sometime excavator has to defend or support the decisions undertaken in the field. If not noted down, minor details may slip off the mind, but a written document will always be a useful reference.
- Don't be rigid; be flexible while excavating an archaeological site. Archaeological like any other scientific discipline seeks through the process of continuous experimentation and experiences. Do not hesitate to change your opinion, if not supported by the evidence. It is the only way to correct the faults and improve the quality of research work.
- It is not always possible to take a full team of surveyors, draftsmen, photographers and conservators in the field. An archaeologist has to master several qualities and talents which are not generally found together in a person. An excavator should have the preliminary knowledge and practice of surveying, mapping and plotting, studying the ground, directing the excavation, examining the objects, classifying and describing them, drawing horizontal plan and vertical sections, archaeological photography, taking measurements, and basic laboratory treatment of the objects.
- Every excavator should have a good hand for simple drawing and plotting. It is only a matter of practice and interest. A topographic plan of the site is plotted separately. A rough plan of the trench is drawn on the notebook on daily basis. The archaeological remains and architectural features are drawn on the top plan with the help of triangulation method. Drawing through triangulation is a simple method, and a precise technique of documenting the original archaeological and physical context.

- The important artifacts should not be removed from their original archaeological context before putting their position on the top plan according to three-dimensions (i.e. depth, and horizontal measurements from two given points), and photography.
- Vertical sections of a trench are also drawn whenever necessary. A draftsman may not be present on a site every day; neither can he draw every section of all trenches of the site. An excavator has to undertake this responsibility of drawing the top plan and filling them with important details, in order to secure promising results in comparatively shorter time period. It should be kept in mind that there are many details which the eye of a camera cannot catch. Such details are emphasized with the help of handmade sketches and illustrations.
- The archaeological objects decay, deteriorate and crumble with different degrees of sensitivity, once excavated and exposed to air. The organic materials decay much faster than the well-fired pottery and stone.
- Be sensitive to the importance of archaeological evidence. No piece of evidence is negligible in an archaeological excavation. It is through such minor pieces of evidence that a wider range of information is collected, about the life of the ancients left behind in the form of architectural features and material objects.
- An archaeological team cannot always afford several experts in field. Though for instance a palaeo-botanist can appreciate the importance of charcoal or seeds recovered from a site, while every excavator may not have an ability to do so. However, every excavator should acknowledge the importance of all the objects and remains collected from the site. Nothing should be discarded as “unimportant”, no matter how trivial it seems to the excavator. The excavator should preserve such objects carefully after cleaning them properly, for future study by the experts of relevant fields.

1.3.11.1 Recording of Archaeological Finds

i) **Archaeological Photography:** Technically, photography is a process of making pictures by the action of recording light patterns, reflected or emitted from objects, on a photosensitive medium or an image sensor through a timed exposure. The process is done through mechanical, chemical, or electronic devices known as cameras. A lens is used to focus the light reflected or emitted from objects into a real image on the light-sensitive surface inside a camera during a timed exposure. With an electronic image sensor, this produces an electrical charge at each pixel, which is electronically processed and stored in a digital image file for subsequent display or processing. The result with photographic emulsion is an invisible latent image, which is later chemically "developed" into a visible image, either negative or positive depending on the purpose of the photographic material and the method of processing. A negative image on film is traditionally used to photographically create a positive image on a paper base, known as a print, either by using an enlarger or by contact printing.

The archaeological photography is essential in the disciplines of archaeology. It is the practice of photographing the many aspects of archeological investigations to create a lasting record of the field work. The job of an archeological photography involves taking pictures of a site before, during, and after a dig including the artifacts. Now-a-days, much archaeological photography is done digitally, a technological development that has improved the field. Along with text, mapping, and drawing, photography is an important task of archaeological method and practice. From analog origins in the second half of the nineteenth century, archaeological photography has now evolved into a digital process since the beginning of this century.

The archaeological photography is intended to create a permanent photographic record of archaeological works or projects. By capturing the diverse elements of these projects on film, the photography provides visual data that can later be studied by the archaeologists working on that particular project, scholarly researchers, museum curators etc. One of the main reasons that archaeological photography is so important to the field of archaeology is that once a site has been excavated, it cannot be restored to its original state. Thus, photographs can provide a lasting record of a site before and while a dig is in progress and after completion of the excavation work.

The digital cameras, scanning technology, storage media and computational photography have afforded the greatest transformations in the process of recording archaeology. While three-dimensional (3D) approaches of visualizing cultural landscapes, excavations, built heritage and artifacts are rapidly changing the face of archaeology, traditional archaeological photography is still the baseline of the discipline.

A large part of an archaeological photography is performed on-site. The camera photographs are taken when the excavation work is continued in the process, showing where and how a particular artifact was situated when it was unearthed. The photographs are taken about the area surrounding a site to record how it looked at the time of an excavation. Further, the pictures of each artifact recovered during the process of an excavation are taken in such a way that its details and size are clear to understand.

The digital technology has many benefits for archaeological photography. For instance, to check the quality and composition of each picture before leaving an excavation site, and also to share photographs quickly and economically. In many respects, the advancement of technology has left traditional photography behind.

Photogrammetry, 3D imaging, computer reconstruction, editable digital photography, and ground-penetrating radar, help us to simulate full reconstructions of a site. However, the use of many of the techniques is not an accepted alternative for publication purposes. As such these technological advances have been an inadequate replacement for good archaeological photography. The best record of an archaeological site results from the combination of high quality digital photography with classical field archaeology. This can serve as a baseline for more advanced Photogrammetry and site documentation.

In the past years all photography was monochrome, or black-and-white. Even after color film was readily available, black-and-white photography continued to dominate for decades, due to its lower cost, chemical stability, and its "classic" photographic look. The tones and contrast between light and dark areas define black-and-white photography. The monochrome printing or electronic display can be used to salvage certain photographs taken in color which are unsatisfactory in their original form; sometimes when presented as black-and-white or single-colored images they are found to be more effective. In order to properly document the excavation and the nature of the archaeological site, archaeologists take numerous photographs and make a multitude of drawings. These demonstrate the relationship between different structures on the site, explain the stratigraphy and illustrate the occupation sequence, give the layout of a building as well as show what kind of artefacts and pottery were found on the site.

In fact, photographs of the archaeological site are taken before the excavations begin. These pictures give an overview of the area prior to excavation, usually seen from a distance. During the excavation, additional photographs are taken as new things are unearthed; these will be overview shots of the excavation units as well as in-situ object photographs, which show objects still in their original spot.

At conclusion of the excavation, final photographs are taken because, in most cases, what was just excavated needs to be re-buried for protection. The additional photos may be taken to document various other things that may or may not be archaeological like landscapes, living area, and even the people. The good quality of photographs will provide much archaeological details and it will be an authentic record.

Trenches: The recording of stratified layers in section can demonstrate difficulty, as trenches are often narrow. It is desirable to gain as square a shot as possible, that is with the camera vertical and square on to the section face with the lens axis as near as possible to the mid-point of the section rather than looking down at an angle. This prevents spherical distortion to the edges of the frame, which is caused by lens foreshortening or perspective shift, if lines are not parallel to the camera view finder. From a high viewpoint, the sections nearer to the camera would appear bigger and deeper than the sections further away from the camera. The digital cameras are convenient to check instantly to see the desired effect first time. To gain a correct position, it will require to place the camera within the trench on a tripod, as to measure the lens to section distance and accordingly adjust the lenses' focusing ring to line up the correct measurement, if cannot seen through the viewfinder, which is often the case in narrow trenches.

When photographing a whole trench, it may be necessary to use a stepladder to gain a slightly higher viewpoint. The extra height gained from using a ladder will enable the photographer to achieve a wider view of both the trench and other trenches or features alongside it. This gives valuable information about the context and relationship of other features on site, as well as considering the important 3-D depth of a single feature. The pictures of isolated trenches with no reference to other surrounding anomalies will have a limited use. It may be better to shoot a few pictures using a ladder as well as a few without, using the four cardinal points as starting points to view the trench from different directions to see which best position to shoot it from. Further, to place the scales in large areas as one will not be sufficient. These should be placed in important areas with a

sense of depth as well as width/ length in deep trenches. It is important to use both vertically placed and horizontally placed scales in strategic points. An ideal viewpoint for trench shots is the vertical position, however this can be difficult to achieve without expensive equipment such as extending poles. The use of quadripods gives excellent results and the final images are of an extremely high quality, far surpassing the detail in a single shot, due to the amount of high resolution images used in one final composite shot.

Lighting: It is always a problem achieving correct lighting when photographing features or vertical sections, during the excavations unless they are deeper ones cut to a batter. It can be difficult to differentiate between layers of different soils, if they are similar in the colours but different textures. A common problem is shadow, with a trench half in the light and half out of direct light. It is good to wait for the clouds to diffuse the sunlight if it is a sunny day or to photograph the feature or section on an overcast day. However bright sunlight is not always a bad thing and slight side lighting is good for sections that have clear relief and surface texture, such as wall foundations, which are best shot from slightly above and to one side, showing the junction with the floor. If one side is in shadow, use reflectors made of foil or white cardboard to fill-in the darker side. Flat soil sections or features maybe better with more oblique side-lighting in early morning or late afternoon sunlight. The best form of practice is to observe the trench in varying lighting conditions to determine the best results. Alternatively, the use of electronic flash to one side of the camera will enhance texture, if used to light the surface at an oblique angle.

Scales: The presence of scales at the site is indispensable in order to give accurate measurements and an idea of size and depth. The scales are generally in lengths of 2m, marked in 50cm bands ranging in size from 2m, 1m with 50cm and 25cm for smaller features. The smaller ones are available for artefact recording. The scales

need to be parallel to the edge of the cameras' viewfinder and square on to the edge of the section or trench and as close to features/artefacts where possible. If the camera is at a slight angle, place the scales at a parallel angle to the camera so that they are square on to the camera. This way, the scales are on the same plane as the lens axis, to minimize perspective distortion. If the scales are not on the same axis as the lens, distortion will occur between the nearest point of the camera and the furthest point from the camera. However, care needs to be taken, if trenches are deep, as scales placed at an acute angle will not give a true indication of depth or angle.

However, with large areas, three or more scales may be used, placed in the foreground, mid-ground and background for definitive reference points in equal proportions. These may be 2m survey poles or even people used as scales. It is important to note that scales should have the measurements recorded clearly on their surface, so it is instantly recognizable if the coloured sections are measured in 1cm or 10cms bands. In addition to the use of vertical and horizontal scales, there is requiring of indicating a 'north arrow' in position alongside a trench information board. The board may be a small blackboard or a magnetic board which states the trench number and any context information. Therefore the photo can be easily recognized for salient features when writing up site reports.

Lenses: The performing qualities of specific lenses may be researched and understood before selecting and using. A basic, standard lens would be suitable for most situations, giving a view similar to that which we see with our own eyes. Distortion is minimal and they usually have a minimum aperture for maximum depth of field. Sometimes wide-angle lenses are useful in tight spots. They will 'squeeze' in information giving a wider viewpoint and are therefore good for placing sites in context with their surrounding environment. Sometimes a slight telephoto lens is used. This gives the effect of flattening perspective and is usually

employed to photograph objects far away, making them appear bigger and closer. This may be useful when photographing different areas on site and investigating how they relate to each other.

Cleaning up the Site: If images are being used for publication, the edges of the trenches should be cleaned carefully, also making sure that the baulk edges and profiles of the sections have been thoroughly cleaned back with a good trowel and sprayed with water. The floor of the trench should be cleaned up and brushed and any bags, buckets or mattocks left lying around should be moved out of shot. When the preliminaries of positioning scales, boards and arrows have been done, viewpoint and lighting can be considered.

Photography of Objects: Depending on the complexity of the artefacts' shape, lighting can be experimented with by finding the best position and angle of the lights used for the job. It is far better to spend some time experimenting and observing, to find the best solution in any difficult situation. The simple lighting or copy stands can help. If in doubt about any exposure difficulties, it is always suitable to bracket any shots and this is good practice for all situations, even if using digital as well as traditional film cameras.

Coins: The lighting needs to strike the flat surface of the coin at a fairly oblique angle, approximately 45°. The camera is the best mounted on a copy-stand, which places the camera on an adjustable column, vertically facing a baseboard below where the artefacts are placed. Such copy stands have small lights, attached to a frame above the baseboard. These lights can be easily re-positioned to achieve the best angles for the job. Further consideration is needed when dealing with coins that have shallow relief marks. Recorded on a copy stand with the light at right angles (90°), such a coin would be rendered flat and lifeless. It would be advisable

to bring the lighting to a more oblique angle, 30° may be better, so that the light creates longer shadows, giving greater contrast and relief.

It is usual to place both sides of the coin in publications, with the obverse on the left and the reverse on the right. This can be achieved by using a multiple exposure function with a black background. With the camera on multiple exposure modes, the first shot records the obverse, which is then removed after exposure. The coin is then flipped around and, using a ruler to place it in the correct alignment, photographed a second time.

Flint: By deciding upon which colour background to use is important and it is dependent upon the colour and dullness of the flint. Lighter coloured, less dense flints would lose definition in the edges against a white background or light-box as the light would transmit through the flint. However, on the other hand, darker, more opaque flints would be lost against a black setting with the edges disappearing into the backdrop. It may be suitable to use a grey background or contrasting colour to the flint. Because flints are multifaceted, it is best to view the artefact under differing lighting conditions before shooting, varying the angle at which the light strikes the surface by moving either the flint or the lights and constantly observing the shadows created for best effect. The darker flints respond well to being placed on a light-box, with two lights at 45° to the lens axis on either side of a copy stand set up. The lights should be far away enough from the flint to minimize reflections on the glossy surface.

Pottery: It is best to take care when setting up shots of complete pots as the angle at which the pot is placed in relation to the camera can make a big difference. If the camera is positioned below the pot, the rim will not be recorded and the base will look enlarged and distorted. If the camera is looking down on the pot, the

base will not be seen and the form is distorted. It is suitable to set the camera on a tripod with the lens axis slightly above the middle of the pot. This way, some of the rim will be viewed which will give the pot some depth rather than a flat profile. At the same time, most of the base will be recorded as well.

The Bowls are generally shot with the camera placed slightly lower than the mid-point to enable definition of the base to be clearly shown. The soft, diffused side lighting will give good definition with surfaces that are incised or those that have relief or raised patterns on the surface. One diffused light at 35° to the side of the pot should suffice but if there is too much shadow on the other side a second, weaker light can be used to fill in the shadow details. The highly glazed surfaces are difficult to record due to the reflective quality of the lights being used. However, it may be necessary to show that the surface is, indeed, shiny. In such a situation, a diffused, single light to one side with a reflector on the other side may prove sufficient.

There is a great need of care when combined pots are to be photographed. The Pots placed nearer the camera will appear bigger and those further away will appear smaller. They should not overlap and attention should be paid to shadows, which can obscure details on adjacent vessels. For recording pot sherds, differences in size and thickness can prove problem. A great care should be taken to arrange them with the rims at the top of the frame and the bases at the bottom. If there are to be several sherds in one frame, line them up so the top of the rims form a straight line.

Glass: A great careful consideration needs to be applied when photographing a glass. There are numerous difficulties, due to the transparent and reflective qualities of the glass. The black or white backgrounds are best, as any coloured backing will give the glass a false colour appearance. The light-boxes are useful, as they will clearly show the outline as well as any cracks or details in the glass

itself. The clear glass shows up well against a light-box and no front lighting is usually necessary. A glass shelf with a white background is easily assembled with a light shining below and behind the shelf so that the light shines up through the object. Glass which is highly reflective, especially forms with complicated shapes i.e. perfume bottles, are best shot in diffused lighting. That is lighting which is shielded by tracing paper or umbrellas.

Exposing with a Light-Box: The best form of lighting is a light box, with two lights above, which should be diffused to avoid shadows forming underneath the artefacts is possible. To give a pure white background, the light box illumination will need to be at least one stop brighter than the lights from above but the exposure reading should be taken from the light sources above. The two different light sources have the same bulbs, i.e. tungsten or fluorescent and not a mixture of the two, otherwise colour casts will occur.

ii) **Archaeological Drawings**

Plans/ Maps: The first drawing needed in archaeological field work is a map of the archaeological site, which illustrates topographic elements i.e. elevations and depressions on the archaeological site. After each season, of excavations the architectural features will be added to a copy of this map. The Architectural features may also be drawn separately upon the completion of the excavation. The archaeologists draw top plans of the features found within an archaeological locus as seen from above. Technically this should be done each time a new context is discovered; however, many archaeologists do it only when they find new architectural features or deposits within a context, making quick sketches in their diary in the meantime. Basically, these are cross-sections of the layers of earth on the dig site that show the vertical sequence of events/activities performed on site

called as 'stratigraphy'. The Baulks might be removed during excavations to create a bigger unit, so it's necessary to draw them before the evidence is disappeared. Once removed from the archaeological site, objects will be drawn by archaeologists who also serve as illustrators.

Pottery Drawing: The Pottery drawing is very important as types of pottery very often help date an archaeological site based on the manufacture, materials and decoration. On an archaeological site, anything that can be drawn may includes carved or painted decoration on building walls, inscriptions on objects and stelae, and even ancient graffiti. The archaeological pottery drawings are extremely significant; as vessels are shown in cutaway side view so that both the exterior form and the section of a three dimensional vessel are presented on the same two-dimensional drawing. The section/profile is shown on the left hand side of a centre line, together with any interior detail, and the exterior is shown on the right. The archaeological Pottery is generally drawn initially at full size (1:1) and reproduced at 1:4 or sometimes 1:3, although there may be exceptions for very large or very small vessels, or where very complex decoration is present.

Tools and Equipment:

- i) Drawing board – A3 or larger, depending on the size of the vessel(s)
- ii) Tracing paper for initial pencil drawing. (90 gsm is a good weight – anything less is flimsy, anything more is too expensive.) Scrap pieces of tracing paper or drafting film can be used for transferring profiles.
- iii) Calipers or dividers for measuring the thickness of a vessel wall.
- iv) Profile gauge or solder wire for measuring profile. A good-quality profile gauge with fine metal teeth is preferable.

- v) Engineer's square, set squares, blocks. In the absence of an engineer's square, a free-standing set square can be made by fixing a block of wood or suitable weighted box flush with the base of a normal set square.
- vi) Radius chart – This can be made by simply drawing concentric arcs of radii from 10mm to 300mm in 10mm increments with a compass. Alternatively, you can buy specialist polar graph paper sheets. It may be useful to mark off percentages around the circumference so that, for example, the percentage of rim present can easily be recorded.
- vii) Pencils – a range of different pencils is useful, a hard lead (3-4H) for outlines, softer pencils for shading, details, transferring profiles etc.
- viii) Technical pens- in several sizes, depending on the reduction required on final drawing. However, the sizes 0.35mm, 0.25mm and 0.5mm are the most useful sizes for general purposes.
- ix) Drafting tape – for taping paper onto a drawing board, and also temporarily holding sheets together while gluing.
- x) Cigarette paper/fine tissue paper/clear acetate film – for rubbings or tracings of decoration or stamps.
- xi) Graphite stick, graphite flakes or graphite powder for making rubbings.
- xii) Scalpel and scalpel blades for sharpening pencils and erasing pencil and/or ink. Swann-Morton of Sheffield produces the finest range; number 15 is particularly useful for drawing purposes.
- xiii) Sand tray – a large tray such as cat litter tray filled with sand is useful for propping up incomplete vessels during refitting.

- xiv) Cellulose nitrate adhesive (e.g HMG – available from most conservation suppliers) for refitting sherds. Do not use an adhesive which is non-reversible, or very difficult to undo, such as epoxys or superglues.
- xv) Acetone – for undoing poor joins and mistakes in repaired pottery.
- xvi) Compasses – occasionally useful for finding the radius of very large vessels, or for drawing radius charts.
- xvii) Flatbed scanner – for importing draft drawings into computer drawing packages, or scanning inked drawings for incorporation into final publication files.

Method: As with all archaeological illustration, the golden rule is to measure twice, draw once, and then check. Always check measurements at every stage, and check again when it is finished. Prepare a drawing board, and attach the tracing paper lightly with drafting tape. Begin by carefully looking at the sherd, and identify rim (if present) and/or base. Make sure to know which is the inner and which the outer surface, and check for any decoration.

Rims: Place the rim top-down against a flat surface and rock it back and forth until the rim ‘sits’ on the surface with minimum movement; in regular wheel-thrown vessels, no light should be seen between the rim line and the surface. This will indicate the angle at which the rim sits. It is important to judge this correctly; if the angle is misjudged the whole form of the pot can be misinterpreted.

Rim Diameter: With the rim in the correct attitude, and viewing directly above the rim, slide the sherd across a radius chart until the outer edge coincides exactly with one of the concentric lines. With irregular or handmade pots this can

sometimes be a matter of ‘best fit’ rather than an exact match. Rule a faint horizontal pencil line near the top of the drawing paper, the length of the rim diameter. Mark a point halfway along the rim line. A tip for finding the radius of vessels larger than the average radius chart, particularly if only a small proportion of the circumference survives is that: holding the rim upside down, lightly trace round the outer edge with a pencil onto a largesheet of paper. Place the point of a pair of compasses on one end of the pencil line and draw a small circle (about 3cm diameter). Draw an identical circle centred on the point where the first circle intersects with the pencil line of the rim. Draw a straight line across the intersection of the circles. Repeat the procedure at the other end of/further along the rim line. The two lines will intersect, giving the centre point and the radius of the pot.

Height: Holding the rim in its correct attitude, measure the height of the sherd using a set square. Draw the centre line of the pot, vertically from the rim line, the length being the sherd height you have just measured. If the base of the pot is present, another horizontal line can be drawn for this; measure the base radius in the same way as the rim radius.

Profile : The outer profile of the sherd can be measured in various ways, such as by positioning the pot on its side with its rim against a block of wood and tracing the outline with an engineer’s square. Always look at the sherd carefully whilst drawing the profile, and be sure to re-check anything that doesn’t look right.

Reconstruction: Where the profile of a pot is reconstructed from several sherds, these may be shown in outline on the drawing– a technique more frequently used for handmade vessels. Alternatively, use dashed lines to show reconstructed portions of the vessel. A pie diagram is sometimes used to show the proportion of the original pot present. Where a profile has been built up from two overlapping

but non-joining sherds of the same vessel, brackets can be used to show the area of overlap. The continuation lines, two short parallel lines projecting beyond the end of the existing section of the pot are used when it is not possible to reconstruct the vessel, and to indicate when a vessel is incomplete; they are normally only shown on the left-hand, section side of the drawing.

Finishing Off : Next to the drawing, write any information about the sherd (site code, context number, type code, drawing number, etc.). This can be vitally important as pencil drawings may be stored for years before publication and a drawing with no information can be very difficult to track down later. Initials of the illustrator and the date drawn can be useful too. If you are drawing a number of sheets of pots for the same site or project, number the sheets and keep them in a folder together, and also keep a record of which sherds are drawn.

Preparing Pottery Drawings for Publication: There are several ways that pottery drawings can be prepared for incorporation into the final publication, which might fall into three broad categories – inked pages, digitally drawn pottery or a combination of the two in which hand-inked drawings are scanned and paged-up in a computer drawing package. It is rare nowadays for pottery to be paged-up as it once was as sheets of inked drawings, and the latter two methods are far more likely to be practiced in professional archaeology. However, if access to computer graphics packages is not available, drawings can be prepared by hand.

Pottery Illustration by Using Computer Software

The basic drawing of the pot is produced in pencil, large drawings can be reduced to 50% using a photocopier (usually adding two 50mm bar scales to the drawing in order to check scale) and then the reduced copy is scanned. This does not need to be a very high-resolution scan; a 200dpi greyscale jpeg will be adequate, as the scan is discarded after tracing.

First, open a new drawing and place the scanned pencil drawing on a layer – make sure centre and rim lines are vertical and horizontal respectively. Turn the scan layer into a template layer. Begin drawing on a new layer; using the Pen tool, draw the horizontal rim line and centre line, and trace the left-hand profile. When complete, transfer to the righthand side using the Reflect horizontal and Copy utilities to create a mirror image; align the two profiles.

The decoration can be drawn using a selection of brushes, although this may be more time-consuming than drawing by hand in ink, and the results can be rather mechanical and artificial looking. However, a more flexible approach to pottery illustration is possible, and a number of alternative approaches may be explored, such as: inserting scans of hand-drawn detail (either pencil or ink) into the Illustrator drawing; exporting the Illustrator drawing into Photoshop and adding shading or colour detail; inserting photographic or photomicrographic details of fabric and texture into the drawing. Once each individual pot drawing is completed, the elements of the drawing may be grouped together as one object, making page layout much more straightforward. The completed page of pottery drawings can be saved as a pdf file.

Scanning PotsFor Page-Up

Inked pot drawings may be scanned individually and imported into a computer graphics package such as Illustrator for layout and final publication; they should be scanned at quite high resolution (at least 300dpi) and the scanned images may need some cleaning-up before paging up. Numbers, scales and other details can then be added. This form of layout is of course much more flexible than the old method of paging up, but as the drawings themselves are raster images they are less easy to edit and usually take up much more file space than they would if drawn as vector files.

Converting Scanned Images To Vector Images

It is also possible to scan inked pot drawings and convert them directly into vector drawings. In order to prepare them for incorporation in a digital publication, the drawings are scanned and converted to vector graphics using Adobe Streamline, and page layouts then made up in Adobe Illustrator. More recent releases of Adobe Illustrator incorporate a Live Trace utility which replaces the function of Streamline.

Fabric and Textures

Shading conventions for pottery are the same as for other artefacts. The light is shown coming from the top left. Shading is not generally shown on wheel-thrown pottery or anything which is to be reduced by more than a half although occasionally 'rilling' or throwing lines may be shown by parallel horizontal lines, and such surface treatment as slip or glaze may be indicated by stipple or some other convention.

Stipple is generally used for showing coarseware texture but line or line and stipple can also be effective. Burnishing can be shown by fine horizontal lines. The other details such as inclusions, cracks and scratches may also be shown but too much detail may clutter up a drawing unnecessarily, or be lost or black in on reduction.

Handmade / Potter's Wheel Pottery

Horizontal lines on wheel-thrown pots are generally drawn with a ruler, whereas handmade pottery is always drawn freehand. Sections can be filled in with black, stipple or hatching and combined to show details of manufacture such as applied handles and decorative cordons. Thumbing and surface treatment can be indicated on handmade or hand-finished pots.

Handles, Spouts and Lugs: Handles or lugs are usually shown to the right, spouts to the left. When one handle is present, it is shown on the right with a cross-section and elevation if necessary. If there are two or more handles they can be shown in elevation on the right and in section with details of the construction on the left. Spouts and lips are shown either on the left in section for jugs or in elevation on the centre line.

Decoration: The decoration around the body of the pot may be shown 'unrolled' to the right or, if the decoration is quite simple and repetitive, drawn out on the curve of the pot. The colour paint or glazes can be shown either as a colour plate or by use of a monochrome convention

1.3. 12 Treatment of Excavated Material in Field Camp

The archaeological finds that survive in the archaeological record are retrieved during the excavations. Recognizing the various types of finds and sub types within artefact group is important to allow the appropriate retrieval of an artefact be undertaken from lifting the item for the purpose of storage and preparation for removal from the site. From fragile material such as woods or other organics or bulk finds like ceramics or perhaps animal bones, it is important to carry out the course of action that best suits the situation. The sampling may be carried out by members of the excavation team or by specialists as appropriate but when samples are to be collected by site staff the exact sampling strategy must be decided with the appropriate specialists in advance especially charcoal or other materials for dating purposes etc. The following steps are required to be taken for treatment of such kind of objects:-

- i) Pottery

Pottery should be washed in running water and brushed with a light brush without removing the coating or slop, or the traces of burning/flanking and incrustations of organic material.

ii) Coins

Coins should be washed rapidly in distilled water and brushed with a soft brush to remove any soil.

iii) Iron or metal objects

A solution of distilled water and tannic and or sulphuric acid about 5 % can be used to remove a tangle of rusted material.

iv) Stone objects

After washing the objects with water and synthetic vinegar (2:1) packs will help to remove the more superficial incrustations.

v) Bones/ Charcoal/ wood/ivory objects

The fragile material should be collected for laboratory chemical analysis in-situ with utmost care without disturbing the cultural environment of the object from the dig.

1.4 Preparation and Publication of Field Reports

In order to meet the requirement of the researchers, students and scholars interested in the culture and art history, it is essential to prepare and publish the reports of excavations. The exploration / excavation reports depend upon the requirement such as; preliminary reports, final reports, technical reports, etc. The archaeologists use data compiled from research, field work and scientific or specialist analysis to document and report on archaeological sites, surveys or research work.

The standards and guidance for archaeological documentation can be dependent on both the target audience and the body who required the report or publication. The essential outline of a report however, will remain the same. The basic elements of technical report writing are as follows:-

- **Title Cover Page**
 - Site name including location and county.
 - Excavation licence number, consent number or direction number, as appropriate.
 - Planning reference number(s) if appropriate.
 - Name of the site director.
 - Date of submission of the report.

- **Abstract or Summary**
 - Concise summary of the results of the report

- **Introduction**
 - Planning background/description of proposed development.
 - Details of Consent or Direction.
 - Indication of archaeological significance before excavation.
 - Dates of commencement and termination of the excavation.
 - Location, data including the Town name; map, including sheet number with proper scale.

- **Objectives**

Aims with questions which are required to answer

- **Methodology**

The procedure and techniques applied during the excavation work

- **Report and Results**
 - Description of area excavated with overall plan showing all cuttings.
 - Description of the excavation methodology including finds retrieval and sampling strategies.
 - Summary of excavation phases and stratigraphic character of the excavation.
 - Reference to key archaeological features and significant finds.
 - Photographs of significant details (where relevant).
 - Post-excavation proposals including publication recommendations.
 - Preliminary reports for development-led test excavations must contain an archaeological impact statement describing the possible direct or indirect effects of the proposed development on archaeological deposits, features or objects.
 - Outline of timeframe for completion and submission of report.

- **Specialist Reports**
It may contain any special reports of tests or analysis reports

- **Conclusion**
 - Preliminary interpretation and discussion of excavation results.
 - Where relevant, include discussion of the impact of any proposed development on the archaeology of the site and suggest any additional measures necessary.

- **Appendixes**
Attach data of different types /categories collected during the work

- **Bibliography/References / Illustrations**

- **Steps for Publication Of Archaeological Reports**

1. The summary of the report provides the results of the excavation by covering all important points for the reader.

2. The introduction gives brief details of all activities and background of the excavation. It is important to describe the geographic boundaries of the site including a description of the area's physical environment and a historical background – either of the site and/or other archaeological works that have taken place. If previous excavations have occurred at the site, it must be included and describe what they found. The aims and objectives of the project must be narrated briefly.

3. The objectives should cover the project goals including the reason for the project, the research questions to be addressed, and the final desired outcome.

4. The description of Methodology is very important to mention and the steps undertaken to achieve the results should be clearly defined for the readers.

5. The results of the excavation report should be mentioned with details along with maps, plans, drawings, photographs and other methods applied during the execution of the excavation work at the site. The result of the report must describe as how you carried out each element of the project? Were they hand dug or with the help of machine, how deep did you decide to go? Did you do the work stratigraphically, how did you decide where to excavate or if you were surveying a large area, how did you record the features and sites? How did you decide what features or sites to record? What photographic method did you use? Include methods of documentation for features and artefacts uncovered through the use of remote sensing, walkover surveys, and excavations etc.

6. It is essential to mention the problems faced during the excavation work such as; with bad weather, site access and visibility.

7. The report must summarize the site data collected with interpretation results. Use figures, charts, photographs and tables to present the information in a way that is understandable. It may be ensured that every context, site or element is presented and the relevance and significance is proposed. It is also necessary to provide details of the analysis of the artefacts and samples taken.

8. The report must list the artefacts from the site and any scientific or specialist analysis which may include: studying the artefact types and distribution across the site; dating artefacts using dating methods, faunal analysis; environmental samples; and ceramic reports.

9. The report must then evaluate the project in terms of the achieving the objectives of the project and create a synthetic discussion of the whole report, that results in a conclusion based on the data collected and collated to date, as well as how this fits into a wider picture.

10. It is important to provide recommendations for ongoing research work for future work.

11. In conclusion a brief picture of the excavation results with some suggestions will enhance the credibility of the report.

12. Appendixes for the report must list all photographs, contexts, sites, features, samples or artefact recovered to provide a cross reference of data.

13. It is important to mention the names of persons or institutions, as acknowledgment for the support and cooperation extended during the excavation work.

14. The report can be concluded with a list of all sources (including maps, journals and books) consulted during the project in the form of a bibliography or references.

15. It is also important to note that the process of publication of the report is completed well timely for the benefit of the readers and to ensure its availability far and wide.

Self Assesment Questions

Q. No. 1: Define the term Archaeology, What does it deal?

Q. No. 2: Discuss the background history about the origin of Archaeology.

Q. No. 3: How did the subject 'Arcaeology' came in to being? Discuss.

Q. No. 4: What do you know about Archaeological survey and exploration? Explain.

Q. No. 5: Highlight field techniques and field tools for carrying out archeological research.

Q.No. 6: What do you know about ancient data colloectin and preparation of field reports?

Q. No. 7: What do you know about ancient pottery drawing and photography?

Q. No. 8: How does Archaeology interct with other subjects of Social Sciences

BIBLIOGRAPHY

- Adkins, L. and R., (1989) *Archaeological Illustration: Cambridge Manuals in Archaeology*. Cambridge, Cambridge University Press, UK.
- Alexander, J. (1917) *The Directing of Archaeological Excavations*, London
- Atkinson, R.J.C (1953) *Field Archaeology*, 2nded, London
- Barker, P. (1983) *The Technique of Archaeological Excavation*, London
- Bowman, S. (1990) *Radiocarbon Dating*, British Museum, London
- Brodribb, A.C.C., (1971) *Drawing Archaeological Finds for Publication*. London: John Baker/New York: Association Press.
- Butzer, K.W. (1971) *Environment and Archaeology: An Introduction to Pleistocene Geography*, 2nded; Chicago:
- Clarke, D.L. (1978) *Analytical Archaeology*, 2nded, London
- Conlon, V.M. (1973) *Camera Techniques in Archaeology.*, John Baker, London.
- Cookson, M.B. (1954) *Photography for Archaeologists*, Max Parrish and Co., London.
- Dorin, J.E and Hodson, F.R. (1975) *Mathematics and Computers in Archaeology*, Edinburgh University press, UK.
- Dorrell, Peter G. (1994) *Photography in Archaeology and Conservation*, Cambridge University Press, Cambridge.
- Gibson, A., (1986) *Neolithic and Early Bronze Age Pottery*, Shire Archaeology, London
- Grinsell, L., Rahtz, P. and Price Williams, D., (1974) *The Preparation of Archaeological Reports*. John Baker, London.
- Hamilton, S., (1996) 'Reassessing Archaeological illustrations: Breaking the Mould.' *Graphic Archaeology* 1996, 20–26.

- Harris, E.C. (1989) *Principles of Archaeological Stratigraphy*, 2nd ed. London.
- Haslam, J., (1978) *Medieval Pottery*, Shire Archaeology, London
- Hodder, I. and Orton, C. *Spatial Analysis in Archaeology*, Cambridge, UK
- Joukowsky, M.A. (1981) *Complete Manual of Field Archaeology*, Englewood Cliffs, USA
- Langford, Michael (2000) *Basic Photography*, 7th edition. Focal Press, Oxford.
- McCormick, A.G., (1977) 'A Guide to Archaeological Drawing', Notes for Students, Department of Archaeology, University of Leicester, UK.
- N., Jenner, A. and Wilson, C., (1990) *Drawing Archaeological Finds: A Handbook*. Archetype Publications, London:
- Parkes, P.A. (1986) *Current Scientific Techniques in Archaeology*, London
- Piggott, S., (1965) *Archaeological Draughtsmanship: Principles and practice. Part 1: Principles and Retrospective*' *Antiquity* 39, 165–176, London
- Renfrew, C. Bahn, P. (1991) *Archaeology: Theories, Methods and Practices*, London:
- Schlitz, M. (2005) 'Archaeological Photography' in *The Focal Encyclopaedia of Photography*, Fourth Edition, Elsevier Inc. Massachusetts
- Swan, V.G., (1988) *Pottery in Roman Britain*, Shire Archaeology, London.
- Williams, D., (1993) 'A Dilemma in Brackets', (on Conventions in Pottery Illustration). *Graphic Archaeology* 1993, 16–18.

UNIT. 2

PHYSICAL AND CULTURAL ANTHROPOLOGY

Written by: Dr. Tahir Saeed
Reviewed by: Dr. Badshah Sardar

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Introduction

Mankind is now the dominant species. This achievement was completed before history began, before even the growth of the first civilizations. Pre-history has no written records, only the surviving remains of past human activity. It is the task of the archaeologist to interpret this into a coherent account and explanation of the formative years of mankind: the first three million years.

The remains include not only artefacts (man-made objects or structures), but also the effects of man's increasing control over the environment. To create as complete a picture as possible archaeologists must collaborate with experts from many other disciplines, especially those of anthropology and the physical and natural sciences.

This book accompanies different units provides a mainly technological account of prehistory. Technology, economy and society are inter linked, each reliant upon the other. Together, as the products of man they create change through time. The key to human dominance lies in the ability of man to learn from experience and pass on the learning directly to the next generation: in a sense, then, man created the circumstances for his own evolution. Thus, in the broad scheme, human history has been a process of cumulative acceleration, each new development creating the circumstances for the next.

The extremes of the period considered here—the 'Stone Age—the contrast of human circumstances well demonstrate this process. The first men (*hominids*) competed on less than equal terms with other hunters' and scavengers in the basic food-quest, because they lacked, for example, the speed and strength of animal predators. At the beginning of the Bronze Age, three million years later but only five thousand years ago, large settled communities were on the threshold of urban civilization.

What, then brought about these changes? The transmission of accumulated experience has already been isolated as man's critical advantage. The practical application was the making of tools and weapons. Initially these were compensation for man's lack of physical specialization so allowing him to compete with other animals. Gradually, though, man became aware of the wide range of tools he could make for a variety of specialized uses and a steady improvement of technology with ever wider applications can be documented.

Rough and rugged implements unearthed by the eroding current of River Soan near Rawalpindi carry the saga of human toil and labour to the inter-glacial ages roughly estimated at two million years from now. These stone choppers, and hand-

axes which are hardly different from river rounded pebbles to the lay-man's eye, have revealed a written chapter to the archaeologist proving that even in so remote a period, man had proved his intellectual superiority over all other beings of the jungle. Indomitable and free, he roved through the thick forests and hunted and slashed other animals for food or play.

Unfortunately we have no other records to link those interglacial anthropos to their monkey fathers or more civilized progeny. The Palaeolithic begins with first appearance of stone tools over two million years ago, and ends around 10,000 years ago. People sometimes find it difficult to appreciate the length of time occupied by the Palaeolithic, compared with more recent archaeological periods. After all a two thousand year old city like Taxila near Islamabad may seem ancient to a historian, but for those studying human origins, 2,000 years is little more than yesterday. The famous palaeolithic cave-art of western Europe is over ten times older, and some is even 30,000 years old. Yet even this is recent to archaeologists interested in the earliest human origins. The earliest objects that we have found that can be regarded as made by human beings are over two million years old—a thousand times older than Taxila.

One way of imagining the enormous time-scale of human evolution is to think of time in terms of distance. Imagine that each step you take represents a hundred years. Twenty steps-or roughly twenty yards-will take you back to the ancient city Taxila, two thousand years ago. At this rate, you will cover everything that has happened since the Palaeolithic that is to say the invention of farming, the development of towns and cities, the invention of writing, and the whole of written history-in only 100 yards. If you walk another 100 paces, you will have gone back 20,000 years to the height of the last ice age when the deserts of Pakistan and India were less arid than they are today, and were the home of stone age hunters. A thousand steps-or just over half a mile-takes you back 100,000 years-back to the time when our ancestors were beginning to look much the same as us.

Objectives: After studying this unit, the student will be able;

- to identify the Stone Age culture of different continents
- to understand the Stone Age in the light of socio-cultural context
- to recognize the evolution of man and their fossils
- to identify the evolution of man in Pakistan
- to be familiar with stone tools and their types
- to classify typology, formation and techniques of stone tools
- to know the beginning of making the stone tools by man
- to realize geological time scale
- to recognize different types of dating

2. Physical and Cultural Anthrology

2.1 The Stone Age Culture of Different Continents

The three-age system is the division of period of history into three-time scales namely; the Stone Age, the Bronze Age, and the Iron Age. The three-age system in fact is a methodological concept adopted during the 19th century by which artifacts and events of late prehistory and early history could be ordered into a recognizable chronology. It was developed by C.J. Thomsen, Director of the Royal Museum of Nordic Antiquities Copenhagen. The organization reflects the cultural and historical background of Mediterranean Europe and the Middle East and soon underwent further subdivisions, in 1865 by partitioning of the Stone Age into Paleolithic (Old Stone Age), Mesolithic (Middle Stone Age) and Neolithic (New Stone Age) periods by John Lubbock.

The prehistory is a term used to describe the period before written history. Stone Age is a period of history that encompasses the first widespread use of technology in human evolution from East Africa to the rest of the world which ends with the development of agriculture, domestication of certain animals and the smelting of copper ore to produce metal.

An important step in the development of the Three-age System came when the Danish antiquarian Christian Jurgensen Thomsen was able to use the Danish national collection of antiquities and the records of their finds as well as reports from contemporaneous excavations to present a solid empirical basis for the system. He showed that artifacts could be classified into types and that these types varied over time in ways that correlated with the predominance of stone, bronze or iron implements and weapons. In this way he turned the Three-age System from being an evolutionary scheme based on intuition and general knowledge into

a system of relative chronology supported by archaeological evidence. In 1819 he opened the first Museum of Northern Antiquities, in Copenhagen, in a former monastery, to house the collections; it later became the National Museum.

By the year 1831 Thomsen circulated a pamphlet, "*Scandinavian Artifacts and Their Preservation*", advising archaeologists to "observe the greatest care" to note the context of each artifact. The results reported to him confirmed the universality of the Three-age System. However, the Paleolithic or Old Stone Age was further divided into three periods as; Lower Paleolithic, Middle Paleolithic and Upper Paleolithic Period.

The early part of the Paleolithic period is called the Lower Paleolithic, which predates *Homo sapiens*, beginning with *Homo habilis* and the earliest stone tools, dated to around 2.5 million years ago. The evidence of control fire by early humans during the Lower Paleolithic Era is uncertain. The most widely accepted claim is that *Homo erectus* made fires between 790,000 and 690,000 BP (before the present period) in Israel. The use of fire enabled early humans to cook food, provide warmth, and have a light source at night. The early *Homo sapiens* originated some 200,000 years ago, ushering in the Middle Paleolithic. Anatomic changes indicating modern language capacity also arise during the Middle Paleolithic.

During the Middle Paleolithic Era, there is the first definitive evidence of human use of fire. The sites in Zambia have charred bone and wood that have been dated to 61,000 BP. The systematic burial of the dead, music, early art and the use of increasingly sophisticated multi-part tools are highlights of the Middle Paleolithic period. Throughout the Paleolithic period, humans generally lived as nomadic hunter-gatherer societies having a tendency to be very small and unrestricted.

The Mesolithic period (Middle Stone Age) is characterized in most areas by small composite flint tools: microliths and microburins. The fishing tackle, stone adzes, and wooden objects have been found at some sites. These technologies first occur in Africa, associated with the Azilian cultures, before spreading to Europe through the Ibero-Maurusian culture of Northern Africa and the Kebaran culture of the Levant. Although there were several species of human beings during the Paleolithic period but by the Neolithic Period (New Stone Age) only *Homo sapiens* remained. This was a period of primitive technological and social development. It began about 10,200 BCE in some parts of the Middle East, South East Asia, and later in other parts of the world and ended between 4,500 and 2,000 BCE.

The Neolithic is a progression of behavioral and cultural characteristics and changes, including the use of wild and domestic crops and of domesticated animals. Early Neolithic farming was limited to a narrow range of plants, both wild and domesticated, which included wheat, millet, and the keeping of dogs, sheep, and goats. The Neolithic period saw the development of early villages, agriculture, animal domestication, tools. The Neolithic era commenced with the beginning of farming and ended when metal tools became widespread.

The story of human evolution begins in East Africa with the emergence of the earliest hominids of the genus *Australopithecus* around 4-5 million years ago. Around 2 million years ago, there is clear fossil evidence for the first known representative of our own genus, *Homo habilis*, from the sites located in Kenya and Tanzania.

The earliest stone tools date from 2.5 million years ago which came from Hadar, Ethiopia and Soan River, Pakistan. It is presumed that australopithecines also had a tool culture before or during *Homo habilis*'s time. The early toolkits which comprise on flakes and pebble tools are collectively called as the Oldowan

industry. The next stage in human evolution is called as *Homo erectus* around 1.6 million years ago, which emerged in East Africa. These hominids had larger brains than *Homo habilis*, their probable ancestor, and were makers of the characteristic teardrop-shaped stone tools flaked on both sides called Acheulean hand-axes. These artifacts are the dominant tool form of the Lower Paleolithic Period.

By the time *Homo erectus* became extinct (400,000-200,000 years ago) the species had colonized the rest of Africa, southern eastern and western Asia, and central and Western Europe. The Middle Paleolithic Period starts from about 200,000 to 40,000 years ago by emergence of *Homo sapiens*. Neanderthals, who are generally classed as a subspecies of *Homo sapiens*, lived in Europe and western and central Asia from about 130,000 to 30,000 years ago. Some experts believe that Neanderthals evolved into fully modern humans, others that they were an evolutionary dead end.

However, the revised idea of experts which is gaining importance is that we have increasing evidence for fully modern people – our own subspecies, *Homo sapiens* in Africa by at least 100,000 years ago. They seem to have reached the eastern Mediterranean about 100,000-90,000 years ago and Europe and Asia by at least 40,000 or 50,000 years ago.

The Paleolithic period lasted through most of the Pleistocene Ice Age. The Lower Paleolithic period is attributed with the earliest forms of man and the predominance of core tools of Pebble Tools, hand axe and chopper type. During the Lower Paleolithic period in South Asia, the Soanian is discovered as an archaeological culture of the Lower Paleolithic period in the Sivalik Hills, in Punjab province of Pakistan which is contemporary to the Acheulean. It is named after the Soan valley. The Soanian sites are found along the Sivalik region in present-day India, Nepal and Pakistan. The Middle Paleolithic is an era of

Neanderthal man and the predominance of Flake tool industries over most of Eurasia. The Upper Paleolithic period is characterized by Blade-and-Burin industries and the cave art of Western Europe. In Asia, for instance, the Zhoukoudian Peking Man site is a cave system in Beijing, China which has yielded a number of archaeological discoveries during one of the first specimens of *Homo erectus* and other remains.

He proposed dates for Peking Man are: 700,000-200,000 years ago, 670,000-470,000 years ago and no earlier than 530,000 years ago. The oldest animal remains date from as early as 690,000 years ago and tools from 670,000 years ago. During the Upper Paleolithic period, the site was re-occupied and remains of *Homo sapiens* and its stone and bone tools have also been recovered from the Upper Cave. The ten Neanderthals at the site were found within a Mousterian layer which also contained hundreds of stone tools including points, side-scrapers, and flakes and bones from animals including wild goats.

It is uncertain when humans first crossed from northeastern Asia into North America across the Bering Strait, and south to Central and South America. However, the earliest dates for early Americans are around 14,000 years ago. However, recently discovery of Brazilian rock shelter site of Pedra Furada has produce disputed evidence for human occupation some 30,000 years ago. Around 10,000 BCE most of the land areas of different continents in the world were populated with the exception of deserts and Antarctica.

However, the most conspicuous exception is the Pacific where Western Polynesia does not seem to have been colonized until the first millennium BCE and Eastern Polynesia progressively from 300 CE. By 1000 CE, the colonization of Polynesia was however, completed. Almost these societies regarded as hunter-gatherer societies made up of relatively small groups of people often termed as

hunter-gatherer bands. The bands are small-scale societies of hunters and gatherers generally of less than 100 people.

However, in this context the most significant occurrences are the development of food production based on domesticated plant species and also of domesticated animal species as well. One of the important factors in the prehistory of continents of the world is that the transition from hunting and gathering to food production seems to have occurred independently in several areas, in each case after the end of the Ice Age about 10,000 years ago. For instance, in the Near East, we can recognize the origins of this transition even before this time, for the process may have been gradual, the consequence of restructuring of the social organization of human societies.

It is presumed that during the Paleolithic period (before 12,000 years ago) most of the archaeological sites appear to be conventional to one or other of these categories such as; camp sites, kill sites and work sites. As the *bands* are composed of mobile groups of hunter-gatherers, their sites consist mainly of seasonally occupied camps and other smaller and more specialized sites. Among the latter are kill or butchery sites, locations where large mammals were killed and sometimes butchered, and the work sites where tools were made or other specific activities were carried out.

It is apparent that the shift from one age to another did not happen rapidly. For instance the Flint tools remained in use in a limited scale into the Iron Age in Europe and early metal items often appear which should technically be called as the Neolithic Period. Further the Three-age System has been difficult to apply fully outside Europe. For instance some Amazonian tribes in South America remain to date in the Neolithic while there was no Bronze Age south of the Sahara as technological innovation progressed from stone to iron working. Therefore by using the Three-age System to measure the advancement of societies is often

inaccurate, as some development have appeared in different societies at massively different stages of their development.

Similarly, Classic Period Maya society had mathematics and astronomy that rivaled early renaissance Europe but were still technically a Stone Age culture. The Japanese culture posses pottery as early as 10,000 BCE but they did not begin bronze work or agriculture farming until 1000 to 500 BCE.

The archaeological discoveries carried out at a number of countries of the continents have also proved the existence of different periods which are overlapping in age. In the continent of Asia, Paleolithic period is comprised on Lower, Middle and Upper Paleolithic. However, In Africa, the Paleolithic period is divided into Pre-Paleolithic or before stone tools, as well as Lower Paleolithic, Middle Paleolithic and Upper Paleolithic period. In the continent of Americas, the prehistoric period is defined as Lithic / Paleoindian or the period before 8000 BCE, the Archaic period or 8000-1000 BCE, The Formative period or 1000 BCE-500 CE, the Classic period or 500-1200 CE and the Post-Classic or 1200-1900 CE. In Oceania, the Paleolithic is followed by Classical period, while in the continent of Europe; Paleolithic period is very much evidenced by Lower, Middle and Upper Paleolithic period.

2.1.2 The Stone Age in the Light of Socio-Cultural Context

The Paleolithic period humans were grouped in clans that ranged from 25-50 members, and these clans were formed by several families. It is revealed that about two million years before present, *Homo habilis* constructed the first man-made structure in East Africa which consists on simple arrangements of stone to hold branches of trees. A simple stone circular arrangement of Ca. 500, 000 years ago was discovered at Terra Amata, near Nice in France. Another tent like structure was also found inside a cave near Nice France. Besides, many huts made of

mammoth bones were found in Eastern Europe and Siberia. Some of these examples have been discovered in valley of Ukraine, in Czech Republic and in southern Poland as well. The Megalithic tombs, multi-chambered and dolmens, single-chambered were graves with a huge stone slab stacked over other similarly large stone slabs. These types of graves have been discovered all across Europe and Asian.

The food sources of the hunter-gatherer humans of the Stone Age included both animals and plant which were part of the natural environment in which these humans lived. The people like animal organs meats and consumed little dairy food or carbohydrate rich plant foods like legumes or cereal grains, a large part of the energy was however, derived from animal foods. The fat content of the diet was believed to be similar to that of the present day. By the end of the last ice age, Ca. 15,000-9000 years ago, a large scale extinction of large mammals occurred in Asia, Europe, North America and Australia. This was the first Holocene extinction event which possibly forced modification in the dietary habits of the humans of that age and with the emergence of agricultural practices plant-based foods also became a regular part of the diet.

In Paleolithic period, the representation of humans in cave paintings was rare. However, mostly animals were painted, not only animals that were used as food but also animals that represented strength like rhinoceros or large cats. Besides, signs like dots were also drawn, rare human representations include hand-prints and half-human / half-animal figures. The most important preserved cave paintings of the Paleolithic period painted in Ca. 31,000 BCE are in the Cave of Chauvet, France. Then the Altamira cave paintings in Spain were created in Ca. 14,000-12,000 BCE which presents among others bison. Besides, the hall of bulls in Lascaux, in France is one of the best known cave paintings which were created in about 15,000-10,000 BCE. The depiction of arrow-like symbols in Lascaux are sometimes interpreted as calendar or almanac use. As these caves were not in an

inhabited area therefore it may have been used for seasonal rituals. In Pakistan, the Stone Age, rock art which belongs to about 30,000-12,000 years ago has been discovered in area of northern Balochistan. This type of art associated chiefly with the cave and rock-shelter dwellers, in Western Europe in Upper Paleolithic times.

The first kind of such cave paintings were however, found at Altamira in Spain. These types of rock art paintings especially in Sulaiman range have also been found in the Dordogne, Lascaux of France. The artists of Stone Age used both techniques of paintings and engraving as in other parts of the world. The subject matter of these rock art is predominantly animals, like horses, leopards, wild boar, ibexes, and wild humped bulls with some very domesticated looking ox which were hunted during the late Pleistocene or Upper Paleolithic period. In the majority of rock shelters, the paintings and engravings show progress and it seems that the region was occupied by the people of Gravettian Culture (22,000-18,000 BCE) as the rock art underwent rapid progress and has reached a certain climax here as it did in the same period in Europe by the people of the same culture. However, the most important work during the Mesolithic era were the marching Warriors, a rock painting at Cingle de la Mola, in Spain dated Ca. 7000-4000 BCE. The technique used was probably spitting or blowing the pigments onto the rock, the paintings are naturalistic, though stylized.

It is believed that in Stone Age certain ritual and beliefs of the people were also existed as the activities of the humans went beyond the immediate requirements of procuring food, body covering and home shelters. During this period specific rites relating to death and burial were practiced, though certainly differing in style and execution between cultures. The other ritual was birth; puberty and marriage whereas several Stone Age dated sites in different parts of the world indicate traces of dancing.

The economy of the society in Paleolithic period was simple; with humans living a hunter-gatherer life style. The people obtain food, firewood and material for the purpose of their tools, clothes or shelters. As regard their tools, the methods of fabrication for tools did not change a great deal during the Paleolithic period, despite the number of cultures that existed through the era.

The Neolithic or New Stone Age is traditionally the last part of the Stone Age. It begins with the rise of farming which produced the “Neolithic Revolution” and ending when metal tools became widespread in the Copper Age (Chalcolithic) or Bronze Age or developing directly into the Iron Age, depending on geological region. The Neolithic culture appeared in the Levant, Palestine about 8500 BCE. It was developed directly from the Epi-paleolithic Natufian culture in the region that was pioneered in wild cereal use. By 8500-8000 BCE farming communities arose in the Levant and spread to Anatolia, North Africa and North Mesopotamia.

In about 7000 BCE it included domesticated cattle and pigs, inhabited settlements and the use of pottery. In other parts of the world such as Africa, South Asia and Southeast Asia, independent domestication events led to their own regionally distinctive Neolithic cultures. These cultures characterized by separate distinct cultures in Asia such as; Halafian culture, Hassuna culture, Mehrgarh culture, Ubaid culture and Uruk culture. In Southeast Europe, agrarian societies first appeared by Ca. 7000 and in Central Europe by Ca. 5500 BCE. Later on, the Neolithic traditions spread west and northwards to reach northwestern Europe by around 4500 BCE.

However, in Mesoamerica a similar set of events like crop domestication and sedentary lifestyles occurred for around 4500 BCE. The Neolithic people were skilled farmers, manufacturing a range of tools necessary for the tending, harvesting and processing of crops and food production. They were also skilled manufactures of a range of other types of stone tools and ornaments including

projectile point beads and statuettes. The people in the Levant, Anatolia, Syria, northern Mesopotamia and Central Asia were also accomplished builders, utilizing mud-brick to construct houses and villages. In Europe long houses built from wattle and daub were constructed. They built elaborated tombs for the dead. A large number of such tombs are discovered in Ireland. In the British Isles built long barrows and chamber tombs for the dead, flint mines and cursive monuments.

The people of the Americas and the Pacific retained the Neolithic level of tool technology up until the time of the European contact. However, there are numerous examples of the development of complex socio-political organization, building technology, scientific knowledge and linguistic culture in these regions that parallel post-Neolithic development in Africa and Eurasia. Mehrgarh is one of the earliest sites with evidence of farming of wheat and barley and herding of cattle, sheep and goats in South Asia.

The early Mehrgarh, Balochistan residents lived in mud brick houses, stored their grain in granaries, fashioned tools with local copper ore and lined their large basket container with bitumen. At Mehrgarh site, numerous burials have been found many with elaborate goods such as baskets, stone and bone tools, beads, bangles, pendants etc. The ornaments of sea shell, limestone, turquoise, lapis lazuli, sandstone and polished copper have also been discovered with simple figurines of women and animals. The sea shells from far sea shore and lapis lazuli found far in Badakshan, Afghanistan shows good contact with those areas.

2.2 The Evolution of Man

The word *homo*, the name of the biological genus to which humans belongs is Latin word for "human". It was chosen originally by Carl Linnaeus in his classification system. The word "human" is from the Latin *humanus*, the adjectival form of *homo*. In the early part of the 19th century witnessed a

profound change in our approach to the history of evolution of mankind and the fact that ancient civilizations were the creation of our ancestors. It was in this century as a result of scientific investigations and awareness of prehistory that evidence for the long descent of man came from the discovery of flint tools mostly hand –axes associated with other material and remains of Extinct mammals. Charles Darwin, placed man in his book entitled as “Decent of Man” in the evolutionary process suggested that man had apelike ancestors and claimed that Africa would prove to be the cradle of mankind. Since then stone tools made in different periods were found at different parts and sites of the world which were recognized as being the works of man before the use of metal. These artifacts indeed belong to the period termed as “Paleolithic”.

Besides, these stone tools prehistoric remains of man particularly human skulls and bones were found in the Neander valley, Germany and at Cro-Magnon near Les Eyzies, Java, China and in Africa as well. The scientific investigations describe to a small apelike creature known as “Ramapithecus” as the common ancestor of all the fossil species of mankind and ourselves. The “Ramapithecus” jaws and teeth have been found at various sites from China to Kenya with the largest collection found in Pakistan as well.

The evolution of man is the evolutionary process that led to the emergence of anatomically modern humans, beginning with the evolutionary history of primates—in particular genus Homo—and leading to the emergence of Homo sapiens as a distinct species of the hominid family, which includes the great apes. This process involved the gradual development of traits. The study of human evolution involves several scientific disciplines, including physical anthropology, archaeology, paleontology, ethnology, linguistic evolutionally psychology, genetics. Genetic studies show that primates diverged from other mammals about 85 million years ago, in the Late Cretaceous period, and the

earliest fossils appear in the Paleocene, , around 55 million years ago. Within the super family Hominoidea, the family Hominidae diverged from the family Hylobatidae some 15–20 million years ago; subfamily Homininae (African apes) diverged from Ponginae (orangutans) about 14 million years ago; the tribe Hominini (including humans, *Australopithecus*, and chimpanzees) parted from the tribe Gorillini (gorillas) between 8–9 million years ago; and, in turn, the sub-tribes Hominina (humans and extinct biped ancestors) and Panina (chimpanzees) separated 4–7 million years ago.

The possibility of linking humans with earlier apes by descent became clear only after 1859 with the publication of Charles Darwin's *On the Origin of Species*, in which he argued for the idea of the evolution of new species from earlier ones. Darwin's book did not address the question of human evolution, saying only that "Light will be thrown on the origin of man and his history."The first debates about the nature of human evolution arose between Thomas Henry Huxley and Richard Owen. Huxley argued for human evolution from apes by illustrating many of the similarities and differences between humans and apes, and did so particularly in his 1863 book *Evidence as to Man's Place in Nature*. Many of Darwin's early supporters did not initially agree that the origin of the mental capacities and the moral sensibilities of humans could be explained by natural selection, though this later changed. Darwin's theory of evolution is based on key facts that:-

- Every species is fertile enough that if all offspring survived to reproduce, the population would grow.
- Despite periodic fluctuations, populations remain roughly the same size.
- Resources such as food are limited and are relatively stable over time
- Individuals in a population vary significantly from one another

- Much of this variation is heritable
- Individuals less suited to the environment are less likely to survive and less likely to reproduce; individuals more suited to the environment are more likely to survive and more likely to reproduce and leave their heritable traits to future generations, which produces the process of natural selection
- This slowly effected process results in populations changing to adapt to their environments, and ultimately, these variations accumulate over time to form new species

In later editions of the book, Darwin traced evolutionary ideas as far back as Aristotle. The text he cites is a summary by Aristotle of the ideas of the earlier Greek philosopher Empedocles. Darwin continued to research and extensively revises his theory while focusing on his main work of publishing the scientific results of the *Beagle* voyage. He tentatively wrote of his ideas to Lyell in January 1842, and then in June he roughed out a 35-page "Pencil Sketch" of his theory.

First fossils

A major problem in the 19th century was the lack of fossil intermediaries. Neanderthal remains were discovered in a limestone quarry in 1856, three years before the publication of *On the Origin of Species*, and Neanderthal fossils had been discovered in Gibraltar even earlier, but it was originally claimed that these were human remains of a creature suffering some kind of illness. Despite the 1891 discovery by Eugene Dubois of what is now called *Homo erectus* at Java, it was only in the 1920s when such fossils were discovered in Africa, that intermediate species began to accumulate. In 1925, Raymond Dart described *Australopithecus africanus*. The type specimen was the Taung Child, an australopithecine infant which was discovered in a cave. The child's remains were a remarkably well-preserved tiny skull and an endocast of the brain.

The East African fossils

During the 1960s and 1970s, hundreds of fossils were found in East Africa in the regions of the Olduvai Gorge and Lake Turkana. These searches were carried out by the Leakey family, with Louis Leakey. From the fossil beds of Olduvai and Lake Turkana they amassed specimens of the early hominins: the australopithecines and *Homo* species, and even *Homo erectus*.

These finds cemented Africa as the cradle of humankind. In the late 1970s and the 1980s, Ethiopia emerged as the new hot spot of paleoanthropology after “Lucy”, the most complete fossil member of the species *Australopithecus afarensis*, was found in 1974 by Donald Johanson near Hadar in the desertic Afar Triangle region of northern Ethiopia. Although the specimen had a small brain, the pelvis and leg bones were almost identical in function to those of modern humans, showing with certainty that these hominins had walked erect. Lucy was classified as a new species, *Australopithecus afarensis* which is thought to be more closely related to the genus *Homo* as a direct ancestor, or as a close relative of an unknown ancestor, than any other known hominid or hominin from this early time range. In 2013, fossil skeletons of *Homo naledi*, an extinct species of hominin assigned to the genus *Homo* were found near Johannesburg. In 2015, fossils of at least fifteen individuals, amounting to 1,550 specimens, have been excavated from the cave. The species is characterized by a body mass and stature similar to small-bodied human populations, a smaller endocranial volume similar to *Australopithecus*, and a cranial morphology (skull shape) similar to early *Homo* species. The individuals show signs of having been deliberately disposed of within the cave near the time of death. The fossils were dated close to 250,000 years ago and thus are not a direct ancestor but a contemporary with the first appearance of larger-brained anatomically modern humans.

The genetic revolution

The genetic revolution in studies of human evolution started when Vincent Sarich and Allan Wilson measured the strength of immunological cross-reactions of blood serum albumin between pairs of creatures, including humans and African apes (chimpanzees and gorillas). The strength of the reaction could be expressed numerically as an immunological distance, which was in turn proportional to the number of amino acid differences between homologous proteins in different species. In 1967 both experts estimated the divergence time of humans and apes as four to five million years ago, at a time when standard interpretations of the fossil record gave this divergence as at least 10 to as much as 30 million years. Subsequent fossil discoveries, notably "Lucy", and reinterpretation of older fossil materials, notably *Ramapithecus*, showed the younger estimates to be correct and validated the albumin method.

On the basis of a separation from the orangutan between 10 and 20 million years ago, earlier studies of the molecular clock suggested that there were about 76 mutations per generation that were not inherited by human children from their parents; this evidence supported the divergence time between hominins and chimpanzees noted above. However, a 2012 study in Iceland of 78 children and their parents suggests a mutation rate of only 36 mutations per generation; this datum extends the separation between humans and chimpanzees to an earlier period greater than 7 million years ago (Ma). Additional research with 226 offspring of wild chimpanzee populations in eight locations suggests that chimpanzees reproduce at age 26.5 years on average; which suggests the human divergence from chimpanzees occurred between 7 and 13 million years ago. And these data suggest that *Ardipithecus* (4.5 Ma), *Orrorin* (6 Ma) and *Sahelanthropus* (7 Ma) all may be on the hominid lineage, and even that the separation may have occurred outside the East African Rift region.

In the 1990s, several teams of paleoanthropologists were working throughout Africa looking for evidence of the earliest divergence of the hominin lineage from the great apes. In 1994, Meave Leakey discovered *Australopithecus anamensis*. The find was overshadowed by Tim D. White's 1995 discovery of *Ardipithecus ramidus*, which pushed back the fossil record to 4.2 million years ago. In 2000, Martin Pickford and Brigitte Senut discovered, in the Tugen Hills of Kenya, a 6-million-year-old bipedal hominin which they named *Orrorin tugenensis*, and in 2001, a team led by Michel Brunet discovered the skull of *Sahelanthropus tchadensis* which was dated as 7.2 million years ago, and which Brunet argued was a bipedal, and therefore a hominid—that is, a hominin.

By anatomically modern human populations continue to evolve, as they are affected by both natural selection and genetic drift. Although selection pressure on some traits, such as resistance to smallpox, has decreased in the modern age, humans are still undergoing natural selection for many other traits. Some of these are due to specific environmental pressures, while others are related to lifestyle changes since the development of agriculture (10,000 years ago), urbanization (5,000), and industrialization (250 years ago).

It has been argued that human evolution has accelerated since the development of agriculture 10,000 years ago and civilization some 5,000 years ago, resulting, it is claimed, in substantial genetic differences between different current human populations and more recent research indicates that for some traits, the developments and innovations of human culture have driven a new form of selection that coexists with, and in some cases has largely replaced, natural selection. The recent human evolution however, is related to agriculture includes genetic resistance to infectious disease that has appeared in human populations by crossing the species barrier from domesticated animals, as well as changes in metabolism due to changes in diet, such as lactase persistence.

The evolution of man in Pakistan

Apart from the physical environment of Pakistan's territory, the land comprising on present Pakistan is heir to at least two million years old going back to the Old Stone Age. The earliest stone tools found in the Potohar region of Pakistan belong to an ancient primitive stage in human development and culture. The Stone Age (Old Stone Age, Middle Stone Age and New Stone Age), as the name suggests, is the period of prehistory in which the technology of implement were primarily based on stone. Economically the Palaeolithic and Mesolithic periods represents the hunting and gathering stage in human history, while the Neolithic represents the stage of food production i.e. plant cultivation and animal husbandry.

The oldest known tools, comprising of cores and flakes have been found from the Siwalik hills of Potohar region at Rewat is of a distinctive local Chellean Culture is of great interest, as it links Potohar region of Pakistan with a vast complex of such early centers of human activity, stretching from France and Spain through the Mediterranean, also south and east Africa, Palestine and Syria, across to Pakistan and then on as far as north –eastern China.

The next stage in stone age technology is known as the Acheulean Culture, broadly speaking, commenced around 400, 000 BCE. The Middle Paleolithic Period began around 100,000 BCE. The Acheulian Culture represents an evolution from the previous one (Chellean) towards more elegant and refined technique in preparation of stone implements. In Pakistan the stone implements of this culture were found by Dr. Noethling (1899) at Kout-Modahi, and Dr. Abdur Rauf Khan (1980) at Bela in Balochistan. The human life at this stage was, of course, highly primitive. Man hardly differed in outward appearance from the brute creation. The people in the Old Stone Age lived in small groups, without any fixed abode, subsisting on hunting and gathering wild fruits, nuts etc. The edible roots were grubbed out with crude stone tools. As known from various

localities of the world, that towards the end of the Acheulean Culture, fire came into general use, and people of the Old Stone Age began to clothe themselves with animal furs (pelts).

The next phase in human life in Pakistan is the upper Paleolithic period, extending from approximately 40,000 to 12,000 BCE. Though hunting and gathering fruits and other edibles remained the chief forms of upper Paleolithic man's economic activity, he also learnt how to fish and finally may even have begun to tame dogs and other beasts. Where no natural caves or shelters were to be found, he made tents out of skine and even elaborate semi-underground dwellings. Unfortunately, no stone implements of this period has so far been discovered or found in Pakistan. However, caves and rock shelter paintings and engravings made by upper Paleolithic and Mesolithic period's people are found in the SulemanRange and Zhob Valley of Balochistan, which shows the dawn of human ingenuity. The people of upper Paleolithic period were free to explore avenues of feeling and self expression which foreshadowed unmistakably the achievements of civilized man. It is indeed no coincidence that the original centers of food production and urban civilization in the mature Bronze Age grew up precisely within the territories of these upper Paleolithic people. However, much remains to be done before the study of Stone Age man heritage in Pakistan can be regarded as complete. But, we have enough evidence to establish Pakistan's right to rank as one of the cradles of human civilization and evolution of man in prehistoric period.

The great step forward, which enabled man to break through the barrier between barbarism and civilization, occurred with the onset of the Neolithic or New Stone Age. The mode of life and general outlook of the folk of the New Stone Age was radically different from that of their Paleolithic and Mesolithic forebears. The stone-using agricultural communities "Neolithic" were established in Balochistan plateau, in Pakistan by 8th millennium at Mehrgarh, Balochistan and then spread

to the fertile Indus valley. In this Neolithic period five new practices played a vital part:

1. Settled Agriculture.
2. Domestication of Animal.
3. Manufacture of pottery.
4. Tool-making by grinding and polishing technique.
5. Sewing, weaving and textile manufacture.

Naturally the fully-fledged Neolithic cultures of Pakistan did not spring in to existence in a few brief generations. They were the result of a process of evolution from the Mesolithic stage, lasting in the region from about 8th millennium which lastly culminated and appeared around 2500 BCE as Indus Civilization in the greater Indus valley.

2.3 Stone Tools and their Types

2.3.1 The Origin of Making the Stone Tools by Man

It is generally believed that about two million years ago when our earth marched into Ice Age, called by geologists “Pleistocene Period”-A biped animal standing erect on his two legs, with a bigger brain and eyes looking straight in front appeared. He is the Man, the tool maker, the weakest creature on the earth but strongest with the help of his tools. He is; the thinker with the memory, the talker with legible sounds, and the fire maker. Further, he is now the great hunter of animals alone or in groups, the conqueror of the nature, ready to create his own world out of this fantasy win facilities from nature to build his own environment for a better living. His early tools; made of flint or quartzite by chipping the edges either on one side and hence named as chopper tool or on both sides and hence called chopping tool or turned into long tool, easy to hold with hand and hence are called as hand-axe. Such rough tools maker belonged to the early Stone Age.

With the passage of time, man braved the cold and warm climatic fluctuation of the ice age by moving away from the open into rock shelters and caves and thus became cave dweller. He shared his hunt with his fellows, learnt to scrape the skin from the flesh of the animal by using improving tools, the stone split into cutting cores and scraping flakes. The re-touched edges of the cores now of medium or small size, sometimes, tied with handle, were good for digging, throwing or cutting. The flakes with sharpened edges were good for scraping. Man advanced to make varieties of cutting tools, or scraping or piercing flakes. Man began to live in caves, sometime painted on the cave walls or engraved some figures. Sometimes he left behind his fellow in eternal sleep but with food and other objects belonging to him. Thus, he became aware of Death. This was the middle Stone Age period.

Nearly ten thousand years ago, Ice Age came to an end and recent climatic conditions ushered in. With this change, the old stout animals perished and fast running animals such as; deer, appeared to feed on the tall grasses now growing over the pastoral land. Man could hardly chase such animals. He now invented bow, reduced his flake tools to small size, called microlith, tied them to the end of a long handle and made the first arrow. Man was reborn as an archer, saved himself from cold by using animal skin. His tools were made of variety of fine-grained stones, such as quartz, flint, and bones. He ate the hunted animals as well as the grass of his own taste on which animals fed. Man thus began to like the taste of corn and moved with animals as nomad in search of pasture land. This was the Mesolithic Age.

Some ten thousand years ago, Man recognized the roots of corn around his caves, which he brought from pasture lands. For cutting them, he fixed a series of flakes on the inner side of a curved stick and invented the saw. By using it, he discovered a fine polish on the flake-blade and thus learnt the technique of polishing and

sharpening. Some corns and seed fell down on loss soil and he found more corns in the next season. Thus, he discovered the art of producing more corns. He became food producer, a farmer. For farming he had to live in one place for some months and thus men developed farm-huts which grew into farm villages. Village social life began. The leftovers, dustbins and rotten food attracted animals which hovered around his fields and houses. Thus both man and animals lived together in a new world. Such was the beginning of agriculture known as “Neolithic Revolution”.

The New Stone Age was a time period roughly from 9000 BCE named because it was the last period of the age before woodworking began. The tools available were made from natural materials including bone, antler, hide, stone, wood, grasses, animal fibers and the use of water. After food man needed shelter to rest and to sleep. He collected tree branches, leaves and husk and made huts to live. He tried to cover them with clay for heat in winter and cool in summer. He learnt to put blocks of clay one upon another and succeeded in building a wall. The blocks of clay when shaped regularly turned to be bricks. It is these bricks either of raw clay or baked which he used for building. One house two houses or more came into make up a cluster of houses and there stood the whole village of houses of different shapes and for different purposes. From reed butts to houses of bricks, Man became the master builder.

Making and the use of stone tools has been interpreted by the researchers as a sign of intelligence, and it has further been estimated that tool use have stimulated certain aspects of human evolution, especially the continued expansion of the human brain. The brain of a modern human consumes about 13 watts (260 kilocalories per day), a fifth of the body's resting power consumption. The increased tool use would allow hunting for energy-rich meat products, and would enable processing more energy-rich plant products. Researchers have suggested

that early hominines were thus under evolutionary pressure to increase their capacity to create and use tools. However, when early humans started to use tools is difficult to determine, because the more primitive these tools are (for example, sharp-edged stones) the more difficult it is to decide whether they are natural objects or human artifacts. There is some evidence that the australopithecines (4 Ma) may have used broken bones as tools. Many species make and use tools, but it is the human genus that dominates the areas of making and using more complex tools.

The oldest known tools are flakes from West Turkana, Kenya, which date to 3.3 million years ago. The next oldest stone tools are from Ethiopia and are considered the beginning of the Oldowan technology. These tools date to about 2.6 million years ago. A *Homo* fossil was found near some Oldowan tools, and its age was noted at 2.3 million years old, suggesting that maybe the *Homo* species did indeed create and use these tools. The third metacarpal styloid process enables the hand bone to lock into the wrist bones, allowing for greater amounts of pressure to be applied to the wrist and hand from a grasping thumb and fingers. It allows humans the dexterity and strength to make and use complex tools. This unique anatomical feature separates humans from apes and other nonhuman primates, and is not seen in human fossils older than 1.8 million years.

According to Bernard Wood *Paranthropus* co-existed with the early *Homo* species in the area of the "Oldowan Industrial Complex" over roughly the same span of time. Although there is no direct evidence which identifies *Paranthropus* as the tool makers, their anatomy lends to indirect evidence of their capabilities in this area. Most paleoanthropologists agree that the early *Homo* species were indeed responsible for most of the Oldowan tools found. They argue that when most of the Oldowan tools were found in association with human fossils, *Homo* was always present, but *Paranthropus* was not.

In 1994, Randall Susman used the anatomy of opposable thumbs as the basis for his argument that both the *Homo* and *Paranthropus* species were toolmakers. He compared bones and muscles of human and chimpanzee thumbs, finding that humans have three muscles which are lacking in chimpanzees. Humans also have thicker metacarpals with broader heads, allowing more precise grasping than the chimpanzee hand can perform. Susman posited that modern anatomy of the human opposable thumb is an evolutionary response to the requirements associated with making and handling tools and that both species were indeed toolmakers.

The stone tools are first attested when hominins in Eastern Africa used so-called core tools choppers made out of round cores that had been split by simple strikes. This marks the beginning of the Paleolithic or Old Stone Age; its end is taken to be the end of the last Ice Age, around 10,000 years ago. The Paleolithic is subdivided into the Lower Paleolithic (Early Stone Age), ending around 350,000–300,000 years ago, the Middle Paleolithic (Middle Stone Age), until 50,000–30,000 years ago, and the upper Paleolithic (Late Stone Age), 50,000–10,000 years ago. The archaeologists working in the Great Rift Valley in Kenya have discovered the oldest known stone tools in the world. Dated to around 3.3 million years ago, the implements are some 700,000 years older than stone tools from Ethiopia that previously held this distinction.

The period from 700,000–300,000 years ago is also known as the Acheulean, when *H. ergaster* (or *erectus*) made large stone hand axes out of flint and quartzite, at first rough (Early Acheulian), later “retouched” by additional, more-subtle strikes at the sides of the flakes. The rough and rugged implements unearthed by the eroding current of the river Soan near Rawalpindi carry the saga of human toil and labour to the interglacial ages, roughly estimated at 500,000 years from now.

After 350,000 BP the more refined so-called levallois technique was developed, a series of consecutive strikes, by which scrapers, slicers ("racloirs"), needles, and flattened needles were made. Finally, after about 50,000 BP, ever more refined and specialized flint tools were made by the Neanderthals and the immigrant Cro-Magnons (knives, blades, skimmers). Bone tools were also made by *H. sapiens* in Africa by 90–70,000 years ago and are also known from early *H. sapiens* sites in Eurasia by about 50,000 years ago.

It is estimated that about 50,000 B.P, the modern human culture started to evolve more rapidly. The transition to behavioral modernity has been characterized by some as a "Great Leap Forward", or as the "Upper Palaeolithic Revolution", due to the sudden appearance of distinctive signs of modern behavior and big game hunting in the archaeological record. The evidence of behavioral modernity significantly earlier also exists from Africa, with older evidence of abstract imagery, widened subsistence strategies, more sophisticated tools and weapons, and other "modern" behaviors, and many scholars have recently argued that the transition to modernity occurred sooner than previously believed. Some scholars consider the transition to have been more gradual, noting that some features had already appeared among archaic African *Homo sapiens* since 300–200,000 years ago.

The recent evidence suggests that the Australian Aboriginal population separated from the African population 75,000 years ago, and that they made a sea journey of up to 160 km 60,000 years ago, which may diminish the evidence of the Upper Paleolithic Revolution. The modern humans started burying their dead, using animal hides to make clothing, hunting with more sophisticated techniques (such as using trapping pits or driving animals off cliffs), and engaging in cave painting. As human culture advanced, different populations of humans introduced novelty to existing technologies: artifacts such as fish hooks, buttons,

and bone needles show signs of variation among different populations of humans, something that had not been seen in human cultures prior to 50,000 BP.

2.3 2 Typology, Formation and Techniques of Stone Tools

The stone tools were made by removing material from a pebble or core until the desired shape of the core has been attained. The first flakes struck off bear traces of the outer surface. Trimming flakes are then struck off to achieve the final shape and certain edges may then be retouched by further removal of tiny secondary flakes. Although the core is the main implement thus produced the flakes themselves may well be used as knives, scrapers etc. The tool maker's work will have varied in accordance with the type and amount of raw material available. The history of stone tool technology shows a sporadically increasing degree of refinement. The first recognizable tools are simple choppers and flakes made by knocking pieces off pebble to obtain sharp edges. The best known examples are the so called Oldowan tools from Olduvai Gorge, Tanzania. After hundreds of thousands of years, people progressed to flaking both surfaces of the tool eventually producing the symmetrical Acheulian hand-axe shape, with its finally worked sharp edges. The next improvement around 100,000 years ago came with the introduction of the "Levallois technique" named after a site in Paris where it was first identified.

Around 35,000 years ago with the Upper Paleolithic period blade technology became dominant in some parts of the world. Long parallel sided blades were systematically removed with a punch and hammer stone from a cylindrical core. This was a great advance not only because it produced large numbers of blanks that could be further trimmed and retouched into a wide range of specialized tools, but also because it was far less wasteful of the raw material.

The pre-historians often adopt function to identify tool types; for instance handaxe is named after an axe held by hand, chopper-chopping tool after chopping-cutting and scraper for scraping wood or bone. Similarly the form or shape of a stone tool can be judged by its appearance such as; circular, triangular, irregular, oval or named after fruits e.g. pear shaped, almond shaped or date-shaped etc. Then there is another attribute; the technique, which can separate different types of artefacts and tools, for example flakes could be Clactonian, Levallois or non-Levallois, with faceted or prepared striking platforms, with deep or shallow flakes scars indicating hard-soft hammer. It could be direct percussion one or two-way directional flaking and short or wide flake removal.

- 1. Flint:** Flint is most commonly used materials for the manufacture of stone tools during the Stone Age. It splits into thin sharp splinters called flakes or blades when struck by another hard object such as a hammer stone made of another material. This process is referred to as knapping. Flint was widely used historically to make stone tools and start fires. It occurs chiefly as nodules and masses in sedimentary rocks, such as chalks and lime stones. Inside the nodule, flint is usually dark grey, black, green, white or brown in colour and often has a glassy or waxy appearance. A thin layer on the outside of the nodules is usually different in colour, typically white and rough in texture. The nodules can often be found along streams and beaches. Flint breaks and chips into sharp-edged pieces, making it useful for knife blades and other cutting tools. The use of flint to make stone tools dates back millions of years, and flint's extreme durability has made it possible to accurately date its use over this time. Flint is one of the primary materials used to define the Stone Age. During the Stone Age, access to flint was so important for survival that people would travel or trade to obtain flint.

2. **Handaxe:** It is a standard Lower Paleolithic tool, flaked on both sides with or without regular cutting edge, either made on a core or a flake. It is a prehistoric stone tool with two faces that is the longest-used tool in human history. It is usually made from flint or chert. It is characteristic of the lower Acheulean and middle Palaeolithic (Mousterian) periods. Its technical name (biface) comes from the fact that the archetypical model is generally bifacial Lithic flake and almond-shaped (amygdaloidal). Handaxes tend to be symmetrical along their longitudinal axis and formed by pressure or percussion. The most common hand axes have a pointed end and rounded base, which gives them their characteristic shape, and both faces have been knapped to remove the natural cortex, at least partially. Hand axes are a type of the somewhat wider biface group of two-faced tools or weapons. Hand axe tools were possibly used to butcher animals; to dig for tubers, animals and water; to chop wood and remove tree bark; to throw at prey; and as a source for flake tools.

There are different forms such as;

- i. Pear shape; in this shape, the butt is convex with broad side above it. The width below tip is lesser than the middle portion.
 - ii. Dumbbell shape; where a handaxe has convex edges but both ends are U-shaped
 - iii. Oval shape; the oval shape is rather long with or without regular edges
 - iv. Oval concave; it forms the combination of both oval shape as a whole and concavities to its side edges somewhat resembling as string bean.
3. **Cleaver:** It is another characteristic tool form of Paleolithic period which is widely spread in South Asia and Africa. A cleaver is a large knife that

varies in its shape but usually resembles a rectangular-bladed hatchet. It is largely used for hacking through bone.

It has usually following main forms:

- i. Convex shape; it gives resemblance to chopper but here it is made on a thick flake with cutting edge opposite to prominent bulb of percussion.
 - ii. V shape; it is usually made on large flakes by trimming sides to obtain cutting edge which may be straight or convex by retouch.
 - iii. U shape; the cutting edge may be opposite to the bulb of percussion or on its sides.
4. **Pick:** It is classified under a separate type because of its pointed character. It is neither a hand-axe nor a cleaver. It has a wide convex base often with cortex and the pointed end opposite it. The end could be sharp, slightly smooth or convex. The end usually shows retouch or signs of use.
5. **Chopper:** This is referred to a pebble tool classification. It is a core tool made on a pebble with cortex on butt end, which could be convex or u-shaped depending upon the shape of a pebble. The butt could be thick or thin. The cutting edge is produced by flaking one end of a pebble on one side only. Choppers are crude forms of stone tool and are found in industries as early as the Lower Palaeolithic from around 2.5 million years ago. These earliest known specimens were found in the Olduvai Gorge in Tanzania by Louis Leakey in the 1930s. The name Oldowan was given to the tools after the site in which they were excavated. These types of tools were used an estimated time range of 2.5 to 1.2 million years ago.
6. **Chopping tool:** This is another variety but more developed than the chopper. It is made on a pebble as a core tool with convex cortex base held by hand and convex cutting edge opposite it.

7. **Scraper:** Scrapers are mostly made on flakes. The retouch varies from wide to small with shallow or deep scars. A hand scraper is a single-edged tool used to scrap a surface.
8. **Borer:** They are smaller and less heavy than the Pick type. Borers are made on a flake or on a thin core with flat bottom and dome-shaped upper surface.
9. **Core:** A core is a stone from which flakes have been detached so that the flakes can be made into tools. It is developed out of the parent rock or pebble which provides basis raw material. The intension of the tool maker is to break it into pieces, so that either core or broken pieces with sharp edges which could be used as tools. Core may be of any convenient size from a small to a large pebble either round, flat or oval in shape, with cortex area on un-flaked surface. Core tools date at least to the beginning of the Oldowan tool industry and are the earliest stone tools known to have been deliberately fashioned by humans. Core tools include choppers, cleavers, and hand axes.
10. **Levallois Core:** A core is a stone from which flakes have been detached so that the flakes can be made into tools. The name Levallois is derived from the Paleolithic site of Levallois Perret Paris reported in the 19th century. The intention of tool maker is usually to flake a core in such a way that it represent a turtle-back form where only one flake is detached. A core is in fact a stone from which flakes are detached so that the flakes can be made into tools. This one was made with a special technique called Levallois core preparation that was widely used during the Middle Paleolithic Period. The Middle Paleolithic saw the rise of more complex stone tool technologies and more variability in tool types compared to the Lower Paleolithic. This change is associated with the increasing complexity of Hominin behavior —such as specialized hunting, and the

use of symbols— eventually resulting in anatomically and behaviorally modern humans. Levallois cores were made by removing flakes in a specific way, such as centripetally around an edge, so that the last flakes detached have a predetermined shape.

11. **Scrapers:** They usually form an important retouched tool kit associated with Acheulian collection. Most of the scrapers are made on flakes and are therefore lesser in weight.
12. **Flakes:** The next common artefacts of Lower Paleolithic Age are flakes. It is piece or pieces from core. The main purpose of early man was to obtain a sharp edged artifact so that he could employ or use it to cut or process food. The raw meat is difficult to cut with bare hands as it becomes slippery, so a tool such as flake was needed by him. There could be one flake or several from the same core depending upon the size of pebble, raw material or an intention of the tool maker. It could be triangular, sub-circular, oval or irregular in shape with sharp edges on sides or distal end. Its thickness varies but such flakes are usually thick with prominent cone and bulb of percussion, and this character separates them from later Paleolithic Cultures.
13. **Blades:** It is observed that occasionally or by accident when tool maker was flaking river pebbles, long pieces of stone were detached, which can be called blades, because they resemble shaving blades and may be parallel sided. They are actually flakes but are classified separately, their length being twice their width or more. They retain cortex on dorsal surface with prominent bulbs of percussion indicating stone hammer technique. The signs of rolling may be preserved on their surfaces. They may have been utilized for various functions such as those performed by flakes.

2.3.3 Paleolithic Stone Tool Techniques:

This basic principle in the manufacture of stone tools is the removal of a flake or series of flakes from a stone matrix. It is characteristic of all stones that a blow struck near an edge of a block will detach a chip or flake. The flakes may be removed from blocks by various natural causes such as wave action, pressure in the earth and soil creep, but those produced intentionally by man exhibit definite characteristics. Their most important attribute is the bulb of percussion which appears on the lower surface of the flake just below the point where the blow was struck. The bulbs of percussion vary in size and shape depending on the force and direction of the blow, the nature of the stone and the nature of the object with which the blow was struck. The block from which a flake has been detached the core or nucleus bears the imprints of the bulb in the form of a bulbular cavity and also lateral ridges left by the removal of the flake. These ridges often form a definite pattern showing that a piece has unquestionably been the work of man. The flaking produced by natural causes is usually haphazard and fractures by frost or heat are characterized by a series of concentric rings as opposed to the ripple marks left by a man-made fracture.

The stone tools were chipped basically by two principle methods; percussion and pressure. The chipping by percussion may be done either by striking a block of flint with a hammer of stone, wood or bone held in the hand or by striking the block itself on the edge of a fixed stone; the latter method is called the anvil method. The pressure flaking consists of applying pressure by means of a pointed stick or bone near the edge of a flake or blade, to detach small flakes from both sides. This method was used mostly to put the finishing touches on tools or to produce desired shape. The following techniques were used for manufacturing of stone tools:-

- i. **Hamerstone- Artefact:**
One of the common and important techniques is this in which a hammerstone is directly hitting a pebble to flake it. This method is also called as direct percussion. Here a pebble to be flaked is held in one hand and a hammerstone in the other, either single or multiple blows are applied to detach flakes or sometimes artifacts may have been retouched.
- ii. **Hammerstone-Artefact-Anvil:**
The second method is the application of three objects involved to flake pebbles, heavy raw material, anvil and Bipolar scars.
- iii. **Non-Levallois Technique**
It is the commonest technique in collections of Lower Paleolithic, Middle Paleolithic and Mesolithic. It may require direct percussion or the application of above mentioned two techniques. Flaking is done regularly or at random removing one, two, three or several flakes some retaining cortex on dorsal surface. The flakes may be circular sub-circular, triangular or sub-triangular in shape some with prominent bulbs percussion.
- iv. **Levallois Technique:**
It is mainly characterized by production of flakes but in a different manner than the non-Levallois types. Core is prepared carefully with flake scars nearly from all directions leaving no cortex on dorsal surface. The prehistoric man had predetermined the shape of a flake in his mind before he started knapping stone he wanted a cortex free flake with sharp edges and a single blow detached the required piece.

2.4 Geological Time Scale

2.4.1 Early Brief History:

In ancient Greece, Aristotle (384–322 BCE) experimental that fossils of seashells in rocks resembled those found on beaches, so he inferred that the fossils in rocks were formed by organisms, and he reasoned that the positions of land and sea had changed over long periods of time. Then Leonardo da Vinci (1452–1519) mentions with Aristotle's interpretation that fossils represented the remains of ancient life. Later on in the 11th century Persian polymath Avicenna (Ibn Sina) and the 13th century Dominican bishop Albertus Magnus extended Aristotle's explanation into a theory of a petrifying fluid. Avicenna also first proposed one of the principles underlying geologic time scales, the Law of superposition of strata, while discussing the origins of mountains in *The Book of Healing* (1027). The Chinese [Shen](#) Kuo (1031–1095) also recognized the concept of “Deep Time”.

2.4.2 Primary Principles

In the late 17th century Nicholas Steno (1638–1686) pronounced the principles underlying geologic (geological) time scales. Steno argued that rock layers (or strata) were laid down in succession, and that each represents a "slice" of time. He also formulated the law of superposition, which states that any given stratum is probably older than those above it and younger than those below it. While Steno's principles were simple, applying them proved challenging. Steno's ideas also lead to other important concepts geologists use today, such as Relative Dating. As such over the course of the 18th century geologists realized that:

1. Sequences of strata often become eroded, distorted, tilted or even inverted after deposition
2. Strata laid down at the same time in different areas could have entirely different appearances

3. The strata of any given area represented only part of Earth's long history

The theories popular at this time proposed that all rocks had precipitated out of a single enormous flood. A major shift in thinking came when James Hutton presented his *Theory of the Earth; or, an Investigation of the Laws Observable in the Composition, Dissolution, and Restoration of Land Upon the Globe* in 1785. John McPhee however, asserts that "as things appear from the perspective of the 20th century, James Hutton in those readings became the founder of modern geology". Hutton proposed that the interior of Earth was hot, and that this heat was the engine which drove the creation of new rock, the land was eroded by air and water and deposited as layers in the sea, and heat then consolidated the sediment into stone, and uplifted it into new lands. This theory, known as "Plutonism" stood in contrast to the "Neptunist" flood-oriented theory.

Formulation

The first serious attempts to formulate a geologic time scale that could be applied anywhere on Earth were made in the late 18th century. The most influential of those early attempts divided the rocks of Earth's crust into four types: Primary, Secondary, Tertiary, and Quaternary. Each type of rock, according to the theory, formed during a specific period in Earth history. It was thus possible to speak of a "Tertiary Period" as well as of "Tertiary Rocks." Indeed, "Tertiary" remained in use as the name of a geological period well into the 20th century and "Quaternary" remains in formal use as the name of the current period.

The identification of strata by the fossils they contained, pioneered by William Smith, George Cuvier, Jean d'Omalius d'Halloy and Alexander Brongniart in the early 19th century, enabled geologists to divide Earth history more precisely. It also enabled them to correlate strata across national (or even continental) boundaries. If two strata (however distant in space or different in composition)

contained the same fossils, chances were good that they had been laid down at the same time. Detailed studies between 1820 and 1850 of the strata and fossils of Europe produced the sequence of geologic periods still used today. The geological time scale is therefore a result of hundreds of years of investigation and remains very much a work in progress.

The geologic time scale is an important tool used to represent the history of the Earth. It is a standard timeline used to describe the age of rocks and fossils, and the events that formed them. It spans Earth's entire history and is separated into four principle divisions; Precambrian, Paleozoic, Mesozoic, and Cenozoic Eras. A geological period is one of the several subdivisions of geologic time enabling cross-referencing of rocks and geologic events from place to place. These periods form elements of a hierarchy of divisions into which geologists have split the Earth's history. The Geologic time spans are divided into units and subunits, the largest of which are eons. The Eons and Eras are larger subdivisions than periods while periods divided into Epochs and Ages.

Eons

The eon is the broadest category of geological time. Earth's history is characterized by four eons; in order from oldest to youngest, these are the Hadean, Archean, Proterozoic, and Phanerozoic. Collectively, the Hadean, Archean, and Proterozoic are sometimes informally referred to as the "Precambrian." (The Cambrian period defines the beginning of the Phanerozoic eon; so, all rocks older than the Cambrian are Precambrian in age.)

We live during the Phanerozoic, which means "visible life." This is the interval of geological time characterized by abundant, complex fossilized remains. Being the youngest eon of time, it is also very well represented by rock at Earth's surface.

Because of these two factors, most paleontologists and geologists study fossils and rocks from the Phanerozoic eon.

The Hadean and Archean are difficult eons to study, however, because they are exposed in very limited places on Earth's surface. (Since they are the oldest eons, rocks that are Hadean and Archean in age are often buried far below younger rocks at Earth's surface.) Proterozoic rocks--which span nearly 2 billion years (42% of Earth's history)--are much more accessible, but, until recently, have received significantly less attention from paleontologists than rocks from the younger, fossil-rich Phanerozoic eon. That is slowly beginning to change, however, as more clues about the origins of complex life begin to be revealed from Proterozoic-aged rocks.

Eras

Eons of geological time are subdivided into eras, which are the second-longest units of geological time. The Phanerozoic eon is divided into three eras: the Paleozoic, Mesozoic, and Cenozoic. Most of our knowledge of the fossil record comes from the three eras of the Phanerozoic eon. The Paleozoic ("old life") era is characterized by trilobites, the first four-limbed vertebrates, and the origin of land plants. The Mesozoic ("middle life") era represents the "age of dinosaurs," though also is noteworthy for the first appearances of mammals and flowering plants. Finally, the Cenozoic ("new life") era is sometimes called the "age of mammals" and is the era during which we live today.

As chronological points of reference, it is worth memorizing the ages of the boundaries that separate the three eras of the Phanerozoic eon. Long before geologists knew these absolute age dates, they realized that the boundaries represent important events in the history of life: mass extinctions. For example, many fossils that are commonly found in the youngest Paleozoic rocks are not found in overlying Mesozoic rocks. Similarly, dinosaur fossils found in the

youngest Mesozoic rocks are never again found in the overlying Cenozoic rocks. Paleontologists and geologists used these mass extinction events to define these (and other) boundaries within the Phanerozoic portion of the geological time scale. It is therefore no coincidence that some of the major boundaries coincide with mass extinction events. The older Archean and Proterozoic eons are similarly divided into several eras. For example, the youngest era of the Proterozoic eon is called the Neoproterozoic.

Periods

Just as eons are subdivided into eras, eras are subdivided into units of time called periods. The most well known of all geological periods, is the Jurassic period of the Mesozoic era. The Paleozoic era is divided into six periods. From the oldest to the youngest, these are the Cambrian, Ordovician, Silurian, Devonian, Carboniferous, and Permian. In the United States, the Carboniferous is divided into two separate periods: the Mississippian and the Pennsylvanian.

Epochs and Ages

Periods of geological time are subdivided into epochs. In turn, epochs are divided into even narrower units of time called ages. For the sake of simplicity, only the epochs of the Paleogene, Neogene, and Quaternary periods are shown on the time scale at the top of this page. It is important to note, however, that all of the periods of the Phanerozoic era are subdivided into the epochs and ages.

The Paleogene period is divided into--from oldest to youngest--the Paleocene, Eocene, and Oligocene epochs. The Neogene is divided into the Miocene and Pliocene epochs. Finally, the Quaternary is divided into the Pleistocene and Holocene epochs. Some geologists now think that--since humans are having such a notable impact on the Earth and its life--a new, youngest epoch should be added

to the Quaternary: the Anthropocene. There is still considerable discussion in the geological community about whether this epoch should be added, as well as debate about what characteristics should define its beginning.

The Geologic dating allows scientists to better understand ancient history, including the evolution of plant and animal life from single-celled organisms to dinosaurs to primates to early humans. It also helps them learn more about how human activity has transformed the planet. The time scale was developed through the study of physical rock layers and relationships as well as the times when different organisms appeared, evolved and became extinct through the study of fossilized remains and imprints.

The primary and largest catalogued divisions of time are periods called *eons*. The first eon was the Hadean, when the Earth and moon were predicted to be formed, lasting over 600 million years until the Archean, , which is when the Earth had cooled enough for continents and the earliest known life to emerge. After about 2.5 billion years, oxygen generated by photosynthesizing single-celled organisms began to appear in the atmosphere marking the beginning of the Proterozoic. Finally, the Phanerozoic eon encompasses 541 million years of diverse abundance of multi cellular life starting with the appearance of hard animal shells in the fossil record and continuing to the present.

Eons are divided into eras, which are in turn divided into periods, epochs and ages. The first three eons can be referred to collectively as the Precambrian **supereon**. This is in reference to the significance of the Cambrian Explosion, a massive diversification of multi-cellular life forms that took place in the Cambrian period at the start of the Phanerozoic.

Corresponding to eons, eras, periods, epochs and ages, the terms “eonothem”, “erathem”, “system”, “series”, “stage” are used to refer to the layers of rock that

belong to these stretches of geologic time in Earth's history.

Geologists qualify these units as "early", "mid", and "late" when referring to time, and "lower", "middle", and "upper" when referring to the corresponding rocks. For example, the Lower Jurassic Series in chronostratigraphy corresponds to the Early Jurassic Epoch in geochronology. The adjectives are capitalized when the subdivision is formally recognized, and lower case when not; thus "early Miocene" but "Early Jurassic."

Evidence from radiometric dating indicates that Earth is about 4.54 billion years old. The geology or *Deep Time* of Earth's past has been organized into various units according to events which are thought to have taken place. Different spans of time on the GTS are usually marked by corresponding changes in the composition of strata which indicate major geological or paleontological events, such as mass extinctions. For example, the boundary between the Cretaceous period and the Paleogene period is defined by the Cretaceous-Paleogene extinction event, which marked the demise of the non-avian dinosaurs and many other groups of life. The older time spans, which predate the reliable fossil record (before the Proterozoic eon) are defined by their absolute age.

Geologic units from the same time but different parts of the world often look different and contain different fossils, so the same time-span was historically given different names in different locales. For example, in North America, the Lower Cambrian is called the Waucoban series that is then subdivided into zones based on succession of trilobites. In East Asia and Siberia, the same unit is split into Alexian, Atdabanian and Botomian stages. A key aspect of the work of the International Commission on Stratigraphy is to reconcile this conflicting terminology and define universal horizons that can be used around the world.

Some other planets and moons in the Solar System have sufficiently rigid structures to have preserved records of their own histories, for example, Venus, Mars and the Earth's Moon. Dominantly fluid planets, such as the gas giants, do not preserve their history in a comparable manner. Apart from the Late Heavy Bombardment, events on other planets probably had little direct influence on the Earth, and events on Earth had correspondingly little effect on those planets. Construction of a time scale that links the planets is, therefore, of only limited relevance to the Earth's time scale, except in a Solar System context.

Since the early work on developing the geologic time scale was dominated by British geologists, and the names of the geologic periods reflect that dominance. The "Cambrian", (the classical name for Wales) and the "Ordovician" and "Silurian", named after ancient Welsh tribes, were periods defined using stratigraphic sequences from Wales. The "Devonian" was named for the English county of Devon, and the name "Carboniferous" was an adaptation of "the Coal Measures", the old British geologists' term for the same set of strata. The "Permian" was named after Perm, Russia, because it was defined using strata in that region by Scottish geologist Roderick Murchison.

However, some periods were defined by geologists from other countries. The "Triassic" was named in 1834 by a German geologist Friedrich Von Alberti from the three distinct layers (Latin *trias* meaning triad) – red beds, capped by chalk, followed by black shales – that are found throughout Germany and Northwest Europe, called the 'Trias'. The "Jurassic" was named by a French geologist Alexandre Brongniart for the extensive marine limestone exposures of the Jura Mountains. The "Cretaceous" as a separate period was first defined by Belgian geologist Jean d'Omalius d'Halloy in 1822, using strata in the Paris basin and named for the extensive beds of chalk found in Western Europe.

British geologists were also responsible for the grouping of periods into eras and the subdivision of the Tertiary and Quaternary periods into epochs. In 1841 John Phillips published the first global geologic time scale based on the types of fossils found in each era. Phillips' scale helped standardize the use of terms like Paleozoic ("old life") which he extended to cover a larger period than it had in previous usage, and Mesozoic ("middle life") which he invented.

2.4.3 Dating of Time Scales

Chronological dating, or simply dating, is the process of attributing to an object or event a date in the past, allowing such object or event to be located in a previously established chronology. This usually requires what is commonly known as a "dating method". Several dating methods exist, depending on different criteria and techniques, and some very well known examples of disciplines using such techniques are, for example, history, archaeology, geology, paleontology, astronomy and even forensic science in the latter it is sometimes necessary to investigate the moment in the past during which the death of a cadaver occurred. These methods are typically identified as absolute, which involves a specified date or date range, or relative, which refers to dating which places artifacts or events on a timeline relative to other events and/or artifacts. Other markers can help place an artifact or event in a chronology, such as nearby writings and stratigraphic markers.

William Smith and Sir Charles Lyell were however, the first who recognized that rock strata represented successive time periods, and time scales could be estimated only very imprecisely since estimates of rates of change were uncertain. While creationists had been proposing dates of around six or seven thousand years for the age of Earth based on the Bible, early geologists were suggesting millions of years for geologic periods, and some were even suggesting a virtually infinite age for Earth. The Geologists and paleontologists constructed the geologic table

based on the relative positions of different strata and fossils, and estimated the time scales based on studying rates of various kinds of weathering, erosion sedimentation and lithification. Until the discovery of radioactivity in 1896 and the development of its geological applications through radionmetric dating during the first half of the 20th century, the ages of various rock strata and the age of Earth were the subject of considerable debate.

The first geologic time scale that included absolute dates was published in 1913 by the British geologist Arthur Holmes. He greatly furthered the newly created discipline of geochronology and published the world-renowned book *The Age of the Earth* in which he estimated Earth's age to be at least 1.6 billion years.

In 1977, the *Global Commission on Stratigraphy* (now the International Commission on Stratigraphy) began to define global references known as GSSP (Global Boundary Stratotype Sections and Points) for geologic periods and faunal stages.

Popular culture and a growing number of scientists use the term “Anthropocene” informally to label the current epoch in which we are living. The term was coined by Paul Crutzen and Eugene Stoermer in 2000 to describe the current time in which humans have had an enormous impact on the environment. It has evolved to describe an "epoch" starting sometime in the past and on the whole defined by anthropogenic carbon emissions and production and consumption of plastic goods that are left in the ground. The critics of this term say that the term should not be used because it is difficult, if not nearly impossible, to define a specific time when humans started influencing the rock strata – defining the start of an epoch. Others say that humans have not even started to leave their biggest impact on Earth, and therefore the Anthropocene has not even started yet.

Relative dating

Relative dating methods are unable to determine the absolute age of an object or event, but can determine the impossibility of a particular event happening before or after another event of which the absolute date is well known. In this relative dating method, Latin terms *ante quem* and *post quem* are usually used to indicate both the most recent and the oldest possible moments when an event occurred or an artifact was left in a stratum, respectively. But this method is also useful in many other disciplines. Historians, for example, know that Shakespeare's play *Henry-V* was not written before 1587 because Shakespeare's primary source for writing his play was the second edition of Raphael Holinshed's *Chronicles*, not published until 1587. Thus, 1587 is the *post quem* dating of Shakespeare's play *Henry V*. That means that the play was without fail written after (in Latin, *post*) 1587.

The same inductive mechanism is applied in archaeology, geology and paleontology, by many ways. For example, in a stratum presenting difficulties or ambiguities to absolute dating, paleopalynology can be used as a relative referent by means of the study of the pollens found in the stratum. This is admitted because of the simple reason that some botanical species, whether extinct or not, are well known as belonging to a determined position in the scale of time.

Absolute dating

The Absolute dating methods seek to establish a specific time during which an object originated or an event took place. While the results of these techniques are largely accepted within the scientific community, there are several factors which can hinder the discovery of accurate absolute dating, including sampling errors and geological disruptions. This type of chronological dating utilizes absolute referent criteria, mainly the radiometric dating methods. Material remains can be

absolutely dated by studying the organic materials which construct the remains. For example, remains that have pieces of brick can undergo the process of thermoluminescence dating in order to determine approximately how many years ago the material was fired. This technique was used to discover the date of St. James Church in Toruń by testing the thermoluminescence of removed bricks. In this example, an absolute date was determined which filled a gap in the historical knowledge of the church.

These techniques are utilized in many other fields as well. Geologists, for example, apply absolute dating methods to rock sediment in order to discover their period of origin.

Some examples of both radiometric and non-radiometric absolute dating methods are the following:

1. Amino acid dating
2. Archaeomagnetic dating
3. Argon–argon dating
4. Uranium–lead dating
5. Samarium–neodymium dating
6. Potassium–argon dating
7. Rubidium–strontium dating
8. Uranium–thorium dating
9. Radiocarbon dating
10. Fission track dating
11. Electron spin resonance dating
12. Luminescence dating
 - i. Thermoluminescence dating
 - ii. Optically stimulated luminescence
13. Iodine–xenon dating
14. Lead–lead dating
15. Oxidizable carbon ratio dating
16. Rehydroxylation dating

17. Cementochronology (this method does not determine a precise moment in a scale of time but the age at death of a dead individual)
18. Wiggle matching
19. Datestone (exclusively used in archaeology)
20. Obsidian hydration dating (exclusively used in archaeology)
21. Tephrochronology
22. Molecular clock (used mostly in phylogenetics and evolutionary biology)
23. Dendrochronology
24. Herbchronology

The geological time scale is one of the crowning achievements of science in general and geology in particular. It is a reference and communication system for comparing rocks and fossils from throughout the world and is geology's equivalent of the periodic table of the elements. Most of the boundaries on the geological time scale correspond to the origination or extinction of particular kinds of fossils. Knowing when major groups of fossils first appeared or went extinct is therefore incredibly useful for determining the ages of rocks in the field. For example, if a rock is with a trilobite fossil upon it, then the rock is Paleozoic in age (541 Ma to 252 Ma) and not older or younger; knowing the species of trilobite allows even greater precision. This relates to a third important principle of relative age dating: the principle of faunal succession. Faunal succession is the principle that different kinds of fossils characterize different intervals of time. This is because evolution and extinction are facts of nature.

The principle of faunal succession was developed by an English surveyor named William Smith (1769-1839). As he studied layers of rocks to determine where to build canals, he noticed that he found the same ordering of fossil species from place to place; Fossil A was always found below Fossil B, which in turn was always found below Fossil C, and so on. By documenting these sequences of fossils, Smith was able to temporally correlate rock layers (or, strata) from place to place (in other words, to establish that rock layers in two different places are

equivalent in age based upon the fact that they include the same types of fossils). Temporal correlation allowed Smith to construct the first geological map of an entire country. The geological time scale provides a global summary of countless small-scale temporal correlations of rock layers made at local and regional scales. It is based almost entirely upon careful observations of the distributions of fossils in time and space.

The ICS's *Geologic Time Scale 2012* book which includes the new approved time scale also displays a proposal to substantially revise the Precambrian time scale to reflect important events such as the formation of the Earth or the Great Oxidation Event, among others, while at the same time maintaining most of the previous chronostratigraphic nomenclature for the pertinent time span.

- Hadean Eon – 4600–4031 Ma
 - Chaotian Era – 4600–4404 Ma – the name alluding both to the mythological Chaos and the chaotic phase of planet formation
 - Jack Hillsian or Zirconian Era – 4404–4031 Ma – both names allude to the Jack Hills Greenstone Belt which provided the oldest mineral grains on Earth, zircons[39][36]

- Archean Eon – 4031–2420 Ma
 - Paleoarchean Era – 4031–3490 Ma
 - Acastan Period – 4031–3810 Ma – named after the Acasta Gneiss[39][36]
 - Isuan Period – 3810–3490 Ma – named after the Isua Greenstone Belt[39]

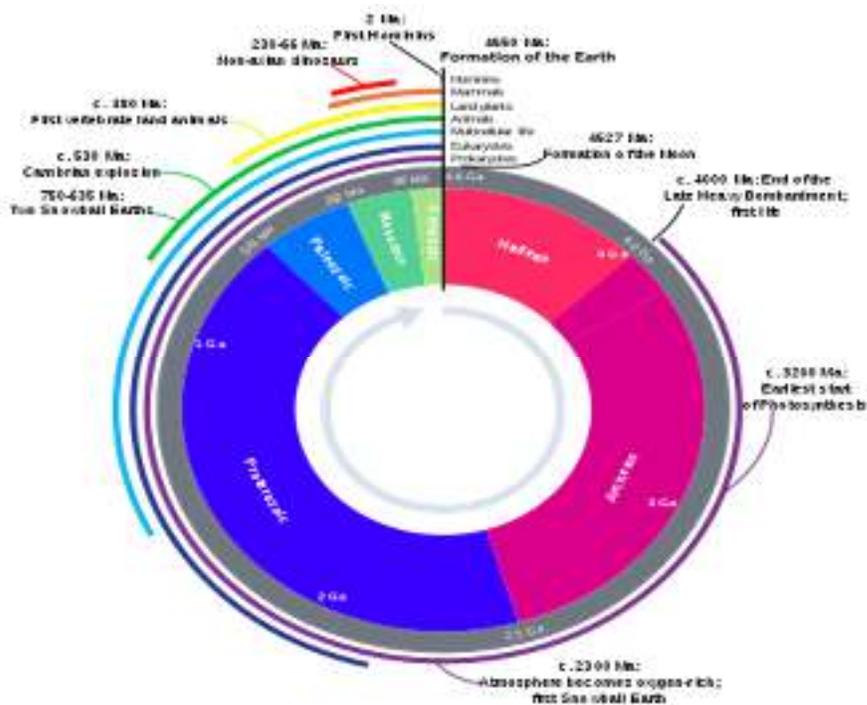
- Mesoarchean Era – 3490–2780 Ma
 - Vaalbaran Period – 3490–3020 Ma – based on the names of the Kapvaal (Southern Africa) and Pilbara (Western Australia) cratons[39]

- Pongolan Period – 3020–2780 Ma – named after the Pongola Supergroup[39]
- Neoproterozoic Era – 2780–2420 Ma
 - Methanian Period – 2780–2630 Ma – named for the inferred predominance of methanotrophic prokaryotes[39]
 - Siderian Period – 2630–2420 Ma – named for the voluminous banded iron formations formed within its duration[39]
- Proterozoic Eon – 2420–541 Ma
 - Paleoproterozoic Era – 2420–1780 Ma
 - Oxygenian Period – 2420–2250 Ma – named for displaying the first evidence for a global oxidizing atmosphere[39]
 - Jatulian or Eukaryian Period – 2250–2060 Ma – names are respectively for the Lomagundi–Jatuli $\delta^{13}\text{C}$ isotopic excursion event spanning its duration, and for the (proposed)[41][42] first fossil appearance of eukaryotes[39]
 - Columbian Period – 2060–1780 Ma – named after the supercontinent Columbia[39]
- Mesoproterozoic Era – 1780–850 Ma
 - Rodinian Period – 1780–850 Ma – named after the supercontinent Rodinia, stable environment[39]
- Neoproterozoic Era – 850–541 Ma
 - Cryogenian Period – 850–630 Ma – named for the occurrence of several glaciations[39]
 - Ediacaran Period – 630–541 Ma

Table showing Geological eras in Earth's history

<u>Eon</u>	<u>Era</u>	Time frame (<u>Ma</u> = million years ago)
<u>Phanerozoic</u>	<u>Cenozoic</u>	<u>66 million years ago to present</u>
	<u>Mesozoic</u>	<u>251.902 to 66 million years ago</u>
	<u>Paleozoic</u>	<u>541 to 251.902 million years ago</u>
<u>Proterozoic</u>	<u>Neoproterozoic</u>	<u>1,000 to 541 million years ago</u>
	<u>Mesoproterozoic</u>	<u>1,600 to 1,000 million years ago</u>
	<u>Paleoproterozoic</u>	<u>2,500 to 1,600 million years ago</u>
<u>Archean</u>	<u>Neoarchean</u>	<u>2,800 to 2,500 million years ago</u>
	<u>Mesoarchean</u>	<u>3,200 to 2,800 million years ago</u>
	<u>Paleoarchean</u>	<u>3,600 to 3,200 million years ago</u>
	<u>Eoarchean</u>	<u>4,000 to 3,600 million years ago</u>
<u>Hadean</u>	<i>not officially divided into eras</i>	<u>Formation of Earth to 4,000 million years ago</u>

This clock representation below shows of the major units of geological time and definitive events of Earth history. The Hadean eon represents the time before fossil record of life on Earth; its upper boundary is now regarded as 4.0 Ga ([billion](http://www.wikipedia.org) years ago). Other subdivisions reflect the evolution of life; the Archean and Proterozoic are both eons, the Paleozoic, Mesozoic, are eras of the Phanerozoic eon. The three million year Quaternary period, the time of recognizable humans, is too small to be visible at this scale. (source: www.wikipedia.org)



Self Assessment Questions

Q. No. 1: Define three Age System of Archaeology.

Q. No. 2: What do you know about Stone Age culture of Europe?

Q. No. 3: What do you know about the evolution of Man? Discuss.

Q. No. 4: Discuss the beginning of life on the earth and origin of Man.

Q. No. 5: Write a detailed essay on the types and techniques of stone tools.

Q. No. 6: Explain the Geological Time Scale of the world with examples.

Q. No. 7: Discuss different dating methods of archaeology.

Bibliography

- Allchin, B & Allchin, R (1982). *The Rise of Civilization in India and Pakistan*, Cambridge Printing University Press, Cambridge.
- Allchin, B. (1979). Stone Blade industries of Early Settlements in Sindh as indicators of geographical and Socio-Economic change, *South Asian Archaeology*, 1977, Naples, Italy.
- Biagi, P. & Shaikh, Nilofer (1994). *An Italo Pakistani Joint Project in the Rohri Hills (Sindh Pakistan) in Ancient Sindh*, Vol. 1. Shah Abdul Latif University, Khairpur, Sindh.
- Dennell R. (1991) *Pakistan's Oregustirt: a glimpse at the first two million years*, Ancient India and Iran Trust, Cambridge.
- Kenoyer, J.M. (1998). *Ancient cities of Indus Valley Civilization*, U.S.A.
- Pelegri, J. (1994). *Lithic Technology in Harappan times*, *South Asian Archaeology*, 1993.
- Renfre, Colin & Bahn, P. (1991). *Archaeology: Theories, Methods and Practice*, Thames & Hudson Ltd. London.
- Salim, M. (1996). Lower Paleolithic in the Soan Valley, Rawalpindi, *Journal of Central Asia*, Vol. XIX, No. 2, Islamabad.
- Veesar, G.M & Shaikh, Nilofer. (2006-7). *Archaeological Investigations of Mesolithic Period in the Western Thar Desert of Sindh*, in *Ancient Sindh*, Vol. 9, Shah Abdul Latif University, Khairpur, Sindh.

UNIT. 3

WORLD CIVILIZATIONS

Written by: Dr. Tahir Saeed
Reviewed by: Dr. Badshah Sardar

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Introduction

Roughly 6000 to 8000 years ago, agriculture was well under the way in several regions including Ancient Egypt, around the Nile River; the Indus Valley civilization; Mesopotamia, between the Tigris and the Euphrates rivers; and the Ancient China, along the Yellow and the Yangtze rivers. This is because the regular river floods made for fertile soil around the banks and the rivers could also supply fresh water to irrigate crops. It's no coincidence that as agriculture allowed for denser and denser populations along with more specialized societies, some of the world's first civilizations developed in these areas as well.

Ancient Egypt was a civilization of the ancient Northeast Africa, situated in the Egyptian Nile Valley in the country Egypt. Ancient Egyptian civilization followed prehistoric Egypt and coalesced around 3100 BC with the political unification of Upper and Lower Egypt under Menes. Egyptian civilization developed along the Nile River in large part because the river's annual flooding ensured reliable, rich soil for growing crops. Repeated struggles for political control of Egypt showed the importance of the region's agricultural production and economic resources.

Mesopotamia—mainly modern-day Iraq and Kuwait—in particular is often referred to as the cradle of civilization because some of the most influential early city-states and empires first emerged there—although it's not the only place! Its modern name comes from the Greek for middle—*mesos*—and river—*potamos*—and literally means a “country between two rivers.” Those two rivers are the Tigris and the Euphrates. Not only was Mesopotamia one of the first places to develop agriculture, it was also at the crossroads of the Egyptian and the Indus Valley civilizations. This made it a melting pot of languages and cultures that stimulated a lasting impact on writing, technology, language, trade, religion and law.

Associated with Mesopotamia are ancient cultures like the Sumerians, Assyrians, Akkadians, and Babylonians. Learning about this time period can be a little confusing because these cultures interacted with and ruled over each other over the course of several thousand years. These terms can also be associated with city-states, languages, religions, or empires—depending on the time and context we are looking at.

Similarly the earliest known written records of the history of China date from as early as 1250 BC, from the Shang dynasty, during the king Wu Ding's reign, who was mentioned as the twenty-first King of Shang by the same. Ancient China is responsible for a rich culture, still evident in modern China. From small farming communities rose dynasties such as the Zhou (1046-256 B.C.E), Qin (221-206 B.C.E), and Ming (1368-1644 C.E.). Each had its own contribution to the region. During the Zhou Dynasty, for example, writing was standardized, iron working refined, and famous thinkers like Confucius and Sun-Tzu lived and shared their philosophies. During the Qin Dynasty, Qin Shi Huang commissioned the Terracotta Army, and the Ming Dynasty refurbished the Great Wall to protect the nation from Mongol attacks.

Objectives: After studying this unit, the student will be able;

- to arouse student's interest in the history, antiquities and monuments of the Egyptian, Mesopotamian and Chinese civilizations of the world.
- to create a public consciousness that they may respect and seek to preserve these remains of world cultural heritage.
- to trace the growth and development of ancient culture and civilization of world wide
- to examine analytically the sources of Ancient history of Egyptian civilization
- to understand human past and evolutionary process that mankind underwent through ages
- to give insight to the student an in-depth understanding of the development of Mesopotamian civilization.
- to highlight history, geographical extension and achievements of the Chinese civilization

3. World Civilizations

3.1 Origin and Developments

The written history was preceded by its prehistory, which began with the Paleolithic Era ("Old Stone Age"), followed by the Neolithic Era ("New Stone Age"). The Neolithic saw the Agricultural Revolution begin, between 10,000 and 5000 BCE, in the Near East's Fertile Crescent. During this period, humans began the systematic husbandry of plants and animals. As agriculture advanced, most humans transitioned from a nomadic to a settled lifestyle as farmers in permanent settlements. The relative security and increased productivity provided by farming allowed communities to expand into increasingly larger units, fostered by advances in transportation.

In prehistoric or historic times, people always needed to be near reliable sources of potable water. Settlements developed as early as 4,000 BCE in Iran, in Mesopotamia, in the Indus River valley, on the banks of Egypt's Nile River, and along China's rivers. As farming developed, grain agriculture became more sophisticated and prompted a division of labour to store food between growing seasons. Labour divisions led to the rise of a leisured upper class and the development of cities, which provided the foundation for civilization. The growing complexity of human societies necessitated systems of accounting and writing.

With civilizations flourishing, ancient history up to about 500 CE saw the rise and fall of empires. Post-classical history (the "Middle Ages," c. 500–1500 CE, witnessed the rise of Christianity, the Islamic Golden Age (c. 750 CE – c. 1258 CE), the Timurid and Italian Renaissance (from around 1300 CE). The mid-15th-century introduction of movable-type printing in Europe revolutionized communication and facilitated ever wider dissemination of information, hastening the end of the middle Ages and ushering in the Scientific Revolution. The Early

Modern Period, sometimes referred to as the "European Age and Age of the Islamic Gun powders", from about 1500 to 1800, included the Age of Enlightenment and the Age of Exploration. By the 18th century, the accumulation of knowledge and technology had reached a critical mass that brought about the Industrial Revolution and began the Late Modern Period, which started around 1800 and has continued through the present.

However, by the 18th century, due to extensive world trade and colonization, the histories of most civilizations had become substantially intertwined, a process known as globalization. In the last quarter-millennium, the rates of growth of population, knowledge, technology, communications, commerce, weapons destructiveness, and environmental degradation have greatly accelerated, creating unprecedented opportunities and perils that now confront the planet's human communities.

The word civilization comes from the 16th-century French *civilisé* ("civilized"), from Latin *civilis* ("civil"), which is related to *civis* ("citizen") and *civitas* ("city"). The most basic definition of the word "civilization" is "a society made up of cities." However, early in the development of the term, anthropologists used "civilization" and "civilized society" to differentiate between societies they found culturally superior and those they found culturally inferior. The term "civilization" was often applied in an ethnocentric way, with "civilizations" being considered morally good and culturally advanced.

The first known use of word in French is in 1757, by Victor de Riqueti, marquis de Mirabeau, and the first use in English is attributed to Adam Ferguson, who in his 1767 *Essay on the History of Civil Society* wrote, "Not only the individual advances from infancy to manhood but the species itself from rudeness to civilization". In the late 1700s and early 1800s, during the French Revolution,

"civilization" was meant the progress of humanity as a whole. The use of "civilizations" as a countable noun was in occasional use in the 19th century, but has become much more common in the later 20th century, sometimes just meaning culture.

Earlier in the 18th century, civilization was not always seen as an improvement. The historically important distinction between culture and civilization is from the writings of Rousseau, particularly his work about education, *Emile*. Here, civilization, being more rational and socially driven, is not fully in accord with human nature, and "human wholeness is achievable only through the recovery of or approximation to an original discursive or pre-rational natural unity". From this, a new approach was developed, especially in Germany, first by Johann Gottfried Herder, and later by philosophers such as Kierkegaard and Nietzsche. This sees cultures as natural organisms, not defined by "conscious, rational, deliberative acts", but a kind of pre-rational "folk spirit". Civilization, in contrast, though more rational and more successful in material progress, is unnatural and leads to "vices of social life". In "The Philosophy of Civilization" (1923), Albert Schweitzer outlines two opinions: one purely material and the other material and ethical. He said that the world crisis was from humanity losing the ethical idea of civilization, "the sum total of all progress made by man in every sphere of action and from every point of view in so far as the progress helps towards the spiritual perfecting of individuals as the progress of all progress".

A political scientist and historian Anthony Pagden wrote that the 18th-century social theory held that a civilization was "the optimum condition for all mankind." He further said that "only the civilized can know what it is to be civilized," pointing out the implicit elitism of this concept. As imperialism

boomed in the 19th century, this meaning of CIVILIZATION gained popularity, but today it is considered narrow-minded, except when used in a historical context.

In the early twentieth-century philosopher Oswald Spengler, uses the German word Kultur, "culture", for what many call a "civilization". Spengler believed a civilization's rationality is based on a single primary cultural symbol. Cultures experience cycles of birth, life, decline and death, often supplanted by a potent new culture, formed around a compelling new cultural symbol. Spengler states civilization is the beginning of the decline of a culture as "the most external and artificial states of which a species of developed humanity is capable". This "unified culture" concept of civilization also influenced the theories of historian Arnold J. Toynbee in the mid-twentieth century. Toynbee explored civilization processes in his *A Study of History*, which traced the rise and, in most cases, the decline of civilizations. Civilizations generally declined and fell, according to Toynbee, because of the failure of a "creative minority", through moral or religious decline, to meet some important challenge, rather than mere economic or environmental causes. Samuel P. Huntington defines civilization as "the highest cultural grouping of people and the broadest level of cultural identity people have short of that which distinguishes humans from other species".

It is generally believed that once a nation, culture, or group of people has been brought out of the darkness into an enlightened and advanced state, it becomes a Civilization. This sense arose about the same time, but without the imperialistic undertones attached to the original meaning of the word. When used with a modifier, it refers to the civilization of a specific region such as *European civilization*, *French civilization* or people such as *Mayan civilization* or period of time such as *modern civilization*. In the early 19th century, speakers of English

started using CIVILIZATION to mean cities or populated areas in general—that is, places where civilizations are located.

However, still most anthropologists agree on some criteria to define a society as a civilization. First, civilizations have some kind of urban settlements and are not nomadic. From this specialization comes class structure and government, both aspects of a civilization. Another criterion for civilization is a surplus of food, which comes from having tools to aid in growing crops. Besides, the writing, trading, artwork and monuments, and development of science and technology are all aspects of civilizations.

However, there are many societies that scholars consider civilizations that do not meet all of the criteria above. For example, the Incan Empire was a large civilization with a government and social hierarchy. It left behind a wealth of art, and had highly developed architecture—but no written language. This is why the concept of “civilization” is hard to define; however, it is still a helpful framework with which to view how humans come together and form a society.

A civilization is any complex society characterized by urban development, social stratification, a form of government and symbolic systems of communication such as writing. Civilizations are intimately associated with and often further defined by other socio-politico-economic characteristics, including centralization, the domestication of both humans and other organisms, specialization of labour, culturally ingrained ideologies of progress and supremacism, monumental architecture, taxation, societal dependence upon farming and expansionism.

Civilization has often been understood as a larger and "more advanced" culture, in contrast to smaller, supposedly primitive cultures. In this broad sense, a

civilization contrasts with non-centralized tribal societies, including the cultures of nomadic pastoralists. Civilizations are organized in densely populated settlements divided into hierarchical social classes with ruling elite and subordinate urban and rural populations, which engage in intensive agriculture, mining, small-scale manufacture and trade. Civilization concentrates power, extending human control over the rest of nature, including over other human beings. Therefore Civilization is a concept originally linked to towns and cities.

The earliest emergence of civilizations is generally associated with the final stages of the Neolithic Revolution, culminating in the relatively rapid process of urban revolution and state formation, a political development associated with the appearance of governing elite. Gordon Childe defined the emergence of civilization as the result of two successive revolutions: the Neolithic Revolution, triggering the development of settled communities, and the Urban Revolution.

At first, the Neolithic was associated with shifting subsistence cultivation, where continuous farming led to the depletion of soil fertility resulting in the requirement to cultivate fields further and further removed from the settlement, eventually compelling the settlement itself to move. In major semi-arid river valleys, annual flooding renewed soil fertility every year, with the result that population densities could increase significantly. This encouraged a secondary products revolution in which people used domesticated animals not just for meat, but also for milk, wool, manure and pulling ploughs and carts.

The earlier Neolithic technology and lifestyle were established first in Western Asia (about 9,130 BCE), and later in the Yellow River and the Yangtze basins in China (7,500 BCE), and later spread. Mesopotamia is the site of the earliest developments of the Neolithic Revolution from around 10,000 BCE, with

civilizations developing from 6,500 years ago. This area has been identified as having "inspired some of the most important developments in human history including the invention of the wheel, the planting of the first cereal crops and the development of the cursive script." Similar pre-civilized "Neolithic revolutions" also began independently from 7,000 BCE.

This marked the beginning of the accumulation of transferable surpluses, which helped economies and cities develop. It was associated with the state monopoly of violence, the appearance of a soldier class and endemic warfare, the rapid development of hierarchies, and the appearance of human sacrifice. The civilized urban revolution in turn was dependent upon the development of seeding, the domestication of grains and animals and development of lifestyles that facilitated economies of scale and accumulation of surplus production by certain social sectors. The transition from complex cultures to civilizations, while still disputed, seems to be associated with the development of state structures, in which power was further monopolized by an elite ruling class who practiced human sacrifice. Towards the end of the Neolithic period, various elitist Chalcolithic civilizations began to rise in various "cradles" from around 3300 BCE, expanding into large-scale empires in the course of the Bronze Age.

A parallel development took place independently in the Pre-Columbian Americas. Urbanization in the Norte Chico civilization in coastal Peru emerged about 3200 BCE; the oldest known Mayan city, located in Guatemala, dates to about 750 BCE and Teotihuacan in Mexico was one of the largest cities in the world in 350 CE with a population of about 125,000. The Bronze Age collapse was followed by the Iron Age around 1200 BCE, during which a number of new civilizations emerged, culminating in a period from the 8th to the 3rd century BCE which Karl Jaspers termed the Axial Age, presented as a critical transitional phase leading to

classical civilization. William Hardy McNeill proposed that this period of history was one in which cultural contact between previously separate civilizations and led to accelerated social change from China to the Mediterranean, associated with the spread of coinage, larger empires and new religions.

The term "Civilization" can also refer to the culture of a complex society, not just the society itself. Every society, civilization or not, has a specific set of ideas and customs, and a certain set of manufactures and arts that make it unique. Civilizations tend to develop intricate cultures, including a state-based decision making apparatus, a literature, professional art, architecture, organized religion and complex customs of education, coercion and control associated with maintaining the elite. The intricate culture associated with civilization has a tendency to spread to and influence other cultures, sometimes assimilating them into the civilization. For example Chinese civilization and its influence on nearby civilizations occurred such as Korea, Japan and Vietnam. Many civilizations are actually large cultural spheres containing many nations and regions. The civilization in which someone lives is that person's broadest cultural identity.

3.1.2 The Components of a Civilization

The social scientists such as V. Gordon Childe have named a number of traits that distinguish a civilization from other kinds of society. Civilizations have been distinguished by their means of subsistence, types of livelihood, settlement patterns, and forms of government, social stratification, economic systems, literacy and other cultural traits. Similarly Andrew Nikiforuk claim that "civilizations relied on shackled human muscle. It took the energy of slaves to plant crops, clothe emperors, and build cities" and considers slavery to be a common feature of pre-modern civilizations.

All the civilizations have depended on agriculture for subsistence, with the possible exception of some early civilizations in Peru which may have depended upon maritime resources. Grain farms can result in accumulated storage and a surplus of food, particularly when people use intensive agricultural techniques such as artificial fertilization, irrigation and crop rotation. It is possible but more difficult to accumulate horticultural production, and so civilizations based on horticultural gardening have been very rare. Grain surpluses have been especially important because grain can be stored for a long time. A surplus of food permits some people to do things besides producing food for a living: early civilizations included soldiers, artisans, priests and priestesses, and other people with specialized careers. A surplus of food results in a division of labour and a more diverse range of human activity, a defining trait of civilizations. However, in some places hunter-gatherers have had access to food surpluses, such as among some of the indigenous peoples of the Pacific Northwest and perhaps during the Mesolithic Natufian culture. It is possible that food surpluses and relatively large scale social organization and division of labour predates plant and animal domestication. There are many different elements must come together before a human community develops to the level of sophistication commonly referred to as civilization. The first is the existence of settlements classifiable as towns or cities. This requires food production to be efficient enough for a large minority of the community to be engaged in more specialized activities like buildings or works of art, the practice of skilled warfare, and above all the administration of a centralized bureaucracy capable of running the machinery of state. In the organization, a system of writing is an almost indispensable aid. Our knowledge of prehistory derives from surviving objects from the evidence of archaeology. History, by contrast, is based on documents. These various interconnections mean that history, civilization and writing all begin at the same time, which is about 3100 BCE.

3.1.3 Cradle of Civilization

The use of word “cradle” to mean "the place or region in which anything is cherished or sheltered in its earlier stage" is traced by the Oxford English Dictionary to Spenser (1590). Charles Rollin's Ancient History (1734) has mentioned as "Egypt that served at first as the cradle of the holy nation".The phrase "cradle of civilization" plays a certain role in national mysticism. It has been used in Eastern as well as in Western cultures, for instance, in Indian nationalism (In Search of the Cradle of Civilization 1995) and Taiwanese nationalism (Taiwan; The Cradle of Civilization 2002). The terms also appear in esoteric pseudohistory, such as the Urantia Book, claiming the title for "the second Eden” or the pseudoarchaeology related to Megalithic Britain (Civilization One 2004, Ancient Britain: The Cradle of Civilization 1921).

The Cradle of civilization is a location, where civilization is understood to have independently emerged. There was no single "cradle" of civilization; instead, there were several cradles of civilization which developed independently. The Fertile Crescent for instance Mesopotamia and Ancient Egypt and Ancient India are believed to be the earliest. Ancient China emerged somewhat later. The extent to which there was significant influence between the early civilizations of the Near East and those of the East Asia or Far East is disputed. Scholars accept the fact that the civilizations of Mesoamerica, those which mainly existed in modern-day Mexico, and the civilization which existed in Norte Chico, a region which is located in the north-central coastal region of Peru, emerged independently from those which emerged in Old World.

Some scholars have defined civilization by using various criteria such as the use of writing, cities, a class-based society, agriculture, animal husbandry, public buildings, metallurgy and monumental architecture. The term cradle of

civilization has frequently been applied to a variety of cultures and areas, in particular the Ancient Near Eastern Chalcolithic as Ubaid period and Fertile Crescent, Ancient India and Ancient China. It has also been applied to ancient Anatolia, the Levant and Iranian plateau, and used to refer to culture predecessors—such as Ancient Greece as the predecessor of Western civilization.

The coming of farming had allowed the growth of settled populations to take place, but it did not make the coming of civilization predictable. With the rise of civilization, small-scale, village-based societies became large-scale ones with cities, advanced technologies and the capability to mobilize the labour of thousands of workers to achieve specified ends. The emergence of civilization is the rise of two social institutions, the State and the City. Both are dependent upon one another: cities cannot exist without states, and states without cities.

The earliest signs of a process leading to sedentary culture can be seen in the Levant to as early as 12,000 BC, when the Natufian culture became sedentary; it evolved into an agricultural society by 10,000 BCE. The importance of water to safeguard an abundant and stable food supply, due to favourable conditions for hunting, fishing and gathering resources including cereals, provided an initial wide spectrum economy that triggered the creation of permanent villages. The earliest proto-urban settlements with several thousand inhabitants emerged in the Neolithic. The first cities to house several tens of thousands were Memphis and Uruk, by the 31st century BCE. The historic times are marked when "records of the past begin to be kept for the benefit of future generations"; it may be in written or oral form. If the rise of civilization is taken to coincide with the development of writing out of proto-writing, the Near Eastern Chalcolithic, the transitional period between the Neolithic and the Bronze Age during the 4th millennium BCE, and the development of proto-writing in Harappa in the Indus

Valley of South Asia around 3300 BC are the earliest, followed by Chinese proto-writing evolving into the oracle bone script, and again by the emergence of Mesoamerican writing systems from about 900 BCE.

However, in the absence of written documents, most aspects of the rise of early civilizations are contained in archaeological assessments that document the development of formal institutions and the material culture. A "civilized" way of life is ultimately linked to conditions coming almost exclusively from intensive agriculture. A small number of major river valleys in different parts of the Eastern Hemisphere played a critical role as cradles of civilization: it was here that all the "original" or "foundational" civilizations emerged. The great civilizations of Mesopotamia, Egypt, the Indus Valley and China all belonged to this category whereas those of Greece, Rome, Japan and Korea are examples of secondary civilizations, as they owed their existence to earlier ones. The river valleys offer areas of well-watered, fertile soil which, because of their very high agricultural productivity, can give rise to large human populations concentrated in a comparatively small area.

3.2 Egyptian Civilization

The ancient Egypt was a splendid civilization of ancient North Africa, concentrated along the lower reaches of the Nile River, situated in the place that is now Egypt. The ancient Egyptian civilization followed prehistoric Egypt and united around 3100 BC with the political unification of Upper and Lower Egypt. The history of ancient Egypt was occurred as a series of stable kingdoms, separated by periods of relative instability known as Intermediate Periods: the Old Kingdom of the Early Bronze Age, the Middle Kingdom of the Middle Bronze Age and the New Kingdom of the Late Bronze Age.

The ancient Egypt reached at the apex of its power in the New Kingdom, ruling much of Nubia and a sizable portion of the Near East, after which it entered a period of slow decline. During the course of its history Egypt was invaded or conquered by a number of foreign powers, including the Hyksos, the Libyans, the Nubians, the Assyrians, the Achaemenid Persians, and the Macedonians under the command of Alexander the Great. The Greek Ptolemaic Kingdom, formed in the aftermath of Alexander's death, ruled Egypt until 30 BC, when, under Cleopatra, it fell to the Roman Empire and became a Roman territory.

The success of ancient Egyptian civilization came partly from its ability to adapt to the conditions of the Nile River valley for agriculture. The predictable flooding and controlled irrigation of the fertile valley produced surplus crops, which supported a more dense population, and social development and culture. As with resources to spare, the administration sponsored mineral exploitation of the valley and surrounding desert regions. The early development of an independent writing system, the organization of collective construction and agricultural projects, trade with surrounding regions, and a military planned to declare Egyptian dominance. Hence by inspiring and organizing these activities was a bureaucracy of elite, religious leaders, and administrators under the control of a pharaoh, who ensured the cooperation and unity of the Egyptian people in the context of an elaborate system of religious beliefs.

A number of achievements of the ancient Egyptians include the quarrying, surveying and construction techniques that supported the building of monumental pyramids, temples, and obelisks; a system of mathematics, a practical and effective system of medicine, irrigation systems and agricultural production techniques, the first known planked boats, Egyptian faience and glass technology, new forms of literature. Its art and architecture were widely copied, and its

antiquities carried off to far corners of the world. Its monumental ruins have inspired the imaginations of travelers and writers for centuries. A spanking respect for antiquities and excavations in the early modern period by Europeans and Egyptians led to the scientific investigation of Egyptian civilization and a greater appreciation of its cultural legacy.

The Egyptian civilization was developed in about 3200 BCE in the region where the southwest Asia joins northeast Africa along the narrow strip of the Nile valley. In the historic outlook, rivers offer two main advantages to a developing civilization as it is well witnessed from the Egyptian civilization. They provide water to irrigate the fields, and they offer the easiest method of transport for a society without paved roads. The river played an equally important role in two other early civilizations of the Indus Valley and of China.

The developed Neolithic cultures (10,200 BCE) and (7600 to 6000 BCE) appeared in the Fertile Crescent and from there spread eastwards and westwards. Then contemporaneously, a grain-grinding culture using the earliest type of sickle blades had replaced the culture of hunters, fishers, and gathering people using stone tools along the Nile. The geological evidence and research studies also suggest that natural climate changes around 8000 BCE began to dry out the extensive pastoral lands of northern Africa, eventually forming the Sahara. The continued drought forced the early ancestors of the Egyptians to settle around the Nile more permanently and to adopt a more sedentary lifestyle. The oldest fully developed Neolithic culture in Egypt is Fayum -A culture which began around 5500 BCE.

In Ancient Egypt, the Bronze Age begins in the Protodynastic period, c. 3150 BC. The archaic Early Bronze Age of Egypt, known as the Early Dynastic Period of Egypt,[11][12] immediately follows the unification of Lower and Upper Egypt,

c. 3100 BC. It is generally taken to include the First and Second Dynasties, lasting from the Protodynastic Period of Egypt until about 2686 BC, or the beginning of the Old Kingdom. With the First Dynasty, the capital moved from Abydos to Memphis with a unified Egypt ruled by an Egyptian god-king. Abydos remained the major holy land in the south. The hallmarks of ancient Egyptian civilization, such as art, architecture and many aspects of religion, took shape during the Early Dynastic Period. Memphis in the Early Bronze Age was the largest city of the time. The Old Kingdom of the regional Bronze Age[11] is the name given to the period in the 3rd millennium BC when Egypt attained its first continuous peak of civilization in complexity and achievement – the first of three "Kingdom" periods, which mark the high points of civilization in the lower Nile Valley (the others being Middle Kingdom and the New Kingdom).

The First Intermediate Period of Egypt,[13] often described as a "dark period" in ancient Egyptian history, spanned about 100 year after the end of the Old Kingdom from about 2181 to 2055 BC. Very little monumental evidence survives from this period, especially from the early part of it. The First Intermediate Period was a dynamic time when the rule of Egypt was roughly divided between two competing for power bases: Heracleopolis in Lower Egypt and Thebes in Upper Egypt. These two kingdoms would eventually come into conflict, with the Theban kings conquering the north, resulting in the reunification of Egypt under a single ruler during the second part of the 11th Dynasty.

Middle Bronze Dynasties

The Middle Kingdom of Egypt lasted from 2055 to 1650 BCE. During this period, the Osiris funerary cult rose to dominate Egyptian popular religion. The period comprises on the 11th Dynasty, which ruled from Thebes and the 12th & 13th Dynasties centered on el-Lisht. The unified kingdom was previously

considered to comprise the 11th and 12th Dynasties, but historians now at least partially consider the 13th Dynasty to belong to the Middle Kingdom.

During the Second Intermediate Period, Ancient Egypt fell into disarray for a second time, between the end of the Middle Kingdom and the start of the New Kingdom. It is the best known for the Hyksos, whose reign comprised the 15th and 16th Dynasties. The Hyksos first appeared in Egypt during the 11th Dynasty, began their climb to power in the 13th Dynasty, and emerged from the Second Intermediate Period in control of Avaris and the Delta. By the 15th Dynasty, they ruled Lower Egypt, and they were expelled at the end of the 17th Dynasty.

Late Bronze Dynasties

The New Kingdom of Egypt, also referred to as the Egyptian Empire, lasted from the 16th to the 11th century BCE. The New Kingdom followed the Second Intermediate Period and was succeeded by the Third Intermediate Period. It was Egypt's most prosperous time and marked the peak of Egypt's power. The later New Kingdom (1292–1069 BCE), is also known as the Ramesside period, after the eleven pharaohs that took the name of Ramesses.

3.2.1 Cultures of Egypt Civilization

In about 5500 BCE, small tribes living in the Nile valley had developed into a series of inter-related cultures as far south as Sudan, demonstrating firm control of agriculture and animal husbandry and identifiable by their pottery and personal items, such as combs, bracelets and beads. The largest of these early cultures in the upper Southern Egypt was the Badari, which probably originated in the Western Desert; it was known for its high quality ceramics, stone tools and use of copper. The oldest known domesticated bovines in Africa are however from

Fayum dating back to around 4400 BCE. The Badari culture was followed by the Naqada culture, which brought a number of technological improvements.

As early as the first Naqada Period, Amratia, Egyptians imported obsidian from Ethiopia, used to shape blades and other objects from flakes. During the period about 3300 BCE, just before the first Egyptian dynasty, Egypt was divided into two kingdoms, known as Upper Egypt to the south, and Lower Egypt to the north.

The Egyptian civilization was however begin during the second phase of the Naqada culture, known as the Gerzeh period, around 3500 BCE and united with the unification of Upper and Lower Egypt around 3150 BCE. Then farming produced the vast majority of food; with increased food supplies, the populace adopted a much more sedentary lifestyle and the larger settlements grew to cities.

It was in this time that the city dwellers started using mud brick to build their cities, and the use of the arch and recessed walls for decorative effect became popular. Similarly, copper instead of stone was increasingly used to make tools and weaponry. The symbols on Gerzean pottery also resemble nascent Egyptian hieroglyphs.

The early evidence also exists of contact with the Near East, particularly Canaan and the Byblos coast, during this time. As a result of these cultural advances, a process of unification of the societies and towns of the upper Nile River, or Upper Egypt, occurred. At the same time the societies of the Nile Delta, or Lower Egypt, also underwent a unification process. King Narmer during his reign in Upper Egypt defeated his enemies on the Delta and merged both the Kingdom of Upper and Lower Egypt under his single rule.

The Early Dynastic Period of Egypt immediately followed the unification of Upper and Lower Egypt. It is generally taken to include the First and Second Dynasties, lasting from the Naqada III archaeological period until about the beginning of the Old Kingdom, Ca. 2686 BCE. The capital was moved from Thisis to Memphis with a unified Egypt.

The hallmarks of ancient Egyptian civilization, such as art, architecture and many aspects of religion, took shape during the Early Dynastic period. The strong institution of kingship developed by the pharaohs served to legitimize state control over the land, labour, and resources that were essential to the survival and growth of ancient Egyptian civilization.

3.2.2 Art, Architecture and Technological Development

The major advances in architecture, art and technology were made during the subsequent Old Kingdom, fueled by the increased agricultural productivity and resulting population, made possible by a well-developed central administration. Egypt's greatest achievements, the Giza pyramids and Great Sphinx, were constructed during the Old Kingdom. The state officials collected taxes, coordinated irrigation projects to improve crop yield, drafted peasants to work on construction projects, and established a justice system to maintain peace and order. Along with the rising importance of a central administration there arose a new class of educated scribes and officials who were granted estates by the pharaoh in payment for their services. Pharaohs also made land grants to their mortuary cults and local temples, to ensure that these institutions had the resources to worship the pharaoh after his death.

The scholars believe that five centuries of these practices slowly eroded the economic power of the pharaoh, and that the economy could no longer afford to

support a large centralized administration. As the power of the pharaoh lessens, regional governors began to challenge the supremacy of the pharaoh. This, coupled with severe droughts between 2200 and 2150 BCE, is assumed to have caused the country to enter the 140-year period of famine and strife known as the First Intermediate Period.

The birth of pharaonic civilization itself, shortly before the beginning of the third millennium BCE was marked by the appearance of new motifs in art and architecture that had direct antecedents in archaic Susa and the Uruk culture of Mesopotamia. The evidence of direct trade exists in Mesopotamian cylinder seals found in Egypt and in the use of silver imported from Anatolia. These commodities were probably acquired through contact with the Uruk-Jamdat Nasr culture in northern Syria rather than directly from Mesopotamia.

The existed Mesopotamian motifs and objects disappeared from the Egyptian record in the middle of the First Dynasty contemporary with Early Bronze Age-II. From the reign of Khasekhemui (Second Dynasty, Ca. 2650 BCE) onward Egyptian kings sent regular trading missions by sea to Byblos, primarily for cedar. The Egyptian inscriptions throughout the third millennium BCE mention frequently military campaigns in the Sinai and the southern Levant. These seem to have been intended primarily to protect Egyptian commercial interests from the predations of nomads, both along the land route used between about 3000 -2700 BCE.

The end of the third millennium corresponds to Egypt's First Intermediate Period (Ca. 2250-2050 BCE). This was a time of weakened central rule and internal turmoil in Egypt, and contemporary records for Egypt's relations with the Near West during this period are lacking. However, literary texts from the early Middle Kingdom (Ca.2000-1900 BCE) reflect incursions of nomadic population from the east into Egypt's Delta. Though largely regulated by Pharaohs of the Middle

Kingdom these migrations continued into the middle of the second millennium eventually resulting in the Asian control of northern Egypt.

In the field of history of technology, the glass materials are relative latecomers. The earliest was however, faience, and might be called as pre-glass. It was made by coating a core material of powdered quartz with a vitreous alkaline glaze. Originating in pre-dynastic Egypt, before 3000 BCE, it was much used in dynastic times for simple beads and pendants. The first real glass vessels have been found in sites of the Egyptian 18th Dynasty, Ca. 1500 BCE. The earliest known glass furnace is that at Tell el Amarna, Egypt dating to 1350 BCE. The vessels were made using a technique like the lost-wax method; the molten glass was fashioned around clay core which was scraped out once the glass had cooled. This leaves a characteristic rough, pitted interior. Besides, statuettes and hollow vessels were also made in stone or clay molds.

A combination of favorable geographical features contributed to the success of ancient Egyptian culture, the most important of which was the rich fertile soil resulting from annual inundations of the Nile River. The ancient Egyptians were thus able to produce an abundance of food, allowing the population to devote more time and resources to cultural, technological and artistic pursuits. Land management was crucial in ancient Egypt because taxes were assessed based on the amount of land a person owned.

The system of farming in Egypt was dependent on the cycle of the Nile River. The Egyptians recognized three seasons: Akhet (flooding), Peret (planting), and Shemu (harvesting). The flooding season lasted from June to September, depositing on the river's banks a layer of mineral-rich silt ideal for growing crops. After the floodwaters had receded, the growing season lasted from October to February. Farmers plowed and planted seeds in the fields, which were irrigated

with ditches and canals. Egypt received little rainfall, so farmers relied on the Nile to water their crops. From March to May, farmers used sickles to harvest their crops, which were then threshed with a flail to separate the straw from the grain.

The ancient Egyptians cultivated emmer and barley, and several other cereal grains, all of which were used to make the two main food staples of bread and beer. The Flax plants, uprooted before they started flowering, were grown for the fibers of their stems. These fibers were split along their length and spun into thread, which was used to weave sheets of linen and to make clothing. Papyrus growing on the banks of the Nile River was used to make paper. The vegetables and fruits were grown in garden plots, close to habitations and on higher ground and had to be watered by hand. Vegetables included leeks, garlic, melons, squashes, pulses, lettuce and other crops, in addition to grapes that were made into wine.

The ancient Egyptians engaged in trade with their foreign neighbors to obtain rare, exotic goods not found in Egypt. In the Predynastic Period, they established trade with Nubia to obtain gold and incense. They also established trade with Palestine, as evidenced by Palestinian-style oil jugs found in the burials of the First Dynasty pharaohs. An Egyptian colony stationed in southern Canaan dates to slightly before the First Dynasty. Narmer had Egyptian pottery produced in Canaan and exported back to Egypt.

By the Second Dynasty at latest, ancient Egyptian trade with Byblos yielded a critical source of quality timber not found in Egypt. By the Fifth Dynasty, trade with Punt provided gold, aromatic resins, ebony, ivory, and wild animals such as monkeys and baboons. Egypt relied on trade with Anatolia for essential quantities of tin as well as supplementary supplies of copper, both metals being necessary for the manufacture of bronze. The ancient Egyptians prized the blue stone lapis lazuli, which had to be imported from far-away Afghanistan. Egypt's

Mediterranean trade partners also included Greece and Crete, which provided, among other goods, supplies of olive oil. In exchange for its luxury imports and raw materials, Egypt mainly exported grain, gold, linen and papyrus, in addition to other finished goods including glass and stone objects.

The architecture of ancient Egypt includes some of the most famous structures in the world: the Great Pyramids of Giza and the temples at Thebes. Building projects were organized and funded by the state for religious and commemorative purposes, but also to reinforce the wide-ranging power of the pharaoh. The ancient Egyptians were skilled builders; using only simple but effective tools and sighting instruments, architects could build large stone structures with great accuracy and precision that is still envied today.

The domestic dwellings of elite and ordinary Egyptians alike were constructed from perishable materials such as mudbricks and wood, and have not survived. The peasants lived in simple homes, while the palaces of the elite and the pharaoh were more elaborate structures. A few surviving New Kingdom palaces, such as those in Malkata and Amarna, show richly decorated walls and floors with scenes of people, birds, water pools, deities and geometric designs. Important structures such as temples and tombs that were intended to last forever were constructed of stone instead of mudbricks. The architectural elements used in the world's first large-scale stone building, Djoser's mortuary complex, include post and lintel supports in the papyrus and lotus motif.

The earliest preserved ancient Egyptian temples, such as those at Giza, consist of single, enclosed halls with roof slabs supported by columns. In the New Kingdom, architects added the pylon, the open courtyard, and the enclosed hypostyle hall to the front of the temple's sanctuary, a style that was standard until the Greco-Roman period. The earliest and most popular tomb architecture in the

Old Kingdom was the mastaba, a flat-roofed rectangular structure of mudbrick or stone built over an underground burial chamber. The step pyramid of Djoser is a series of stone mastabas stacked on top of each other. Pyramids were built during the Old and Middle Kingdoms, but later rulers abandoned them in favor of less conspicuous rock-cut tombs. The use of the pyramid form continued in private tomb chapels of the New Kingdom and in the royal pyramids of Nubia.

The ancient Egyptians produced art to serve functional purposes. For over 3500 years, artists adhered to artistic forms and iconography that were developed during the Old Kingdom, following a strict set of principles that resisted foreign influence and internal change. These artistic standards—simple lines, shapes and flat areas of color combined with the characteristic flat projection of figures with no indication of spatial depth—created a sense of order and balance within a composition. Images and text were intimately interwoven on tomb and temple walls, coffins, stelae and even statues. The Narmer Palette, for example, displays figures that can also be read as hieroglyphs. Because of the rigid rules that governed its highly stylized and symbolic appearance, ancient Egyptian art served its political and religious purposes with precision and clarity.

Ancient Egyptian artisans used stone as a medium for carving statues and fine reliefs, but used wood as a cheap and easily carved substitute. Paints were obtained from minerals such as iron ores, copper ores, soot or charcoal, and limestone. Paints could be mixed with gum arabic as a binder and pressed into cakes, which could be moistened with water when needed.

Despite the homogeneity of ancient Egyptian art, the styles of particular times and places sometimes reflected changing cultural or political attitudes. After the invasion of the Hyksos in the Second Intermediate Period, Minoan-style frescoes were found in Avaris. The most striking example of a politically driven change in

artistic forms comes from the Amarna Period, where figures were radically altered to conform to Akhenaten's revolutionary religious ideas. This style, known as Amarna art, was quickly abandoned after Akhenaten's death and replaced by the traditional forms.

The culture and monuments of ancient Egypt have left a lasting legacy on the world. Egyptian civilization significantly influenced the Kingdom of Kush and Meroë with both adopting Egyptian religious and architectural norms (hundreds of pyramids which are 6–30 meters high were built in Egypt/Sudan), as well as using Egyptian writing as the basis of the Meroitic script. Meroitic is the oldest written language in Africa, other than Egyptian, and was used from the 2nd century BC until the early 5th century CE. The cult of the goddess Isis, for example, became popular in the Roman Empire, as obelisks and other relics were transported back to Rome. The Romans also imported building materials from Egypt to erect Egyptian-style structures. Early historians such as Herodotus, Strabo, and Diodorus Siculus studied and wrote about the land, which Romans came to view as a place of mystery.

During the middle Ages and the Renaissance, Egyptian pagan culture was in decline after the rise of Christianity and later Islam, but interest in Egyptian antiquity continued in the writings of medieval scholars such as Dhul-Nun al-Misri and al-Maqrizi. In the seventeenth and eighteenth centuries, European travelers and tourists brought back antiquities and wrote stories of their journeys. This renewed interest sent collectors to Egypt, who took, purchased, or were given many important antiquities. Napoleon arranged the first studies in Egyptology when he brought some 150 scientists and artists to study and document Egypt's history, which was published.

3.3 Mesopotamian Civilization

Mesopotamia is a historical region of Western Asia situated within the Tigris–Euphrates river system, in the northern part of the Fertile Crescent, presently comprising on Iraq, Kuwait, the eastern parts of Syria, Southeastern Turkey, and regions along the Turkish–Syrian and Iran–Iraq borders. The Euphrates and Tigris rivers have their headwaters in the Taurus Mountains. Both rivers are fed by numerous tributaries, and the entire river system drains a vast mountainous region. Overland routes in Mesopotamia usually follow the Euphrates because the banks of the Tigris are frequently steep and difficult.

The Sumerians and Akkadians dominated Mesopotamia from the beginning of historic period (Ca. 3100 BCE) to the fall of Babylon in 539 BCE, when it was conquered by the Achaemenid Empire. It fell to Alexander the Great in 332 BCE, and after his death, it became part of the Greek Seleucid Empire. In about 150 BCE, Mesopotamia was under the control of the Parthian Empire. Mesopotamia became a battleground between the Romans and Parthians, with western parts of Mesopotamia coming under ephemeral Roman control. However, in 226 CE, the eastern regions of Mesopotamia fell to the Sassanid Persians. The division of Mesopotamia between Roman and Sassanid Empires lasted until the 7th century Muslim conquest of Persia of the Sasanian Empire and Muslim conquest of the Levant from Byzantines. Mesopotamia is the site of the earliest developments of the Neolithic Revolution from around 10,000 BCE. It has been identified as having been inspired some of the most important developments in human history, including the invention of the wheel, the planting of the first cereal crops, and the development of cursive script, mathematics, astronomy and agriculture.

The Greek historian Herodotos, writing in the 6th century BCE marveled at the fertility of Babylonia, the richest grain bearing country in the world and its

enormous crops of wheat, millet and sesame that grew to unbelievable size. This land known in the 3rd millennium BCE as Sumer and Akkad and later named after the city of Babylon encompasses the southern part of a diverse landscape that is referred to in later Greek sources as Mesopotamia or the land between the rivers Tigris and the Euphrates. It comprises the eastern tip of the Fertile Crescent of popular literature. Mesopotamian's fertility however is not the natural state of this southern alluvial plain where the first cities were founded, but the bounty as praised by Herodotes was the work of men who invented irrigation agriculture to overcome an adverse climate characterized by unpredictable rainfall and damaging floods. It extends from the mountains and fertile plains of eastern Turkey and the barren plateau of the Jazira in eastern Syria and northern Iraq to the lowland alluvial plains that reach beyond the Tigris into Elam, in southwestern Iran. In the south the plains give way to the vast marshlands in the delta at the head of the Gulf. The other areas under the cultural hegemony of Sumer or Akkad are also sometimes referred to as being part of Mesopotamia. Its unique geography was one of the determining factors that promoted the technological and cultural advancements in the southern Mesopotamian alluvium. The flat plains and river channels promoted unification and communication.

The Mesopotamia civilization occupies a special place among the world's first civilizations. It appears to be not only the oldest having produce the first cities, but also one of the most enduring lasting for more than three thousand years. This civilization emerged during the fourth millennium BCE within the wide alluvial plain between present Baghdad and the head of the Gulf. The creation of the city is one of the most significant legacies of ancient Mesopotamia. The cities emerged after millennia of continuous settlement on the level of villages and small towns over large areas that extended from the mountainous realms towards the great central plains. Therefore increasing dependence on agriculture and

experience in food production enabled settlements to occupy ever larger areas. In addition, a similarly narrow spectrum of utilizable material for housing and implements was available, requiring organized ways of securing further resources from abroad. These developments indicate a level of organization that implies the existence of a set of rules as a guiding principle for societal institutions. The appearance of city walls, the specialization of labour, the emergence of writing and administration, these all principles define urban life.

The Sumerians inherited some of the means for the artistic expression of their societal values from the complex visual and conceptual vocabulary that had developed in the great city of Uruk before the onset of the Early Dynastic period. This inherited iconographic system included the definition of the ruler as the supreme priest who mediates and effectuates the man-god relationship, a link that encompasses all aspects of life. In Mesopotamia, the junction of the Tigris and Euphrates rivers produced rich fertile soil and a supply of water for irrigation to the civilization. Around 10,200 BCE the first fully developed Neolithic cultures (7600 to 6000 BCE) appeared in the Fertile Crescent and from there spread eastwards and westwards direction.

The old civilizations that emerged around the rivers are among the earliest known non-nomadic agrarian societies. It is because of this that the Fertile Crescent region, and Mesopotamia in particular, are often referred to as the cradle of civilization. The period known as the Ubaid period (Ca. 6500 to 3800 BCE) is the earliest known period on the alluvial plain, although it is likely earlier periods exist obscured under the alluvium. It was during the Ubaid period that the movement towards urbanization began. Agriculture and animal husbandry were widely practiced in sedentary communities, particularly in Northern Mesopotamia, and intensive irrigated hydraulic agriculture began to be practiced

in the south. In about 6000 BCE, Neolithic settlements appear all over Egypt. The Eridu is the oldest Sumerian site settled during this period, around 5300 BCE, and the city of Ur also first dates to the end of this period. In the south, the Ubaid period had a very long duration from around 6500 to 3800 BCE; when it is replaced by the Uruk period.

Sumerian civilization united in the subsequent Uruk period (4000 to 3100 BCE). This period saw the emergence of urban life in Mesopotamia and, during its later phase, the gradual emergence of the cuneiform script was occurred. The Proto-writing in the region dates to around 3500 BCE, with the earliest texts dating to 3300 BCE; early cuneiform writing emerged in 3000 BC. It was also during this period that pottery painting declined as copper started to become popular, along with cylinder seals. Sumerian cities during the Uruk period were probably theocratic and were most likely headed by a priest-king, assisted by a council of elders, including both men and women. It is quite possible that the later Sumerian pantheon was modeled upon this political structure. The Uruk trade networks started to expand to other parts of Mesopotamia and as far as North Caucasus, and strong signs of governmental organization and social stratification began to emerge leading to the Early Dynastic Period (Ca. 2900 BCE).

The Jemdet Nasr period, which is generally dated from 3100–2900 BCE and succeeds the Uruk period, is known as one of the formative stages in the development of the cuneiform script. The oldest clay tablets come from Uruk and date to the late fourth millennium BCE. By the time of the Jemdet Nasr Period, the script had already undergone a number of significant changes. It originally consisted of pictographs, but by the time of the Jemdet Nasr Period, it was already adopting simpler and more abstract designs. It is also during this period that the script acquired its iconic wedge-shaped appearance.

The discovery of Polychrome pottery from a destruction level below the flood deposit has been dated to immediately before the Early Dynastic Period around 2900 BCE. By 2500 BCE, Mesopotamia was making the first beads of real glass, which seem to have been highly prized of the Mesopotamia civilization. Once it had been discovered, glass was easy and cheap to make as it simply involves melting sand and cooling it again the liquid cools without crystallization and therefore remains transparent.

The center of Sumerian culture remained in southern Mesopotamia, even though rulers soon began expanding into neighboring areas, and neighboring Semitic groups adopted much of Sumerian culture for their own. The earliest ziggurats began near the end of the Early Dynastic Period, although architectural precursors in the form of raised platforms date back to the Ubaid period. The well-known Sumerian King List dates to the early second millennium BCE. It consists of a succession of royal dynasties from different Sumerian cities, ranging back into the Early Dynastic Period. Each dynasty rises to prominence and dominates the region, only to be replaced by the next. The document was used by later Mesopotamian kings to legitimize their rule.

Eannatum, the Sumerian king of Lagash, established one of the first verifiable empires in history in 2500 BCE. The neighboring Elam, in modern Iran, was also part of the early urbanization during the Chalcolithic period. Elamite states were among the leading political forces of the Ancient Near East. The emergence of Elamite written records from around 3000 BCE also parallels Sumerian history, where slightly earlier records have been found. During the 3rd millennium BCE, there developed a very intimate cultural symbiosis between the Sumerians and the Akkadians. The Akkadian gradually replaced Sumerian as a spoken language somewhere between the 3rd and the 2nd millennia BCE. The Semitic-speaking

Akkadian empire emerged around 2350 BCE under Sargon the Great. The Akkadian Empire reached its political peak between the 2400-2200 BCE. Under Sargon and his successors, the Akkadian language was briefly imposed on neighboring conquered states such as Elam and Gutium. After the fall of the Akkadian Empire and the overthrow of the Gutians, there was a brief reassertion of Sumerian dominance in Mesopotamia under the Third Dynasty of Ur. After the final collapse of Sumerian hegemony in Mesopotamia around 2000 BCE, the Semitic Akkadian people of Mesopotamia eventually coalesced into two major Akkadian-speaking nations: Assyria in the north, and, a few centuries later, Babylonia in the south.

3.3.1 Bronze Age Culture of Mesopotamia

The Mesopotamian Bronze Age began about 3500 BC and ended with the Kassite period (Ca. 1500 -1155 BCE). The cities of the Ancient Near East housed several tens of thousands of people. Ur, Kish, Isin, Larsa and Nippur in the Middle Bronze Age and Babylon, Calah and Assur in the Late Bronze Age similarly had large populations.

The Akkadian Empire (2335–2154 BCE) became the dominant power in the region, and after its fall the Sumerians enjoyed a renaissance with the Neo-Sumerian Empire. Assyria was extant from as early as the 25th century BCE, and became a regional power with the Old Assyrian Empire (Ca. 2025–1750 BCE).

The earliest mention of Babylon appears on a tablet from the reign of Sargon of Akkad in the 23rd century BCE. The Amorite dynasty established the city-state of Babylon in the 19th century BCE. Akkad, Assyria, and Babylonia all used the written East Semitic Akkadian language for official use and as a spoken language.

By that time, the Sumerian language was no longer spoken, but was still in religious use in Assyria and Babylonia, and would remain so until the 1st century CE. The Akkadian and Sumerian traditions played a major role in later Assyrian and Babylonian culture, even though Babylonia itself was founded by non-native Amorites and often ruled by other non-indigenous peoples, such as Kassites, Arameans and Chaldeans, as well as its Assyrian neighbors.

3.3.2 Significant Achievements of the Mesopotamian Civilization

A considerable quantity of written record of ancient Sumer and Babylon (Ca.3000-1600 BCE) has been discovered mainly in the form of clay tablets. The Sumerian king list provides an excellent example of annals recording information for future use. It is very useful to the modern scholars for dating purposes as well as it offers stoical insights in to the way the Sumerian conceived the exercise of power, for instance the terminology of rank that they used. Besides, the inscriptions on royal statues help us perceive how the Sumerians viewed the relationship between their rulers and the immortals.

However, of even greater significance for an understanding of the structure of Sumerian society are the tablets associated with the working or organizing centers which in Sumerian society were often temples. For example the 1600 tablets from the temple of Bau at Tello give a close insight into the dealing of the shire, listing fields and the crops harvested in them, craftspeople and receipts or issues of goods such as grain and livestock. But perhaps the most important of all are the law codes, of which the most impressive example is the law code of Hammurabi of Babylon written in the Akkadian language and in cuneiform script dating about 1750 BCE.

Agriculture throughout the region has been supplemented by nomadic pastoralism, where tent-dwelling nomads herded sheep and goats (and later camels) from the river pastures in the dry summer months, out into seasonal grazing lands on the desert fringe in the wet winter season. The area is generally lacking in building stone, precious metals and timber, and so historically has relied upon long-distance trade of agricultural products to secure these items from outlying areas. In the marshlands to the south of the area, a complex water-borne fishing culture has existed since prehistoric times, and has added to the cultural mix.

Periodic breakdowns in the cultural system have occurred for a number of reasons. The demands for labor have from time to time led to population increases that push the limits of the ecological carrying capacity, and should a period of climatic instability ensue, collapsing central government and declining populations can occur. Alternatively, military vulnerability to invasion from marginal hill tribes or nomadic pastoralists has led to periods of trade collapse and neglect of irrigation systems. Equally, centripetal tendencies amongst city states has meant that central authority over the whole region, when imposed, has tended to be ephemeral, and localism has fragmented power into tribal or smaller regional units.

The Mesopotamian people invented many technologies including metal and copper-working, glass and lamp making, textile weaving, flood control, water storage, and irrigation. They were also one of the first Bronze Age societies in the world. They developed from copper, bronze, and gold on to iron. Palaces were decorated with hundreds of kilograms of these very expensive metals. Also, copper, bronze and iron were used for armor as well as for different weapons such as swords, daggers, spears and maces.

Irrigated agriculture spread southwards from the Zagros foothills with the Samara and Hadji Muhammed culture, from about 5,000 BCE. The Sumerian temples functioned as banks and developed the first large-scale system of loans and credit, but the Babylonians developed the earliest system of commercial banking.

In the early period down to Ur III temples owned up to one third of the available land, declining over time as royal and other private holdings increased in frequency. The word Ensi was used to describe the official who organized the work of all facets of temple agriculture. Villeins are known to have worked most frequently within agriculture, especially in the grounds of temples or palaces.

The geography of southern Mesopotamia is such that agriculture is possible only with irrigation and good drainage, a fact which has had a profound effect on the evolution of early Mesopotamian civilization. The need for irrigation led the Sumerians, and later on the Akkadians, to build their cities along the Tigris and Euphrates and the branches of these rivers. The cities, such as Ur and Uruk, took root on tributaries of the Euphrates, while others, notably Lagash, were built on branches of the Tigris. The rivers provided the further benefits of fish, reeds and clay for building materials.

The Tigris and Euphrates River valleys form the northeastern portion of the Fertile Crescent, which also included the Jordan River valley and that of the Nile. Although land nearer to the rivers was fertile and good for crops, portions of land farther from the water were dry and largely uninhabitable. This is why the development of irrigation was very important for settlers of Mesopotamia. The other Mesopotamian innovations include the control of water by dams and the use of aqueducts. The early settlers of fertile land in Mesopotamia used wooden plows to soften the soil before planting crops such as barley, onions, grapes, turnips and apples. Mesopotamian settlers were some of the first people to make

beer and wine. As a result of the skill involved in farming in the Mesopotamian, farmers did not depend on slaves to complete farm work for them, but there were some exceptions. Although the rivers sustained life, they also destroyed it by frequent floods that ravaged entire cities. The unpredictable Mesopotamian weather was often hard on farmers; crops were often ruined so backup sources of food such as cows and lambs were also kept.

The art of Mesopotamia rivaled that of Ancient Egypt as the most sophisticated and elaborate in western Eurasia from the 4th millennium BCE until the Persian Achaemenid Empire conquered the region in the 6th century BCE. The main emphasis was on various, very durable, forms of sculpture in stone and clay; little painting has survived, but what has suggests that painting was mainly used for geometrical and plant-based decorative schemes, though most sculpture was also painted.

The Proto-literate period, dominated by Uruk, saw the production of sophisticated works like the Warka Vase and cylinder seals. The Guennol Lioness is an outstanding small limestone figure from Elam of about 3000–2800 BCE, part man and part lion. The sculptures from the Sumerian and Akkadian period generally had large, staring eyes and long beards on the men. Many masterpieces have also been found at the Royal Cemetery at Ur (Ca. 2650 BCE).

From the many subsequent periods before the ascendancy of the Neo-Assyrian Empire Mesopotamian art survives in a number of forms: cylinder seals, relatively small figures in the round, and reliefs of various sizes, including cheap plaques of moulded pottery. The Burney Relief is an unusual elaborate and relatively large terracotta plaque of a naked winged goddess with the feet of a bird of prey, and attendant owls and lions. The stone stelae, votive offerings, or ones probably commemorating victories and showing feasts, are also found from temples.

The conquest of the whole of Mesopotamia and much surrounding territory by the Assyrians created a larger and wealthier state than the region had known before. The Assyrians developed a style of extremely large schemes of very finely detailed narrative low reliefs in stone for palaces, with scenes of war or hunting. They produced very little sculpture in the round, even before dominating the region they had continued the cylinder seal tradition with designs which are often exceptionally energetic and refined. The study of ancient Mesopotamian architecture is based on available archaeological evidence, pictorial representation of buildings, and texts on building practices. The scholarly literature usually concentrates on temples, palaces, city walls and gates, and other monumental buildings, but occasionally one finds works on residential architecture as well. The brick is the dominant material, as the material was freely available locally, whereas building stone had to be brought a considerable distance to most cities. The ziggurat is the most distinctive form, and cities often had large gateways, of which the Ishtar Gate from Neo-Babylonian Babylon, decorated with beasts in polychrome brick, is the most famous.

The most notable architectural remains from early Mesopotamia are the temple complexes at Uruk from the 4th millennium BCE, temples and palaces from the Early Dynastic period sites in the Diyala River valley such as Khafajah and Tell Asmar, the Third Dynasty of Ur remains at Nippur and Ur, Middle Bronze Age remains at Syrian-Turkish sites of Ebla, Mari, Alalakh, Aleppo and Kultepe, Late Bronze Age palaces at Bogazkoy (Hattusha), Ugarit, Ashur and Nuzi, Iron Age palaces and temples at Assyrian (Kalhu/Nimrud, Khorsabad, Nineveh), Babylonian (Babylon), Urartian (Tushpa/Van, Kalesi, Cavustepe, Ayanis, Armavir, Erebuni, Bastam) and Neo-Hittite sites (Karkamis, Tell Halaf, Karatepe).

The houses are mostly known from Old Babylonian remains at Nippur and Ur. The textual sources on building construction and associated rituals are Gudea's cylinders dated from the late 3rd millennium are however, notable, as well as the Assyrian and Babylonian royal inscriptions from the Iron Age.

3.4 Chinese Civilization

The ancient China had created one of the greatest human civilizations in the world. The Great Wall of China, the Terracotta Army, the Forbidden City and many other achievements are known to the whole world as the best representatives of Chinese civilization. The Chinese people have created a splendid civilization during a long process of historical evolution from Da Yu control of the floods to the “four great inventions” i.e compass, papermaking, printing and gun powder. It has continuous recorded history of nearly 4000 years. In China, cultivated rice and millet as well as farming tools have been found from Hemudu ruins in Yuyao, Zhejiang Province and the Banpo ruins near Xi'an in Shaanxi Province. These relics of the past date back 6000 to 7000 years ago.

China's earliest dynasty appeared over 4000 years ago-the Xia Dynasty (Ca.2070-1600 BCE). During the Shang Dynasty (1600-1046 BCE) iron tools came into use. Zhou Dynasty (1046-256 BCE) witnessed the emergence of steel production technology. During the Spring and Autumn and the Warring States period (770-221 BCE) there was a great upsurge of intellectual activity, producing many famous philosophers and military strategists. During this and later periods, the agriculture, handicrafts, as well as commerce flourished and textile, dying, ceramic and smelting technologies were developed. During the Han Dynasty (206 BCE-220 CE) the great “Silk Roads” from Chang'an (Xi'an) through today's Xijiang and Central Asia and on to the eastern shores of the Mediterranean was

commenced. All types of Chinese goods including silks and porcelains were traded along the Silk Road.

3.4.1 Significance of Bronze Age Culture in China

In China, the earliest bronze artifacts have been found in the Majiayao culture site during the period about 3100-2700 BCE. The "Early Bronze Age" in China is sometimes taken as equivalent to the "Shang Dynasty" period of Chinese prehistory about 16th-11th centuries BCE), and the "Later Bronze Age" as equivalent to the "Zhou dynasty" period around 11th-3rd Century BCE. Although there is an argument to be made that the "Bronze Age" proper never ended in China, as there is no recognizable transition to an "Iron Age". Significantly, together with the jade art that precedes it, bronze was seen as a "fine" material for ritual art when compared with iron or stone, a stone only becoming popular for tombs in the Han on probable Indian influence.

The Bronze metallurgy in China originated in what is referred to as the Erlitou period, which some historians argue places it within the range of dates during the Shang dynasty.

The widespread use of bronze in Chinese metallurgy and culture dates to significantly later, probably due to Western influence. While there may be a reason to believe that bronze work developed inside China separately from outside influence, the discovery of Europoid mummies in Xinjiang suggests a possible route of transmission from the West beginning in the early second millennium BCE. This is, however, still just speculation since there is a lack of direct evidence. The Shang dynasty of the Yellow River Valley rose to power after the Xia dynasty around 1600 BCE, while some direct information about the Shang dynasty comes from Shang-era inscriptions on bronze artifacts, most

comes from oracle bones – turtle shells, cattle scapulae, or other bones – which bear glyphs that form the first significant corpus of recorded Chinese characters.

Iron is found from the Zhou dynasty, but its use is very nominal. The Chinese literature dating to the 6th century BCE attests knowledge of iron smelting, yet bronze continues to occupy the seat of significance in the archaeological and historical record for some time after this achievement. Historian W.C. White argues that iron did not displace bronze "at any period before the end of the Zhou dynasty (256 BCE)" and that bronze vessels make up the majority of metal vessels through the Later Han period, or to 221 BCE.

The Chinese bronze artifacts generally are either utilitarian, like spear points or adze heads, or "ritual bronzes", which are more elaborate versions in precious materials of everyday vessels, as well as tools and weapons. Examples are the numerous large sacrificial tripods known as dings in Chinese. The surviving identified Chinese ritual bronzes tend to be highly decorated, often with the motif, which involves highly stylized animal faces. These appear in three main motif types: those of demons, of symbolic animals and abstract symbols. There are many large bronzes also bear cast inscriptions that have helped historians and archaeologists to piece together the history of China, especially during the Zhou dynasty (1046–256 BCE).

3.4.2 Peculiarity of Chinese Civilization

The specific cultural regions that developed Chinese civilization were the Yellow River civilization, the Yangtze civilization, and Liao civilization. Early evidence for Chinese millet agriculture is dated to around 7000 BCE, with the earliest evidence of cultivated rice found at Chengtoushan near the Yangtze River, dated to 6500 BCE. Chengtoushan may also be the site of the first walled city in China. By the beginning of the Neolithic Revolution, the Yellow River valley began to

establish itself as a center of the Peiligang culture which flourished from 7000 to 5000 BCE, with evidence of agriculture, constructed buildings, pottery and burial of the dead. With agriculture came increased population, the ability to store and redistribute crops, and the potential to support specialist craftsmen and administrators. Its most prominent site is Jiahu. Some scholars have suggested that the Jiahu symbols (6600 BCE) are the earliest form of proto-writing in China. However, it is likely that they should not be understood as writing itself, but as features of a lengthy period of sign-use which led eventually to a fully-fledged system of writing.

The archaeologists believe that the Peiligang culture was egalitarian, with little political organization. It would eventually evolve into the Yangshao culture (5000 to 3000 BC), and their stone tools were polished and highly specialized. They may also have practiced an early form of silkworm cultivation. The main food of the Yangshao people was millet, with some sites using foxtail millet and others broom-corn millet, though some evidence of rice has been found. The exact nature of Yangshao agriculture, small-scale slash-and-burn cultivation versus intensive agriculture in permanent fields, is currently a matter of debate. Once the soil was exhausted, residents picked up their belongings, moved to new lands, and constructed new villages. However, Middle Yangshao settlements such as Jiangzhi contain raised-floor buildings that may have been used for the storage of surplus grains. Grinding stones for making flour were also found.

Later, Yangshao culture was superseded by the Longshan culture, which was also centered on the Yellow River from about 3000 to 1900 BCE, its most prominent site being Taosi. The population expanded dramatically during the 3rd millennium BCE, with many settlements having rammed earth walls. It decreased in most areas around 2000 BCE until the central area evolved into the Bronze Age

Erlitou culture. The earliest bronze artifacts have been found in the Majiayao culture site (3100 to 2700 BCE).

3.4.3 Cultural Significance of the Chinese Civilization

Chinese civilization embarks on during the second phase of the Erlitou period (1900 to 1500 BCE), with Erlitou considered the first state level society of East Asia. There is considerable debate whether Erlitou sites correlate to the semi-legendary Xia dynasty. The Xia dynasty (2070 to 1600 BCE) is the first dynasty to be described in ancient Chinese historical records such as the Bamboo Annals, first published more than a millennium later during the Western Zhou period. Although Xia is an important element in Chinese historiography, there is to date no contemporary written evidence to corroborate the dynasty. Erlitou saw an increase in bronze metallurgy and urbanization and was a rapidly growing regional center with palatial complexes that provide evidence for social stratification.

The Erlitou civilization is divided into four phases, each of roughly 50 years. During Phase I, covering 100 hectares (250 acres), Erlitou was a rapidly growing regional center with estimated population of several thousand, but not yet an urban civilization or capital. Urbanization began in Phase II, expanding to 300 ha (740 acres) with a population around 11,000. A palace area of 12 ha (30 acres) was demarcated by four roads. It contained the 150x50 m Palace 3, composed of three courtyards along a 150-meter axis, and Palace 5. A bronze foundry was established to the south of the palatial complex that was controlled by the elite who lived in palaces. The city reached its peak in Phase III, and may have had a population of around 24,000. The palatial complex was surrounded by a two-meter-thick rammed-earth wall, and Palaces 1, 7, 8, 9 were built.

The earthwork volume of rammed earth for the base of largest Palace 1 is 20,000 m³ at least. Palaces 3 and 5 were abandoned and replaced by 4,200-square-kilometer (4.5×10¹⁰ sq ft) Palace 2 and Palace 4. In Phase IV, the population decreased to around 20,000, but building continued. Palace 6 was built as an extension of Palace 2, and Palaces 10 and 11 were built. Phase IV overlaps with the Lower phase of the Erligang culture (1600–1450 BCE).

Around 1600 to 1560 BCE, about 6 km northeast of Erlitou, Eligang cultural walled city was built at Yanshi, which coincides with an increase in production of arrowheads at Erlitou. This situation might indicate that the Yanshi City was competing for power and dominance with Erlitou. Production of bronzes and other elite goods ceased at the end of Phase IV, at the same time as the Erligang city of Zhengzhou was established 85 km (53 mi) to the east. There is no evidence of destruction by fire or war, but, during the Upper Erligang phase (1450–1300 BCE), all the palaces were abandoned.

The earliest traditional Chinese dynasty for which there is both archeological and written evidence is the Shang dynasty (1600 to 1046 BCE). The Shang sites have yielded the earliest known body of Chinese writing, the oracle bone script, mostly divinations inscribed on bones. These inscriptions provide critical insight into many topics from the politics, economy and religious practices to the art and medicine of this early stage of Chinese civilization. A few historians argue that Erlitou should be considered an early phase of the Shang dynasty. The Chinese Bronze Age is described as the period between about 2000 and 771 BCE; a period that begins with the Erlitou culture and ends abruptly with the disintegration of Western Zhou rule. The Sanxingdui culture is another Chinese Bronze Age society, contemporaneous to the Shang dynasty, however they developed a different method of bronze-making from the Shang. A bronze-foundry site (Ca. 500 BCE) in Shaanxi Province has yielded over 30,000 items including piece-

mold, clay models and cores. The Chinese perfected the system of piece-molding quite early in on, already at the time of the Shang Dynasty around 1500 BCE. As with most of the finest early bronze-working the principle was that of lost-wax casting. The extraordinary works of craftsmanship were created by the Chinese in this way.

In China, the Qin dynasty (221–206 BCE), which is considered as the first imperial dynasty of China, was followed by the Han Empire (206 BCE – 220 CE). The Han Dynasty was comparable in power and influence to the Roman Empire that lay at the other end of the Silk Road. Han China developed advanced cartography, shipbuilding, and navigation. The Chinese invented blast furnaces, and created finely tuned copper instruments. As with other empires during the Classical Period, Han China advanced significantly in the areas of government, education, mathematics, astronomy, technology, and many others.

After the fall of the Eastern Han Dynasty and the demise of the Three Kingdoms, nomadic tribes from the north began to invade during the 4th century, eventually conquering areas of northern China and setting up many small kingdoms. The Sui Dynasty successfully reunified the whole of China in 581, and laid the foundations for a Chinese golden age under the Tang dynasty (618–907). China experienced the successive Sui, Tang, Song, Yuan, and early Ming dynasties. Middle Eastern trade routes along the Indian Ocean, and the Silk Road through the Gobi Desert, however, provided limited economic and cultural contact between Asian and European civilizations.

After a period of relative disunity, China was reunified by the Sui dynasty in 581 and under the succeeding Tang dynasty (618–907) China entered a Golden Age. The Tang Empire competed with the Tibetan Empire for control of areas in Inner and Central Asia. The Tang dynasty eventually wrecked. The Mongol Empire

conquered all of China in 1279, along with almost half of Eurasia's landmass. After about a century of Mongol Yuan dynasty rule, the ethnic Chinese reasserted control with the founding of the Ming dynasty (1368).

It is not a denying fact that the longest consistent civilization in the human story so far is that of China. This vast eastern empire seems set apart from the rest of the world, fiercely proud of its own traditions, resisting foreign influences. Its history begins in a characteristically independent manner. There are no identifiable precedents for the civilization of the Shang dynasty, which emerges in China in about 1600 BCE. Its superb bronze vessels seem to achieve an instant technological perfection; its written texts introduce characters recognizably related to Chinese writing even today.

Self Assessment Questions

- Q. No. 1:** What do you know about the origin & development of world ancient civilizations? Discuss.
- Q. No. 2:** How does ancient civilizations contribute to the history of that particular region? Discuss.
- Q. No. 3:** Can you explain & highlight the history and discovery of Egyptian Civilization?
- Q. No. 4:** Highlight the art and architecture of Egyptian Civilization in light of readings materials.
- Q. No. 5:** What do you know about Mesopotamian Civilization? Discuss in detail.
- Q. No. 6:** Discuss the different features of Bronze Age culture of Mesopotamia.
- Q. No. 7:** Evaluate the significant achievements of the Mesopotamian Civilization.
- Q. No. 8:** Discuss the different phases of Chinese Civilization.
- Q. No. 9:** What is the cultural significance of Chinese Civilization? Discuss.

Bibliography

- Allchin, F. R. *Neolithic Cattle-Keepers of South India*, Cambridge, 1963.
- Dani, A. H.(1981). *Indus Civilization—New Perspective*, Islamabad.
- Fairservis, W. A. (1967). *The Origin, Character and Decline of an Early Civilization*.
- Fairservis, W. A. (1975). *The Roots of Ancient India*, 2nd ed., Chicago.
- Gowlett, J.(1984). *Ascent to Civilization: The Archaeology of Early Man*. Collins: London.
- Gupta, S. P. (1979). *Archaeology of Soviet Central Asia and the Indian Borderland*, Vols.I & II, Delhi.
- Jacobson, J., (1986) ed., *Studies in the Archaeology of India and Pakistan*, New Delhi.
- Kenoyer, M. (1998). *Ancient Cities of the Indus Valley Civilization*, Oxford.
- Lal, B. B. (1997). *The Earliest Civilization of South Asia*, New Delhi.

UNIT. 4

EARLY URBANIZATION IN PAKISTAN

Written by: Dr. Tahir Saeed
Reviewed by: Dr. Badshah Sardar

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Introduction

As we know that earliest civilizations of the world were flourished in the valleys of Nile in Egypt, Tigris-Euphrates in Mesopotamia, and Indus in Pakistan. Till very recently it was believed that out of these riverine civilizations, Indus was the youngest and even with its political vastness and cultural homogeneity, it received least attention. The major reason for this has been the absence of such evidences which could prove that Indus Civilization was the mature stage of that cultural progression which started earlier in Baluchistan. In absence of such evidence students of ancient history were made to believe that Indus Civilization was intended to outside influence of the obvious fact that the Indus valley geographically lies in the highly probable sphere of interaction of two earliest civilizations of Mesopotamia and Egypt.

In antiquity the Indus Valley resembled Mesopotamia, Susiana and Egypt in being an alluvial plain which was watered jointly the the Indus and the five rivers of the Panjab. But in areas, the Indus Valley was more extensive than the Tigris-Euphrates civilizations, the Karun valley in the western province of Khuzistan in Iran or the Nile Valley, being roughly 1000 miles in length from north to south and more than 300 miles broad.

Hence this unit provides you those missing links which were required to complete the human sequence in the Indus Valley and the Sub-continent. This unit endeavored to trace the origin and development of human cultures and civilizations of the Sub-continent from its earliest roots in Stone Age to urbanism, but the students still need to study this phenomenon in its continuity. By reading this unit students would be able to understand cultural progression in Indus

system today's Pakistan, from earliest agricultural communities in Baluchistan to a complex urban Indus culture.

Objectives: After through study this unit, the student will be able to understand the following;

- to create a public consciousness about ancient period urbanization process.
- to understand human past and evolutionary process that mankind underwent through ages
- to trace the growth and development of ancient culture and civilization in sub-continent
- to aware students about Bronze Age culture and its relics
- to arouse student's interest in the history, antiquities and monuments of the Indus Valley civilizations.
- to examine analytically different stages of the Indus civilization
- to give insight to the student an in-depth understanding about the decline of Indus civilization.

4. Early Urbanization in Pakistan

4.1 Origin and Developments of Urbanization in the Sub-continent

According to the Oxford English Dictionary, the term "subcontinent" signifies a "subdivision of a continent which has a distinct geographical, political, or cultural identity" and also a "large land mass somewhat smaller than a continent". Geographically the Indian subcontinent is a region in southern Asia, which is situated on the Indian Plate and projecting southwards into the Indian Ocean from the Himalayas. The Indian subcontinent is related to the landmass that rifted from the supercontinent Gondwana during the Cretaceous and merged with the Eurasian landmass nearly 55 million years ago. It is the peninsular region in south-central Asia, delineated by the Himalayas in the north, the Hindu Kush in the west and the Arakanese in the east.

Geopolitically, the Indian subcontinent includes all or part of present Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka, as well as the country of Maldives. The Indian subcontinent as a term has been particularly common in the British Empire and its successors, while the term "South Asia" is the more common usage in Europe and North America. The region has also been called the "Asian subcontinent", the "South Asian subcontinent", or the "Indo-Pak subcontinent".

It is estimated that the modern humans first arrived on the Indian subcontinent from Africa between 73,000 and 55,000 years ago. However, the earliest known human remains in Pakistan date to 2.5 million years ago with the discovery of stone tools made by proto-humans in the Soan River valley, at Rewat and in the Pabbi Hills, in Pakistan. The oldest hominin fossil remains in the Indian subcontinent are those of *Homo erectus* or *Homo heidelbergensis*, found from the Narmada Valley in central India, and are dated to approximately half a million years ago. The settled life, which involves the transition from foraging to farming

and pastoralism, began in Mehrgarh, Balochistan around 7,000 BCE. At the site of Mehrgarh, presence of the wheat and barley, rapidly followed by that of goats, sheep, and cattle is evident. By 4,500 BCE, settled life had spread more widely and began to gradually evolve into the Indus Valley Civilization, an early civilization of the Old world, which was contemporaneous with Ancient Egypt and Mesopotamia. This civilization flourished between 2,500 BCE and 1900 BCE in what today is Pakistan and north-western India and was noted for its urban planning, baked brick houses, elaborate drainage, and water supply.

In the early second millennium BCE, persistent drought caused the population of the Indus Valley to scatter from large urban centers to villages. Around the same time, Indo-Aryan tribes moved into the Punjab from regions further northwest in several waves of migration. The resulting Vedic period was marked by the composition of the Vedas, large collections of hymns of these tribes whose postulated religious culture, through synthesis with the preexisting religious cultures of the subcontinent, gave rise to Hinduism. The concept of Varna, a social grouping system which divided people into different groups based on their occupations and abilities, such as priests, warriors, merchants, and tradesmen, was created during this time.

Towards the end of this period, around 600 BCE, after the pastoral and nomadic Indo-Aryans spread from the Punjab into the Gangetic plain, large swaths of which they deforested to pave way for agriculture, a second urbanization took place. The small Indo-Aryan chieftaincies, or janapadas, were consolidated into larger states. The urbanization was accompanied by the rise of new ascetic movements in Greater Magadha, including Jainism and Buddhism. These movements gave rise to new religious concepts, which opposed the growing influence of Brahmanism and the primacy of rituals, presided by the Brahmin priests that had come to be associated with Vedic religion.

Most of the Indian subcontinent was conquered by the Maurya Empire, during the 4th and 3rd centuries BCE. From the 3rd century BCE onwards, Prakrit and Pali literature in the north and the Tamil Sangam literature in southern India started to flourish. During the Classical period, various parts of India were ruled by numerous dynasties for the next 1,500 years, among which the Gupta Empire stands out. This period, witnessing a Hindu religious and intellectual resurgence, is known as the classical or Golden Age of India. During this period, many aspects of Indian civilization, administration, culture, and religion of Hinduism and Buddhism, spread to much of Asia, while kingdoms in southern India began to have maritime business links with the Middle East and the Mediterranean.

The most significant event between the 7th and 11th centuries was the Tripartite struggle centered on Kannauj that lasted for more than two centuries between the Pala Empire, Rashtrakuta Empire, and Gurjara-Pratihara Empire. Southern India saw the rise of multiple imperial powers from the middle of the fifth century, most notably the Chalukya, Chola, Pallava, Chera, Pandyan, and Western Chalukya Empires. The Chola dynasty conquered southern India and successfully invaded parts of Southeast Asia, Sri Lanka, the Maldives, and Bengal in the 11th century.

The Islamic conquests introduced new cultural traits as early as the 8th century, followed by the invasions of Mahmud Ghazni. The Delhi Sultanate was founded in 1206 CE by Central Asian Turks who ruled a major part of the northern Indian subcontinent in the early 14th century, but declined in the late 14th century, and saw the advent of the Deccan Sultanates. The wealthy Bengal Sultanate also emerged as a regional and diplomatic power, lasting over three centuries. This period saw the emergence of several powerful Hindu states, notably Vijayanagara, Gajapati, and Ahom, as well as Rajput states, such as Mewar. The 15th century saw the advent of Sikhism.

The early modern period began in the 16th century, when the Mughal Empire conquered most of the Indian subcontinent, becoming the biggest global economy and manufacturing power, with a nominal GDP that valued a quarter of the world GDP, superior to the combination of Europe's GDP. The Mughals suffered a gradual decline in the early 18th century, which provided opportunities for the Marathas, Sikhs, Mysoreans, and Nawabs of Bengal to exercise control over large regions of the Indian subcontinent.

From the mid-18th century to the mid-19th century, large regions of Indian subcontinent were gradually annexed by the East India Company, a chartered company, acting as a sovereign power on behalf of the British government. Dissatisfaction with the Company rule in India led to the Indian Rebellion of 1857, which rocked parts of north and central India, and led to the dissolution of the company. The country was afterward ruled directly by the British Crown, in the British Raj. After World War I, a nationwide struggle for independence was launched by the Indian National Congress, led by Mahatma Gandhi, and noted for nonviolence. Later, the All-India Muslim League would advocate for a separate Muslim-majority nation-state. The British Indian Empire was partitioned in August 1947 into the Dominion of India (present day Republic of India) and Dominion of Pakistan (present day Islamic Republic of Pakistan).

According to Michael Fisher, "Scholars estimate that the first successful expansion of the Homo sapiens range beyond Africa and across the Arabian Peninsula occurred from as early as 80,000 years ago to as late as 40,000 years ago, although there may have been prior unsuccessful emigrations. Some of their descendants extended the human range ever further in each generation, spreading into each habitable land they encountered. One human channel was along the warm and productive coastal lands of the Persian Gulf and northern Indian Ocean. Eventually, various bands entered India between 75,000 years ago and 35,000

years ago." Further, the Archaeological evidence has been interpreted to suggest the presence of anatomically modern humans in the Indian subcontinent 78,000–74,000 years ago.

During the Neolithic period, the settled life emerged on the subcontinent in the western margins of the Indus river alluvium approximately 9,000 years ago, evolving gradually into the Indus valley civilization of the third millennium BCE. By 7,000 years ago agriculture was firmly established in Baluchistan and over the next 2,000 years, the practice of farming slowly spread eastwards into the Indus valley. The earliest settled agricultural society was at Mehrgarh in the hills between the Bolan Pass and the Indus plain. From as early as 7000 BCE, communities there started investing increased labor in preparing the land and selecting, planting, tending, and harvesting particular grain-producing plants. They also domesticated animals, including sheep, goats, pigs, and oxen.

4.2 Bronze Age Culture

The Bronze Age is a historical period that was characterized by the use of bronze, in some areas proto-writing and other early features of urban civilization. The Bronze Age is the second principal period of the three-age i.e. Stone-Bronze-Iron system, for classifying and studying ancient societies. An ancient civilization is defined to be in the Bronze Age either by producing bronze by smelting its own copper and alloying with tin, arsenic, or other metals, or by trading for bronze from production areas elsewhere. Bronze itself is harder and more durable than other metals available at the time, allowing Bronze Age civilizations to gain a technological advantage. The overall period is characterized by widespread use of bronze, though the place and time of the introduction and development of bronze technology were not universally synchronous. Human-made tin bronze technology requires set production techniques. Tin must be mined and smelted

separately, then added to hot copper to make bronze alloy. The Bronze Age was a time of extensive use of metals and of developing trade networks.

The first urbanization (Ca. 3300 – c. 1800 BCE)

Indus Valley Civilization

The Bronze Age in the Indian subcontinent began around 3300 BCE. Along with Ancient Egypt and Mesopotamia, the Indus valley region was one of three early cradles of civilization of the Old World. Of the three, the Indus Valley Civilization was the most expansive, and at its peak, may have had a population of over five million.

The civilization was primarily centered in modern-day Pakistan, in the Indus river basin, and secondarily in the Ghaggar-Hakra river basin in eastern Pakistan and northwestern India. The Mature Indus civilization flourished from about 2600 to 1900 BCE, marking the beginning of urban civilization on the Indian subcontinent. The civilization included cities such as Harappa, Ganeriwala, and Mohenjo-daro in modern-day Pakistan, and Dholavira, Kalibangan, Rakhigarhi, and Lothal in modern-day India.

Inhabitants of the ancient Indus river valley, the Harappans, developed new techniques in metallurgy and handicraft (carneol products, seal carving), and produced copper, bronze, lead, and tin. The civilization is noted for its cities built of brick, roadside drainage system, and multi-story houses and is thought to have had some kind of municipal organization.

Second urbanization (800–200 BCE)

During the time between 800 and 200 BCE the Śramaṇa movement formed, from which originated Jainism and Buddhism. In the same period, the first Upanishads

were written. After 500 BCE, the so-called "second urbanization" started, with new urban settlements arising at the Ganges plain, especially the Central Ganges plain.

The foundations for the "second urbanization" were laid prior to 600 BCE, in the Painted Grey Ware culture of the Ghaggar-Hakra and Upper Ganges Plain; although most of these sites were small farming villages, "several dozen" PGW sites eventually emerged as relatively large settlements that can be characterized as towns, the largest of which were fortified by ditches or moats and embankments made of piled earth with wooden palisades, albeit smaller and simpler than the elaborately fortified large cities which grew after 600 BCE in the Northern Black Polished Ware culture.

The Central Ganges Plain, where Magadha gained prominence, forming the base of the Mauryan Empire, was a distinct cultural area, with new states arising after 500 BCE during the so-called "second urbanization". It was influenced by the Vedic culture, but differed markedly from the Kuru-Panchala region. It "was the area of the earliest known cultivation of rice in South Asia and by 1800 BCE was the location of an advanced Neolithic population associated with the sites of Chirand and Chechar".

4.3.1 Indus Valley Civilization

From the beginning of the 4th millennium BCE, the individuality of the early village cultures began to be replaced by a more homogenous style of existence. By the middle of the 3rd millennium, a uniform culture had developed at settlements spread across nearly 500,000 square miles, including parts of Punjab, Sindh, Balochistan, coastal area of Makran and Indian Territory of Uttar Pradesh, and Gujarat. This earliest known civilization in the Sub-Continent, the starting point in its history, dates back to about 3000 BCE. Discovered in the 1920s, it was

thought to have been confined to the valley of the river Indus; hence the name given to it was Indus Valley civilization. This civilization was a highly developed urban one and two of its main cities, Moenjodaro and Harappa, represent the high watermark of the settlements. Subsequent archaeological excavations established that the contours of this civilization were not restricted to the Indus valley but spread to a wide area beyond the alluvial plains of Indus River.

The emergence of this civilization is as remarkable as its stability for nearly a thousand years. All the cities were well planned and were built with baked bricks of the same size; the streets were laid at right angles with an elaborate system of covered drains. There was a fairly clear division of localities and houses were earmarked for the upper and lower strata of society. There were also public buildings, the most famous being the Great Bath at Moenjodaro and the vast granaries. Production of several metals such as copper, bronze, lead and tin was also undertaken and some remnants of furnaces provide evidence of this fact. The discovery of kilns to make bricks support the fact that burnt bricks were used extensively in domestic and public buildings.

Evidence also points to the use of domesticated animals, including cows, goats, water buffaloes and fowls. The Harappans cultivated wheat, barley, peas and were probably the first to grow and make clothes from cotton. Trade seemed to be a major activity at the Indus Valley and the sheer quantity of pictographic steatite seals discovered suggest that each merchant or mercantile family owned its own seal. These seals are in various quadrangular shapes and sizes, each with a human or an animal figure carved on it. Discoveries suggest that the Harappan civilization had extensive trade relations with the neighboring regions in India and with distant lands in the Persian Gulf and Iraq.

The Harappan society was probably divided according to occupations and this also suggests the existence of an organized government. The figures of deities on seals indicate that the Harappans worshipped gods and goddesses in male and female forms and has also evolved some rituals and ceremonies. No monumental sculpture survives, but a large number of human figurines have been discovered, including a steatite bust of a man thought to be a priest, and a striking bronze dancing girl. Countless terra-cotta statues of Mother Goddess have been discovered suggesting that she was worshipped in nearly every home.

4.3.1 Discovery of Indus Valley Civilization

The first modern recorded accounts of the ruins of the Indus civilization are those of Charles Masson, a deserter from the East India Company's army. In 1829, Masson traveled through the princely state of Punjab, gathering useful intelligence for the Company in return for a promise of clemency. An aspect of this arrangement was the additional requirement to hand over to the Company any historical artifacts acquired during his travels. Masson, who had versed himself in the classics, especially in the military campaigns of Alexander the Great, chose for his wanderings some of the same towns that had featured in Alexander's campaigns, and whose archaeological sites had been noted by the campaign's chroniclers.

Masson's major archaeological discovery in the Punjab was Harappa, a metropolis of the Indus civilization in the valley of Indus's tributary, the Ravi River. Masson made copious notes and illustrations of Harappa's rich historical artifacts, many lying half-buried. In 1842, Masson included his observations of Harappa in the book *Narrative of Various Journeys in Baluchistan, Afghanistan, and the Punjab*. He dated the Harappa ruins to a period of recorded history, erroneously mistaking it to have been described earlier during Alexander's campaign. Masson was

impressed by the site's extraordinary size and by several large mounds formed from long-existing erosion. Two years later, the Company contracted Alexander Burnes to sail up the Indus to assess the feasibility of water travel for its army. Burnes, who also stopped in Harappa, noted the baked bricks employed in the site's ancient masonry, but noted also the haphazard plundering of these bricks by the local population.

Despite these reports, Harappa was raided even more perilously for its bricks after the British annexation of the Punjab in 1848–49. A considerable number were carted away as track ballast for the railway lines being laid in the Punjab. Nearly 160 km of railway track between Multan and Lahore, laid in the mid 1850's was supported by Harappan bricks.

In 1861, three years after the dissolution of the East India Company and the establishment of Crown rule in India, archaeology on the subcontinent became more formally organized with the founding of the Archaeological Survey of India (ASI). Alexander Cunningham, the Survey's first director-general, who had visited Harappa in 1853 and had noted the imposing brick walls, visited again to carry out a survey, but this time of a site whose entire upper layer had been stripped in the interim. Although his original goal of demonstrating Harappa to be a lost Buddhist city mentioned in the seventh century CE travels of the Chinese visitor, Xuanzang, proved elusive, Cunningham did publish his findings in 1875. For the first time, he interpreted a Harappan stamp seal, with its unknown script, which he concluded to be of an origin foreign to India.

The archaeological work in Harappa thereafter flagged until a new viceroy of India, Lord Curzon, pushed through the Ancient Monuments Preservation Act of 1904, and appointed John Marshall to lead the ASI. Several years later, Hiranand Sastri, who had been assigned by Marshall to survey Harappa, reported it to be of

non-Buddhist origin, and by implication more ancient. Expropriating Harappa for the ASI under the Act, Marshall directed ASI archaeologist Daya Ram Sahni to excavate the site's two mounds.

Farther south, along the main stem of the Indus in Sind province, the largely undisturbed site of Mohenjo-daro had attracted notice. Marshall deputed a succession of ASI officers to survey the site. These included D. R. Bhandarkar (1911), R. D. Banerji (1919, 1922–1923), and M.S. Vats (1924). In 1923, on his second visit to Mohenjo-daro, Banerji wrote to Marshall about the site, postulating an origin in "remote antiquity," and noting a congruence of some of its artifacts with those of Harappa. Later in 1923, Vats, also in correspondence with Marshall, noted the same more specifically about the seals and the script found at both sites. On the weight of these opinions, Marshall ordered crucial data from the two sites to be brought to one location and invited Banerji and Sahni to a joint discussion. By 1924, Marshall had become convinced of the significance of the finds, and on 24 September 1924, made a tentative but conspicuous public intimation in the *Illustrated London News*:

"Not often has it been given to archaeologists, as it was given to Schliemann at Tiryns and Mycenae, or to Stein in the deserts of Turkestan, to light upon the remains of a long forgotten civilization. It looks, however, at this moment, as if we were on the threshold of such a discovery in the plains of the Indus." The systematic excavations began in Mohenjo-daro in 1924–25 with that of K. N. Dikshit, continuing with those of H. Hargreaves (1925–1926), and Ernest J. H. Mackay (1927–1931). By 1931, much of Mohenjo-daro had been excavated, but occasional excavations continued, such as the one led by Mortimer Wheeler, a new Director-General of the ASI appointed in 1944.

After the partition of India in 1947, when most excavated sites of the Indus Valley civilization lay in territory awarded to Pakistan, the Archaeological Survey of India, its area of authority reduced, carried out large numbers of surveys and excavations along the Ghaggar-Hakra system in India. Some speculated that the Ghaggar-Hakra system might yield more sites than the Indus river basin. Now over 1,000 Mature Harappan cities and settlements had been reported, of which just under a hundred had been excavated, mainly in the general region of the Indus and Ghaggar-Hakra rivers and their tributaries; however, there are only five major urban sites: Harappa, Mohenjo-daro, Dholavira, Ganeriwala and Rakhigarhi. It is estimated that about 616 sites have been reported in India, whereas 406 sites have been reported in Pakistan. However, according to an archaeologist, many Ghaggar-Hakra sites in India are those of local cultures; some sites display contact with Harappan civilization, but only a few are fully developed Harappan ones.

Sir Mortimer Wheeler, the Director of ASI from 1944, oversaw the establishment of archaeological institutions in Pakistan, later on joining a UNESCO effort tasked to conserve the site at Mohenjo-daro. The other international efforts at Mohenjo-daro and Harappa have included the German Aachen Research Project Mohenjo-daro, the Italian Mission to Mohenjo-daro, and the US Harappa Archaeological Research Project (HARP) founded by George F. Dales. Following a chance flash flood which exposed a portion of an archaeological site at the foot of the Bolan Pass in Balochistan, excavations were carried out in Mehrgarh by French archaeologist Jean-François Jarrige and his team.

4.3.2 Cultural Significance of Indus Valley Civilization

The Indus Valley Civilization or Harappan Civilization represents one of the world's earliest urban societies of 3rd millennium BCE. The researches have brought out its unique character through detailed studies of its cities and architecture, the organization of technology and trade, its subsistence economy and a wide range of symbolic arts and ornaments etc. At Harappa at least following five major periods of development represent a continuous process of cultural development where new aspects of culture are balanced with long term continuous and linkage in many crafts and artifact styles:-

Period	Chronology/Era	Dated
Period-1	Ravi-Hakra Phase	3300-2800 BCE
Period-II	Early Harappa Phase (Kot Diji)	2800-2600 BCE
Period-III A	Harappa Phase-A	2600-2450 BCE
Period-III B	Harappa Phase-B	2450-2200 BCE
Period-III C	Harappa Phase-C	2200-1900 BCE
Period-IV	Late Harappan (Transitional)	1900-1800 BCE
Period-V	Late Harappan Phase	1800-1300 BCE

The results of the systematic archaeological excavations have revealed the Ravi or Hakra Phase by representing the very initial occupation. Then over time the economic and political importance of this small community resulted in its growth and expansion during the Kot Diji Phase. The excavations of early Ravi and Kot Diji levels (Period-I & II) from different parts of the ancient city have focused on aspects of settlement organization, craft technologies, subsistence activities and various forms of social and political organization. During the Ravi and Kot Diji Phases various aspects of settlement structure, specialized technologies, and

socio-economic networks were developed and became the foundation for later urban structure of the Harappa Phase.

Although the initial urban character of Harappa begins during the Kot Diji Phase but it is in the following Harappa Phase (Period-III) that the settlement became a major urban centre with links to other equally large centers, towns and rural settlements throughout the greater Indus Valley Civilization. Then with the rise of the Indus cities, technology and crafts appear to have become an essential mechanism for creating unique wealth objects to distinguish socio-economic classes and reinforce the hierarchy of the classes in an urban context. The utilization of pictographic seals along with various forms of writing on a wide range of artifacts appears to be directly associated with the need to communicate social or ritual status and for economic control. The limited preserved areas have been identified dating to the Late Harappan Phases (Period-IV & V) which provides information on the nature of the Late Harappan subsistence, architecture and very day life of the people. The Indus Valley Civilization flourished in the basins of the Indus River, which flows through the length of Pakistan, and along a system of perennial, mostly monsoon-fed, rivers that once coursed in the vicinity of the seasonal Ghaggar-Hakra River in northwest India and eastern Pakistan.

The civilization's cities were noted for their urban planning, baked brick houses, elaborate drainage systems, water supply systems, clusters of large non-residential buildings, and new techniques in handicraft (carnelian products, seal carving) and metallurgy (copper, bronze, lead and tin). The large cities of Mohenjo-daro and Harappa very likely grew to containing between 30,000 and 60,000 individuals, and the civilization itself during its florescence may have contained between one and five million individuals.

The Indus civilization is also known as the Harappan Civilization, after its type site, Harappa, the first of its sites to be excavated early in the 20th century in what was then the Punjab province of British India and now is Pakistan. The discovery of Harappa and soon afterwards Mohenjo-daro was the culmination of work beginning in 1861 with the founding of the Archaeological Survey of India during the British Raj. There were however earlier and later cultures often called Early Harappan and Late Harappan in the same area; for this reason, the Harappan civilization is sometimes called the Mature Harappan to distinguish it from these other cultures. The Harappan language is not directly attested, and its affiliation is uncertain since the Indus script is still un-deciphered. A relationship with the Dravidian or Elamo-Dravidian language family is favoured by a section of scholars like leading Finnish Indologist, Asko Parpola.

The Indus Valley Civilization is named after the Indus river system in whose alluvial plains the early sites of the civilization were identified and excavated. Following a tradition in archaeology, the civilization is sometimes referred to as the Harappan, after its type site, Harappa, the first site to be excavated in the 1920s; this is notably true of usage employed by the Archaeological Survey of India after India's independence in 1947.

The geophysical research suggests that unlike the Sarasvati, whose descriptions in the Rig Veda are those of a snow-fed river, the Ghaggar-Hakra was a system of perennial monsoon-fed rivers, which became seasonal around the time that the civilization diminished, approximately 4,000 years ago. In addition, proponents of the Sarasvati nomenclature see a connection between the decline of the Indus civilization and the rise of the Vedic civilization on the Gangetic plain; however, historians of the decline of the mature Indus civilization consider the two to be substantially disconnected.

The Indus civilization was roughly contemporary with the other riverine civilizations of the ancient world: Egypt along the Nile, Mesopotamia in the lands watered by the Euphrates and the Tigris, and China in the drainage basin of the Yellow River and the Yangtze. By the time of its mature phase, the civilization had spread over an area larger than the others, which included a core of 1,500 kilometres (900 mi) up the alluvial plain of the Indus and its tributaries. In addition, there was a region with disparate flora, fauna, and habitats, up to ten times as large, which had been shaped culturally and economically by the Indus.

It is unsurprising that around 6500 BCE, agriculture emerged in Balochistan, on the margins of the Indus alluvium. In the following millennia, settled life made inroads into the Indus plains, setting the stage for the growth of rural and urban human settlements. The more organized sedentary life in turn led to a net increase in the birth rate. The large urban centers of Mohenjo-daro and Harappa very likely grew to containing between 30,000 and 60,000 individuals, and during the civilization's florescence, the population of the subcontinent grew to between 4–6 million people. However, it is believed that during this period the death rate increased as well, for close living conditions of humans and domesticated animals led to an increase in contagious diseases. According to one estimate, the population of the Indus civilization at its peak may have been between one and five million.

The Indus Valley Civilization extended from Pakistan's Balochistan in the west to India's western Uttar Pradesh in the east, from northeastern Afghanistan in the north to India's Gujarat state in the south. The largest number of sites is in Gujarat, Haryana, Punjab, Rajasthan, Uttar Pradesh, Jammu and Kashmir (disputed states between Pak & India) and Sindh, Punjab, and Balochistan provinces in Pakistan. Coastal settlements extended from Sutkagan Dor in Western Baluchistan to Lothal in Gujarat. An Indus Valley site has been found on

the Oxus River at Shortugai in northern Afghanistan, in the Gomol River valley in northwestern Pakistan, at Manda, Jammu on the Beas River near Jammu, India, and at Alamgirpur on the Hindon River, only 28 km (17 mi) from Delhi. The southernmost site of the Indus valley civilization is Daimabad in Maharashtra. Indus Valley sites have been found most often on rivers, but also on the ancient seacoast, for example, Balakot, and on islands, for example, Dholavira. Hence, a long period of cultural evolution eventually led to a fully mature and urbanized stage that is known from the past and recent excavations at Moenjodaro, Harappa, and a number of other sites in the Indus River Valley of Pakistan and adjacent of India.

4.3.3 Salient Features of Indus Valley Civilization

A remarkable cultural pattern such as; urban town planning, as demonstrated at Moenjodaro with streets and lanes lined with public and private buildings and an elaborated drainage system and water management, economic strength of cities, network of exchange of finished and raw material with outside, availability of resources to mobilize labour and construction of large fortification and public buildings like the Great Bath and granaries, these all produce interest for investigation of the unknown mysteries of the Indus Valley Civilization. The recent researches at Dholavira, Lothal, Kalibangan, Harappa and small sites like Alladino have added more details about this Civilization.

Many aspects of the Indus society are being reconstructed based on inferences drawn from divers categories of evidence such as the funerary objects, specialized craft related activities of pottery making of specific shapes and functions, decorative and ritual objects, production of steatite pictographic seals and implements, bronze utensils and weapons of war and standardized weights and measures are worth mentioning. The mass production of standardized articles of daily use, existence of high level of technology, availability of economic surplus

for keeping armies to defend cities and their wealth, creation of an elaborate communication network and an effective political or administrative system over a vast territory did lead to the creation of a sort of pan-Indus cultural integration not approached anywhere in the ancient world.

The Indus Valley Civilization is known for the production of various types of earthen vessels and their decoration by painting or incised designs. The Indus people have continued the typical form of expression of early hunters of pre-harappan phase by adopting the animal style in rock paintings. They were greatly impressed and adopted in their drawing and painting on the pottery and seals. The animal world depiction wild and species as well as domesticated animals were main topic of artisans of early civilizations. The Indus artists also have drawn their skills of portraying such kinds of images from the rock art phase. The skill of the graffiti shows the strength of engraving and that the superimposition of figures must be the outcome of their observations of animal's line drawing of the rock art period.

The main ceramic types of Mature Harappan Period are the large storage jars with straight sides and large mouth with flat extended rims. The other forms are the small jars with a globular body, high neck and disc or ring footed base, the dish-on-stand, the dishes, the cylindrical perforated jars, the large and medium sized jars, the beakers, goblets, vases, etc. These are made with fine clay, turned on fast wheel and fired well. A coarse Gray Ware was also in use for cooking purposes and storing the water as well. A few of these types were decorated with incised designs on the body surfaces.

However, a large quantity of pottery of Mature and Late Harappan period is plain and only a small percentage is decorated. However, some of the motifs occurring in the Harappan period are worth noted. Among them the animal figures drawn on the pots of Harappa and Moenjodaro are very few and not fully integrated as they

are painted only to fill the surface without regard for realism. But in the provincial style like Lothal, a great attention was given to realism and the animal figures which are fully integrated with environment. The motifs generally found on the pottery contain the figures of human, animals and plants.

4.3.4 Moenjodaro - Sign Post of Indus Civilization

The structural remains of Moenjodaro which are lying on the right bank of River Indus consist of a number of high and low mounds. Among these, two are however worth mentioning; the first one which is close to the river is spread over an area of about 450,000 square metre and rose to a height of 5 to 7 metre above the surrounding area. The second important mound is lying towards its west which occupies approximately 80,000 square metre and is about 22 metre above the ground level.

The high mound or the citadel area contains administrative and religious buildings while the low mound or the lower city represents residential quarters, shopping areas and other important buildings. Each area has been given a particular name which is derived from the name of the principal excavator who worked in that particular sector. For instance the S.D Area is derived from the name of A.D Siddiqui, D.K Area from K.N Dikshit, H.R from H. Hargreaves, V .S from M.S Vans, L from B.L Dhama, M.N from Q.M Muneer and D from G.F Dales.

The Buddhist Stupa of Kushan period (2nd Century CE) is the most prominent feature of S.D area. It was built at the highest surviving, mound concealing beneath it the remains of Moenjodaro. The Stupa itself is 21.9 metre above the surrounding plain and encircled by 30 cells on its four sides. The inner core of the stupa is constructed with sun-dried bricks, while in all other buildings including the monastic cells baked bricks have been used. These bricks were obtained from the nearby old remains. The presence of this magnificent stupa (about 1700 years

old) facilitated the discovery of the lost city of Moenjodaro, which remained hidden from the earth surface for the last 35 centuries.

Another imposing architectural marvel of Indus Civilization at Moenjodaro is the Great Bath. It is a beautifully laid out rectangular swimming pool constructed with bricks, measuring 11.9 metre in length, 7 metre in breadth and 1.9 metre deep, The Great Bath which is undoubtedly the first ever swimming pool of South-Asia has been made water tight by laying out the floor with baked bricks set on edge .in gypsum mortar. The side walls of the Great Bath have been provided with a thick damp proof course (D.P .C) of bitumen. The cloistered area of the Great Bath originally appears to had two entrances each on the northern and southern sides and an opening on the eastern side. The whole complex of this Great Bath seems to have carried some ritualistic significance. It was most probably a place for social gatherings of the elite on religious occasions. It is apparent that the Great Bath used to be filled with fresh water at regular intervals from the three wells located in its neighborhood.

On the east of the Great Bath is a building seems to be the residence of the Priest or the college of Priests. The building is, however, unusually long consisting of an open cloistered court and an assemblage of rooms paved with bricks. The building was evidently a double storey structure.

To the west of Great Bath, are the remains of a large Granary. The Granary presumably served the purpose of a State Treasury. It appears that there was no currency and the people were required to pay the taxes in kind. Unfortunately only the podium of the State Granary now exists. The Granary was originally comprised twenty-seven blocks constructed with bricks of varying but regulated size. The super structure of the Granary was made with timber and the external walls of the podium were battered, which looks like a fortress. It is believed that

the use of this treasury continued for a long period during the heyday of Moenjodaro and ultimately fell into ruins with the decline of the city.

To the south of the large group of buildings of the stupa mound is a small mound which is separated from it by a distance of about 28 metre. The geographical extent shows that the stupa mound and this mound, where the Pillared Hall is situated, were linked together but the rains and denudation have now created a .vast gap between them. The Pillared Hall, which measures 8 square metre has got 20 brick piers arranged in four aisles probably to support the roof. The building has got a small courtyard, which carried a large roof supported on twenty pillars arranged in row of five. According to the scholars, it was used as a court of the city magistrate or a secretariat of the city.

The houses in D.K area are comparatively large in size and in certain cases comprise many rooms. The best representation of the town planning of Moenjodaro can be seen here through the beautiful streets and lanes of this area. However the most important building in this area is the "Chiefs House". This house includes two courtyards with an eight feet door opening through the corridor towards south. Besides, there are two wells in this house, which make it prominent from other houses.

This architectural planning provides ample proof of the remarkable town planning of Moenjodaro.

The houses in H.R area is small as compared to D.K area which was occupied by the working class of the people of Moenjodaro. But the unique specimen of architecture of this area is two well built privies constructed against the wall. The privies are about half a meter higher from the level and resemble with old style of privies which are still being used in many villages, towns, and small cities of

Pakistan. The world famous "Dancing Girl" in bronze was found about 1.92 meter below the surface in a house of this area.

V.S area is an extensive irregularly shaped mound immediately to the north of the H.R area. Here are the remains of a house which measures 26 metre by 20 metre and divided into four separate dwellings. The main entrance to this house was from the Main Street. The remains of which can be traced very easily. The main feature of this entrance chamber is that it consists of five conical pits or holes sunk in the floor and formed by wedge shaped bricks, apparently intended to hold the pointed bases of large storage jars.

4.3.2 Different Phases of Indus Civilization

The remarkable discovery of the archaeological remains of Moenjodaro was made in 1922 when Mr. Rakal Das Banerji, an archaeologist, who was in search of a Buddhist Stupa in this area, found some inscribed seals akin to that already discovered at Harappa by Rai Bahadur Daya Ram Sahni in 1921. These pictographic seals and other objects like copper vessels, painted pottery and lithic implements witnessed an entirely different culture from what the archaeologists were expecting in this area. Sir John Marshall, who was the Director General of Archaeology in India at that time himself started excavations which were continued upto 1927. He published the results of excavations in his book entitled " Moenjodaro & the Indus Civilization" in 1931. Sir John Marshall declared the discovery of Indus Civilization comparable with Mesopotamian Civilization in Tigris-Euphrates Valley as well as the Egyptian Civilization in the Nile Valley and the Chinese Civilization in the Hwang Valley.

Further excavations at Moenjodaro were resumed under the guidance of Ernest H.J Mackey from 1927 to 1931 who published his report in 1938 with its title "Further Excavations at Moenjodaro". The publication of these early reports

aroused great excitement among the scholarly world. The discovery of Moenjodaro in fact represented such a civilization which was spread over the whole expanse of alluvium plains of the River Indus and its large tributaries. The evidences show that the area covered by the Indus Civilization was larger than any of the known civilizations of the ancient worldly was extended to the east upto Delhi, on the west upto the Makran coast, to the north upto Jammu-Kashmir and to the south upto the coast of C3mbay Gulf. It was cellainly a tremendous leap backwards in the antiquity of civilization in the South-Asian Sub-Continent dating back about 5000 years.

After the emergence of Pakistan, Sir R.E Mollimer Wheeler excavated the remains of Moenjodaro in 1950 and obtained some substantial results. Later on Dr. George F.Dales, an American Archaeologist did some field work at Moenjodaro during 1964-65. However, due to rise in the sub-soil water he could not continue his work and had to abandon J the excavations. The Federal Department of Archaeology, which is custodian of the cultural heritage of Pakistan however carried out limited salvage excavations during 1987 and 1989.

A number of phases are employed for the periodisation of the Indus Valley Civilization. The most commonly used classifies the Indus Valley Civilization into Early, Mature and Late Indus or Harappan Phase. An alternative approach by Shaffer divides the broader Indus Valley Tradition into four eras, the pre-Harappan "Early Food Producing Era," and the Regionalisation, Integration, and Localisation eras, which correspond roughly with the Early Harappan, Mature Harappan, and Late Harappan phases. However, Gregory Possehl includes the Neolithic stage in his periodisation, using the term Indus Age for this broader time span, into a seven stage sequence.

The most commonly used nomenclature classifies the Indus Valley Civilization into Early, Mature and Late Harappan Phase. The Indus Civilization was preceded by local agricultural villages, from where the river plains were populated when water-management became available, creating an integrated civilization. This broader time range has also been called the Indus Age and the Indus Valley Tradition.

The Early, Mature and Late Harappan periodisation was introduced by archaeologists like Mortimer Wheeler, who "brought with them existing systems from elsewhere, such as the Three Age System," and further developed by M.R. Mughal, who "proposed the term Early Harappan to characterize the pre- or proto-urban phase." This classification is primarily based on Harappa and Mohenjodaro, assuming an evolutionary sequence. According to Manuel, this division "places the Indus Valley within a tripartite evolutionary framework, of the birth, florescence, and death of a society in a fashion familiar to the social evolutionary concepts of Elmond Service.

Whereas, Shaffer divided the broader Indus Valley Tradition into four eras, the pre-Harappan "Early Food Producing Era," and the Regionalization, Integration, and Localisation eras, which correspond roughly with the Early Harappan, Mature Harappan, and Late Harappan phases. Each era can be divided into various phases. A phase is an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived. There was considerable regional variation, as well as differences in cultural sequences, and these eras and phases are not evolutionary sequences, and cannot uniformly be applied to every site.

A critical feature of Shaffer's developmental framework was replaced; the traditional Mesolithic/Neolithic, Chalcolithic/Early Harappan, Mature Harappan

and Late Harappan terminology with Eras which were intended to reflect the longer-term changes or processes which provided the platform for eventual complexity and urbanization.

The Early Food Producing Era corresponds to ca. 7000-5500 BCE. It is also called the Neolithic period. The economy of this era was based on food production, and agriculture developed in the Indus Valley. Mehrgarh Period I belongs to this era. The Regionalisation Era corresponds to ca. 4000-2500/2300 BCE or ca. 5000-2600 BCE. The Early Harappan phase belongs to this Era. According to Manuel, "the most significant development of this period was the shift in population from the uplands of Baluchistan to the floodplains of the Indus Valley." This era was very productive in arts, and new crafts were invented. The Regionalisation Era includes the Balakot, Amri, Hakra and Kot Diji Phases.

The Integration Era refers to the period of the "Indus Valley Civilisation". It is a period of integration of various smaller cultures. The Localisation Era (1900-1300 BCE) is the fourth and final period of the Indus Valley Tradition. It refers to the fragmentation of the culture of the Integration Era. The Localisation Era comprises following several phases:

- Punjab Phase (Cemetery H, Late Harappan). The Punjab Phase includes the Cemetery H and other cultures. Punjab Phase sites are found in Harappa and in other places.
- Jhukar Phase (Jhukar and Pirak) The Jhukar Phase refers to Mohenjo-daro and sites in Sindh.
- Rangpur Phase (Late Harappan and Lustrous Red Ware). Rangpur Phase sites are in Kachchh, Saurashtra and mainland Gujarat.

- The Pirak Phase is a phase of the Localisation Era of both the Indus Valley Tradition and the Baluchistan Tradition.

Gregory Possehl includes the Neolithic stage in his periodisation, using the term Indus Age for this broader time span, into a seven stage sequence:

1. Beginnings of Village Farming Communities and Pastoral camps
2. Developed Village Farming Communities and Pastoral camps
3. Early Harappan
4. Transition from Early Harappan to Mature Harappan
5. Mature Harappan
6. Post-urban Harappan
7. Early Iron Age of Northern India and Pakistan

The cities of the Indus Valley Civilization had "social hierarchies, their writing system, their large planned cities and their long-distance trade which mark them to archaeologists as a full-fledged 'civilization.' The mature phase of the Harappan civilization lasted from c. 2600–1900 BCE. With the inclusion of the predecessor and successor cultures – Early Harappan and Late Harappan, respectively – the entire Indus Valley Civilization may be taken to have lasted from the 33rd to the 14th centuries BCE. It is part of the Indus Valley Tradition, which also includes the pre-Harappan occupation of Mehrgarh, the earliest farming site of the Indus Valley.

4.4 Early Indus, Mature Indus & Late Indus Periods

The Early Harappan era:

The site of Mehrgarh is a Neolithic (7000 BCE to c. 2500 BCE) period site in the

Balochistan province of Pakistan which gave new insights on the emergence of the Indus Valley Civilization. Mehrgarh site is one of the earliest sites with evidence of farming and herding in South Asia. Mehrgarh was influenced by the Near Eastern Neolithic, with similarities between "domesticated wheat varieties, early phases of farming, pottery, other archaeological artefacts, some domesticated plants and herd animals."

Jean-Francois Jarrige argues for an independent origin of Mehrgarh. He describes "the assumption that farming economy was introduced full-fledged from Near-East to South Asia," and the similarities between Neolithic sites from eastern Mesopotamia and the western Indus valley, which are evidence of a "cultural continuum" between those sites. But given the originality of Mehrgarh, Jarrige concludes that Mehrgarh has an earlier local background," and is not a "'backwater' of the Neolithic culture of the Near East."

Lukacs and Hemphill suggest an initial local development of Mehrgarh, with continuity in cultural development but a change in population. According to Lukacs and Hemphill, while there is a strong continuity between the Neolithic and chalcolithic (Copper Age) cultures of Mehrgarh, dental evidence shows that the chalcolithic population did not descend from the Neolithic population of Mehrgarh, which "suggests moderate levels of gene flow.

i) Early Indus or Early Harappan Period (Ca. 3300–2600 BCE)

The Early Harappan Ravi Phase, named after the nearby Ravi River, lasted from Ca. 3300 BCE until 2800 BCE. It is related to the Hakra Phase, identified in the Ghaggar-Hakra River Valley to the west, and predates the Kot Diji Phase (2800–2600 BCE, Harappan 2), named after a site in northern Sindh, Pakistan, near Mohenjo-daro. The earliest examples of the Indus script date to the 3rd millennium BCE. The mature phase of earlier village cultures is represented by

Rehman Dheri in Khyber Pakhtunkhwa and Amri in Sindh. Kot Diji represents the phase leading up to Mature Harappan, with the citadel representing centralized authority and an increasingly urban quality of life.

Another town of this stage was found at Kalibangan in India on the Hakra River. The trade networks linked this culture with related regional cultures and distant sources of raw materials, including lapis lazuli and other materials for bead-making. By this time, villagers had domesticated numerous crops, including peas, sesame seeds, dates, and cotton, as well as animals, including the water buffalo. Early Harappan communities turned to large urban centres by 2600 BCE, from where the mature Harappan phase started. The latest research shows that Indus Valley people migrated from villages to cities. The final stages of the Early Harappan period are characterized by the building of large walled settlements, the expansion of trade networks, and the increasing integration of regional communities into a "relatively uniform" material culture in terms of pottery styles, ornaments, and stamp seals with Indus script, leading into the transition to the Mature Harappan phase.

About the early Indus period, Qasid H. Mallah mentions that the early Indus period, especially the Kot Dijian phase (2800-2600 BCE) has larger settlement and mass-production of various items and increase in occurrence of the permanent settlements in Sindh. For instance, the archaeological features in Loal Mari, Peer Sarihiyo, Kandherki and other settlements shows that in the Thar Desert and the Rohri hills mass production of beads and chert tools was conducted. The development of settlement and economic complexity is observed all over the Indus valley during Kot Dijian Period. The arrival of several semi precious stones as raw material explain the existence of wide spread interaction system. The gold, semiprecious stone, faience and other type of material was spreading and arriving at distant settlements from the original resources areas. During the Kot

Dijian phase, further increase in settlement number is seen throughout the Indus Valley and beyond. The most important sites appeared in north and Balochistan such as Rehman Dheri, Sarai Khola and Jalilpur, Amri, Kot Diji, Loal Mari, Bhando Qubo and many others in Sindh. The sites of Sindh were connected not only with those settlements, but also with the raw material source areas.

ii) Mature Indus or Mature Harappan Period (Ca. 2600–1900 BCE)

The mature Indus Period is the most fascinating period when a highly developed state society appeared. The several new mega cities appeared during this period, for instance; Harappa in the Ravi Phase, Ganweriwala in Cholistan and Moenjodaro in the lower Indus plains, these all cities developed their own infrastructure. During the Mature Indus Period, several cities grew with definite industrial character and a variety of cultural items were produced. The producers and merchants focused on the lapidary, metallurgy, architecture, and all other aspects required for production and safe transaction of the items.

The metropolitan city of Moenjodaro itself was the largest production centre as its eastern section of the Lower Mound was used for manufacturing of various types of beads, shell, bangles pottery and other items. Many cities around the city of Moenjodaro were developed as archaeological documentation is gradually adding information about their commercial activities such as; Chanhudaro, Lakhanjodaro and Juderjodaro. The site of Chanhudaro was a famous centre for manufacturing of seals and various types of beads. Similarly the chert tool industrial unit of the Rohri hills was actively engaged in the manufacturing and distribution of chert production like blade, cores, and even good quality plain and banded chert nodules.

Besides, the tools, the good quality of chert, banded chert and limestone blocks were obtained and distributed within the settlements in Sindh and throughout the communities of the entire Indus Valley Civilization. There have been found many

other smaller towns around these cities. The discovery of seals and identical copper figurines from Chanhudaro and Lakhanjodaro suggest the establishment of some type of administrative organization, distribution and arrangements having extended relations with other settlements around the cities.

According to Giosan, the slow southward migration of the monsoons across Asia initially allowed the Indus Valley villages to develop by taming the floods of the Indus and its tributaries. Flood-supported farming led to large agricultural surpluses, which in turn supported the development of cities. The Indus Valley Civilization residents did not develop irrigation capabilities, relying mainly on the seasonal monsoons leading to summer floods. Brooke further notes that the development of advanced cities coincides with a reduction in rainfall, which may have triggered reorganization into larger urban centers.

According to J.G. Shaffer and D.A. Lichtenstein, the Mature Harappan Civilization was "a fusion of the Bagor, Hakra, and Kot Diji traditions or 'ethnic groups' in the Ghaggar-Hakra valley on the borders of India and Pakistan". By 2600 BCE, the Early Harappan communities turned into large urban centers. Such urban centers include Harappa, Ganeriwala, Mohenjo-daro in modern-day Pakistan, and Dholavira, Kalibangan, Rakhigarhi, Rupar, and Lothal in modern-day India. More than 1,000 cities and settlements have been found, mainly in the general region of the Indus and Ghaggar-Hakra Rivers and their tributaries.

iii) Late Indus or Late Harappan Period (Ca. 1900-1300 BCE)

During the period of approximately 1900 to 1700 BCE, multiple regional cultures emerged within the area of the Indus civilization. The Cemetery H culture was in Punjab, Haryana, and Western Uttar Pradesh, the Jhukar culture was in Sindh, and the Rangpur culture (characterized by Lustrous Red Ware pottery) was in Gujarat.

Other sites associated with the Late phase of the Harappan culture are Pirak in Balochistan, Pakistan, and Daimabad in Maharashtra, India.

Around 1900 BCE signs of a gradual decline began to emerge, and by around 1700 BCE most of the cities had been abandoned. Recent examination of human skeletons from the site of Harappa has demonstrated that the end of the Indus civilization saw an increase in inter-personal violence and in infectious diseases like leprosy and tuberculosis. According to historian Upinder Singh, "the general picture presented by the late Harappan phase is one of a breakdown of urban networks and an expansion of rural ones."

The largest Late Harappan sites are Kudwala in Cholistan, Dwarka in Gujarat, and Daimabad in Maharashtra, which can be considered as urban, but they are smaller and few in number compared with the Mature Harappan cities. Bet Dwarka was fortified and continued to have contacts with the Persian Gulf region, but there was a general decrease of long-distance trade. On the other hand, the period also saw a diversification of the agricultural base, with a diversity of crops and the advent of double-cropping, as well as a shift of rural settlement towards the east and the south.

The pottery of the Late Harappan period is described as "showing some continuity with mature Harappan pottery traditions," but also distinctive differences. Many sites continued to be occupied for some centuries, although their urban features declined and disappeared. Formerly typical artifacts such as stone weights and female figurines became rare. There are some circular stamp seals with geometric designs, but lacking the Indus script which characterized the mature phase of the civilization. Script is rare and confined to potsherd inscriptions. There was also a decline in long-distance trade, although the local cultures show new innovations in faience and glass making, and carving of stone beads. Urban amenities such as

drains and the public bath were no longer maintained, and newer buildings were "poorly constructed". Stone sculptures were deliberately vandalized, valuables were sometimes concealed in hoards, suggesting unrest, and the corpses of animals and even humans were left unburied in the streets and in abandoned buildings. During the latter half of the 2nd millennium BCE, most of the post-urban Late Harappan settlements were abandoned altogether. The subsequent material culture was typically characterized by temporary occupation, "the campsites of a population which was nomadic and mainly pastoralist" and which used "crude handmade pottery." However, there is greater continuity and overlap between Late Harappan and subsequent cultural phases at sites in Punjab, Haryana, and western Uttar Pradesh, primarily small rural settlements.

After 1900 BCE, the Indus Valley Civilization began to decline, resulting into two major phenomena first that the large cities reduced in their size, character and elegance of residential and material culture as well. The second critical phenomenon was the localization which appeared as fragmentation of united cultures into smaller cultural units commonly known as "Cemetery H culture" in Punjab and Cholistan, Gandhara Grave Culture in Khyber Pakhtunkhwa and Jhukar Culture in Sindh. The same process of fragmentation is documented in Balochistan and the sites in India. The factors like invaders, flood, less rainfall, change in population, wearing out of the landscape, change of river course, drying up of Saraswati/Hakra, powerful tectonics, collapse of the administrative system and even the idea of epidemics are documented.

4.5 Decline of Indus Civilization

The decline and disappearance of the civilization is never likely to be so firmly fixed. In approaching the causes of its fall we have to exercise a degree of caution, on the one hand there is archaeological testimony of internal decay; in the

final centuries at Moenjodaro a marked lowering of civic standards took place. On the other hand we have the Aryan invaders occupying the Punjab the land of the Five Rivers, and their traditions of military conquest. They were in control of the Indus valley around 1500 BC. They may have been a source of anxiety to the Indus people from a much earlier date. The degeneration was in progress at most Indus valley sites after 1900 BC. The residential houses ceased to be so meticulously planned and the chief concern was the building up of the city level against renewed flooding.

At Moenjodaro the numbers of inhabitants were declined. Further, into the depressed Indus valley poured the fierce Aryans. The date of their first arrival in the Punjab is unknown but in Balochistan the earliest presence of Aryans is well attested around 1800 BC. Their settlements are found in Sibi and Kachhi plans on the borders of the present day Sindh province just 200 km far from Moenjodaro. So the pressure of nomad Aryans could have been long-standing. Their raids would have been sufficient to complete the ruin of the cities. The causes of decline or cultural changes have been debated and discussed ever since the discovery and history of archaeological excavations carried out at Moenjodaro and Harappa. There are however, several factors which are considered as main causes of decline of this great civilization such as;

- i. climate change,
- ii. diseases,
- iii. floods,
- iv. environmental degradation,
- v. depletion of economic resources and
- vi. foreign invasions

These main factors have been considered and discussed frequently with varying degree of emphasis responsible of decline of the Indus Valley Civilization.

The increasing effect of natural disasters such as flood and earthquake resulted in the decline of a prosperous commercial and industrial port-town like Lothal in about 2000 BCE. It provides an evidence of the general decline of other large and small Indus Valley cities and towns which were built in the flood plains of the Indus, Sarasvati and its tributaries. In Lothal, about 2000-1900 BCE, the merchants and craftsmen tried to revive trade but internal decay had set in and civic amenities were lacking, and the towns sank in size too. The ragged constructed houses, the ill-paved drains, and the damaged public works such as protective ramparts and the poor ceramic wares are a pointer to a general decline in Late Harappan Period.

In fact in the life history of the Indus Valley Civilization, the beginning of second millennium is considered very significant because of visible changes in the material culture and settlement patterns that began to appear in the Indus Valley. These changes have been identified at a number of towns and cities in the greater Indus Valley Civilization. In this regard of special interest are absence of square Indus seals, rarity of Indus script and virtual absence of cubical weights. These and other changes are considered to be the signs of decline of Indus Valley Civilization which had seen its climax around 2500 BCE.

The researches carried out in Cholistan area by Dr. M. R Mughal reveals that various cultural changes in the Indus Civilization were actually induced by the frequent hydrographic changes in the upper and lower Indus Valley. The riverine plain of Sindh was profoundly affected by the changes in river courses especially of the Ghaffar-Hakra River which once flowed all the way down to the Rann of Kutch skirting the Thar Desert in ancient times. As a result the water deflected towards southeast to feed the Ganges and Yamuna Rivers and the once perennial

Hakra River gradually dried up. By the first millennium BCE the river had dried up completely as indicated by the location of Painted Grey Ware sites right in the bed of the dry water.

The consequences of various environmental changes are seen in the abandonment of settlements and weakening of Indus political and administrative system, forcing changes in the organizational structure of the Indus society. The depletion of economic resources and demographic changes due to migration or movement of population would have weakened the culturally integrated Greater Indus Valley. However, the Harappan culture and tradition lingered on for some time until about the middle of second millennium BCE and most probably even later.

A review of archaeological and environmental data makes it clear that the Indus Valley Civilization did not disappear suddenly or abruptly but with some kind of gradually as some factors are found responsible as evident from excavations for its decline. However, the gradual drying of the region's soil during the 3rd millennium BCE may have been the initial spur for the urbanization associated with the civilization, but eventually weaker monsoons and reduced water supply caused the civilization's demise, and to scatter its population eastward and southward.

As mentioned by Mark Kenoyer, the first urban civilization of the subcontinent gradually faded into the background as new cultures emerged at the eastern and northern edges of the Indus Valley region. It took over one thousand years for the political and cultural centre of the northern sub-continent to shift from the Indus Valley to the middle Ganga region. Because the process of change was gradual, it is unlikely that anyone living during the period between the decline of the Indus cities (1900-1300 BCE) and the rise of the Early Historic cities (800 -300 BCE) would have been aware of the shift. The factors that had played a role in the decline of the Indus cities are as diverse as those which stimulated their growth.

In the core regions of the Indus and Ghaggar-Hakra valley the wide extension of trade networks and political alliances was highly venerable to relatively more

changes in the environment and agricultural base. Further with the increase in water flow the Indus itself began to swing east, flooding many settlements and burying them with silt. The mounds of Moenjodaro survived because they were on slightly higher land and were protected by massive mud-brick walls and platforms but many smaller sites were destroyed. Therefore extensive and repeated flooding, combined with shifting rivers had a devastating effect to the agricultural foundation and economic structure of the Indus cities. The refugees were forced to develop new subsistence strategies or move to more stable agricultural regions. In the absence of direct external forces we can attribute the decline of the Indus cities to internal factors that over time undermined the economic and political power of the ruling elites.

Self Assessment Questions

- Q. No.1. Define and discuss the origin and developments of urbanization in the Sub-continent.
- Q. No.2. What do you know about early Bronze Age culture of the Sub-continent?
- Q. No.3. Discuss the cultural heritage of the Indus Valley Civilization.
- Q. No.4. What do you know about the different stage of the Indus Valley Civilization.
- Q. No.5. What do you understand by the terms i.e., Early Indus, Mature Indus & Late Indus?
- Q. No.6. Evaluate the cultural relics of the Indus Valley Civilization.
- Q. No.7. Define the town planning and trade relation of Indus Valley Civilization.
- Q. No.8. Discuss the writing system and highlight religious belief of Indus Valley Civilization.
- Q. No.9. What do you know about the economy and trade relation of the Indus Valley Civilization?

Bibliography

- Dales, G.F. & J.M. Kenoyer.(1989). Excavations at Harappa, in *Pakistan Archaeology* No. 24, Department of Archaeology and Museums, Karachi.
- Jansen, Michael. (1980). *Settlement Patterns in the Harappa Culture*, In *South Asian Archaeology 1979* Edi. by Herbert Hartel, Berlin.
- Jarrige, J.F Quivran, G. and Jarrige, C. (2011) *Nindowari, Pakistan. The Kulli Culture: its Origins and Its Relations with the Indus Civilization*. Paris: CNRS, Musee Guimet.
- Jarrige, J.F. (1985) *Continuity and Change in the North Kachi Plain (Baluchistan, Pakistan) at the Beginning of the Second Millennium B.C.* in, J. Schotosmans and M. Taddei (eds), *South Asian Archaeology 1983*, Naples.
- Kenoyer, J. M. and Meadow, R. H. (2000) *The Ravi Phase: A New Cultural Manifestation at Harappa, Pakistan*. In, M. Taddei and G. De Marco, *South Asian Archaeology 1997*, Rome.
- Keoyer, J.M. *Acient Cities of Indus Valley Civilization*. (1998) Oxford University, Karachi.
- Mackay, E. J. H. (1943) *Chanhu -daro Excavations 1935*, vol 20.American Oriental Society, American Oriental Series, New Haven Connecticut.
- Mackay, Ernest J.H. (1938). *Further Excavations at Moejodaro*, New Delhi.
- Majumdar, N. G. (1934) *Explorations in Sind*. *Memoirs of the Archaeological Survey of India*.,No. 48, New Delhi.
- Mallah, Q. H. (2008) *Recent Archaeological Discoveries in Sindh Pakistan*. In, T. Osada and A. Uesugi (eds), *Lirtstiistic3, Archaeology and Human Past.: Indus Project Research Institute for Humanity and. Nature: Kyoto, Japan*.
- Marshall, Sir John. (1931) *Moejodaro and the Indus Civilization*, London.
- Meadow, R. H. ed. (1991) *Harrppa Excavations 1986 — 1990: A Multidisciplinary Approach to Third Millennium Urbanism*. Prehistory Press, Monographs in World Archaeology, 3, Madison.

- Mughal, Mohammad Rafique (1972) A Summary of Excavations and Explorations in Pakistan, Pakistan Archaeology (Karachi) No. 8.
- Mughal Mohammad Rafique (1974) New Evidence of the Early Harappan Culture from Jalilpur, Archaeology, Vol.27 (2), New York.
- Mughal, Mohammad Rafique (1982) Recent Archaeological Research in the Cholistan Desert In, Possehl, G. L. (ed). Harappan Civilization: A Contemporary Perspective. Oxford and IBH Publishing Co., New Delhi, Bombay, Calcutta.
- Mughal, Mohammad Rafique (1990) The Decline of the Indus Civilization and the Late Harappan Period in the Indus Valley, Lahore Museum Bulletin (Lahore), Vol.LII (2), Lahore.
- Mughal, Mohammad Rafique (1997) Ancient Cholistan: Archaeology and Architecture. Lahore: Ferozsons (Pvt.), Ltd.
- Nash, A. (1998) Rakhigarhi: A Harappan Metropolis in the Sarasvati- Drishadvati Divide, New Delhi
- Parpola, Asko (1994) Deciphering the Indus script, Cambridge University Press.
- R. Allchin and B. Allchin (eds) South Asian Archaeology 1995 (Cambridge): the Ancient India and Iran Trust.
- Rao, S. R. (1973) Lothal and the Indus Civilization. Bombay: Asia Publishing House, India.
- Saeed, Tahir (1998) Moenjodaro-Signpost of a Civilization, Karachi.
- Shaikh, Nilofer (1997) Recent Explorations of Archaeological and Monuments of Khairpur District. In
- Thapar, B. K. (1973) New Traits of the Indus Civilization at Kalibangan, An Appraisal. In, N. Hammond (ed), South Asian Archaeology, Park Ridge, Noyes, Press, India.
- Wheeler, R.E. Mortimer. (1953). The Indus Civilization, Cambridge University Press.
- Wright, Rita P. (1991). Patterns of Technology and the Organization of Production at Harappa, in Harappa Excavations 1986-90, ed. by Richard H. Meadow, Madison.

UNIT. 5

**ANCIENT ART AND ARCHITECTURE IN
SOUTH ASIA**

**Written by: Dr. Badshah Sardar
Reviewed by: Dr. Tahir Saeed**

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Introduction

The works of art which can be held in the hand have always been source of fascination and pleasure to collectors, but they have often been neglected in the broad study of the history of art and architecture, simply because of their size. South Asia has every reason to be proud of the thousands of year's old and rich tradition of art and architecture. A brief recapitulation of the area history appears necessary as an introduction to the understanding of this phenomena.

The earliest human art that has been found dates back into the Late Stone Age during the Upper Paleolithic period around 70,000 BCE-40,000 BCE, when the first creative works were made from shell, stone, and paint by Homo sapiens, using symbolic thought. During the Upper Paleolithic (50,000–10,000 BCE), humans practiced hunting and gathering and lived in caves, where cave painting was developed. During the Neolithic period (10,000–3,000 BCE), the production of handicrafts was started

The architecture of the Indus civilization is plain and utilitarian rather than ornamental. There are no imposing temples as in Sumer, nor royal tombs as at Ur and in Egypt. It seems that the aim of the city builders was to make life comfortable rather than luxurious. The houses are well planned.

Similarly the various objects of art have been found in these ancient cities, is a large number of burnt clay male and female figurines and models of animals and birds. The female figurines wear short skirts round their loins, and are profusely bedecked with jewellery and pannier-like arrangement on each side of the head; some of the panniers are smoke-stained, and it is possible that oil, or perhaps incense was burnt in them. The few male figurines are always nude and mostly bearded, and they wear long hair at back. Both they and the female

figurines were modeled by hand and painted light red. The millennium following the collapse of the Indus Valley Civilization, coinciding with the Indo-Aryan migration during the Vedic period, is devoid of anthropomorphically depictions.

Objectives: After details study of this unit, the student will be able to understand the following;

- to origin of palaeolithic art and architecture of South Asia.
- to understand Bronze Age (Indus Valley civilization) art and architecture
- to trace the growth and development of Vedic period art and architecture
- to make aware students about the Jain period art and architecture of South Asia
- to stimulate student's interest in Hindu period art and architecture
- to examine analytically different stages of Gandhara Civilization
- to provide insight and in-depth understanding about Buddhist Art of Gandhara

5. Ancient Art and Architecture in South Asia

5.1 Ancient Art and Architecture

The word 'Art' has two meanings, one is general and the other is more specified. In broad sense every skill which has been developed to its highest proficiency is regarded as art, like the art of writing, art of horse-riding, art of speaking etc. When it is applied to plastic arts or performing arts it is taken as specific forms such as sculpture, paintings, architecture, music, poetry etc. The arts and its different expressions are considered as mirror of a particular society or a culture. Therefore, an activity which the aesthetic function develops into a firm tradition has a way of expression that is known as 'art'. The history of art presents as on objects made by humans in visual form for aesthetic purposes. The visual art can be classified in diverse ways, such as separating fine arts from applied arts; inclusively focusing on human creativity; or focusing on different media. The history of art is often told as a chronology of masterpieces created during different ages of civilizations.

The earliest human art that has been found dates back into the Late Stone Age during the Upper Paleolithic period around 70,000 BCE-40,000 BCE, when the first creative works were made from shell, stone, and paint by Homo sapiens, using symbolic thought. During the Upper Paleolithic (50,000–10,000 BCE), humans practiced hunting and gathering and lived in caves, where cave painting was developed. During the Neolithic period (10,000–3,000 BCE), the production of handicrafts was started.

The manifestation of creative capacity within these early societies exemplifies an evolutionarily selective advantage for artistic individuals. Since survival is not contingent on the production of art, art-producing individuals demonstrated

agency over their environments in that they had spare time to create once their essential duties, like hunting and gathering were completed.

The artistic manifestations of the Upper-Paleolithic reached their peak in the Magdalenian period ($\pm 15,000$ –8,000 BC). This surge in creative outpourings is known as the "Upper Paleolithic Revolution" or the "Creative Explosion". Surviving art from this period includes small carvings in stone or bone and cave painting. The first traces of human-made objects appeared in southern Africa, the Western Mediterranean, Central and Eastern Europe (Adriatic Sea), Siberia (Baikal Lake), India and Australia. These first traces are generally worked stone (flint, obsidian), wood or bone tools. To paint in red, iron oxide was used. Color, pattern, and visual likeness were components of Paleolithic art. Patterns used included zig-zag, criss cross, and parallel lines.

The ancient cave paintings have been found in the Franco-Cantabrian region. There are pictures that are abstract as well as pictures that are naturalistic. The cave paintings were symbolically representative of activities that required learned participants as they were used as teaching tools and showcase an increased need for communication and specialized skills for early humans. Animals were painted in the caves of Altamira, Trois Frères, Chauvet and Lascaux. A function of Paleolithic art was magical, being used in rituals. Paleolithic artists were particular people, respected in the community because their artworks were linked with religious beliefs. In this way, artifacts were symbols of certain deities or spirits

The Neolithic painting is often schematic, made with basic strokes as; men in the form of a cross and women in a triangular shape. There are also cave paintings in Pinturas River in Argentina, especially the Cueva de las Manos. In portable art, a style called Cardium pottery was produced, decorated with imprints of seashells. New materials were used in art, such as amber, crystal, and jasper. In this period,

the first traces of urban planning appeared, such as the remains in Tell as-Sultan (Jericho), Jarmo (Iraq) and Çatalhöyük (Anatolia). In South-Eastern Europe appeared many cultures, such as the Cucuteni-Trypillia culture (from Romania, Republic of Moldova and Ukraine), and the Hamangia culture (from Romania and Bulgaria). Other regions with many cultures are China, most notable being the Yangshao culture and the Longshan culture; and Egypt, with the Badarian, the Naqada I, II and III cultures.

However, the common materials of Neolithic sculptures from Anatolia are ivory, stone, clay and bone. Besides, many are anthropomorphic, especially female, zoomorphic ones being rare. Female figurines are both fat and slender, both zoomorphic and anthropomorphic carvings have been discovered in Siberia, Afghanistan, Pakistan and China.

The last prehistoric phase is the Bronze Age, during which the use of copper, bronze and iron transformed ancient societies. When humans could smelt and forge, metal implements could be used to make new tools, weapons and art.

In the Chalcolithic or Copper Age, megaliths emerged. Examples include the dolmen, menhir and the English cromlech, as can be seen in the complexes at Newgrange and Stonehenge. In Spain, the Los Millares culture, which was characterized by the Beaker culture, was formed. In Malta, the temple complexes consist of Ħaġar Qim, Mnajdra, Tarxien and Ġgantija were built. In the Balearic Islands, notable megalithic cultures were developed, with different types of monuments: the naveta, a tomb shaped like a truncated pyramid, with an elongated burial chamber; the taula, two large stones, one put vertically and the other horizontally above each other; and the talaiot, a tower with a covered chamber and a false dome.

In the Iron Age, the cultures in Austria and Switzerland emerged in Europe. The former was developed between the 7th and 5th century BC, featured by the necropolis with tumular tombs and a wooden burial chamber in the form of a house, often accompanied by a four-wheeled cart. The pottery was polychromic, with geometric decorations and applications of metallic ornaments. La Tène was developed between the 5th and 4th century BC, and is more popularly known as early Celtic art. It produced many iron objects such as swords and spears.

The Bronze Age refers to the period when bronze was the best material available. Bronze was used for highly decorated shields, fibulas, and other objects, with different stages of evolution of the style. Decoration was influenced by Greek, Etruscan and Scythian art.

In the first period of recorded history, art coincided with writing. The great civilizations of the Near East: Egypt and Mesopotamia arose. Globally, during this period the first great cities appeared near major rivers: the Nile, Tigris and Euphrates, Indus and Yellow River.

One of the great advances of this period was writing, which was developed from the tradition of communication using pictures. The first form of writing were the Jiahu symbols from Neolithic China, but the first true writing was cuneiform script, which emerged in Mesopotamia c. 3500 BCE, written on clay tablets. It was based on pictographic and ideographic elements, while later Sumerians developed syllables for writing, reflecting the phonology and syntax of the Sumerian language. In Egypt hieroglyphic writing was developed using pictures as well, appearing on art such as the Narmer Palette (3,100 BCE). The Indus Valley Civilization sculpted seals with short texts and decorated with representations of animals and people. Meanwhile, the Olmecs sculpted colossal

heads and decorated other sculptures with their own hieroglyphs. In these times, writing was accessible only for the elites.

The Mesopotamian art was developed in the area between Tigris and Euphrates Rivers in modern-day Syria and Iraq, where since the 4th millennium BC many different cultures existed such as Sumer, Akkad, Amorite and Chaldea. Mesopotamian architecture was characterized by the use of bricks, lintels, and cone mosaic. Notable examples are the ziggurats, large temples in the form of step pyramids. The tomb was a chamber covered with a false dome, as in some examples found at Ur. There were also palaces walled with a terrace in the form of a ziggurat, where gardens were an important feature. The Hanging Gardens of Babylon was one of the Seven Wonders of the Ancient World.

The relief sculpture was developed in wood and stone. The Sculpture depicted religious, military, and hunting scenes, including both human and animal figures. In the Sumerian period, small statues of people were produced. These statues had an angular form and were produced from colored stone. The figures typically had bald head with hands folded on the chest. In the Akkadian period, statues depicted figures with long hair and beards, such as the stele of Naram-Sin. In the Amorite period (or Neosumerian), statues represented kings from Gudea of Lagash, with their mantles and a turbans on their heads, and their hands on their chests. During Babylonian rule, the stele of Hammurabi was important, as it depicted the great king Hammurabi above a written copy of the laws that he introduced. Assyrian sculpture is notable for its anthropomorphism of cattle and the winged genie, which is depicted flying in many reliefs depicting war and hunting scenes, such as in the Black Obelisk of Shalmaneser III.

One of the first great civilizations arose in Egypt, which had elaborate and complex works of art produced by professional artists and craftspeople. Egypt's

art was religious and symbolic. Given that the culture had a highly centralized power structure and hierarchy, a great deal of art was created to honour the pharaoh, including great monuments. Egyptian art and culture emphasized the religious concept of immortality. Later Egyptian art includes Coptic and Byzantine art.

The architecture is characterized by monumental structures, built with large stone blocks, lintels, and solid columns. Funerary monuments included mastaba, tombs of rectangular form; pyramids, which included step pyramids (Saqqarah) or smooth-sided pyramids (Giza); and the hypogeum, underground tombs (Valley of the Kings). Other great buildings were the temple, which tended to be monumental complexes preceded by an avenue of sphinxes and obelisks. Temples used pylons and trapezoid walls with hypaethros and hypostyle halls and shrines. The temples of Karnak, Luxor, Philae and Edfu are good examples. Another type of temple is the rock temple, in the form of a hypogeum, found in Abu Simbel and Deir el-Bahari.

The Egyptians painted the outline of the head and limbs in profile, while the torso, hands, and eyes were painted from the front. Applied arts were developed in Egypt, in particular woodwork and metalwork. There are superb examples such as cedar furniture inlaid with ebony and ivory which can be seen in the tombs at the Egyptian Museum. Other examples include the pieces found in Tutankhamun's tomb, which are of great artistic value.

Discovered long after the contemporary civilizations of Mesopotamia and Egypt, the Indus Valley Civilization or Harappan civilization (Ca. 2400–1900 BCE) is now recognized as extraordinary advanced, comparable in many ways with those cultures. The various sculptures, seals, bronze vessels pottery, gold jewellery, and

anatomically detailed figurines in terracotta, bronze, and steatite have been found at excavation sites.

A number of gold, terracotta and stone figurines of girls in dancing poses reveal the presence of some dance form. These terracotta figurines included cows, bears, monkeys, and dogs. The animal depicted on a majority of seals at sites of the mature period has not been clearly identified. Part bull, part zebra, with a majestic horn, it has been a source of speculation. As yet, there is insufficient evidence to substantiate claims that the image had religious or cultic significance, but the prevalence of the image raises the question of whether or not the animals in images of the civilization are religious symbols.

Realistic statuettes have been found in the site in the Indus Valley Civilization. One of them is the famous bronze statuette of a slender-limbed Dancing Girl adorned with bangles, found in Moenjodaro. Two other realistic statuettes have been found in Harappa in proper stratified excavations, which display near-Classical treatment of the human shape: the statuette of a dancer who seems to be male, and a red jasper male torso, both now in the Delhi National Museum.

These statuettes remain controversial, due to their advanced techniques. Regarding the red jasper torso, the discoverer, Vats, claims a Harappan date, but Marshall considered this statuette is probably historical, dating to the Gupta period, comparing it to the much later Lohanipur torso. A second rather similar grey stone statuette of a dancing male was also found about 150 meters away in a secure Mature Harappan stratum. Overall, anthropologist Gregory Possehl tends to consider that these statuettes probably form the pinnacle of Indus art during the Mature Harappan period.

Seals have been found at Moenjodaro depicting a figure standing on its head, and another sitting cross-legged in what some call a yoga-like pose such as the so-

called Pashupati. This figure has been variously identified. Sir John Marshall identified a resemblance to the Hindu god, Shiva. If this can be validated, it would be evidence that some aspects of Hinduism predate the earliest texts, the Veda.

During the Chinese Bronze Age (the Shang and Zhou dynasties) court intercessions and communication with the spirit world were conducted by a shaman (possibly the king himself). In the Shang dynasty (Ca. 1600–1050 BCE), the supreme deity was Shangdi, but aristocratic families preferred to contact the spirits of their ancestors. They prepared elaborate banquets of food and drink for them, heated and served in bronze ritual vessels. Bronze vessels were used in religious rituals to cement Shang authority, and when the Shang capital fell, around 1050 BCE, its conquerors, the Zhou (Ca. 1050–256 BCE), continued to use these containers in religious rituals, but principally for food rather than drink. The Shang court had been accused of excessive drunkenness, and the Zhou, promoting the imperial Tian ("Heaven") as the prime spiritual force, rather than ancestors, limited wine in religious rites, in favour of food. The use of ritual bronzes continued into the early Han dynasty (206 BC–220 CE).

One of the most commonly used motifs was the taotie, a stylized face divided centrally into 2 almost mirror-image halves, with nostrils, eyes, eyebrows, jaws, cheeks and horns, surrounded by incised patterns. Whether taotie represented real, mythological or wholly imaginary creatures cannot be determined. The enigmatic bronzes of Sanxingdui, near Guanghan (in Sichuan province), are evidence for a mysterious sacrificial religious system unlike anything elsewhere in ancient China and quite different from the art of the contemporaneous Shang at Anyang.

Even in antiquity, the arts of Greece were recognized by other cultures as pre-eminent. The Latin poet Horace, writing in the age of Roman emperor Augustus

(1st century BC to 1st century AD), famously remarked that although conquered on the battlefield, "captive Greece overcame its savage conqueror and brought the arts to rustic Rome." The power of Greek art lies in its representation of the human figure and its focus on human beings and the anthropomorphic gods as chief subjects. During the Classical period (5th-4thcenturies BCE), realism and idealism were delicately balanced. In comparison, work of the earlier Geometric (9th- to 8thcenturies BCE) and Archaic (7th-6thcenturies BCE) ages sometimes appears primitive, but these artists had different goals: naturalistic representation was not necessarily their aim. Roman art lover collected ancient Greek originals, Roman replicas of Greek art, or newly created paintings and sculptures fashioned in a variety of Greek styles, thus preserving for posterity works of art otherwise lost. Wall and panel paintings, sculptures and mosaics decorated public spaces and well-to-do private homes. Greek imagery also appeared on Roman jewellery, vessels of gold, silver, bronze and terracotta, and even on weapons and commercial weights. Since the Renaissance, the arts of ancient Greece, transmitted through the Roman Empire, have served as the foundation of Western art. The Greek and Etruscan artists built on the artistic foundations of Egypt, further developing the arts of sculpture, painting, architecture, and ceramics. Greek art started as smaller as and simpler than Egyptian art, and the influence of Egyptian art on the Greeks started in the Cycladic islands between 3300 and 3200 BCE.

The Achaemenid art includes frieze reliefs, metalwork, decoration of palaces, glazed brick masonry, fine craftsmanship (masonry, carpentry, etc.), and gardening. Most survivals of court art are monumental sculpture, above all the reliefs, double animal-headed Persian column capitals and other sculptures of Persepolis.

Although the Persians took artists, with their styles and techniques, from all corners of their empire, they produced not simply a combination of styles, but a synthesis of a new unique Persian style. Cyrus the Great in fact had an extensive ancient Iranian heritage behind him; the rich Achaemenid gold work, which inscriptions suggest may have been a specialty of the Medes, was for instance in the tradition of earlier sites. There are a number of very fine pieces of jewellery or inlay in precious metal, also mostly featuring animals, and the Oxus Treasure has a wide selection of types. Small pieces, typically in gold, were sewn to clothing by the elite, and a number of gold items have survived.

The Roman art is sometimes viewed as derived from Greek precedents, but also has its own distinguishing features. Roman sculpture is often less idealized than the Greek precedents, being very realistic. Roman architecture often used concrete, and features such as the round arch and dome were invented. Luxury objects in metal-work, gem engraving, ivory carvings, and glass are sometimes considered in modern terms to be minor forms of Roman art, although this would not necessarily have been the case for contemporaries.

Roman artwork was influenced by the nation-state's interaction with other people's, such as ancient Judea. A major monument is the Arch of Titus, which was erected by the Emperor Titus. Scenes of Romans looting the Jewish temple in Jerusalem are depicted in low-relief sculptures around the arch's perimeter. The ancient Roman pottery was not a luxury product, but a vast production of "fine wares" in terra sigillata were decorated with reliefs that reflected the latest taste, and provided a large group in society with stylish objects at what was evidently an affordable price. The Roman coins were an important means of propaganda, and have survived in enormous numbers.

The art of ancient and medieval Central Asia reflects the rich history of this vast area, home to a huge variety of peoples, religions and ways of life. The artistic remains of the region show a remarkable combination of influences that exemplify the multicultural nature of Central Asian society.

From the late second millennium BC until very recently, the grasslands of Central Asia – stretching from the Caspian Sea to central China and from southern Russia to northern India – have been home to migrating herders who practised mixed economies on the margins of sedentary societies. The prehistoric 'animal style' art of these pastoral nomads not only demonstrates their zoomorphic mythologies and shamanic traditions but also their fluidity in incorporating the symbols of sedentary society into their own artworks. Central Asia has always been a crossroads of cultural exchange, the hub of the so-called Silk Road – that complex system of trade routes stretching from China to the Mediterranean. Already in the Bronze Age (3rd and 2nd millennium BCE), growing settlements formed part of an extensive network of trade linking Central Asia to the Indus Valley, Mesopotamia and Egypt.

Indian art consists of a variety of art forms, including architecture, painting, sculpture, pottery, and textile arts such as woven silk etc. Geographically, it spans the entire Indian subcontinent, including what are now called as; India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and eastern Afghanistan. A strong sense of design is characteristic of Indian art and can be observed in its modern and traditional forms. The origin of Indian art can be traced to pre-historic settlements in the 3rd millennium BCE. On its way to modern times, Indian art has had cultural influences, as well as religious influences such as Hinduism, Buddhism, Jainism, Sikhism and Islam. In spite of this complex mixture of religious traditions, generally, the prevailing artistic style at any time and place has been shared by the major religious groups.

In historic art, sculpture in stone and metal, mainly religious, has survived the Indian climate better than other media and provides most of the best remains. Many of the most important ancient finds that are not in carved stone come from the surrounding, drier regions rather than India itself. Indian funeral and philosophic traditions exclude grave goods, which is the main source of ancient art in other cultures.

Indian artist styles historically followed Indian religions out of the subcontinent, having an especially large influence in Tibet, South East Asia and China. Indian art has itself received influences at times, especially from Central Asia and Iran, and Europe.

Rock art of India includes rock relief carvings, engravings and paintings, some (but by no means all) from the South Asian Stone Age. It is estimated there are about 1300 rock art sites with over a quarter of a million figures and figurines. The earliest rock carvings in India were discovered by Archibald Carlley, twelve years before the Cave of Altamira in Spain, although his work only came to light much later via J Cockburn (1899). Similarly, Dr. V. S. Wakankar discovered several painted rock shelters in Central India, situated around the Vindhya mountain range. Of these, the c. 750 sites making up the Bhimbetka rock shelters have been enrolled as a UNESCO World Heritage Site; the earliest paintings are some 10,000 years old. The paintings in these sites commonly depicted scenes of human life alongside animals, and hunts with stone implements. Their style varied with region and age, but the most common characteristic was a red wash made using a powdered mineral called geru, which is a form of Iron Oxide (Hematite).

5.2 Vedic Art and Architecture

Hinduism is one of the oldest religions which have passed through various

evolutionary stages before it attained its present form. The Vedas and the Vedic religion are considered to be the basis of Hinduism and Hindu civilization but, it is striking that these books contain references to earlier cultures and religious practices. It is believed that from the prehistoric times, man has sought to worship powers of nature or symbols representing those powers or idols reflecting those symbols. Besides, the primitive man's idea of God always tended to be anthropomorphic. The heavenly bodies were also worshipped by the ancient Greeks. For instance, the sun god was represented by Apollo; the moon god was represented by Selene. Similarly, in the Indus Valley Civilization of South Asia, there is indirect evidence that worship of heavenly bodies such as sun and other planets was in vogue. The religious practices followed by the people of Indus Valley have a great bearing on Hinduism. According to some scholars the religion of Indus people was the lineal progenitor of Hinduism.

A number of cults prevalent in the Indus Valley Civilization are shared by Hinduism. For instance, apart from Mother Goddess, there is a male god which is a proto-type of Hindu "Shiva". The various forces of nature having been personified as gods and goddesses were namely; Fire (Agni) on earth, wind (Indra) in the air and sun (Surya) in the heavens. The Vedic deities; Agni, Indra and Surya, however lost their importance in the crowd of deities introduced by the Puranas as Brahmanical religion. Thus emerged the Puranic Triad; Brahma, Vishnu and Shiva. By the time the art of sculptures stepped into give these conceptions Lithic form. Brahma had almost forfeited his claims to worship through the growth of an immoral charge against him. Further Vishnu and Shiva were practically the masters of the field. Their only powerful competitor was the old sun god, Vishnu. But since this historic phase began the sun god has been ousted from the field his worship is no longer an active cult. Vishnu and Shiva in

their various forms together with their wives, children, vehicles, incarnations etc. now share among themselves the worship of the Brahmanical population of India.

There is no recorded evidence of the use of image worship in the Vedic times. The image worship seems to be a contribution of non-Vedic cultural trends, as it is observed from the presence of a number of images found from the Indus Valley Civilization. Further later on the Mahayana School of Buddhism enriched the Hindu image worship. The worship of different sects in Hinduism, which like so many small streams move together to meet god, who is like the ocean. However, the chief aim of the images or art work is the expression of '*bhava*' or emotion rather anatomic precision. The Hindus place images of gods or abstract symbols on shrines in their homes, for the purpose of worship and the temples dedicated to certain gods/goddess like Shiva, Vishnu, Kali etc. are built to shrine these Hindu religious art pieces.

Early Vedic Period (Ca.1500-1000 BCE)

The Rigveda contains accounts of conflicts between the Aryas and the Dasas and Dasyus. It describes Dasas and Dasyus as people who do not perform sacrifices (akratu) or obey the commandments of gods (avrata). Their speech is described as mridhra which could variously mean soft, uncouth, hostile, scornful or abusive. Other adjectives which describe their physical appearance are subject to many interpretations. However, some modern scholars such as Asko Parpola connect the Dasas and Dasyus to Iranian tribes Dahae and Dahyu and believe that Dasas and Dasyus were early Indo-Aryan immigrants who arrived into the subcontinent before the Vedic Aryans. Likewise, Bronkhorst has argued that the central Ganges Plain was dominated by a related but non-Vedic Indo-Aryan culture, a difference also noted by Samuel.

Accounts of military conflicts inbetween the various tribes of Vedic Aryans are also described in the Rigveda. Most notable of such conflicts was the Battle of Ten Kings, which took place on the banks of the river Parushni (modern day Ravi). The battle was fought between the tribe Bharatas, led by their chief Sudas, against a confederation of ten tribes. The Bharatas lived around the upper regions of the river Saraswati, while the Purus, their western neighbours, lived along the lower regions of Saraswati. The other tribes dwelt north-west of the Bharatas in the region of Punjab. Division of the waters of Ravi could have been a reason for the war. The confederation of tribes tried to inundate the Bharatas by opening the embankments of Ravi, yet Sudas emerged victorious in the Battle of Ten Kings. Purukutsa, the chief of the Purus, was killed in the battle and the Bharatas and the Purus merged into a new tribe, the Kuru, after the war.

Later Vedic period (Ca. 1000 – 600 BCE)

After the 12th century BCE, as the Rigveda had taken its final form, the Vedic society, which is associated with the Kuru-Pancala region but were not the only Indo-Aryan people in northern India, transitioned from semi-nomadic life to settled agriculture in north-western India.[40] Possession of horses remained an important priority of Vedic leaders and a remnant of the nomadic lifestyle, resulting in trade routes beyond the Hindu Kush to maintain this supply as horses needed for cavalry and sacrifice could not be bred in India. The Gangetic plains had remained out of bounds to the Vedic tribes because of thick forest cover. After 1000 BCE, the use of iron axes and ploughs became widespread and the jungles could be cleared with ease. This enabled the Vedic Aryans to extend their settlements into the western area of the Ganga-Yamuna Doab. Many of the old tribes coalesced to form larger political units.

The Vedic religion was further developed with the emergence of the Kuru kingdom, systematizing its religious literature and developing the Śrauta ritual. It is associated with the Painted Grey Ware culture (Ca.1200-600 BCE), which did not expand east of the Ganga-Yamunya Doab. It differed from the related, yet markedly different, culture of the Central Ganges region, which was associated with the Northern Black Polished Ware and the Mahajanapadas of Kosala and Magadha.

In this period the varna system emerged, state Kulke and Rothermund, which in this stage of Indian history were a "hierarchical order of estates which reflected a division of labor among various social classes". The Vedic period estates were four: Brahmin priests and warrior nobility stood on top, free peasants and traders were the third, and slaves, labourers and artisans, many belonging to the indigenous people, were the fourth. This was a period where agriculture, metal, and commodity production, as well as trade, greatly expanded, and the Vedic era texts including the early Upanishads and many Sutras important to later Hindu culture were completed.

Modern replica of utensils and falcon shaped altar used for Agnicayana, an elaborate Śrauta ritual originating from the Kuru Kingdom, around 1000 BCE. The Kuru Kingdom, the earliest Vedic "state", was formed by a "super-tribe" which joined several tribes in a new unit. To govern this state, Vedic hymns were collected and transcribed, and new rituals were developed, which formed the now orthodox Śrauta rituals. Two key figures in this process of the development of the Kuru state were the king Parikshit and his successor Janamejaya, transforming this realm into the dominant political and cultural power of northern Iron Age India.

The most well-known of the new religious sacrifices that arose in this period were the Ashvamedha (horse sacrifice). This sacrifice involved setting a consecrated horse free to roam the kingdoms for a year. The horse was followed by a chosen

band of warriors. The kingdoms and chiefdoms in which the horse wandered had to pay homage or prepare to battle the king to whom the horse belonged. This sacrifice put considerable pressure on inter-state relations in this era. This period saw also the beginning of the social stratification by the use of varna, the division of Vedic society in Brahmins, Kshatriya, Vaishya and Shudra.

The Kuru kingdom declined after its defeat by the non-Vedic Salva tribe, and the political centre of Vedic culture shifted east, into the Panchala kingdom on the Ganges, under King Keśin Dālbhya (approximately between 900 and 750 BCE). Later, in the 8th or 7th century BCE, the kingdom of Videha emerged as a political centre farther to the East, in what is today northern Bihar of India and southeastern Nepal, reaching its prominence under the king Janaka, whose court provided patronage for Brahmin sages and philosophers such as Yajnavalkya, Uddalaka Aruni, and Gargi Vachaknavi; Panchala also remained prominent during this period, under its king Pravahana Jaivali.

The Vedic religion due to the process of assimilation and absorbed some of the pre-Vedic cults. The Puranas and Brahmanas also brought some new concepts. The Buddhism in the Mahayana sect encouraged the worship in the Hindu pantheon. Further, with the downfall of the Mauryans and emergence of Gupta who rule from 350-650 CE, the Hinduism was revived. The object of worship began to assume a visible form usually an image. This necessitated a covered edifice, where the deity could be installed and worshipped. In consequence, the structure that so came into being was in fact the Hindu Temple. The *Shastras*, the ancient texts on architecture classify temples into three different orders such as; the Nagara or Northern style, the Dravida or southern style and Vasara or hybrid style which is seen in the Deccan between the two main styles. It is generally believed that the temples of Hindu architecture have got a distinct style of architecture having been influenced by the architectural traditions of Gandhara

and Hellenism. All the temples were constructed between 8-10th centuries when the region was ruled by Hindu-Shahi dynasty.

The Expressions in Art Form

The millennium following the collapse of the Indus Valley Civilization, coinciding with the Indo-Aryan migration during the Vedic period, is devoid of anthropomorphically depictions. It has been suggested that the early Vedic religion focused exclusively on the worship of purely "elementary forces of nature by means of elaborate sacrifices", which did not lend themselves easily to anthropomorphological representations. Various artefacts may belong to the Copper Hoard Culture (2nd millennium CE), some of them suggesting anthropomorphological characteristics. Interpretations vary as to the exact signification of these artifacts, or even the culture and the periodization to which they belonged. Some examples of artistic expression also appear in abstract pottery designs during the Black and red ware culture (1450-1200 BCE) or the Painted Grey Ware culture (1200-600 BCE), with finds in a wide area, including the area of Mathura.

After a gap of about a thousand years, most of the early finds correspond to what is called the "second period of urbanization" in the middle of the 1st millennium BCE. The anthropomorphic depiction of various deities apparently started in the middle of the 1st millennium BCE, possibly as a consequence of the influx of foreign stimuli initiated with the Achaemenid conquest of the Indus Valley, and the rise of alternative local faiths challenging Vedism, such as Buddhism, Jainism and local popular cults.

The north Indian Maurya Empire flourished from 322 BCE to 185 BCE and at its maximum extent controlled all of the sub-continent except the extreme south as

well as influences from Indian ancient traditions, and Ancient Persia, as shown by the Pataliputra capital.

The emperor Ashoka, who died in 232 BCE, adopted Buddhism about half-way through his 40-year reign, and patronized several large stupas at key sites from the life of the Buddha, although very little decoration from the Mauryan period survives, and there may not have been much in the first place. There is more from various early sites of Indian rock-cut architecture.

The most famous survivals are the large animals surmounting several of the Pillars of Ashoka, which showed a confident and boldly mature style and craft and first of its kind iron casting without rust until date, which was in use by vedic people in rural areas of the country, though we have very few remains showing its development. The famous detached Lion Capital of Ashoka, with four animals, was adopted as the official Emblem of India after Indian independence. Mauryan sculpture and architecture is characterized by a very fine Mauryan polish given to the stone, which is rarely found in later periods. Many small popular terracotta figurines are recovered in archaeology, in a range of often vigorous if somewhat crude styles. Both animals and human figures, usually females presumed to be deities, are found.

The Gupta period is generally regarded as a classic peak of north Indian art for all the major religious groups. Although painting was evidently widespread, and survives in the Ajanta Caves, the surviving works are almost all religious sculpture. The period saw the emergence of the iconic carved stone deity in Hindu art, as well as the Buddha-figure and Jain tirthankara figures, these last often on a very large scale. The main centres of sculpture were Mathura Sarnath, and Gandhara, the last the centre of Greco-Buddhist art. The Gupta period marked the

"golden age" of classical Hinduism, and saw the earliest constructed Hindu temple architecture, though survivals are not numerous.

The tradition and methods of Indian cliff painting gradually evolved throughout many thousands of years - there are multiple locations found with prehistoric art. The early caves included overhanging rock decorated with rock-cut art and the use of natural caves during the Mesolithic period (6000 BCE). Their use has continued in some areas into historic times. The Rock Shelters of Bhimbetka are on the edge of the Deccan Plateau where deep erosion has left huge sandstone outcrops. The many caves and grottos found there contain primitive tools and decorative rock paintings that reflect the ancient tradition of human interaction with their landscape, an interaction that continues to this day.

The oldest surviving frescoes of the historical period have been preserved in the Ajanta Caves with Cave 10 having some from the 1st century CE, though the larger and more famous groups are from the 5th century. Despite climatic conditions that tend to work against the survival of older paintings, in total there are known more than 20 locations in India with paintings and traces of former paintings of ancient and early medieval times (up to the 8th to 10th centuries CE), although these are just a tiny fraction of what would have once existed. The most significant frescoes of the ancient and early medieval period are found in the Ajanta, Bagh, Ellora, and Sittanavasal caves, the last being Jain of the 7th-10th centuries. Although many show evidence of being by artists mainly used to decorating palaces, no early secular wall-paintings survive.

The Chola fresco paintings were discovered in 1931 within the circumambulatory passage of the Brihadisvara Temple at Thanjavur, Tamil Nadu, and are the first Chola specimens discovered. Researchers have discovered the technique used in these frescoes. A smooth batter of limestone mixture is applied over the stones,

which took two to three days to set. Within that short span, such large paintings were painted with natural organic pigments. During the Nayak period the Chola paintings were painted over. The Chola frescoes lying underneath have an ardent spirit of saivism is expressed in them. They probably synchronised with the completion of the temple by Rajaraja Cholan the Great.

In 6th century BCE, the political units consolidated into large kingdoms called Mahajanapadas. The process of urbanisation had begun in these kingdoms, commerce and travel flourished, even regions separated by large distances became easy to access. Anga, a small kingdom to the east of Magadha (on the door step of modern-day West Bengal), formed the eastern boundary of the Vedic culture. Yadavas expanded towards the south and settled in Mathura. To the south of their kingdom was Vatsa which was governed from its capital Kausambi. The Narmada River and parts of North Western Deccan formed the southern limits. The newly formed states struggled for supremacy and started displaying imperial ambitions.

The end of the Vedic period is marked by linguistic, cultural and political changes. The grammar of Pāṇini marks a final apex in the codification of Sutra texts, and at the same time the beginning of Classical Sanskrit. The invasion of Darius I of the Indus valley in the early 6th century BCE marks the beginning of outside influence, continued in the kingdoms of the Indo-Greeks. Meanwhile, in the Kosala-Magadha region, the shramana movements (including Jainism and Buddhism) objected the self-imposed authority and orthodoxy of the intruding Brahmins and their Vedic scriptures and ritual. According to Bronkhorst, the sramana culture arose in "Greater Magadha," which was Indo-European, but not Vedic. In this culture, kshatriyas were placed higher than Brahmins, and it rejected Vedic authority and rituals.

The main deities of the Vedic pantheon were Indra, Agni (the sacrificial fire), and

Soma and some deities of social order such as Mitra–Varuna, Aryaman, Bhaga and Amsa, further nature deities such as Surya (the Sun), Vayu (the wind), and Prithivi (the earth). Goddesses included Ushas (the dawn), Prithvi, and Aditi (the mother of the Aditya gods or sometimes the cow). Rivers, especially Saraswati, were also considered goddesses. Deities were not viewed as all-powerful. The relationship between humans and the deity was one of transaction, with Agni (the sacrificial fire) taking the role of messenger between the two. Archaeological cultures identified with phases of Vedic material culture include the Ochre Coloured Pottery culture, the Gandhara Grave culture, the Black and red ware culture and the Painted Grey Ware culture.

Ochre coloured pottery culture was first found during 1950-1951, in western Uttar Pradesh, in the Badaun and Bisjuar district. It is thought that this culture was prominent during the latter half of the 2nd millennium, within the transition between the Indus Valley civilization and the end of Harrapan culture. This pottery is typically created with wheel ware, and is ill-fired, to a fine to medium fabric, decorated with a red slip, and occasional black bands¹. When this pottery was worked with, it often left an ochre color on the hands, most likely because of water-logging, bad firing, wind action, or a mixture of these factors. This pottery was found all throughout the doab, most of it found in the Muzaffarnagar, Meerut, and Bulandshahr districts, but also existing outside these districts, extending north and south of Bahadrabad. This pottery does however seem to exist within different time frames of popularity, ochre colored pottery seeming to occur in areas such as Rajasthan earlier than we see it in the doab, despite the doab being heavily associated with the culture.

The Gandhara grave culture refers to the protohistoric cemeteries found in the Gandhara region, stretching all the way from Bajuar to the Indus. These cemeteries seem to follow a set grave structure and “mortuary practice”, such as

inflexed inhumation and cremation. This culture is thought to occur in 3 stages: the lower, in which burials take place in masonry lined pits, the upper, in which urn burials and cremations are added, and the “surface” level, in which graves are covered with huge stone slabs. In the lower stage, excavators found that these graves are typically 2–3 feet deep, and covered with stones on top. After digging out the stones, skeletons were found facing southwest to northeast, with the head facing one direction, and the hands laying on top of one another. Female skeletons were often found wearing hair pins and jewelry. Pottery is greatly important to this culture, as pottery was often used as a “grave good”, being buried with the bodies of the dead. Buried alongside the skeletons, we typically see various pots on top of the body, averaging at about 5 or less pieces of pottery per grave. Within this culture we typically see 2 kinds of pottery: gray ware, or red ware.

Black and red ware culture was coined as a term in 1946 by Sir Mortimer Wheeler. The pottery, as the name suggests, typically has a black rim/inside surface, and a red lower half on the outside of the piece. Red-ware pottery tends to fall into 2 categories: offering stands, or cooking vessels. Most of these pieces of pottery were open mouthed bowls that were burnished, painted, or slipped on one side, however, jars, pots, and dishes-on-stands have also been found in small quantities. Black and red ware, and the surrounding culture, began its spread during the Neolithic period and continue until the early medieval period in India, as well as being found in parts of West Asia and Egypt. There are many theories about the process of its creation, the most popular being the use of an inverted firing technique, or a simultaneous oxidation and reduction firing. One researcher however learned that these 2 theories are quite possibly misguided, as they were able to recreate black and red ware pottery through double firing, one stating “the characteristic coloration of the pottery cannot merely be achieved by inverted firing”.

Painted grey ware culture is a significant pottery style that has been linked to a group of people who settled in Sutlej, Ghagger, and the Upper Ganga/Yamuna Valleys, loosely classified with the early Aryans who migrated to India in the beginning of the Vedic period. It's also thought that the groups that introduced the painted grey ware culture also brought iron technology to the Indo-gangetic plains, making this pottery a momentous mark of the Northern Indian Iron age. The style of grey-ware often includes clay wheel-thrown into a smooth texture, ash-grey in color, and often decorated with black ink, creating small circular patterns, sometimes spirals, swastikas, or sigmas. Grey-ware pottery is almost exclusively drinking ware, and tends to have 3 different forms: narrow-waisted, tall drinking glasses, middle-sized drinking goblets, and drinking vases with outturned lips. There was a distinct grey ware culture surrounding the establishment of the pottery, but while the culture is significant, grey ware has only made up 10-15% of found Vedic pottery, a majority of the pottery red ware, as grey ware pottery was seen as a "highly valued luxury".

5.3 Jain Art and Architecture

Jain art refers to religious works of art associated with Jainism. Even though Jainism spread only in some parts of India, it has made a significant contribution to Indian art and architecture. The Jain art broadly follows the contemporary style of Indian Buddhist and Hindu art, though the iconography, and the functional layout of temple buildings, reflects specific Jain needs. The artists and craftsmen producing most Jain art were probably not themselves Jain, but from local workshops patronized by all religions. This may not have been the case for illustrated manuscripts, where many of the oldest Indian survivals are Jain.

Jains mainly depict tirthankara or other important people in a seated or standing meditative posture, sometimes on a very large scale. Yaksa and yaksini, attendant

spirits who guard the tirthankara, are usually shown with them.

A tirthankara or Jina is represented either seated in lotus position (Padmasana) or standing in the meditation Khadgasana (Kayotsarga) posture. This latter, which is similar to the military standing at attention is a difficult posture to hold for a long period, and has the attraction to Jains that it reduces to the minimum the amount of the body in contact with the earth, and so posing a risk to the sentient creatures living in or on it. If seated, they are usually depicted seated with their legs crossed in front, the toes of one foot resting close upon the knee of the other, and the right hand lying over the left in the lap.

Tirthanakar images do not have distinctive facial features, clothing or (mostly) hair-styles, and are differentiated on the basis of the symbol or emblem (Lanchhana) belonging to each tirthanakar except Parshvanatha. Statues of Parshvanath have a snake crown on the head. The first Tirthankara Rishabha can be identified by the locks of hair falling on his shoulders. Sometimes Suparshvanath is shown with a small snake-hood. The symbols are marked in the centre or in the corner of the pedestal of the statue. The sects of Jainism Digambara and Svetambara have different depictions of idols. Digambara images are naked without any ornamentation, whereas Svetambara ones may be clothed and in worship may be decorated with temporary ornaments. The images are often marked with Srivatsa on the chest and Tilaka on the forehead. Srivatsa is one of the ashtamangala (auspicious symbols). It can look somewhat like a fleur-de-lis, an endless knot, a flower or diamond-shaped symbol.

The bodies of tirthanakar statues are exceptionally consistent throughout the over 2,000 years of the historical record. The bodies are rather slight, with very wide shoulders and a narrow waist. Even more than is usual in Indian sculpture, the depiction takes relatively little interest in the accurate depiction of the underlying

musculature and bones, but is interested in the modelling of the outer surfaces as broad swelling forms. The ears are extremely elongated, suggesting the heavy earrings the figures wore in their early lives before they took the path to enlightenment, when most were wealthy if not royal.

Sculptures with four tirthanakars, or their heads, facing in four directions, are not uncommon in early sculpture, but unlike the comparable Hindu images, these represent four different tirthanakars, not four aspects of the same deity. Multiple extra arms are avoided in tirthanakar images, though their attendants or guardians may have them.

Like Buddhists, Jains participated in Indian rock-cut architecture from a very early date. Remnants of ancient jaina temples and monasteries temples can be found all around India, and much early Jain sculpture is reliefs in these. Ellora Caves in Maharashtra and the Jain temples at Dilwara near Mount Abu, Rajasthan. The Jain tower in Chittor, Rajasthan is a good example of Jain architecture.

Modern and medieval Jains built many Jain temples, especially in western India. In particular the complex of five Dilwara Temples of the 11th to 13th centuries at Mount Abu in Rajasthan is a much-visited attraction. The Jain pilgrimage in Shatrunjay hills near Patilana, Gujarat is called "The city of Temples". Both of these complexes use the style of Solanki or Māru-Gurjara architecture, which developed in west India in the 10th century in both Hindu and Jain temples, but became especially popular with Jain patrons, who kept it in use and spread it to some other parts of India. It continues to be used in Jain temples, now across the world, and has recently revived in popularity for Hindu temples.

A Jain temple or Derasar is the place of worship for Jains, the followers of Jainism. Jain architecture is essentially restricted to temples and monasteries, and secular Jain buildings generally reflect the prevailing style of the place and time

they were built. Derasar is a word used for a Jain temple in Gujarat and southern Rajasthan. Basadi is a Jain shrine or temple in Karnataka. The word is generally used in South India. Its historical use in North India is preserved in the names of the Vimala Vasahi and Luna Vasahi temples of Mount Abu. The Sanskrit word is vasati, it implies an institution including residences of scholars attached to the shrine.

Temples may be divided into Shikar-bandhi Jain temples, public dedicated temple buildings, normally with a high superstructure, typically a north Indian shikhara tower above the shrine) and the Ghar Jain temple, a private Jain house shrine. A Jain temple which is known as a pilgrimage centre is often termed a Tirtha. The main image of a Jain temple is known as a mula nayak. A Manastambha (column of honor) is a pillar that is often constructed in front of Jain temples. It has four 'Moortis' i.e. stone figures of the main god of that temple. One facing each direction: North, East, South and West.

Figures on various seals from the Indus Valley Civilisation bear similarity to jaina images, nude and in a meditative posture. The Lohanipur torso is the earliest known jaina image (presumed to be Jain because of the nudity and posture), and is now in the Patna Museum. It is also one of the earliest Indian monumental sculptures in stone of a human, if the dating to the 3rd century BCE is correct; it might be from about the 2nd century CE. Bronze images of the 23rd tirthankara, Pārśva, can be seen in the Prince of Wales Museum, Mumbai, and in the Patna Museum; these are dated to the 2nd century BCE. The carved Kankali Tila architrave with centaurs worshipping a Jain Stupa, is Mathura art, of circa 100 BCE, showing Hellenistic influence.

The early Udayagiri and Khandagiri Caves, are a number of finely and ornately carved caves built during 2nd-century BCE excavated by King Kharavela of Mahameghavahana dynasty. Chitharal Jain Monuments is the earliest Jain

monument in the southernmost part of India dating back to first century BCE. The Chausa hoard is the oldest of group of bronzes to be found in India. The bronzes have varied dates, from between the Shunga and the Gupta periods, from (possibly) the 2nd century BCE to the 6th Century CE.

The Badami cave temples and the constructed Aihole Jain monuments were built by Chalukya rulers in the 7th century, and the Jain parts of the Ellora Caves date from around this period. The earliest of the large group of Jain temples at Deogarh were begun, and in general the excavation of new rock-cut sites ceased in this period, as it also did in the other two main religions. Instead stone-built temples were erected.

Ayagapata is a type of votive slab associated with worship in Jainism. Numerous such stone tablets discovered during excavations at ancient Jain sites like Kankali Tila near Mathura in India. Some of them date back to 1st century CE. These slabs are decorated with objects and designs central to Jain worship such as the stupa, dharmacakra and triratna.

A large number of ayagapata (tablet of homage), votive tablets for offerings and the worship of tirthankara, were found at Mathura. The sculpture seems to have been part of Jain tradition since the last centuries BCE, but probably was mostly in wood, which has not survived. The earlier known examples of Jain sculpture are stone architraves of the 1st century BCE, found in the Art of Mathura, particularly from the Jain mound of Kankali Tila.

Perhaps the most famous single Jain work of art is the Gommateshvara statue, a monolithic, 18 meter statue of Bahubali, built by the Ganga minister and commander Chavundaraya around 983. It is situated on a hilltop in Shravanabelagola in the Hassan district of Karnataka state. This statue was voted as the first of the Seven Wonders of India.

Smaller bronze images were probably for shrines in homes. A number of medieval collections of these have been excavated, probably deposited when populations fled from wars. These include the Vasantgarh hoard (1956, 240 pieces), Akota Bronzes (1951, 68 pieces, to 12th century), Hansi hoard (1982, 58 pieces, to 9th century), and the Chausa hoard (18 pieces, to 6th century).

Each of the twenty-four tirthankara is associated with distinctive emblems, which are listed in such texts as Tiloyapannati, Kahavaali and Pravacanasaarodhara. The Jivantasvami images represent Lord Mahavira (and in some cases other Tirthankaras) as a prince, with a crown and ornaments. The Jina is represented as standing in the kayotsarga pose.

A monolithic manastambha is a standard feature in the Jain temples of Mudabidri. They include a statue of Brahmadeva on the top as a guardian yaksha. The 58-foot tall monolithic Jain statue of Bahubali is located on Vindhyagiri Hill, Shravanabelagola built in 983 CE was the largest free standing monolithic statue until 2016, 108 feet monolithic idol Statue of Ahimsa (statue of first Jain tirthankar, Rishabhanatha) was erected at Mangi-tungi.

Jain temples and monasteries had mural paintings from at least 2,000 years ago, though pre-medieval survivals are rare. In addition, many Jain manuscripts were illustrated with paintings, sometimes lavishly so. In both these cases, Jain art parallels Hindu art, but the Jain examples are more numerous among the earliest survivals. The manuscripts begin around the 11th century, but are mostly from the 13th onwards, and were made in the Gujarat region. By the 15th-century they were becoming increasingly lavish, with much use of gold.

The swastika is an important Jain symbol. Its four arms symbolise the four realms of existence in which rebirth occurs according to Jainism: humans, heavenly beings, hellish beings and non-humans (plants and animals). This is conceptually

similar to the six realms of rebirth represented by bhavachakra in Buddhism. It is usually shown with three dots on the top, which represent the three jewels mentioned in ancient texts such as Tattvartha sūtra and Uttaradhyayana sūtra: correct faith, correct understanding and correct conduct. These jewels are the means believed in Jainism to lead one to the state of spiritual perfection, a state that is symbolically represented by a crescent and one dot on top representing the liberated soul.

The hand with a wheel on the palm symbolizes ahimsā in Jainism with ahimsā written in the middle. The wheel represents the dharmachakra (Wheel of the Dharma), which stands for the resolve to halt the saṃsāra (wandering) through the relentless pursuit of ahimsā (compassion). In 1974, on the 2500th anniversary of the nirvana of Mahāvīra, the Jain community chose one image as an emblem to be the main identifying symbol for Jainism. The overall shape depicts the three loka (realms of rebirth) of Jain cosmology i.e., heaven, human world and hell. The semi-circular topmost portion symbolizes Siddhashila, which is a zone beyond the three realms. The Jain swastika is present in the top portion and the symbol of Ahimsā in the lower portion. At the bottom of the emblem is the Jain mantra, Parasparopagraho Jīvānām. According to Vilas Sangave, the mantra means "all life is bound together by mutual support and interdependence". According to Anne Vallely, this mantra is from sūtra 5.21 of Umaswati's Tattvarthasūtra, and it means "souls render service to one another".

The five colours of the Jain flag represent the Pañca-Parameṣṭhi and the five vows, small as well as great: The Ashtamangala is a set of eight auspicious symbols, which are different in the Digambara and Śvētāmbar traditions. In the Digambara tradition, the eight auspicious symbols are Chatra, Dhvaja, Kalasha, Fly-whisk, Mirror, Chair, Hand fan and Vessel. In the Śvētāmbar tradition, these

are Swastika, Srivatsa, Nandavarta, Vardhmanaka (food vessel), Bhadrasana (seat), Kalasha (pot), Darpan (mirror) and pair of fish.

The Jains left their imprints in some of the areas now comprising on Pakistan. The existence of Jain temples at Jandial and Sirkap at Taxila are well known. At Katas and Murti in Chakwal district some objects pertaining to Jains art were discovered by A. Stein. The accounts are based on relevant Archaeological Reports. Before the creation of Pakistan, a large number of Jains were living in Maujgarh, Phulra, Derawar and Bahawalpur in Punjab. A few stone columns and pedestals belonging to Jain temples are in the different museums of Pakistan. However the main concentration of Jain temples is in Tharparkar district in Sindh where Jains temples are found in abundance. These are mostly located in Parinnagar, Nagarparkar, Viravah, Bodhesar etc. In Parinagar, there are remains of five or six temples constructed in white marble. Nagarparkar is well known for its beautiful Jain temples in Karonjhar Mountains close to the city of Nagarparkar.

The Jain temples follow in their architectural treatment almost the same principles as the Hindus temples. The general character of Jain architecture has been quite similar in style to that of the Buddhist and Hindus of the same period. As such there is no distinct Jain architecture. However, certain adjustments are made so as to meet the requirements of the Jain rituals, for instance the Jains preferred enclosed compartments instead of open columned cell, thus ensuring more isolation for their religious ceremonies.

In Jain temples the embellishment is only confined to the interior its façade being generally left plain. It was the custom of Jains to build their fanes on the summit of the mountains which are regarded as sacred and worshipped as deities. In view of the considerable aggregation of religious buildings on the mountains these places are called “temple cities”. The principle cities where Jain temples have

been constructed include Kathiawar, Jodhpur, Mewar, Mount abu in Rajutana. In the realm of art it left very impressive and extensive evidence of the intricacies of its iconographic trends.

Further on the architectural side, there was a remarkable contribution made by Jains. These Jain architectural elements show highly monumentality, graceful and grandeur. For instance in Tharparkar, the Jain temples are modest; each temple having its own individually character, some of these represent Nagara style of architecture and Dravidian style. The significant Jain architectural examples are; Jain temple at Gori, Jain temple at Viravah, three temples at Bodhesar, Jain temple at Nagarparkar etc.

5.4 Hindu Art and Architecture

The first sculptures in India date back to the Indus Valley civilization some 5,000 years ago, where small stone carvings and bronze castings have been discovered. Later, as Hinduism, Buddhism and Jainism developed further, India produced some of the most intricate bronzes in the world, as well as unrivaled temple carvings, some in huge shrines, such as the one at Ellora. The Ajanta Caves in Maharashtra, India are rock-cut cave monuments dating back to the second century BCE and containing paintings and sculpture considered to be masterpieces of both Buddhist religious art and universal pictorial art.

Indian architecture encompasses a wide variety of geographically and historically spread structures, and was transformed by the history of the Indian subcontinent. The result is an evolving range of architectural production that, although it is difficult to identify a single representative style, nonetheless retains a certain amount of continuity across history. The diversity of Indian culture is represented in its architecture. It is a blend of ancient and varied native traditions, with building types,

forms and technologies from West and Central Asia, as well as Europe. Architectural styles range from Hindu temple architecture to Islamic architecture to western classical architecture to modern and post-modern architecture.

India's Urban Civilization is traceable originally to Mohenjodaro and Harappa, now in Pakistan. From then on, Indian architecture and civil engineering continued to develop, manifesting in temples, palaces and forts across the Indian subcontinent and neighbouring regions. Architecture and civil engineering was known as *sthatpatya-kala*, literally "the art of constructing"

Indian rock-cut architecture provides the earliest complete survivals of Buddhist, Jain and Hindu temples. The temples of Aihole and Pattadakal are well-known early examples of Hindu temple architecture, when the temple was taking on its final form. This was more or less set out in the *Sulbasutras*, appendices to the Vedas giving rules for constructing altars, with detailed geometrical and ritual requirements. "They contained quite an amount of geometrical knowledge, but the mathematics was being developed, not for its own sake, but purely for practical religious purposes." Nonetheless, there is great variety in the details and decoration of regional and period styles, for example in Hoysala architecture, Vijayanagara architecture and Western Chalukya architecture.

During the Mauryan Empire and Kushan Empire, Indian architecture and civil engineering reached regions like Baluchistan and Afghanistan. Statues of Buddha were cut out, covering entire mountain cliffs, like in Buddhas of Bamyan, Afghanistan. Over a period of time, the ancient Indian art of construction blended with Greek styles and spread to Central Asia.

The rule of the Delhi Sultanate, Deccan Sultanates and Mughal Empire led to the development of Indo-Islamic architecture, a style that combined Islamic influences with traditional Indian styles. During the British Raj, a new style of

architecture known as the Indo-Saracenic revival style developed, this incorporated varying degrees of Indian elements into the British style. The Churches and convents of Goa which is cast in the Indian Baroque Architectural style under the orientation of the most eminent architects of the time. It is a prime example of the blending of traditional Indian styles with western European architectural styles

Hindu temple architecture as the main form of Hindu architecture has many varieties of style, though the basic nature of the Hindu temple remains the same, with the essential feature an inner sanctum, the garbha griha or womb-chamber, where the primary Murti or the image of a deity is housed in a simple bare cell. Around this chamber there are often other structures and buildings, in the largest cases covering several acres. On the exterior, the garbhagriha is crowned by a tower-like shikhara, also called the vimana in the south. The shrine building often includes an circumambulatory passage for parikrama, a mandapa congregation hall, and sometimes an antarala antechamber and porch between garbhagriha and mandapa. There may further mandapas or other buildings, connected or detached, in large temples, together with other small temples in the compound.

Hindu temple architecture reflects a synthesis of arts, the ideals of dharma, beliefs, values and the way of life cherished under Hinduism. The temple is a place for Tirtha—pilgrimage. All the cosmic elements that create and celebrate life in Hindu pantheon, are present in a Hindu temple—from fire to water, from images of nature to deities, from the feminine to the masculine, from kama to artha, from the fleeting sounds and incense smells to Purusha—the eternal nothingness yet universality—is part of a Hindu temple architecture. The form and meanings of architectural elements in a Hindu temple are designed to function as the place where it is the link between man and the divine, to help his progress to spiritual knowledge and truth, his liberation it calls moksha.

The architectural principles of Hindu temples in India are described in Shilpa Shastras and Vastu Sastras. The Hindu culture has encouraged aesthetic independence to its temple builders, and its architects have sometimes exercised considerable flexibility in creative expression by adopting other perfect geometries and mathematical principles in Mandir construction to express the Hindu way of life.

Possibly the oldest Hindu temples in South East Asia dates back to 2nd century BC from the Oc Eo culture of Mekong Delta from southern Vietnam. They were probably dedicated to a sun god, Shiva and Vishnu. The temples were constructed using granite blocks and bricks, one with a small stepped pond. The cultural sphere often called Greater India extended into South-East Asia. The earliest evidence trace to Sanskrit stone inscriptions found on the islands and the mainland Southeast Asia is Võ Cạnh inscription dated to 2nd or 3rd century CE in Vietnam or in Cambodia between 4th and 5th-century CE. Prior to the 14th-century local versions of Hindu temples were built in Myanmar, Malaysia, Indonesia, Thailand, Cambodia, Laos and Vietnam. These developed several national traditions, and often mixed Hinduism and Buddhism. Theravada Buddhism prevailed in many parts of the South-East Asia, except Malaysia and Indonesia where Islam displaced them both.

Hindu temples in South-East Asia developed their own distinct versions, mostly based on Indian architectural models, both North Indian and South Indian styles. However, the Southeast Asian temple architecture styles are different and there is no known single temple in India that can be the source of the Southeast Asian temples. According to Michell, it is as if the Southeast Asian architects learned from "the theoretical prescriptions about temple building" from Indian texts, but never saw one. They reassembled the elements with their own creative interpretations. The Hindu temples found in Southeast Asia are more conservative

and far more strongly link the Mount Meru-related cosmological elements of Indian thought than the Hindu temples found in the subcontinent. Additionally, unlike the Indian temples, the sacred architecture in Southeast Asia associated the ruler (devaraja) with the divine, with the temple serving as a memorial to the king as much as being house of gods. Notable examples of Southeast Asian Hindu temple architecture are the Shivaist Prambanan Trimurti temple compound in Java, Indonesia (9th century), and the Vishnuite Angkor Wat in Cambodia (12th century)

A Hindu temple is a symmetry-driven structure, with many variations, on a square grid of padas, depicting perfect geometric shapes such as circles and squares. Susan Lewandowski states that the underlying principle in a Hindu temple is built around the belief that all things are one, everything is connected. A temple, states Lewandowski, "replicates again and again the Hindu beliefs in the parts mirroring, and at the same time being, the universal whole" like an "organism of repeating cells". The pilgrim is welcomed through mathematically structured spaces, a network of art, pillars with carvings and statues that display and celebrate the four important and necessary principles of human life—the pursuit of artha (prosperity, wealth), the pursuit of kama (desire), the pursuit of dharma (virtues, ethical life) and the pursuit of moksha (release, self-knowledge).

At the centre of the temple, typically below and sometimes above or next to the deity, is mere hollow space with no decoration, symbolically representing Purusa, the Supreme Principle, the sacred Universal, one without form, which is present everywhere, connects everything, and is the essence of everyone. A Hindu temple is meant to encourage reflection, facilitate purification of one's mind, and trigger the process of inner realization within the devotee. The specific process is left to the devotee's school of belief. The primary deity of different Hindu temples varies to reflect this spiritual spectrum.

The appropriate site for a Mandir, suggest ancient Sanskrit texts, is near water and gardens, where lotus and flowers bloom, where swans, ducks and other birds are heard, where animals rest without fear of injury or harm. These harmonious places were recommended in these texts with the explanation that such are the places where gods play, and thus the best site for Hindu temples.

While major Hindu mandirs are recommended at sangams (confluence of rivers), river banks, lakes and seashore, the Brhat Samhita and Puranas suggest temples may also be built where a natural source of water is not present. Here too, they recommend that a pond be built preferably in front or to the left of the temple with water gardens. If water is neither present naturally nor by design, water is symbolically present at the consecration of temple or the deity. Temples may also be built, inside caves and carved stones, on hill tops affording peaceful views, mountain slopes overlooking beautiful valleys, inside forests and hermitages, next to gardens, or at the head of a town street.

In practice most temples are built as part of a village or town. Some sites such as the capitals of kingdoms and those considered particularly favourable in terms of sacred geography had numerous temples. Many ancient capitals vanished and the surviving temples are now found in a rural landscape; often these are the best-preserved examples of older styles. Aihole, Badami, Pattadakal and Gangaikonda Cholapuram are examples.

The temples were built by guilds of architects, artisans and workmen. Their knowledge and craft traditions were originally preserved by the oral tradition, later with palm-leaf manuscripts. The building tradition was typically transmitted within families from one generation to the next, and this knowledge was jealously guarded. The guilds were like a corporate body that set rules of work and standard wages. These guilds over time became wealthy, and themselves made charitable

donations as evidenced by inscriptions.[The guilds covered almost every aspect of life in the camps around the site where the workmen lived during the period of construction, which in the case of large projects might be several years.

The work was led by a chief architect (sutradhara). The construction superintendent was equal in his authority. Other important members were stonemason chief and the chief image-maker who collaborated to complete a temple. The sculptors were called shilpins. Women participated in temple building, but in lighter work such as polishing stones and clearing. Hindu texts are inconsistent about which caste did the construction work, with some texts accepting all castes to work as a shilpin. The Brahmins were the experts in art theory and guided the workmen when needed. They also performed consecration rituals of the superstructure and in the sanctum.

In the earliest periods of Hindu art, from about the 4th century to about the 10th century, the artists had considerable freedom and this is evidenced in the considerable variations and innovations in images crafted and temple designs. Later, much of this freedom was lost as iconography became more standardized and the demand for econometric consistency increased. This "presumably reflected the influence of brahman theologians" states Michell, and the "increasing dependence of the artist upon the brahmins" on suitable forms of sacred images. The "individual pursuit of self-expression" in a temple project was not allowed and instead, the artist expressed the sacred values in the visual form through a temple, for the most part anonymously.

The style of Hindu temple architecture is not only the result of the theology, spiritual ideas, and the early Hindu texts but also a result of innovation driven by regional availability of raw materials and the local climate. Some materials of construction were imported from distant regions, but much of the temple was built

from readily available materials. In some regions, such as in south Karnataka, the local availability of soft stone led to Hoysala architects to innovate architectural styles that are difficult with hard crystalline rocks. In other places, artists cut granite or other stones to build temples and create sculptures. Rock faces allowed artists to carve cave temples or a region's rocky terrain encouraged monolithic rock-cut temple architecture. In regions where stones were unavailable, innovations in brick temples flourished.

Hindu Temples in Pakistan

A large number of specimens of Hindu art and architecture are found in the different areas of Pakistan. The structural remains of one of the Hindu temples were found during excavations at Banbhore, Sindh. In pre-Muslim period at the site, a building was recovered which was a Shiva temple due to discovery of two *lingas*. The fragments of Vishnu image were also reported. At Sewistan (Sehwan) in Sindh the existence of a big temple dedicated to Shiva is reported by the later historians as well. A brass image of Brahma was discovered from Mirpurkhas which is one of the finest metal sculptures ever discovered anywhere in the sub-continent. At Brahmanabad (Mansura) several fragments of Hindu stone images were discovered. A marble frame in relief found from a Shiva temple at Nagarparkar is a fine specimen of plastic art. In Karachi, the Daryalal temple at Manora and Swami Narayan temple (M.A Jinnah Road) are very famous. It is presumed that the cults of Shiva and Vishnu were popular in Sindh from early historical period. However, the most widely followed cult amongst the Hindus was the cult of trinity. It consist of the worship of the male-god Shiva, the mother goddess (Shakti) and their son Ganesh.

In Balochistan the oldest Hindu shrines are located at Hinglaj, Lasbela and Haptalar, district Makran. The other important architectural specimens include;

Kali temple at Kalat, sacred place known as Harisar pool, Shobro near Khuzdar and Gandava. Besides, the temple at Sonmiani contains Lingas and Yunies which is called as Shiva temple.

In the political history of the area, a new change take place when the Kushans were over thrown by the advance of Sassanids. Thereafter due to incursion of Huns and other invaders the area remained a hot bed of rivalries. The Turk Shahi emerged as victorious and they ruled over the region for nearly two centuries form 666 to 843 CE. The Turk Sahis were replaced by Hindu Sahis, who held their sway over the area from 843 to 1026 CE. The Hindu Shahis were definitely Sivites. In the Gandhara art we can found many elements of Hinduism. For instance the depiction of Shiva images in a number of Gandhara art. A number of Rock Carvings depict temples, crowned with sikhara (temple spire) and trisula (trident). Besides, some depiction of Brahmanic gods likes Brahmana Lakshamana Paramesvara i.e Shiva. Shivaism seemed to be the dominant cult in the region as the tribula engravings are found comparatively in large number of rock carvings in Gilgit-Baltistan. During the excavations at Kashmir Smast, a large number of Hindu objects found. Beside a large number of Hindu sculptures of art, there are found a large number of standing temples which are worth mentioning. However, the most outstanding surviving Hindu temples constructed during the reign of Hindu Shahi period are at Kafirkot North (7th -8th Century CE) and Kafirkot South (9th-10th Century CE) near Balot in Dera Ismail Khan.

In Punjab, the city of Lahore was a city totally inhabited by Hindus in 10th and 11th century, while its history can be trace back to Vedic times ranging from 1500 BC to 1000 BCE. . It was founded by *Loh* son of Ramachandra, legendry hero of Ramayana. The large number of cultural material pertaining to Hindu art has been discovered at a number of sites in the province. The important sites from where the Hindu sculptures have been discovered includes; Mian Ali Faqiran, district

Sheikhupura, Tulumba, district Khanewal, Son-sakesar, district Khushab, rokhri, district Mianwali, Pattan Minara, Rahim Yar Khan, Taxila district Rawalpindi etc.

Besides there are a great number of Hindu architectural specimens as well which are spread all over the region. The most striking examples of the Hindu architecture are located in various places in Salt Range such as; Malot, Kallar, Katas, Amb, Nandana etc. However, the district of Chakwal is extremely rich in the antiquarian remains of Hindu Shahi period as well as the Hindu architecture. There was a Hindu temple known as Shiv Ganga at Malkana, which is about 5 kilometer in north-east of Malot. There are remains of Kathwai near Pind Dadan Khan. Then there is a cluster of Hindu temples in a small city of Bhaun, district Chakwal which were constructed in the middle of 20th century.

5.5 Gandhara Civilization

The word “Gandhāra” is an ancient Sanskrit name of the region which is presently the area of Peshāwar Valley in Khyber Pakhtunkhwa province of Pakistan. It is first mentioned in *Rigveda*, the earliest of the Indian sacred texts (2nd Millennium BCE), which describes region located on the Northwest Frontier of India. The text from Achaemenian, Hellenistic and Roman periods indicates a region on the northwestern frontier of India. The ancient region of Gandhāra was however a very important part of the later Kushan Empire. Alexander the Great came to Swāt, Ora in 327 BCE. Arrian, the historian of Alexander made distinct mention of three flourishing towns in Swāt, among them one was Ora-the modern Udegram. Geographically the boundaries of Gandhāra encircle Jalalabad (Afghanistan), Khyber and Mohmmand Agencies in the north and towards the south Kohat, Minawali, Salt Range down to the banks of River Jhelum, in the east Taxila Valley.

Brief Political History of Gandhāra:

The ancient land of Gandhāra had been a centre of cultural diffusions throughout the ages. Archaeologically, the pre-historic period of this region begins with Middle Paleolithic artifacts recovered from the lowest levels at Sanghao Cave, Mardan as a result of excavations carried out by A.H. Dani during 1962-63. The other sites beside Sangao Cave are; Jamal Garhi rock shelter, Mardan and Khanpur Cave, Haripur, Hazara. Besides, Tangu Nau in Bajure is reported by the University of Peshāwaras site belonging to Middle Paleolithic Period.

The Mesolithic period was succeeded by the New Stone Age or Neolithic Period. This Period in and around Gandhāra has come to known from the site of Sarai Khola, south of Taxila. This site has yielded a cultural sequence as; late Neolithic (4000-2800 BCE), Bronze Age Culture (2800-1500 BCE), Late Bronze and Early Iron Age Culture (1000 BCE). The “Harappan Culture” in Gandhāra was replaced by Gandhāra Grave Culture from the period 1700-600 BCE.

The Gandhāran Grave Culture is associated with speakers of Indo-European who are believed to have introduced various artifact styles that were brought to Gandhāra through various immigration processes from north western passes during the last quarter of the 2nd millennium BCE. During 6th / 5th Century BCE Gandhāra was incorporated as a province into the Achaemenid Empire under Darius-I (528-486 BCE). The results of excavations at Bala Hisar testify that this area was under the control of Achaemenian Rule. In the early 4th Century BCE Alexander the Great entered Gandhāra to conquer all the Achaemenid provinces.

The Greeks were displaced by Chandra Gupta Maurya when Gandhāra first time became part of an Indian Empire. His grandson Asoka (272-32 BCE) was a great patron of Buddhism. He dispatched a number of missionaries from his capital Patliputra to different areas of the world to propagate Buddhism. The

archaeological remains of Buddhist Stūpas and Monasteries such as; Rock Edicts of Asoka at Shahbaz Gari, Mardan, Dharmarajika Stūpa, Taxila, Jamal Garhi, Mardan, Butkara-I, Swāt are some of the good examples of Mauryan Empire in Gandhāra. The Emperor Asoka in his lifetime issued a series of edicts and proclamations, which were inscribed on rock surfaces and on finely polished sandstone pillars throughout his vast empire.

Around 190 BCE the Bactrian Greeks under Demetrius–I established Indo-Greek Rule, in the Gandhāra region by capturing this region from the Mauryans. Their rule over Gandhāra lasted for about one hundred years from 190 to 90 BCE. The Indo-Greeks were defeated by the Sakas (Indo-Scythians) from Iran in 90 BCE. They were followed by Indo-Parthian in the early first century CE, as evident from an inscription of Indo-Parthian king Gondophares discovered from Takht-i-Bhāi, which dates early first century C.E.

During the first half of second century BCE, the Kushanas, Central Asian nomadic tribes conquered the region of Bactria. The tribe became the most powerful under the Kushan ruler Kujula Kadphises-I, who united various tribes and established the Kushan dynasty. The most famous of Kushan rulers was Kanishka, the successor of Vima Kadphises, who ruled for twenty one years. The Kushanas contributed a large to the cultural heritage of the north west of the Indian subcontinent. Their support of Indian, Greek, Roman and Iranian religious ideas placed significant impact on the religious development of Gandhāra. Hence with syncretic religious approach, they made Gandhara a centre of multicultural activities. During the rule of Kanishka, Gandhāra enjoyed its greatest prosperity and the art of Gandhāra reached at its highest climax.

During 5th Century CE, a cluster of Chinese known as White Huns or Hephthalites, from Central Asia under Toramana, crushed Gandhāra region. The destructions of the Buddhist establishments are mainly attributed to them. After their massive destruction, Gandhāra however, never recovered. In the absence of datable monuments it is not possible to affirm that the Gandhāra School had neatly come to an end with the disasters of the late 5th and early 6th centuries. During the 7th and 9th century, Gandharā was under the rule of Turk Śāhi dynasty. Their first ruler was Barhatigin, who took control of Gandhāra, in the first half of 7th century.

After the death of Bhimpala in 1026, the Hindu Śāhis rule in Gandharā came to an end. It was steadily forced south into the inhospitable salt range by the annual incursions from Central Asian Islamic States from the 11th century CE, onwards that culminated in the 16th century CE with the establishment of Mughal Empire. The Mughal fortress at Hund, Attock and the Bala Hisar at Peshāwar are testimonies of the strategic importance. The control over Gandhāra was gained from the Mughals in the 17th century by Afghan rulers and later by Sikhs until its annexation by the British Raj in the 19th Century.

The results of excavations conducted by Italian Archaeological Mission (during 1985 – 1999) at mount Raja Gira near Udegram, Swāt have identified Islamic occupation dating from the 11th 13th centuries CE., and almost overlapping two main pre-Islamic phases, the alter one dated to 8th – 10th centuries and the earlier one dating from 1st/2nd – 4th centuries. In the beginning of 11th century CE Sultan Mahmood of Ghazni defeated the Hindu rulers in the battle of Hund and established the foundation of Muslim rule over Indo Pakistan sub-continent.

Although the Muslims invaded Swāt in the beginning of 11th century and the foundation of a general spread of Islam here was laid, Buddhism and Hinduism

prevailed here for centuries to come. It has been proved from the results of archaeological excavations carried out by Italian Mission to Swāt, at the Ghaznavid Mosque of Udegram which was abandoned in the 12th century. With such a history behind them it is not surprising that the people of Gandhara were thoroughly cosmopolitan in their culture and their outlook. The common speech of the people was an Indian Prakrit, but the script they used for the writing of this vernacular was Kharoshthi a modified form of the Aramaic of Western Asia, which had been adopted for official use throughout the Persian Empire during Achaemenid times.

Significant Buddhist archaeological sites in Gandhara:

A brief description of some of the important Buddhist city sites discovered in Gandhāra which played a model role as well as served as a melting pot, for cultural diffusion between east and west civilizations in ancient times is presented as under:

i) **Puskalavati:** Puskaravati or Pushkalavati means “town of lotus”, it was capital of Gandhāra before Purusapura which had undergone many survey. Alexander Cunningham explored the site in 1870 and Sir John Marshall conducted a trial dig at the beginning of the 20th century. In 1958, The Department of Archaeology, Pakistan, investigated Charsadda under the supervision of Sir Mortimer Wheeler. They dug a trial trench stretching east to west on the southeast cliff of BalaHissar. It was the capital until somewhere between the 2nd century BCE and the 1st century CE.

ii) **ShaikhanDheri:** There is a low wide hill called ShaikhanDheri in the northeast of BalaHissar. Dr. A.H Dani, from Peshawar University investigated the site and revealed that it was established by Greco-Bactrians in the 2nd century

BCE and that even though alterations and reconstruction of the city was carried out, the original city layout has been adhered to. The city had been the capital until the Kushanas dynasty of Vasudeva –I moved it in the beginning of the 3rd century BCE. Shaikhandheri is the second city of Charsadda and has similar structures and characteristics to Sirkap, which is the second city of Taxila. The capital of Gandhāra was moved Purusapura by King Kanishka, it became the capital of the Kushan Empire.

iii) **Purusapura:** Purusapura or the modern city of Peshawar is central city of Khyber Pakhtunkhwa province of Pakistan. The Kanishka grand stupa of “shah-ji-ki-Dheri” (Peshawar) was mentioned by Chinese monk, Fa Xian, Xuan Zang and Song Yun in their accounts and was considered as architectural marvel because of its height. The stupa was investigated by D.B Spooner’s mission from 1909 to 1910. A relic casket with the name of the King Kanishka was excavated from the site which is now preserved in the Peshawar Museum.

iv) **Mekhasanda:** The remains of Mekhasanda Temple are located to the northeast of Shahbagzarhi, on the southeast ridge of Mount Karamar. Foucher excavated the eastern half of the center of this site including the main stupa between the years 1895-97. Then in 1902, an expeditionary team headed by KozuiOtani visited this site and collected the artifacts. The Kyoto University Scientific Mission for Iran, Afghanistan and Pakistan conducted a detailed survey from 1962 to 1967. The main stupa is located at the center of the site whereas the small stupas surround the main stupa on all four sides. According to Koji Nishikawa, many of the excavated relics were stucco sculptures along with a few stone reliefs. This site in the late Gandhāran Temple style of the 3rd-5th centuries.

v) **Thareli:** To the northeast of Jamalgarhi, lies the Utomankhel mountain range that borders the north of the Gandhāran Plain. Many Buddhist sites scatter across the southern slope of this mountain range. The Thareli Temple (early Gandharan Temple) site stands on the ridge of a mountain, which stretches to the southeast. The Kyoto University Scientific Mission for Iran, Afghanistan and Pakistan conducted an extensive investigation on this site from 1963 to 1976. Among the excavated relics, the ratio of stone reliefs was higher than that of stucco. In addition coins excavated from the site date back to the time when Kushan dynasty was flourishing during the reign of Kings Kanishka, Huvishka and Vasudeva.

vi) **Chanaka-dheri:** The result of the archaeological excavations (carried out from 1959-1967) showed that this site consists of secular buildings with giant base stones, indicating that it was built somewhere between 1st-3rd century.

vii) **Kashmir Smast:** Kashmir Smast is the name of a historic period cave located some 50 km north-east of Mardan and about 20 km north of Shahbagzarhi, Pirsai village a further 16 km to the north. Many archaeological sites so far have been discovered in Gandhāra region but the significance of Kashmir Smast can hardly be compared with any other site of the region. Antiquities discovered from the site, are quite distinct from those found in the area, suggest that the Hindu religion was flourishing in this region at least from the 2nd century CE up to the 10th century CE side by side with other religions of the time. The Kyoto University Mission surveyed this site in 1960. Besides Dr. Muhammad Nasim Khan, Peshawar University has conducted extensive archaeological excavations.

viii) **Jamalgarhi:** This important Buddhist site is located to the northeast of Takht-i-Bahi on a rocky ridge running east-west. Prof. Koji Nishikawa mentions that at the centre of the site is the main stupa built on a circular plinth, surrounded by shrines. The south stairs of the stupa lead down to a courtyard where small votive stupas stand. Most of the structures in the courtyard are shrines. On a level one step lower, small stupas and shrines with niches in them are lined up. There are monasteries in the southern part of the site and a large assembly hall, a canteen and kitchen on the outer side of the terrace to the east.

ix) **Shahbagzarhi:** Shahbagzarhi, a famous city of ancient Gandhara is situated about 14 km east of Mardan, on the main highway from Peshawar to Hund, on the main crossing of river Indus. It was also junction of commercial activities in old days. It was graced with the royal edicts of Asoka. These inscriptions permanently recorded for the propagation and preaching among the people. To convey to them the message of pious deeds and the commandments of administration. Among the fourteen rock edicts instated by Asoka in the subcontinent, two rocks edicts are founded here inscribed with Kharosthi script.

x) **Takht-i-Bahi:** The Buddhiststupa and monastery of Takht-i-bahi like Jamalgarhi is well preserved which is located about 15 km north east of Mardan district. The main stupa and two courtyards created on different terraces are augmented votives stupas and shrines; cells surround the monastic quadrangle for monks and large square assembly hall. Underground meditations chambers also discovered in the monastery.

xi) **Sehr-i-Behlol:** The Kushan city of Sehr-i-Behlol is located on a mound about 12 km northeast of Mardan. The city was heavily fortified and full equipped with all the meeting amenities of supporting a large Buddhist population. It was a

major ceremonial and religious center during the peak period of the Gandhāran Civilization. The archaeological site of Sehr-i-Behlol and the Buddhist monuments around the city were extensively explored by Dr. D. B. Spooner in 1907 and by Sir Aurel Stein after a decade later. The excavations yielded a large number of Buddhist sculptures most of which presently housed in the Peshawar Museum.

xii) **Ranigat:** The Ranigat site is named after Ranigat (the Queen's Rock) rock. It is one of the largest Buddhist sites in Gandhāra, covering a hilly area, extending about one km from north to south and 0.7 km from east to west. The site is about 600-650 m above sea level and about 200 meter higher than Nowgram. According to Alexander Cunningham¹, after his visit (1848) says that this site was the stronghold called Aornos, located in the mountains along the Indus River, which was conquered by Alexander the Great. Ranigat has attracted attention because of the large amount of structural remains which can be found near the small village called Nogram, about 26 km north of Ohind, and 35 km east of Mardan. During 1881-82, Alexander Cunningham investigated the Ranigat site again with H.B. Garrick. Similarly, I. Lowenthal who surveyed the Peshawar District in 1860's mentions that the palace and the temple, where the king lived and prayed, were surrounded on all sides by masonry buildings. He also mentions that the most notable thing on Ranigat hill is the gigantic rock at the top and the caves carved into a large stones dotted around hill.

In 1864 H.W. Bellew conducted survey and said that the Ranigat site is similar to Jamalgarhi, Takht-i-Bahi and Sahr-i-Behlol in its plan structure and architectural forms, however, the material used were different. In 1883 H.H.

Cole also visited the Ranigat site and conducted an archeological survey. In December 1891, Sir Aurel Stein visited the site and showed a great interest. The Ranigat site has been scientifically excavated and properly conserved by a research group of Kyoto University Japan from 1983-1992, under the leadership of Prof. Koji Nishikawa and then by Prof. M. Masui. At the site stone, stucco and terracotta sculptures have been discovered (total number of antiquities comes to 3659) apart from the coins right from the Scytho Parthian to early Kushan period.

xiii) ZarDheri: ZarDheri is located in Hazara division; district Mansehra in Khyber Pakhtunkhwa province. Tokyo National Museum Archaeological Mission carried out survey and excavations here during 1995-2000. This site is a Buddhist complex having significant role in the old days when pilgrims and traders passed through this on Silk Route. In 1999 more than 145 unused stone sculptures, architectural panels have been discovered from a cell.

xiv) Gumbatuna: Swāt, ancient Savastu “land of fragrance” is located in northern part of Pakistan. According to ancient records Swāt was filled with about 1400 imposing Buddhist stupas and monasteries. The cultural potential of this valley goes back to 3000 BCE. Gumbatuna site is consisting on a colossal stupa with viharas and stupas, which is located on the right bank of Swāt River about 6 km west of Barikot village. The salvage excavation conducted by Dr. M. Ashraf Khan in 1994 and discovered a large number of stone and stucco objects from this site which belongs to 1st to 3rd century.

xv) Dadhara: It is situated about 26 km west of Saidu Sharif on the right bank of Swāt River on Kabul Parri road and 1 km to the east of modern village of Dadhara. It is a Buddhist establishment consisting of stupas and chapels and belongs to 2nd-5th century. Dr. M. Ashraf Khan excavated this site in 1992.

xvi) **AndanDheri:** It is also a Buddhist monastic complex which stands in the heart of Adin Zai plain about 8 km north of Chakdara. It was excavated by Department of Archaeology and Museums, Pakistan and University of Peshawar in 1966. The main stupa is surrounded by votive stupas and a monastery. A large number of sculptures, coins and minor antiquities discovered which belongs to 2nd-4th century.

xvii) **Chatpat:** It is located 2 km west of Chakdara and 4 km from the main Chakdara-Dir road. This Buddhist site has been excavated by Department of Archaeology and Museums, Pakistan and Dr. A. H. Dani Peshawar University. It comprised 37 votive stupas and monastic cells. A number of black schist sculptures, coins, and pottery as well as Kharosthi inscriptions have been discovered from here which are mostly belonging to late 1st – 4th century.

xviii) **Butkara-I:** It is located at the eastern end of Mingora which consist on a complex of very large and wide stupa & monastery. The Italian Archaeological Mission (IsMEO now IsIAO) in collaboration with Department of Archaeology and Museums, Pakistan excavated the site in 1956 – 58. About seven thousand stone sculptures were recovered from this site. The main stupa and surrounding structures belong to Ca. 3rd century BCE -10th century.

xix) **Butkara-III:** The Butkara- III, marks the site of an ancient Buddhist establishment, the actual name of which has long been forgotten. The present name, a corrupted form of the Persian word *butkada* meaning ‘the house of images’ is the name of the area lying adjacent to the town of Saidu Sharif, Swat to the east. The actual lies astride on the sides of a ravine called NariKhwar- one of the several seasonal streams which drain the northern side of the Latokhp hill

and after meandering through the terraced fields for a short distance join the main stream called Jambil, a tributary of the river Swāt. Dr. Abdur Rahman has conducted archaeological excavation at the site in 1982 and 1985.

xx) **Saidu Stupa:** This Buddhist complex is located about 1 km south of Swāt Museum. The Buddhist sacred area of Saidu Sharif is situated at the foot of the mountains separating the Saidu River valley from the valley of the River Jambil, not far from the early and extensive built-up area identified by Giuseppe Tucci as *Mengjieli*, one of the major cities of Swāt. The Italian Archaeological Mission and Department of Archaeology, Pakistan had excavated and discovered a large number of stone sculptures representing Gandhāra art & Buddhist cult objects. This stupa belongs to 1st -5th century.

xxi) **Panr:** Panr is situated about 2 km east of Mingora Jambilroad. Italian archaeological Mission and Department of Archaeology and Museums, Pakistan excavated the site which consists of two terraces connected by steps. There is a main stupa surrounded by votive stupas and a column made of soapstone. The site belongs to the period after the construction of great stupa-III at Butkara-I.

xxii) **Nimogram:** It is a Buddhist stupa and monastery site, located in Shamoza area, north of the streamlet in lower Swāt. It was excavated by the Department of Archaeology and Museums, Pakistan in 1968-69. The three main stupas stand in a row with viharas, fifty-six votive stupas all around it, over a paved floor with the remains of a monastery in the west. The sacred area was destroyed due to fire and finally it was abandoned.

xxiii) **Baligram:** It is Buddhist establishment situated about 4 km south of Swāt Museum which was excavated by Dr. M. Ashraf Khan, Department of

Archaeology and Museums, Pakistan in 1991.

xxiv) **Nawagai:** The site of Nawagai is situated about 3 km east of Barikot village on the way to Karakar Pass. The site was excavated by Mian Said Qamar of the Department of Archaeology and Museums, Pakistan in 1992. This site consists of main stupa, chapels and numerous votive stupas around over a paved floor. A number of stone sculptures, a relic casket, copper objects and pottery were found which belongs to 2nd-10th century. With the exception of only a few fragments in stucco all the other pieces were carved from blue schist or green phyllite. Most of the sculptures were found fragmentary and damaged condition which comprises on isolated images, panel reliefs and friezes depicting various scenes from the Buddha's life and also a large number of archaeological elements such as stupa brackets, cornice parts, umbrella pieces, Corinthian pillars and a large number of stone slabs with floral, vegetal and geometrical patterns. It was these sculptures that once adorned the decorated walls of the stupa.

xxv) **Shanaisha:** The site of Shanaisha is situated about six km south of Saidu Sharif, and about 9 km south of Mingora (Swāt). This site was explored by Sir Aurel Stein in 1926 revisited some thirty years later by G. Tucci in 1958. Aurel Stein mentioned this site fairly well preserved while Prof. Tucci found the stupa greatly damaged. He was also told that from this site many sculptures had been dug out and sold in the underground market by treasure hunters. In 1989, the first excavation campaign was conducted by Mr. Nazir Ahmad Khan, the then Curator of Swāt Museum, Department of Archaeology and Museums, Pakistan. In 1990 a joint archaeological investigations was carried out by the University of Peshawar and Department of Archaeology and Museums, Pakistan under the leadership of Dr. Abdur Rahman with the representation of Mian Said Qamar, the then Deputy Director.

xxvi) **Marjanai:** The site of Marjanai is situated about 21 km northwest of Mingora city in Swat. Dr. Shah Nazar Khan excavated this site and reported results in “Ancient Pakistan”. According to him the sculptures came from Votive stupa No. 3 which is mostly carved out of green phyllite with the exception of a few pieces moulded in stucco. The stone sculptures are panels, reliefs depicting important incidents from the life of the Buddha.

xxvii) **Aziz Dheri:** The site of Aziz Dheri has been investigated by Dr. M. Nasim Khan, Peshawar University who has reported that the results shows a complete and uninterrupted cultural sequence at the site starting at least from the Indo-Greek to the Islamic period. The archaeological excavations at the site were carried out during 1993 to 2008. He also mentions that sculptural remains from this site are quite varied representing various themes starting the previous birth stories of the Buddha and from the palace life to the display of his relics etc.

xxviii) **Charg-pate:** The Buddhist religious site of Charg-pate is located about 2 km to the north of Khanpur village some 15 km to the northwest of Chakdara in District Dir, Khyber Pakhtunkhwa. It was explored and excavated by the Department of Archaeology, University of Peshawar in 1981. The site was built on two terraces; an upper and a lower. Executed in grey schist the sculptures from the upper terrace were rough in style and dresses on some of the figures closely resemble those Central Asian. The lower terrace yielded sculptures mostly in green phyllite that exhibit depth in carving ,excellence in workmanship and Western influences in their style.

xxix) **Tokardara, Najigram:** The Buddhist monastery of Tokardara is located about 5 km on the south of Barikot and about 1 km west of the modern village Najigram at the mouth of a small picturesque gulley. It is surrounded on the

west, east and south by hills and on the north by wide strip of agriculture land. The Buddhist sanctuary of Tokardara was first recorded in 1926 by Sir Aurel Stein during his archaeological survey in the Swāt Valley. He was followed by E. Barger and P. Wright, who conducted a small scale test excavation at the site. After small excavation on the site by Barger and Wright, the site was then robbed by antique dealers. Nevertheless the site seems to offer a good opportunity for systematic excavation yielding promising results. The site was revisited by G. Tucci, Italian Archaeological Mission to Swāt, in 1955. Dr. M. Ashraf Khan, Department of Archaeology and Museums, Pakistan carried out archaeological excavations in 1995. Most of the findings are sculptures, carved in black and grey schist, depicting the life story of the Buddha and architectural elements. One of the stucco fragments depicts the lower part of the Buddha. According to Prof. M. Farooq Swāti, the sculptures collected from the site are fragmentary but some pieces are in good state preservation and exhibit deep and fine carving similar to those excavated from Nawagai, Baligram, Butkara-III, Shanaisha, Marjanai, Butkara-I, Saidu Sharif Swāt, AndanDheri and Chatpat in Dir. The sculptures date from 1st to 5th-6th century. Further such sculptures embellished the plinth of the stupas as some of them found still *insitu*.

xxx) **Taxila Valley:** The archaeological remains of Taxila valley are scattered in Punjab and Khyber Pakhtunkhwa provinces. Sir Alexander Cunningham, explored the Taxila valley and Sir John Marshall, was the first archaeologist who carried out regular archaeological excavations in the Taxila valley and exposed the buried history of this region. Then Mortimer Wheeler continued the excavations for some time. After independence of Pakistan in 1947, excavations were carried out by Mr. M. A Halim, Dr. M. Sharif, Mr. G.M. Khan, Dr. M. Ashraf Khan, Mr. Muhammad Bahadur Khan, Dr. Muhammad Arif, of the Department of Archaeology and Museums, Pakistan. A number of some

important cultural heritage sites are included; Sarai Khola, Hathial, Bhir Mound, Sirkap, Sirsukh, Jandial Temple, Dharmarajika Stupa, Julian (I & II), Kunala, Giri, MohraMuradu, Kalawan, Piplan, Jinan WaliDheri, Lal Chak, Badalpur, Bhalar, Bhamala, Mankiyala etc.

xxxii) **Dharmarajika Stupa Complex:** It is the oldest of the Sangharama in Gandhāra. The *Chirtop* site where main Dharmarajika stupa located is a huge complex over a period of about seven centuries from 3rd century BCE to 5th century CE, hundreds of stupas, chapels, and monastic cells were constructed. This construction belongs to Mauryan, Indo-Scythians, Parthians, Indo Sasanians and KidaraKushan but its expansion and maintenance were largely done during Kushan period particularly during the reign of Kanishka, Huvishka, and Vasudeva.

In Gandhāra region a large number of Buddhist settlements, Stūpas, Monasteries were established by the Buddhist followers in the areas such as: present Malakand area at the village of Derai Kssinath, Totakan in Zulamkot Valley, Loriyan Tangai, Allah Dand Dheri and over the hill of Shahkot, Dabar Tangai and Guniar at Thana. Then in the sub valley of Bari kot: the ancient Bazira of Greek historians and other note worthy Buddhist sanctuaries including; Udegram, the Ora of Greek Historians, Kanjar Kote, Nat Maira, Tokardara, Amluk Dara, Najigram, Abba Sahib China, Nawagai, Abu Tangai, Shingardar and rock carvings near the village of Tindodag. In Swāt Valley other imposing Buddhist establishments are at Saidu, Butkara-I, Butkara-III, Loebanr Stūpa, Arab Khan China, Dangram, Jorjorai, Topdara, Panr, Baligram, Shanasha, including a large number of rock carvings. Then on the north of Mingora Swāt, an important Buddha rock image is on high rock near Jahanabad. Another all-embracing Buddhist site is at Malamjaba plains next to Manglawar.

Besides masterpieces of Buddhist sculptures, the architecture of Gandhara also has a marked characteristic of its own composition in nature and scope lending towards Ionic and Doric style of Classical Greeks. The city plan of Sirkap in Taxila, the remains of religious establishments Stupas and Monasteries at Jaulian, Mohra Moradu, Dharmarajika etc. around Taxila, and those at Takht-i-Bahi, Jamal Garhi, Sehri Bahlol in Mardan district, are remarkable ensemble of the dissemination and blending of foreign and local traditions of the art of building. Besides, Butkara, Panr, Udegram, Nimogram, Chat Pat, Andan Dheri, Saidu Stupa, Shingardar Stupa, Thokardara Stupa, to name only a few, are some of the famous sites in Swat and Dir area which provide ample evidence of the extent of this religious cultural phenomenon.

5.6 Buddhist Art of Gandhara

In Gandhara due to diffusion of different cultures there developed an art between 1st century BCE and 7th Century CE, known after its geographic name as “Gandhara Art”. It is a triangular piece of land (about 100 KM across east to west and 70 KM north to south) on the western side of Indus River. Gandhara is a remote area surrounded by mountains yet it served as a gateway to Silk Road, giving access to Central Asia and hence to the countries of the East and West. We see that Buddhism became an international faith as it intermingled with various cultures from Greece, Rome, Saka, Parthia and Sasan. The Silk Road was an ideal ground for Buddhism to grow and develop. Buddhism’s route of introduction into China originated in Gandhara then reached in Afghanistan. The fame of Gandhara however rested on its capital “Taxila” which was a great centre of learning and a resort of students from all parts of India. Since from the Achaemenians time through Alexander the Great, the Mauryan Emperor Asoka, the Scythians, the Parthians, the Khushanas, the Huns and even down through Muslim period to the

great Mughals, when big caravan sarai was built here, Gandhara specially Taxila continued to maintain a link between East & West.

The Greek companions of Alexander the Great came across Buddhism in Northern India, where it had been forced to confine itself by the Brahmanic reaction. The Indo-Greek princes, the descendents of Alexander the Great's companions were Buddhists and it was under their rule that began the amazing art style, combined Hellenic forms and characteristics with Buddhist attitude & motifs and which became to known as the art of Gandhara. The advance of Buddhism towards the east carried it first to China and later to Japan.

However the real amalgamation and cultural interaction between East & West began in the Kushan dynasty and Gandhara was located in the heart of the Kushan regime. The events in the history of Buddhist Art like the creation of a Buddha image, and the remarkable development of relics of Buddha's life story took place after the last half of the first century CE. At that time the Kushans (nomads from Central Asia) founded a great empire extending from Central Asia to India. The emergence of the great empire changed the region of North West India from a frontier district to the focus of events. Not only did it become a junction between Central Asia & India but it was also a link with places as far as away as the Mediterranean world. The Kushan dynasty was an empire open to the outside and had an ability to assimilate different cultures. The coins used by this dynasty for example which depict gods of three different worlds- Greco-Roman, Iranian and Indian testify this theory. Gandhara art undoubtedly owes its prosperity to flourishing economical developments and cultural exchanges between east and west during the Kushan dynasty which controlled the important places along the Silk Road.

Gandhara and Mathura were the centres of the Kushan dynasty but there were also other areas where artistic activity was practiced prior to the dynasty. In

Gandhara which retained the Hellenistic tradition, Buddha images were made, probably with reference to statues of Roman emperors as models. The facial expressions and bodies of the Buddha images in Gandhara are however realistic.

As a result of the recent archaeological excavations carried out in the different areas of Gandhara it has been proved that Gandhara art lasted until the 5th -6th Century CE. A number of statues of Buddha, Bodhisattva and religious donors were made from Stucco in those centuries. During 7th-8th Century CE when Turkish rulers had gained power over Central Asia, Gandhara lost its position as an important centre and handed it over to other mountain regions such as Bamiyan, Kapisi, Swat and Kashmir. The Buddhist Art however enjoyed its last glory in those places.

Similarly the architecture of Gandhara is represented mainly by a multitude of stupas and monasteries. It reflects the influence of Greek and Roman forms, but essentially it is Indian. The archaeological excavation however has revealed a great deal of the monumental splendor. The efforts have succeeded in uncovering the remains of the Buddhist religious establishments Stupas and monasteries, at a large number of places like Charsada, Sarah-e-Bahlol, Takht-e-Bahi, Shah-ji-ki-Dheri, Jamal Garhi, Taxila and Swat. Charsada is one of the most important sites so far discovered in the Gandhara region, where are lying the remains of the ancient capital of Gandhara once known as Pushkalavati. The city was on the famous trade route linking China and the West. Nevertheless, it is true to say that Gandhara took its everyday speech from India and its writing from the West. This intimate fusion of widely divergent elements was equally apparent in the religious life of the people. As each successive conqueror added his quota to the local galaxy of deities and creeds, the number and variety went on growing.

The impetus given to Buddhists by the Mauryan Emperor, Asoka, and the artistic

impulses emanating from the Bactrian Greeks in Central Asia led to the fruition of the Gandhara Art under the patronage of the Kushanas and their successors. The period from 1st Century CE to 4th Century CE is a remarkable period in the history of Pakistan when the sculptural art becomes a hand maiden to spiritual zeal. Initially, the medium of sculptural art appears to have been the grey schist in Taxila, Peshawar, Mardan, Malakand, Dir, Swat and Buner regions, but then other kinds of locally available stones like phyllite, soapstone, green schist, chlorite, etc. were also used for carving sculptures alongwith the more plastic stucco to fulfill the insatiable demand of Buddhist devotees who filled the innumerable monasteries and stupas thickly dotting the whole Gandharan country of that time. While, Graeco-Roman impulse was responsible for initiation and development of Gandhara art, the local talent made it what it looked like the representation of the true society of the elite and the religious monks who roamed about with an aura of spiritual dignity.

In Theravada, only images of the Buddha are used as aids to meditation, focusing on his virtue, but the followers of Mahāyanā Buddhism worship many different Buddhas and Bodhisattvas. When the word ‘Bodhisattva’ began to be used is not known. Some scholars believe that it already existed during Asoka’s time, and others suggest that it appeared during the first century BCE. It seems certain that the meaning and the usage of the word were fully established by the first and second centuries CE around which time the images with the inscription “Bodhisattva” appeared in Mathurā.

In Mahāyanā, based on the concept of Mahapurusa (Great Man), with distinctive “laksanas”, the images of Buddha were created in the different areas. As a result different regional styles were evolved and developed which were based on the existing artistic customs as well as methods. The first images of Buddha are said to have been created in ancient Gandhāra by the Buddhist followers due to their

spiritual zeal of Buddhist faith. The Buddhist Sculptures were used to fix to the bases, drums and stairs of the Buddhist Stūpas and around which the worshippers circumambulated. The individual Buddha images were used to fill the niches around the Stūpas and monasteries. The “Harmika” (solid box in square) above the dome of the Stūpa was carved on all sides with Buddha life stories by chiseling on stone tablets and fixed to the Stūpas inside which, the “relics” of Buddha were kept in a casket for worship.

The Buddhist art of Gandhara presents a heterogeneous social picture of the time; a medley of foreign immigrants such as Greeks, Scythians, Parthians, Kushans and Huns. This art is primarily created in the schist but is also seen in other mediums as in stucco, terracotta and also on Bronze material. The primary aim of this art was not to extol the kings and their ministers but to adore the Buddha, his whole life and his preaching to mankind for the observation of moral ways of life and salvation.

Gandhara art represents a phase of cultural efflorescent which was the result of the fervent zeal and religious consciousness of Buddhism that had affected the life of the people of this region. This religious awakening inspired the creation of Gandhara art which are now pored processions of different museums in Pakistan and abroad.

The Buddhist art of Gandhara flourished for a long time and thousands of stupas and monasteries were decorated with these sculptures. The masterpieces were chiefly designed to decorate the base of the stupa or stand in niches within the monasteries. A large number of Gandhara sculpture depict *Jataka* tales and scene such as; birth of Sidhartha, his childhood, his departure from palace, his march towards enlightenment his attainment as ‘Buddha’ under the Bodhi tree, his death scene as well as division of his ashes among his devotees and then burial in

different stupas. Beside, these marvels of Gandhara several other Indian deities, especially Indra and Brahma also carved.

The study of Gandhāra Art has a history of about one hundred years which is being carried out from the end of the last century. The historical dating and the nature of Gandhāra Art has been complicated and made extremely difficult by many factors such as the insufficient archaeological investigations, the availability of small number of images with inscriptions and the remaining obscurity of historical conditions of this area due to the complicated movements and rapid alternations of races and dynasties. According to the views of Jayawardena, in investigating the objectives of the origin and development of Buddhist art one should pay attention to expose the thoughts of early Buddhists who created the artistic works and the ideas of Pali literature.

Gauranga Nath Banerjee describes that “the Hellenistic sculptures of the region of the Northwestern frontier, anciently known as Gandhāra have received their full share of attention in Europe and have been the subject of voluminous discussion. The existence of an Indo-Hellenistic School of Sculpture was not recognized generally, until 1870, when Leitner brought to England a considerable collection of specimens to which he gave the name of Graeco- Buddhist. But so far back as 1833, Gerrard had unearthed the first known example of a circular relief of Buddha from the chamber of a ruined Stūpa near Kabul. In 1836, James Prinsep published his account of the so-called Silenus, discovered by Colonel Stacey at Mathurā”.

Farooq Swāti claims that “the sculptural or regional styles of these states which are slightly differed from each other and therefore these should be referred to as *Uḍḍiyāna*, Gandhāra, Kapisa and Bactrian. Therefore, due to large scale interaction among these states, the regional styles share some broad characteristic

features and collectively they should be called as the “Indus-Oxus School of Buddhist Art”. Vincent A. Smith however, describes that the celebrated Gandhāra Sculptures found abundantly in the Peshāwar district, and neighboring regions in the ancient Gandhāra, of which many excellent examples date from the time of Kanishka and his proximate successors gave vivid expression in classical forms of considerable artistic merit to this modified Buddhism a religion with a complicated mythology and well filled pantheon.

According to Juhyung Rhi, Gandhāra is famous for the creation of the first Buddha images along with Mathurā in northern India. Although the precedence between the two places was the issue of heated debate in the early 20th century, scholars tend to support the simultaneous and independent origin of the Buddha image in both places or to favor the precedence of Mathurā over Gandhāra. The origin of the Buddha image has been frequently attributed to the Mahayanists. The image of Fasting Buddha in Gandharā, without any line of difference is a unique and master piece in the Art history.

Anna Filigenzi however, is very particular when she says that the history of studies on the art of Gandhāra could be summarized as; analysis of the formal and iconographical elements in relation to the various components including Hellenistic, Roman, Indian and Persian (Iranian), origin of the anthropomorphic Buddha image, identification of the subjects and in the absence of safe reference for an absolute chronology, a broad criterion to order the bulk of Gandhāran production at least within a relative chronological framework. This writer further mentions that on the basis of archaeological excavation results at Butkara-I, by the Mission, it has been further brought that the earliest images of Butkara-I show not the “Buddha/Apollo” held by many to be most typical of the genuine Gandhāran product, but a far more “Indian” Buddha with characteristics very close to the production of Mathurā.

The decline of the Buddhist Art of Gandhara started with Sasanid and Hun invasions which resulted in mass destruction of the cities and religious establishments of the area. The society and its norm were annihilated, while the art and architecture adversely affected when monumental buildings, both religious as well as secular, were put to fire. The havoc was faced throughout the areas which are now Pakistan. Chinese Pilgrim Hun-Tsang's account of the ruined monasteries, stupas and other secular buildings mention that he saw everywhere in the region is description of the despair of these once flourishing centers. However, the Buddhist faith was not wiped out completely from these areas. We come across its manifestation at many places, especially in today's Sind and in the Khyber Pakhtunkhwa.

Self Assissments Quesitons

- Q. No.1. What do you know about palaeolithic art traditions of South Asia? Explain it with examples.
- Q. No.2. Explain the diverse features of art and architecture developed during Bronze Age in South Asia.
- Q. No.3. Discuss the source of art and architecture during Indus Valley period? Highlight it in detail.
- Q. No.4. Discuss Vedic period architecture and emphasize its features.
- Q. No.5. Explain the rich traditions of art produced during the Vedic period.
- Q. No.6. Discuss the historical and geographical extension of Gandhar art, why do call it Gandhara art?
- Q. No.7. Critically analyze the origin of Gandhara art and architecture in South Asia, also explain its different phases.
- Q. No.8. Evaluate the difference between Gandhara art and Hindu art and explain the difference between them with examples.

Bibliography

- Ali, Iand Muhammad Naeem Qazi. (2008). *Gandharan Sculptures in the Peshawar Museum*. Hazara University, Mansehra.
- Bhattacharyya, D. C. (1978). *Studies in Buddhist Iconography*, Manohar Book Service, New Delhi.
- Braarvig, J. and Liland, F. (2010). *Traces of Gandharan Buddhism*, Hermes Publishing, Oslo, Amarin Printing and Publishing Public Co. Ltd. Bangkok.
- Bridget and Raymond Allchin. (1968). *The Birth of Indian Civilization, India & Pakistan before 500 BC*, Penguin Books Ltd. U.S.A.
- Brown, Percy (1965) *Indian Architecture (Buddhist and Hindu Period)*, Bombay.
- Coomaraswamy, Ananda K. (1926). *The Indian Origin of the Buddha Image*. In *Journal of the American Oriental Society* 46: 165-170, U.S.A.
- Cousens, Henry (1975) *Antiquities of Sindh* (reprint), Karachi.
- Craven, Roy C. (1976) *A Concise History of Indian Art*, London.
- Cumming, John. (1939). *Revealing India's Past*, London.
- Cunningham, A. (1871) *Ancient Geography of India*, London.
- Dani, Ahmad Hassan. (1986). *The Historic City of Taxila*, UNESCO, The Centre for East Asian Cultural Studies, Hinode Printing Co. Ltd, Japan.
- Dani, Ahmad Hassan. (1988a). *Archaeology in South Asian Subcontinent, New Challenges and Prospects*. In *Proceedings of third South Asian Archaeological congress*, Department of Archaeology & Museums: 33-45 Karachi.
- Dani, Ahmad Hassan. (1988b). *The Significance of the Silk Road in the History of Human Civilizations, Integral Study of the Silk Roads: Roads of Dialogue*: 21-26, Osaka.
- Dar, Saifur Rahman. (1998). *Gandhara Art in Perspective*. In *Journal of Asian Civilizations*, 21(2): 71-118, Islamabad.
- Douie, James Mc. Crone. (1916). *The Punjab, North-West Frontier Province and Kashmir*, First Indian Edition, 1974, Seema Publications, Delhi.

- Eiland, Murray. (2009). Buddhist Gandhara: Legends, Monasteries, & Paradise. In *Ancient Gandhara Art*, Minerva, International Review of Ancient Art & Archaeology 20 (1): 7-12, London.
- Faccenna, Domenico. (1961). *A Glimpse of the Italian Archaeological Excavations in Swāt-Pakistan*, Karachi.
- Falk, Harry. (2006b). The Tidal Waves of Indian History: Between the Empires and Beyond. In *Between the Empires: Society in India 300 BCE to 400 CE*, Edited P. Olivelle: 145-66, New York.
- Ferguson, James (1910) *History of Indian & Eastern Architecture*, Vol. I & II, London.
- Filigenzi, Anna. (2003). Narrative Art in Gandhara. In *At the Origin of Gandhara Art, The Contribution of the IsIAO Italian Archaeological Mission in the Swāt Valley, Pakistan*, Ancient Civilizations from Scythian to Siberia, 9(3-4): 350-375, Brill, Leiden, Boston.
- Foucher, A. (1917). *The Beginnings of Buddhist Art*, Paul Geuthner, Paris.
- Gandhara: The Buddhist Heritage of Pakistan*, Legends, Monasteries, and Paradise, (2008). Vaerlag Philipp von Zabern, Mainz, Germany.
- Gazetteer of the Peshawar District*. (1897-98). Compiled and Published under the authority of the Punjab Government, India.
- Goldman, Bernard. (1978). Parthians at Gandhāra. In *East & West*, 28(1-4): 189-202, IsMEO, Rome.
- Gupta, S. P. (2003). Looking at Indian Art History - A Model. In *Art & Archaeology of India, Stone Age to the Present*, Edited B.S Harishankar, Indraprastha Museum of Art & Archaeology, D.K Printworld (P) Ltd.: 53-57, New Delhi.
- Harle, J.C. (1986). *The Art and Architecture of the Indian Subcontinent*, Penguin Books Ltd, London.
- Havell, E.B (1927) *Indian Architecture*, London.
- Heirman, Ann and Stephan Peter Bumbacher. (2007). *The Spread of Buddhism*, Brill, Leiden-Boston.
- Higuchi, Takayasu. (1984). Gandhara: Its Geography and History. In *Gandhara Art of Pakistan*, (Exhibition Catalogue) NHK: 210-211, Japan.

- Ingholt, Harald. (1957). *Gandhara Art in Pakistan*, Pantheon Books, New York.
- Jettmar, Karl. (2002). *Beyond the Gorges of the Indus, Archaeology before Excavation*, Oxford University Press, New York.
- Joshi, C.V. (1956). Life and Teachings. In *2500 Years of Buddhism*, Edited P.V. Bapat, *The Publications Division, Ministry of Information and Broadcasting*: 21-34. India.
- Joshi, N.P and R.C. Sharma.(1969). *Catalogue of Gandharā Sculptures in the State Museum Lucknow*, the State Museum, Lucknow.
- Kenoyer, Jonathan Mark. (2010). Gandharan Cultural Traditions: Context, Chronology and legacies of the Indus Civilization. In *Ancient Punjab 1*: 1-18, Research Journal, Department of Archaeology, University of the Punjab, Lahore.
- Khan, Muhammad Ashraf and A.G. Lone.(2012). *Gandhara, Geography, Antiquity, Art & Personalities, Illustrious Heritage of Pakistan*, Islamabad.
- Khan, Sohail Ahmed.(1998). *Ancient, Medieval & Recent History and Coins of Pakistan*, Leo Books, Islamabad.
- Marshall, John. (1912-13). *Excavation at Taxila, Annual Report of Archaeological Survey of India*.
- Marshall, Sir John. (1951). *Taxila, an illustrated Account of Archaeological Excavations* (3 Vol.)Cambridge University Press, England.
- Marshall, Sir John. (1960). *The Buddhist Art of Gandhara*, Cambridge University Press, England.
- Miyaji, Akira. (1984). The Sculptures of Gandhara, Gandhara: Its Geography and History. In *Gandhara Art of Pakistan*: 220-224, (Exhibition Catalogue) NHK, Japan.
- Olivieri, Luca Maria. (2014). *The Last Phases of the Urban Site at Bir-kot Ghwandai (Barikot), The Buddhist Sites of Gumbat and Amlukdara (Barikot)*, Sang-e-Meel Publication, Lahore.
- Rahman, Abdur. (1979). *The Last Two Dynasties of the Sahis*, Published by Centre for the Study of the Civilization of Central Asia, Islamabad.
- Rahman, Abdur. (2005). New Light on the Khingal, Turk and the Hindu Sahis. In *Archaeologies of the Indian Ocean*, Brepols: 413-420, Belgium.

- Rhi, Ju-Hyung. (2009a). On the Peripheries of Civilizations: the Evolution of a Visual Tradition in Gandhara. In *Journal of Central Eurasian Studies*, 1: 1-13, Centre for Central Eurasian Studies, Seoul National University, Korea.
- Rhi, Ju-Hyung. (2006) Bodhisattvas in Gandhara Art: an Aspect of Mahayana in Gandharan Buddhism. In *Gandharan Buddhism: Archaeology, Art, Texts*, Edited Pia Brancaccio and Kurt Behrendt, Vancouver and Toronto: University of British Columbia Press: 151-182.
- Roberts, J.M. (2004). *Ancient History, From the First Civilization to the Renaissance*, (First Published 1976), Puncan Baird Publishers, England.
- Roland, Benjamin (1956) *The Art and Architecture of India*.
- Samad, Abdul. (2010). *Emergence of Hinduism in Gandhāra, An Analysis of Material Culture*, PhD Dissertation (un-published), Freien University, Berlin, Germany.
- Sardar, Badshah. (2005). *Buddhist Rock Carvings in the Swāt Valley*, Published by Ministry of Culture, Sports and Youth Affairs, Islamabad.
- Sen, K.M (1963) *Hinduism, The World's Oldest Faith*.
- Smith, Vincent A. (1914). *The Early History of India, from 600 BC to Muhammadan Conquest, Including the Invasion of Alexander the Great*, Oxford, at the Clarendon Press.
- Smith, Vincent A. (1920). *Asoka, the Buddhist Emperor of India*, Oxford Press, U.K.
- Soper, Alexander C. (1951). The Roman Style in Gandhāra. In *American Journal of Archaeology*, 55(4): 301-319, U.S.A.
- Swati, Muhammad Farooq. (2012). Some Narrative Reliefs from Charga-pate in District Dir. In *Journal of Asian Civilization* 35(1): 1-43, Islamabad.
- Taddei, Maurizio. (2006). Recent Archaeological research in Gandhāra: the New Evidence. In *Gandhāran Buddhism, Archaeology, Art, Texts*, UBC Press, Vancouver, Toronto.
- Wheeler, Sir Mortimer (1950) *Five Thousand Years of Pakistan*, London
- Zwalf, W. (1985). *Buddhism, Art and Faith*, British Museum Publication, London.

UNIT. 6

NUMISMATICS

Written by: Dr. Badshah Sardar
Reviewed by: Dr. Tahir Saeed

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Introduction

Coins provide a visual guide to the history of the South Asia regions in general and the sub-continent in particular. Ancient coins always carry portrait, script and language of that time. Coins offer a valuable source of information regarding the kings who issued them. Their designs provide detailed information on many aspects of the culture of the region also. Coins supply an almost unparalleled series of historical documents. They invoke before us the life and story of those who had issued them. They furnish us a true picture of environment in which they are struck. Numismatic research has established a highly refined sequence of gradual transition from Greek to Scythian, Parthian, Kushan, Sasanian, Hun and Turkish rule can now be documented.

In Pakistan we do not possess much literature of ancient times, which may serve as historical evidence in the modern sense. Such of it, as we have, does not reveal many facts about the rulers, their names, dynasties, their thought and actions. But we find these facts well illustrated in many instances on coins. Reconstructing the history of ancient north-western Pakistan depends as much on the evidence derived from the coins found in the area as it does on ancient texts and the diverse data obtained from archaeological excavations.

Brief references to the Kushans and the other nomadic peoples who succeeded the Greeks as masters of the region are to be found in Chinese historical Texts, particularly the official chronicles of the Han Dynasty. It was in 1830 that the European adventurers in Afghanistan began to collect the coins of the area to identify the Greek language and extension of Greek culture in the area. Large numbers of these coins were placed in the hands of the Asiatic Society of Calcutta, where James Prinsep used them to make a major breakthrough in the study of the history of the region.

In the first century of the Christian era, North-Western Pakistan was governed by monarchs of the Kushan dynasty. Their vast empire extended from Varanasi on the Ganges, through Pakistan, Baluchistan, Afghanistan and Bactria, up to the River Oxus. The Kushan displayed a keen awareness of the conflicting forces and pressures that could arise in an empire straddling so wide a range of ethnic and cultural boundaries. Their diplomacy is strikingly evident in the two distinct types of coinage they issued for circulation in the western and eastern parts of their

empire. From their summer capital at Begram in the hills of Afghanistan, they issued coins featuring Iranian deities, Greek goddesses and the Buddha. Here, their coin legends used the local Kharoshthi script derived from Aramaic, and occasionally incorporated Greek lettering. On these coins, emperor Kanishka chose to call himself ‘‘Shah of Shaha, Kanishka of Kushans’’.

Objectives: After going through this unit, the students will be able to understand the following points;

- to know the origin of coinage in South Asia
- to recognize the Punch Marked coins of South Asia
- to make out Indo-Greeks coins and their artistic details
- to understand Scytho-Parthian coins and its features
- to familiarize with Kushana coins and understand its scope and importance
- to identify source of Huna dyanasty’s coins
- to distinguish Hindu-Shahi period coins and its facial appreance

6. Numisrnatics

6.1 Origin of Coinage in South Asia

The ancient coins are discovered from time to time either through the course of archaeological excavations/explorations or as accidental finds from the earth deposits. The coins play an important role in illuminating history not known from other sources and help in the reconstruction of the missing parts of the history of mankind. Further the ancient coins confirm and substantiate the history known from other sources. The discovery of new coins therefore constantly provides information and knowledge which help to modify our earlier thoughts and views about the particular period of the history of any region.

The history of coins presents us with such an abundance of material that we can trace its course from the remote antiquity to the present time. A coin is a piece of metal of definite weight, has a mark or marks of authorization, preferably of the state, testifying to the weight and purity of the metal and serves the purpose of a medium of exchange. They are standardized in weight, and produced in large quantities at a mint in order to facilitate trade. Coins often have images, numerals, or text on them. Obverse and its opposite, reverse, refer to the two flat faces of coins and medals. In this usage, obverse means the front face of the object and reverse means the back face. The obverse of a coin is commonly called heads, because it often depicts the head of a prominent person, and the reverse tails. The coins are usually product of a metal or an alloy, or sometimes made of manmade materials. The ancient coins found from the course of archaeological excavations are usually in the disc shape.

The coins in their own time faithfully served the purpose for which they were made. But beyond that they still retain their value and importance. They provide an almost unparalleled series of historical documents. They provide us the life and times of those who had issued them. They weave the texture of history into their being and do not simply illustrate it. They provide us true information as historical references.

Even for the history of those who are known from other sources, coins are equally important. In the realm of religious history coins play an equally important role. The coins of the Kushanas, for instance, during the first and second centuries CE bear the effigies of a number of Greek, Iranian, Buddhist and Brahmanical gods and goddesses. They reflect not only which popular deities were worshipped amongst the people they rules, but also throw light on the development of various pantheon and other iconographic forms. The representation of Buddha in human form is noticed for the first

time on the coins of Kanisha, while in earlier he is shown symbolically. Similarly, the earliest depiction of Siva in human form with four hands is seen only on these coins.

6.1.1 The Origin of Coins

After the domestication of cattle and the start of cultivation of crops in 9000–6000 BCE, livestock and plant products were used as money. However, it is in the nature of agricultural production that things take time to reach fruition. The farmer may need to buy things that he cannot pay for immediately. Thus the idea of debt and credit was introduced, and a need to record and track it arose.

The establishment of the first cities in Mesopotamia (Ca. 3000 BCE) provided the infrastructure for the next simplest form of money of account—asset-backed credit or Representative money. Farmers would deposit their grain in the temple which recorded the deposit on clay tablets and gave the farmer a receipt in the form of clay token which they could then use to pay fees or other debts to the temple. Since the bulk of the deposits in the temple were of the main staple, barley, a fixed quantity of barley came to be used as a unit of account.

Trading with foreigners required a form of money which was not tied to the local temple or economy, money that carried its value with it. As commodity that would mediate exchanges which could not be settled with direct barter was the solution. Which commodity would be used was a matter of agreement between the two parties, but as trade links expanded and the number of parties involved increased the number of acceptable proxies would have decreased. Ultimately, one or two commodities were converged on in each trading zone, the most common being gold and silver.

In early Mesopotamia copper was used in trade for a while, but was soon superseded by silver. The temple (which financed and controlled most foreign trade) fixed exchange rates between barley and silver, and other important commodities, which enabled payment using any of them. It also enabled the extensive use of accounting in managing the whole economy, which led to the development of writing and thus the beginning of history.

The earliest coins are mostly associated with Iron Age Anatolia of the late 7th century BCE, and especially with the kingdom of Lydia. Early electrum coins (an alluvial alloy of gold and silver, varying wildly in proportion, and usually about 40–55% gold) were not standardized in weight, and in their earliest stage may have been ritual objects, such as badges or medals, issued by priests. The unpredictability of the composition of naturally occurring electrum implied that it had a variable value, which greatly hampered its development. The Greek coinage reaches a high level of technical and aesthetic quality. Larger cities now produced a range of fine silver and gold coins, most bearing a portrait

of their patron god or goddess or a legendary hero on one side, and a symbol of the city on the other. The use of inscriptions on coins also began, usually the name of the issuing city.

6.1.2 The Origin of Coins in South-Asia

The Cowry shells were first used in Indo-Pakistan sub-continent as commodity money. The Indus Valley Civilization may have used metals of fixed weights such as silver for trade activities which is evident from Mohenjo Daro from the late Harappan period (1900–1800 BCE or 1750 BCE). D.D Kosambi proposed a connection between Mohenjodaro silver pieces with the Punch marked coins based on their remarkable similarity and identity between weights. The remarkable similarities between Punch marked coin symbols with those appearing in the Indus seals have also been highlighted. Chalcolithic unmarked gold disc discovered from Eran have been dated to 1000 BCE and due to their lack of ornamental use, it has been proposed that it was utilized as an object of money.

When Cyrus the Great (550–530 BCE) came to power, coinage was unfamiliar in his realm. Barter and to some extent silver bullion was used instead for trade. The practice of using silver bars for currency also seems to have been current in Central Asia from the 6th century. Cyrus the Great introduced coins to the Persian Empire after 546 BCE, following his conquest of Lydia and the defeat of its king Croesus, who had put in place the first coinage in history. With his conquest of Lydia, Cyrus acquired a region in which coinage was invented, developed through advanced metallurgy, and had already been in circulation for about 50 years, making the Lydian Kingdom one of the leading trade powers of the time. It seems Cyrus initially adopted the Lydian coinage as such, and continued to strike Lydia's lion-and-bull coinage. Original coins of the Achaemenid Empire were issued from 520 BCE – 450 BCE to 330 BCE. The Persian Daric was the first truly Achaemenid gold coin which, along with a similar silver coin, the Siglos, represented the bimetallic monetary standard of the Achaemenid Persian Empire.

The Achaemenid Empire already reached the doors of India during the original expansion of Cyrus the Great, and the Achaemenid conquest of the Indus Valley is dated to c. 515 BCE under Darius I. An Achaemenid administration was established in the area. The Kabul hoard, also called the Chaman Hazouri hoard, is a coin hoard discovered in the vicinity of Kabul, Afghanistan, containing numerous Achaemenid coins as well as many Greek coins from the 5th and 4th centuries BCE. The deposit of the hoard is dated to the Achaemenid period, in approximately 380 BCE. The hoard also contained many locally produced silver coins, minted by local authorities under Achaemenid rule. Several of these issues follow the "western designs" of the facing bull heads, a stag, or Persian column capitals on the obverse, and incuse punch on the reverse.

According to numismatist Joe Cribb, these finds suggest that the idea of coinage and the use of punch-marked techniques were introduced to India from the Achaemenid Empire during the 4th century BCE. More Achaemenid coins were also found in Pushkalavati and in Bhir Mound. The Karshapana is the earliest punch-marked coin found in India, produced from at least the mid-4th century BCE, and possibly as early as 575 BCE, influenced by similar coins produced in Gandhara under the Achaemenid empire, such as those of the Kabul hoard, or other examples found at Pushkalavati and in Bhir Mound.

The first manufactured actual coins seem to have appeared separately in India, China, and the cities around the Aegean Sea 7th century BCE. While these Aegean coins were stamped (heated and hammered with insignia), the Indian coins (from the Ganges river valley) were punched metal disks, and Chinese coins (first developed in the Great Plain) were cast bronze with holes in the center to be strung together. The different forms and metallurgical processes imply a separate development. All modern coins, in turn, are descended from the coins that appear to have been invented in the kingdom of Lydia in Asia Minor somewhere around 7th century BC and that spread throughout Greece in the following centuries: disk-shaped, made of gold, silver, bronze or imitations thereof, with both sides bearing an image produced by stamping; one side is often a human head.

Sometime around 600 BCE in the lower Ganges valley in eastern India a coin called a punch marked Karshapana was created. According to Hardaker, T.R. the origin of Indian coins can be placed at 575 BCE and according to P.L. Gupta in the seventh century BCE, proposals for its origins range from 1000 BCE to 500 BCE. Kasi, Kosala and Magadha coins can be the oldest ones from the Indian Subcontinent dating back to 7th century BC and Kosambi findings indicate coin circulation towards the end of 7th century BCE.

The study of the relative chronology of these coins has successfully established that the first punch-marked coins initially only had one or two punches, with the number of punches increasing over time. The first PMC coins in India may have been minted around the 6th century BCE by the Mahajanapadas of the Indo-Gangetic Plain, The coins of this period were punch-marked coins called Puranas, old Karshapanas or Pana. Several of these coins had a single symbol, for example, Saurashtra had a humped bull, and Dakshin Panchala had a Swastika, others, like Magadha, had several symbols. These coins were made of silver of a standard weight but with an irregular shape. This was gained by cutting up silver bars and then making the correct weight by cutting the edges of the coin. They are mentioned in the Manu, Panini, and Buddhist Jataka stories and lasted three centuries longer in the south than the north (600 BCE – 300 CE).

A small round bronze coin recovered from Pandu Rajar Dhibi has a primitive human figure on obverse and striations on reverse and may recall striated coins of Lydia and

Ionia in 700 BC may well be dated before the punch marked coins of ancient India. Cast copper coins along with punch marked coins are the earliest examples of coinage in India, archaeologist G. R. Sharma based on his analysis from Kausambi dates them to pre Punched Marked Coins (PMC) era between 855 and 815 BC on the bases of obtaining them from pre NBPW period, while some date it to 500 BC and some date them to pre NBPW end of 7th century BCE.

According to some scholars Punch marked coins were replaced at the fall of the Maurya Empire by cast, die-struck coins. The coin devices are Indian, but it is thought that this coin technology was introduced from the West, either from the Achaemenid Empire or from the neighboring Greco-Bactrian kingdom.

Saurashtra Janapada coins are probably the earliest die-struck figurative coins from ancient India from 450 to 300 BCE which are also perhaps the earliest source of Hindu representational forms. Most coins from Surashtra are approximately 1 gram in weight.

In this context the antiquity of coins in ancient Pakistan goes back to about 6th century BCE. The earliest coins of these series are small ingots of silver with three circular dots on one side. The other type is of some heavy bent bars of silver with devices stamped out with a punch on one side. These coins have not however been found in any quantity. The time and the territory in which these circulated were perhaps restricted. The certain small ingots and Bent Bar coins can hardly be derived from ancient Greek or Achaemenians coins. Their shape and size indicate of the bulge of metal that were current in the ancient world. It is believed that such currency was already known to the some parts of ancient Pakistan before the appearance of ancient Greek and Achaemenians in the region but there lumps no doubt circulated by the Achaemenians rulers on their own standard as proved by their weight in order to grantee this weight. The symbols were punched on them in imitation of their own coins. Thus the local currency was kept up by the Persian rulers in order to meet the needs of the business community and the use of familiar symbols would have reassured them of authenticity. Hence, with this new idea, Persian rulers brought the local currency inline with the system prevalent in their empire. Further, with this change the other issue of the empire slowly found currency in their region as well. As such, the origin of coinage in Indo-Pakistan or south Asia is largely indebted to techniques borrowed form foreign sources but the invention of new types and varieties is due to local genius.

It is comprehend that the coinage of ancient Indo-Pakistan sub-continent in its earliest age developed much on the same lines as it did on the shores of the Aegean. The small ingots of silver marked only with three circular dots, represents the earliest form. The next chorological orders are some heavy bent bars of silver with devices stamped out

with a punch on one side. These two classes of coin are thought to have been circulated as coins at least as early as 600 BCE but they have not been found in any great quantity. One the other hand from almost every ancient site from Bengal in the East to Kabul in the West and in South as Combater, thousands of punch marked coins have been unearthed.

6.2 Punch Marked Coins

The Punch Marked Coins are rectangular and circular flat pieces of thin silver or more rarely copper cut from a hammered sheet of metal and clipped to standard weight. The obverse side is marked by a large number of symbols on metal by means of separate punches. The reverse side usually remains blank but occasionally there are one or a few punch marks. Some coins have both obverse and reverse covered with recognizable devices. They comprise human figures, birds, animals, solar and planetary signs.

The early coinage of the sub-continent from the 6th to fourth centuries are of slightly concave bent bars of silver with wheel symbol found from Taxila, Charsadda and Bajaur Agency in Pakistan and from Gardez, Jalalabad, Kabul in Afghanistan. Double the weight of the Persian coins, they were the silver currency of the eastern Achaemenid province, while the small round concave silver coin with the same solar symbol provided a fractional denomination.

The silver punch marked coins circulation in the Gangetic region from the 6th century BCE and subsequently became the standard currency of the unified Mauryan Empire. The un-inscribed cast copper coins are among the commonest form of ancient era. These are found especially in Rajputana and the Utter Pradesh on sites which yield punched marked silver of the same general period.

The 3rd century BCE copper punch-marked coins are much rarer than the silver coins which were most likely the local coinage of Maghda in the Mauryan period. Many of the inscribed copper coins have a Brahmi legend naming the tribe who stuck them. The others are closely associated with a particular locality such as Taxila by the pattern of finds. Many of them are square in shape with clear traces of the incase square of the reverse die.

The Mauryan Empire coins were punch marked with the royal standard to ascertain their authenticity. The *Arthashastra*, written by Kautilya, mentions minting of coins, but also indicates that the violation of the Imperial Maurya standards by private enterprises may have been an offence. Kautilya also seemed to advocate a theory of bimetallism for coinage, which involved the use of two metals, copper and silver, under one government. The Mauryan rule also saw a steady emergence of inscribed copper coins as evidenced by

Tripuri coins in Ashokan brahmi script and various pre Satavahana coins dated 3rd-2nd century BCE in Deccan.

The earliest die-stuck coins with a device of the Buddhist symbols like Swastika or Bodhi-tree have been ascribed to the end of the 4th century BCE. A few specimens bear inscriptions however, ascribed to about 300 BCE. The coins with a lion device were struck at Taxila and show not only a greater symmetry of shape but an advanced knowledge of die-cutting.

There have found two types of systems of weights of the Punch-marked coins in the sub-continent. The first system has been termed by Durga Pasad as Rati weight 1 standard; it is characterized by a group of four symbols well known from Paila Hoard which estimated to be 43-44 grains in weight. These types of coins are the earliest in sub-continent introduced in about 200 BCE or earlier. The second type has been termed as 32 Rati weight standards. This group is according to five symbols and known by large number of sites in subcontinent. The coins measured about 57 grains in weight.

The study of these punch-marked coins reveals many interesting points to consider. The devices on these coins are as varied as numerous; more than three hundred of them have been recognized. These symbols are executed beautifully. The commonest of the symbols is the sun which occurs on the obverse of practically every coin, others are of animals like elephant, bulls, rabbits, hunting dogs, and the like. The symbols were organically stamped only on one side of the coin. In course of time when coins had become worn the other side was also used for depiction of symbols. The coins differ from one another in their execution, fabric, weight, quality of metal and symbols.

The coins issued from Gandhara were of a peculiar shape of a concave long bar, about 1 to 1.75" in length and averaging about 0.4" in width. The bars appear to be strips cut from oblong ingots. The width of the ingots determined the length of the coins, the thickness remaining the same. The strips were therefore cut into a width which combined with the other two dimensions, gave the required weight. After being cut the bars were adjusted more exactly to the correct width by chiseling the corners and in some cases the obverse sides. A common symbol was punched on them twice on each at the end of the bar. Then the coins were struck while hot on a wooden anvil which resulted in the concaveness of the coins. The coins in a fresh condition would be in the approximately 183 grains, but are generally found between 150 and 180 grains according to their condition. Coins of smaller denominations weighting 90, 80, 43, 20 and 7 grains are also known to have been used. They are different in shape and are cup-shaped, irregular pieces and bear only one punch of the same symbol which is found in the bigger coins.

6.3 Indo-Greeks Coins

After the death of Asoka in 232 BCE the Mauryan power began to decline from the Gandhara and the Punjab areas. The later years therefore witnessed the incursion of Bactrian Greeks who conquered these regions and established themselves here for about a hundred years. The coinage of Bactrian Greeks provides yet another point of significance. The historical importance of these coins can be realized by the fact that since their discovery a great number of names of the kings of Greek, Scythians and Parthians have been located from the coins. Further, for the history of the whole dynasties of Parthians and Scythians coins are the only source of information. The names of the later Kushan kings too were first discovered from their coins.

The coinage of Indo-Greek kingdom began to increasingly influence coins from other regions by the 1st century BCE. By this time a large number of tribes, dynasties and kingdoms began issuing their coins and the *Prākṛit* legends began to appear. The extensive coinage of the Kushan Empire (1st–3rd centuries CE) continued to influence the coinage of the Guptas (320 to 550 CE) and the later rulers of Kashmir.

The coins of the Bactrian kings are however, fine specimen executed in Greek style and it is generally believed that these must have been engraved by Greeks or by local engravers trained in the Greek traditions. The most important kings as recorded from their coins were Demetrios (Ca.190-150 BCE), Antialkidas (145 BCE), Menander (160-140 BCE) and Strato-I (Ca.156-140 BCE). They ruled over eastern and western Punjab, Taxila and Gandhara. However, among these rulers, Demetrios was the first king who struck square copper coins with a legend in Greek on the obverse and in Kharoshthi on the reverse. Later on Pantalion and Agathokles introduced not only the name and title in Kharoshthi but imitated the Indian symbols on the square copper coins. Menander's coins are found in abundance in different areas of Pakistan.

The Indo-Greek kings in fact introduced Greek types of coins and among them the portrait head, into the Indian coinage. Their examples were followed for eight centuries. Every coin has some mark of authority in it; this is what known as "types". It appears on every Greek and Roman coin. Demetrios was the however, the first Bactrian king to strike square copper coins of the Indian type, with a legend in Greek on the obverse, and in Kharoshthi on the reverse. The copper coins, square for the most part, are very numerous. The devices are almost entirely Greek, and must have been engraved by Greeks, or Indians trained in the Greek traditions. With the exception of certain square hemidrachms of Apollodotos and Philoxenos, they are all round, struck to the Persian (or Indian) standard, and all have inscriptions in both Greek and Kharoshthi characters.

The Indo-Bactrian rulers issued coins by die-striking technique which was perhaps earlier unknown in India and followed the Greek pattern. They gave a new form to coinage in more than one way. Firstly they placed portraits of the king on the obverse. The diademed or helmeted head or bust is usual. Demetrios is shown on some of the types of his coins wearing an elephant scalp. The heads of Alexander, Antiochus, Diodotus, Euthydemus, Demetrius and Pantaleon are portrayed on the coins issued by Agathocles to commemorate them. Secondly they introduced the effigy of the Greek gods and goddesses such as; Zeus, Artemis, Heracles, Poseidon, Apollo, Dioskouroi, Nike and Pallas or some of the symbols of their worship. Inscription is another feature on these coins. The coins of Diodotus and Euthydemus bear an inscription in Greek on the reverse.

As mentioned by S.R Dar, the earliest Greek coins found from Afghanistan and Pakistan are however, 30 Athenian drachms and about 20 Greek coins of the 5th and 4th centuries now in Kabul Museum and in one gold coin of Croesus of Asia Minor discovered from Mari on the Indus River. But it was only after the secession of Diodotus from the imperial Hellenistic dynasty of Syria that the Greeks in Bactria and later their successors in the Indus land started issuing their own coins which still form the only source of reconstructing their history in Afghanistan, Pakistan and India. These coins mark the real beginning of proper coinage in the sub-continent. The most significant contribution of these coins is their standard weight and high technique of die-cutting process. Besides, these coins also display for the first time the portrait of the rulers identified with an inscription and a cult object whether in the form of an image of the deity and its attribute. All the Greek coins this region display one or another Greek deity on the obverse or more frequently on the reverse of the coin. The other side is usually occupied by the portrait of the ruler or his predecessors or even some animal or bird; such as bull, elephant, horse, leopard, panther, boar, Bactrian camel, and ox among animals and cock, owl & eagle among the birds.

From the coins of Demetrios and later onward, the Greek legends on the reverse are rendered in local *Prakrit* language and *Kharoshthi* script inscribed on the sides occupied by the figure of the deity. The deities appearing on these coins are invariably Greek ones or their attitudes. Beside silver and copper coins the rare metals like gold, nickel and lead were also used by various kings. The gold was scarcely used by a few kings for instance Diodotus only because of the higher value of the metal. However, Nickel was used by Euthydemus-II and Agathokles and lead metal by Strato-I with Strato-II. As regard deities the figures of Apollo, Artemis, Athena, Dioskouroi, Heracles, Nike, Poseidon and Zeus appear on the coins of one king Philoxenos and Hekate only on silver coins of one king namely Helokles with Laodike. Besides, Apollo appears on the nickel coins of Euthydemus-II and on lead coins of Strato-I with Strato-II whereas Dionysos appear only on a nickel coin of Agathokles.

However, in addition to the figures of Greek deities a few local deities human beings, animals, birds, some specimens of aquatic life and some other objects of regions significance also appear on the coins of some of the kings. These mostly represent attributes of certain Greek deities, for instance, tripod-lebes of Apollo appears on the coins of Euthydemus-II, Apollodotos, Strato-I, Menander, Dionysios, Zoilos, Hippostratos and Strato-I with Strato-II; palms and piloi of Dioskuroi bothers appear on the coins of Eukratides, Atialkidas ad Archebios; aegis and buckler with Gorgon's head on it i.e the attributes of Athena can be seen on the coins of Demetrios, Polyxenos, Menander, Antimachos Nikepheros; bow, club, lion's skin ad ivy of Herakles are found on the coins of Strato-I with Agathokleia, Menander, Zoilos and Theophilos; cornucopia of Demeter on the coins of Theophilos; anchor and trident of Poseidon on the coins of Nikias; quiver of Artemis on the coins of Strato-I and winged-thunderbolt of Zeus on the coins of Demetrios etc. The figure of Apollo is also said to have close connection with beasts especially elephant, horse ad bull. However, Zeus is always shown on the Greek coins as a well built make of mature age. Whether seated or standing position he is shown with undraped bust and a diademed or radiant head. The wings at his anklets, thunderbolt, aegis, palm ad wreath, scepter and a spear are his usual accompaniments. At few coins a small statue of Nike or Hekate appears on one of his outstretched arms. It is found that Zeus appears on the gold and silver coins for the Bactria and Indus Greeks coins fricht from the first to the last king of the dynasty.

6.4 Scytho-Parthian Coins

In about 90 BCE the Scythians overthrew the Bactrian Greeks. The leader of the tribe conquered the Punjab and Taxila and established a new rule in the region. The later rules extended the territory by annexing the areas across the Indus to Gandhara. The famous rulers of the Scythians were Mause, Azes-I (Ca. 38 BCE), Rajuvula, Azilises (Ca. 10 BCE), and Azes-II (Ca. 5 CE). During the reign of Azes-II, the imperial currency which had hitherto been maintained on a remarkably high lever, suffered a sudden and surprising eclipse. Not only was the silver replace by billon or potin, but there corresponding deterioration in the design and execution of the coins. Not long after 19 CE, the power of the Scythians was broken by the Parthians under Gondopharnes. By about 2nd century CE, the empire was comprised on almost the whole of present Pakistan, Seistan and southern Afghanistan.

During the Indo-Scythians period, a new kind of the coins of these two dynasties were very popular in circulation in various parts of the subcontinent and parts of central and northern South Asia; Sogdiana, Bactria, Arachosia, Gandhara, Sindh, Kashmir, Punjab, Haryana, Rajasthan, Uttar Pradesh and Bihar. These dynasties were Saka and The Pahlavas. After the conquest of Bactria by the Sakas in 135 BCE there must have been

considerable intercourse sometimes of a friendly, sometimes of a hostile character, between them and the Parthians, who occupied the neighboring territory.

The Parthian coinage was produced within the domains of the Parthian Empire (247 BCE – 224 CE). The coins struck by the Parthians were mainly made of silver, with the main currencies being the drachm and tetradrachm. The tetradrachm, which generally weighed around 16 g, was only minted in Seleucia, first conquered by the Parthians in 141 BC. Design-wise, Parthian coinage was based on Seleucid and Achaemenid satrapal coinage. Maues, whose coins are found only in the Punjab, was the first king of what may be called the Azes group of princes. His silver is not plentiful; the finest type is that with a "biga" (two-horsed chariot) on the obverse, and this type belongs to a square Hemi drachm, the only square aka silver coin known. His most common copper coins, with an elephant's head on the obverse and a "Caduceus" (staff of the god Hermes) on the reverse are imitated from a round copper coin of Demetrius. On another copper square coin of Maues the king is represented on horseback. This striking device is characteristic both of the Saka and Pahlava coinage; it first appears in a slightly different form on coins of the Indo-Greek Hippostratos; the Gupta kings adopted it for their "horseman" type, and it reappears on the coins of numerous Hindu kingdoms until the 14th century CE.

According to Cunningham there were three distinct dynasties of Scythians whose names have been preserved to us on their coins; one proceeding from Vonones and his lieutenant, Spalphores and Spalagadames, holding the west of the Indus, a second from Maues and Azes in the Punjab, and a third in Sindh to which the great satrap Nahapana belonged. The coins of three prominent kings Maues, Azes and Azilise are found chiefly. The dynasties of Maues and Vonones coined extensively in silver and copper. There are joint types both in silver and copper of Azes and Azilise. Azes struck coins bearing his own name in Greek on the obverse and that of Azilise in Kharoshthi on the reverse. Like the Bactrian kinds, Scythians did not strike gold coins.

6.5 Kushan Coins

In about the middle of the first century CE the Kushans conquered the territories of the present day Pakistan. Much of what little information we have of Kushan political history derives from coins. The language of inscriptions is typically the Bactrian language, written in a script derived from Greek. Many coins show the tamga symbols as a kind of monogram for the ruler. There were several regional mints, and the evidence from coins suggests that much of the empire was semi-independent.

This political change brought the region into contact with the Roman Empire. The contribution of the Kushan emperors to the coinage was that they used gold in place of

silver for their currency. The primary reason for this change was no doubt the extreme debasement of the silver currency which had taken place under Azes-II and his Parthians successors and which had made it impossible to continue to use a silver standard. Besides, it was also to compete with Roman traders that the early Kushan emperors started striking gold coins on the Roman standard.

The first Kushan emperor, Kujula Kadphises-I issued copper coins bearing the king's head in imitation of Augustus. In spite of the imitation, however, these are mainly Oriental in character and not merely slavish copies of Roman models. The coins of Kujula's successor Wima Kadphises are so radically different from those of his father that had there not been other evidence, on the basis of coins alone his direct succession would have been deemed doubtful. The coins of Wima portray his powerful and accomplished image while those of his father are barbarous. He issued copper coins in continuation of the earlier tradition but his most notable contribution is the introduction of extensive gold coins for the first time. The gold coins of three denominations were issued by him; double-*dinara*, *dinara* and quarter *dinara*. Wima is portrayed on the obverse of the coins as an elderly man with a heavy body in various postures such as; seated on a couch, seated cross-legged, seated at a *jharokha* (window), riding an elephant, driving in a biga, standing sacrificing at an altar. On some coins Wima is shown floating through or rising from the clouds and a flame is shown issuing from his shoulders. On the reverse of the coins of Wima, Siva with his long trident and accompanied by his bull is invariably seen. Certain copper coins bear on one side a bust facing right and on the other a horseman holding a whip, like the one seen on the coins of Azes.

The most celebrated emperor of the Kushan dynasty was Kanishka. It is generally accepted that his rule over the areas of present Pakistan started sometimes in the second quarter of the second century CE. Kanishka's outstanding fame is due to his patronage of Buddhism. His coins are distinct in many respects from those of early Kushan emperors. He introduced the Iranian title, *Shaonanoshao* "King of Kings" in place of the Greek form 'Basileos Basileon'. On the reverse side of his extensive gold and copper coinage is portrayed a whole pantheon of gods and goddesses, both Buddhist and non-Buddhist. Among these are depicted the Greek gods, Helios, Herakles, Selene; the Hindu god, Siva; the Iranian deities, Athro, "Fire", Oado, the wind god, and Nana and Buddha himself. This multitude of gods and goddesses was perhaps intended to conciliate the religious sentiments of the people of different faiths over whom he ruled. A standing figure of the king appears on the obverse of all these coins.

Kanishka reigned for 23 years and was followed by Vasashka Huvishka, Kanishka-II and Vasudeva Vassaskha the son of Kanishka, perhaps died young as no coins struck by him are known. Huvishka however issued coins in abundance. His gold does not bear the full

standing figure; it is either half length or merely the head. On one coin he is seated cross-legged; on another, he is riding an elephant. His copper coins are more varied. Vasudeva closely imitated Khsinka's standing figure type on his gold coins. The currency of this period furnishes a valuable clue to the economy and culture of this period.

Kanishka's copper coinage which came into the scene during 100–200 CE was of two types: one had the usual "standing king" obverse, and on the rarer second type the king is sitting on a throne. At about the same time there was Huvishka's copper coinage which was more varied; on the reverse, as on Kanishka's copper, there was always one of the numerous deities; on the obverse the king was portrayed as; riding on an elephant, reclining on a couch, seated cross-legged, or seated with arms raised. Huvishka portrayed his profile bust on his gold coins generally facing left and rarely to the right, wearing garments decked with jewels and a high or flat-topped ornamental headgear. He normally holds an imperial scepter or club in his right hand, in his left hand he holds on some coins, an *ankusa* (goad) and on some others he has a spear that rests on his shoulder. The copper coins bearing the name Huvishka are of several types such as; king reclining on a couch, king seated frontally, profile of king seated on a cushion holding a club in the right hand. All the Iranian deities bearing *Orlagno*, seen on the coins of Kanishka are also seen on the coins of Huvishka. The Huvishka's coins also have a few non-Iranian deities. He retained Siva god on the coins. After Huvishka, Vasudeva adopted the obverse device of Kanishka; a king standing in profile sacrificing at the altar but the king is seen holding a trident in place of the spear held by Kanishka in his left hand. The reverse devices were reduced to three deities, *Oesho* (Siva), Nana and Vasudeva.

In the coinage of the Kushan Empire the main coins issued were gold, weighing 7.9 grams, and base metal issues of various weights between 12 g and 1.5 g. Little silver coinage was issued, but in later periods the gold used was debased with silver.

The coin designs during this period, usually broadly follow the styles of the preceding Greco-Bactrian rulers in using Hellenistic styles of image, with a deity on one side and the king on the other. Kings may be shown as a profile head, a standing figure, typically officiating at a fire altar in Zoroastrian style, or mounted on a horse. The artistry of the dies is generally lower than the exceptionally high standards of the best coins of Greco-Bactrian rulers. Continuing influence from Roman coins can be seen in designs of the late 1st and 2nd century CE, and also in mint practices evidenced on the coins, as well as a gradual reduction in the value of the metal in base metal coins, so that they become virtual tokens.

The coinage of the Kushans Empire, later on was copied as far as the Kushano-Sasanians in the west, and the kingdom of Samatata in Bengal to the east. Towards the end of Kushan rule, the first coinage of the Gupta Empire was also derived from the coinage of

the Kushan Empire, adopting its weight standard, techniques and designs, following the conquests of Samudragupta in the northwest. The imagery on Gupta coins then became more local in both style and subject matter compared to earlier dynasties, where Greco-Roman and Persian styles were mostly followed. The standard coin type of Samudragupta, the first Gupta ruler to issue coins, is highly similar to the coinage of the later Kushan rulers, including the sacrificial scene over an altar, the depiction of a halo, while differences include the headdress of the ruler (a close-fitting cap instead of the Kushan pointed hat), the Garuda standard instead of the trident, and Samudragupta's jewelry.

6.6 Huna Coins

The Hunas also called as Ye-tha or Hephthalites, were nomads living in the borders of China. They were migrated from their homeland and moved westwards and formed two main streams; one turned towards the Volga figuring prominently in Roman history. The other branch established itself first on the Oxus and in the 5th century it pushed towards Persia and India. The Hunas of this branch crossed the Hindukush occupied Gandhara and marched towards the territories of the Gupta empire. But their progress was halted by Skanda Gupta.

The Hunas succeeded in building up a vast empire in Persia. With their enhanced power the Hunas moved again towards India towards the end of the 5th or the beginning of the 6th century under the leadership of Toramana and conquered a large part of western India and Malwa. His son Mihirakula extended empire towards northern India and the capital was established at Sakala (Sialkot). He seized Kashmir and held it till his death in 528 CE.

However, in 565 CE the Huna hold on Transoxania was broken by the Sassanid king Chosroes-I with the assistance of the Turks and this was perhaps a death blow to Huna power in India. After 6th century little is known in ancient India about the Hephthalites and what happened to them is unclear. Some historians suggest that the remaining Hephthalites were assimilated into the population of northwest India and Pakistan. However, the last Hephthalites king Yudhisthira ruled until about 670 CE when he was replaced by the Turk Shahi dynasty.

The Huna invaders reproduced the coinage of the territories which they conquered. They borrowed the Sassanian type in Afghanistan. These Huna coins may conveniently be called Hephthalo-Sassanid. Their notable feature being that the king wears a head dress adorned with a buffalo head and wings on either side. These coins seem to be re-struck. The reverse showing a fire-altar with attendants is found almost obliterated. But this partial or total effacement is the result of the use of an unusual striking technique. The best known and finely executed silver and copper coins of the Hunas are those which bear the name in Pahlvi.

The Hinas issued the Later Kushana-type coins in Kashmir and the silver Gupta-type coins elsewhere. They issued their coins only in silver and copper whether they issued any gold coins is however not yet known. Toramana and Mihirakula both issued silver coins of the Sassanian bust-type showing a coarse impression of the bust of the king to the right on the obverse. On the reverse appears the Sassanian fire-altar with its two attendants. Toramana also issued silver coins of two other types. One followed the Sassanian tradition for its reverse and had the fire-altar with the two attendants and adopted a new obverse showing a horseman. The legend on these coins is *Sahi Jabula* or *Sahi Janabula*. The other type closely followed the Gupta silver coins of the eastern region with the difference that the king's head is turned to the left. The reverse retains the fantailed peacock and the legend is almost the same with only the change of name.

There are a large number of copper coins of the Kidara Kushan type, found mainly in Kashmir where the king is standing with the legend Sri Toramana on the obverse and crudely executed Ardoksho, holding a lotus with the legend Kidara on the reverse. The copper coins of Mihirakula are of three types, first the large copper coins portray the king riding a horse on the obverse and Lakshmi on the reverse and this appears to have been copied from the Gupta horseman type. The second type follows the coins of the Later Kushanas whereas the third is the Sassanian type with the king's bust on the obverse and a humped bull on the reverse. However, some of these coins appear to be counter struck.

There have found some unusual type of gold coins towards the east in the Chhatisgarh region of Madhya Pradesh in the adjoining areas of Orissa. These coins are very thin in fabric and repousse in technique and weigh about 19-20 grains. These coins were during the later part of the 5th and early part of the 6th centuries CE. These coins relate to two dynasties. The earliest belong to the Nala dynasty, which flourished in south Kosala towards the end of the 5th century. The rulers who issued these coins are Varaharaja, Bhavadattaraja, and Arthapatiraja. The coins bear within a circle of dots a couchant bull. Below the bull is the name of the issuer in the box-headed Brahmi of the south. The later coins bear a Garuda with on stretched wings and belong to Prasannamatra, Mahendraditya and Kramaditya. While Prasannamatra is the well known ruler of the Sarabhapuriya, dynasty, the other two are un-known.

6.7 Hindu Shahi Coins

The "Turk Shahi" dynasty of Kabul which boasted descent from the Kushana king Kanishka was supplanted by a dynasty of Hindu Shahia and they are called as "Shahi". Kabul was the earliest capital of the Hindu Shahi after they expelled the Turk Shahi dynasty. At the beginning their territory extended from Kabul to Chenab River, Punjab. The last Turk Shahi ruler, Lagaturman, is said to have been imprisoned by his Brahman minister, Kallar and it was

the later who became the founder of the dynasty of the Hindu Shahis, Kaller was succeeded by Brahman kings Samand, Kamala, Bhim, Jaypal and their descendants. The Hindu Shahi dynasty succeeded from about the third quarter of the 9th century to the first third quarter of 11th century when they were finally reduced by the Ghaznavids.

The Hindu Shahis held sway not only over the Kabul Valley (Afghanistan), but also at Gandhara (modern-day Pakistan), during the early medieval period in the subcontinent. A large amount of details about the rulers have been gathered from chronicles, coins and stone inscriptions which are the only sources in history. The kingdom was known as the Kabul Shahan or Ratbelshahan from 565 CE to 670 CE, when the capitals were located in Kapisa and Kabul, and later Udabhandapura, also known as Hund, for its new capital.

Earlier, when the Abbasids led by Caliph Al-Ma'mun defeated the Turk Shahi Kingdom in 815 CE, the Turkic Shah had to convert to Islam and had to pay on annual basis 1,500,000 Dirhams and also slaves to the Abbasids. These Kabul Shahis went through a political disaster due to the defeats and annual payments. In 850 CE the unpopular Kabul Shah Lagaturman was disposed of his position by his minister called Kallar. This gave way to another Kabul Shahi dynasty. This new dynasty was called "Hindu Shahi" by the Arabs, and Shahi kingdom possessed the Kabul Valley and Gandhara.

In 870 CE, King Kallar lost the city of Kabul. He was displaced from there by the local Saffarid dynasty which was ruled by Emir Ya'qub bin Laith as-Saffar. Due to the ongoing conquests of the local Saffarids and Samanids, he moved his capital in 870 to Udabhandapura (Also called Waihund or Hund), located on the banks of the Indus. The loss of Kabul remained short as in 879 CE the Hindu Shahi captured the city back. This victory remained short too due to Samanid expansion in the region which eventually led to the final Shahi rule in Kabul around 900 CE. The Hindu Shahi remained strong in Gandhara and other parts of the Punjab.

The Kabul Shahis ruled the Kabul Valley and Gandhara (Pakistan and Afghanistan) from the decline of the Buddhist Kushan Empire in the 3rd century to the early 9th century CE. The Shahis are generally split up into two eras: the earlier Buddhist Shahis and the later Hindu Shahis, with the change-over thought to have occurred sometime around 870 CE, after which Hinduism gained primacy in the region.

The Hindu Shahis under Jayapala, is known for his struggles in defending his kingdom against the Ghaznavids in the modern-day eastern Afghanistan and Pakistan region. Jayapala saw a danger in the consolidation of the Ghaznavids and invaded their capital city of Ghazni both in the reign of Sebuktigin and in that of his son Mahmud, which initiated the Muslim Ghaznavid and Hindu Shahi struggles. Sebuk Tigin, however, defeated him, and he was forced to pay an indemnity. Later, Jayapala defaulted on the

payment and took to the battlefield once more. Jayapala, however, lost control of the entire region between the Kabul Valley and Indus River.

The Shahi issued coins in their own distinctive devices, weight and fabric in silver and copper as well. The most common type has a horseman with a banner or lance in the right hand and reins in the left of the rider on one side and a recumbent bull with saddle-cloth and a *Sarada* legend in the other. Another important type probably a supplementary series shows an elephant on the obverse and a lion on the reverse. The bull and horseman type was first introduced by Spalapati and was continued by several rulers after him. Samantadeva changed the legend, but he did not alter the main pattern. These coins are found in various forms of execution and fabric and remained current long after the end of the Hindu Shahi dynasty, to influence the coinage of the subsequent periods. Later on during the 12th and 13th centuries a number of dynasties and rulers issued coins of this type in silver and billon. They not only copied the type but also retained the legend and added their names on the reverse. However, the enigmatic problem of the coinage of the Shahi is that most of the legends do not correspond with the names of the rulers. Besides, the most famous among the Shahi rulers have no coins to their credit. It is also assumed that no coins were issued after Bhimadeva for well known political and economic reasons. The Shahi rulers were not very conscious of the royal prerogative of issuing coins and left the mints in private hands. The mints operated in response to the trading needs of business and not to the will of the rulers. Further, the gradual reduction in weight of the Shahi coins can be attributed to the private mints. As regard the method of manufacturing coins, the actual method in the time of Shahi rulers is not recorded but it was probably no different from what we find in other parts of regions.

According to Abdur Rehman, in 1844 Reinaud published detailed researches which included Albiruni's passage on the Shahi dynasties. This brought the famous list of the Shahi kings into the limelight. For the first time the names of Kallar, Samand, Kamalu and Bhim, the predecessors of the 'Palas' became to known. Further the fact that Kallar the Brahman minister of the last Turk Shahi rulers was the founder of the Hindu Shahi dynasty. Thereafter, clear distinction was made between the Brahman and the Pala dynasties. For the names of the rulers belonging to the former ended in -deva and those of the latter in -pala. Macdowall considers the two principal series of the Shahi coins; the Sapapati and the Samanta series as successive and not contemporaneous. He assigns the former to the period of the Turk Shahi and the latter to that of the Hindu Shahi. Further he within the series has attempted to find issues (rulers) marked by different weight standards and stages of type deterioration. The issuance of coins was successive and it was revealed that the same assigned to the individual rulers of these dynasties. Thus for the first time an attempt was made to assign coins from the known series not only to the 'Palas' and the 'Devas' but also to their predecessors, i.e. the Turk Shahis.

As regard geographical distribution of the Hindu Shahi coins it is understood that the coins of Samanta are common in Kabul and are even more plentiful in the Panjab and Gandhara. The coins of Bhima are found in Afghanistan but seldom in the Sub-continent. Similarly the coins of Vakka are common in the Punjab and Gandhara and are also found in Kabul. Similarly Khudarayaka coins are found both in Afghanistan and Gandhara. The Sahi coins are also found in mixed hoards in Eastern Europe, Russia and other parts of the Sub-continent.

The weights of the Shahi coins have not been recorded in every case. From the known evidence, however, it seems that the weights varied considerably from reign to reign and even within one reign. But all the coins do not seem to have been issued simultaneously and therefore do not give a consistent pattern of weights which could be used to build up such a hypothesis. Moreover, of the five hypothetical denominations postulated by Gopal, the coins of the first three are virtually indistinguishable from each other either by size or device and therefore their classification could not have served any useful purpose.

The coins of Sri Samantadeva having the 'bull and horseman' series is commonly identified with Samand of Albiruni's list. But there are difficulties in regarding Samand as the sole issuer of the whole series. The coins bearing this name had a wide diffusion in northern India and were issued by many rulers contemporary with the latter part of the Hindu Shahi rule and also in the post-Hindu Shahi period. Some of these rulers prefixed an epithet to the name of Sri Samantadeva, of which the real significance is still obscure. The Tomara rulers Sallaksanapala (978-1008 CE) and Anangapala (1049-79 CE) seem to have issued coins in this late period without prefixing any epithet to the main legend. The Gahadavala coins of Madanapala (1080-1115 CE) have the word Madhava and those of the Cahamana rulers of Sakambari Somesvaradeva (1162-66 CE) and Prithviraja (1162-92 CE) have Asawari before Sri Samantadeva. Similarly Sri Pipala of some unknown dynasty used the prefix Kutamana. But these later types are thick and dumber in fabric and their figures of the bull and the horseman are more stylized. They can be easily distinguished from the types of the period of the Hindu Shahis.

The precise date of the origin of the Samanta series is not known. Assuming however that the series started in the reign of Samand, when it succeeded and replaced the earlier Spalapati series, it seems that a large number of Samanta's coins were produced posthumously in the time of his successors, who used his name on the coins instead of their own names.

The Samanta coins belonging to the period of the Hindu Shahis are found in silver, billon and copper. The silver and billon coins have couchant bull on the obverse and horseman on the reverse. The figure of the horseman is generally stylized. But in some better examples he is shown wearing a conical cap, which is marked by a ribbon or turban at the

base. The two ends of the turban hang down to the right and left of the head. The banner held by the horseman in his right hand shows two streamers.

The silver denomination of Samanta finally degenerated into billon with weights ranging between 3.1 gms (48 gr) and 3.7 gms (51 gr). The billon coins show a silver content of 25 to 30 per cent which marks a sharp reduction as compared to the 61 to 67 per cent of the silver *dirhams*. Significantly there is no indication of any progressive deterioration in the coinage to bridge this gap. This, however, becomes meaningful when considered in the light of the record of Awfi who says that this debased currency came under attack in the time of the Ghaznavid sultan Masud III (1099 CE), long after the extinction of the Shahi regime. As no such sharp reduction in the silver content could have occurred during the Shahi period presumably because of continuous state checks, there is a definite link between the fall of the Shahis and the sudden drop in the silver content of the coins. Apparently this could have happened only towards the end of the rule of the Hindu Shahis.

The Khudarayaka's coins are known only in silver and follow the general pattern of the bull and horseman series of the silver of Samanta. The figures of the bull and the horseman retain their plastic form, which compares with variety of Samanta's silver. The Khudarayaka's coins bear the Sarada letter *ma* in the field to the left of the horseman and weigh between 3.3 gms (52 gr) and 2.5 gms (40 gr) with a point of concentration between 2.9 gms (46 gr) and 2.8 gms (44 gr). Typologically the coins must be placed early in the Samanta series.

The precise identification of Khudarayaka (ksudra rajaka = small raja or Samanta) has not been finally settled. Alexander Cunningham associated him with Kamalu, the successor of Samand in Albiruni's list. However, Macdowall on the contrary maintains that 'Khudavayaka' of the coins may well be ya'qub, the Muslim conqueror of Kabul. Macdowall's attribution is, however, based on the hypothetical reading of the device seen above the horse's head as the Arabic word '*adl*'. But the device in question is not uniform on all the known coins and is clearly a remnant of the Baktrain legend. Moreover, similar signs resembling Arabic letters can also be seen on the coins of Bhima and Samanta who in no case can be taken to represent *Ya qub*.

Vakkadeva's coins are known only in copper. The obverse of these coins shows a caparisoned elephant walking to left with legend Sri Vakkadeva on the top. The reverse contains an open mouthed lion with raised front paw and curved tail. Typologically the coins may be placed after the end of the 'elephant and lion' series of Samanta. The weight of these coins varies between 3.5 gms (55 gr) and 0.96 gms (14 gr), a fact which indicates that they represent two different denominations.

The coins of Sri Bhimadeva are generally identified with Bhim of Albiruni. The identification has been accepted on all hands and is supported by the numismatic and geographical context of Bhima's coins. Bhima issued coins in gold, silver and copper.

It is evident that the motifs of the goddess Laksmi and king-on-throne do not fit into the general pattern of the Hindu Shahi coins. The attribution of this coin to Bhima therefore solely rests on the reading of the obverse legend. But unfortunately the letter *bhi*, in the name Bhima, is obliterated and can only be conjecturally restored. The reverse legend is even more confused and difficult to read.

The silver coins of Bhima are not very many. The obverse of these coins shows a couchant bull and the legend Sri Bhimadeva in neat Sarada letters and the reverse a horseman and the remnants of the corrupt Bactrain legend which in the present examples looks like a flat-topped hook and the Arabic numerals 117. The part of this legend above the horse's head takes different nondescript forms. In the field to the left of the horseman is the much disfigured letter *bhi*. The animals in some cases still retain a plasticity and roundness of features comparable to the earliest coins of Samanta's silver money. The weights of these coins vary between 3.2 gms (50 gr) and 3.1 gms (48 gr). The copper denomination of Bhima similarly follows the 'elephant and lion' type of Samanta and Vakkadeva. But the animals in these examples lose depth of figure and plasticity of features. The coins between 1.9 gms (30 gr) and 1.5 gms (24 gr).

Self Assessment Questions

- Q. No.1.** What do you know about the origin of ancient coinage in the South Asia? Discuss
- Q. No.2.** Discuss Punch Marked Coins of the Sub-continent and highlight its scope and importance.
- Q. No.3.** Why do we consider Indo-Greek coins as a source of history in the South Asia?
- Q. No.4.** Discuss the various features of Scytho-Parthian coins, how do they contribute to the history of the region? Discuss.
- Q. No.5.** What is the importance of Kushan period coins? Discuss its range and geographical extension in the Sub-continent.
- Q. No.6.** What do you know about Huna coins? How do they elaborate the history of the region? Discuss.
- Q. No.7.** Hindu-Shahi period coins are always considered as basis/foundation for the history of North-Western region of the sub-continent? Discuss.

Bibliography

- Agrawala, V.S (1953) Ancient coins as known to Panini, Journal of the Numismatic Society of India No. 15, India.
- Allan, John. (1936). Catalogue of the Coins of Ancient India in the British Museum, London.
- Benerjee, G.N., (1929) Hellenism in Ancient India, Calcutta.
- Biswas, Atreyi (1973) The political history of Hunas in India on the Period from 650 to 325 BC New Delhi, Munshiram Maoharlal, India.
- Chettopadhyay, B., (1977) Coins and Icons: A Study of Myths and Symbols in Indian Numismatic Art, Calcutta.
- Cunningham, Alexander (1963) Coins of ancient India from the Earliest Times Down to the Seventh Century AD (reprint), Delhi, Motilal Banarsidass, India.
- Dani, A. H (1991) Bactrian and Indus Greeks, A Romantic Story from their Coins, Lahore Museum, Lahore.
- Dani, A. H (1991) Bactrian and Indus Greeks-A Romantic Story from their Coins, Lahore Museum, Lahore.
- Dani, A.H (1962) The Evolution of the Punch-Marked Coinage in Indo-Pakistan, Museum Journal of Pakistan, Karachi
- Dani, A.H. (1956) Indian Punch Marked Coins- A New Approach, Journal of the Asiatic Society of Pakistan.
- Dar, S. R (1991) Deities on Bactrian and Indus Greek Coins, in Bactrian and Indus Greeks, A Romantic Story from their Coins, Lahore Museum, Lahore.
- Dobbins, K. Walton, (1980) A Schema of Indo-Baktrain Coinage, Numismatics Note and Monographs, The Numismatic Society of India, Banares.
- Gardner, P., (1971) The Coins of the Greek & Scythic Kings of Bacteria and India in the British Museum, London: Reprint, New Delhi.

- Gupta, P. L (2004) Coins –India, Land and the People, Reprint, National Book Trust, India.
- Gupta, P.L., (1971) Coins, 2nd Edition, Delhi
- Hazan, Fernand (Editor), (1970) A Dictionary of Ancient Greek Civilization, Methuen & Co. London.
- Jassop, Martin (1980) Coins: An illustrated Survey from 650 BC to the Present Day, London.
- Kerengi, C., (1951) The God of the Greeks, (Editor, Joseph Campbell), London
- Michael Mitchiner, (1975) Indo-Greek and Indo Scythian Coinage, Vol. I: The Early Indo-Greeks & Their Antecedents. Hawkins Publications, London
- Narain, A.K, (1955) The Coin-Type of the Indo-Greek Kings: The Numismatic Society of India, Bombay.
- Patrick, Richard, (1972) Greek Mythology, Octopus Books, London
- Rahman, Abdur (1979) The last two Dynasties of Sahis, Islamabad.
- Singh, Shatrughna Sharan, (1984) Early Coins of North India: An Iconographic Study, Janaki Prakashan, Patna.
- Tam, W.W., (1951) Greeks in Bactria and India, Cambridge
- Walsh, E.H.C (1939) Punch-Marked Coins from Taxila, Dehli and Calcutta, India.
- Whitehead R.B., (1914) Catalogue of Coins in the Punjab Museum, Lahore: Vol. I, Indo-Greeks Coins, Reprint. Argonaut Inc., Publishers, Chicago: MCMLXIX (1969).
- Wilson, H.H., (1841) Ariana Antiqua, London.

UNIT. 7

**MUSLIM ART AND ARCHITECTURE IN THE
SUB-CONTINENT**

**Written by: Dr. Badshah Sardar
Reviewed by: Dr. Tahir Saeed**

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Introduction

In this unit author has emphasized how the tradition of Islam reached in the regions of the Sub-continent both from the north and the south route of invasions. In 711 CE, an Arab naval expedition under the command of Muhammad bin Qasim arrived at the sea port of Banbhore, Sindh to suppress piracy on Arab shipping and ended up by establishing control over the Sub-continent as far north as Multan. Most of the local rulers remained in power but now paid tributes to the caliph of Baghdad.

Similarly in the 11th century, the Turkish rulers of Afghanistan began the Islamic conquest of Indian the Sub-continent from the northwest. Mahmood of Ghazni (979-1030 CE), led a series of raids against the Rajput kingdoms and the wealthy Hindu temples. Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan became integral parts of the Ghaznavid Empire, which had its capital at Ghazni in Afghanistan. The Ghaznavids developed Lahore as their centre of Islamic culture in the Punjab, and mass conversions to Islam began at this time.

The Ghaznavid kingdom was shattered near the end of the next century by the Ghorids, the Turkish Muslim rulers of Ghor in Afghanistan. Muhammad of Ghor swept down the Indus into India, defeated the Rajput confederacy there in 1192 CE and captured Delhi in the following year. This marked the beginning of the Sultanat Period, which lasted for over 300 years, with five dynasties of Muslim Sultans succeeding one another in Delhi. The Mongol, Genghiz Khan, harassed the Delhi sultans during the 13th century CE, never succeeding in overthrowing them. Tamerlane, the great Turkish conqueror who had his capital at Samarkand, enter India soon after in 1398-9 CE and sacked Delhi.

In short, the real Islamic movements of the regions were completed in two phases and from two different directions. The first phase is represented by the Arab's invasion of Sindh when Muhammad bin Qasim, was dispatched to Sindh to punish those pirates who have plundered some vessels laden with valuable presents sent by the ruler of Ceylon (Sri Lanka) for the Khalifa. He reached Debul (identified as Banbhore) and took it by storm and Raja Dahir the ruler of Sindh fled away.

The second phase is marked by the invasions of the Ghaznavids on the North-West Frontier of Pakistan. It was through these north-western passes that many Muslim invaders, traders, artists, poets and soldiers with their Central Asian heritage pierced into the Indian Sub-continent. Towards the end of the 10th century C.E, the Ghaznavid kingdom was passed on to Sabuktigin, who defeated Jaipal, the Hindu Shahi ruler and incorporated Peshawar into his kingdom.

Objectives:After reading this unit, students will be able to understand the following points;

- to stimulate student's interest in the early Islamic and medieval history of the Sub-continent.
- to create awareness among the readers about Mughal period art and architecture
- to trace the history of regional style of Muslim period art and architecture of the Sub-continent.
- to examine analytically the sources of Muslim period's calligraphy.
- to understand historical background Muslim Paintings
- to know Muslim minor arts & crafts and coins

7. Muslim Art and Architecture in the Sub-Continent

7.1 Early Medieval History

It was within a hundred years of the advent of Islam that the rule of its followers stretched from the Indus in the east through North Africa and Suain to the shores of the Atlantic in the west, absorbing the Persian Empire of the Sassanians and the Roman provinces round the eastern and southern coasts of the Mediterranean. At this time the southern region of Pakistan was also annexed to the dominions of Islam. Later, the Islamic influence extended further to the other parts of Pakistan and since then it has primarily been a unit of Muslim culture.

In fact the Muslim art emerged from the selective fusion of Arab, Syrian, Byzantine, Sassanian-Persian and later Turkish, Mongol-Chinese and Indian traditions. Its background basically was the desert and the oasis. Its spatial sense was expressed in infinity systematically subdivided and the sense of time determined by the swiftness of horse and the endlessness of God. As such, a new complex of artistic forms was developed using the older techniques of the preceding art styles, but in accordance with a new scale of values.

The tectonics of Muslim architecture was in the beginning, therefore, limited to the primary forms, though delightful shapes and geometrical decorations on the wall surfaces were frequently employed. The decorative art was further embellished with script and arabesque ornamentation and inter-twined. These geometric, floral and calligraphic motifs were reproduced in endless combinations with taste and vigour. The representation of the human figure was, however, prohibited in the early period, though under the Sassanian and Turkish influences later on, it was only excluded from public places. The industrial art was functional but the ceramic wares possessed designs and colours not even surpassed by Chinese pottery and porcelain.

In Pakistan, the Muslim era was formally inaugurated by Muhammad bin Qasim when he conquered the lower Indus Valley in 711-12. Then early in the eleventh century Sultan Mahmud of Ghazna annexed the Punjab, but it was not until the arrival of Sultan Muizzuddin and his Governor Qutb-uddin Aibak in 1192 that the Muslim rule was established in a large portion of the Indo-Pakistan sub-continent. In 1206 Qutb-uddin Aibak founded the first dynasty of the Sultans of Delhi and settled down here, thereby creating conditions for the growth of Muslim culture under local influences. The Khaljis and the Tughlaq Sultans extended their rule down to Madurai in South India, but, in the 15th and early 16th centuries, the Indo-Pak sub-continent was divided into a number of warring principalities under the local Muslim rulers. Later in the 16th century, the Muslim rule was again consolidated under the Mughal emperors. The 18th century, however, saw the disintegration of the Mughal Empire which was completely replaced by the British in 1857.

The earliest remains of Muslim art and culture have been exposed at Banbhore situated about 60 kilometer north-east of Karachi. Here, the first Muslims to appear on the scene were Arabs and as an evidence of that a number of copper coins of the tenth Umayyad Caliph, Hisham bin Abdul Malik (724 to 734), have been found. Along with these coins from the early levels has been unearthed a type of pottery which was made in Syria during the Umayyad period. It is glazed white, thin textured and moulded in relief with Kufic inscriptions and floral-cum-geometric patterns. Glazed pottery vessels recovered from the same levels show Persian influence. However, special significance in this class of pottery is the heavy textured blue-green glazed storage jars.

The Persian influence appears even more predominant during the later periods and a large number of glazed pottery-ware discovered from the upper levels closely resembles the Persian prototypes of the 10th-13th centuries CE. Unglazed

polychrome with cream, black and red colours is another significant type of pottery found from the later layers. It has geometric designs with representations of birds and animals. Glass articles show a high quality of craftsmanship and display the technique of glass-making in vogue in Syria in the early Muslim period. The Arab culture, language and literature were introduced and breakthrough in these areas. During the second and third Centuries of Hijra, these influences were strengthened when Arab independent Emirates were established here with capitals at Multan and Al-Mansurah.

The structural remains exposed at Banbhore so far, include the citadel defenses, gates, residential buildings and a mosque. The architectural style is simple and locally available stone has been generally used in the construction though baked bricks are also to be seen here and there. The mosque which dates back to 109 A.H. (772 CE) establishing itself as the earliest mosque in the Indo-Pakistan sub-continent, is not much different in plan from the early mosques built by the Muslims at Kufa and Wasit without a niche pointing to “Kaba” which was introduced later on. It consists of an open court surrounded by roofed arcades. Under the medieval Muslim dynasties of the sub-continent the chaste style of Muslim architecture was highly influenced by the local traditional arts. But the fusion of Muslim and local forms and ornaments was so perfect that it did not impair the purely Muslim impression. The imposing mausoleums of the saints Bahauddin Zakarya and Shams Tabrez at Multan are the excellent examples of this period.

The beckon of Islamic culture came from Central Asia to this part of the Subcontinent which was initiated through the military excursions of Sebuktegin, and later by his son and successor Mahmood of Ghazna in the later decades of the 10th and the early decades of the 11th Century CE. Sultan Mahmood introduced

characteristic features of Central Asian architecture in the land of today's Pakistan and is said to have erected a mosque and a victory tower at Lahore.

The Islamic rule and culture in the Subcontinent, however, gained a permanent footing after Shahab-ud-Din Ghuri defeated Pirthvi Raj and captured the throne at Delhi in 1193. The stream of history since then flowed uninterrupted through the successive rule of the Central Asian Turks, the Khaljis, the Tughluqs, Sayyids and the Lodis. This was a very important period of the socio-cultural, religious-spiritual as well as political history of Pakistan, all permeated with Central Asian character and traditions.

Through the religious and secular buildings of this period anew and distinct style of architecture was introduced and practiced. It was based on the characteristic features of Central Asian art of buildings. The naked brick architecture, as it is commonly known, its specimens are mainly brick construction having marvelous cut-brick decoration. The earliest known outstanding specimens are like the tomb of Muhammad b. Harun at Bela (Balochistan), the Mausoleum of Khalid Walid at Kabirwala (Multan) and the tomb of Sadan Shah at Muzaffargarh. Later on brick decoration was replaced with faience or faience mosaic revetment, and wooden embellishment. These specimens are mostly funerary memorials erected over the graves of the saintly personages.

In Pakistan, we have a number of such memorials spread over almost every place in the country. The climax of this style is however, significantly represented by the famous mausoleum of Shah Rukn-i-Alam at Multan which has been acclaimed as the most splendid memorial ever erected in honour of the dead. The specimens of the later period are present at Uchchh, Dipalpur, Multan, Sitpur, Muzaffargarh, Dera Ghazi Khan, Dera Ismail Khan, Kot Mithan, Jalalpur Pir Wala and many other places.

The land of Sind has, in this connection, its own distinguished identity. During the long period of history, its large parts were ruled by local dynasts of Sumras, Sammas, Tarkhans, Arghuns and Talpurs. These rulers have left an imprint on the socio-cultural history of Sind; they issued coins, built palaces and other religious and secular buildings, patronized arts and literature. The masterpieces of the art of buildings belonging to these periods are Makli Hill Grave yard, Chokundi, Hanidan and Mausoleums of Talpurs at Hyderabad.

In fact the first major Islamic kingdom in Indo-Pakistan subcontinent was the Delhi Sultanate, which led to the development of Indo-Islamic architecture, combining Indian and Islamic features of art and architecture. The rule of the Mughal Empire, when Mughal architecture evolved, is regarded as the apex of Indo-Islamic architecture, with the Taj Mahal being the high point of their contribution. The Indo-Islamic architecture influenced the Rajput and Sikh styles as well. The earliest examples of Indo-Islamic architecture were constructed during this period by the Delhi Sultanates, most famously the Qutb Minar complex, which consists of Qutb Minar, a brick minaret commissioned by Qutub-ud-Din Aibak, as well as other monuments built by successive Delhi Sultans. Similarly, Alai Minar, a minaret twice the size of Qutb Minar was commissioned by Alauddin Khilji but never completed. The other examples include the Tughlaqabad Fort and Hauz Khas Complex during the early medieval period.

The early Muslim medieval architecture is in fact the architecture of the Indian subcontinent produced by and for Islamic patrons and purposes. The development of this architecture began with the establishment of Delhi as the capital of the Ghurid dynasty in 1193. Thereafter succeeding the Ghurids was the Delhi Sultanate, represented by a series of Central Asian dynasties that consolidated a large part of India, and later by the Mughal Empire during the 15th century. These

dynasties introduced Persian, Turk and Islamic art and architecture styles into the subcontinent.

The types and forms of large buildings required by Muslim elites, with mosques and tombs much the most common, were very different from those previously built in the sub-continent. The exteriors of both were very often topped by large domes, and made extensive use of arches. Both of these features were hardly used in Hindu temple architecture and other indigenous Indian styles. These types of building essentially consist of a single large space under a high dome, and completely avoid the figurative sculpture so important to Hindu temple architecture. The Muslim architecture initially adapted the skills of a workforce trained in earlier Indian traditions to their own designs. As we see that most of the Islamic world, where brick tended to predominate, but sub-continent had highly skilled builders to producing stone masonry of extremely high quality of architecture.

The best-preserved examples from the days of the early years of Islam in South Asia are of a mosque at Banbhore and the city of al-Mansura, in Sindh. The start of the Delhi Sultanate in 1206 under Qutb al-Din Aibak introduced a large Islamic state to India, using Central Asian styles. The important Qutb Complex in Delhi was begun under Muhammad of Ghor, by 1199, and continued under Qutb al-Din Aibak and later sultans. The Quwwat-ul-Islam Mosque was the first structure representing the Iranian style, but the arches are still corbelled in the traditional Indian style. Besides, the Qutb Minar, (victory tower), which is about 73 meters high.

The Tomb of Iltutmish was constructed in 1236, its dome, the squinches again corbelled, is now missing, and the intricate carving has been described as having an "angular harshness", from carvers working in an unfamiliar tradition. The early mosque, which begun in the 1190s, is the Adhai Din Ka Jhonpra in Ajmer,

Rajasthan, built for the same Delhi rulers, again with corbelled arches and domes. The bold contrasting colours of masonry, with red sandstone and white marble, introduce what was to become a common feature of Muslim architecture, substituting for the polychrome tiles used in Persia and Central Asia. The pointed arches come together slightly at their base, giving a mild horseshoe arch effect, and their internal edges are not cusped but lined with conventionalized "spearhead" projections, possibly representing lotus buds.

The marvelous tomb of Shah Rukn-e-Alam (built 1320 to 1324) in Multan is a large octagonal brick-built mausoleum with polychrome glazed decoration that remains much closer to the styles of Iran and Afghanistan. This was the earliest major monument of the Tughlaq dynasty (1320–1413), built during the unsustainable expansion of its massive territory. It was built for a Sufi saint rather than a sultan. The tomb of the founder of the dynasty, Ghiyath al-Din Tughluq (d. 1325) is more ascetic, but impressive. It is completely lacks carved texts, and sits in a compound with high walls and battlements. The Tughlaqs left many buildings, and a standardized dynastic style. Sultan, Firuz Shah (r. 1351-88) is said to have designed buildings himself, and was the longest ruler and greatest builder of the dynasty, his Firoz Shah Palace Complex (started 1354) is at Hisar, Haryana.

By this time Islamic architecture in sub-continent had adopted some features of earlier Indian architecture, such as the use of a high plinth and often mouldings around its edges, as well as columns and brackets and hypostyle halls. After the death of Firoz the Tughlaqs declined, and the following Delhi dynasties were weak. The monumental buildings constructed were mostly the tombs. The impressive Lodi Gardens in Delhi decorated with fountains, charbagh gardens, ponds, tombs and mosques were constructed by the late Lodi dynasty. Besides, the architecture of other regional Muslim states was often more imposing and impressing.

7.2 Mughal Period

The early decades of the 16th century witnessed political change in the Subcontinent and brought a new reigning power to the scene. The progenitor of the Moghul Empire, was Zahir-ud-Din Muhammad Babur (1526-1530). He was succeeded by Humayun (1530-1554) Akbar (1554-1604), Jahangir (1605-1627), Shahjahan (1628-1658), Aurangzeb (1658-1707) and others. The rule of this imperial power lasted for well over three hundred years when it declined and fell. It was in 1857 that the last Moghul emperor Bahadur Shah Zafar was deposed by the British East India Company who inaugurated the British rule.

These imperial patrons of art and culture patronized not only architecture but almost all art forms such as: paintings, calligraphy, coinage, armoury, and other minor arts. They established imperial libraries and studios to create best specimens of these arts. The coins of this period too are pieces of art for their purification, designing and variety. The art of book reached its height which combined miniature paintings as well. Their objects of daily use were in fact objects de-art which were made of gold, silver and other precious and semi precious metals and stones. A large number of these arts, illustrated manuscripts of classical Persian works, albums of painting and calligraphy, gold and silver coins now form proud possessions of museums and art galleries throughout the world.

The Mughal Empire from 1526 to 1857 left a mark on Indian architecture that was a mix of Islamic, Persian, Turkish, Arabic, Central Asian and native Indian architecture. A major aspect of Mughal architecture is the symmetrical nature of buildings and courtyards. Akbar made a major contribution to Mughal architecture. He systematically designed forts and towns in similar symmetrical styles that blended Indian styles with outside influences. The gate of a fort Akbar designed at Agra exhibits the Assyrian gryphon, Indian elephants, and birds.

The Mughal Emperors whose ideas of culture were strongly coloured by their Timurid ancestors and Safavid contemporaries, introduced further refinement in the architectural features during the 16th and 17th century. The tomb of Jahangir, Palaces in the Old Fort of Lahore, the Badshahi Mosque and various other monuments of this period are remarkable for their rich interiors, decorative designs and the use of bulbous double domes, octagonal pavilions and beautiful gardens. The material normally used by the Mughals in the construction, apart from marble, was red sand stone. In the later Mughal period, brick core was covered first with a mosaic of special cut monochrome tiles in bright blue, white, yellow and green encaustic colours and later with square tiles on which a much richer decoration, predominantly green, sometimes also pink or marine blue had been painted, were used. The tile decoration though primarily introduced under the Persian influence, also comprised many local elements which may be seen most pronounced on the north and west walls of the Lahore Fort. Features of the paramount court style of the Moghuls also infiltrated into the provinces and we find many examples of tile decoration with local variations in Multan and the Sindh region of Pakistan.

However, during the Mughal era design elements of Islamic-Persian architecture were fused with and often produced playful forms of the local art. Lahore, occasional residence of Mughal rulers, exhibits a multiplicity of important buildings from the empire, among them the most significant and splendid specimen of Muslim architecture are; Badshahi mosque, the Lahore Fort with the famous Alamgiri Gate, the Wazir Khan Mosque, as well as numerous other mosques and mausoleums. The Shahjahan Mosque at Thatta, Sindh was built under, and probably largely by Shah Jahan, but strongly reflects Central Asian Islamic style, as the emperor had recently been campaigning near Samarkand.

In fact the Mughals introduced a much refined and sophisticated socio-cultural pattern in the society. Babur, a product of Samarqand and Farghana, paid his attention towards laying out gardens at several places of his newly conquered territory. History reveals that one such garden was laid in the Salt Range area and was named as Bagh-i-Safa. Only traces of this vanquished garden are left now. No other building of his, or for that matter, of his successor Humayun is known to exist now in Pakistan, except the ruined Baradari at Lahore erected by Kamran Mirza within a vast enclosed garden. However, Akbar, the real architect of the Moghul Empire, built a number of buildings in Lahore of which the fortifications of the fort with impressive gate-ways, and the palaces within it are remarkable specimens of an architectural style which is termed as an admixture of the Hindu-Jaina and Iranian characteristics. His son and successor Jahangir added a few more buildings within and without the fort.

The architectural accomplishments for instance, the Maryam Zamani Masjid and the tomb of Anarkali, both at Lahore, are significant examples of majestic but robust architecture. While the latter is an embodiment of majesty and grandiose representing a link between the Lodi, Suri and the Mughal architectural characterizes, the former presents a unique feat of colour presentation of fresco art. Incidentally, here in this mosque we meet for the first time in Pakistan the earliest example of the double dome.

The city of Lahore and Thatta are no doubt the two celebrated historic cities where the most sumptuous representation of Islamic architecture of the grand Moghuls is found in such abundance. The sumptuous palaces in the Lahore Fort, the Shalamar, the mausoleums of Jahangir, Nurjehan and Asif Khan, the Badshahi Mosque, an at Lahore, and a galaxy of funerary memorials, the Dabgaran Mosque, the Shah Jahan Mosque at Thatta and Makli, and a number of religious and secular monuments spread over the various parts of Sind are some of the best specimens of the art of

building created during the period which show the height of tasteful patronage and the skill and proficiency of the master-artists and artisans.

The most famous examples of the Mughal architecture are the series of imperial mausolea, which started with the pivotal Tomb of Humayun, but are best known for the Taj Mahal. It is known for features including monumental buildings with large, bulbous onion domes, surrounded by gardens on all four sides, and delicate ornamentation work, including *pachin kari* decorative work and *jali-latticed* screens. The Red Fort at Agra (1565–74) and the walled city of Fatehpur Sikri (1569–74) are among the architectural achievements of the Mughal period as is the Taj Mahal, in Agra which was built as a tomb for Queen Mumtaz Mahal by Shah Jahan (1628–58). The marvelous work includes the employing of the double dome, the recessed archway and tile work of plant ornaments which is one of the wonders of the world.

The Mughal architecture however influenced indigenous Rajput styles of architecture. The Rajput Architecture represents different types of buildings, which may broadly be classed as secular or religious. The secular buildings are of various scales. These include temples, forts, step well, gardens, and palaces. The forts were specially built for defense and military purposes. The Mughal architecture has however, a uniform pattern of structure and character, including large bulbous domes, slender minarets at the corners, massive halls, large vaulted gateways and delicate ornamentation, usually surrounded by gardens on all four sides.

Akbar and Jahangir Period (1556–1627)

The earliest example in Pakistan is the Lahore Fort, which had existed at least since the 11th century but was completely rebuilt by various Mughal Emperors. The Tomb of Anarkali, Hiran Minar and Begum Shahi Mosque also date back to this period.

Shah Jahan Period (1628–1658)

The Tomb of Jahangir, the fourth Mughal Emperor, was completed in 1637 during the reign of his son and successor Shah Jahan. The Emperor had forbidden the construction of a dome over his tomb, and thus the roof is simple and free of any embellishments. It stands amidst a garden which also houses the Tomb of Nur Jahan, Tomb of Asif Khan and Akbari Sarai, the one of the most well-preserved caravanserais. The Mughal architecture reached its zenith in the 17th century during the reign of Shah Jahan. During this time, several additions were made to the Lahore Fort. Other masterpieces of this time include the Wazir Khan Mosque, Dai Anga Mosque, Tomb of Dai Anga, Shalimar Gardens and Shahi Hammam in Lahore. The Shah Jahan Mosque in Thatta reflects a heavy Persian influence.

Aurangzeb Period (1658–1707)

The Badshahi Mosque in Lahore was built during the reign of Aurangzeb in 1673. It is made out of red sandstone with three marble domes, very similar to the Jama Masjid of Delhi. It remains one of the largest mosques in the world.

However, with the decline and collapse of the Mughal empire, the Muslim society in the subcontinent also received a real set back, never to regain the lost glory. The petty states and chiefdoms at many places of the areas which are now Pakistan, were only a shadow of its past grandeur, which have never been able to view with its past. The rule of the Sikhs and the earlier phase of the British ascendancy brought a death knell to this Islamic culture.

7.3 Regional Style of Muslim Architecture

Muslim architecture is represented mainly in the shape of standing monuments and archaeological heritage sites which constitute:-

- i. The Mosque architecture
- ii. The Madrasa architecture
- iii. Tombs and Mausolea
- iv. Cities and Towns
- v. Victory Towers
- vi. Forts and Fortresses
- vii. Gardens
- viii. Serai (Inn)
- ix. Baolis (Step well)

Alongside the architecture which developed in Delhi and prominent centers such as at Agra, Lahore and Allahabad, a variety of regional styles was also developed in regional kingdoms like the Bengal, Gujarat, Deccan, Jaunpur and Kashmir Sultanates. By the Mughal period, generally agreed to represent the peak of the style, aspects of Islamic style began to influence architecture made for Hindus. This was especially the case in palace architecture. However, with the disintegration of the Mughal Empire, regional *nawabs* such as in Lucknow, Hyderabad and Mysore continued to commission and patronize the construction of Mughal-style architecture in the princely states.

The significant regional styles developed in the independent sultanates formed when the Tughlaq Empire weakened in the mid-14th century, and lasted until most were absorbed into the Mughal Empire in the 16th century. The sultanates of the Deccan Plateau, Gujarat, Bengal and Kashmir are some examples. Besides, the architecture of the Malwa and Jaunpur sultanates has also left some significant buildings. The notable buildings of the Bahmani and Deccan sultanates in the Deccan include the Charminar, Makkah Masjid, Qutb Shahi Tombs, Madrasa Mahmud Gawan and Gol Gumbaz.

The style of the Bengal Sultanate mostly used brick, with characteristic features being indigenous Bengali elements, such as curved roofs, corner towers and complex terracotta ornamentation which were with blended. One feature in the Sultanate was the relative absence of minarets. Many small and medium-sized medieval mosques, with multiple domes and artistic niche mihrabs, were constructed throughout the region. The largest mosque in the subcontinent was the 14th century Adina Mosque. Built of stone, it featured a monumental ribbed barrel vault over the central nave, the first such giant vault used anywhere in the subcontinent. The mosque was modelled on the imperial Sasanian style of Persia. The Sultanate style flourished between the 14th and 16th centuries. A provincial style influenced by North India evolved in Mughal Bengal during the 17th and 18th centuries.

The Bahmani Sultanate in the Deccan broke away from the Tughlaqs in 1347, and ruled from Gulbarga, Karnataka and then Bidar until overrun by the Mughals in 1527. The main mosque (1367) in the large Gulbarga Fort or citadel is unusual in having no courtyard. There are a total of 75 domes, all small and shallow and small except for a large one above the *mihrab* and four lesser ones at the corners. The large interior has a central hypostyle space and wide aisles with "transverse" arches springing from unusually low down (illustrated). This distinctive feature is found in other Bahmanid buildings, and probably reflects Iranian influence, which is seen in other features such as a four-iwan plan and glazed tiles, some actually imported from Iran, used elsewhere. The architect of the mosque is said to have been Persian.

The Mahmud Gawan Madrasa (begun 1460s) is a large *madrassa* "of wholly Iranian design" in Bidar founded by a chief minister, with parts decorated in glazed tiles imported by sea from Iran. Outside the city, the Ashtur tombs are a group of eight large domed royal tombs. These have domes which are slightly

pulled in at the base, predating the onion domes of Mughal architecture. The Qutb Shahi dynasty of Hyderabad, not absorbed by the Mughal until 1687, greatly developed the city and its surrounding region, building many mosques such as the Makkah Masjid, Khairtabad Mosque, Hayat Bakshi Mosque and Toli Mosque, as well as the Golconda Fort, tombs of the Qutb Shahis, Charminar, Char Kaman and Taramati Baradari.

The architecture of Bengal has a long and rich history, blending indigenous elements from the Indian subcontinent, with influences from different parts of the world. Bengali architecture includes ancient urban architecture, religious architecture, rural vernacular architecture, colonial townhouses and country houses, and modern urban styles. The bungalow style is a notable architectural export of Bengal. The corner towers of Bengali religious buildings were replicated in medieval Southeast Asia. Bengali curved roofs, suitable for the very heavy rains, were adopted into a distinct local style of Indo-Islamic architecture, and used decoratively elsewhere in the north India in Mughal architecture.

However, Bengal is not rich in good stone for building, and traditional Bengali architecture mostly uses brick and wood, often reflecting the styles of the wood, bamboo and thatch styles of local vernacular architecture for houses. Decorative carved or moulded plaques of terracotta (the same material as the brick) are a special feature. The brick is extremely durable and disused ancient buildings were often used as a convenient source of materials by local people, often being stripped to their foundations over the centuries.

The Bengal Sultanate (1352–1576) normally used brick as the primary construction material of large buildings, as pre-Islamic buildings had done. The stone had to be imported to most of Bengal, whereas clay for bricks was plentiful. But stone was used for columns and prominent details. The early 15th century

Eklakhi Mausoleum at Pandua, Malda or Adina, is often taken to be the earliest surviving square single-domed Islamic building in Bengal, the standard form of smaller mosques and mausoleums. But there is a small mosque at Molla Simla, Hooghly district that is possibly from 1375, earlier than the mausoleum. The Eklakhi Mausoleum is large and has several features that were to become common in the Bengal style, including a slightly curved cornice, large round decorative buttresses at the corners, and decoration in carved terracotta brick.

The Choto Sona Mosque (around 1500), which is in stone, unusually for Bengal, but shares the style and mixes domes and a curving "paddy" roof based on village house roofs made of vegetable thatch. However, such roofs feature even more strongly is seen in later Bengal Hindu temple architecture, with types such as the do-chala, jor-bangla, and char-chala. For larger mosques, Bengali architects multiplied the numbers of domes, with a nine-domed formula (three rows of three) being one option, surviving in four examples, all 15th or 16th century and now in Bangladesh.

The Adina Mosque (1374–75) is very large, which is unusual in Bengal, with a barrel vaulted central hall flanked by hypostyle areas. It is said to be the largest mosque in the sub-continent, and modeled after the Ayvan-e Kasra of Ctesiphon, Iraq, as well as the Umayyad Mosque of Damascus. The heavy rainfall in Bengal necessitated large roofed spaces, and the nine-domed mosque, which allowed a large area to be covered, was more popular there than anywhere else.

Under the Gujarat Sultanate, independent between 1407 and 1543, Gujarat was a prosperous regional sultanate under the rule of the Muzaffarid dynasty, who built lavishly, particularly in the capital, Ahmedabad. The sultanate commissioned mosques such as the Jami Masjid of Ahmedabad, Jama Masjid at Champaner, Jami Masjid at Khambhat, Qutbuddin Mosque, Rani Rupamati Mosque, Sarkhej

Roza, Sidi Bashir Mosque, Kevada Mosque, Sidi Sayyed Mosque, Nagina Mosque and Pattharwali Masjid, as well as structures such as Teen Darwaza, Bhadra Fort and the Dada Harir Step well in Ahmedabad.

The Gujarat style of the 15th century is especially notable for its inventive and elegant use of minarets. They are often in pairs flanking the main entrance, mostly rather thin and with elaborate carving at least at the lower levels. Some designs push out balconies at intervals up the shaft; the most extreme version of this was in the lost upper parts of the so-called "shaking minarets" at the Jama Mosque, Ahmedabad, which fell down in an earthquake in 1819. This carving draws on the traditional skills of local stone-carvers, previously exercised on Hindu temples in the Māru-Gurjara and other local styles.

During the year 1339, Shams-ud-din Shah Mir of the Shah Mir dynasty established a sultanate encompassing the region of Kashmir (consisting of modern-day Gilgit-Baltistan, Azad Kashmir, Jammu and Kashmir, Ladakh, and Aksai Chin), allowing for the gradual Islamization of the region and the hybridization of culture and architecture with the indigenous Buddhist styles of Kashmir. In the capital at Srinagar, Sikandar Shah Mir constructed the Jamia Masjid, a large wooden congregational mosque that incorporates elements of Buddhist pagoda structure, as well as the wooden Khanqah-e-Moulah mosque.

Also in Srinagar are the Aali Masjid and the Tomb of Zain-ul-Abidin. The two 14th-century wooden mosques in Gilgit-Baltistan are the Chaqchan Mosque in Khaplu (1370) and the Amburiq Mosque in Shigar. Both have stone-built cores with elaborately carved wooden exterior galleries, at Amburiq on two levels, in an adaptation of traditional regional styles.

In Hyderabad, the Asaf Jahi dynasty became exceedingly wealthy and was one of the richest royal families in the world by the mid-20th century. The Nizam

commissioned construction of various public works and buildings in their state (often in Indo-Saracenic and Mughal style) such as the Telangana High Court, City College, Public Gardens, (formerly Bagh-e-Aaam), Jubilee Hall, Asafia Library, The Assembly building, Niloufer Hospital, the Osmania Arts College and Osmania Medical College, as well as palaces like Hyderabad House and Chowmahalla Palace.

The Deccan sultanates were five dynasties that ruled late medieval kingdoms, namely, Bijapur, Golkonda, Ahmadnagar, Bidar, and Berar in south-western India. The Deccan sultanates were located on the Deccan Plateau. Their architecture was a regional variant of Indo-Islamic architecture, heavily influenced by the styles of the Delhi Sultanate and later Mughal architecture, but sometimes also directly from Persia and Central Asia.

The rulers of five Deccan sultanates had a number of cultural contributions to their credit in the fields of art, music, literature and architecture. Deccan sultanates have constructed many grand and impregnable forts. Bidar and Golconda forts are classic example of military planning of Deccan sultanates. Apart from forts, they have constructed many tombs, mosques and madrasas. Gol Gumbaz (tomb of Mohammed Adil Shah), was the second largest dome in the world. Bidar is famous for Bidar Fort, Mahmud Gawan Madrasa, the Bahamani tombs at Ashtur and the Barid Shahi tombs.

Bidar Fort is one of the grandest forts which has about ten kilometer long wall made of huge stone blocks of reddish stone. The fort contains many palaces and two large mosques, the Jami Masjid and the Solha Khumba Masjid. The Ashtur tomb complex contains 12 tombs of Bahmani rulers out of which the tomb of Ahmad Shah I Wali has a large dome. Madrasa of Mahmud Gawana is one of the

most beautiful Madrasa created by the Deccan sultanate. The tomb of Ali Barid Shah I contains a Persian charbagh garden.

The most remarkable monuments in Bijapur are the Gol Gumbaz and Ibrahim Rouza. Gol Gumbaz is the tomb of Mohammed Adil Shah and it contains the second largest dome in the world constructed before modern age. The external diameter of the hemispherical dome is 44 m. Ibrahim Rouza is the tomb for Ibrahim Adil Shah II and it is one of the most beautiful monuments in Bijapur. Other important architectural works of this period in Bijapur are the Chini Mahal, Jal Mandir, Sat Manzil, Gagan Mahal, Anand Mahal and the Asar Mahal (1646).

The most remarkable achievement of the Qutb Shahi dynasty is construction of Golkonda fort. It is one of the most impregnable forts. It is also famous for its acoustic features and water management. The Jami Masjid (1518) built by Quli Qutb Mulk is a notable mosque in Golkonda. The tombs of Qutb Shahis are a mausoleum complex, a royal necropolis of 30 tombs of the royal family. These were erected from 1543 to 1672. Char Minar, in the heart of Hyderabad, was completed in 1591. It has four minarets of 56 m. height. The construction of the Makkah Masjid was started in 1617 during the reign of Muhammad Qutb Shah but completed only in 1693. Gulbarga was the initial capital of Bahamani sultanate. It has Shah Bazar Masjid, Gulbarga Fort and Great Mosque, in the Fort and the Haft Gumbad complex.

The Makli Necropolis at Thatta, Sindh which includes tombs of various rulers, noblemen and Sufi saints, was built between the 14th and 18th centuries. It showcases a wide variety of architecture, including Indo-Islamic, Persian, Hindu and Rajput and Gujarati influences. The Chaukhandi Tombs near Karachi are similar in style.

7.4 Muslim Calligraphy

During 12th Century BCE, the phoenicians had given birth to a revolutionary era in the world of writing by introduction and adopting of alphabets. The Aramis is further refined and expanded it which gave rise to many of shoots including the modern Hebrew, Arabic, Khoroshiti, Brahmi and the (old Persian) Pahlavi script. At that time the criteria for development of a civilization, was its script. In this perspective, by tradition, Iran had a strong legacy of cultural, intellectual and literary heritage. After the dominance of Islam and the end of the Sassanian reign in Iran, the ancient Pahlavi script also ceased to exist and the Arabic script was adopted for writing Pahlavi language.

Along with the Arabic Language, the Arabic script also quickly became popular and quickly found its place in Iran and therefore the Arabic script not only encompassed the whole scenario of life in Iran but efforts began for its improvement. All the evolutionary stages of the Arabic script were quickly crossed due to the nature of the local complexion and the high degrees of taste in Iran. Therefore by the fourth century, six different styles of the script had been invented which were given the name of "Khutut-e-Shashgana" i.e the "Six styles of Writing" These styles were the accomplishment of Hasan bin Husain Ali Farsi, commonly known as Ibn-e-Muqlah.

The first effort for correction in the Arabic script was made by Khawaja Abdul Ali Back who invented "گ", "چ", "پ" and "ز", while simultaneously making improvements in the "Taliq" style. By invention of new letters, on the one hand where Arabic letters harmonized with Persian sounds, it also added to the beauty of Taliq.

The continuous improvements in Taliq, even led to a misconception among some

researcher and they started referring Khawja Abdul Ali as the inventor of the Taliq style. The name of Maulana Darvesh is also very important in connection with Taliq. A part from him Khawaja Abdullah Sarfi, Mullah Mohy-ud-din Shirazi, Mullah Marvarid have also been renowned Abdulla Ash Parharvi, Mullah Abu bakr, Mullah Shiekh Mahmood, Hafiz Hafeez and Khawaja Abdullah figures in Taliq. Taliq for personal use and Naskh for transcribing of religious books also came specific in Iran, while Sulus was used for decorative purposes. The other styles were also visible at some places.

In the beginning of the Muslim era, the Arabic script was written in “Kufic” characters. It had three distinctive styles: a rounded cursive, elongated uprights, and rectilinear connectives. It was the script of the Caliphate and was used for writing the Holy Quran up to c. 1000 and for other inscriptions until the 15th century. “Naskh,” a rounded script of rather level ductus, was the characteristic writing of the Seljuq period and since then it has been in use with a variety of decorative styles. “Nastaliq” is the most completely Persian of the forms with a drooping ductus, strongly repetitive curvature and almost complete elimination of straight lines. It evolved gradually in the late 14th century and has been used mostly in the writing of Persian works.

Before the introduction of printing techniques, all the literary and other works were handwritten and great interest was taken in calligraphy. But the extraordinary attention, with which the Muslims turned calligraphy into an art, may be accounted to the reason that the representation of living things was forbidden by their religion and they had to confine the outlet of their artistry almost exclusively to calligraphy, both for writing the books and decorating their buildings. Like other parts of the Muslim world, this art also flourished in Pakistan from the earliest period of its conquest by the Muslims, a fact which is

corroborated by the discoveries of a number of inscriptions at Banbhore dating back to the beginning of the 2nd and 3rd centuries of Hijra.

Since then calligraphy has been the favourite art of the Muslims in this sub-continent. It, however, attained the height of its development under the Mughal patronage. It formed an important factor even in the training of royal princes. Emperor Aurangzeb himself was an excellent scribe and the specimens of the Holy Quran transcribed by him are well known. The manuscript copy of “Diwan Prince Dara Shikoh”, which is in the National Museum of Pakistan, is an excellent piece of calligraphy.

The illumination of manuscript developed side by side with calligraphy in all the Muslim countries. At first, the illuminations were largely in gold with tricks of brown, red, blue and green. In the 14th and early 15th centuries delicate black or black and gold drawings in margins assumed a characteristic minute scale. However, Pink, violet, orange and blue greens were added in the later periods.

The manuscripts and rich miniature books were generally bound in leather, the edges being protected by a flap. The normal decoration of stamping with beaded edges, medallions in the centre and unobtrusive script in the corners lasted up to the 15th century. In the later periods it was replaced by opulent stamped gilding with arabesques and decorative figure groups and occasionally lacquer work in the Chinese manner.

After the acceptance of Islam, the Persians also adopted the Arabic script. At that time Kufic style was in practice in Arabic script. When Kufic found its way in Iran, greater attention was paid to its vertical portions, rather than its horizontal and flat angularities. This resulted in a comparatively different Kufic style in Iran and so much attention was devoted to its decorative aspect, that when a word transformed into a sentence, an unfeigned symmetry doubled its beauty. These were

early formations and the Quranic copies of that period, written on leather and their resemblance with decorative styles of a much later period bears testimony to the taste and skill of the Iranians.

The Suljuki period from the beginning of 5th century Hijrah till the end of the 6th century Hijrah, also proved very beneficial for calligraphy. In this period Kufic seems to reach the height of its glory. The Kufic was a favorite art of the ancestors. Therefore Babar learned it himself and was given the title of "Haft Qalam". When Babar came to India, he not only brought along with him, painters, architects, poets, writers and historians, but Khawaja Abd-al Samad, Mir Syed Ali, Sheikh Zain Khawani also accompanied him as calligraphers. Humainyun also tried to patronize the art of calligraphy in the way that Babar had laid its foundation, but he did not live that long.

Apart from Abdul Hae, the renowned calligrapher of the Humaiyun's period, Khawja Sultan Ali was also a part of Humaiyun's court, who was later given the title of "Afzal Khan" by Akbar. The period of Akbar is in fact, the golden period of the Fine Arts. Here, calligraphy crossed the evolutionary stages in Asia. Akbar was very fond of painting, and therefore new dimensions of decorative calligraphy appeared and expressed themselves in painting.

At that time the trend of expressing poetry through painting was evolving. Therefore, many books appeared with decorative calligraphy and painting, in which experts of art portrayed their skill. Many artistic works of such painting based calligraphy are even found today in many libraries across the world, especially in the Metropolitan Museum of Art, USA.

Many calligraphers belonged to the Mughal period which include Muhammad Husain Kashmiri, Khawaja Abd-ul-Samad, Vaswant, Maulana Abdul Aziz, Khawja Muhammad Sharif, Abdur Rasheed Valmi, Amanat Khan Shirazi, Mirza

Abdul Rahim Khan-e-Khanan, Mir Masoom Qandhari, Maulana Maqsood Harvi, Tamkeen Kabuli, Ahmad Husain Chishti, Ali Ahmad Har Kanna, Mirza Muhammad Husain Noor Allah, Mir Abdullah Tabrezi, Khusro Shahzadah, Sultan Parvez Shahzadah, Muhammad Din Ishaq, Ahmad Ali Arshad, Abdul Bazi Madar, Arif Yaqut Raqam, Mir Muhammad Kashi, Muhammad Saleh Kashmiri, Syed Ali Khan Husaini and many other eminent calligraphers. The art of calligraphy continued to develop, even after the establishment of Pakistan and many calligraphers achieved world fame, however all this was done on an individual level.

7.5 Muslim Paintings

Many texts refer to wall paintings during the early Muslim period in the sub-continent. It appears it have been a Ghaznavid import by the early Sultans in Delhi. Later references are from such cross-cultural works. They describe wall paintings with subjects from the Indian epics. The Sultanate paintings (16th century) pre-Mughal or non-Mughal paintings for Muslim curs or the Muslim community is in most cases readily identifiable by the Indian figures in Indian garb portrayed in an Indian manner along with salient features from Timurid painting. However, the first notable surviving Sultanate paintings illustrate a Ni'mat Nama produced in Mandu in the first year of the 16th century for Ghiyas-us-din Khalji, whose 15000 seraglio were trained in all the useful arts.

During the Mughal rule, the art of miniature painting was introduced when Emperor Humayun brought along with him Mir Sayid Ali and Abd al-Samad, the two painters of the Persian court of Shah Tahmasp-I. Later on, during the rule of Akbar the Great they were responsible to train a number of Muslim and Hindu artists. The result was that the Persian delicacy of detail and linear grace combined with the characteristic Indian palette of varied greens, glowing reds,

oranges, and the fusion into a single style of the indigenous taste for scenery and figures produced a number of remarkable manuscripts and album paintings.

With the passage of time, the number of local artists grew considerably at the Mughal court and master painters like Daswanth and Basawan illustrated the famous romance of Hamza, Razm-Nama etc. But much of their finest work was produced in the shape of isolated miniature paintings for allbums depicting portraits, incidents of court life, beautiful animals and flowers. This was executed in a style basically Safavid-Persian, but indigenous in most of its detail. During the reign of Emperor Jahangir, the naturalistic tendency gained the upper hand. The careful studies of animals, birds, flowers, and trees etc., executed at this time are some of the most exquisite examples of the Mughal art.

However, with Shah Jahan, the builder of the Taj Mahal, this art reached its perfection. The stage of experiments was over and the paintings represented a harmonious and sometimes even gorgeous depiction of court ceremonies, social parties and palace life. It was noble, representative and refined but lacking the vitality of Akbar's period or the keen interest in life of Jahangir's time. Under Aurangzeb (1658-1707), the art of painting did not receive much encouragement but with Farrukhsiyar (1713-1718) and Muhammad Shah (1719-1748), painting again became a favorite art at the court.

The decadence of the Mughal Empire saw the dispersal of the artists, who were induced more and more to find a secure existence in the service of local Nawabs and Rajas, who had by then established their independent states in various parts of the sub-continent. The imitation of the Imperial Mughal style, however, continued for another century though it did not achieve more than clumsy copying of scenes and figures without proportions, and expression in dull colours. Amongst the various local schools of painting which thus came into existence, the Hyderabad

School produced some fine work in the early 18th century under the impact of the late Deccani painting.

Similarly, originally defined as a small painting in an illuminated scroll or book, miniature paintings were popular in the scholarly centers of Europe, Persia, and Asia in the 13th and 14th centuries, where their small scale and great detail made jewel like additions to the written pages. The main function of the miniature was to visually explain or extend the written text, helping make it more understandable; over time, the practice of miniature painting became a method of storytelling in itself, with rich details woven into the small spaces.

Influenced by Persian artists, South Asia was no exception to this large-scale love of tiny pictures. The Mughal emperors introduced and popularized the Mughal style of Indian painting which emerged, developed and took shape during the period of the Mughal Empire (1526-1857). The war scenes, courtly life, and palace ceremonies were the usual subjects for a miniature. Later, intricate miniatures of animals and flowers were also painted.

The Mughals, perhaps more than any other Islamic dynasty, made their love of the arts and their aesthetics, a central part of their identity as rulers. The second Mughal emperor, Humayun believed that artists "were the delight of the entire world" and lured several Persian masters to his court from Persia and Central Asia. When he was abruptly deposed by an Afghan rebel, he sought political asylum at the court of the Shah of Iran. The Shah, who had just undergone a conversion to a strict form of Islam, lost interest in figural painting and dismissed the painters of his renowned atelier. Humayun, a lover of the arts, took advantage of the situation and hired some of the Shah's recently unemployed painters, most notably Mir Sayyid Ali and returned with them to India. This began the era of one

of the most celebrated art forms of the Indian subcontinent namely Mughal miniature art.

The imperial Mughal painting rose with remarkable rapidity in the mid-sixteenth century. In its initial phases it showed some indebtedness to the Safavid school of Persian painting but rapidly moved away from Persian ideals. Probably the earliest example of Mughal painting is the illustrated folktale "Tuti-nameh"- Tales of a Parrot. Mughal painting was essentially a court art; it developed under the patronage of the ruling Mughal emperors and began to decline when the rulers lost interest. The subjects treated were generally secular, consisting of illustrations to historical works and Persian and Indian literature, portraits of the emperor and his court, studies of natural life, and genre scenes, paintings of unprecedented vitality, brilliant coloration, and impossibly precise detail.

Phases of Mughal Miniature Art in the Sub-Continent

Mughal art in India is divided broadly into four phases, three of these phases being those of the proper Mughal art, that is, the art created at the official atelier of Mughal court by its court artists under direction and supervision of the Mughal emperors themselves, the fourth phase being that of the provincial Mughal art. Although initiated by empower Humayun, the reigns of three of the great Mughals, Akbar, Jahangir and Shah Jahan, define practically the first three phases of Mughal art.

Akbar expanded a prior royal atelier by employing in it over a hundred best skilled painters. Illustrating classics of both Indian and Persian origins and Hindu and Islamic traditions was the prime thrust of Akbar's art. Jahangir added to it nature study, art of portrayal, especially the female portraits and the stylistic sophistication. Shah Jahan loved renditions of individualized things. Lavish embellishment, courtly grandeur and a little over-sophistication marked the art of his era.

Each of these phases apparently had its own thrust, preferences and options, themes and, to some extent, stylistic features. To Akbar, an illiterate, a miniature was a book inscribed in lines and colors. To Jahangir, a painting manifested the aestheticism inherent in a man. To Shah Jahan, it was a mirror palace and there he was in every glass-piece. To the provincial Nawabs, a painting was as sensuous a thing as was a nautch-girl. However, despite such points of departure, there are threads that bind, at least the three phases of the proper Mughal art, into a uniform art style, the more important of them till being its realistic approach to the depicted theme, or the realism. As such, the Mughal art is the mirror wherein one discovers not so much the Mughal world as the world of Mughal days, the world of nature, the world of commercial activities, the world of social courtesies, merriment, pastime, warfare and what not.

Akbar's period (1556-1605)

Practically, the art of Mughal miniature painting begins with Akbar, although two miniatures, the Portrait of a Young Scholar (1549-1556) and Prince Akbar Hunting a 'Nilgae' (1555-1560), in characteristic Persian style, or at least in a style much different from the subsequent style of Akbar's court, confirm the existence of some art activity prevailing at the court of Akbar's father Humayun.

In the early 1580s, the greatest Persian painter Farrukh Husain made the decision to leave his homeland and his appointment as court painter at the Saffavid court in Isfahan and make his way into the dominions of the Great Mughal Emperor Akbar. By 1585 Akbar had ennobled him for his services to painting, giving him land, an honored position at court and changing his name to Farrukh Beg - (Lord Farrukh). He was also honored with a prominent mention in the official biography of Akbar as one of the two greatest artists in a court that took its art very seriously. As the emperor's biographer, Abu'l Fazl, wrote, quoting Akbar himself:

"More a hundred painters have become famous masters of the art, while the number of those who approach perfection, or those who are middling, is very large ... It would take too long to describe the excellence of each. My intention is 'to pluck a flower from every meadow, an ear from every sheaf.'"

Akbar gave State patronage to art of Miniature painting by hiring more than 200 artists to his court. Thus began the tradition of State sponsored Ateliers in the Mughal Empire. The earliest and most important undertaking of the artists was a series of large miniatures of the "Dastan-e-Amir Hamzeh", undertaken during Akbar's reign, which, when completed, numbered some 1,400 illustrations of an unusually large size (22 by 28 inches [56 by 71 cm]). Of the 200 or so that have survived, the largest number are in the Austrian Museum of Applied Art in Vienna.

Whatever the stylistic changes, the art of Akbar's era continues this spirit of being realistic in its approach. Akbar ruled for almost five decades. He was near fourteen, when he ascended the throne of the Mughal Empire. Art, therefore, had at Akbar's court tenure of some forty-five years. Akbar was illiterate and wished to know a book not by its linguistics but by the pictorial representation of its theme. Thus for him, a painting was a book. He therefore, preferred illustrative painting serializing a theme, whatever its kind, a book of tales, legends, history, religion, theology, astrology and so on. He did not approve fanciful renditions, or even much of random depictions. He could accept legends, romances, ghost tales, even superstitions but only when they reached his atelier through an authentic channel, literary, traditional or even folk.

The early works of Akbar's atelier, such as "Hamzanama", the story of Amir Hamza, "Tutinama", the tales of a parrot, "*Duval Rani Khizr Khan*", the Persian romance of Duval Rani and Khizr Khan, "*Gulistan*", the Rose-garden of Sadi, "*Anvar-i-Suhayli*" and "*Tarikh-Alfi*", or the history of a thousand years, are

stylistically different from its later works. But, as regards their perception they show an amazing uniformity. "*Timurnama*", "*Chingiznama*", "*Baburnama*" and "*Akbarnama*" are histories composed as biographies and autobiographies.

In the "*Ain-i-Akbari*" Abul Fazl tells us about Akbar's love for painting and his regard for his painters. Some of his artists were "Mansabdars" and occupied high offices of State. In 1573 when Akbar, accompanied by twenty-seven officers, led a lightening expedition to Ahmedabad, there were also three painters in the royal entourage. If a distinguished visitor came to the court he was taken around the atelier by the Emperor himself. According to the testimony of Jahangir, Akbar treated the Persian master Abdus Samad with great respect. Such was the background against which Mughal painting came into being and which provided the stimulus for further development in the following reign.

Jahangir's period (1605 - 1627)

Jahangir's love for the art of painting was no less, and for realism it was more. Under him, Akbar's energetic naturalism was refined into a calmer and intensely realistic style capable of revealing not only the outer appearance but also its unique inner spirit. Actually, as a rebel prince he set up his independent studio at Aghahabad much before he ascended the Mughal throne under the Persian painters Aqa Riza and his son Abu Hasan. He had equal a prince, he set up his independent studio at Allahabad much before he ascended the Mughal throne under the Persian for both, the simple version of his father's court art and the precise, flat and highly style of Persian art, which Aqa Riza and his son practiced. After he ascended as the Emperor, he inspired his artists to develop their own individual styles, traits and talent and each to have a specialized area.

Jahangir was a man with a developed aesthetic sense. He loved painting and possessed a descriptive sense. He was endowed with an inquiring mind. He was a

connoisseur of miniature art and greatly prided himself on his connoisseurship. The paintings of his period well symbolize his character.

Jahangir preferred court scenes, portraits, and animal studies, which were assembled in albums, many of them with richly decorated margins. The style shows technical advancement in the fine brushwork; the compositions are less crowded, colors are more subdued, and movement is much less dynamic. The artist of the Jahangir period exhibited a sensitive understanding of human nature and an interest in the psychological subtleties of portraiture. Noted painters of the period were Abu al-Hasan, called the "Wonder of the Age" Abu Hasan specialized in the court scenes and official portraits; Bishandas, was praised for his portraiture; and Ustad Mansur, excelled in animal studies. He favored elegant, small works with fewer illustrations worked singly by an artist.

Abu'l Hasan seems to have been a particular favorite of Jahangir. *"I have always considered it my duty to give him much patronage,"* wrote the emperor in his autobiography, the *"Jahangirnama"*, *"and from his youth until now I have patronized him so that his work has reached the level it has."* Whenever Jahangir went out, a team of his skilled artists accompanied him. A bird with the beauty of its feathers, or by its sportive frisking, or an unusual object, an animal, or even a flower would catch his attention and one of his talented artists would reproduce it on his canvas for their master. Jahangir's art, thus, presents the most authentic reproductions of natural history and to scholars studying birds and animals it is yet the most reliable data of the animal world of those days.

He also allowed the artists to depict Humans. He allowed his wife Nurjahan to be portrayed and brought 'sufis', saints and divines to the walls of the chambers of the household. To this period belongs the practice of mounting miniatures with

gorgeous "Hashiyahs" (border decoration on the mount). These hashiyahs became even more elaborate in the reign of Shah Jahan.

Shah Jahan's period (1628 - 1658)

Instead of the art of painting, architecture was Shah Jahan's fascination. However, it is strange that not even a single painting of his time depicts the Taj Mahal. Shah Jahan continued with the court atelier and Mughals' cult of realism. Well-embellished portraits with exact likeness of the portrayed figures were more favored. On one of his portraits Shah Jahan not only put down his signatures but also put a remark acclaiming that the portrait represented his likeness in perfect exactness.

The emphasis was now on court scenes, scenes of outing, portrayal including female portraits and other personalized things and occasions, but the approach was the same 'realistic'. Art in Shah Jahan's era depicted the lavish life style of the people lived. Genre scenes such as musical parties, lovers on a terrace, or ascetics gathered around a fire became frequent, and the trend continued in the reign of Aurangzeb (1658-1707). Despite a brief revival during the reign of Muhammad Shah (1719-48), Mughal painting continued to decline, and creative activity ceased during the reign of Shah Alam II (1759-1806).

After Aurangzeb, the history of Mughal painting, like the history of the Mughal Empire, is one of decompose. Though up to the time of Muhammad Shah (1720-1748) Mughal painting, as far as technique is concerned, retained something of its former glory, the moral decay of the court, reflected in the manners and customs of a sensuous aristocracy resulted in the adoption of harem themes. Music parties, dancing parties, drinking scenes, and love scenes, became the order of the day.

However, whatever traces of Mughal glory had remained, disappeared with Alamgir II (1754-1759). The battle of Panipat acted as the drop-curtain on the great drama. Shah Alam (1759-1806), the successor of Alamgir II, was an emperor only in name. When we come to the period of Shah Alam we find that the artists still had in their possession the tracings (charbas) of the old miniatures handed down from generation to generation, and with their help they prepared new copies, which have deceived more than one connoisseur. To make the copies complete, even the royal seals were stamped on such paintings. It is likely that several of these copies were prepared for Shah Alam himself, such as the magnificent portrait of Jahangir in close imitation of an earlier portrait of that Emperor by the artist Bichittar. Murshidabad, Lucknow, and Hyderabad, the former capitals of the Mughal Subahs (provinces) became the centers of independent states. In these capitals the late Mughal style flourished, but bereft of any progressive spirit it came to an end by the closing years of the 18th century.

7.6 Muslim Minor Arts and Crafts

When Islam began dramatic career which in its western course, was destined to plant a new form of art in cities overlooking the Atlantic, it set out from regions where art was in a primitive state. In fact Islamic art has derived its spiritual complexion from Arabia. However, its material texture was fashioned elsewhere, in lands where art was a vital force. The minor arts and crafts of the Muslim culture are however, of great beauty and interest. The carved wooden doors, panels, furnishings, lacquer work on pen boxes with exquisite floral decoration, astrolabes, gold inlaid steel weapons and implements, embroidered garments, carpets, glazed tile work, porcelain, decorated ceramics, earthenware utensils, rugs, traditional costumes with geometrical patterns and designs, embroidery

work, glass work, leather work, decorated inlay work and gold jewellery are only a few of the many examples which were patronized by the Muslims.

In many ways of decorating metal besides raising patterns in relief or engraving these were practiced by Muslim skilled craftsmen. They excelled in the art of inlaying designs not only in the gold and silver but equally in bronze or brass. In the finest and most ancient kind the patterns were incised in the metal round and the grooves filled in with gold or silver, both sometimes being used on the same object. The brilliance of the design was often highlighted by filling other interstices with a black mastic composition and in some cases this was the sole method of enrichment. Hence Muslim inlay metal work reached perfection and persistent in great excellence of many centuries.

In the 16th century Persian craftsmen carried carpet weaving to heights ever attained before or since producing with miraculous skill designs unparalleled in beauty. The European craftsmen learned how to weave pile carpets from the Muslims using at first the traditional oriental sleight of hand, but in later time purely mechanical means. Upon the machine made carpets and rugs now almost universally in use, designs borrowed from Islamic originals are common. Muslims produced many beautiful objects made partly or wholly of ivory, a substance which they decorated with carved, inlaid, or painted ornaments. The ivory caskets painted, carved or pierced were used as jewel cases, perfume or sweetmeat boxes and for other similar purposes. They were often as the inscriptions testify made especially as gifts. The earlier are amongst the most valuable records of Islamic art in its beginning. Another innovation inspired by Muslim work was a new method of decorating leather book covers.

The lacquer art is yet another sophisticated hand work of Muslim art work which is applied on wooden pieces with fascinating colour by skilled artists. The lacquer

art is made on selected customized pieces of a refined wood. The wooden pieces are shaped into different designs and sizes on lathe machine though traditional iron tools. Then the layers of lacquer are applied on wooden pieces, usually in three or four colors. The layers are sequentially coated completely on each other which are articulately removed by artisan with the help of sharp knife in a way that all colours become prominent with a design on it.

The stone carvings was also developed by Muslim artisans which produced a large number of specimens by engravings the stone slabs for uses in the tombs, graves and other places or different decoration purposes. The graves and tombs at Makli Hills Monuments, Thaatta and Chaukhandi Tombs, Karachi are some of the best examples of the stone carvings. The artisans first refine the stone with a chisel and hammer. Then a sketch is drawn on this stone and then carved with the help of a chisel and hammer. The finishing touches are given with sandpaper. Besides, the marble work also got attention of the artisans and craftsmen who created master pieces of art work which are embellished in the Islamic period monuments especially in the Lahore Fort, Shalmar Gardens and other buildings of Islamic era.

Among the regional handicrafts, the art of painting and the blue pottery is very famous. In blue painting the clay is the basic element which is taken especially from the rivers. After grinding and staining this clay it is moistened in water for three days, after this it is softened by crushing with hands, then this clay is extended to the surface of smooth ground and with iron tools cut into tiles or pieces because this clay shrinks on dehydration. On drying, the tiles or pots are cut into required size. Then they are carved with various tools. A panel can be made by joining tiles for big designs. The glazed tiles have been extensively used in the tombs and graves of Muslims. The wood work and carvings is another important art which was developed in the different areas of sub-continent

especially the area of Chiniot is very famous in Pakistan. The best specimen found in a large number of both religious and secular buildings, tombs and other prominent architectural heritage of Muslim period located in the different areas of the country.

The ornamentation of buildings is an integral part of the traditional architectural monumental buildings. This craftsmanship is evidenced in the buildings of Sultanate period and further in those of the later periods. These examples are marked with the uses of cut and molded bricks and the buildings were embellished with fresco work, wall paintings, mirror work, tile work, and lacquered wooden ceilings, intricate wooden *jallis*, carved wooden doors, and stucco tracery were some of the crafts used for the purpose. The extant funerary structures and mosques of the Sultanate period best exemplify the decorative building arts which are prevalent from at least the 11th and 12th centuries in the different areas such as Multan and Lahore and other areas of Pakistan.

The art of wall painting has its roots in antiquity. However, it is well known that during the Mughal period fresco painting achieved its zenith in its design, technique and skill as can be seen from the Mughal monuments in Lahore especially at Lahore Fort, Mariam Zamani Mosque, Shalimar Gardens and many other buildings.

The arts and crafts are the expression of the diverse and colorful traditions of the sub-cultural groups inhabiting the vast regions which gives each its distinct identity while providing objects which still continue to be of use to the communities. Besides, these creations are rightly known as the traditional crafts as they uphold the age old techniques and designs employed by the artisans in the creation of these unique items and objects. The origin of the textile craft for instance, lies in antiquity. The textile weaving of the prehistoric times became the

basis of all the later development in the textile of the South Asian region or sub-continent. The Muslim of subcontinent turned the textile crafts into a timeless art form. Mughal's were great patron of textile arts and its development. Various paintings belonging to the Mughal period show exquisite textiles being worn by the Mughal royalty and courtiers. The ornate and rich textiles displayed in the colorful miniature paintings indicate that the textile craft had devolved into an art form.

7.7 Muslim Period Coins

The Arab conquest of Sind in 711-12 CE by Muhammad bin Qasim, inaugurates the Muslim era in ancient Pakistan. The date also marks the influx of Arab currency into sub-continent. During this and later period, the *Khilafat* coin found their way into various towns and cities of Pakistan. The coins are now found buried in the remains of ancient towns and places, once frequented by Muslim population. The archaeological Excavations at Banbhore, for instance, have uncovered a large number of such foreign coins. Among these, the most important is a gold coin of the Abbaside Caliph, Abu Jufar Harun al-Wasiq Billah, who ruled in Baghdad from 227 A. H. to 232 A. H. (842-847 CE). It was minted in Egypt in 229 A.H. (844 CE). There are other coins of these Arab Caliphs in silver and copper, which have been found in a large quantity during the excavation. There were, however, certain Arab governors and petty chieftains in Sindh and Punjab who struck coins in their name.

The earliest known currency of the Muslim rulers minted at various places in the sub-continent, starts with that of Sultan Mahmud at Ghazna, who annexed the Punjab with his fast-growing empire in 1021. He struck silver coins from the Lahore mint called Mahmudpur. These coins bear an Arabic Inscription and the name of the Sultan on the reverse, and the Sanskrit version of the Kalima on the obverse. His billion coins contain an Arabic inscription on the obverse and the

famous Rajput bull on the reverse. The later Ghaznavid kings used the same mint to strike coins of the 'Bull and Horseman type.

In 1187, Muhammad bin Sam of Ghaur deposed Khusrau Malik, the last of the Ghaznavide princes, and occupied Lahore. Later in 1192, he subdued Prithvi Raj of Ajmer at the second battle of Panjpat and founded the first Muslim dynasty in the sub-continent. He numerous coins are of billion and usually exhibit the Gandhara device of the 'Bull and Horse-man'. His gold coins are the imitations of the Hindu Kings of Qannuj which bear the image of Lakshmi, the goddess of wealth In the Hindu pantheon.

Iltutmish (1211-36), the third king of the Turkish Sultan of Delhi issued a large number of coins of many varieties. The earliest issues bear a portrait of the Sultan on hone back, surrounded by a marginal inscription on the obverse, while the reverse consists of inscription in Arabic. The latest however possesses the inscription on both sides. The name of the Abbasid Caliph Al-Mustansir appears on obverse in recognition of the diploma of investiture from the Caliph. The reverse continued to carry the Sultan's name and title. On the circular margins are the names of the mint and the date in Arabic. He introduced a 90-rati silver coin called '*tanka*' which became the standard denomination of the Delhi Sultanate and was followed, occasionally with modifications, by succeeding Sultans.

The famous coins called Dehliwals with the humped bull and the king's name in Nagri characters on the resent and the Chauhan horseman on the obverse, were minted copiously by almost every Sultan until the reign of Alauddin Masud (1241-46) who discontinued striking this type.

The coins struck in billon by the early Sultans are uniform in size and weight. Billon coins of the "Bull and Horseman" type were also struck by other foreign Invaders who attacked the areas of ancient West Pakistan during the 13th century CE. These Sultans had a large establishment of mints.

Muhammad bin Tughlaq, (1325-51), the most celebrated king of the Tughlaq dynasty, was the first Muslim ruler who revolutionized the coinage of the sub-continent. He paid serious attention towards the reform of his coinage and established several mints at various cities of his kingdom. His experiments with his coinage, particularly his 'forced currency', give him a prominent place among the greatest moneyers of history. He has been called as "the prince of moneyers."

In addition to his normal currency, Muhammad bin Tughlaq struck some special coins. The commemorative coins were in memory of his father, while the Khilafat issues were in honour of the investiture he had received from the Abbaside Caliph. But, his most remarkable venture was the introduction of the 'forced currency'. The coins were struck in copper and brass but their face value was that of silver and gold. These beautifully executed coins bear several religious formulas from the Holy Quran and the Traditions. The innovation of the Emperor, however, could not succeed as he had arranged no check upon the authenticity of the currency. People, therefore, started imitating and producing it in mass. The house of every Hindu turned into a mint where thousands of such forgeries were made. After some time, therefore, the emperor had to withdraw the currency.

Muhammad bin Tughlaq issued coins of more than twenty-five varieties in copper and billon. The inscriptions on some of these coins mention their various denominations. He struck a new coin of 140 rails and called it 'Adli'. This remained the standard denomination throughout his reign. He also divided the tanka into several parts, and issued coins of different denominations according to this division. They were called Du- Kani, Shash-Kant, Hash-kani, Dwazda-kani, Shanzda-kani, etc. Kani was also called a Jital.

The coinage of the succeeding kings of the Tughlaq dynasty has little of special interest. The gold coins of Firuz Shah Tughlaq are fairly common, but the other later kings issued mainly copper and billon; their gold coins are extremely rare.

The pieces minted by the members of the Lodhi dynasty (1451-1526) Bahlul, Sikandar, and Ibrahim, bear close resemblance to the issues of Sharqi kings of Jaunpur which bear the legend on the obverse; "The caliph, the commander of the faithful, may his Khilafat be perpetuated." The reverse gives the name of the king. Bahlul Lodhi issued a large billon coin which was named 'Bahluli.

In 1526, the last Lodhi king Ibrahim was defeated by Babur who founded the dynasty of the great Mughals. The coins of Babur and Humayun, specially the silver Shah-rukhis follow the Timurid devices and were struck at Lahore, Delhi, Agra and Kabul. On the obverse of these coins is the Kalma with the names of the four orthodox caliphs and their attributes in the margins. On the reverse is the king's name, in the area, together with various titles, name of mint and date.

Sher Shah, the founder of the Suri dynasty, who defeated Humayun in 1540 and ruled the country for about five years, is credited with the honour of introducing a reformed currency. He abolished the inconvenient billon coinage of mixed metal, and struck well-executed pieces in gold, silver and copper, with a fixed standard of weight. His silver rupees have a standard weight of 178 grains, while copper dam weighs 330 grains. He also standardized the sub-division of the rupees and the dam. These coins, especially silver pieces, bear the usual Arabic inscriptions as well as the name of the king in Nagri script. Genuine gold coins of the Suri kings are very rare, but the fine quality rupees are found abundantly. Sher Shah also established a number of new mints at various places in his kingdom.

With Akbar's accession in 1556 a new era of the coinage began in the sub-continent. In 1577 the emperor reorganized the imperial mints. Up to that time, mints were under the control of petty officers called Chaudhari (a headman). Akbar established a separate department for purpose and appointed a Mint Master at the capital to control the minting of coins. The first Master of Mint was Khawaja Abdus Samad, an eminent painter and calligrapher. The five principal provincial mints were placed under the management of one of the highest

imperial officers. Raja Todar Mal was responsible for the Bengal Mint, while Muzaffar Khan was entrusted with the mint at Lahore.

The excellent pieces issued by the various mints throughout the empire are really masterpieces of numismatic art. The early issues of his reign closely follow the model and scheme of Sher Shah's coins. The Kalimah and the companions' names appear on the obverse, while on the reverse is the name of the Emperor and his titles. Squares, circles, lozenges and other geometric patterns were employed to decorate the legends on the coins. Both gold and silver bear the same inscriptions though there is some variation in their arrangement. The mint name and, sometimes, the date appear on the reverse.

The Ilahi coins of Akbar are the most interesting series which depict the religious and social changes in Akbar's policy. He used the coinage to express his views about the "Divine Religion". These new coins bear entirely new legends. The inscription was in the first instance, 'Allahu Akbar' but was soon changed to 'Allahu Akbar Jalla Jalaloha'. These Ilahi coins bear dates according to Akbar's majestic era with Persian solar months. The Ilahi coins issued from Lahore were some of the finest of the Mughal series.

Some of the pieces issued by Akbar represent beautiful specimens of numismatic art. Besides the finest calligraphic inscriptions, they depict figures of birds, like ducks and hawks. The gold Muhr, depicting the hawk, was issued from Asirgarh to commemorate its conquest and accession to the Mughal Empire. Akbar also started the innovation of using the Persian couplets on his coins which indicate his name or the mint and date.

Besides the gold Muhrs and silver rupees, there was the dam, paisa or fulus in copper, weighing normally 323 grains. One silver rupee had forty copper fulus. The dam or fulus was divided into twenty-five *jitals*, but it was only for account purpose; no coin of such name existed during the Mughal period. The value of a rupee in English money was at that time estimated to about two shillings and six pence.

Jahangir (1605-1627) maintained on the whole his father's mint system. His gold and silver coins are the most ornate of all the Mughal series. He used Persian

couplets so frequently on his coins that forty-seven different couplets of his reign have been recorded. He was so fond of these poetic innovations that during the fifty-sixth year of his reign, he used new couplet every month on the coins. This was specially so with the coins issued from Lahore and Agra. His deep and abiding affection for his beautiful Queen Nur Jahan is also evident from his coins, which he struck in his later days. The coins mainly issued from Lahore, Agra and Surat, bear the name of the Queen along with that of Jahangir in the usual Persian couplets.

Jahangir's most celebrated Muhrs are those which bear his portrait. The portrait Muhrs depict the Emperor sitting cross-legged on his throne with a wine-cup in his hand. The most remarkable of these is the piece bearing the full faced portrait of Akbar with the inscription of '*Allahu Akbar*' on the obverse and a representation of the Sun on the reverse,. The particular piece was issued in the first year of Jahangir's reign. In the thirteenth year, he issued the beautiful series of zodiac Muhrs on which pictorial representations of the zodiac symbols were substituted for the name of the month. The zodiac symbols were also used for rupees.

Shah Jahan, (1628-1657) however, abstained from copying his father's innovations and issued coins with Kalimah, the names of the Caliphs and other usual devices. His copious currency is regarded as monotonous but not without artistic merit. The coins were decorated with endless variations, in which squares, circles, lozenges form borders enclosing the Kalimah on the obverse and the Emperor's name on the reverse.

The coins of Aurangzeb (1658-1707) and his successors have, with a few exceptions, no novelty except that the Emperor discontinued inclusion of the Kalimah on his coins and dates were given in Hijri era. During later period, pretentious personal titles were frequently shown on the coins. However, a very few commemorative coins were also issued.

In the words of Ahmaad Nabi Khan, the coinage of the Mughal emperors has been regarded as the finest among the series struck in the sub-continent. Further that according to V.A. Smith, the learned author of '*Akber the Great Mughal*', mentions that 'the Mughal coinage was far superior and more beautiful than that of Queen Elizabeth or of other con-temporary sovereigns of Europe. Another

numismatist, C.J. Brown remarks on the Mughal coinage in these words "considering it as the output of a single dynasty, which maintained the high standard and purity of gold and silver for three hundred years, considering also its variety, the number of its mints, the artistic merit of some of its series, the influence it exhibits on contemporary and subsequent coinages, and the importance of its standard coin—the rupee—in the commerce of today, the Mughal currency surely deserves to rank as one of the great coinages of the world".

Self Assessment Questions

- Q. No.1.** What do you know about Muslim period Art and Architecture in the Sub-continent?
- Q. No.2.** Discuss the early medieval history of the Sub-continent in detail.
- Q. No.3.** Why Mughal period is considered as golden era for architectue developement?
- Q. No.4.** What are the cheristiric features of regional style of Muslim architecture in the Sub-continent? Discuss.
- Q. No.5.** Discuss the cheristiric features of Muslim calligraphyand highlight its origin and developemtn in the Sub-continent.
- Q. No.6.** Evaluate the source of Muslim’s period Paintings with sepical reference of Mughal period paintings.
- Q. No.7.** Discuss Muslim perminor arts and crafts of the Sub-continent.
- Q. No.8.** Highlight the importance of Muslim period coins in history of Sub-conitnent.

Bibliography

Arnold, Thomas (Sir) (1928) *Painting in Islam, A study of the place of pictorial Art in Muslim Culture*, Oxford.

Arnold, Thomas (Sir) (2001), First Published in 1931, *The Islamic Art and Architecture*, Goodword Books, New Delhi.

Beach, Milo (1987) *Early Mughal Painting*, Harvard University Press, USA

Brown, Percy (1985) *Indian Architecture, (Islamic Period)*, Reprint, Bombay

Ebba Koch (1991), *Mughal Architecture-An outline of its History and Development (1576-1858)* Prestal, Munich.

Khan, Ahmed Nabi (1993) *Islamic Architectural Heritage of Pakistan, South Asia and Central Asia*, Department of Archaeology and Museums, Karachi.

Krishnadasa, Rai (1955) *Mughal Miniatures*, India.

Mumtaz, Kamal Khan (1985), *Architecture in Pakistan, A Mimar Book*, Singapore.

Noon Wal-Qalam (2017) *National History and Literary Heritage Divison*, Islamabad.

Rizvi, A.A (1980) *The Legacy of architecture in World of Islam*, ed. Bernard Lewis, Thames and Hudson, London

Saeed, Tahir & Merani, M.A (2000) *A Rare Collection of Mughal Miniature Paintings in National Museum of Pakistan, Karachi*, in *Ancient Sindh*, No. 6, Shah Abdul Latif University, Kharipur.

UNIT. 8

**CULTURAL HERITAGE & MUSEUMS IN
PAKISTAN**

**Written by: Dr. Badshah Sardar
Reviewed by: Dr. Saeed Arif**

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Introduction

Pakistan has been the cradle of cultural diffusion and had been a center of ancient civilizations, the cultural heritage of the country has been recognized by the UNESCO, and its prime duty of the department of Pakistan Studies to conduct field survey, cultural tours, scientific documentations and archeological excavations at potential sites of different phases of glorious past of the country. We considered that conducting research on cultural heritage and archeological wealth of the country is necessary for boost of tourism and to promote a soft image of Pakistan.

Pakistan is one of the few fortunate countries of world which has a rich cultural heritage. However, despite the best efforts of the scholars to document the rich ancient heritage of of Pakistan, surviving in the form of archeological sites, pre-historic, protohistoric, and historic period monuments. In Pakistan Hindu, Buddhist, Muslims, British period monuments, shrines and memorials had not received the desired attention in the past.

Cultural heritage sites like ancient rock shelter, rock carvings, Hindu temples, and Buddhist stupas, Mughal's period Boali, Sarais, Mosques and Forts are particular interest and their scientific investigation is likely to shed new light on some key questions of prehistory and historic periods of this region. The research will also highlight the origin and spread of agriculture evolution of the society, the nature and the origin of the early communities and their cultural relations with Central Asia and Persian world in the ancient times.

Cultural relics or cultural heritage of a country are the virtual foundations for advancement in corporate life a nation. As achievements acquired after prolonged struggle with nature and environment, they manifest the store of creative intelligence, initiative, perseverance, and integrity that have gone into making of a

particular national character. Admittedly, this land has been an important primeval stage for the grand and grim drama of man's first endeavor, his integral rise, his phenomenal fall, and the great resilience which kept the stream of human life in action in spite of all obstructions and intermittent lapses. Pakistan is a melting pot of ancient cultures and civilizations. It is a land of many splendors, each conqueror, traveler and sage has left behind an imprint, adding a step to the cultural evolution of this region. Apart from the physical environment of Pakistan's territory, the people of this country have inherited history of about two million years old going back to the Paleolithic Period or Old Stone Age. The earliest stone tools found in the Potohar region near Islamabad Capital Territory belong to an ancient primitive stage in human development and culture are displayed in different museums of the country.

Objectives: After thorough study of this unit the students will be able to understand the following objectives;

- to understand basic concept & potential of cultural heritage of their country
- to describe Museum and identify its functions in Pakistani society
- to study something about Archaeological Museum Saidu Sharif, Swat
- to learn about Chakdara Museum, Dir, Khyber Pakhtunkhwa
- to explain the historical background of Peshawar Museum Peshawar
- to elucidate the history of Taxila Museum and its relics
- to know about Lahore Museum and its antiquities potentials
- to gain the knowledge about Harappa Museum and its different galleries
- to acquire the scope and value of Mohenjodaro Museum
- to obtain the importance & significance of National Museum of Pakistan, Karachi

8. Cultural Heritage & Museums in Pakistan

Museums are repositories of a nations' cultural heritage and serve as centres of visual instructions for the people and research laboratories for the scholars. At a museum the general public and visitors both from home and abroad can gain understanding and appreciation of the rich fabric of the past which has gone into the making of the nations present.

The history of Museums in south-Asia goes back to the 18th century. The first museum collection was founded as long ago as 1786 only forty years after the inception of British Museum in London. In that year the Asiatic Society of Bengal decided that the many curiosities it had accumulated should be suitably housed in Calcutta but it was not until 1814 that a proper museum was established. The Government later paid to the Asiatic Society one and half lack of rupees for constructing a new museum building. It was in 1875 that the new museum was ready for occupation. In the territory now forming Pakistan Victoria Museum, Karachi was established in 1851 by Sir Bartle Frere, the then Commissioner of Sindh, in the Frere Hall. At the eve of independence of Pakistan, it was under the administrative control of Karachi Municipal Corporation. It was 17th April, 1950 that the National Museum of Pakistan was inaugurated in Frere Hall building replacing the defunct Victoria Museum.

It was not until 1864 that a provincial museum was opened in Lahore which was followed by Peshawar Museum in 1907 and Lahore Fort Museum in 1928. Later on three archaeological museums were created on excavated sites on pursuance of the policy of the Government to keep the small and movable antiquities, recovered from the ancient sites in close association with the remains to which they belonged so that they may be studied in their natural surroundings. These three museums were at Taxila, Moenjodaro and Harappa. This practice was

followed which gave birth to Swat Museum, and Banbhore Museum. The Mac Mohan Museum, Quetta was established in 1906 but it was severely damaged in great earthquake of 1935. The Museum at Taxila was excellent planned and equipped but at the remote sites of Harappa and Moenjodaro the collections were only partially displayed and arranged. However, these museums have been now re-organized and equipped with modern concepts of museology. Later on, Allama Iqbal Museum, Lahore, Wazir Mansion, Karachi, Quaid-i-Azam House Museum, Karachi were also established by the Department of Archaeology and Museums, Government of Pakistan.

Functions of Museums

The International Council of Museums defines a Museum as “a permanent institution in the service of society and of its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment, for the purpose of education, study and enjoyment”. Museums have been regarded as places where objects of scientific, artistic or historical importance are housed, taken care of and made available for public viewing. Museums in Pakistan vary from those housing large collections in major cities covering many categories such as fine arts, crafts, archaeology, anthropology ethnology, history, cultural history, military history, science, technology, natural history and numismatics, to vary small museums covering either a particular location in a general way or a particular subject. There are house museums, personality museums, site museums, general museums, science museums etc. in the service of societies for the purpose to educate them. Thus Museology is science of museums which manage all the related activities with the museum studies including travelling exhibitions both at home and abroad.

The modern trends in museology have broadened the range of subject matter and

introduced for instance, many interactive exhibits, which give the public an opportunity to make choices and engage in varied and productive activities. With the advancement of new IT technology there are growing numbers of virtual exhibits like tele-exhibitions, web versions of exhibits showing images and playing recorded sound, 3D imaging, QR Code, Digital Documentation of artifacts exhibited in the museums or art galleries, Virtual Tours etc.

A brief introduction of some important museums of Pakistan is given as under:-

8.1 Archaeological Museum Saidu Sharif, Swat

Swat Museum is one of the largest site museums in Pakistan which was established by Mian Gul Jehanzeb, the then Wali-e-Swat, to house his private collection and the material excavated by the Italian Archaeological Mission working at Swat in 1959. It was formally inaugurated on November 10, 1963 by Field Marshall Ayub Khan, the President of Pakistan at that time. The new display of the museum was reorganized in 1992 with the technical assistance of Japan. The Gandhāran collection of the museum which comprised on 3180 objects are manly came from the sites of Butkara-I, Saidu Sharif, Panr, Udegram, Nimogram and other prehistoric and proto historic objects from Loebanr, Aligrama and Butkara-III, Swat. Butkara-I, the most important site in Swat is located close to the Swat Museum. Sir Aurel Stein the first Curator of Peshawar Museum was the pioneer to record the site which was fist excavated by the Italian Archeological Mission during 1956-62. The five periods of the stupa was dated to the 3rd century BCE and the last was dated from 7th to 10th century CE.

Most of the artifacts displayed in the museum belong to the settlement sites and the Buddhist monasteries of the Swat region which include specimens of the Buddhist Art of Gandhara, daily use items recovered during the course of archaeological excavations conducted by the Department of Archaeology, Italian

Archaeological Mission and collection of sculptures donated by the Wali-e-Swat. One gallery of the museum has also been dedicated to the marvelous ethnological material of the Swat Valley.

The museum has a gift shop, a small reference library, an auditorium with audio-visual facilities for general visitors and students.

8.2 Dir Museum, Chakdara:

The Department of Archaeology, Peshawar University excavated various archaeological sites in Dir during 1966-69 and to house the collection this museum was established. The museum remained a state museum till 1969 when the state was merged with NWFP (now Khyber Pakhtunkhwa). Dir Museum has a total collection of 2161 objects, with more than 1444 Gandhāran objects. The collection includes the themes of Buddha's pre-birth and life stories, miracles, worship of symbols, relic caskets and individual standing Buddha sculptures. The Gandharān art pieces in the Dir Museum mainly came from the sites of Andan Dheri, Chat Pat, Baghrajal, Bumbolai, Jabagai, Shalizar, Ramora, Tribanda, Macho, Amluk Darra, Damkot, Bajaur and Talash, Dir, Malakand, Balambat, Timargarha, Shamlai Graves, Inayat Qila, Shah Dheri Damkot, Gumbatuna, Jandol, Matkani and Shalkandi.

8.3 Peshawar Museum:

Peshawar Museum was built in 1906 in the memory of Queen Victoria and it was organized in November 1907 to house the Gandharan sculptures excavated from the major Gandhāran sites of shah-ji-ki-Dheri, Peshawar, Sehr-i-Behlol, and Takht-i-Bahi in the Mardan District. Later on antiquities from Jamal Garhi and other sites excavated by the British scholars were also added to the collection.

The main collection of Peshawar Museum is 15156 which includes Gandhāran

sculptures, coins, manuscripts, copies of Holy Quran, inscriptions, weapons, dresses, jewellery, Mughal and later period paintings, ethnological objects, local and Persian handicrafts etc.

It has one of the best collections of Gandhāran Art in the world, consisting of 5498 (954 on display and 4544 in reserve) antiquities of Buddhist stone sculptures and panels, architectural elements, stucco sculptures, terracotta figurines, relic caskets and toiletry trays etc. The selected collection is exhibited in the main hall, eastern and western galleries on the ground floor and on the first floor as well. The subject matter of Gandhara art in the main hall included Buddha's pre-birth and life stories, miracles, worship of symbols, relic caskets individual standing Buddha sculptures.

8.4 Taxila Museum:

Taxila Museum is located 35 km north-west of Islamabad on the Grand Trunk Road to Peshawar. It was Sir Alexander Cunningham who identified the remains of the Greek city of Taxila at Shah Dheri and conducted archaeological excavations, which yielded rich material of stone, stucco and terracotta sculptures. Construction of the museum started in 1918. Its foundation stone was laid by Lord Chemsford, viceroy of India. Construction was concluded in 1928 and the museum was opened for public by Sir Habibullah then the minister for Education. The rich and varied collection consists of the Gandhāran antiquities that principally came from the sites of Bhir Mound, Sirkap, Sirsukh and the monasteries and stupas of Dharmarajika, Julaian and Mohra Muradu. The material was mainly collected over a period of about 20 years (1913-34). The total Gandhāran collection in the museum (reserve and display) is about 6000 pieces.

Sir John Marshall, who was going to be retired from the post of Director General of Archaeological survey of India in 1928, could not complete its original plan.

The government of Pakistan constructed the northern gallery in 1998. There are 4000 objects displayed, including stone, stucco, terracotta, silver, gold, iron and semiprecious stones. Mainly the display consists of objects from the period 600 BCE to 500 CE. Buddhist, Hindu and Jain cults are well represented through these objects discovered from three ancient cities and more than two dozen Buddhist stupas and monasteries and Greek temples. It is famous for remains of the Buddhist Art of Gandhara.

UNESCO has inscribed entire remains of Taxila Valley on the World Heritage list in 1980. Taxila Museum has been renovated by the Department of Archaeology and Museums in 2002 and all necessary public facilities i.e. gift shop, snake bar, reference library, washrooms, rest areas, drinking water etc. have been provided.

8.5 Lahore Museum:

Lahore Museum is the oldest and largest museum of Pakistan. The British, after the annexation of Punjab, realized the importance of cultural and economic potentials, and established the museum in the historic building of Wazir Khan. The first Punjab Exhibition was arranged in 1864 which was later on converted into a permanent display. The district museum collection was also transferred to it and it soon assumed ample importance, which was designated as “Jubilee Museum” though housed in a temporary building. The foundation stone of the present building was laid on Friday 3, 1890 by Prince Albert Victor, to mark the golden Jubilee of Queen Victoria. The entire collection of the Jubilee Museum was transferred it in 1894. This museum is known for the unique and splendid collection of Gandhāran art, spearheaded by the fasting Siddhartha, miracle of Sravasti, Buddhapada (foot print of Buddha), Sikri Stupa and statue of Greek goddess Athena. The total Gandhāran collection of the museum is 1932, out of which 1604 are in reserve stores and 328 on display. The archaeological

excavations at Sikri, near the famous ruins of Takht-i-Bahi and Jamal Garhi was carried out by Captain Deane which brought to light some Graeco-Buddhist sculptures of extreme interest.

8.6 Harappa Museum

The site of Harappa is located about 27 kilometers south-west of Sahiwal city. It is considered the second largest city of the Indus Valley Civilization.

The first mention of the site of Harappa is found in the travel account of Mr. Charles Masson, a British military deserter, who visited the site of Harappa in 1826 for the first time. After that, Alexander Cunningham, a famous Archaeologist paid visit to the site twice in 1853 and 1856.

After a long period, the Harappa site was declared as protected in 1920 under Ancient Monuments Preservation Act, 1904 but unfortunately before the area was declared protected; the mounds of Harappa had long been the source of brick hunters to use as ballast for about 160 kilometers of *Lahore - Multan* Railway track as well as a ready means of bricks for building houses for the local people of modern Harappa town. The laying of Railway line and the activities of local brick robbers destroyed most of the brick-structure of the ancient remains.

After the protection, archaeological excavations were started and many archaeologists excavated the site to understand the mysteries of the Indus Valley Civilization”

A small site museum was established at Harappa site in 1926 to exhibit the objects recovered during the course of excavations at Harappa. Recent building of the museum was constructed in 1967 for proper display on scientific lines. The present display is very impressive from educational point of view. The objects include Steatite Seals, Copper tablets, Seals, Ceramics, Stone tools, Sculptures, Weights, copper artifacts, Jewelry, figurines, toys and human skeletons. Besides,

the artifacts from *Moenjodaro*, *Kot diji*, and *Amri* have been displayed to show the similarity and diversity of Harappan Culture.

8.7 Moenjodaro Museum

Archaeological Museum, Moenjodaro is situated at some 27 km from Larkana in the Province of Sindh. A large number of Antiquities discovered from the Archaeological Remains of Moenjodaro are housed in this museum. The museum was opened on 20th January, 1967. The present two storied museum building located near the Archaeological Rest House is laid out in a beautiful charming garden. Before the present building the antiquities were displayed in a small building constructed before the emergence of Pakistan in 1925. At the ground floor of building are displayed different models, relief maps, large objects and a number of enlargements of Indus seals. After ascending the staircase one can reach the displayed galleries at the first floor. Here is a large mural painting measuring 9.30 X 3.40 meters jointly made by Pakistan and Italian Artists, depicting the everyday life in Moenjodaro some 5000 year ago.

There are twenty showcases in all which exhibit the artifacts of different types and nature. Some showcases are however reserved for the display of dioramas and objects discovered from Kot-Diji and Amri. The showcases of museum are specially designed for providing the natural light in them from the top, without the need of electric light. This new technique which was a novel experiment in the history of museums in Pakistan has since been adopted in many other site museums.

A variety of pottery both plain and painted is displayed in the museum which ranges from huge storage jars to small household utensils. Here are also displayed terracotta figurines of mother goddess, male and female heads in stone and replica of King Priest and Dancing Girl. A number of Indus Seals, weights and measures, terracotta toys, jewellery items, faience and variety of shell objects including shell

bangles are also exhibited. One last showcase is reserved for display of modern objects like model of a bullock cart, pottery, animal figurines etc. for comparison with those objects discovered from Moenjodaro which gives a clear indication that there has been continuity in the traditional art even the lapse of 50 centuries.

8.8 National Museum of Pakistan, Karachi

The Victoria Museum, first museum of Pakistan was established in 1851 in Karachi by Sir Bartle Frere. The National Museum of Pakistan was inaugurated in April, 1950 in a hired building of the Municipal Corporation. In 1970 the new building was constructed in Burns Garden where nearby still stands the building of the defunct Victoria Museum.

The National Museum of Pakistan was first established at Frere Hall in 1951. The present building of the National Museum of Pakistan is located at Burns Garden, Karachi which was completed in 1971. The basic objective of establishing National Museum was to collect, preserve, study, and exhibit the records of the cultural history of Pakistan and to promote a learned insight into the personality of its people. The museum has 11 Galleries which present specimens of art objects belonging to different stages of the history of Pakistan i.e. Indus Civilization artifacts, Gandhara Civilization Sculptures, Islamic Art, Miniature Paintings, Ancient Coins and Manuscripts documenting Pakistan's Political History, manuscripts. There is also an interesting Ethnological Gallery which represents different ethnic groups living in the four provinces of Pakistan. The Quranic gallery has recently been renovated.

Museum offers education services like guided Tours, Illustrated Lectures, Documentary Film shows, - Quiz programmes for school & college students, To facilitate the students visiting the Museum, provides Transport for educational purpose.

Every year National Museum holds around a dozen exhibitions on National Days and other occasions. The Museum premises also have an auditorium with 250 seating capacity. Museum has its own modeling section and conservation laboratory. Necessary public facilities like Reference Library, Souvenir Shop, Rest House, Snack Bar and public toilets have been provided in the museum premises.

Self Assessment Questions

- Q. No.1.** Define the cultural heritage of Pakistan and highlight its scope and importance.
- Q. No.2.** What do you know about Museums in Pakistan? Evaluate their educational services for Pakistani community.
- Q. No.3.** What is the importance of Archaeological Museum Saidu Sharif, Swat? Discuss.
- Q. No.4.** Discuss the importance of Chakdara Museum, Dir.
- Q. No.5.** Peshawar Museum is famous Gandhara Art of Pakistan, why is it so?
- Q. No.6.** Discuss the antiquities of Taxila Museum, when was this museum established?
- Q. No.7.** Highlight the services of Lahore Museum. Discuss its various galleries and its relics.
- Q. No.8.** Why was it called Harappa Museum? Discuss its historical background.
- Q. No.9.** Why is the Mohenjodaro Museum an attractive place for foreign scholars?
- Q. No.10.** Discuss the potential of the National Museum of Pakistan, Karachi.

Bibliography

Alam, Humera (1998) Gandhara Sculptures in Lahore Museum, Lahore Museum, Lahore

Brown, Percy (1994) History of Lahore Museum, Lahore Museum Bulletin, Vol.1-2, Lahore Museum, Lahore.

Cultural Heritage of Pakistan (1966) Department of Archaeology and Museum, Karachi.

Dar, Saifur Rehman (1988) Lahore Museum Treasures, Lahore, Museum, Lahore.

Dar, Saifur Rehman (2006) Historical Routes through Gandhara (Pakistan) 200 BC -200 AD. Lahore.

Gandhara Sculpture in the National Museum of Pakistan, (1956), Department of Archaeology, Karachi.

Hargreaves, H.(1986). *Gandharan Sculptures*, Peshawar Museum, (re-print) Mayur Publications, India.

Khan, Makin (1997) Archaeological Museum, Saidu Sharif, Swat, A Guide, Second Edition, Swat.

Khan, Muhammad Ashraf (1993) Gandhara Sculptures in the Swat Musuem, Artico Printers, Lahore

Khan, Muhammad Bahadur (2004), Gandhara Stone Sculptures in Taxila
Museum, Arr Bee Graphics, Peshawar

Masterpieces of Gandhara Art in Pakistan (2004), UNESCO Publication,
Islamabad.

Rehmani, Anjum. (1999). *Masterpieces of Lahore Museum*,Lahore Museum
Publication, Lahore.

Saeed, Tahir (1998) Moen-jo-daro, Signpost of a civilization, Karachi.

Sehrai, Fidaullah. (1991). *The Buddha Story in the Peshawar Museum* (First
published 1978, Second 1982) Peshawar.

UNIT. 9

TOURISM IN PAKISTAN

Written by: Dr. Badshah Sardar
Reviewed by: Prof. Dr. Muhammad Ashraf Khan

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Introduction

Pakistan, from Khber to Karachi, is a geographical, historical, cultural, religious and racial unit. Its all provinces, namely Khyber Pakhtunkhwa, Punjab, Sindh, Baluchistan and Gilgitbaltistan including Kashmir are historically, naturally, religiously and culturally rich and productive. Punjab and Sindh has plenty of ancient monuments, and Baluchistan and Khyber Pakhtunkhwa having natural and cultural wealth in abundance. Similarly in Gilgitbaltistan and Kashmir have a rich cultural heritage and extraordinary tourism potentials.

All these provinces and Kashmir together present a happy blending and an ideal balancing of Nature's bounties. Besides these Tribal stocks, religious beliefs, eating habits, dressing patterns, are all identical. Few nations are so fortunate as to have such a happy blending of the desert and the arable, mountains and strong and powerful homogeneity as prevails in the length and breadth of Pakistan. Few nations in the world have so many common ingredients of nationhood as Pakistan. This is not merely rhetoric but this study bears a testimony to this fact. If the reader still has an iota of doubt on any point which needs further clarification, he is advised to traverse through the length and breadth of this beautiful country, meet its people; see their way of life and their culture; for seeing believes.

This unit is neither a travelogue nor a traveller's tale nor a tourist guide, yet it unfolds candidly what is most alluring in this admirable country. Journey through Pakistan, therefore, is incomplete without knowing its people and their regional customs and dance, sculpture and architecture, language and literature, history and calendar; in short, their cultural patterns and way of life. While though Wester, style food is available in all the larger cities of Pakistan, the visitor will miss a new experience, if he leaves the country without sampling delicious Pakistani food. In order to have a real 'feel' of Pakistan, rub your shoulders with the folks, go for the folklore, listen the folk songs- the folk music, see the folk dances, participate in the festivities and the festivals, and remember the land you visited by purchasing a handicraft as a souvenir.

Paistan is famous fior its handicrafts. Exquisite hand-made articles are available at moderate prives. There is an endless variety. Delicate silver trinkets, finely carved wooden tables, trays, screens and other articles, colourful camel – skin lamps, beautiful objects of ivory, fragile pottery, embroidered purses, brassware of every description, bamboo decorations, cane and conch shell products, glass bangles, gold and silver ornaments, hand embroidered shawls, luxurious rugs and carpets

and hundreds of other decorative handicrafts can be bought as souvenirs. Things purchased as a memento would always remind you of this beautiful country.

The people of Pakistan, without any consideration of their respective religious faith, linguistic group or ethnic stock, are proud of this land of singing rivers and dancing rivulets, of rugged mountains, of snow capped peaks, of plains and of fields and their produce, of the mineral wealth, of the natural resources and many more things beyond the horizon of their imagination. And of its Islamic spirit, and robust patriotism, of the study guardians of Northern West Frontier, and of the simple farmers of the fertile wheat fields of Punjab the land of five rivers, of the innocent peasants working ceaselessly from dawn to dusk in the field of cotton and rice, of Indus Valley Civilization, of camels and caravans, of deserts and fertile fields, of plains and mountains, of beautiful beaches and the deep blue sea.

The Muslims, from the earliest days, left their landmarks in the field of architecture as they built cities and citadels, forts and palaces, mosques and mardrasahs, tombs and mausoleums, and introduced the laying out of gardens in this South Asian land. The plans of both secular and sacred buildings were those that had been standardized in the tradition of Islamic architecture. For instance, the architecture of the mosques is grand and simple, at once attractive and awe-inspiring, ordered and restrained, marked by symmetry and proportion, with open spaces and abundance of light in accord with the Islamic conception of man's relationship to God as opposed to the Hindu tradition of sacred architecture which is florid in character, profusely decorative, with closed and dark cells and niches and mysterious labyrinthine passages.

Objectives: After going through this unit, the students will be able to understand the following;

- to know little bit about cultural tourism of Pakistan
- to recognize Pre-historic sites and scope and importance of Pakistan
- to understand Pre-Muslim sites and monuments and its features
- to make known the students about history of early Mughal period art & architecture
- to identify Muslim period sites of Pakistan
- to study folk heritage festivals of Pakistan
- to learn about natural tourism in Pakistan

9. Tourism in Pakistan

9.1 Introduction

Cultural tourism is the subset of tourism concerned with a country or region's culture, specifically the lifestyle of the people in those geographical areas, the history of those people, their art, architecture, religion and other elements that helped shape their way of life. Cultural tourism includes tourism in urban areas, particularly historic or large cities and their cultural facilities such as museums and theatres. It can also include tourism in rural areas showcasing the traditions of indigenous cultural communities, and their values and lifestyle. It is generally agreed that cultural tourists spend substantially more than standard tourists do. This form of tourism is also becoming generally more popular throughout the world, and a recent report has highlighted the role that cultural tourism can play in regional development in different world regions.

Cultural tourism is big business nowadays. The economy of a large number of countries depends on the tourism and its related areas. Although tourism, in one form or another, has always been linked to learning, the fact is that since the 1970s, when UNESCO produced the Convention on World Cultural and Natural Heritage together with proposals to conserve and promote it, cultural tourism has experienced huge growth throughout the world, but especially in Europe.

Pakistan is one of the few fortunate countries of the world which has great potential of cultural tourism. We can increase the number of visitors to our own country, if basic facilities with infrastructure are provided. At first stage facilities like provision of approach path leading to the sites/ facilities of guides, provision of amenities and services should be provided at all World Heritage Sites. This can help to develop socio-economic condition of Pakistan.

However, the revenue contribution from tourism sector of Pakistan is only 2%. According to the World Economic Forum's Travel and Tourism Competitiveness Index, Pakistan is ranked 122nd in the list of 140 countries and the ratio of tourists in our country is lowest among the Asian countries. Travel & Tourism is an important economic activity in most countries around the world. As well as its direct economic impact, the industry has significant indirect and induced impacts. According to the report of Country Rankings, the real growth during the year 2018 was 5.9 % as compare to India 7.6 % whereas for total contribution to GDP was 5.8 % as compare to India 7.5 % during the same year. Similarly, total contribution to employment was 2.6% as compare to India 3.0 % growth.

9.2 Cultural Tourism

A cultural historian Raymond Williams (1921–1988) says that the difficulty in defining the word 'Culture' is located on its "intricate historical development" in European languages and on the fact that despite its long history the term is relatively new in the English language. The word derives from the Latin word which had a wide range of meanings that corresponded to different domains in life for instance: agricultural (to cultivate), domestic (to inhabit), religious (to honor a deity through worship), and social (to protect). Williams pointed to the eventual divergences of these original meanings, such as the derivation of the term colony, from the meaning of cultura "to inhabit," or cult, from the meaning "to honor through worship." Hence culture and cultura still echo the original main meaning of cultivation. The poet and critic T. S. Eliot (1885–1965), in his 1949 book 'Notes Towards the Definition of Culture', observed that the term "cultivation" applies as much to "the work of the bacteriologist or the agriculturalist" as "to the improvement of the human mind and spirit," although he concludes that the primary location of culture is religion. By the mid-

eighteenth century the term appears in both French and English in its proto-modern form, and in German it appears as a borrowing from the French first as *Cultur* (in the eighteenth century) and then as *Kultur* (in the nineteenth century) as almost synonymous with “civilization.”

The German philosopher Johann Gottfried von Herder (1744–1803) observed that the slippery nature of the two terms denoted the slippery understanding of “culture” and “civilization” and the frequent conflation of the two. Herder separated the notion of “civilization” from the notion of “culture” and developed the theory of “cultures” in the plural, refuting the Universalist theories of a unified development of humanity. The anthropological development of the theory of culture rests precisely on this notion of “culture-in-the-plural,” the acknowledgment that specific cultures existed in different times and places.

"Culture is one of the driving forces for the growth of tourism." This was stated by the Secretary-General of the World Tourism Organisation (UNWTO), during the third conference on cultural tourism organized by the UNWTO and UNESCO; and one statistic backs it up - cultural tourism in the world represents nearly 37% of the total for the sector.

According to the United Nations World Tourism Organization, cultural tourism is “movements of persons for essentially cultural motivations such as study tours, performing arts and cultural tours, travel to festivals and other cultural events, visits to sites and monuments, travel to study nature, folklore or art and pilgrimages.” Cultural tourism has been defined as 'the movement of persons to cultural attractions away from their normal place of residence, with the intention to gather new information and experiences to satisfy their cultural needs'. These cultural needs can include the solidification of one's own cultural identity, by observing the exotic "other".

There are many benefits of cultural tourism such as; the conservation of cultural and artistic heritage, local prosperity for non-traditional tourist destinations and the establishment of links between different cultures and civilizations, further like the impact on the economy and jobs. The money spent by cultural travelers has a very positive repercussion, both at financial level and in the creation of jobs in sectors such as the hotel and catering industry, trade and culture. Cultural tourism is almost as diverse as culture itself in that it can embrace practically any activity connected with, or peculiar to, a country, area, city or town: especially like art, cinema, language, sport, religion, architecture, gastronomy, nature or any kind of folklore.

Cultural tourism is a type of special interest tourism involving leisure travel for the purpose of viewing or experiencing the distinctive character of a place, its peoples, and its products or productions. A wide range of destinations and cultural activities fall under the umbrella heading of cultural tourism such as; visits to Heritage Sites, tours of historic cities, architectural sites, and battlefields; study and visit to museums, tours of ethnic neighborhoods, travel to local music festivals and cultural performances; visits to indigenous villages or distinctive cultural landscapes (e.g. observing farming practices in Asian rice fields). Although cultural tourists' motives vary, some common themes include the desire to experience an "authentic" cultural landscape, interest in other cultures, and an interest in scenery that fosters an engagement with the past. Since anthropologists and sociologists first turned their attention to tourism in the 1970s, there have been a variety of attempts to classify particular types of tourism. Some scholars, such as Valene Smith (1989), have proposed more refined subdivisions to the broader category of cultural tourism, including ethnic tourism to (of indigenous peoples), historical tourism (focused on the glories of the past, museums, monuments, and ruins), and, in a separate category, cultural tourism, to see "vestiges of a vanishing lifestyle that lies within human memory" and involves

folklore performances, festivals”. While some scholars embrace these taxonomic distinctions, others simply utilize the broader umbrella term cultural tourism. Recognizing that most tourists engage in a variety of activities on any given trip (ranging from sampling local delicacies to touring picturesque villages), more social scientific attention has been directed away from refining taxonomies and toward better understanding the socio-cultural transformations that are part and parcel of cultural tourism.

9.3 Prehistoric Sites

Apart from the physical environment of Pakistan’s territory, the people of this country are heirs to a two million years old socio-political background going back to the Old Stone Age. The earliest stone tools found in the Potohar region of Pakistan belong to an ancient primitive stage in human development and culture. The Stone Age is divided into three periods namely Palaeolithic (Old Stone Age), Mesolithic (Middle Stone Age) and Neolithic (New Stone Age). As the name suggests, the technology of implement in these periods were primarily based on stone. Economically the Palaeolithic and Mesolithic periods represents the hunting and gathering stage in human history, while the Neolithic represents the stage of food production i.e. plant cultivation and animal husbandry.

The oldest known tools, comprising of cores and flakes have been found from the Siwalik hills of Potohar region at Rewat is of a distinctive local (Chellean) Culture is of great interest, it links Potohar region of Pakistan with a vast complex of such early centers of human activity, stretching from France and Spain through the Mediterranean, also south and east Africa, Palestine and Syria, across to Pakistan and then on as far as north –eastern China.

The next stage in Stone Age technology is known as the Acheulean Culture,

broadly speaking, commenced around 400, 000 BC. The Middle Paleolithic began around 100, 000 BC. The Acheulean Culture represents an evolution from the previous one (Chellean) towards more elegant and refined technique in preparation of stone implements. In Pakistan the stone implements of this culture have been found by Dr. Noethling (1899) at Kout-Modahi, and Dr. Abdue-Rauf Khan (1980) at Bela in Balochistan.

Human life at this stage was, of course, highly primitive. Man hardly differed in outward appearance from the brute creation. People in the Old Stone Age lived in small groups, without any fixed abode, subsisting on hunting and gathering wild fruits, nuts etc. Edible roots were grubbed out with crude stone tools. As known from various localities of the world, that towards the end of the Acheulean Culture, fire came into general use, and people of the Old Stone Age began to clothe themselves with animal furs (pelts).

The next phase in human life in Pakistan is the upper Paleolithic period, extending from approximately 40, 000 to 12, 000 BC. Though hunting and gathering fruits and other edibles remained the chief forms of upper Paleolithic man's economic activity, he also learnt how to fish and finally may even have begun to tame dogs and other beasts.

Where no natural caves or shelters were to be found, he made tents out of skin and even elaborate semi-underground dwellings. Unfortunately no stone implements of this period has so far been discovered or found in Pakistan. However, caves and rock shelter paintings and engravings made by upper Paleolithic and Mesolithic period's people are found in the Suleman Range and Zhob Valley of Balochistan, which shows the dawn of human ingenuity. The people of upper Paleolithic period were free to explore avenues of feeling and self

expression which foreshadowed unmistakably the achievements of civilized man. It is indeed no coincidence that the original centers of food production and urban civilization in the mature Bronze Age grew up precisely within the territories of these upper Paleolithic people.

Much remains to be done before the study of Stone Age man heritage in Pakistan can be regarded as complete. However, we have enough evidence to establish Pakistan's right to rank as one of the cradles of human civilization.

Great steps forward, which enabled man to break through the barrier between barbarism and civilization, occurred with the onset of the Neolithic or New Stone Age. The mode of life and general outlook of the folk of the New Stone Age was radically different from that of their Paleolithic and Mesolithic forebears. Stone-using agricultural communities "Neolithic" were established in Balochistan plateau, in Pakistan by 8th millennium (Mehrgarh) and spread to the fertile Indus valley. In this Neolithic period five new practices played a vital part:

- 3 Settled agriculture.
- 4 Domestication of Animal.
- 5 Manufacture of pottery.
- 6 Tool-making by grinding and polishing technique.
- 7 Sewing, weaving and textile manufacture.

Naturally the fully-fledged Neolithic cultures of Pakistan did not spring in to existence in a few brief generations. They were the result of a process of evolution from the Mesolithic stage, lasting in the region from about 8th millennium which lastly culminated and appeared around 2500 BCE as Indus Civilization in the greater Indus valley.

Pre-historic sites

S#	Name of the Site / cultural Object or material
1	Chellean stone tools sites, Potohar Region, Punjab
2	Acheulean sites, Khut Mudai and Bela, Balochistan
3	Caves/rock shelters of Upper Palaeolithic period with paintings and engravings, Balochistan.
4	Mesolithic tools, Sind
5	Mehrgarh Site, Balochistan
6	Mehrgarh artefacts, Balochistan
7	Dabar Kot, Balochistan
8	Anjira, Rana Gundai, Periano Gundai, Balochistan
9	Amri, Pandi Wahi, Kohtras, Kot Diji, Sindh
10	Sarae Khola, Jalilpur, Hakra, Punjab
11	Gahedgai, Lewan, Gumla, Rehman Dheri, Khyber Pakhtunkhwa
12	Archaeological remains of Moenjodaro, Sindh
13	Archaeological remains of Harappa, Punjab

9.4 Pre-Muslim Sites and Monuments

The Achaemenian period of Persia established their sovereignty during 6th century BCE over most of the lands comprising present day Pakistan. The Macedonian invasion led by Alexander the Great in 326 BCE is likewise a great

event in the history which served as a vehicle in the process of cultural interaction between East and West civilizations. Buddhism reached Gandhara (northern part of Pakistan) in the 3rd Century BCE during the reign of Asoka the Great of the Mauryan dynasty and flourished under the royal patronage of the successive ruling dynasties of Indo-Greeks, Scythians, and Parthians. It reached its climax in the 2nd Century CE under the Kushans.

Gandhara was the ancient name of the tract of country on the west bank of the Indus River which comprises the Peshawar valley and the modern Swat, Buner and Bajaur. It was a country with rich, well-watered valleys, clear-cut hills and a pleasant climate. Situated on the borderland between India and Western Asia, it belonged as much and as little to the one as to the other. In the sixth and fifth centuries BCE. it formed part of the Achaemenid Empire of Persia. In the fourth it was occupied for a brief period by the armies of Alexander the Great. Thereafter it was conquered by Chandragupta Maurya, but after a century of local rule the West again asserted itself, and in the second century BCE. Greek dynasts took the place of Indian. Then in the early first century BCE., the victorious Sakas or Scythians, entered who were followed, after yet another century, by the Parthians and Kushans. However, even then the tale of foreign conquest was not ended. In the third century CE, Gandhara again reverted to Persia, now under Sasanid sovereigns, and was again re-conquered by the Kidara Kushans in the fourth. Finally, the death-blow, to its prosperity was given by the Ephthalites or White Huns, who swept over the country about CE., 465, carrying fire and sword wherever they went and destroying the Buddhist monasteries. With such a history

behind them it is not surprising that the people of Gandhara were thoroughly cosmopolitan in their culture and their out-look. The common speech of the people was an Indian Prakrit, but the script they used for the writing of this vernacular was Kharoshthi a modified form of the Aramaic of Western Asia, which had been adopted for official use throughout the Persian Empire during Achaemenid times.

Nevertheless, it is true to say that Gandhara took its everyday speech from India and its writing from the West. This intimate fusion of widely divergent elements was equally apparent in the religious life of the people. As each successive conqueror added his quota to the local galaxy of deities and creeds, the number and variety went on growing. The impetus given to Buddhists by the Mauryan Emperor, Asoka, and the artistic impulses emanating from the Bactrian Greeks in Central Asia led to the fruition of the Gandhara Art under the patronage of the Kushanas and their successors. The period from 1st Century A.D. to 4th Century CE., is a remarkable period in the history of Pakistan when the sculptural art becomes a hand maiden to spiritual zeal. Initially, the medium of sculptural art appears to have been the grey schist in Taxila, Peshawar, Mardan, Malakand, Dir, Swat and Buner regions, but then other kinds of locally available stones like phyllite, soapstone, green schist, chlorite, etc. were also used for carving sculptures alongwith the more plastic stucco to fulfill the insatiable demand of Buddhist devotees who filled the innumerable monasteries and stupas thickly dotting the whole Gandharan country of that time.

While Graeco-Roman impulse was responsible for initiation and development of Gandhara art, the local talent made it what it looked like the representation of the true society of the elite and the religious monks who roamed about with an aura of spiritual dignity. Besides sculptures, the architecture of Gandhara also has a marked characteristic of its own composition in nature and scope lending towards Ionic and Doric style of Classical Greeks. The city plan of Sirkap in Taxila, the remains of religious establishments Stupas and Monasteries at Jaulian, Mohra Moradu, Dharmarajika etc. around Taxila, and those at Takht-i-Bahi, Jamal Garhi, Sehri Bahlol in Mardan district, are remarkable ensemble of the dissemination and blending of foreign and local traditions of the art of building. Besides, Butkara, Panr, Udegram, Nimogram, Chat Pat, Andan Dheri, Saidu Stupa, Shingardar Stupa, Thokardara Stupa, to name only a few, are some of the famous sites in Swat and Dir area which provide ample evidence of the extent of this religious cultural phenomenon.

Decline of the Buddhist Art of Gandhara started with Sasanid and Hun invasions which resulted in mass destruction of the cities and religious establishments of the area. The society and its norm were annihilated, while the art and architecture adversely affected when monumental buildings, both religious as well as secular, were put to fire. The havoc was faced throughout the areas which are now Pakistan. The Chinese Pilgrim Hun-Tsang's account of the ruined monasteries, stupas and other secular buildings mentions what he saw everywhere in the region is an awesome but accurate description of the horrible desolation of these once flourishing centers. However, the Buddhist faith was not wiped out completely from these areas. We come across its manifestation at many places especially in today's Sind and in the Khyber Pakhtunkhwa.

Archaeological sites of pre-Muslim period

S#	Name of the Site
1	Takht Bhai and Sehre Behlol remains
2	Jamal Garhi remains
3	Shahbazgarhi Rock Edicts
4	Buddhist Sites in Swat; Butkara-I, Butkara-II, Panr, Saidu Stupa, Udegram, Nimogram, Chat Pat, Andan Dheri, Tokardara Stupa
5	Rock Edicts Mansehra
6	Mankiala Stupa
7	Archaeological Sites of Taxila; Bhir Mound, Sirkap, Sirkap, Dharmarajika Stupa, Kalawan, Giri, MohraMoradu, Jaulian, Jandial.
8	Shah-ji-ki Dheri, Peshawar
9	Charsadda, near Peshawar
10	Shingardara Stupa, Swat

9.5 Muslim Period Sites and Monuments

The first impulse of Islam was actually felt in the north-western regions of the Subcontinent almost immediately after its stabilization in the Arabian Peninsula under the caliphate of the first and second pious Caliphs. However, its real impact of far-reaching effect was felt a little later when the Sindh was attacked and

reduced by a young Arab General, Muhammad ibn-al-Qasim in (711-12 CE). Muhammad ibn-al-Qasim reduced the land upto Multan and Dipalpur. This was the time that the Arab rule was established here and the areas became part of the fast growing Umayyed Caliphate. With this political change, the socio-religious pattern of the local society was also changed. Soon Arab culture, language and literature was introduced and penetrated in these areas. Later during the second and third Centuries of Hijra, these influences were strengthened when Arab independent Emirates were established here with capitals at Multan and Al-Mansurah.

The next wave of Islamic culture which came from Central Asia to this part of the Subcontinent was initiated through the military excursions of Sebuktegin, and later by his son and successor Mahmood of Ghazna in the later decades of the 10th and the early decades of the 11th Century CE., Sultan Mahmood introduced characteristic features of Central Asian architecture in the land of today's Pakistan and is said to have erected a mosque and a victory tower at Lahore.

The Islamic rule and culture in the Subcontinent, however, gained a permanent footing after Shahab-ud-Din Ghuri defeated Pirthvi Raj and captured the throne at Delhi in 1193. The stream of history since then flowed uninterrupted through the successive rule of the Central Asian Turks, the Khaljis, the Tughluqs, Sayyids and the Lodis. This was a very important period of the socio-cultural, religio-spiritual as well as political history of Pakistan, all imbued with Central Asian traits and traditions.

Through the religious and secular buildings of this period a new a distinct style of architecture was introduced and perpetuated. It was based on the characteristic features of Central Asian art of building. Called fondly by the architectural historians the naked brick architecture, its specimens are mainly brick construction having cut-brick decoration. The earliest known outstanding

specimens are the tomb of Muhammad b. Harun at Bela (Balochistan), the Mausoleum of Khalid Walid at Kabirwala (Multan) and the tomb of Sadan Shah at Muzaffargarh. Later on brick decoration was replaced with faience or faience mosaic revetment, and wooden embellishment. These specimens are mostly funerary memorials erected over the graves of the saintly personages. In Pakistan, we have a number of such memorials spread over almost every place. The climax of this style is represented by the famous mausoleum of Rukn-i-Alam at Multan which has been acclaimed as the most splendid memorial ever erected in honour of the dead. The specimens of the later date are extant at Uch Shereif, Dipalpur, Multan, Sitpur, Muzaffargarh, Dera Ghazi Khan, Dera Ismail Khan, kot Mithan, Jalalpur Pir Wala and elsewhere.

The land of Sind has, in this connection, its own distinguished identity. During the long period of history, its large parts were ruled by local dynasts of Sumras, Sammas, Tarkhans, Arghuns and Talpurs. These rulers have left an imprint on the socio-cultural history of Sind; they issued coins, built palaces and other religious and secular buildings, patronized arts and literature. The masterpieces of the art of buildings belonging to these periods are Makli Hill Grave yard, Chokundi, Hanidan and Mausoleums of Talpurs at Hyderabad.

The beginning decades of the sixteenth century witnessed yet another political change in the Subcontinent, and brought a new reigning power to the scene. The progenitor of this dynasty the Moghul Empire, was Zahir-ud-Din Muhammad Babur (1526-1530). He was succeeded by Humayun (1530-1554) Akbar (1554-1604), Jahangir (1605-1627), Shahjahan (1628-1658), Aurangzeb (1658-1707) and others. The rule of this imperial power lasted for well over three hundred years when it declined and fell. It was in 1857 that the last Moghul emperor

Bahadur Shah Zafar was deposed by the British East India Company who inaugurated the British rule.

The Imperial Mughals introduced a much refined and sophisticated socio-cultural pattern in the society. Babur, a product of Samarqand and Farghana, paid his attention towards laying out gardens at several places of his newly conquered territory. History reveals that one such garden was laid in the Salt Range area and was named as Bagh-i-Safa. Only traces of this vanquished garden are left now. No other building of his, or for that matter, of his successor Humayun is known to exist now in Pakistan, except the ruined Baradari at Lahore erected by Kamran Mirza within a vast enclosed garden. However, Akbar, the real architect of the Moghul Empire, built a number of buildings in Lahore of which the fortifications of the fort with impressive gate-ways, and the palaces within it are remarkable specimens of an architectural style which is termed as an admixture of the Hindu-Jaina and Iranian characteristics. His son and successor Jahangir added a few more buildings within and without the fort.

Of the architectural accomplishments, the Maryam Zamani Masjid and the tomb of Anarkali, both at Lahore, are significant examples of majestic but robust architecture. While the latter is an embodiment of majesty and grandiose representing a link between the Lodi, Suri and the Moghul architectural characterizes, the former presents a unique feat of colour presentation of fresco art. Incidentally, here in this mosque we meet for the first time in Pakistan the earliest example of the double dome.

Indeed Lahore and Thatta are the two celebrated historic cities where the most sumptuous representation of Islamic architecture of the grand Mughals is found in

such abundance. The sumptuous palaces in the Lahore Fort, the Shalamar, the mausoleums of Jahangir, Nurjehan and Asif Khan, the Badshahi Mosque, at Lahore, and a galaxy of funerary memorials, the Dabgaran Mosque, the Shah Jahan Mosque at Thatta and Makli, and a number of religious and secular monuments spread over the various parts of Sind are some of the best specimens of the art of building created during the period which show the height of tasteful patronage and the skill and proficiency of the master-artists and artisans.

These imperial patrons of art and culture patronized almost all art forms: paintings, calligraphy, coinage, armoury, and other minor arts. They established imperial libraries and studios to create best specimens of these arts. The coins of this period too are pieces of art for their purification, designing and variety. The art of book reached its height which combined miniature paintings as well. Their objects of daily use were in fact objects de-art which were made of gold, silver and other precious and semi precious metals and stones. Numerous pieces of these arts, illustrated manuscripts of classical Persian works, albums of painting and calligraphy, gold and silver coins now form proud possessions of museums and art galleries throughout the world.

With the decline and fall of the Moghul empire, the Muslim society in the subcontinent also received a real set back, never to regain the lost glory .The petty states and chiefdoms at many places of the areas which are now Pakistan, were only a shadow of its past grandeur, which have never been able to view with its past. The rule of the Sikhs and the earlier phase of the British ascendancy brought a death knell to this Islamic culture.

Muslim period sites and monuments

S#	Name of the Site/Monument
1	Tomb of General Muhammad Ibn-e-Haroon, Las Bela, Balochistan
2	Fort of Azad Khan, Kharan
3	Mir Chakar Fort, Sibi, Balochistan
4	Graveyard including four Tombs at Lal Mohra Sherif, Dera Ismail Khan
5	Tomb of Hazrat Shaheed Ahmed Mujadid Baralvi, Balakot
6	Gor Khatree monuments, Peshawar
7	Udegram Castle and Mosque, Swat
8	Tomb of Ghulam Shah Kalhora, Hyderabad
9	Tomb of Ghulam Nabi Khan Kalhora, Hyderabad
10	Nasar Ji Mosque, Hyderabad
11	One enclosure containing Tombs of Talpur Mirs, Hyderabad
12	Chaukandi Tombs, Near Karachi
13	Mohatta palace (Qasr-e-Fatima), Karachi
14	Tomb of Nur Muhammad Kalhora, Hyderabad
15	Shrine Known as Satyan-jo-Than, Rohri
16	Kot Diji Fort, Kot Diji, near Sukkhar
17	Makli Hill Graveyard, Thatta
18	Shahjahani Mosque, Thatta
19	Lala Rukhs Tomb, Hasan Abdal, Attock
20	Attock Monuments, Attock near Indus Bridge
21	Uch Sharif Monuments, Uch Sharif, Multan
22	Tomb of Abdul Nabi, Kotli Maqbra Gujranwala
23	Rohtas Fort, Jhelum

24	Ruins of Nandna Fort, Jhelum
25	Tomb of Khalid Walid, Kabirwala, Khaniwala
26	Tomb of Ali Mardan, Lahore
27	Dai Anga Tomb, Lahore
28	Shalamar Garden, Lahore
29	Lahore Fort, Lahore
30	Shahdara Monuments, Lahore
31	Choburji Monument, Lahore
32	Wazir Khan Mosque, Lahore
33	Hiran Minar, Sheikhpura
34	Shah Rukan-e-Alam and other tombs, Multan
35	Gates and other monuments inside the walled city of Lahore
36	Marium Zamani Mosque, Lahore

9.6 Folk Heritage Festivals

Pakistan is blessed with immense cultural diversity. The tangible cultural heritage of Gandhara and Indus valley Civilization are in fact complemented by magnificent intangible cultural heritage as well. This intangible cultural heritage of Pakistan comprises on; social practices, expressions, traditional knowledge and skills, oral traditions performing arts, social practices and folk heritage festivals. Each province of our country has its own unique cultural traditions. The indigenous knowledge, traditions, developed over centuries through interaction of human beings with their environment which is now cherished cultural heritage of Pakistan. There are a number of Folk Heritage Festivals which are celebrated enthusiastically and devotedly in Pakistan.

i. Shandur Polo Mela

Shandur Polo festival is one of the most famous festivals in Pakistan. This festival is held in the month of July every year on Shandur Top in Ghizer District of Gilgit Baltistan. The Polo match is played between the teams of Chitral district and Gilgit –Baltistan on the world’s highest ground. This festival also includes folk music, folk dances and traditional sports.

ii. Nowruz Festival

Nowruz in Pakistan is celebrated as “Alam Afroz” or the “New Day”. During this festival special ceremonies and prayers are offered while sweets, perfumes, fruits, and flowers mark the offering of Nowruz. The main attractions include socio-cultural and religious gatherings. Over the past many years Nowruz festival has received recognition at different levels including the government. Nowruz is ‘cultural bridge’ between various communities of Pakistan and it provides a platform for pluralism. It gives message of peace and tolerance in society by providing an opportunity for rethinking, reviving and rejuvenating the cultural ethos of the communities associated with it and also creates harmony in the society.

iii. Chawmos

The Chawmos festival is celebrated from 7-22 December every year by the *Kalasha* community to mark end of the year’s field work and welcome the arrival of New Year. It contains a series of celebrations. Each ceremony in this festival has its own traditions, foods and songs. It is most exciting among all the festivals, in which girls dance in cold weather and snowfall and boys play various games in the festival.

iv. Sibi Mela

Sibi Mela is a cultural festival that has been organized regularly over the past centuries. Basically it is a livestock trade venue. The festival is considered as an extension of Mehrgarh culture where domestication of animals was a practice. Traditionally in this festival, a large number of livestock breeders gather every spring at Sibi Town for sale/purchase, competition and display of various breeds of different animals. The salient feature of this festival is horse and cattle show, cultural displays, tent pegging, camel races, animal markets and exhibitions, if handicrafts, tribal dresses and folk dances.

v. Mela Chiraghan

Mela Chiraghan (Festival of Lights) is a three day annual festival to mark the URs (death anniversary) of the Punjabi poet and Sufi saint Shah Hussain (1538-1599) who lived in Lahore in the 16th century. It takes place at the shrine of Shah Hussain in Baghbanpura, Lahore adjacent to Shalamar Gardens. This festival is used to be the largest festival in the Punjab province of Pakistan. The common peasants, Mughal rulers, the Punjabi Sikh rulers and even the British officers during their British Raj used to show up at this festival. Maharaja Ranjit Singh (1780-1839) had high respect for this Sufi saint Shah Hussain. In the early half of the 19th century during the Sikh rule, Maharaja Ranjit Singh used to lead a procession from the Lahore Fort to this festival site.

vi. Eid-ul-Fitr

Eid-ul-Fitr is an important festival celebrated by Muslims worldwide that marks the end of Ramzan, the Islamic holy month of Fasting. This religious festival is the first and the only day in the month of Shawwal during which Muslims are not permitted fast. In fact it is the day of getting reward from Almighty Allah. The

festival falls on first day of Shawwal, the tenth month of Islamic Calendar. Therefore it is subject to appearance of moon. Before offering the prayer the Muslims are ordered to pay Sadq-e-Fitr at fixed rate to the eligible poor people so that they may also celebrate the festival. After offering the prayer people embrace and wish happy Eid-ul-Ftr to each other.

Eid-ul-Fitr has a particular prayer and generally offered in an open area as it may be performed only in congregations. At the eve of the festival sweet dishes are prepared. The festival marks a lot of enjoyment including shopping wearing new cloths, gift sharing and social gatherings.

vii. Eid-ul-Azha

Eid-ul-Azha also called the “Festival of Sacrifice” is the second of two Islamic festivals celebrated worldwide each year. It honors the willingness of Hazrat Ibrahim to sacrifice his son as an act of obedience to the command of Almighty Allah. But, before Ibrahim could sacrifice his son, Almighty Allah provided a lamb to sacrifice instead. In commemoration of this, an animal is sacrificed by Muslims. The meat from the sacrificed animal is preferred to be divided into three parts. The family retains one third of the share, another one third is given to relatives, friends and neighbors and other remaining is given to the poor and needy people.

viii. Eid-Milladun Nabi

Eid-Milladun Nabi is the observance of birthday of the Holy Prophet Hazrat Muhammad (Peace be upon him) on 12th Rabi-ul-Awwal, the third month of the Islamic calendar. State and religious organizations, Milad committees and individual plan a large number of activities comprising processions, seminars, conferences, discussions and program to mark the annual event. The sacred day

begins with offering of special prayers in mosques offer upholding and flourishing of Islam and religious teachings, unity, solidarity, progress and welfare of the Muslim Ummah. Numerous Eid Milladun Nabi (Peace be upon him) processions take out across the country and Mehfil-e-Milad are held to celebrate the occasion. All streets and roads as well as bazaars, shopping centres, and government/private buildings are beautifully decorated and illuminated with lights colourful banners bearing the celebrations of Eid-Milladun Nabi (PBUH).

ix. Shab-e-Bra'at

Literally Shab-e-Bra'at means the night of salvation or the night of freedom from the fire of Hell. It occurs in Mid-Shahban between the 14th day of Shaban which is eighth month of Islamic calendar. Muslim observes it as night of worship and salvation. Some people spend whole night awake and worship. During this night teachings of Holy Prophet (PBUH) tell us that Almighty Allah determines the destiny of all people, including whether a person is to live or die in the coming year.

x. Basant

Basant festival is considered to be a seasonal festival and celebrated to mark the beginning of spring. In Punjab Basant Panchami has been a long established tradition of flying kites. Through this festival people welcome the spring by flying colourful kites, eating sweets dishes and wearing yellow dresses. Historically Maharaja Ranjit Singh one of the rulers of Punjab held an annual Basant fair and introduced kite flying as a regular feature of the fair. Maharaja Ranjit Singh and his wife Moran used to dress in yellow and fly kites on Basant. The association of kite flying with Basant soon became a Punjabi tradition with the centre in Lahore which had been remained the regional hub of the festival for a long time.

9.7 Natural Tourism

Heritage is that which is inherited from past generations, maintained in the present, and bestowed to future generations. The heritage tourism, which falls under the purview of cultural tourism is one of the most prominent and widespread types of tourism. Further it is among the very oldest forms of travel whose linkages are well attested from the ancient times. In this context the Natural Heritage consist of physical and biological formations or groups of formations, geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants. In fact it refers to the sum of the elements of biodiversity, including flora and fauna, ecosystems and geological structures. It forms part of our natural resources. The 1972 UNESCO World Heritage Convention established that biological resources, such as plants, are the common heritage of mankind. This Convention mentions about the preservation of Cultural and Natural Heritage in these words: "need to be preserved as part of the world heritage of mankind as a whole."

Natural resources are resources that exist without any actions of humankind. This includes all valued characteristics such as commercial and industrial use, aesthetic value, scientific interest and cultural value. On Earth, it includes sunlight, atmosphere, water, land (includes all minerals) along with all vegetation, and animal life. Natural resources can be part of our natural heritage or protected in nature reserves. Natural resources may be further classified in different ways. Further, Natural resources are materials and components (something that can be used) that can be found within the environment. Every man-made product is composed of natural resources (at its fundamental level). A natural resource may exist as a separate entity such as fresh water, air, as well as any living organism such as a fish, or it may exist in an alternate form that must be processed to obtain

the resource such as metal ores, rare-earth elements, petroleum, and most forms of energy.

There are various methods of categorizing natural resources. These include the source of origin, stage of development, and by their renewability. On the basis of origin, natural resources may be divided into two types:

- i. Biotic — Biotic resources are obtained from the biosphere (living and organic material), such as forests and animals, and the materials that can be obtained from them. Fossil fuels such as coal and petroleum are also included in this category because they are formed from decayed organic matter.
- ii. Abiotic – These resources are those that come from non-living, non-organic material. Examples of abiotic resources include land, fresh water, air, rare-earth elements, and heavy metals including ores, such as gold, iron, copper, silver, etc.

9.8 Natural Tourism of Pakistan

The northern highlands of Pakistan include lower elevation areas of Potohar and Azad Jammu and Kashmir regions and higher elevation areas embracing the foothills of Himalayan, Karakorum and Hindukush mountain ranges. These areas provide an excellent habitat for wildlife in the form of alpine grazing lands, sub-alpine scrub and temperate forests.

Some of the wildlife species found in northern mountainous areas and Pothohar Plateau include the bharal, Eurasian lynx, Himalayan goral, Marco Polo sheep, marmot (in Deosai National Park) and yellow-throated marten and birds species of chukar partridge, Eurasian eagle-owl, Himalayan monal and Himalayan snow cock and amphibian species of Himalayan toad and Muree Hills frog. Threatened

species include the snow leopard, Himalayan brown bear, Indian wolf, rhesus macaque, markhor, Siberian ibex and white-bellied musk deer. Bird species present are cheering pheasant, peregrine falcon and western tragopan.

The Indus River and its numerous eastern tributaries of Chenab, Ravi, Sutlej, Jhelum, Beas are spread across most of Punjab. The plain of the Indus continues towards and occupies most of western Sindh. The plains have many fluvial landforms (including bars, flood plains, levees, meanders and oxbows) that support various natural biomes including tropical and subtropical dry and moist broadleaf forestry as well as tropical and xeric shrublands (deserts of Thal and Cholistan in Punjab, Nara and Thar in Sindh). The banks and stream beds of the river system also support riparian woodlands that exhibit the tree species of kikar, mulberry and sheesham. Such geographical land forms accompanied by an excellent system of monsoon climate provide an excellent ground for diversity of flora and fauna species. However, the plains are equally attractive to humans for agricultural goals and development of civilization.

Some of the non-threatened mammal species includes the nilgai, red fox and wild boar, bird species of Alexandrine parakeet, barn owl, black kite, myna, hoopoe, Indian peafowl, Indian leopard, red-vented bulbul, rock pigeon, shelduck and shikra, reptile species of Indian cobra, Indian star tortoise, Sindh krait and yellow monitor and amphibian species of Indus Valley bullfrog and Indus Valley toad. However, some of the threatened mammal species include the, axis deer, blackbuck (in captivity; extinct in wild), hog deer, dholes, Indian pangolin, Punjab urial and Sindh ibex, bird species of white-backed vulture and reptile species of black pond turtle and gharial. Grey partridge is one of the few birds that can be found in the Cholistan desert. Mugger crocodiles inhabit the Deh Akro-II Desert Wetland Complex, Nara Desert Wildlife Sanctuary, Chotiari Reservoir and Haleji Lake.

The Western region of Pakistan is enveloped in Balochistan province, has a complex geography. In mountainous highlands, habitat varies from conifer forests of deodar in Waziristan and juniper in Ziarat. Thenumerous mountain ranges surround the huge lowland plains of Balochistani Plateau, through which a rather intricate meshwork of seasonal rivers and salt pans is spread. Deserts are also present, showing xeric shrubland vegetation in the region. Date palms and ephedra are common flora varieties in the desert. The Balochistan leopard has been described from this region. Some of the mammal species include the caracal, Balochistan dormouse, Blanford's fox, dromedary camel, goitered gazelle, Indian crested porcupine, long-eared hedgehog, markhor, ratel, and striped hyena, bird species of bearded vulture, houbara bustard and merlin, reptile species of leopard gecko and saw-scaled viper and amphibian species of Balochistan toad.

There are a number of protected wetlands (under Ramsar Convention) in Pakistan. These include Tanda Dam and Thanedar Wala in Khyber Pakhtunkhwa, Chashma Barrage, Taunsa Barrage and Uchhali Complex in Punjab, Haleji Lake, Hub Dam and Kinjhar Lake in Sindh, Miani Hor in Balochistan. The wetlands are a habitat for migratory birds such as Dalmatian pelicans and demoiselle crane as well as predatory species of osprey, common kingfisher, fishing cat and leopard cat near the coast line. Chashma and Taunsa Barrage Dolphin Sanctuary protect the threatened Indus river dolphins which live in freshwater.

The east half of the coast of Pakistan is located in the south of Sindh province which features Indus River Delta and coast of Great Rann of Kutch. The largest saltwater wetland in Pakistan is the Indus River Delta. Unlike many other river deltas, it consists of clay soil and is very swampy. West coast of Great Rann of Kutch, east to the Indus River Delta and below Tharparkar desert, is one of the few places where greater flamingos come to breed. The vegetation of Indus River

Delta is mainly represented by various mangrove species and bamboo species. The Indus River Delta-Arabian Sea mangroves are a focused eco region of WWF. Nearly 95% of the mangroves located in the Indus River Delta are of the species *Avicennia marina*.

The west half of the Pakistan coast is in the south of Balochistan province. It is also called the Makran coast and exhibits protected sites such as Astola Island and Hingol National Park. The three major mangrove plantations of Balochistan coast are Miani Hor, Kalamat Khor and Gwatar Bay. Miani Hor is a swampy lagoon on the coast in the Lasbela district where the climate is very arid. The sources of fresh water for Miani Hor are the seasonal river of Porali. The nearest river to the other lagoon, Kalamat Khor, is the Basol River. Gawatar, the third site, is an open bay with a mouth almost as wide as its length. Its freshwater source is the Dasht River, the largest seasonal river of Baluchistan. All three bays support mainly *A. marina* species of mangrove.

Along the shores of Astola and Ormara beaches of Balochistan and Hawk'e Bay and Sandspit beaches of Sindh are nesting sites for five endangered species of sea turtles. Sea snakes such as yellow-bellied sea snake are also found in the pelagic zone of the sea. The wetlands of Pakistan are also a home to the mugger crocodile that prefer freshwater habitat.

The areas of Gilgit-Baltistan and Central Karakorum Park are one of the most preferred tourist destinations in the world. The Central Karakorum National Park is a mountain area endowed with rich biodiversity, natural beauty, important resources and unique cultural and natural heritage. The Park encompasses the world's largest glaciers, outside the Polar Regions. It was declared as National Park in 1993 which today is the largest protected area of Pakistan covering over 10,557.73 sq km and the highest park all over the world. It is characterized by

extremes of altitudes that range from 2000 meter above sea level to over 8,000 meter above sea level including K2, the second highest peak in the world.

The Central Karakoram National Park is however, the highest protected area as well as unique natural heritage of Pakistan. This area belong to an area rich in history and culture that evolved over time under diverse cultural influences and traditions which left their mark from the 5th millennium BCE onwards. It covers over 10,000 kilometers square in the central Karakorum mountain range, notable for its natural environment and cultural as well as natural heritage. It falls within four administrative districts of Gigit-Baltistan namely; Ganche, Skardu, Gilgit and Hunza-Nagar. The area include the world's largest glaciers systems outside the Polar Regions and it is characterized by extreme of latitudes that range from 2,000 to over 8,000 meter above sea level, with four peaks over 8000 meters, including K2 being the second highest peak in the world. The great altitudinal range and the climatic conditions of the area have carved out distinctive environment and eco systems with a big variety of flora species ranging from endemic herbs and chiefly perennial grasses to coniferous forests, several threatened and rare species of wild animals and birds, mostly endemic to Karakoram. The snow leopard, Brown bear, Ladakh urial, Astore Markhor Himalayan blue sheep and Himalayan ibex represent the key mammalian fauna.

The Gigit-Baltistan region has one of the most diverse avifauna of the mountainous regions of the world. Around 90s pecies of birds are known to occur in the Central Karakoram Park in 13 families. Their occurrence status varies from resident to breeder to migratory. Common snow cock, Chukar, rock pigeon, snow pigeon oriental turtle dove, booted eagle, and common kestrel are among the common resident birds of the area. Common hoopoe, common cuckoo, common swift and Eurasian skylark, Spanish sparrow, Himalayan accentor, Eurasian goldfinch and pine bunting are winter visitors to the area. Some rare birds include

Snow partridge, Himalayan Monal, Golden Eagle, Alpine Accentor and Humer's Wheatear. Alpine and moraine lakes are important stopovers on the Indus flyway hence becoming one of the largest migratory birds routes in the world. Both migratory and resident birds are observable in the area.

Among the landscapes that characterize the territories of the Karakorum, the glaciers are an essential part. The numerous and vast glaciers cover more than 16,500 square kilometers. The glaciers constitute the largest glacial system outside the Polar Regions and represent a reserve of water that is vital to all surrounding areas for which that were defined as "water towers of mankind".

Self Assessment Questions

- Q. No.1.** Define the term tourism and highlight the potential of Tourism in Pakistan.
- Q. No.2.** What do you know about Prehistoric sites, explain its importance in the cultural history of Pakistan?
- Q. No.3.** Discuss Pre-Muslim sites and monuments of Pakista, how it contribute to the cultural profile of the country? Discuss.
- Q. No.4.** What do you know about UNESCO cultural heritage sites in Pakistan? Explain their importance.
- Q. No.5.** Evaluate the scope and importance of Muslim period monuments in Pakistan
- Q. No.6.** Discuss the famous folk heritage festival of Pakistan.
- Q. No.7.** What do you know about natural tourism? Discuss its types and potential in Pakistan.

Bibliography

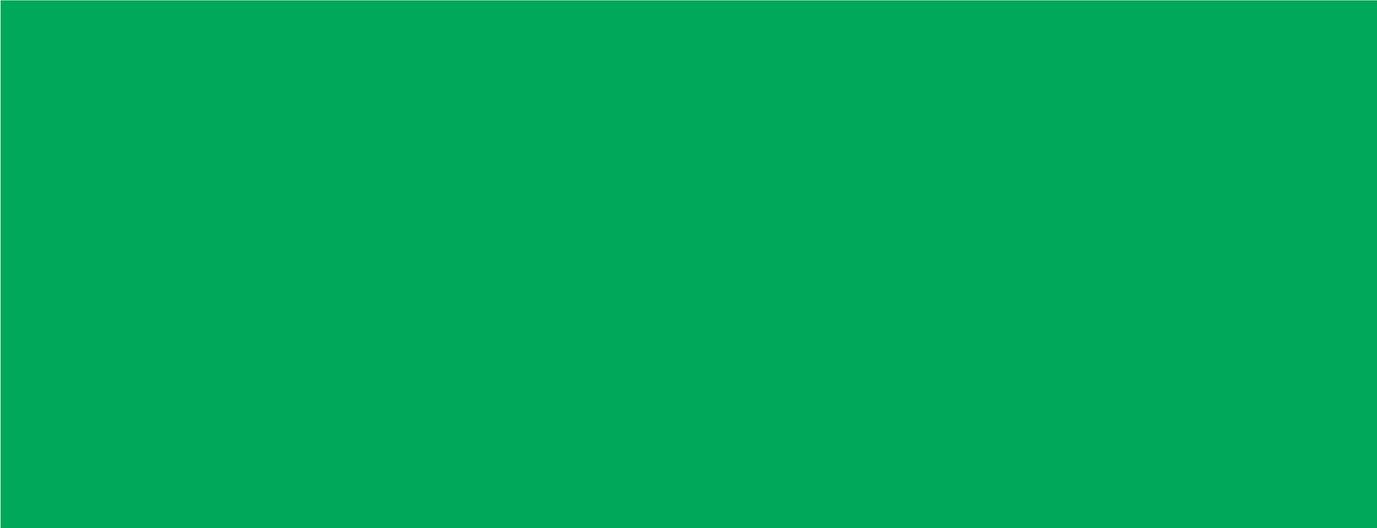
- Bridget and R. Allchin, (1985) *The Rise of Civilization in India and Pakistan*, Cambridge University Press Cambridge, (First pub. 1982)
- Halim, M. A., (1970-71) *Excavations at Sarai Khola, Part-I*, Pakistan Archaeology No. 7. Department of Archaeology and Museums, Karachi.
- Invernizzi, Ermes & Locatelli, Michele (2015) *Central Karakoram National Park, Natural Environment and Cultural Heritage in the Land of K2*, PIPS (Pvt) Ltd. Ev-K2-CNR Pakistan, Islamabad.
- Johnson, E., (1973) *Notes on a Palaeolithic Site Survey in Pakistan*, Asian Perspectives, 15: 60-65.
- Kalhor, Z. A., (2010) *Hindu and Sikh Architecture in Islamabad*, Journal of Asian Civilizations Vol. 33, No.1, Quaid-i-Azam University, Islamabad.
- Khan, F. A. (1965) *Excavations at Kot Diji*, Pakistan Archaeology, No. 2, Department of Archaeology and Museums, Karachi.
- Khan, G. M., (1987-88) *New Elements of Chronology in Taxila Valley*, Pakistan Archaeology No. 23, Karachi, Department of Archaeology and Museums, Karachi.
- Khan, M. B. et al. (2002), *Bhir Mound: The First City of Taxila* (Excavations Report 1998-2002), Department of Archaeology and Museums Gov. of Pakistan & NFCH, Islamabad.
- Marshall, J. (1931) *Mohenjo-Daro and the Indus Civilization*, (Vol. I), London.
- Marshall, S. J., (1951) *Taxila*, 3.vol, Cambridge University Press.
- Mughal, M. Rafique (1972a) *Exploration at Jalilpur*, Pakistan Archaeology, No-8, Department of Archaeology and Museums Pakistan, Karachi
- Mughal, M. Rafique (1972b) *Exploration in Central Punjab*, Pakistan Archaeology, No-8, Department of Archaeology and Museums Pakistan, Karachi
- Mughal, M. Rafique (1991) *Ancient Sites in Cholistan, Bahawalpur* (1974-77 Survey), Lahore Museum Bulletin Vol 4, (2): 1-152, Lahore

- Mughal, M. Rafique (1997a) *Ancient Cholistan: Archaeology and Architecture*, Feroz Sons (pvt) Ltd. Lahore
- Mumtaz, K. K. (1985) *Architecture in Pakistan*, Mimar Book, Concept Media Ltd, Singapore
- Nadiem, I. H. (1995) *Rohtas Formidable Fort of Sher Shah*, Sang-E-Meel Publications, Lahore
- Peterson, A. (1996) *Dictionary of Islamic Architecture*, Rutledge, London.
- Rasool, N (1996), *Pakistan Archaeology (Special Number)*, Vol. 29 (1994-1996) Department of Archaeology and Museums Gov. of Pakistan. Karachi.
- Rehman, A., M. W. Meister and Farid Khan (1998) *Temples of the Indus and the Salt Range: A Fresh Probe (1995-97)*, The Pakistan Heritage Society News Letter, No 1, Peshawar
- Salim, M., (1981) *Hand Axe Collection in Pakistan*, Journal of Central Asia, 4, No. 1: 77-81. Islamabad
- Salim, M., (1986) *Middle Stone Age Sites in the Meyal Oilfield in Attock District*, Journal of Central Asia, 9, No. 1: 107-119. Islamabad
- Sardar, B. (1992) *Decorative Motifs of the Harappan Ceramics*, Journal of Pakistan Archaeologists Forum, vol. I, Karachi.
- Shaikh, N. Veesar, G. M. & Q. H. Mallah, (2004-2005) *The Excavation of Indus Period Site Lakhan-Jo-Daro 2006'*, Ancient Sindh, Vol.8, Shah Abdul Latif University, Khairpur (Sindh)
- Sharif, M. (1990) *Archaeological Explorations Around Multan-1989*, Pakistan Archaeology, No-24, Department of Archaeology and Museums Pakistan, Karachi
- Stacul, G. (1985) *A Harappan Post-Urban Outpost in the Swat Valley*, South Asian Archaeology 1983, Vol. XXIII, Naples.
- Stacul, G. (2005) *Symbols of early Swat (c. 1700-1400)*, South Asian Archaeology 2003, Aachen, Germany
- Terra, H., & T T. Peterson (1939) *Studies in the Ice Age of India and Associated Human Cultures*, Washington DC, Carnegie Institute of Washington DC.
- Vats, M. S. (1940) *Excavation at Harappa*, Delhi.

Prescribed and Recommended Books

1. Joukowsky, M.A. *Complete Manual of Field Archaeology, USA, 1980.*
2. Renfrew, C. and Bahn, P. *Archaeology: Theories, Methods and Practice*, Thames and Hudson, London, 1991.
3. Wheeler, R. E. M. *Archaeology from the Earth*, London, 1961.
4. Abdur Rahman, *The Last two Dynasties of the Śāhis*, Islamabad, 1979.
5. Basham, A. L. *The Wonder that was India*, rpt. India, 1963.
6. Dani, A.H. *History of Northern Areas of Pakistan*,
7. Majumdar, R. C. et. al. *An Advanced History of India, Part-I*, London, 1960.
8. Nasim Khan, M. *Treasures from Kashmir Smast – The Earliest Shivaite Monastic Establishment*. Peshawar. 2006
9. Nasim Khan, M. *Kharoshthi Manuscripts from Gandhara* (Rprt.). Peshawar 2009.
10. Nasim Khan, M. *The Sacred and the Secular. Investigating the Stupa and Settlement Site of Aziz, Peshawar Valley, Khyber Pukhtoonkhwa* (3 vols). Peshawar. 2010.
11. Dani, A.H. *The Cultural History of Northwest Paksitan*, Year Book of the American Philosophical Society, Philadelphia, 1960.
12. Smith, V. A. *The Early History of India, from 600 BC to the Muhammad Conquest*, Oxford, 1967.
13. Thapar, R. *A History of India*, vol. 1, Penguin Books, New York, 1979.
14. Agrawal, D. P. and Chakrabarti, D. K., eds. *Essays in Indian Protohistory*, Delhi, 1979.
15. Agrawal, D. P. *Archaeology of India*, Great Britain, 1985.
16. Agrawal, D. P. *The Copper-Bronze Age in India*, Delhi, 1971.
17. Allchin, B. and Allchin, R. *The Birth of Indian Civilization*, London, 1968.
18. Allchin, B. and Allchin, R. *The Rise of Civilisation in India and Pakistan*, Cambridge University Press, 1982.
19. Allchin, F. R. *Lewan and the Bannu Basin*, Oxford, 1986.
20. Allchin, F. R. *Neolithic Cattle-Keepers of South India*, Cambridge, 1963.

21. Allchin, F.R., Allchin, B., Durrani, F. A. and Khan, F. *Lewan and the Bannu Basin*, Great Britain, 1986.
22. *Ancient Pakistan*, University of Peshawar, (relevant volumes.).
23. Asthana, S. *Pre-Harappan Cultures of India and the Borderlands*, New Delhi, 1985.
24. Chakrabarti, D. K. *The External Trade of the Indus Civilisation*, Delhi, 1990.
25. Dales, G. F. and Kenoyer, M. *Excavations at Moenjodaro, Pakistan: the Pottery*, Pennsylvania, 1986.
26. Dani, A. H. *Indus Civilization—New Perspective*, Islamabad, 1981.
27. Fairservis, W. A. *The Roots of Ancient India*, 2nd ed., Chicago, 1975.
28. Fairservis, W. A. *The Origin, Character and Decline of an Early Civilization*, 1967.
29. Gupta, S. P. *Archaeology of Soviet Central Asia and the Indian Borderland*, Vols. I & II, Delhi, 1979.
30. Jacobson, J., ed., *Studies in the Archaeology of India and Pakistan*, New Delhi, 1986.
31. Kenoyer, M. *Ancient Cities of the Indus Valley Civilization*, Oxford, 1998.
32. Khan, F. A. *The Glory that was Harappa*, Karachi, n.d.
33. Khan, F. A. *Preliminary Report on KotDiji Excavations 1957-8*, Karachi, 1958.
34. Khan, F. A. *The Indus Civilization and Early Iran*, Karachi, 1964.
35. Khan, F. A. *The KotDiji Culture*, Khairpur University, 2002.
36. Lal, B. B. *The Earliest Civilization of South Asia*, New Delhi, 1997.
37. Mackay, E.J. *Further Excavations at MohenjoDaro*, Delhi, 1938.
38. Mackay, E.J. *Chanhudaro Excavation 1935-36*, New Haven, 1943
39. Marshall, J. *MohenjoDaro and the Indus Civiisation*, London, 1931.
40. Mughal, M. R. *Ancient Cholistan*, Lahore, 1998.
41. Mughal, R. *Present Stage of Research on the Indus Valley Civilisation*, Karachi, 1973.



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Faculty of Social Sciences & Humanities